New Mexico State University

Las Cruces Campus
Academic Catalog
2026-2027

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COMM-COMMUNICATION 1680

CSCI-COMPUTER SCIENCE 1686

CTEC-CYBER TECHNOLOGY 1703

CTFM-CLTHNG/TXTLS/FSHN MRCHDSG 1704

DANC-DANCE 1705

DHYG - DENTAL HYGIENE/HYGIENIST 1712

DRFT-DRAFTING 1717

E E-ELECTRICAL ENGINEERING 1723

E T-ENGINEERING TECHNOLOGY 1739

ECDV-ECONOMIC DEVELOPMENT 1753

ECED-EARLY CHILDHOOD EDUCATION 1754

ECON-ECONOMICS 1767

EDLT-EDUCATIONAL TECHNOLOGY 1770

EDUC-EDUCATION 1773

ELAD-EDUCATIONAL LEADERSHIP ADMINISTRATION 1784

ELT - ELECTRONICS TECHNOLOGY 1791

ELTR-ELECTRICAL 1794

ENGL-ENGLISH 1796
ENGR-ENGINEERING 1809
ENTR-ENTREPRENEURSHIP AND INNOVATION 1812
ENVE-ENVIRONMENTAL ENGINEERING 1812
ENVS-ENVIRONMENTAL SCIENCE 1814
EPWS-ETMLGY/PLNT PTHLGY/WD SCI 1816
FCSC-FAMILY & CONSUMER SCI 1822
FCST-FAMILY AND CHILD STUDIES 1823
FDMA-FILM & DIGITAL MEDIA ARTS 1829
FIRE-FIRE INVESTIGATION 1844
FREN-FRENCH 1849
FSTE-FOOD SCIENCE & TECHNOLOGY 1852
FWCE-FISH,WILDLF,CONSERV ECOL 1857
FYEX-FIRST YEAR EXPERIENCE 1865
G S-GRADUATE STUDIES 1867
GENE-GENETICS 1868
GEOG-GEOGRAPHY 1869
GEOL-GEOLOGY 1881
GNDR-WOMEN'S STUDIES 1885
GPHY-GEOPHYSICS 1889
GREX-GRAD CROSS UNIV EXCH 1889
GRMN-GERMAN 1889
HESC - HEALTH EQUITY SCIENCES 1891
HIST-HISTORY 1893
HLED-HEALTH EDUCATION 1906
HMRT-HUMAN RIGHTS 1906
HMSV-HUMAN SERVICES 1908
HNRS-HONORS 1908
HORT-HORTICULTURE 1918
HOST-HOSPITALITY AND TOURISM 1922
HRTM-HOTEL/RESTRNT/TOURISM MGT 1926
HVAC-HEATING/AC/REFRIGERATION 1936
I B-INTERNATIONAL BUSINESS 1938
I E-INDUSTRIAL ENGINEERING 1939
ICT-INFO &COMMUNICATION TECH 1947
INST-INSTRUMENT & CONT TECH 1951
INTR-INTERDISCIPLINARY STUDIES 1952
JAPN-JAPANESE 1952
JOUR-JOURNALISM 1953
L SC-LIBRARY SCIENCE 1959
LANG-LANGUAGE 1960
LAWE-LAW ENFORCEMENT 1960
LIBR-LIBRARY SCIENCE 1962
LING-LINGUISTICS 1962
M E-MECHANICAL ENGINEERING 1963
MAT-AUTOMATION & MANUFACTURING 1970
MATH-MATHEMATICS 1971
MGMT-MANAGEMENT 1983
MKTG-MARKETING 1988
MLSL-MILITARY SCIENCE 1996
MOLB-MOLECULAR BIOLOGY 2001
MUSC-MUSIC 2002
NATV-NATIVE AMERICAN STUDIES 2016
NAV-NAVAJO 2018
NGEC-NATURAL GAS ENGINE COMP 2018
NMNC-NEW MEXICO NURSING EDUCATION CONSORTIUM 2019
NURS-NURSING 2022
NUTR-NUTRITION 2045
OECS-COMPUTER TECHNOLOGY 2052
OETS-TECHNICAL STUDIES 2053
PHED-PHYSICAL EDUCATION 2054
PHIL-PHILOSOPHY 2055
PHLS-PUBLIC HEALTH SCIENCES 2058
PHYS-PHYSICS 2068
PL-S-PARALEGAL SERVICES 2079
PLEN-PLANT,ENVRMTL SCIENCES 2081
POLS-POLITICAL SCIENCE 2083
PORT-PORTUGUESE 2091
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RADT-RADIOLOGIC TECHNOLOGY 2097
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RGSC-RANGE SCIENCE 2108
RXPP-PRESCRIP PRIV PRAC PSYCH 2113
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SUR-SURVEYING 2188
TBGD-TRANSBORDER & GLOBAL HUMAN DYNAMICS 2191
TCEN-ENVIRONMENTAL/ENERGY TECH 2192
THEA-THEATER 2194
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WELD-WELDING TECHNOLOGY 2203
WSAM-WATER SCIENCE & MGT 2205
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LAS CRUCES ACADEMIC CATALOG

This catalog is the student's guidebook to earning a degree or other academic credential. The catalog contains three important parts: (1) the official listing of NMSU's academic programs and their requirements, (2) a listing of the courses offered at NMSU with descriptions and prerequisites, and (3) other information essential for student success including many of the rules and regulations that govern the student's academic journey at NMSU.

As with any other journey, advance planning is essential. To avoid wrong turns and lost time, each student must chart their own path, with the help of their academic advisors and this guidebook. Each student is responsible for planning an academic program of study in compliance with university, community college, college and departmental requirements as set forth in the Catalog. In addition, each student is obligated to abide by the Academic Rules and Regulations as set forth in the Catalog, as well as the Student Social Code of Conduct, as set forth in the Student Handbook (available through the Dean of Students website).

Upon proper application and payment of fees, students will be awarded academic degrees and designations when the completion of the academic program requirements is verified by the relevant NMSU academic unit. Degrees and designations may be awarded under any catalog in effect on the date of degree or designation completion, provided that the catalog year is the same or subsequent to the year in which the student was first enrolled.

The academic program requirements of each catalog are effective for a period of eight academic years. This 2026-2027 Catalog is effective summer 2026 through spring semester 2034. All other catalog content, including rules, regulations, course descriptions and prerequisites are effective only for the catalog's denoted academic year. While content changes are typically implemented between Catalog years, the catalog does not represent a contract and NMSU reserves the right to make modifications to the catalog at any time.

Academic programs at the New Mexico State University System are available to all students without regard to age, ancestry, color, disability, gender, national origin, race, religion, sexual orientation or veteran status.

Associate Registrar: Gabrielle Martinez
Graduation & Curriculum Data Specialist: Daniela Lucero

University Leadership

NEW MEXICO STATE UNIVERSITY SYSTEM

President

Valerio Ferme, President of the NMSU System

Board of Regents

Michelle Lujan Grisham, Governor of New Mexico, Ex Officio Regent from Santa Fe.

Ammu Devasthali, Chair of Regent from Las Cruces, NM for term expiring December 31, 2028.

Deborah Romero, Vice Chair of Regent from Santa Fe, NM for term expiring December 31, 2026.

Christopher Saucedo, Secretary/Treasurer from Albuquerque, NM for term expiring December 31, 2026.

Marisol Olivas, Member from Belen, NM for term expiring December 31, 2026.

Ricardo Gonzales, Member from Las Cruces NM for term expiring December 31, 2030.

Provost/Academic

TBA, Chief Academic Officer & Provost

James McAteer, Deputy Provost

Tara Gray, Associate Provost for Faculty Development

Cecilia Hernandez, Associate Provost for Institutional Effectiveness

Chancellors

Monica Torres, Chancellor, Community College System

Vice Presidents/Provosts

Patricia Sullivan, Vice President for Research, Creativity & Economic Development

Sylvia Acosta, Chief Executive Officer, Foundation

Teresa Maria Linda Scholz, Vice President for Office of Land Grant Inclusive Mission

Allen Bottorff, Interim Vice President of Administration and Finance

Deans

Bryan Ashenbaum, Dean, Business College

Phame Camarena, Dean, Honors College and Undergraduate Research

Kevin Comerford, Dean, Library

Rolando Flores-Galarza, Dean, Agricultural, Consumer and Environmental Sciences College

David Jauregui, Interim Dean, Engineering College

Ranjit Koodali, Dean, Graduate School

Enrico Pontelli, Dean, Arts and Sciences College

Rick Marlatt, Dean, Health, Education and Social Transformation College

COMMUNITY COLLEGES ADMINISTRATION

Alamogordo

Mark P. Cal, Vice President Academic Affairs

Jessica Morales, Vice President Student Success

Antonio A. Salinas, Vice President Business & Finance

Dona Ana

Kelly Brooks, Vice President Business & Finance

Shannon Bradley, Acting Vice President of Academic Affairs

Amadeo "Ike" Ledesma, Vice President Student Services

Grants

Marlene Chavez-Toivanen, Vice President Academic Affairs

Priscilla Arungwa, Vice President Student Services

The History of the University

New Mexico State University (NMSU) was founded in 1888 as the state's land-grant university. Through serving the educational needs of New Mexico's diverse population, NMSU has provided comprehensive programs of education, research, extension education and public service. Upon its founding, NMSU was known as Las Cruces College and later renamed New Mexico College of Agriculture and Mechanic Arts. In 1960, the constitution of New Mexico formally recognized the institution as NMSU. Today, NMSU is a major institution of higher education. Throughout its history, the university has preserved many traditions of its land-grant origin while also increasing emphasis on the fine arts, humanities, social and natural sciences.

For more history, points of pride, and the ranking of New Mexico State University please visit the About NMSU (https://nmsu.edu/about/) page of the university website.

Mission

The mission of the New Mexico State University system is to serve the diverse needs of the state through comprehensive programs of education, research, extension and outreach, and public service. As the state's land-grant and space-grant university, and as a Hispanic Serving Institution, NMSU fosters learning, inquiry, diversity and inclusion, social mobility, and service to the broader community.

Vision

By 2025, the NMSU system will excel in promoting social mobility for our diverse student populations, achieve the highest Carnegie research status (R1), and maintain our Carnegie Community Engagement classification.

Values

- **Leadership:** Promoting and creating the ability for Aggies to shape the future
- **Excellence:** Providing the highest level of education, research, outreach, and service
- **Access:** Welcoming diverse populations to higher education and to the NMSU community
- **Diversity & Inclusion:** Embracing our differences as an asset and actively seeking to include wide-ranging perspectives
- **Student-Centered:** Supporting the education of our students through every aspect of our university, every day

These values are encapsulated as: BE BOLD. Shape the future.

Accreditation

New Mexico State University has been accredited by The Higher Learning Commission (HLC) since 1926. The HLC may be contacted at:

The Higher Learning Commission
230 North LaSalle St.
Suite 7-500
Chicago, IL 60604-1411
Phone: (800) 621-7440

In addition, the university maintains various specialized and professional accreditations, as listed at the beginning of each college section in the catalog, and as found at https://accreditation.nmsu.edu/Accreditation%20at%20NMSU/Specialized%20Accreditation/index1.html.

NMSU Graduation and Retention Rates

These rates may be found on the NMSU Institutional Research website at: https://oia.nmsu.edu/.

Programs A-Z

Academic Programs

Associate Degree Programs

NMSU awards both designated and undesignated associate degrees following completion of at least 60 semester credits (excluding "N" suffix courses). Please see the NMSU System Academic Regulations & Policies (p. 31) section of the catalog for specific information about Associate Degree Program graduation requirements. (Service personnel enrolled under the two-year Servicemembers Opportunity College Program may be exempt from this requirement.)

The designation Meritorious Graduate is awarded to the top 15 percent of the students receiving associate degrees within each college in any one academic year; the students must have completed 45 or more credits with computable grades at NMSU.

Las Cruces Campus

Detailed information on admission requirements, curricula, and associate degree or certificate requirements will be found in the section of this catalog devoted to the administering department/college.

- **Associate of Arts**
  Administered by the Community Colleges
- **Associate of Fine Arts**
  Administered by the Community Colleges
- **Associate of Science**
  Administered by the Community Colleges
- **Associate of Science in Engineering Technology**
  Administered by the College of Engineering

Designated Associate Degrees

The following designated associate degrees are granted to students completing the specified requirements of the degree.

- **Associate in Art and Graphic Design**
  Administered by the Community Colleges
- **Associate in Criminal Justice**
  Administered by the Community Colleges
- **Associate in Education**
  Administered by the Community Colleges
- **Associate in Pre-business**
  Administered by the College of Business
- **Associate of Arts in Heritage Interpretation**
  Administered by the Community Colleges

Community Colleges

The Associate of Pre-Business degree offered on the Las Cruces campus is also available at the Dona Ana Community College. For more information on community college campus offerings, refer to the "Community Colleges (p. 1487)" chapter in this catalog and to their respective catalogs or admissions offices.

Please see the Community College Catalogs for more information about the Associate Degree Programs.

- Alamogordo Catalog (https://catalogs.nmsu.edu/alamogordo/)
- Dona Ana Catalog (https://catalogs.nmsu.edu/dona-ana/)
- Grants Catalog (https://catalogs.nmsu.edu/grants/)

Undergraduate Programs

For a full listing of all Undergraduate Programs offered at New Mexico State University, please see the Undergraduate Admissions webpage http://admissions.nmsu.edu/academics/.

Graduate Degree Programs

For a full listing of the Graduate Programs offered at New Mexico State University, please see the Graduate Admissions webpage (https://nmsu.edu/degree-programs/)

Academic Minors

Students seeking a degree may elect to complete one or more minors from those available, and the minor(s) will be designated on their transcripts. Minors cannot be earned after a degree has been conferred. A minor may be in a single department or may be interdepartmental. Specific requirements for minors are available in the Academic Catalog, please see the College sections for each college's complete list of the minors offered.

Programs offered at New Mexico State University

Program are titled in the following styles:

- **Agricultural Biology (Applied Biology) - Bachelor of Science in Agriculture**
  - Major Title (Agricultural Biology), will appear on diplomas and transcripts.
  - Concentration Title (Applied Biology), will appear on transcripts.
  - Degree Title (Bachelor of Science in Agriculture), will appear on diplomas and transcripts.
- **Animation and Visual Effects - Bachelor of Creative Media***
  - Major Title (Animation and Visual Effects), will appear on diplomas and transcripts.
  - Degree Title (Bachelor of Creative Media), will appear on diplomas and transcripts.
- **Mathematics (Statistics for Data Science) - Bachelor of Science (Online)**
  - Major Title (Mathematics), will appear on diplomas and transcripts.
  - Degree Title (Bachelor of Science), will appear on diplomas and transcripts.
  - Concentration Title (Statistics for Data Science), will appear on transcripts.
  - Online denotes that these programs are a part of NMSU Global Campus.

**Note: that some degrees will have emphasis, options, pathways, etc. appear on the degree page, but these items will not appear on transcripts.*

- **Brewery Engineering - Undergraduate Minor**
  - Minor Title (Brewery Engineering), will appear on transcripts
  - Minor Level (Undergraduate Minor), corresponds with the level for the coursework required and what level a student must be in to declare the minor

A

- Accounting - Bachelor of Accountancy (p. 981)
- Accounting - Master of Accountancy (p. 93)
- Accounting - Undergraduate Minor (p. 985)
- Advanced Manufacturing - Graduate Minor (p. 253)
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- Aerospace Engineering - Doctor of Philosophy (p. 200)
- Aerospace Engineering - Master of Engineering in Aerospace Engineering (p. 95)
- Aerospace Engineering - Master of Science (p. 96)
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- Agricultural and Extension Education (Agricultural Extension/Development) - Bachelor of Science in Agriculture (p. 341)
- Agricultural and Extension Education - Graduate Minor (p. 254)
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- Agricultural Economics and Agricultural Business - Bachelor of Science in Agriculture (p. 352)
- Agricultural Engineering - Undergraduate Minor (p. 1086)
- Agriculture (Agribusiness) - Master of Agriculture (p. 97)

- Agriculture (Domestic Animal Biology) - Master of Agriculture (p. 98)
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- Algorithm Theory - Undergraduate Minor (p. 669)
- American Government and Politics - Undergraduate Minor (p. 947)
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- Applied and Agricultural Biology (Applied Microbiology) - Bachelor of Science in Agriculture (p. 389)
- Applied and Agricultural Biology (Entomology) - Bachelor of Science in Agriculture (p. 390)
- Applied and Agricultural Biology (Environmental Biology) - Bachelor of Science in Agriculture (p. 391)
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- Applied and Agricultural Biology - Doctor of Philosophy (p. 201)
- Applied and Agricultural Biology - Master of Science (p. 101)
- Applied Mathematics - Supplemental Major (p. 871)
- Applied Statistics - Doctor of Philosophy (p. 203)
- Applied Statistics - Graduate Minor (p. 254)
- Applied Statistics - Master of Science (p. 107)
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- Applied Studies - Bachelor of Applied Studies (p. 527)
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- Business Administration (Health Services Management) - Master of Business Administration (p. 120)
- Business Administration (Information Systems) - Master of Business Administration (p. 121)
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- Chemical Engineering - Master of Science in Chemical Engineering (p. 126)
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- Digital Communications - Graduate Certificate (https://catalogs.nmsu.edu/nmsu/graduate-school/digital-communications-graduate-certificate/)
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Catalog Glossary

A

Academic Calendar

A calendar designating important dates from the start of the fall semester and continuing through the completion of the following summer session.

Academic College:

A degree granting academic unit, generally organized around subject matter, which house related academic Departments and degree programs.

Academic Course:

Courses that count as credit toward a degree, or other academic credential such as a certificate, concentration or minor.

Academic Department:

An academic unit, generally organized around subject matter, which house related degree programs and report to an Academic College.

Academic Integrity:

Behavior that supports and affirms he fundamental values of honor, integrity and ethics.

Academic Probation I:

Registration restrictions of no more than 13 credit hours applied when:

- An Undergraduate student on Academic Warning with a semester GPA less than 2.0, and the cumulative GPA remains below 2.0 at the conclusion of the semester or if the student maintains a semester GPA greater than 2.0 while on Academic Probation I but the cumulative GPA is still less than 2.0. Academic Probation I will also occur if a student falls below a 2.0 cumulative GPA from Good Academic Standing if Academic Warning already occurred in a previous term.
- A graduate student's semester GPA is above a 3.0 and the cumulative GPA drops below 3.0; or when the semester and cumulative GPA's

drop below 3.0 and the previous academic standing is Graduate Academic Good Standing.

Academic Probation II:

Registration restrictions of no more than 7 credit hours applied when:

- An undergraduate student falls below a semester 2.0 GPA and the cumulative GPA remains below a 2.0 while on Academic Probation I, or maintains a semester GPA greater than 2.0 while on Academic Probation II but the cumulative GPA is still less than 2.0.
- A graduate student's semester GPA and the cumulative GPA drops below as 3.0 and the previous academic standing is one of Graduate Academic Probation I or Graduate Re-admit on Probation I.

Academic Standing:

Academic standing is defined by a student's grade point average (GPA). Academic standings at NMSU are:

- Good standing
- Warning
- Probation I
- Probation II
- Suspension

Academic Suspension:

Registration restriction barring students from enrolling in courses at NMSU for, at least, one semester when:

- An undergraduate student does not achieve a semester 2.0 GPA or higher, and the cumulative remains below a 2.0 while under Academic Probation II. Undergraduate students on Academic Suspension must sit out a minimum of 1 semester and apply for re-admission.
- A graduate student is unable to maintain a semester GPA of 3.0 or higher and the cumulative remains below 3.0 GPA while under Graduate Academic Probation II.

Academic Warning (Undergraduate Only):

Notification to an undergraduate student, after final grades are processed, that their cumulative grade point average is below the 2.0 minimum requirement to continue enrollment at NMSU. Issued only once, the first time an undergraduate student's cumulative GPA falls below 2.0 while in good academic standing.

Academic Year

A period of time from the start of the fall semester and continuing through the completion of the following summer session.

Accreditation / Accredited:

Formal recognition of an educational entity that maintains standards qualifying its graduates for further study or professional practice. A university, college or program can be certified as fulfilling certain standards of national and/or regional professional associations.

Admission:

The process of applying and meeting a set of requirements, established by the University, College, and/or degree program, that enable the student to be accepted.

Adjusted Credit Option (ACO):

A policy that allows students who had previously experienced academic difficulty to make a fresh start. The adjusted credit option provides eligible undergraduate students who earned a low grade-point average (less than 2.0 cumulative) during their first few semesters to reset their GPA calculation. This option may be used only once and is not reversible. This option must be approved by the Director of the Center for Academic Advising and Student Support or the Associate Dean/VP for Academics at the student's academic college.

Administrative Withdrawal:

In the event that a student has stopped either attending class or stopped using the online Learning Management System, without formally withdrawing, the University reserves the right to remove the student from the class by means of an administrative withdrawal.

Advanced Placement (AP):

A group of standardized tests assessing college-level knowledge. At NMSU, AP scores may be evaluated for academic transfer credit in accordance with State of NM Higher Education Department guidance.

Advising Document:

An unofficial document of a student's academic record, including courses taken and grades earned from time of admission to end of the last semester attended.

Advisor:

A University employee who helps students make informed and responsible decisions in the pursuit of their academic goals.

Articulation:

The process of evaluating courses to determine whether coursework completed at one college will meet the requirements for admission, transfer credit, general education, or major preparation at another college.

Articulation Agreement:

Agreements between community and four-year colleges which indicate the acceptability of courses in transfer toward meeting specific degree requirements. See https://miniapps.nmsu.edu/transfer/.

Associate Degree (AA/AS/AAS):

A degree, usually, granted by a community college to students who complete a specified program of study totaling a minimum of 60 credit hours of coursework. Academic associate degrees are awarded in arts or science and are designed to prepare a student to transfer to a baccalaureate program and generally cover the first two years of a four-year degree. Applied associate degrees are professional programs designed to prepare students to enter the workforce in a specific field. Associate degrees are sometimes called *two-year degrees,* in contrast to a *four-year or bachelor's degree* awarded by a university.

Asynchronous Class (WB):

A class that is taught fully online, with no requirement for attendance at a specific day/time.

Audit:

A grade mode and enrollment status that carries no course credit. Auditing a class indicates a student is attending for the purpose of reviewing the information. No grades or credits are earned and audited courses cannot be used to meet pre- or co-requisite requirements or count in enrollment verification. Full tuition is charged.

B

Bachelor's (Baccalaureate) Degree (BA/BS):

A level of education marked by the completion of the equivalent of four or more years of full-time education (at least 120 credit hours of coursework) designed to provide the student with a broad educational base as well as knowledge in a specific field. The baccalaureate degree requires coursework to satisfy the New Mexico General Education requirements, New Mexico State University's Viewing a Wider World requirements, and the requirements of the major field of study. Bachelor of Arts (BA), Bachelor of Science (BS), and other named bachelor's degrees are offered by NMSU and many other four-year universities.

Basic Skills:

All undergraduate students must demonstrate Basic Academic Skills in both English and mathematics before enrolling in any upper-division course (numbered 300 or higher). These requirements ensure that each student in the upper-division courses has the ability to succeed without compromising the learning experience of other students.

C

Career Technical Courses (CTE):

Courses that provide students with relevant technical knowledge and skills through applied learning toward the completion of a certificate or applied associates degree.

Catalog:

A student's official guide to programs, courses and policies.

Catalog Year:

The degree requirements for each program are updated and published annually, by academic year. Students must meet the degree requirements in the Catalog that was published the year they were first admitted, or any year thereafter until they graduate. Catalogs expire eight (8) academic years after the year of initial publication.

Canvas (Learning Management System):

A web-based learning management system (LMS) used by NMSU faculty and students to access and manage online course learning materials and communicate about skill development and learning achievement.

CCN (State of NM Common Course Number):

Common numbering system used to identify courses which are often required as lower division preparation for majors. The courses are taught at many colleges and universities in the State of NM. The CCN system allows counselors and students to determine equivalent courses offered at different colleges by referring to the common number.

Certificate:

An award granted upon completion of a prescribed series of courses preparing students for employment in selected occupation/vocational fields which require training beyond high school. A certificate indicates skill competency in a technical career area and may be earned while progressing toward degree.

- **Certificate of Achievement (1 – 15 credit hours):**
  - A program of study less than 16 credits and is not eligible for Federal financial aid. It must provide employment related and/or career enhancing skills necessary to succeed in a job or a chosen field of study. These courses can be a subset of those required for a corresponding Certificate of Completion or Applied Associate's Degree. These certificates are recorded on the student's transcript.
- **Certificate of Completion (16+ credit hours):**
  - A program of study of 16 or more credits that may be eligible for Federal financial aid and has been approved through the University academic review process. These courses can be a subset of those required for a corresponding Applied Associate's Degree. These certificates are recorded on the student's transcript.

Challenge Exam:

Any enrolled student with a cumulative GPA of at least 2.0 currently attending classes may, with permission of the appropriate department, challenge by examination any undergraduate course in which credit has not been previously earned except an independent study, research or reading course, or any foreign language course that precedes the final course in the lower-division sequence. The fee for challenging a course is the same as the approved tuition rate. Courses may not be challenged under the S/U option.

Class:

A scheduled section of a course offered for student enrollment during a particular semester.

Class Delivery Modes:

Classes at NMSU are delivered in a variety of modalities.

- **CL (Classroom/Lecture):** traditional in-person class meetings that occur on specified days and times in a specified location.
- **LB (Lab):** traditional in-person lab meetings that occur on specified days and times in a specified location.
- **HY (Online with In Person Meetings):** hybrid delivery that is offered both online and with required in-person class meetings that occur on specified days and times in a specified location.
- **ONL (Online with Synchronous Meetings):** online class meetings that require all students to meet virtually on specified days and times
- **WB (Online with no Synchronous Meeting):** online class meetings that do not require students to meet virtually
- **IND (Independent Meeting):** students and instructors schedule meetings on an as needed basis to discuss course content and student progress
- **TD (Thesis/Dissertation):** thesis/dissertation with implied meetings on an as needed basis to discuss course content and student progress
- **PC (Practicum):** practicum/clinical with implied meetings on an as needed basis to discuss course content and student progress

Classification:

Student levels are determined by the number of undergraduate credit hours completed, or by the graduate level degree program to which a student is admitted:

- Freshman (1 – 28 credit hours)
- Sophomore (29 – 59 credit hours)
- Junior (60 – 89 credit hours)
- Senior (90+ credit hours)

- Masters (Master level degree program)
- Doctoral (Doctoral level degree program
- Non-degree seeking
- Dual credit (concurrent high school enrollment)

Clinical:
A temporary, hands-on work experience course specifically in clinical settings that allow students to practice skills learned in healthcare related areas of student in a real world environment under direct supervision of a qualified clinical professional.

Cohort:
A group of students that start and complete a degree or certificate program together.

College:
See "Academic College"

College Level Examination Program (CLEP):
A group of standardized tests assessing college-level knowledge. At NMSU, CLEP scores may be evaluated for academic transfer credit.

Commencement:
The ceremonial celebration for students who have completed their program of study at the end of the semester. Commencement and graduation are not the same thing (see "Graduation").

Community College:
Postsecondary educational institution that typically offer college preparatory, workforce development, and adult education coursework.

Completion Rate:
Ratio of courses completed versus attempted.

Concentration:
An area of emphasis or specialization within a program or study (major). A minimum of 12 credits within the concentration are required, although some majors may require more. At the baccalaureate level, at least 9 of these 12 credits must be numbered 300 or above; at the graduate level at least 9 of these 12 credits must be numbered 500 or above. A concentration will be indicated on the student's transcript.

Consent of Instructor:
Student must receive consent of the class instructor prior to being allowed to register for the class / course section.

Corequisite:
Courses that students must register for at the same time.

Course:
See "Academic Course"

Course Exception:
An exemption from a required course because competencies and/or learning objectives of the course have been, demonstrably, attained. An exception removes the course, and its associated credits, from a student's degree program requirements. All substitutions must be approved the Academic Associate Dean of the College awarding the degree.

Course Substitution:
The replacement of a required course in a student's program with another course that meets the expected outcomes, has common general content, and is similarly aligned to the required course. All substitutions must be approved the Academic Associate Dean of the College awarding the degree.

Credit Hour:
A measure of credit earned for course completion. A unit is based on the number of hours of instruction per week required in the classroom and/or lab or in independent study. A course earning three semester units will usually meet for three lecture hours a week. One credit hour is equal to 750 hours of instruction time per semester.

Credit for Prior Learning (CPL):
Competency-based education that grants academic credit to students for pre-defined documented life experiences that indicate mastered competencies in an area of study, such as state licensures.

CRN (Course Reference Number):
A five digit number identifying a particular class being offered for student registration.

D

Dean / Associate Dean (Academic):
The title of an administrative position in charge of an Academic College.

Dean of Students:
An administrative position, and office, that oversees the majority of student related experiences outside the college classroom, and can assist with classroom/academic related issues, as well.

Dean's List:
A published list of students, who were enrolled in 12 or more credit hours and earned a GPA in the top 15% of their Academic College each semester.

Degree:
Recognition of completion of program of study. A diploma is issued and notation posted on the transcript.

Degree Audit (DARS / STAR):
A system that produces individualized reports reflecting a student's academic progress toward a specific degree or credential. The degree audit is a tool for use throughout the academic career of student; from advising to graduation.

Department:
See "Academic Department"

Department Head / Department Chair:
The title of an administrative position in charge of an Academic Department.

Developmental Courses:

Courses that prepare students to complete required college level coursework in Math (CCDM), English (CCDE) and Writing (CCDW).

Diploma:

An official document issued by an educational institution signifying the recipient has successfully completed a particular program of study.

Dropping/Withdrawing from Courses:

Officially withdrawing from a class through the online registration system, or in person with an academic advisor or at the Student Records Office. Classes may be dropped/cancelled according to the registration deadlines posted at https://records.nmsu.edu/students/important-dates.html.

Doctoral Degree:

A degree requiring significant scholarly study beyond the master's. The individualized program of study is designed to meet the campus residency requirement and includes a minimum of 30 graduate course credits beyond the master's. If the Doctoral degree requires a dissertation, at least 18-credits of dissertation work must be included. The professional doctoral degree includes a practicum or special project that culminates in a written report which demonstrates a command of the relevant scholarly literature and links it to the specific clinical or practical experience.

Dual Credit:

Students who are simultaneously enrolled in both high school and NMSU. Dual credit courses and grades appear on both the high school and college transcripts.

E

Elective:

Courses that are not used to meet a specific major, general education, or graduation requirements, but can be used to complete the total number of credit hours required for a degree.

Enrollment:

Process by which students formally select classes each term.

Exception:

College determination to allow a student to graduate without completing a degree requirement.

Experiential Learning:

A method of learning from experience that encourages reflection on the development of new skills and knowledge. Examples include internships, co-ops, study abroad, student exchange, practicums, clinicals, and field experience.

F

Faculty (Instructor):

Any employee who teaches classes at an educational institution.

Fees:

Costs, not included in tuition, to cover the cost of materials, equipment and services. Fees may be charged at the institutional level, College level, Department level, Degree/program level, and/or course level.

FERPA (Family Educational Rights and Privacy Act):

A Federal law that protects the privacy of student education records. The law applies to all schools that receive funds under an applicable program of the U.S. Department of Education.

Financial Aid:

Federal and State funding to assist students with the cost of their college education.

A Department at each NMSU campus that coordinates and administers this funding.

FAFSA (Free Application for Federal Student Aid):

Universal application for federal financial aid, typically required before consideration for any need based assistance is awarded.

Fractional Grading:

Plus and minus designations added to traditional letter grades (A-, B+/B-, C+) used in calculating the grade point average.

Freshman:

A student classification for undergraduate students who have completed less than 28 college credits, including transfer credits.

Full-time:

A schedule of 12 or more credit hours per semester for undergraduate students, and 9 or more credit hours per semester for graduate students.

G

General Education (GE):

A program of courses that provides students with a broad educational experience. Courses are typically introductory in nature and provide students with fundamental skills and knowledge in mathematics, English, arts, humanities, and physical, biological, and social sciences. Transfer students often take these classes while attending a community college. Completion of a general education program is required for the baccalaureate degree.

General Education (GE) Certification:

An official transcript notation verifying that a student has completed courses satisfying all or a portion of the lower division General Education (GE) requirements.

Grade Appeals:

It is the student's responsibility to communicate concerns they may have about any grade in a class to the instructor of the class. If the issue is not resolved, the student may formally appeal a final grade for the following reasons:

- Inconsistency between what is written in the syllabus and what is practiced.
- Grade miscalculation or other grading errors that cause a change to the final course grade.

Students may not appeal disagreements with teaching methodologies, instructor specific policies, specific course assignments, grade weighting methods, or attendance policies.

Grade Mode:
A method of scoring academic achievement. Grade modes include, but are not limited to, traditional letter grades, S/U grades (satisfactory/unsatisfactory), and audit.

Grade Point Average (GPA):
The average of all grades received. Also called GPA. Term GPA is the average of the grades received in a single semester/term. Cumulative GPA is the average of all the grades earned over the course of a student's academic career at NMSU. Transfer grades are not included in the NMSU term and cumulative GPA calculations.

Grading System:
Final grades are submitted at the end of each semester, by instructors, and processed by the University Student Records Office. Final grades are recorded on the students' transcripts and are available to students through the online student portal. Academic standing and GPA calculations are updated at the end of each term and, thereafter, as corrections are submitted by College Academic Associate Deans/Campus VPs for Academic Affairs.

Graduate Certificate:
Graduate certificate programs require 12-18 credit hours of course work that is interrelated and designed to develop a focused skill or area of expertise but do not culminate in awarding of a degree. Courses that comprise the graduate certificate must be regular approved courses offered by the University and must be numbered 450 or above. A graduate certificate is indicated on the student's transcript.

Graduate level:
Courses offered beyond the bachelor's degree level (course numbers range between 450/4500 and 699/6999). Also, students who have received a bachelor's degree and who are enrolled in post-baccalaureate instruction.

Graduation:
Official confirmation that the requirements for degree were successfully completed, in accordance with the published catalog. Final degree certification is completed within the Academic College under which the degree program is offered. Then the University Student Records Office orders a diploma sent to the student and adds the degree information to the student's transcript.

Graduation with Honors:
Formal recognition accorded students with a cumulative GPA in the top 15% of the graduating class in their Academic College.

Graduation with High Honors:
Formal recognition accorded students with a cumulative GPA in the top 1.5% of the graduating class in their Academic College.

Graduation with Highest Honors:
Formal recognition accorded one student in each Academic College, with the highest cumulative GPA and greatest number of credits earned at NMSU of the graduating class.

H

Hybrid class:
Class delivery method that incorporates more than one modality, e.g., face-to-face **and** remote synchronous or asynchronous delivery. Face-to-face attendance is limited and may include alternating in-person and online synchronous or asynchronous attendance; may also provide recordings of lectures or experiential components for later reference to supplement concurrent transmission of lectures or experiential components. All students participate in all delivery modalities.

I

Incomplete (I) Grade:
A grade that can be issued, as agreed upon by the instructor and the student, when circumstances prevent a student from completing the coursework by the end of the enrolled term. Coursework must be completed within one year of the assignment of the I grade. If an "I" grade is not removed by the established deadline, it will either become permanent or changed to a D/F, depending on the terms stated on the "I" Grade Information Form.

Independent Study:
Individualized learning, which allows student to work independently under the supervision of an assigned instructor on specific topics directly related to a course or program of study. The meeting time is arranged between the student and instructor.

Instructor (Faculty):
Any employee who teaches classes at an educational institution.

Internship / Co-op:
A for-credit temporary student learning hands-on work experience course with an industry partner that is directly related to the student's program of study. The experience must meet pre-determined learning objectives and focus on providing practical work experience, while developing professional skills. Internships are typically unpaid, while co-op experiences tend to be paid experiences and vary in required work hours. Both types of experiences are generally completed within one semester.

J

Junior:
A student classification for undergraduate students who have completed 60 to 89 college credits, including transfer credits.

L

Lab:
A course, or portion of a course, focused on the application of an instructional strategy that allows students to interact directly with the material, models, and tools and collect data.

Late Registration Fee:
A fee charged to students who register for classes after the second day of the term.

Lecture (Class):
A course in which content is primarily delivered through presentation of facts, principles, context, and/or interpretation. Instruction takes place in a traditional classroom setting and/or online format.

Lower Division:
Courses, usually, offered for freshmen/sophomore level credit (designated by course numbers between 100-299 and 1000-2999). Usually completed the first two years of college.

M

Master's Accelerated Program (MAP):
An opportunity for select undergraduate students to take graduate level courses that will apply to their future graduate degree at NMSU.

Master's Degree:
A degree beyond the bachelor's, also called a graduate degree. A minimum of 30 semester graduate course credits is required for the master's degree. Master's programs involving a thesis include no more than six and no fewer than four credits of thesis. At least 15 credits for the master's degree must be for work in courses in the department in which the student was admitted. Master of Arts and Master of Science degrees are most common, but there are also professional master's degrees, such as the MFA (Master of Fine Arts) or the MBA (Master of Business Administration). Usually takes two years of full-time enrollment to complete.

Major:
A program of study comprising a specific group of courses compiled to provide the expected education or training in a specialized field. The subject area in which a student pursuing a college degree develops the greatest depth of knowledge.

Maximum Time Frame:
Calculation of maximum allowable hours related to limited financial aid eligibility. In general, the maximum is 150% of the required credit hours for the declared major/degree. This calculation includes all attempted hours, including repeated courses, ineligible courses, and transfer credits. Only developmental/remedial hours are excluded from the calculation.

Military Duty:
Active or reserve duty students in the military who receive orders that will prohibit continued enrollment.

Minor:
No less than eighteen (18) undergraduate credits or nine (9) graduate credits in an area outside a student's major department.

my.NMSU:
NMSU's online student information portal that houses all online services, including registration, grades, financial aid, Canvas, MS Office 365, email, etc.

N

New Mexico State University Global Campus (UO)
Fully online degree programs and support services for online learners seeking bachelor, master, doctorate degrees, as well as certificates and microlearning courses, 100% online.

New Mexico State University System:
The University campus and three community college campuses (Alamogordo, Doña Ana, and Grants) governed by the NMSU Board of Regents.

Non-Degree Status:
Students who do not intend to earn a degree or certificate at NMSU, or who have not yet been accepted to a graduate program.

No Release of Information:
Students can request that their public directory information not be released to any public entity or being by completing the "No Release of Information" form found at https://records.nmsu.edu/forms/inventory.html.

O

Official Transcript:
An official document of a student's academic record, including courses taken and grades earned from time of admission to end of the last semester attended. Official transcripts are printed on special paper and include a signature of the Registrar verifying the authenticity and accuracy of the document.

P

Part-time:
A schedule of less than 12 credit hours per semester for undergraduate students, and less than 9 credit hours per semester for graduate students.

Placement Exams:
Subject exams, administered to determine eligibility for waiver of prerequisites for specific courses. Placement exams do not award credit. Subject areas include, but are not limited to, Math, English, and Computer Science.

Practicum:
A temporary, hands-on work experience course integrated with academic instruction that prepares a student for specific pre-professional training in occupational fields such as education, healthcare, and the arts.

Prerequisite:
Course, test score, and/or grade level that must be completed before taking a specific course.

Prior Learning Assessment (PLA):
See "Credit for Prior Learning (CPL)".

Priority Registration Dates:
One

Probation:
See "Academic Probation I" "Academic Probation II" and "Student Code of Conduct".

Program of Study:
See "Major".

Public Directory Information:
Student information that can be released to the public without students' approval. Students can request to withhold their directory information by completing and submitting a "No Release of Information" form found at https://records.nmsu.edu/forms/inventory.html. NMSU has defined public directory information as:

- Name
- Aggie ID number
- Class (i.e. Freshman, Sophomore, Junior, Senior)
- College and major
- Dates of attendance
- Degree(s) earned
- Honors and awards received, including selection to the dean's or chancellor's list, honorary organization, or the GPA range for the selection
- Address
- Telephone number
- NMSU e-mail address
- Most recent previous educational institution attended
- Participation in officially recognized activities and sports
- The weight and height and age of members of athletic teams

Q

R

Readmission

When a student does not enroll for three consecutive terms, they must submit another application for admission and get accepted again.

Registration:

Process by which students formally select classes and creates a financial obligation to pay tuition and fees.

Repeating a Course for Credit:

When an undergraduate student has enrolled in a course more than once, each enrollment and all grades will appear on the student's transcript. Once a student receives a grade of C- or higher (or CR for transfer credits), they will not be allowed to repeat the course for credit again. A student may obtain special permission, from the advisor, to repeat a course they have already received a grade of C- or better, but the grade earned will not be included in the GPA calculation. This policy does not apply to courses that can be repeated for credit, up to a maximum number of credits, such as special topics, internships, cooperative education and thesis/dissertation.

When a graduate student has enrolled in a course more than once, each enrollment and all grades will appear on the student's transcript. Every grade earned will be included in the GPA calculation.

Restriction (Registration):

Conditions that apply to courses, at the class/section level, to limit registration. Common restrictions include: department approval, instructor approval, major, program, student level, student classification, campus.

Residency for Tuition Purposes:

Status used in calculating tuition. Students are either a resident or non-resident of the State of NM. Students are also coded as in-district or out-of-district based on County. Community Colleges, within the NMSU system, assess tuition differently depending on whether students who contribute to the local property and/or income tax base. Learn more at https://records.nmsu.edu/students/residency.html.

Residency Requirement:

The minimum number of program credit hours a student is required to earn for coursework taken at NMSU to earn a degree from NMSU.

S

Satisfactory Academic Progress (SAP):

Federal regulations require all students receiving financial aid to meet Satisfactory Academic Progress in order to maintain eligibility for financial aid. Undergraduate students must maintain a 2.0 cumulative GPA or greater on all hours attempted at NMSU. Graduate students must maintain a 3.0 cumulative GPA or greater. Undergraduate and Graduate students are required to pass and complete 70% of all hours attempted. Students receiving financial aid must complete their program of study within a reasonable timeframe. The maximum timeframe is 150% of the published length of the academic program or certificate

Schedule of Classes:

An online list of classes/sections offered in a term. The schedule includes class information such as course number, section number, meeting day(s)/time, the CRN (course reference number), instructor, course delivery mode, and notes.

Second Degree:

Enrollment classification for students who have earned one or more bachelor's degrees.

Section:

An individual course offering, distinguished from other sections by various attributes, such as meeting day, time, location, instructor, etc.

Semester:

A term, within an academic year, marking the beginning and end of classes. At NMSU, each semester is fifteen (15) weeks in length and there are two semesters (fall and spring) in an academic year.

Senior:

A student classification for undergraduate students who have completed 90 or more college credits, including transfer credits.

Social Security Number (SSN):

A 9-digit federal identification number required for specified college purposes and taxation reporting, but subject to privacy and nondisclosure protections.

Sophomore:

A student classification for undergraduate students who have completed 29 to 59 college credits, including transfer credits.

Student Code of Conduct (Student Handbook):

The rights and responsibilities of NMSU students outlining the standards for social and academic conduct and providing the types of interim measures and sanctions which may be imposed for violation.

Student Concerns Process:
Visit https://report.nmsu.edu/.

Summer Session:
An academic term that is held between the end of spring and fall semesters.

S/U Grade Mode (Satisfactory/Unsatisfactory):
A grade mode that allows the student to attempt to earn course credit without having a course grade included in their grade point average calculations. Under S/U grading, the instructor assigns an S grade for satisfactory achievement of the course learning objectives (normally equivalent to the letter grade of C- or higher) and a U grade for unsatisfactory performance in the class.

Undergraduate limitations: Other than honors courses and courses officially designed as S/U, the following limitations apply to courses in which the S/U option is elected.

- No more than 7 credits per semester or 4 credits per summer session.
- Not to exceed a total of 21 credits towards a degree.
- Not a required course for the student's major.

Graduate limitations: With an approval from their advisor and department head, graduate students in good academic standing may elect the S/U option, at the time of registration, for courses taken outside the major department, subject to the regulations stated below:

- No more than a total of 6 credits of elected S/U courses are permitted in the master's degree.
- Doctoral candidates may take an additional 6 credits under the S/U option after application to candidacy.

Substitution:
An approved exchange of course and credit where the faculty determine competencies and/or learning objectives of one course are comparable, but not equivalent, to those of the required course.

Suspension:
Status whereby a student is ineligible for enrollment at NMSU due to poor academic performance or disciplinary reasons.

Syllabus:
A course summary or outline distributed by an instructor, normally including topics to be covered, meeting and instructor information, assignment and deadlines, grading standards, attendance and other policies, and resources available to students.

Synchronous Class (ONL):
A class that is taught fully online, with a requirement for attendance at a specific day/time.

T

TBD:
Abbreviation for To Be Determined. When found in the Schedule of Classes, relates to class information that has not yet been determined, such as room or instructor.

Term:
A portion of an academic year. NMSU has three standard terms in an academic year: fall, spring and summer, and many abbreviated parts of term: MS1, MS2, SU1, SU2, etc.

Teaching Credential:
A basic multiple or single-subject teaching credential obtained upon completion of a bachelor's degree and prescribed professional education requirements in four or more years of college.

TOEFL (Test of English as a Foreign Language):
An English exam for foreign students used for admission purposes and for placement in college English classes.

Traditional Grading:
Letter grade (A, B, C, D or F) used in calculating the grade point average and recommended for courses required to meet degree requirements.

Transcript:
A student's academic record, including courses taken and grades earned from time of admission to end of the last semester attended. May be official or unofficial, depending on the purpose for which the student is using the document.

Transfer Courses (Transfer Credits):
Earned credits at one institution of higher education counting toward the academic record of a student at another institution of higher education. Grades are not transferred. Transfer coursework is articulated as CR (credit) for passing grades, NC (no credit) for non-passing grades, and CD (credit but repeatable) for passing with a grade of D.

Tuition:
The cost a student is expected to pay for receiving instructional services at a school, college, or university. The charge is based on course type, credit hour and student's residence classification.

U

Upper Division Courses:
Courses, usually, offered for junior/senior level credit (designated by course numbers between 300-499 and 3000-4999). Usually completed the second two years of a four-year degree. These courses are not offered by community colleges and they often require completion of prerequisite courses. Also refers to junior and senior students.

Undergraduate:
Courses offered at the bachelor's degree level (course numbers range between 100/1000 and 499/4999). Also, an enrolled student who has not completed a baccalaureate degree.

Unofficial Transcript (Advising Document):
An unofficial document of a student's academic record, including courses taken and grades earned from time of admission to end of the last semester attended. Unofficial transcripts are NOT printed on special paper and DO NOT include a signature of the Registrar verifying the authenticity and accuracy of the document.

W

Wait List:

An automated function that enables students to indicate their interest in registering for a particular class/section that is already at full capacity. Students are notified, by email to their NMSU email address, when a spot opens and only have 24-hours from the receipt of the email to add themselves to the class. If the student does not add themselves to the class/section during that 24-hour window, the system automatically notifies the next student on the waitlist.

Warning:

Notification to a student, after final grades are processed, that their cumulative grade point average is below the requirement to continue enrollment at NMSU (2.0 for undergraduate students, 3.0 for graduate students).

Withdraw from a Course (Drop):

Officially withdrawing from a class/section through the online registration system, or in person with an academic advisor or at the Student Records Office. Classes may be dropped/cancelled according to the registration deadlines posted at https://records.nmsu.edu/students/important-dates.html.

Withdraw from the University:

Officially dropping all courses and ceasing to be a student at any campus in the NMSU system.

Work Study:

State and federally funded programs that make part-time jobs available to students with financial need.

The NMSU System Academic Regulations

The following regulations are effective with the publication of all the NMSU system catalogs, this includes the Las Cruces-Academic Catalog, NMSU Global, Alamogordo Community College, Dona Ana Community College, and the Grants Community College catalogs. All regulations in this section of the catalog pertain to all the campuses housed within the NMSU System. This means that information for students pursuing Associate Degrees/Certificates, Bachelor's Degrees, and Graduate Degrees/Certificates is in this catalog section.

The regulations section is broken down into different areas:

- Academic Programs of Study
- Registration
- Academic Performance and Progress
- Grading
- Withdrawals
- Degree Applications, Graduation and Commencement
- Academic Standing and Probation
- Academic Misconduct and Grievances
- The University Student Records

Academic Programs of Study

NMSU offers Associate, Baccalaureate, Master's, Specialist, and Doctoral degrees. NMSU also offers Certificates at the associate and graduate levels. Requirements for specific degrees and other designations are set forth by this catalog for the NMSU-Las Cruces (main) campus, NMSU Global campus, and the corresponding catalogs for the NMSU Community Colleges (Alamogordo, Dona Ana, and Grants).

Additional Degree Designations

As part of a degree program, students may also earn additional degree designations indicating fields of study such as majors, minors, or concentrations. A major is defined as a recognized area of study in which there is an extensive and well-developed curriculum offered at the university, in addition, adequate library resources and support services. A minor is based on courses that encompass a recognized supplementary field of study outside the student's major. Concentration is based on a collection of coursework in an area that is part of a major program of study. Degrees and additional designations awarded, limited to majors, minors, and concentrations, will be noted on the student's transcript.

Catalog Effective Period

The annual catalog edition is effective Summer Session I through Spring Semester and is considered active for eight years for all campuses. Curricular requirements (course requirements and the number of credits required) for a specific degree or other designation may be met by completing all of the course requirements as set forth by the catalog in effect at first matriculation, or any subsequent catalog, provided the selected catalog is considered active when the requirements for graduation are met. For all other matters, the current catalog is the authority. NMSU reserves the right to withdraw courses at any time, change fees, rules, calendar, curriculum, degree programs, degree requirements, graduation procedures and any other requirements affecting students. Except as otherwise stated here, changes will become effective whenever the proper authorities so determine and will apply to both prospective students and those already enrolled.

Application for Degree/Graduation or Certificate

Upon completion of all requirements for degrees and certificates, students will not receive their degrees automatically. To receive the degree or certificate, students must submit an application and pay the required fee in the semester in which the student expects to graduate or complete the degree or certificate requirements. Specified in the academic calendar for each semester is the deadline for all applications. The application must indicate/ note all designations earned. After awarding the degree, you cannot add any additional designations.

Students who will be completing two degrees/certificates in the same semester must apply for graduation and pay the fee for each degree separately. Students applying for graduate degrees or certificates must satisfy requirements as described in the Master's, Certificates, Specialist, and Doctoral Degree sections below.

Students who do not meet requirements or elect not to graduate after filing an application need to re-apply in a subsequent semester and pay another fee.

Multiple Degrees and Designations

A student may earn more than one degree or multiple degree designations by completing all of the requirements in an appropriate catalog for each degree or designation. Students meeting requirements for more than one degree must apply for and pay the application fee for each degree to be awarded. Upon completion of all requirements, multiple

majors for a single degree (e.g., B.A., Major in Art; Major in Anthropology) and multiple bachelor's degrees (e.g., B.A. and B.S.) will be noted on the student's academic record/transcript and may also be granted at one commencement.

Degree Revocation

The Board of Regents reserves the right to revoke a degree should it be determined upon investigation that the degree requirements were not adequately met. A degree revocation must be in accordance with NMSU policy and related rules.

Honorary Degrees

Ceremonial Honorary Degrees may be awarded in accordance with NMSU policy and rules as outlined in the NMSU Regents Policy Manual and the related Administrative Rules and Procedures.

Community College Certificate

A Community College may offer two types of certificates, the Certificate of Achievement and/or the Certificate of Completion. Certificates may be awarded independently from any degree program.

Certificate of Achievement

The Certificate of Achievement is a program of study less than 16 credits and is not eligible for Federal financial aid. This Certificate provides employment-related and/or career-enhancing skills necessary to succeed in a job or a chosen field of study. These courses can be a subset of those required for a corresponding Certificate of Completion or Applied Associates Degree. These certificates are recorded on the student's transcript. The following requirements apply to all certificates of achievements:

1. **Minimum Credit Hours**: The number of credit hours varies from certificate to certificate but must be fewer than 16 credits. Students must successfully complete the total number of credit hours as outlined in the respective catalogs and sections describing these certificates.
2. **GPA requirement:** Students must successfully complete all courses for the certificate as outlined in the catalog and have a cumulative GPA of 2.0 or greater in all courses required for the certificate, but may have a cumulative GPA of less than 2.0 for courses taken outside of the certificate.
3. **Residency:** A minimum of 6 credits earned toward the certificate must be completed within the NMSU system including Las Cruces Main Campus, Global Campus, and community colleges. If the certificate requires fewer than 6 credits, all credits must be completed at NMSU or one of its community colleges. Individual academic programs may have additional requirements.

Certificate of Completion

The Certificate of Completion requires a minimum of 16 credits (other Title IV requirements must be met to be eligible for financial aid) and has been approved through the academic review process. These courses can be a subset of those required for a corresponding Applied Associates Degree. These certificates are recorded on the student's transcript.

Requirements for certificates are found in the respective catalogs and sections concerning these programs. The following requirements apply to all certificates.

1. **Minimum Credit Hours**: The number of credit hours varies from certificate to certificate. Students must complete the total number of credit hours outlined in the respective catalogs and sections describing these certificates.
2. **GPA requirement:** Students must successfully complete all courses for the certificate as outlined in the catalog. In addition, students must have a cumulative GPA of 2.0 or better in all courses taken at NMSU or one of its community colleges**.**
3. **Residency:** A minimum of 6 credits earned toward the certificate must be completed at NMSU or one of its community colleges.

Associate's Degree

Associate's degrees are of two types. The academic associate's degree prepares students to transfer to a baccalaureate program and generally includes credits toward the first two years of a four-year degree. Academic associate's degrees include the Associate of Arts, the Associate of Science, and other named degrees that link to a specific major (the Associate of Education, for example). Other associate degrees, typically called Associate of Applied Science, prepare students for entry into the workforce. Credits for these programs may or may not apply toward a four-year degree. Associate degree-seeking students who are interested in a dual degree should consult with their academic advisor. The Associate of Arts and the Associate of Science degrees cannot be earned together.

Students interested in transferring to NMSU or another four-year institution should check the appropriate sections of the university catalog for more information.

Requirements for the two-year associate degrees are found in the respective catalogs and sections concerning these degrees. The following requirements apply to all associate degrees:

1. **Minimum Credit Hours:** a minimum of 60 credits (excluding "N" suffix courses). Some programs of study require coursework in excess of the 60 credit-hour minimum.
2. **New Mexico General Education-** state mandated general education courses (as specified in General Education section); such courses are designed with a "G"
   a. For Associates Degrees: 32-35 credits
   b. For Applied Associates Degrees: 15-18 credits
3. **GPA requirement:** Students must have a cumulative GPA of 2.0 or better in all courses taken at NMSU or one of its community colleges.
   a. For Associates Degrees: students must earn a C- or better in classes they take to meet the Basic Skills requirement (ENGL 1110G and one of several math course options).
   b. For Applied Associate Degrees: Basic Skills requirements do not apply, but if the student plans to pursue a Bachelor's degree at any point in the future it would be highly recommended.
4. **Residency** - A minimum of 15 of the 60 credits for the associate's degree must be completed at NMSU or one of its community colleges. Individual academic programs may have additional requirements.
5. **Major**: All requirements for at least one major field of study as specified in the college and departmental sections of the respective catalog.

Associate Major

An associate major, consisting of at least 18 credits, may include courses from more than one department. Requirements for the Associate Majors are specified in the respective Community College Catalogs.

Baccalaureate Degree (Bachelor's Degree)

A baccalaureate or bachelor's degree provides students with a broad educational base and knowledge in a specific major field. Each college has unique degree requirements that are listed in the college's designated section of this catalog. In addition to the College and Department requirements, students must complete each of the following degree requirements for every Bachelor's Degree awarded by NMSU:

1. **Minimum Credit Hours:** a minimum of 120 credits (excluding "N" suffix courses)
2. **GPA requirement-** a minimum cumulative GPA of 2.0 in all courses taken at NMSU
3. **New Mexico General Education-** 32-35 credits of state-mandated general education courses (as specified in the General Education section); such courses are designed with a "G"
4. **New Mexico State University's Viewing a Wider World-** 6 credits of Viewing a Wider World courses; such courses are designated with a "V", or alternatives as specified in the Viewing a Wider World section
5. **Upper Division Courses-** a minimum of 48 credits in courses numbered 300-499/3000-4999.
6. **Residency –** Of the last 36 credits earned toward award of the degree:
   a. 30 credits must be completed at NMSU
   b. 21 credits must be upper-division (300/3000 or above) and
   c. 12 of the 21 upper-division credits must be within the student's major.
   NOTE: colleges or departments may require that more than 12 upper-division credits be within the major and they may direct that a certain number of these credits be course specific.
7. **Major** – all requirements for at least one undergraduate major field of study, other than a supplemental major, as specified in the college and departmental sections of the catalog. As an undergraduate student seeking a baccalaureate degree you are expected to declare a major before earning 45 credit hours toward your degree. You should complete your general education requirements within your first 90 credit hours earned.

Second Baccalaureate Degree (Bachelor's Degree)

Students seeking a second bachelor's degree must complete all college, department, and major requirements for the second bachelor's degree including residency. General Education requirements, including Viewer a Wider World, are waived for a second bachelor's degree because those requirements are considered completed within the first bachelor's degree earned. Credits earned toward a previous degree may be used to complete those requirements subject to any college and department-specific limitations as described in the catalog.

Bachelor's Degree Designations

Undergraduate Major

An undergraduate major consists of 24 or more credits within the major field, of which 18 credits must be upper-division courses, and may include courses from more than one department. Additional major requirements are specified in the college and department's designated sections of this catalog.

Supplemental Major

A supplemental major consists of 24 or more credits of interdisciplinary coursework, of which at least 18 credits must be upper-division (300/3000-499/4999), and no more than 9 credits may be from the student's major course of study. Additional requirements for supplemental majors are specified in the catalog listing of the departmental/college sections.

Undergraduate Minor

An undergraduate minor consists of 18 credits of course work, of which 9 credits must be upper-division (300/3000-499/4999). A minor encompasses courses that may be in a single department or interdisciplinary and are in a recognized field of study outside the student's declared major. At least 9 upper-division credits of a minor must be completed at NMSU. Additional requirements for minors are specified in the college and department's designated sections of this catalog. Minors cannot be earned after the degree has been conferred.

Undergraduate Concentration

A concentration consists of 12 or more credits of coursework in a specialty area that is related to a specific major field of study. At least 9 of the 12 credits must be upper-division (300/3000-499/4999), and at least 9 credits must be completed at NMSU. Additional requirements for concentrations are specified in the college and department's designated sections of this catalog.

Distance Education Bachelor's Degree Completion Program

A Bachelor Degree Completion Program allows students who have met the lower division requirements (100/1000 and 200/2000 level) of an undergraduate degree program to complete the remaining upper-division credits (300/3000 and 400/4000 level) through distance delivery courses offered by NMSU Las Cruces. Only selected degrees are available as degree completion programs. Students must complete all required lower-division (100/1000 and 200/2000 level) credits before they can be admitted to the Bachelor's Degree Completion Programs. The program(s) normally require two years of upper-division (300/3000 and 400/4000 level) coursework.

Graduating with Honors

For information about graduating with Honors, please refer to the Recognition of Academic Achievement section of this catalog.

Graduate Degrees

All graduate degrees are subject to the rules and regulations of the Graduate School. Degrees will be certified by the Graduate School only upon the complete review and clearance of the candidate's program of study.

Graduate Degree Designations

Graduate Major

A graduate major may include courses from more than one department, but at minimum, it must consist of at least 30 graduate credits beyond the previous degree, i.e., 30 credits beyond the bachelor's for a master's degree, and 30 credits beyond the master's for a doctoral degree. Additional requirements may be imposed by the State of New Mexico and New Mexico State University as specified in this Catalog.

Graduate Minor

A graduate minor is based on at least 9 graduate credits in courses encompassing a recognized field of study outside the student's major. Departments may require certain courses to be a part of a minor and may exclude other courses. Minors cannot be earned after the degree has been conferred. Students will work with their department and the

Graduate School to ensure that the graduate minor is added to their academic record.

Graduate Concentrations

A concentration is a collection of coursework in a specific area that is part of a degree program of study at NMSU. At the graduate level at least 9 of these 12 credits must be numbered 500/5000 or above. Only approved concentrations within a student's department or program may be noted on a transcript.

Concentrations will not be added to a transcript after a degree is awarded. In order for the approved concentration to be noted on the student's transcript, the following conditions must be met:

1. Apply for the correct program and concentration from the outset or connect with the department and Graduate School upon admission to correct the concentration if initial admission is incorrect.
2. Identify the concentration on their official Application for Degree.

Graduate Certificates

A Graduate Certificate program requires 12-18 credits of course work that is interrelated and designed to develop a focused skill or area of expertise but does not culminate in the awarding of a degree. Courses that comprise a graduate certificate must be regular approved courses offered by the University and must be numbered 450/4500 or above. A graduate certificate is indicated on the student's transcript.

Master's Degree

New Mexico State University offers both academic and professional master's degrees. A link to the list of all master's degrees is provided in the Graduate School section of this catalog. (https://catalogs.nmsu.edu/nmsu/graduate-school/)

Underprepared students may be required to take additional general or discipline-specific undergraduate or graduate courses to prepare them for the advanced academic work necessary for success in graduate-level courses in their chosen field. This may result in an extended graduation date.

Admissions to the Master's Degree

The admission of a student into the Graduate School does not imply admission to candidacy for an advanced degree. The major department in which the student intends to become a candidate for a master's degree must determine the student's ability to pursue studies at the graduate level. Please see the Department(s) for specific requirements.

Program of Study

Students will follow the coursework requirements outlined in their catalog and degree audit. A Program of Study is not required by the Graduate School but may be prepared by the student's advisor in consultation with new graduate students for effective advising.

Application to Candidacy

The degree audit will formally list the curriculum requirements for degree completion and is required to meet in order for the degree or graduate certificate to be conferred. Some programs may use The Program of Study Form as part of its Application to Candidacy process. In these cases, the program of study must be approved by the advisor, department, and academic dean and submitted to the Graduate School. The Program of study may specify the Catalog at the time of graduation, as long as the catalog is considered active. Otherwise, the current catalog will be listed.

Application for Graduation

Students must file an application to receive their degree during their final semester of the program. The program's catalog entry will formally list the curriculum requirements for degree completion and a completed degree audit is required. The degree audit may specify the catalog at the time of graduation, as long as the catalog is considered active. Otherwise, the current catalog will be used.

The student must have a minimum cumulative GPA of 3.0 at the time the application is submitted. The application may specify the catalog at the time of graduation, as long as the catalog is considered active. Otherwise, the current catalog will be listed. If a student's degree audit does not meet, the student must submit a Degree Audit Exception (DAE) form to document course substitutions and credit hour alignment such that the exceptions will allow the degree audit to meet.

Credit Hour Requirement

A minimum of 30 credits beyond the bachelor's is required for the master's degree. Most master's degrees require at least 15 credits in courses numbered 500/5000 or above. This includes thesis credits for any master's programs that include a thesis option. Master's programs involving a thesis, must include, either a minimum of 4 credits or a maximum of 6 credits of thesis. Please see the "Thesis" section for more information.

At least 15 credits for the master's degree must be for work in courses within the student's department. Additional credits may be selected from other fields to fit into a logical and justifiable program. However, courses that are used to remove deficiencies or satisfy prerequisites cannot be counted as requirements for a master's degree. As per NMSU's campus residency requirement, a minimum of 50% of degree coursework must be taken at NMSU.

Coursework Requirement

Students must take coursework from a variety of faculty. Students may not take more than half of the minimum credits required for a master's degree with the same professor, excluding thesis credits.

All graduate students must register for a minimum of 1 credit of graduate coursework in their final semester. Please see the Tuition, Fees and Other Expenses section for more information.

A student taking an oral examination must enroll for at least one credit for that term (fall, spring, or summer terms).

Thesis Option

A thesis in the major field is recommended and may be required at the discretion of the department. A minimum of 4 credits and a maximum of 6 credits may be counted toward the requirements for a master's degree. The final examination shall consist of an oral defense of the student's thesis as well as a general examination of the candidate's field of study.

- *Continuous Enrollment* - once registered, a student must continue to register for a minimum of 1 credit in thesis or graduate coursework each regular semester until the thesis is approved by the Graduate School and submitting electronically into ProQuest.

Graduate Committee for Thesis Option

The graduate committee for the master's degree consists of a minimum of three faculty members who hold, at least, a master's degree and meet the following criteria:

1. **Committee chair:**
   a. Must be from the student's home department
   b. Must be a graduate faculty member
2. **Committee member(s):**
   a. One other committee member, in addition to the chair, must be from student's home department
   b. Other committee members may be from outside the student's home department
   c. Students with a declared minor- must have a representative from the minor department.
   d. Must be a graduate faculty member
3. **Dean's Representative:**
   a. Must be a representative from a related area or appointed by the Dean of the Graduate School
   b. Must be a graduate faculty member

Finalizing the Master's Thesis

After successful completion of the final examination, electronic submission of the approved thesis must be submitted to ProQuest ETD, no later than the deadline posted to the Graduate School website. The form and style of the thesis must comply with the guidelines provided in preparing your manuscript for submission, located here. The guidelines also contain detailed information on the thesis submission and approval process. The thesis is not complete until the Graduate School has accepted it electronically.

Non-Thesis Final Examination

Each candidate may be given a final examination conducted by their graduate committee in accordance with the schedule provided by the Graduate School.

The final examination format for the professional degrees and non-thesis option will be determined by the department. The department is responsible for ensuring that the Report of Results for the Master's Professional or Non-Thesis Final Examination form, where applicable is submitted to the Graduate School no later than ten working days after the exam.

At the time of the final examination, a graduate student must have a cumulative GPA of at least a 3.0 and must be enrolled for a minimum of one credit hour in the final semester.

NOTE: the cumulative GPA, will be calculated from NMSU graduate coursework only.

Any candidate who fails the final examination may either:

1. Be granted a second examination, written or oral, after a lapse of at least one semester, only with a recommendation from the student's advisor and approval from the Dean of the Graduate School.
2. Be excluded from further candidacy for the degree.
3. Failure in the second examination disqualifies a candidate from obtaining the degree.

Students in professional or non-thesis options may be required to pay a special exam fee in lieu of registering for 1 credit of graduate coursework. Please see the Tuition, Fees and Other Expenses section for more information.

Time Limit

Students must complete the master's degree program within seven years (or eight successive summers) of the start of the degree, including completion of the master's thesis or final project. Inclusion of any coursework over seven years old at the time of the final examination will be at the department's discretion.

Master's Accelerated Program (MAP)

The Master's Accelerated Program (MAP) allows academically qualified undergraduate students to begin working on a master's degree during their junior and senior years while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires two more years. The master's accelerated programs allow students to complete a graduate program in an accelerated manner.

Undergraduate students may apply for acceptance to MAP listed in the New Mexico State University Catalog by submitting the Master's Accelerated Application Form after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at New Mexico State University and apply towards the undergraduate major. The grade point average must be a minimum of 2.75; departments participating in MAP may have requirements that exceed these minimum requirements. **It is the student's responsibility to meet with their financial aid advisor. Awards may be adjusted to reflect enrollment in undergraduate/graduate courses.**

Graduate departments within the colleges may allow academically qualified undergraduate students to substitute up to 50% of their graduate course credits (i.e., 15 of 30, etc.) but no more than 18 credit hours for elective or required courses in an undergraduate degree program. Graduate programs can use up to 50% of NMSU coursework (450/4500 level or higher) that can logically be applied toward completing a master's program of study (at least 50% of the credits allocated for the master's degree – usually 15 of 30 – must be for courses designed for graduate work.). Students must consult with participating MAP departments to determine program-specific guidelines on the allowable credits toward the undergraduate and graduate degree. A grade of 3.0/4.0 or higher in each course will be required.

Program Participation Requirements:

1. Students participating in MAP are required to obtain prior approval by the graduate program and submit a completed Master's Accelerated Program Application from to the Graduate School by the first Friday of classes with all required signatures. Student's course work must be general or discipline electives in the student's undergraduate course of study.
2. Students will enroll in approved graduate-level courses. If the course(s) requires instructor approval, it is the student's responsibility to obtain the necessary approval.
3. Students participate in the Developing New Scholars Program (DNSP) through the Graduate School. The DNSP program provides formal mentoring supporting the application process to Graduate School. Upon awarding of the Bachelor's degree and formal admissions into a master's program at NMSU, the approved credits (up to 12) will be recorded on both the undergraduate and the graduate transcript.

Interdisciplinary Master's Degree

Interdisciplinary studies, at New Mexico State University, are intended for individuals specializing in programs that require integrating more than one discipline to fully engage in the field of study. The programs provide a mechanism to address emerging scholarship, innovation, research, and allow graduate students to engage in emerging technologies that

optimize their education outside the traditional disciplinary boundaries. An Interdisciplinary study takes advantage of traditional academic training within specific departments and also allows students to customize their own career preparation. In these programs, a coherent common core is expected to combine existing courses across disciplines to meet unique objectives.

The interdisciplinary studies option should not be used in cases where the applicants' objectives can be realized by admission to a specific department with a degree program, and inclusion of up to two minor areas in the program of study.

Students should be admitted to an existing graduate program which closely relates the desired interdisciplinary trajectory. Students interested in pursuing an Interdisciplinary Master's (IMAS) degree should take the following steps.

1. **Establish an IMAS graduate committee.**
   The student will form a committee composed of members of the graduate faculty and select an advisor who will chair the committee. The chair must be from the primary department where the student will take at least 15 credit hours listed in the proposal. The other committee member must be from the department in which the student has selected a minor area of study from the approved list.

2. **Develop a proposal for interdisciplinary studies.**
   The student must work with their committee to create a proposal of the program concept consisting of the following:

   a. The designated degree being sought and the name of the interdisciplinary area.

   b. The program of study to be followed, which must include a minimum of 30 graduate-level credits and a maximum of 36 graduate-level credits. Students may take six credits in departments that do not grant a graduate degree, but the courses must be numbered 450/4500 or above and be pertinent to the program of study. The committee can require additional materials such as a statement of interest, letters of recommendation, GRE or GMAT scores and conduct a personal interview.

   c. The majority of the departments involved in the student's program will be master's degree granting departments. The student is expected to take at least 15 credits in the primary area of study within one department. The primary department selected by the student will receive the student's application for admissions to the Graduate School for approval. In addition, the student is required to select a minor area of study in another department that consists of at least 9 graduate credit hours. The program will meet all requirements of a master's degree, with the interpretation, that "major field" includes courses from two or more departments and in the designated interdisciplinary study area.

   d. The program of study will include the completion of a research thesis or project. The work may be submitted in the form of a publishable manuscript, technical report, thesis or creative option. The objective of the program of study should include proposed areas of skill development and proposed courses in more than one graduate degree granting department at NMSU.

   e. Justification for not using an existing degree program.

   i. Once the student has formed their committee and compiled a rough draft of the proposal, they must contact the Graduate School to make an appointment with the Dean of the Graduate School to review the proposal. The student and advisors from the main program and minor program should attend the meeting as well.

   ii. If the proposal is accepted by the Graduate School, the student will then be advised to submit an application as a Master's Interdisciplinary student through the application system.

   f. Procure final signatures from all committee members and academic department heads from primary and minor departments on the IMAS proposal. The student should submit a copy of the completed and signed proposal to the Graduate School.

Degree(s) Awarded

Students receive a Master of Arts (MA) or a Master of Science (MS) and a concentration in the designated interdisciplinary study area.

Other conditions for being awarded a degree within the interdisciplinary studies program are:

1. The student may enroll on a part-time basis keeping in mind that coursework cannot be more than seven years old at the time of the final examination.
2. The student will be administered a final comprehensive exam that is consistent with the department selected for the primary area of study. For example, if a department requires a written exam, the student in the interdisciplinary masters will also be required to take a written exam.
3. The final oral comprehensive exam will consist of questions pertinent to the area of study and the defense of the research thesis or project. In both cases, an integrated approach to the areas of study chosen should be followed.
4. All other rules for graduate study at NMSU must be followed.

Thesis/Non-thesis Option

As with any graduate student, the student in interdisciplinary studies can select to follow a thesis or non-thesis option. Students enrolled in the thesis option register for up to six thesis credits. Students not wishing to follow the thesis option will be required to complete a project report. The project must reflect the interdisciplinary nature of the program which the student is pursuing.

Comprehensive Exam

Students in interdisciplinary studies take a comprehensive exam composed of questions designed by the student's committee. The committee consists of two individuals in the area of study, the dean's representative who must be outside of the department/program/interdisciplinary study option, and a committee chair.

Second Master's Degree

NMSU discourages duplication of a master's degree. In instances where a program would like to admit students to earn a duplicate degree, a letter of support by the department involved must be submitted at the time of admission to the Graduate Dean. The applicant will need to follow standard admission requirements and graduate school policies including transfer of credits. Students wishing to earn the duplicate masters must satisfy all requirements for the degree, including completing a master's

thesis if this is a formal requirement for the degree in question. Financial Aid may not be applicable for the duplicate degree.

Teacher Licensure

Students wishing to take graduate courses for licensure, renewal of licensure, or for personal enrichment must be fully admitted to a department to do so. Undeclared students may not register for teacher licensure classes.

Endorsement is available at both the elementary and secondary levels in bilingual education, Teaching of English as a Second Language (TESOL), reading, and special education. Endorsement is also available in early childhood education at the elementary level. Contact schooloftpal@nmsu.edu for more information.

Specialist in Education

The specialist in education degree is available for experienced members of the education profession who have maintained a 3.3 grade-point average while pursuing this degree or its equivalent. Programs are available in Reading within the School of Teacher Preparation, Administration, and Leadership and in school psychology within the Department of Counseling and Educational Psychology. Emphasis is placed on the development of the competencies needed for professional specialization in a given field. Students must complete the general application for the Graduate School and they should also check with the admitting department for specific departmental requirements.

Residency and Credit Requirements

The specialist in education degree requires a minimum of 30 credits including research, intern experiences and graduate courses. Twenty-four of these credits must be completed at NMSU to meet the campus residency requirements.

Students must maintain a 3.0 GPA, no more than 6 credits of C level work are allowed for this program.

Program of Study

Students will follow the coursework requirements outlined in their degree audit. A Program of Study is not required by the Graduate School but may be prepared by the student's advisor in consultation with new graduate students for effective advising. Some programs may also use the Program of Study as part of its Application to Candidacy process.

Major Field

All course work taken for the degree should apply directly, through a logical program of study, to the specialty which candidate has selected. Each department is responsible for defining the required sequence of courses.

Internship

Each candidate will earn from three to six semester credits in an internship. This experience will consist of supervised performance of duties related to the candidate's specialty. The student's department will determine the structure of the internship and a research project will be conducted in conjunction with the internship.

Oral Examination

The oral examination committee will consist of the student's committee and a dean's representative appointed from the graduate faculty by the dean of the Graduate School. This committee will conduct an oral examination at the conclusion of the research project and no earlier than the candidate's last semester of enrollment.

The examination will consist of a defense of the project along with general questions on subject matter related to the candidate's field of study. Any candidate who fails the oral examination may upon the advisor's recommendation and with the graduate dean's approval, be granted a second examination after a lapse of at least one semester. Failure in the second examination disqualifies the candidate from obtaining the degree.

Time Limit

The specialist in education degree must be completed within seven years following admission to the program. Inclusion of any coursework over seven years old at the time of the final examination will be at the department's discretion.

Doctoral Degrees

The doctoral degree requires significant scholarly study beyond the master's program, including a minimum of 30 credit hours beyond the master's and a minimum of 18 credit hours of dissertation. As per NMSU's campus residency requirement, a minimum of 50% of degree coursework must be taken at NMSU.

Prospective candidates are expected to hold bachelor's or master's degrees from accredited institutions, based on curricula that include the prerequisites for graduate study in the department of their subject. To be considered for admission to a doctoral program, the applicant must have a grade-point average of at least 3.0. Prospective candidates are urged to consult the department in which they wish to study for information concerning specific requirements.

Professional Doctoral Degrees

Doctor of Economic Development (DED)

Students enrolled in the Doctor of Economic Development are required to complete and pass a comprehensive examination. Since a dissertation is not required, students are expected to complete an internship experience and a project paper as defined by their program. They can embark on the project paper once they have completed and passed their comprehensive examination. Students are not required to take 700/7000 level dissertation hours. However, they are expected to complete at least 12 credits at the 600/6000 level including ECDV 694 Internship and ECDV 699 Doctoral Project.

Doctor of Education (Ed.D)

The degree of Doctor of Education demonstrates proficiency in a program of graduate study in which the emphasis is on preparation for performance in educational leadership. This program is intended primarily for students pursuing careers in educational leadership, school district or higher education administration, or educational services are predominant rather than those in research. The Ed.D. Degree in educational leadership and administration is offered in the School of Teacher Preparation, Administration, and Leadership

Two concentrations are available within the Ed.D. degree: Higher Education Administration and PK-12 Administration is offered in the Department of Curriculum and Instruction; the degree in educational administration is offered in the Department of Educational Leadership and Administration. Any transfer credit or predoctoral course work to be included in the related field must have the approval of both the major and minor (if applicable) department at the outset. Specified course work in both research and statistics is required for this degree. Other requirements are described in the departmental sections of this catalog.

Doctor of Nursing Practice (DNP)

Students holding a Bachelor's degree in Nursing are required to complete and pass all required course work for the DNP program, in

addition, complete and pass their comprehensive examination. Since a dissertation is not required, they are expected to complete an internship experience and a project paper as defined by their program. They can embark on the project paper once they have completed and passed their comprehensive examination. They are not required to take 700/7000 level dissertation hours. However, they are expected to complete at least 12 credits at the 600/6000 level including NURS 6990 Advanced Practice Nursing Immersion credits sufficient to complete the DNP Final Project.

Students who hold a Master's of Science in Nursing are required to complete the following:

1. All course work requirements
2. Their comprehensive exam (with passing marks)
3. The DNP Project.

Post- MSN DNP students must complete at least 6 credits at the 600/6000 level, including NURS 6990 Advanced Practice Nursing Immersion credits sufficient to finish the DNP Project. Finalized projects must be uploaded to a national DNP Project repository approved by the Graduate Faculty of the School of Nursing in order to achieve the DNP degree.

Doctor of Philosophy (Ph.D.)
The Doctor of Philosophy degree requires distinguished attainment in both scholarship and original research. The doctoral degree requires significant scholarly study beyond the master's that is tailored to the needs and interests of the student. The degree is granted in recognition of the candidate's high attainments and ability in the special field, shown by work on the required examinations covering both the general and the special fields. The individualized program of study is designed to meet the campus residency requirement, includes a minimum of 30 graduate credits beyond the master's, and includes the preparation of a dissertation. A candidate for the Ph.D. degree is expected to maintain a higher level of work than the grade-point average of 3.0, plus at least 18 credits of dissertation work (700/7000-level courses).

Interdisciplinary Doctorate (IDOC)

Students interested in pursuing an Interdisciplinary Doctorate (IDOC) degree program must meet with the Graduate School for advisement. The advisement session will include information on completing the IDOC admission application.

The following requirements for admission to the interdisciplinary doctorate degree program are:

1. Students wishing to study in the interdisciplinary doctoral degree program must apply and be accepted into a doctorate-granting department.
2. A master's degree or equivalent program of study that includes at least 30 credits of graduate course work with a minimum cumulative GPA of 3.0.
3. Twelve credits of graduate course work must be completed at NMSU in order to apply for admission into the interdisciplinary doctorate degree program. Additional course work is required for degree completion.
4. Evidence of outstanding academic achievement in graduate school.
5. A written description of the program concept prepared by the student consisting of:
   a. Areas in which competency is required
   b. Purposed readings and course work and how these relate to required competencies
   c. Objectives and an outline for thesis research
   d. Justification for not using an existing departmental degree program
6. Student must select an advisor from his/her department to help structure and chair a committee consisting of at least five faculty members from the graduate faculty list who are willing to work on the interdisciplinary degree program. The committee must include at least two members from each of the two doctorate-granting departments. The committee chair will convene a meeting to review and approve the proposed program.
7. The Graduate School will send an Admission Referral document, signed by all the committee members, to the heads of all the departments from which the student proposes to use more than 8 credits of course work, or from the department which the faculty are requested to serve on the proposed committee.
8. Once the Admission Referral document has been approved by all departments, the committee chair will convene a meeting of the committee to review the student's program and make changes as necessary. In addition, the committee will set the format and date for the qualifying exam. An effort should be made to incorporate the interdisciplinary nature of the program into the qualifying exam.
9. Students have satisfied the requirements for admission to the program once the qualifying exam has been passed and the respective department heads approve the Admission Referral memorandum. Formal acceptance into a doctoral program may be required in order to receive financial assistance.
10. The number of courses required for degree completion will vary depending on the student's program of study, please see the department for more specific requirements. However, Interdisciplinary doctorate degree students must meet the requirements for residency, registration, the comprehensive examination, the Final Examination, the dissertation and the declaration of approved minor.
11. The dissertation work shall include at least 18 credits of a 700/7000-level course.

Completing your Doctoral Degree Program

Any student who fails to abide by the regulations in this section will be considered withdrawn from the university. In order to resume their studies, the student must formally apply for readmission to the Graduate School and satisfy any requirements that are in effect at the time of reapplication. Readmission information can be located here (https://apply.nmsu.edu/apply/?id=1c3c41ea-b5f9-48ef-83c3-b085794ba277).

Declaration of Approved Minor

Any doctoral applicant for candidacy may declare up to two approved minors in addition to the major area of study. Demonstration of competency in the minor area will be required at both comprehensive and final examinations.

Qualifying Examination

Doctoral students must pass a qualifying examination that is scheduled by the student's advisor and is administered by the major department. Its purpose is to determine the areas in which the student shows strength or weakness, and the ability to assimilate subject matter presented at the graduate level. A student may not register for dissertation credits prior to the successful completion of the qualifying examination.

The following conditions apply to students who wish to take the qualifying examination:

1. For students who enter the Graduate School with little or no previous graduate experience but wish to proceed directly to the doctorate, the

qualifying examination should be taken after 12 credits of graduate work.
2. For students who enter with a master's degree or equivalent from another university, or another department, the qualifying examination should be taken before completing one semester of graduate work.
3. For students who earn their master's degree at New Mexico State University and will continue in the same department, the department may allow the master's final examination to serve as the doctoral qualifying examination or a separate examination may be required.

Based on the result of the qualifying examination, the department will take one or more of the following actions:

1. Admit the student to further work toward the doctorate
2. Recommend that the program be limited to the master's degree
3. Recommend a re-evaluation of the student's progress after the lapse of one semester
4. Recommend discontinuation of graduate work

In all cases, the Graduate School shall be notified by the department of the results of the qualifying examination.

Students will be admitted to the doctoral program once the qualifying examination is passed. The student's advisor and department head will then appoint the doctoral committee to prepare the student's preliminary doctorate program of study.

Doctoral Graduate Committee

The doctoral committee will comprise at least four graduate faculty members who hold doctoral degrees. The following rules apply to the composition of the committee:

- The committee chair must be from a discipline within the student's major department
- At least one additional member of the committee must also be from a discipline within the student's major department.
- If an approved minor is declared, at least one (but no more than two) members of the committee must be from the minor department.
- All committee members must be members of the graduate faculty and be from a doctorate-granting department.
- Only one member may be outside of the student's department.
- One member of the committee must serve as the dean's representative. In programs where more than one department participates, the dean's representative may not be from any of those departments. The dean's representative may be one of the following
  - the member from the related area
  - a member from the minor area
  - An independent member, not from the student's department, that is appointed by the Dean of the Graduate School.

Departments may structure committees that include more than the minimum number of members, as long as the following conditions are satisfied. No changes can be made to the doctoral committee membership without prior approval from the Dean of the Graduate School.

Additional voting and nonvoting members may be any person approved or appointed by the Dean of the Graduate School

All members of the committee will attend the comprehensive oral and final defense for the student's dissertation.

Doctoral Program of Study

Students should follow the course requirements outlined in the program's catalog and pursue the roadmap featured in the program's degree audit. A minimum of 50% of the degree coursework must be taken at NMSU. If the doctoral program does not have an active degree audit, students should work with their advisor to file a Program of Study Form once they have:

- Completed 1 year of enrollment while at NMSU that are beyond the master's degree
- Successfully completed a qualifying examination if required by the program

The individualized program of study is designed to meet the campus residency requirement and includes a minimum of 30 graduate credits beyond the masters.

If the Doctoral degree requires a dissertation, at least 18 credits of dissertation work must be included. The professional doctoral degree includes a practicum or special project that culminates in a written report which demonstrates a command of the relevant scholarly literature and links it to the specific clinical or practical experience.

Comprehensive Examination

The Graduate School should receive the Program of Study and the Committee for Doctoral Students Form and the Doctoral Qualifying Examination Form.

Students will be admitted to the comprehensive examination only after the following conditions are met:

1. Completion of adequate course work, to the satisfaction of the major department and the Graduate School,
2. The graduate committee determines the student is adequately prepared for the examination, and
3. Successful completion of all language requirements (where applicable).

Students must be registered for 3 credits of graduate course work during the semester in which they take the comprehensive examination. A student taking an oral examination must enroll for at least one credit for that term (fall, spring, or summer terms).

The Doctorate of Philosophy Examination or Professional Doctorate Examination Form must be on file at the Graduate School at least ten working days prior to the proposed date for the examination. The examination must be part written and part oral. The oral examination results will be reported to the Graduate School by the Dean's Representative of the committee. These and all graduate forms are available on the Graduate School Form webpage.

Any student who fails the comprehensive examination may either be terminated from the doctoral program or upon recommendation of the committee and approval of the Dean of the Graduate School or be granted a second examination after a lapse of at least one semester.

NOTE: Generally, there should be a time-lapse of at least one year between the comprehensive and final oral examination. However, due to the type of research required and the method of administering the written comprehensive in some departments, such a time lapse is not always practical. In all cases there must be one semester between the comprehensive and the final oral examinations.

Time Limit for the Comprehensive Examination

If more than five years have passed since the date of the comprehensive examination, the candidate will be required to take another comprehensive examination before admission to the final examination.

Advancement to Candidacy

Advancement to Candidacy recognizes that the student has demonstrated the ability to sustain a level of scholarly competency commensurate with the successful completion of degree requirements. Upon advancement to candidacy, the student is cleared for the final stages of the graduate program which may include a dissertation, project or written examination.

For advancement to candidacy the following criteria must be met

1. Successful completion of the comprehensive examination
2. Recommendation of the graduate committee
3. Approval of the Dean of the Graduate School

Upon receiving advancement to candidacy, students must follow the Dissertation Registration Requirements.

Dissertation Registration during Fall/Spring Sessions

After becoming a candidate, students must continue to register for at least 3 credits of dissertation or graduate course work, each spring/ fall semester until the dissertation is approved by the Graduate School and the dissertation format review has been completed. The total number of dissertation hours must be 18 credits. The doctoral committee can impose additional requirements for courses numbered 700/7000.

A student who fails to abide by these regulations will be considered withdrawn from the university and in order to resume studies, must formally apply for readmission and satisfy the requirements in effect at the time of reapplication.

Dissertation Registration during Summer Sessions

If the final examination is to be held during the summer or the dissertation is to be completed during the summer, students must register for one credit during the summer session in which the final examination will be held or the dissertation will be completed.

Dissertation Leave of Absence

Students may seek a leave of absence from their dissertation. A leave of absence requires that a student must get prior approval from the Dean of the Graduate School, which means the student must receive permission for the leave of absence before discontinuing their formal studies.

Final Examination

NOTE: If more than five years have elapsed since the student passed the comprehensive examination, the candidate will be required to take another comprehensive examination before admission to the final examination.

Every student working toward the doctoral degree will submit a dissertation embodying the results of original research. The dissertation is expected to demonstrate the student's ability in independent investigation and to be a contribution to human knowledge. The dissertation shall display a mastery of the literature of the subject field, present an organized and coherent development of ideas with a clear exposition of results, and provide a critique of the limits and validity of the student's conclusions.

When a complete draft of the dissertation has been prepared, the student's doctoral committee (appointed after the qualifying examination) will conduct the final examination. The final examination is concerned primarily with the research work of the student as embodied in the dissertation, but it may be much broader and extend over the candidate's entire field of study. The intention of the final examination is to verify that the candidate has a satisfactory grasp of the major subject as a whole and has a general acquaintance with the fields of knowledge represented by the course of study. The final examination is oral and is open to the public.

Every student meeting the final examination qualifications must be enrolled in a minimum of 1 credit hour in order to defend. The final examination must be completed in accordance with the schedule provided in the academic calendar. Ten working days before the examination is taken the department must submit the form requesting this examination to the Graduate School. This form may be found by visiting the Graduate School website and departmental offices.

Students must ensure that each member of the examining committee receives a copy of the dissertation, no later than seven working days before the date of the final examination.

Any candidate who fails the final oral examination may either be terminated from the doctoral program or upon recommendation of the committee and approval of the Dean of the Graduate School, be granted a second examination after a lapse of at least one semester. Failure in the second examination disqualifies the candidate from obtaining the degree.

Finalizing the Doctoral Dissertation

After successful completion of the final examination, electronic submission of the approved dissertation must be submitted to ProQuest ETD, no later than the deadline posted to the Graduate School website. The format review of dissertation will be performed electronically by the Graduate School. The form and style of the dissertation must comply with the regulations given in Preparing your manuscript for submission located on the Graduate School's website (https://gradschool.nmsu.edu/current-students/graduating-thesis-and-dissertation-students.html). The dissertation is not complete until the required forms are received at the Graduate School. Required forms may be found here.

Registration

Registration at NMSU is a process that includes: (1) academic advising, (2) registering for classes, online or with your academic advisor, and (3) payment of tuition and fees. For first time freshman and transfer undergraduate students (at the Las Cruces campus), the registration process occurs during Aggie Welcome/Transfer Student Orientations. For currently enrolled Undergraduate students and all Graduate students registration occurs in collaboration with your advisor or online through the myNMSU portal. For detailed instructions and questions about registration which are not addressed on the website, please contact the University Student Records (USR) (https://records.nmsu.edu).

Admission Requirement

No person will be allowed to register for courses until formally admitted to NMSU through the Community College, International Programs, Undergraduate or Graduate Admissions processes.

Class Schedule

Each semester and summer session, the University Student Records provides an online schedule of classes which can be accessed through myNMSU or the NMSU website. Note that not all courses listed in this catalog are offered every semester.

Registration Schedule by Classification

Several groups of students (e.g. Crimson Scholars, Students with Disabilities, Veterans) receive priority dates for course registration. For other students, registration dates are determined by the student's current classification at the time of registration. A student's classification is determined by the number of credits completed, and does not include courses in progress. A student's classification depends upon the number of credits completed toward graduation. Sophomore classification is achieved with successful completion of 28 credits; Junior classification, 60 credits; Senior classification, 90 credits.

University Credits

The unit of university credit is the semester hour, which is based upon one hour of lecture class or a minimum of two hours of practice/lab per week during one semester, and assumes a minimum of two hours additional, by the student, outside of class. The number of credits associated with each course is indicated in the course schedule.

Course Load for Undergraduate Students

The full-time course load in a regular semester (fall or spring) for a main campus undergraduate students is 12-18 credits. A full-time course load for a summer term is 9-12 credits, with a maximum of 6 credits per session. Some scholarships have a 15 credit course load eligibility requirement. Each student is responsible for meeting their own scholarship eligibility requirements.

An overload is classified as more than 18 credits for a regular semester and more than 12 credits for the summer term. A one-credit course in physical education or supplemental instruction will not create an overload. Registration for a course overload requires written permission from an Associate Director of the Center for Academic Advising and Student Support (CAASS) or the Associate Dean for Academics in the student's academic college. A "Change of Schedule (https://records.nmsu.edu/_files/sro-forms/Change%20of%20Schedule%20Form.pdf)" form is required and available on the University Student Records website (https://records.nmsu.edu). Freshmen and students with a grade of D or F, or a cumulative grade-point average of less than 2.5, in either of the last two semesters, are not eligible for overloads. Concurrent enrollment in non-NMSU courses at other post-secondary institutions requires prior approval from the Associate Dean for Academics in the student's college, and these courses are counted as part of a student's class load.

Course Load for Graduate Students

A full-time course load in a regular semester (fall or spring) is 9 credits, with a maximum of 15 graded credits. A full-time course load for a summer term is 6 credits with a maximum of 9 credits.

Course Numbering

The course numbering system at NMSU indicated the levels as follows:

- 100-299/1000-2999 – Lower Division (Las Cruces and Community College Campuses)
- 300-499/3000-4999 – Upper Division (Las Cruces Campus)
- 450-499/4500-4999 – Senior and graduate courses (Las Cruces Campus)
- 500-799/5000-7999 – Graduate courses (Las Cruces Campus)

All undergraduate students must demonstrate Basic Academic Skills in both English and mathematics before enrolling in any upper-division course (numbered 300/3000 or higher). These requirements ensure that each student in the upper-division courses has the ability to succeed without compromising the learning experience of other students.

Class Delivery

Classes at NMSU are delivered in a variety of modalities. Students may see any of the following schedule types when viewing the class schedule through myNMSU or the NMSU website.

- **CL (Classroom/Lecture):** traditional in-person class meetings that occur on specified days and times in a specified location.
- **LB (Lab):** traditional in-person lab meetings that occur on specified days and times in a specified location.
- **HY (Online with In Person Meetings):** hybrid delivery that is offered both online and with required in-person class meetings that occur on specified days and times in a specified location.
- **ONL (Online with Synchronous Meetings):** online class meetings that require all students to meet virtually on specified days and times
- **WB (Online with no Synchronous Meeting):** online class meetings that do not require students to meet virtually
- **IND (Independent Meeting):** students and instructors schedule meetings on an as needed basis to discuss course content and student progress
- **TD (Thesis/Dissertation):** thesis/dissertation with implied meetings on an as needed basis to discuss course content and student progress
- **PC (Practicum):** practicum/clinical with implied meetings on an as needed basis to discuss course content and student progress

Prerequisites and Corequisites

Some courses require advance or concurrently acquired specific knowledge and skills. Prerequisite(s) and corequisite(s) for each courses are indicated in the course description section of this catalog. Students must have completed (or be presently enrolled in the prerequisite(s)) courses in order to register for a course with prerequisites. Where a student was allowed to register for a course while completing the prerequisite(s), and then subsequently fails to successfully complete a prerequisite course, the student shall be dis-enrolled from the course requiring the prerequisite. In the case of a corequisite, a student must enroll in the courses during the same semester. In some instances, where a course has an enforced "pre/corequisite" the student can elect to either take the requirement before registering for the course, or take the courses at the same time.

Registration Changes

Subject to any registration "holds" and any applicable deadlines, students may change their course registration online. Caution should be exercised as registration changes may negatively impact eligibility for scholarships, financial aid or athletic participation, the student's ability to progress through their degree program in a timely manner, and the student's obligations with respect to tuition and fees.

The University Student Records publishes an online schedule of "Important Dates for Students (https://records.nmsu.edu/students/important-dates.html)" for each semester. The student is responsible for reviewing and adhering to the Important Dates, including the deadlines to add, drop or withdraw from course(s) for the relevant semester.

Adding Courses: There are two different types of deadlines for adding courses:

1. **Last day to add a class without instructor's signature** - during this period courses may be added online through myNMSU, or through your academic advisor (if necessary).
2. **Last day to add a class with instructor's signature -** during this period courses may only be added with either the "Change of Schedule (https://records.nmsu.edu/_files/sro-forms/Change%20of%20Schedule%20Form.pdf)" form signed by the instructor (available online on the University Student Records website (https://records.nmsu.edu)).
   Or students taking classes online and who do not live in the Las Cruces Area must email the instructor, using the NMSU email, in order to get permission to be added to the course. If the instructor approves the addition, the approved response must be sent to either the student's academic advisor or to record_grade@nmsu.edu with the student's name, ID number and course CRN number they are wanting to add.

Withdrawing from Courses: There are two different types of deadlines for withdrawing from courses:

1. **Last day to drop without a "W" grade –** during this period, the student can drop the course and not have it appear on their official transcript in any form, and the student will have no financial obligation related to the course (students will receive a 100% refund if tuition has been paid for the course).
2. **Last day to drop with a "W" grade –** during this period, the student can withdraw from the course, but the course will appear on their official transcript with the withdrawal (W) designation as the grade, and the student will be responsible for the full tuition and fees related to that course.

Students are responsible for initiating official withdrawal from any course(s) they do not intend to complete. Students who experience extraordinary circumstances that prevent timely registration changes should consult with their Academic Associate Dean or the Registrar. For more information about the process for adding or withdrawing from a course(s), please speak with your academic advisor or contact the University Student Records.

Any student attending under Veteran Educational Assistance must notify the Military and Veteran's Programs office before processing registration changes to determine if changes will affect their enrollment status or benefits.

A student found insufficiently prepared for a course they are enrolled in may be transferred to a more elementary course in the same subject any day before the last day to withdraw from an individual course.

Waitlisting

Waitlisting is available for all courses across the NMSU system, except for labs that are linked to a specific lecture class. Waitlisting is an electronic list of students who are waiting to register for a filled course. Once students are put onto the waitlist, the process to get into that course is as follows:

1. A currently enrolled student must drop the course for a seat to become available.
2. The first student on the waitlist is notified through their NMSU email.
3. The notified student has 24 hours to log in to their myNMSU and register themselves for the class.
4. If the first student fails to register within their allotted 24 hours, then the first student is dropped from the waitlist and the next student on the waitlist is notified. This continues until the empty seat is filled.

A student who fails to register for the class during their allotted 24 hours is automatically dropped from the waitlist and can add themselves back onto the bottom of the waitlist for that course.

Students cannot be added to the waitlist after the first day of classes. Instructor overrides can only be made after the second day of class, at which point the instructor's signature is required on either the "Change of Schedule (https://records.nmsu.edu/_files/sro-forms/Change%20of%20Schedule%20Form.pdf)" form to add a course.

Graduate Registration Requirements for Summer

Students who have scheduled their final examination, or who are completing their thesis during a summer session, must be registered for one credit hour during the same summer session. In order to graduate during a summer session, the student must have filed the Application for Degree by the deadline posted on the Academic Calendar.

Repeating Courses for A Change in Grade

See the Grading portion of the Academic Regulations section of this catalog.

Substitutions and Waivers

Students registering for their final semester must have all course substitutions and/or waivers of degree requirements approved before two weeks after the last date of registration for full or summer terms.

Auditing a Course (No Credit)

An audited course is one in which the student registers for the learning experience but does not seek to earn academic credit for the course. A student seeking to audit a course must register and pay tuition and fees for the course and have the consent of the instructor to take the class in audit form. A student who has registered to audit a course may be dis-enrolled from the course at any time before the registration deadline expires if necessary to accommodate a student taking the course for credit. After the last day to register, the student cannot change the course option from audit course to a for credit bearing course.

Audited courses are not used in determining a maximum class load (overload) for undergraduate students in good academic standing, however, the audited course will be counted as part of the maximum allowable course load for graduate students and undergraduate students who are on academic probation.

Academic Performance and Progress Attendance and Student Performance

Academic success is closely correlated to student participation and attendance. Accordingly, students are expected to attend all their classes regularly. Each course instructor will establish the specific attendance and course requirements via the course syllabus. Only students who are currently enrolled in a course for either credit or audit are permitted to attend the classes officially. However, individual instructors may allow an

occasional visitor and may allow a student who formally withdrew from the course to continue to participate for the remainder of the semester.

Absences from Class and Failure to Complete Assignments

Students who must miss class due to accident, illness, or other circumstances beyond their control should consult the course syllabus and the instructor for guidance. Students may be administratively withdrawn from a course due to excessive absences (consecutive absences in excess of the number of class meetings held within a week or any number of absences, including failing to use the online Learning Management System, which are impairing the student's performance), or for persistent failure to complete assignments. In such cases, the Instructor may recommend administrative withdrawal by providing the Academic Associate Dean a completed "Student Absence/Lack of Progress Report" form. If the Academic Associate Dean agrees with the recommendation of the course instructor, the student will be administratively withdrawn from the course. To appeal the decision, see the Administrative Withdrawal (p. 48) section.

Any absences due to the student's participation in a university-sponsored event (e.g. ASNMSU president representing NMSU at legislative session, student-athletes competing in NMSU scheduled athletic events, or students attending educational field trips and conferences) will be excused and deemed an "Authorized Absence". Authorized absences do not relieve the student of the course assignments or responsibilities and instructors may require students to complete course work before the absence. Before the student's absence, the student will provide the instructor(s) with written notice of the dates of expected absence.

Classroom Conduct

Each instructor has the authority to establish and enforce reasonable rules of conduct in their courses. A student who engages in behavior that interferes with the educational environment of the class may be administratively dis-enrolled with the approval of the academic Department Head and Academic Associate Dean for the course, and with notification to the Provost. Any student who has been administratively dis-enrolled from a class may appeal that decision to the Dean of the College where the course was offered within ten days after notification of the dis-enrollment.

Student Performance Assessment

Individual student performance and learning outcomes in a course are measured and evaluated by the course instructor and reported to the student in the form of grades. Each instructor has the authority to establish assignments and other assessments (such as exams and quizzes) and assign grades based on the student's performance. The instructor determines the final grades for the course and reports to the University Registrar as described in the grading section of this catalog. Any student who believes that their academic performance has been evaluated unfairly may appeal the grade through the University's Academic Appeals process (https://report.nmsu.edu/decision-tree/) as provided in this Catalog.

Academic Program Assessment

New Mexico State University is committed to providing its students with a quality education and a supportive learning environment. Academic Program Assessment is a continuous improvement process achieved by identifying a program's desired learning outcomes, evaluating the extent to which students in the program collectively achieve those outcomes, and then implementing changes to enhance and improve the collective program outcomes. For assessment to be effective, students must be actively aware of and engaged in assessment activities.

Academic Program Assessment requires participation of students who are expected to provide feedback on personal, professional and academic development and to participate in a variety of assessment exercises. Assessment activities may be a part of regular graded course assignments, or may require students to engage in other activities as outlined in the course syllabus. Assessments may include course projects, exams, exit interviews, standardized tests, surveys, focus groups, etc. Data gathered through these assessments is published only in aggregate form. Learn more about NMSU's Academic Program Assessment at https://assessment.nmsu.edu/

Exam Week and Final Examinations

NMSU designates the last week of each semester as "Exam Week" during which each course has only a single 2 hour meeting time for a mandatory culminating activity which may be a final examination or some other course-related activity. The University Student Records (USR) establishes the Final Examination Schedule (https://records.nmsu.edu/students/final-examination-schedule.html) for each semester. Examinations are typically held in the course's standard lecture/lab room. Some departments hold Departmental Exams where all students for all sections of a particular course must take the final examination simultaneously. The Final Examination Schedule indicates the Department Exam dates, times, and location. For courses not scheduled to meet at the specific times listed under "Regular Class Time" on the USRO's Final Examination Schedule, the instructor and course department coordinate examination dates, times and locations with NMSU's Academic Scheduling office (575) 646-4790. Final exams for weekend courses are held during the regular class period on the last day of class.

The final exam or culminating activity must not be rescheduled for a different date, time or location, except with the department head's permission and the enrolled students' unanimous consents. During the week before Exam Week, instructors cannot hold examinations lasting more than one class period.

Any student having more than three examinations scheduled in any one day may, no later than the week before exam week, notify the instructor of the examination scheduled latest in the day to obtain an alternative date for that examination. (If the fourth exam is a departmental exam, the instructor of the third exam will make alternate arrangements for that exam upon request.)

Students who believe that their instructor(s) have not honored Exam Week requirements may appeal to the instructor's department head.

Developmental Evaluation

The academic skill level of all entering first-time students at the time of registration is evaluated based on ACT scores, SAT scores, and/or alternative placement assessments. The student's eligibility to enroll in university-level English and Mathematics courses depends on this evaluation. Students without adequate preparation for university-level courses must take developmental courses. Developmental courses are included on the transcript and will be included in the calculation of the GPA, but the developmental course credits do not count towards a degree.

Basic Academic Skills

All undergraduate students must demonstrate Basic Academic Skills in both English and mathematics before enrolling in any upper-division course (numbered 300/3000 or higher). These requirements ensure that each student in the upper-division courses has the ability to succeed without compromising the learning experience of other students. The completion of the Basic Academic Skills requirements **does not necessarily result in the award of academic credit nor satisfaction of university general education requirements** in English and mathematics. (Students should consult the General Education Courses and Requirements section in this chapter for these requirements.)

Transfer students with 45 or more credits are allowed to enroll in upper-division courses for only one semester before satisfying the Basic Academic Skills requirements. The Basic Academic Skills requirements may be satisfied in a variety of different ways as listed below:

English Basic Skill Demonstration Options (achieve one of the following):

- ACT English Score of 30
- Coursework - **ENGL 1110G**, or equivalent, completed with a grade of C- or higher.

Equivalents: the following are deemed equivalents to ENGL 1110G for the purpose of satisfying Basic Academic Skills in English:

- **ENGL 1110H –** completed with a grade of C- or higher
- ENGL 1110M - required for International students who took the TOEFL examination
- CLEP Exam score of 57 or higher in freshman college composition
- English Advanced Placement (AP) Exam score of 3, 4, or 5
- English Composition Transfer Credits - 3 or more credits with a grade of C- or above, transferred from accredited post-secondary institutions (International students may be required to take ENGL 1110M Composition I Multilingual as noted above.)

Credits from Non-accredited Institutions - As a general rule, NMSU does not accept credits from non-accredited institutions. Students with 3 or more credits of college-level English composition with a grade of C- or higher from a non-accredited institution may, however, challenge the Basic Academic Skills requirement in English and ENGL 1110G Composition I course requirement by submitting a theme paper written under the supervision of, and demonstrating achievement of ENGL 1110G Composition I learning outcomes as determined by, the Department of English.

Mathematics Basic Skill Demonstration Options (achieve one of the following):

- ACT Mathematics Score of 23
- Coursework – any one of the following courses or course combinations completed with a grade of C- or higher in each course:
  - MATH 1130G Survey of Mathematics
  - MATH 1215 Intermediate Algebra
  - MATH 1220G College Algebra
  - Any mathematics course numbered 1250G or above (prefix MATH) excluding MATH 1996 Topics in Mathematics and MATH 2992 Directed Study
- Basic Skills Exam Passing Score - offered twice a semester by the Department of Mathematical Sciences
- Calculus AB, Calculus BC or Statistics Advanced Placement (AP) Exam score of 3, 4, or 5

IMPORTANT NOTE: Basic Academic Skills Demonstration fulfillment options may not appear on the transcript, result in the award of academic credit, or satisfy general education requirements. The Basic Academic Skills requirements are used solely to determine eligibility for enrollment in upper-division courses. All students should seek to complete the Basic Academic Skills requirements as early in their academic program as possible. Students who postpone completing Basic Academic Skills may be unable to progress toward degree completion in a timely manner.

Independent Study and Directed Reading Courses

Independent study courses and directed reading (other than those designated in the catalog with a subtitle), are for students capable of and sufficiently motivated to undertake self-directed study with limited oversight of a faculty member. Only students who have completed at least 28 credits at NMSU under traditional grading, with a cumulative GPA of 2.5 or better, can enroll in independent study courses. No student is entitled to enroll in independent study and enrollment requires the consent of an instructor who agrees to supervise and evaluate the student's learning activities in the course. Students seeking registration in an independent study course should prepare an independent study proposal to present to the individual faculty member(s) in the relevant discipline for consideration. At a minimum, the proposal should include the topic of study, a brief survey of the literature or other resources on the subject, and a description of the proposed written product or another tangible outcome of the independent study. The relevant academic department for the discipline may have additional requirements. Each college determines the maximum number of credits that may be earned in independent study courses.

Adjusted Credit Option

The adjusted credit option provides eligible undergraduate students who earned a low grade-point average (less than 2.0 cumulative) during their first few semesters to reset their GPA calculation. This option may be used only once and is not reversible. These are the consequences of exercising the Adjusted Credit Option:

1. All of the student's academic history pre-dating the request, including all NMSU course credits previously attempted or completed, transfer coursework, CLEP, ACT, advanced placement, special examination, and/or military service are included in the adjustment and designated as "ADJUSTED CREDITS" on the transcript. These credits are no longer included in the cumulative grade point average calculation.
2. Courses carrying an academic grade of S, CR, C- or better, earned prior to the grading period in which the student requested this option, are treated as earned academic credit and need not be repeated, except where a higher grade is required in the student's academic program.
3. Courses carrying an academic grade of U, CD, D or F, earned prior to the grading period in which the student requested this option, remain on the student's transcript, but no academic credit is provided for these courses. The student must repeat these courses to obtain academic credit.
4. The student's academic transcripts will continue to reflect all coursework, including courses falling under the adjusted credit

option. In no circumstances will a transcript be issued that does not include all courses attempted at this university.

5. The student's current academic status, eligibility for employment, and financial aid may be impacted. Probationary status and eligibility for on-campus employment are not affected by the exercise of the adjusted credit option.
6. The repeat rule for courses starts anew.
7. The student will not be eligible for the award of an associate degree until earning thirty (30) or more additional credits after exercise of the Option.
8. The student is eligible for University honors at graduation upon completing a minimum of 60 academic credits at NMSU, after the adjusted credit option is exercised, with a resulting grade point average that satisfies University regulations for honors.

After carefully considering the consequences indicated above, eligible students may exercise the Adjusted Credit Option by paying a fee of $10 and submitting an adjusted credit option application to the University Student Records. Application forms are available on the University Student Records website and can be approved by the Director of the Center for Academic Advising and Student Support or the Associate Dean for Academics in the student's college or the Academic Vice President at the Community Colleges. Only students meeting the following criteria are eligible to exercise the Option:

1. No awarded baccalaureate degree
2. Enrolled as a degree-seeking or non-degree undergraduate student
3. A cumulative grade-point average of less than 2.0 at NMSU
4. Fewer than 60 credits accumulated (including both transfer and NMSU credits)

Credit by College Level Examination Program (CLEP)

Before or during a student's enrollment at NMSU, credits may be earned through the College Level Examination Program (CLEP) of the College Entrance Examination Board. CLEP is a national program of credit by examination that offers the opportunity to earn credits for college-level achievement wherever or however the student learned. Earned CLEP credit will be treated as transfer credit without a grade, will count toward graduation, and may be used in fulfilling specific curriculum requirements. A current NMSU CLEP policy and test schedule information is available through Testing Services DACC East Mesa, RM 210. Testing Services may be reached at: (575) 528-7294.

Credit by Examination

Any enrolled student with a cumulative GPA of at least 2.0 currently attending classes may, with permission of the appropriate department, challenge by examination any undergraduate course in which credit has not been previously earned except an independent study, research or reading course, or any foreign language course that precedes the final course in the lower-division sequence. The department in which the course is being challenged shall determine the manner of administering the examination and granting permission. Students may not enroll in a single course, challenge it by examination, and drop it during the drop/add period, unless they enroll in an additional course. In exceptional cases in which a student demonstrates outstanding ability in a course in which they are already registered, they may be permitted to challenge the course. A student desiring to apply for special examination may obtain the necessary forms from the University Student Records. The fee for challenging a course is the same as the approved tuition rate. Courses may not be challenged under the S/U option. The special examination privilege is based on the principle that the student, exclusively, has the responsibility for preparing for a special examination.

Credit for Military Service

New Mexico State University will award academic credit to United States military personnel for courses and Military Occupational Specialties (MOS), based on the American Council of Education Guide (ACE) as well as through national standardized tests, such as CLEP, AP, PEP and DANTES. Credit for military training is in accordance with NMSU Faculty Senate Legislation Proposition 24-07/08, which was passed in May 2008. Military Training and Military Occupational Specialties (MOS) must have a recommendation evaluation by ACE (in the ACE Guide) for credit to be awarded. Courses accepted for transfer credit become part of the student's official NMSU transcript and academic record. If a student wishes to appeal a decision regarding the acceptance of military training/education and/or MOS for academic credit, the student must submit a written statement of appeal to the Dean of the College to which the student has applied. The Dean will review the merits of the appeal and render a decision. The decision of the Dean is final.

Only Primary MOS (s) are eligible for academic credit in the initial review and evaluation. Credit for Duty and/or Secondary MOS may qualify for academic credit if the student petitions the college's Academic Dean. Primary MOS is the primary specialty of a soldier and reflects the broadest and most in-depth scope of military experience. Veterans, active-duty personnel, National Guard and Reservists who are current students or students applying for admission to New Mexico State University may be granted academic credit on a case-by-case basis upon evaluation of military transcripts - the Joint Service Transcript (jst.doded.mil) and the Community College of the Air Force transcripts. Course equivalencies and credit hours awarded for a particular NMSU degree are determined by colleges and/or academic departments. Credit hours may be awarded for specific courses toward degree requirement, or as elective credit. The number of credit hours awarded will be determined by the college and/or academic department.

NOTE: Students submitting military transcripts for credit evaluation must keep in mind the Maximum Time Frame policy. See Financial Aid (p. 75) *Section.*

Graduate Course Deficiencies

Students admitted with departmental deficiencies may be required to take diagnostics tests and additional qualifying examinations. They must complete satisfactorily, in a manner specified by the major department, all undergraduate course deficiencies as prescribed by the department responsible for the graduate program. Courses taken to satisfy deficiencies will be listed on the undergraduate transcript; however, these course grades will not be calculated in the student's graduate GPA or graduate hours. With the permission of the student's advisor and the head of the department, courses to meet undergraduate deficiencies may be taken under a S/U option (with S being a grade satisfactory to the professor), and such courses will not affect the maximum number of S/U graduate credits permitted.

Short Courses for Graduate Students

Short course(s) that are numbered 450/4500 and above have been approved to carry graduate credit. Graduate students must be registered for the short course(s) to receive graduate credit. Concurrent enrollment of graduate students in regular and short courses for the fall/spring

semesters is allowed, provided the combined total credits does not exceed 15. All short courses carrying one-semester credit will be graded on a S/U basis, and these credits will be counted toward the student's limit of S/U credits.

Challenging Graduate Courses

A graduate student may challenge a graduate course by examination, please see the Graduate School for more information.

Grading

University Grading System

Each course department or instructor establishes the system for assessing student performance in achieving course learning objectives. Students should consult the course syllabus for a description of the grading system used in each course. At the conclusion of each course, instructors are required to report a final grade reflecting the instructor's assessment of each student's performance. Shortly after the end of the term, students can access their grades through the MyNMSU portal. No other grade notification will be issued. The final grade is reported on the student transcript. Instructors may elect whether to use fractional grading (the use of the plus and minus) in assigning final letter grades.

The NMSU system for final grades is expressed in letters, which carry grade points that are used in calculating the cumulative grade-point average, as shown in this table:

Letter Grade	Grade Points per Unit of Credit
A+	4.0
A	4.0
A-	3.7
B+	3.3
B	3.0
B-	2.7
C+	2.3
C	2.0
C-	2.0
D+, D, D-	1.0
F	0
W- Withdrawal	0
N- Grade not submitted	0
CR- Credit authorized, but not letter grade	0
IP- In progress	0
RR- Progress in undergraduate course	0
PR- Progress in graduate thesis	0
S- Satisfactory work[1]	0
U- Unsatisfactory work	0
I- Incomplete work	0
AU- Audit	0

[1] S grades are grades that are satisfactory to the professor and are normally equivalent to the letter grade of C- or higher.

Any courses for which only CR, S or PR is awarded, but no traditional letter grade is given, will be included in the total number of earned hours but is not computed in the grade-point average. Traditional letter grades are those which are used in the grade point average determination: A+, A, A-, B+, B, B-, C+, C, C-, D+, D, D- and F. In computing the overall grade-point-average, the total credits in which grades of A+ through F have been assigned is divided into the total number of grade points earned.

Midterm and Six-Week Early Performance Grades

A Six-Week Early Performance Grade (sometimes referred to as Midterm Grade) for courses numbered 100/1000-299/2999 will be posted and available to students through the MyNMSU portal. The purpose of the early grade posting is to ensure that students have an opportunity to address any performance issues. Students should be mindful that the Six-Week Early Performance Grade reflects a students' performance on only that portion of the total coursework that has been graded at that time. Any student who is doing poorly, or not as well as they would like, should meet with the instructor to discuss how they can improve. Students who have concerns about their progress in multiple courses or who are considering withdrawal from course(s) must meet with their academic advisor.

In courses numbered 300/3000 or higher, the posting of Early Performance Grades is optional and may occur through the online course management system rather than the MyNMSU portal. However, prior to the last day to withdraw from a course, upon request, instructors will provide information to students about their progress in the course.

Retention of Grading Records

Individual assignments and exams that are not returned to students should be retained by the instructor or department through the end of the subsequent regular semester. The records used to compute individual final grades should be retained for two years after the completion of a course. If a final grade is appealed, these records are kept for at least two years after the completion of the appeal. Departments, colleges, or the library may require that records be kept for longer periods.

Minimum Grade Requirement for Undergraduate Students

Undergraduate degrees require a cumulative GPA of 2.0 or higher for degree completion. Although D+, D, or D- can be considered passing, some departments have higher grade requirements for the courses within their program and/or their program as a whole. Students should check with their departments regarding specific course grading requirements for their particular degree program.

Minimum Grade Requirement for Graduate Students

Graduate degrees require a cumulative graduate G.P.A. of 3.0 or higher. Although B- and C grades (including C+ and C-) earned at NMSU may be counted toward the requirements for a graduate degree in some programs, this grade does not reflect acceptable graduate-level performance and may cause the cumulative G.P.A. to fall below the 3.0 required for graduate students. Some departments have higher grading requirements for courses in their programs. Students should check with their departments regarding specific course grading requirements for their particular degree program.

Courses in which a student earns a D or F grade do not ever satisfy graduate degree requirements; however, these grades will be calculated

in determining the students' cumulative grade-point average. To obtain academic credit, students must retake courses in which a grade of D or F was earned.

S/U Grading

S/U grading allows the student to attempt to earn course credit without having a course grade included in their grade point average calculations. Under S/U grading, the instructor assigns an S grade for satisfactory achievement of the course learning objectives (normally equivalent to the letter grade of C- or higher) and a U grade for unsatisfactory performance in the class.

Designated S/U Courses

Each academic college may designate courses in which the grading will be on the basis of S or U for all students enrolled in the courses. Credits in designated S/U courses are not included in the limitations on the number of S/U credits a student may take and are not subject to the student eligibility requirements described below.

Election of the S/U Grading Option - Undergraduate Students

In courses other than those designated as S/U for all students, eligible individual students may elect the S/U Grading Option, subject to the regulations stated below. To be eligible for the S/U (satisfactory/unsatisfactory) Grading Option, undergraduate students must meet the eligibility requirements and obtain the approval of an academic advisor. Eligibility requires the completion of 28 credits at NMSU under traditional grading, with an overall average of 2.5 or better. (Upon approval of the adjusted credit option, students must re-establish eligibility.) Non-degree seeking students may take courses under the S/U option without regard to eligibility requirements. However, these courses may not be subsequently applied toward an undergraduate degree at NMSU.

The S/U option must be elected as part of the course registration and may not be added once the course registration period closes. Other than honors courses and courses officially designed as S/U, the following limitations apply to courses in which the S/U option is elected:

1. No more than 7 credits per semester or 4 credits per summer session.
2. Not to exceed a total of 21 credits towards a degree.
3. Not a required course for the student's major.

Students electing the S/U option should be mindful that upon a change of majors, the new major department may require a traditional grade for a course within that major that was previously completed with an S grade. In such cases, the student may request that the original instructor process a change of grade form to apply a traditional grade, however, if more than 2 years have elapsed or if the instructor is no longer at NMSU, such a change will not be possible and the student may be required to retake the course or obtain a traditional grade through a course challenge.

Election of the S/U Grading Option Election - Graduate Students

With approval from their advisor and department head, graduate students in good academic standing may elect the S/U option, at the time of registration, for courses taken outside the major department, subject to the regulations stated below:

1. No more than a total of 6 credits of elected S/U courses are permitted in the master's degree.
2. Doctoral candidates may take an additional 6 credits under the S/U option after application to candidacy.

I Grade Designation

The letter grade of I (incomplete) is given for passable work that could not be completed due to circumstances beyond the student's control that develop after the last day to withdraw from the course. In no case is an I grade to be used to avoid assigning D, F, U or RR grades for marginal or failing work. Examples of appropriate circumstances include documented illness, documented death or crisis in the student's immediate family, unexpected military deployment and similar circumstances. Other job-related circumstances are generally not appropriate grounds for assigning an I grade. Students requesting an I grade are responsible for providing satisfactory evidence of such circumstances. (In the case of medical records, instructors should review the information provided, note that adequate medical documentation was provided for review, and return the documentation to the student. Under no circumstances should the instructor retain any medical records or indicate the specifics of any medical condition in the academic records.) The refusal to grant an I grade may be appealed in the same manner as any other final grade.

To assign an I grade, the instructor must complete the "I grade Information Form (https://records.nmsu.edu/_files/sro-forms/I%20Grade%20Information%20Form.pdf)" by the deadline for final grade submission in the semester the student was enrolled in the course, and have the form delivered to the associate dean of the course college. The instructor must indicate on the form whether the student will be given the option to complete the remaining coursework and have the I grade changed to the earned letter grade. If so, the instructor should indicate the steps necessary to complete the remaining coursework. The I grade form should either be signed by the student in person or digitally, or the associate dean must send a copy of the document to the student's official permanent address or university email address, as recorded in the University Student Records, with a notation on the form that the student was not available for signature.

The I grade will be permanent in instances where (1) the instructor did not provide an option to complete the coursework, (2) the instructor left NMSU before completion of the coursework and grade change, or (3) the student failed to complete the coursework by the relevant deadline, and the instructor did not indicate that the I grade would be changed to the earned grade upon failure to complete. In such instances, the student will be required to re-enroll in the course to receive credit (in which case the permanent I grade and the subsequently earned letter grade will both appear on the transcript).

The student is entitled to have the I grade removed from the transcript only if, within 12 months or any earlier deadline established by the instructor on the "I Grade Information Form" and before graduation, the student completes the remaining coursework, as specified on the I Grade Form, in a manner satisfactory to the instructor. If the student fails to complete the coursework, the instructor may change the I grade to any appropriate grade (including D, F, or U) only if the instructor stated that this would occur on the "I Grade Information Form." The instructor should assign whatever grade was earned for the entire course.

To change the I grade, the instructor must complete a "Change of Grade Form," obtain the signature of the associate dean for the course, and submit the form to the University Student Records.

RR Grade

The RR grade may be assigned only in undergraduate developmental courses (CCDE, CCDL, CCDM & CCDR) and indicates that the student has made substantial progress toward completing the requirements of the

course. It carries neither penalty nor credit, so a student must re-enroll and successfully complete the course in order to earn credit. The grade of RR may be received only once in any given course, and is a permanent notation on the student's transcript.

W Grade Designation

The W grade is assigned only in courses when the student withdraws or is administratively dis-enrolled from the course after the last day to drop the course. The W grade is permanent.

Effect of Change of Grade

The effect of a change of grade on a student's academic standing (academic warning, probation or suspension) depends on the date the transaction is officially recorded on the student's academic record. If the transaction is recorded before the student begins another semester, the grade change (such as replacing the I grade with an earned grade) is included in the grade-point average calculation to establish the student's academic standing. If the transaction is recorded after the student begins another semester, for the purpose of calculating academic standing, the new grade is included with any other grades earned for the semester in which the grade change is processed.

Repeating Courses for a Change in Grade

Undergraduate: Undergraduate students may repeat courses, for a change in grade, when the original grade earned was a D or F. Once a grade of C- or better is earned, the course will then be substituted in the calculation of the grade-point- average and students will no longer be able to repeat that course for change of grade purposes. Student transcripts will continue to show the grade awarded for each course attempt, but only the higher grade will be included in the GPA calculations.
a. If the student's original grade was a D and the student repeats the course, but receives an F, the second grade will not be substituted for the original. Repeat options apply only to courses that were completed prior to the time a student was awarded a degree.

Graduate: Graduate students may repeat courses for a change in grade, to be updated on the official student transcript, when the original grade earned was a B- or lower. Students with active graduate status (admitted to a graduate program) are eligible to use this policy.
a. A course may only be repeated once (a total of two instances within the active program of study), and the course numbers and subtitles must be identical (e.g. GEOG 598 – Intro to Geography AI).
b. To replace the original grade on the transcript, the repeated course must result in an improvement of the previous grade. The higher grade will replace the lower grade in the calculation of the cumulative GPA and earned credit hours.
c. The original grade will remain on the student's transcript. An "E" will appear next to the course to indicate that the lower grade is removed from GPA calculation.
d. No grade may be replaced after a graduate degree has been awarded.
e. Symbol grades such as CR, PR, S, U, and W are not replaceable since these grades do not affect the overall grade point average.

Grade Point Average

Grade point average (GPA) calculations are based solely on courses taken at NMSU or under an approved National Student Exchange.

Grading in Graduate Research

In grading both master's and doctoral research, thesis and dissertation work in progress, the instructor reports for each enrollment period the grade S (satisfactory) or U (unsatisfactory) rather than a traditional letter grade. These assigned grades are permanent notations on the student's transcript. Only those credits graded S (satisfactory) accumulate toward the minimum number of research credits required.

U indicates that the student has stopped work or is doing work of unacceptable quality. After the final examination, and/or when the thesis/dissertation is submitted to the electronic dissertation submission system, the instructor will report the final S or U grade for the research.

The report of an S (satisfactory) grade means that the degree will be certified. A U (unsatisfactory) grade means that the student is doing work of unacceptable quality.

If a student accumulates a total of two U (unsatisfactory) grades in courses numbered either 598, 599, 600, 699 or 700, the student will be placed on Academic Probation I. If three U (unsatisfactory) grades are reported for these courses, the student will be dismissed from the Graduate School.

Withdrawals

For more information regarding how withdrawals impact tuition refunds, please see the Tuition, Fees & Other Expenses (p. 74) section of the catalog.

Withdrawal from a Single Course

Any student wishing to formally withdraw from a single course, after the last day to drop has passed, can do so through their Academic Advisor or the University Student Records. All such withdrawals will be registered on the student's transcript with the "W" grade indication.

For students wishing to withdraw from all courses, please see the section on Withdrawal from NMSU.

Leave of Absence from the Graduate School

Students working on advanced degrees and planning to have an interruption in studies for a calendar year should request a leave of absence through their department head. The student must submit a formal letter through their department head to the Dean of the Graduate School, an email will not be accepted. The request should include the beginning date and the anticipated ending date for the period of absence.

A graduate student on leave of absence will be expected not to use university facilities and place no demands upon the university faculty and staff, and, therefore will pay no fees. Time spent in the "leave-of-absence" status will not be counted toward the advanced degree time limits.

A graduate student who fails to register for one calendar year without obtaining a leave of absence from the Graduate School will be considered withdrawn from the university, by the Graduate School. In order to resume their studies after such absences, the student must go through the formal readmission process.

Administrative Withdrawals

If a student has stopped attending class without formally withdrawing, stopped using the online Learning Management System, or has a history

of persistent unexcused absences or failures to complete assignments, the University reserves the right to remove the student from the class by means of an administrative withdrawal. An administrative withdrawal may be requested under the following circumstances, excluding absences through University policy:

1. At the beginning of the semester, if a student misses the first two (2) class meetings or online activities.
2. At any point in the semester, if a student misses four (4) consecutive class meetings or online activities.
3. If over the course of the semester, the student persistently fails to attend class or fails to complete assignments.

Except in documented cases of persistent unexcused absence/ nonparticipation, administrative withdrawals will not be used to avoid the assigning of D, F, U or RR grades for marginal or failing work. Administrative withdrawals are subject to the same refund rules as student-initiated withdrawals (100% refund prior to census and no refund after census).

To request consideration for an administrative withdrawal, the instructor must complete the Student Absence/Lack of Progress Report (https://records.nmsu.edu/_files/sro-forms/Student%20Absence%20or%20Lack%20of%20Progress%20Report%20-%20Administrative%20Withdrawal.pdf), found on the forms page of the University Student Records webpage, and route for approvals as soon as a pattern of non-attendance/non-participation is established. The University Student Records is ultimately responsible for processing the administrative withdrawal. The form is to be submitted as soon as the pattern of persistent absence/nonparticipation is established. Normally it will be submitted no later than one week after the deadline for a student to withdraw themselves from the course.

Upon receipt of a fully approved Student Absence/Lack of Progress Report, from the Dean's Office, the Student Records staff will notify the student that they will be withdrawn from the class within 48 hours unless they appeal the action. This notification will be sent to the student's official NMSU email address. Students wishing to appeal the administrative withdrawal, should reply to the Student Records' notification email, with a valid reason for non-attendance / non-completion of coursework, within 48 hours of the email delivery time stamp.

If the appeal circumstances are determined reasonable and accepted, the student will not be withdrawn from the class and will be expected to actively participate in all future meetings and coursework. The Student Records will notify the instructor, Department Head and Associate Dean of the determination, via official NMSU email.

When an administrative withdrawal is initiated for a student who is representing the university at an official out-of-town event any administrative withdrawals will become effective upon the student's return from the event or five days after the drop slip fully approved form is submitted to the Student Records.

Military Withdrawal

New Mexico State University understands that our military students may be called to active duty, specialized training, or disaster relief efforts with little notice. U.S. active-duty military students wishing to withdraw from all their classes must present their orders and their request for full withdrawal, as indicated below. However, the below policy does not pertain to a student's basic and/or annual training. A student who has an order for training is encouraged to formally request, through the proper military chain of command, a postponement of their orders until the summer or the end of the semester they are currently enrolled in. If a student's request for postponement is denied, the student may then follow the steps below but must provide documentation that their postponement request was formally denied.

All NMSU students called for active duty must take the following steps to withdraw from all their classes:

1. **Military and Veterans Programs (MVP):** TA/VA students ordered to Active Duty must provide a copy of orders to the MVP office, in Corbett Center Student Union, Room 244, or by email mvp@nmsu.edu. To assist in reporting accurate information to their military service or the VA Regional Office, the student should also provide, in writing, the last day of class attendance.

1. **NMSU University Student Records:** All students presenting their orders to the University Student Records, (575) 646-3411, or records@nmsu.edu, will receive a military withdrawal from classes and full tuition and fees refund for that semester.

1. **Bookstore:** Students who still have their receipts for textbooks purchased the semester in which they are called to active duty will be given a full refund for these textbook purchases when they present their orders. Please contact the bookstore for assistance at (575) 646-4431 or nmsu@bkstr.com.

Military Readmission Policy

New Mexico State University (NMSU) acknowledges that students may be temporarily unable to attend classes or be required to suspend their studies to perform military service. NMSU encourages such students to resume their education once a military service obligation has ended and adopts this policy to ensure the timely readmission of such students.

In accordance with federal regulations, 34 C.F.R. § 668.18 and the Department of Defense (DoD) Voluntary Education Partnership Memorandum of Understanding (MOU), the university will promptly readmit service members who seek readmission to a program that was interrupted due to a uniformed service obligation.

Eligibility

This policy shall apply to (1) service members who are unable to attend classes for more than 30 consecutive days, and (2) service members who are unable to attend classes for less than 30 days (about 4 and a half weeks) when such an absence would result in a withdrawal from NMSU.

A student is eligible for readmission under this policy if, during an absence, the student performs uniformed service, voluntary or involuntary, in the Armed Forces, including the National Guard or Reserve, active duty, active duty for training, or full-time National Guard (under federal authority). The cumulative length of all absences for uniformed service (service time only) must not exceed five years.

Notification of Military Service

The student (or an appropriate officer of the armed forces or official of the Department of Defense) must give written notice of such service to the school as far in advance as is reasonable under the circumstances.

Such notice does not need to indicate when the student will return to NMSU.

Notification of Intent to Return
The student must also give written notice of Intent to Return and supporting official military obligation documentation to University Student Records within three years after the completion of the period of service.

Tuition and Fees
If the student is readmitted to the same program, NMSU will assess the tuition and fee charges that would have been assessed for the academic year during which the student left (first academic year only). However, if veterans' education benefits or other service member education benefits will pay the higher tuition and fee charges that other students in the program are paying for the year, NMSU will assess those charges to the student.

Readmission Requirements

A returning student will be permitted to reenroll in the next class(es) scheduled in the same academic program unless the student requests a later date of re-enrollment or agrees to a different program. A returning student will be readmitted into the same academic program they were enrolled in before the military service obligation. If the exact program no longer exists, the student must be admitted to the program that is most similar, unless the student requests or agrees to admission to a different program. Returning students will be reenrolled with the same enrollment status, number of completed credit hours, and academic standing as the last academic year of attendance.

If NMSU determines that a returning student is not prepared to resume the program with the same academic status or is unable to complete the degree, NMSU will make reasonable efforts to enable the student to resume or complete the program at no additional cost to the student.

NMSU is not required to readmit the student if it determines:

- that there are no reasonable efforts it can take to prepare the student to resume the program at the point where they left off or to enable them to complete the program, or

- that after it makes reasonable efforts (those that do not place an undue hardship on the institution), the student is not prepared to resume or complete the program.

"Undue hardship" means an action requiring significant difficulty or expense considering the overall financial resources of NMSU and the impact of such action on its operation. NMSU has the burden to prove by a preponderance of the evidence that the student is not prepared to resume the program with the same academic status at the point where they left off or that they will not be able to complete the program.

In accordance with federal regulations, returning students who receive a dishonorable or bad conduct discharge, general court-martial, or federal or state prison sentence from the Armed Forces (including the National Guard and Reserves) are not eligible for readmission#under this policy.

Students are encouraged to speak with Military and Veterans Programs regarding any absence due to military service. For more information, please contact mvp@nmsu.edu.

Military Experience Waiver

Before graduating, during the student's junior and/or senior year, NMSU students are required to take two 3-credit Viewing a Wider World (VWW) upper-division (300-400 level) courses. These courses emphasize the international character and multicultural influences in study and strengthen information retrieval skills. There are two options that NMSU allows for replacing one of the two courses (3 credits) of VWW requirement with another form of educational experience, these are: (Study Abroad Experience or Military Experience for students who have served at least four weeks of U.S. Military Foreign/Sea Service in a foreign country.

Steps needed to request a Military Experience Waiver (replacing 3 credits of VWW):

1. Obtain a copy of your DD-214 or Memo from your Commanding Officer proving your 4-week deployment

1. Provide the above copy to your college academic advisor to request a waiver

1. Wait for your college to approve and confirm

Note: Credits are not being waived, only one of the two courses is being waived within the requirement. You may still need to complete three credits in consultation with your academic advisor. Please contact the MVP or your academic advisor for questions and concerns.

Student Medical Withdrawal

A student medical withdrawal applies to a student who becomes seriously ill, injured or hospitalized and is therefore unable to complete an academic term for which they are enrolled. This action applies to all courses a student is registered for in the affected semester(s). The student cannot select which courses they want to withdraw from and which they want to remain registered for when exercising this option. The students' attending physician must provide a letter, on official letterhead with an original signature, stating the date(s) within the semester that the student was under medical care and must withdraw because of that medical condition. This letter must be submitted within the semester or no later than one academic year after the end of the term for which the withdrawal is being requested.

Once the information is reviewed a final determination will be made if the student is eligible for the consideration of tuition or other refunds (students receiving funds awarded by the University Financial Aid and Scholarship Services should be aware of policies regarding withdrawal from the University). At the Las Cruces campus, medical withdrawal begins and ends at the University Student Records. At all other campuses, medical withdrawal begins at the Student Services Office but is ultimately finalized with the University Student Records on the Las Cruces campus.

Medical Conditions of a Family Member Withdrawal

A student who is withdrawing because of a medical condition of an immediate family member must submit a letter from the family member's attending physician. This action applies to all courses a student is registered for in the affected semester(s). The student cannot select

which courses they want to withdraw from and which they want to remain registered for when exercising this option. It must be on official letterhead with an original signature, stating the date(s) within the semester that the student's immediate family member was under medical care and that the student must withdraw to attend to the immediate family member's medical condition. This letter must be submitted within the semester or no later than one academic year at the end of the term for which the withdrawal is being requested.

Immediate family member, in this instance, includes a spouse; a domestic partner, as defined in the NMSU Policy Manual 7.04; a child, parent or legal guardian; a sister or brother and a grandparent or a grandchild. Familial relationships that are created by law are also included (i.e. mother/father in law; half or step siblings); any other relationships can be considered on a case-by-case basis.

Once the information is reviewed a final determination will be made if the student is eligible for consideration of tuition or other refunds (Students receiving funds awarded by the University Financial Aid and Scholarship Services should be aware of policies regarding withdrawal from the University.) At the Las Cruces campus, medical withdrawal begins at the University Student Records. At all other campuses, medical withdrawal begins at the Student Services Office.

Withdrawal from NMSU

Withdrawal from any NMSU campus is an official procedure that must be:

1. Initiated by the student (using the Withdrawal form)
2. Have all necessary signatures (as indicated on the form)
3. Be approved and processed through the University Student Records

Students who withdraw from all courses for the semester should do through the University Student Records. However, students who are unable to come in person may submit an e-mail using their NMSU e-mail account to records@nmsu.edu. Students who leave without following the official procedure are graded appropriately by the instructor.

Applicable dates for the last day to withdrawal are published on the approved university academic calendar or under important dates at: http://registration.nmsu.edu (https://records.nmsu.edu/faculty-and-staff/academic-calendar.html).

A student who withdraws from all classes for the semester will retain access to their NMSU account per current policy but will lose access to other services and privileges available to enrolled students.

Financial information concerning drops and withdrawals can be found at https://uar.nmsu.edu/refunds/withdrawals.html. Financial Aid Recipients should contact University Financial Aid and Scholarship Services before withdrawing. Students receiving funds awarded by the University Financial Aid and Scholarship Services should be aware of policies regarding withdrawal from the University.

The Federal Higher Education Act requires the University to calculate a Return of Federal Student Aid Funds for students who withdraw (officially or unofficially) from all classes on or before the 60 percent attendance point in the semester. Using a pro-rata schedule, the percentage of the semester attended is used to calculate the amount of the student's earned versus unearned Federal student aid funds. The unearned portion of Federal student aid funds will be returned to the appropriate aid program(s). Students withdrawing from classes are responsible for payment of any balance due after the required return of Federal student aid funds.

Graduation and Commencement Graduation Requirements

For specific graduation requirements for any degree offered at NMSU please see the Degrees, Majors, Minors and Other Academic Programs of Study (p. 31) section, as well as the departmental sections for those requirements. These requirements will include the minimum GPA, total credits and specific course requirements for graduation.

Applying for a Degree

Any students that are in their final semester of classes are considered degree candidates and are required to submit an "Application for Degree" as well as pay graduation fees for each degree being sought. The application for Degree form is available online through the myNMSU website. It must be completed and submitted by the designated deadline for that semester. The fees for the Las Cruces campus are all listed in the Tuition, Fees and other Expenses (p. 73) section of the catalog. Once a student submits the application, the fee will be included in the total cost for the semester or session in which the candidate anticipates completing their degree requirements.

If degree requirements are not completed during the semester/ session the student originally applied for, the student must then reapply and pay the appropriate fees. A $50 late fee applies to applications received after the application deadline, and no applications will be accepted after the posted deadline date.

A student must specify which catalog they are using for their degree requirements in order for the university to determine if the requirements are met and if a degree can be certified. The latest date for substitution or waiver of required courses for degree candidates is two weeks after the last date of registration for full or summer terms.

Attendance at the Commencement Ceremony

Commencement is a symbolic ceremony, that students can elect to participate in after they have applied for their degree (https://commencement.nmsu.edu/apply-to-graduate/). Participation in commencement does not, in itself, mean that a student is considered an NMSU graduate. In order to be awarded a degree, a student must fulfill university requirements as determined by academic colleges. The degree will reflect the graduation date from the application for degree in which all degree requirements were determined by the academic colleges.

The academic colleges will confirm students' eligibility to participate in the commencement ceremony that is held at the end of the fall and spring semesters. Eligible candidates who are in the process of completing their final degree requirements and degree recipients from the previous summer session will participate in the fall ceremony. Students who are in the process of completing their final degree requirements in the spring can participate in the spring ceremony. However, degree candidates who wish to participate in a spring commencement, prior to completing degree requirements in summer school may do so if they meet the following conditions:

1. Receive permission from the Academic Dean of their college
2. Show a minimum cumulative grade-point average of 2.0

3. Only need 12 or fewer credit hours to complete their degree requirements
4. These remaining credit hours are being offered in the upcoming summer schedule of classes
5. Submit a degree application and approved petition form (available in the Dean's office of the student's primary major) by the late application deadline to apply for a degree in the spring semester.

Academic Regalia

Each college may approve distinctive symbols to be worn by the top 10 percent of its graduates at commencement. Only one symbol may be worn by each graduate. In addition, the student with the highest honors in each college may wear a crimson- colored gown. No other symbolic additions to academic regalia are allowed without the approval of the Academic Deans Council.

Diploma

All fees and bills owed the university must be paid in full before a student may receive a diploma or official transcripts. The degree title and major(s) will be printed on the diplomas, in accordance to the degree application award, determined by the academic colleges. Academic honors will also be printed on the diplomas below the degree and major(s). The name on the diploma will reflect the student's current official NMSU records. Name changes are only processed for currently admitted students.

Diplomas will be mailed to graduates approximately eight weeks after the individual colleges certify the degree requirements and the final grades have been processed by University Student Records. The diploma will be mailed to the address specified on the degree application, unless an address change was requested before the last day of the semester.

Academic Standing, Probation and Suspension

Undergraduate Academic Standing

When a student does not maintain adequate academic standing, he/she is placed in Academic Warning. If the student's academic standing does not improve, the placement progresses to Academic Probation I. Continued unimproved academic standing moves a student into Academic Probation II, then finally, Academic Suspension. Each stage imposes more structure and limitations on the student in order to help them return to normal academic standing. The intent is not to punish, but to help the student return to normal academic standing and success. Since some of these limitations involve limitations on the number of credit hours, students on Probation or Suspension may be subject to loss of financial aid. It is the student's responsibility to determine the impact of their changed academic standing on their financial aid. Notification to students of academic warning, probation, or suspension appears on the student's grade report at the end of each grading period.

Undergraduate Academic Warning

Issued only once, the first time a student's cumulative GPA falls below a 2.0 while in good academic standing. The University Student Records will notify the student of the consequences should the cumulative grade point remain below a 2.0 at the conclusion of the semester. A student on Academic Warning remains eligible for all extracurricular activities as governed by the rules of the specific activity.

While under Academic Warning the following restrictions may apply:

1. The student cannot enroll in more than 15 hours of coursework during the semester.
2. The student may be required to enroll in a 3-credit hour special study skills/time management course specifically designed for students on Academic Warning, or an equivalent course approved by the appropriate associate dean or CAO of their campus.
3. Students may be required to enter into a contract with their advisor, approved by their department head that places further stipulations on Academic Warning. The contract may include, but is not limited to the following:
4. The student may be required to take at least one repeat course to try to improve their GPA.
5. Except for the special study skills/time management course, the student's coursework may be restricted to their major.
6. The student may be required to get tutoring help.
7. The student may be required to see an academic counselor on a specified time schedule.
8. The number of credit hours a student may register for may be restricted (due to extenuating circumstances such as the student's workload commitments).

The associate dean or CAO may place the student on Academic Probation I should the student not adhere to the stipulations of the contract.

If the student's semester GPA is less than 2.0, and the cumulative GPA remains below 2.0 at the end of the semester on Academic Warning, the student is placed on Academic Probation I. If the semester GPA is greater than 2.0 but the cumulative GPA is still less than 2.0, the student will remain on Academic Warning. If the cumulative GPA is greater than a 2.0 at the end of the semester then the student is returned to good academic standing.

Undergraduate Academic Probation I

This occurs when a student under Academic Warning has a semester GPA less than 2.0, and the cumulative GPA remains below 2.0 at the conclusion of the semester or if the student maintains a semester GPA greater than 2.0 while on Academic Probation I but the cumulative GPA is still less than 2.0. Academic Probation I will also occur if a student falls below a 2.0 cumulative GPA from Good Academic Standing if Academic Warning already occurred in a previous term.

Under Academic Probation I the following conditions apply:

1. The student cannot enroll in more than 13 hours of coursework during the semester. *Note: Students falling below 12 credits in any one semester will jeopardize their financial aid.* Should this occur, students should see the associate dean in their college as soon as possible to try to implement corrective measures.
2. The student may enter into a contract or individualized education plan with their advisor and be approved by the associate dean or CAO that place further stipulations on Academic Probation I. The associate dean or CAO may place the student on Academic Probation II or Academic Suspension should the student not adhere to the contract stipulations.
3. Students on Academic Probation receiving educational benefits from the Veterans' Administration must obtain counseling from the Military & Veterans Programs Office.
4. Students admitted under special provisions whose transcripts indicate less than a 2.0 GPA are admitted on Academic Probation I.

The student must maintain a semester GPA equal to or greater than 2.0 until such time that the cumulative GPA is greater than 2.0 at which time the student goes back to good academic standing. Until the transition happens the student remains on Academic Probation I. The student will be placed on Academic Probation II if they cannot maintain a 2.0 semester GPA, and the cumulative remains below a 2.0 GPA, while under Academic Probation I. A student on Academic Probation I remains eligible for all extracurricular activities as governed by the rules of the specific activity.

Undergraduate Academic Probation II

Academic Probation II is issued in two ways.

- The first is when a student falls below a semester 2.0 GPA and the cumulative GPA remains below a 2.0 while on Academic Probation I.
- The second is when a student maintains a semester GPA greater than 2.0 while on Academic Probation II, but the cumulative GPA is still less than 2.0.

The following restrictions are in place for student's in Academic Probation II:

1. The student cannot enroll in more than 7 credit hours of coursework during the semester.
2. As with rule 2 under Academic Warning and Academic Probation I and at the discretion of the associate dean or CAO, the student will be required to enter into a contract with their advisor, approved by the associate dean or CAO, to place further stipulations on Academic Probation II.

The associate dean or CAO may place the student on Academic Suspension should the student not adhere to the stipulations of the contract.

The student must maintain a semester 2.0 GPA or higher until the cumulative GPA reaches a 2.0 or higher, at which time they are placed on good academic standing. A student unable to maintain a semester GPA of 2.0 or higher, and the cumulative remains below 2.0 GPA, while under Probation II will be placed on Academic Suspension. A student on Academic Probation II remains eligible for all extracurricular activities as governed by the rules of the specific activity.

Continuing in Probationary Status

Students may continue to enroll while on Academic Probation I or II provided they maintain a semester GPA of 2.0 or higher. If they withdraw from the university while on Academic Probation, they continue on that same level of Academic Probation.

Removal of Academic Probation

Such academic standing is removed when the cumulative GPA is raised to 2.0 or higher, with the following exceptions:

1. a transfer student may not remove probation by summer work alone;
2. If an I grade is removed after the student has enrolled, the new grade's effect on academic standing is based on its inclusion with grades for the term for which the student is enrolled;
3. exercise of the Adjusted Credit Option does not change academic status until subsequent grades are earned.

Academic Suspension

When a student does not achieve a semester 2.0 GPA or higher, and the cumulative remains below a 2.0 while under Academic Probation II, the student is placed on Academic Suspension. Students under Academic Suspension are not allowed to take NMSU courses while under suspension. Students on Academic Suspension must sit out a minimum of 1 semester and apply for re-admission.

Under certain conditions, a student may be re-admitted at NMSU under regular status while under Academic Suspension when satisfactory progress has been demonstrated at another college or university (see Readmission- Degree Seeking). Credits earned at another university or college while under Academic Suspension from NMSU or another university or college will be accepted at NMSU only after the student demonstrates satisfactory progress over a period of two semesters after being re-admitted or admitted to NMSU. Acceptance of transfer credits that count toward degree requirements is still governed by the rules established by the student's respective college or campus.

Summer Attendance Impact on Academic Standing

A student may use summer classes to get a warning or probationary status removed. Students suspended at the close of the spring semester may have their Academic Suspension rescinded if they attend a summer session at NMSU or one of its Community College campuses. Such attendance must raise the combined spring semester and summer GPA to 2.0 or better. Under no circumstances may a student on Academic Warning or Academic Probation be allowed to register for an overload. The current academic status is continued if the student withdraws from the university and the probation or suspension status applies to all subsequent enrollments until the cumulative GPA is 2.0 or higher.

Graduate Academic Probation and Suspension

Graduate Academic Standing is based on the student's semester GPA and cumulative GPA. The student must maintain a cumulative GPA of 3.0 or higher to remain on Graduate Academic Good Standing. A student may not remain eligible for all extracurricular activities or Graduate Assistantship as governed by the rules of the specific activity.

Graduate Academic Probation I: A graduate student is placed on Graduate Academic Probation I when the student's cumulative GPA drops below 3.0 and the previous academic standing is Graduate Academic Good Standing. If a student on Probation I earns a semester GPA above 3.0 but the cumulative GPA remains below 3.0, the student continues on Graduate Academic Probation I

Graduate Academic Probation II: If the semester GPA of a continuing or re-admitted graduate student on Graduate Academic Probation I drops below 3.0 then the student is placed on Graduate Academic Probation II

Graduate Academic Suspension: If the graduate student cannot maintain a semester GPA of 3.0 or higher and the cumulative remains below 3.0 GPA while under Graduate Academic Probation II, the student will then be placed on Graduate Academic Suspension.

Students on Graduate Academic Suspension are barred from enrolling in graduate-level courses at NMSU while on suspension. Graduate students on Graduate Academic Suspension must sit out a minimum of one semester. Graduate students on suspension who wish to continue Graduate School after suspension must re-apply to the department and Graduate School. The student must also petition College Academic Dean

or the Graduate School Dean, based on the major and degree the student is pursuing to be removed from Graduate Academic Suspension. At this time the graduate academic suspension status will be evaluated for possible readmission to the department. Should the suspension be lifted, the graduate student is placed on Graduate Academic Probation II or Graduate Re-admit on Probation II until such time that the graduate cumulative GPA equals or exceeds 3.0.

If you have questions about your academic standing, please contact your department academic advisor or Graduate Dean's office.

Academic Misconduct and Grievances Student Academic Code of Conduct

The Student Academic Code of Conduct (SACC), applicable to both undergraduate and graduate students, provides procedures for reviewing and resolving of alleged or suspected academic misconduct within a reasonably prompt time frame. The full SACC is found in the university's published Administrative Rules and Procedures (ARP), specifically ARP 5.10 and ARP 5.11.

While it is essential to refer to the detailed governing rules in the ARP, the process is summarized as follows: An institution-wide Academic Conduct Officer is responsible for processing each case of alleged academic misconduct. The accused student is provided notice of the allegation and has the right to participate during the fact-finding process. The student may contest the investigative findings or sanction in a formal review before a university Hearing Panel. Either party to the matter has the right to a final appeal of the results or a Level II sanction to the Office of the Provost.

The SACC distinguishes between Level I Sanctions and Level II sanctions, depending upon the severity of the offense and other factors. The Level I sanction includes a formal warning. Graduate students' offenses and repeat undergraduate offenses are subject to a Level II sanction, even if less severe. Level II sanctions consist of a notation of academic misconduct on the student's academic transcript.

The full policy, examples of academic misconduct, report form and a flowchart of the procedures for resolving alleged student academic misconduct is available at:

Policies

- ARP 5-10 (https://arp.nmsu.edu/chapter-5/5-10.html)
- ARP 5-11 (https://arp.nmsu.edu/chapter-5/5-11.html)

Examples of Academic Misconduct and Report Form

- ARP Appendix 5.10-A (Examples) (https://arp.nmsu.edu/appendices/appendix-5-10-a.html)
- ARP Appendix 5.11-B (Form) (https://cm.maxient.com/reportingform.php?NewMexicoStateUniv&layout_id=15)

Flowchart of Procedures

- ARP Appendix 5.11-A (https://arp.nmsu.edu/pdf/Appendix-5-11-A.pdf)

University Student Records Privacy Rights

The following information has been designated as directory information and is subject to release to the public under the Buckley Amendment (PL 98-380), "The Family Educational Rights and Privacy Act of 1974." student's name, class level, college and major, dates of attendance, degree(s) earned, honors and awards, address, telephone number, NMSU email address, Aggie ID number, most recent previous educational institution attended, place of birth, and some information about students involved in recognized activities and sports.

Other information regarding disclosure of student data is posted on the University Student Records website (https://records.nmsu.edu) and with University Student Records (USR), in compliance with the Act.

Requests for withholding directory information must be filed in writing with University Student Records . A student may choose to hide his/her address and phone number from the campus phonebook through the myNMSU portal. This will only hide the information from the public but the records will still be officially kept within University Student Records.

Social Security Numbers in Student Records

As required by law, social security numbers are collected from prospective and current students who are either applying for admission to the university or plan to seek employment on campus. The social security number is a confidential record and is maintained as such by the university in accordance with the Family Educational Rights and Privacy Act.

In addition, the university is mandated by federal tax regulations to provide tuition and fee payment information to the student and the Internal Revenue Service so that applicable educational tax credits may be computed. The social security number is required for tax reporting purposes.

Change in Demographic Information

Students wishing to make a legal name change, citizenship change, social security number update or a gender update can do so through the University Student Records (USR). All students will need to fill out the "Demographic Change Form" located at https://records.nmsu.edu/forms/inventory.html and provide one of the following documents to University Student Records. Legal name changes will only be processed for students currently enrolled at New Mexico State University.

1. **Legal name change**: students will need one legal documentation with the new name on it. This can be a Government Issued ID (drivers license, state card or valid passport), a Birth Certificate, a Court Order, a Marriage Certificate/Divorce Decree or a Certificate of Naturalization/I551 Card. *Note: Documentation is not required to add/delete hyphen, space, apostrophe, or to abbreviate a middle name to initial.*
2. **Citizenship change:** Certificate of Naturalization or I551 card.
3. **Social Security Number Update**: students will need to provide an original signed Social Security Card. Unsigned cards will not be accepted.
4. **Gender Update**: students will need to bring a Government Issued ID (drivers license, state ID card or valid passport) and a Revised Birth Certificate

Students may update their "preferred name", which is the name used in lieu of a student's legal name, on certain documents, such as, the email display name, learning management system, the phonebook, class rosters and advisee lists. This can be done by the student through the myNMSU portal and does not need to be done at the USR.

For more information about the specific documents that are needed please contact the University Student Records at (575) 646-3411.

Changes in Residency Status for Tuition Purposes

University Student Records (USR) does not determine the laws and rulings for determining Residency, these are state laws that USR simply administers. An individual must establish legal residency in New Mexico before he or she is entitled to pay in-state tuition rates.

The student's initial residency status is determined at the time of admission, any changes to this status must be initiated by the student through USR. A continuing student, classified as a non-resident, who has satisfied the requirements to establish residency may submit a Petition for In-State Residency Tuition Classification along with the required supporting documentation to USR. Petitions must be filed on or before the third Friday of the semester for which the student is requesting resident tuition.

For specific information about the process of petitioning for In-State Residency or for information about who is eligible for residency for tuition purposes please visit the https://records.nmsu.edu/students/residency.html website.

Official Transcripts

An official transcript is the University's certified statement of your complete NMSU academic record in chronological order by semester and year. It includes the student's coursework, grades and any degrees that were awarded. Any credit hours earned through transfer work are listed as the equivalent course at NMSU. Grades are not transferred, nor are they used to calculate the NMSU grade point averages. Official transcripts will not be released if the student is in debt to the university.

Transcripts can be ordered online at https://records.nmsu.edu/forms/transcripts.html. A fee will apply, which may vary depending on the total number of transcripts ordered and the selected delivery method. Students can request two types of transcripts: an electronic version sent as a secure PDF or a printed hard copy delivered in a sealed envelope.

The name that will appear on the student's transcript will match the name on the student's official NMSU record. Name changes will only be processed for students currently enrolled at NMSU or any of its Community Colleges.

Purging of Student Files

All academic files for students who attend NMSU are kept for five (5) years following the student's final term enrolled. Only archival documentation will be retained. The files of students who do not enroll within one year after being admitted are destroyed.

Student Complaint Resolution

Students enrolled at New Mexico State University (NMSU)—whether taking a single course or enrolled full-time—have the right to submit a complaint or grievance on any issue or subject they deem important, without fear of retaliation or any other adverse action.

Students are encouraged to address their complaint or grievance first with the individual most directly connected to the issue, unless there are compelling reasons not to do so. For more information about student complaint and grievance policies, students can review Administrative Rules and Procedures 5.05 (https://arp.nmsu.edu/chapter-5/5-05.html). To file a student complaint, visit the NMSU Report (https://report.nmsu.edu/) website.

NC-SARA (State Authorization Reciprocity Agreement) - Distance Education

NMSU participates in the State Authorization Reciprocity Agreement (SARA) (https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fnc-sara.org%2F&data=05%7C02%7Cgdmart%40nmsu.edu%7C0591e30ed11041ab447e08de162ffaa8%7Ca3ec87a89fb84158ba8ff11bace1eba%7C1%7C0%7C638972592539740100%7CUnknown%7CTWFpbGZsb3d8eyJFbXB0eU1hcGkiOnRydWUsIlYiOiIwLjAuMDAwMCIsIlAiOiJXa%3D%3D%7C0%7C%7C%7C&sdata=dKgEhzpUZa9INZyCnDINRWmpW%2BaYWhbRGNpIrm76Anc%3D&reserved=0). SARA is an agreement among member states, districts, and territories that establishes national standards for interstate delivery of postsecondary distance education courses and programs.

If a distance education student located in a SARA member state has a complaint about NMSU, the student must first follow the university's standard grievance procedures described above. If the complaint remains unresolved after exhausting NMSU's internal processes, the student may then submit the complaint to the New Mexico SARA Portal Agency (https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fhed.nm.gov%2Fstudents-parents%2Fnc-sara&data=05%7C02%7Cgdmart%40nmsu.edu%7C0591e30ed11041ab447e08de162ffaa8%7Ca3ec87a89fb84158ba8ff11bace1eba%7C1%7C0%7C638972592539789040%7CUnknown%7CTWFpbGZsb3d8eyJFbXB0eU1hcGkiOnRydWUsIlYiOiIwLjAuMDAwMCIsIlAiOiJXa%3D%3D%7C0%7C%7C%7C&sdata=DEEVhqxF6pXui2%2F8Nio7XZEtvNS79IlNWvGDorRvL2M%3D&reserved=0), the New Mexico Higher Education Department (NMHED). The SARA portal agency in the student's home state will be notified of the complaint and may assist as needed.

SARA complaints may include issues related to tuition, accreditation, licensure, or transfer of courses. Grade disputes and student conduct issues, however, are not covered under SARA. Examples of the types of complaints that may be brought to the SARA portal entity include:

- Misrepresentation in recruitment or marketing materials (e.g., admission requirements, tuition, fees, financial aid)
- Inaccuracy of job placement data
- Inaccuracy of information regarding the institution's accreditation or programmatic/specialized accreditation
- Misrepresentation about whether coursework meets relevant professional licensing requirements
- Inaccurate information regarding the transferability of credit to or from other institutions
- Operation of distance education programs inconsistent with expectations of Accreditors and/or the C-RAC Interregional Guidelines for the Evaluation of Distance Education

Higher Learning Commission (HLC)

If all other avenues have been exhausted, unresolved complaints may be filed with the Higher Learning Commission (HLC) (https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.hlcommission.org%2Ffor-students%2Ffile-a-complaint-against-an-institution%2F&data=05%7C02%7Cgdmart%40nmsu.edu%7C0591e30ed11041ab447e08de162ffaa8%7Ca3ec87a89fb84158ba8ff11bace1eba%7C1%7C0%7C638972592539806707%7CUnknown%7CTWFpbGZsb3d8eyJFbXB0eU1hcGkiOnRydWUsIlYiOiIwLjAuMDAwMCIsIlAiOiJXa

%3D%3D%7C0%7C%7C%7C&sdata=s2w8RohL61ehRZBeGoJPG4KTFk9Zc8mHxO30cT22snA%3D&reserved=0), NMSU's accrediting agency.

Areas of Interest

What Are Meta-Majors?

Meta-majors at NMSU are two-semester academic maps designed as planning tools for students who have not yet decided on a program of study. Each meta-major represents a broad cluster of degree programs. The meta-major academic maps include courses (such as English and Math) that lay the academic foundation for all of the degree programs represented by the specific meta-major as well as course options that facilitate exploration of the various disciplines represented.

Meta-majors share a common early pathway toward a degree, diverging as a student becomes more focused on an individual major. By identifying a limited number of meta-majors that encompass all the majors at NMSU, and helping students who are unsure about a major choose a meta-major consistent with their interests, we can help ensure that courses taken early in a collegiate career will count toward a degree, thereby lessening the academic wandering that can impede student success.

Students will be directed to a meta major only if they are uncertain what they want to study. Students who are certain of their major will be advised into courses that are in that major's degree plan.

- Applied and Clinical Health Sciences
- Applied Social and Behavioral Sciences
- Business
- Communication, Media Study, and Creative Arts
- Humanities and Social Sciences
- Life Sciences
- Physical Sciences and Engineering
- Teacher Education

Applied and Clinical Health Sciences

- Human Nutrition and Dietetic Science (Nutrition Education) - Bachelor of Science in Family and Consumer Sciences (p. 419)
- Human Nutrition and Dietetic Science (Pre-Dietetics/Dietetics) - Bachelor of Science in Family and Consumer Sciences (p. 422)
- Kinesiology (Exercise Science) - Bachelor of Science in Kinesiology (p. 1308)
- Kinesiology (Performance Psychology) - Bachelor of Science in Kinesiology (p. 1311)
- Nursing - Bachelor of Science in Nursing (p. 1346)

Applied Social and Behavioral Sciences

- Anthropology - Bachelor of Arts (p. 519)
- Communication Studies - Bachelor of Arts (p. 618)
- Computer Science - Bachelor of Arts (p. 642)
- Counseling and Community Psychology - Bachelor of Science (p. 1267)
- Geography (Geographic Information Science and Technology) - Bachelor of Science (p. 760)
- Kinesiology (p. 1283)
- Social Work - Bachelor of Social Work (p. 1461)
- Sociology - Bachelor of Arts (p. 1474)

Business

- Accounting - Bachelor of Accountancy (p. 981)
- Agricultural Economics and Agricultural Business - Bachelor of Science in Agriculture (p. 352)
- Computer Science - Bachelor of Arts (p. 642)
- Economics (Energy Economics) - Bachelor of Business Administration (p. 1000)
- Economics - Bachelor of Business Administration (p. 998)
- Fashion Merchandising and Design - Bachelor of Science in Family and Consumer Sciences (p. 415)
- Finance (Financial Analysis) - Bachelor of Business Administration (p. 1013)
- Finance (Risk Management and Insurance) - Bachelor of Business Administration (p. 1014)
- Finance - Bachelor of Business Administration (p. 1011)
- General Business (Entrepreneurship) - Bachelor of Business Administration (p. 1025)
- General Business - Bachelor of Business Administration (p. 1023)
- Information Systems - Bachelor of Business Administration (p. 983)
- International Business - Bachelor of Business Administration (p. 1002)
- Management (Human Resource Management) - Bachelor of Business Administration (p. 1027)
- Management (Project Supply Chain Management) - Bachelor of Business Administration (p. 1029)
- Management (Small Business Management Entrepreneurship) - Bachelor of Business Administration (p. 1031)
- Marketing (Advertising) - Bachelor of Business Administration (p. 1042)
- Marketing (PGA Golf Management) - Bachelor of Business Administration (p. 1043)
- Marketing (Professional Selling) - Bachelor of Business Administration (p. 1045)
- Marketing (Strategic Marketing) - Bachelor of Business Administration (p. 1047)
- Natural Resource Economics and Policy - Bachelor of Science in Agriculture (p. 354)

Communication, Media Study, and Creative Arts

- Art (Art History) - Bachelor of Arts (p. 542)
- Art (Museum Conservation) - Bachelor of Fine Arts (p. 545)
- Art (Studio Art) - Bachelor of Arts (p. 544)
- Art (Studio Art) - Bachelor of Fine Arts (p. 548)
- Communication Studies - Bachelor of Arts (p. 618)
- Digital Film Making - Bachelor of Creative Media (p. 690)
- English (Creative Writing) - Bachelor of Arts (p. 730)

- English (Literature, Language and Culture) - Bachelor of Arts (p. 734)
- English (Rhetoric, Digital Media and Professional Communication) - Bachelor of Arts (p. 736)
- English - Bachelor of Arts (p. 732)
- Journalism and Media Studies - Bachelor of Arts (p. 801)
- Music (Instrumental Performance) - Bachelor of Music (p. 901)
- Music (Piano Performance) - Bachelor of Music (p. 903)
- Music (Pre-Speech Language Pathology) - Bachelor of Arts (p. 898)
- Music (Theatre) - Bachelor of Arts (p. 899)
- Music (Vocal Performance) - Bachelor of Music (p. 905)
- Music - Bachelor of Arts (p. 896)
- Music Education (K12 Instrumental) - Bachelor of Music Education (p. 907)
- Music Education (K12 Vocal) - Bachelor of Music Education (p. 909)
- Theatre Arts (Musical Theatre) - Bachelor of Arts (p. 966)
- Theatre Arts - Bachelor of Arts (p. 963)

Humanities and Social Sciences

- Anthropology - Bachelor of Arts (p. 519)
- Communication Studies - Bachelor of Arts (p. 618)
- Criminal Justice - Bachelor of Criminal Justice (p. 701)
- Economics - Bachelor of Arts (p. 709)
- Economics - Bachelor of Arts in Economics (p. 997)
- English (Creative Writing) - Bachelor of Arts (p. 730)
- English (Literature, Language and Culture) - Bachelor of Arts (p. 734)
- English (Rhetoric, Digital Media and Professional Communication) - Bachelor of Arts (p. 736)
- English - Bachelor of Arts (p. 732)
- Geography (Geographic Information Science and Technology) - Bachelor of Science (p. 760)
- History - Bachelor of Arts (p. 790)
- Justice, Political Philosophy, and Law - Bachelor of Arts (p. 914)
- Languages (French) - Bachelor of Arts (p. 826)
- Languages (German) - Bachelor of Arts (p. 828)
- Languages (Spanish) - Bachelor of Arts (p. 831)
- Linguistics - Bachelor of Arts (p. 833)
- Philosophy - Bachelor of Arts (p. 915)
- Psychology - Bachelor of Arts (p. 955)

Life Sciences

- Agricultural and Extension Education (Agricultural Extension/Development) - Bachelor of Science in Agriculture (p. 341)
- Agronomy - Bachelor of Science in Agriculture (p. 458)
- Animal Science (Animal Industry) - Bachelor of Science in Agriculture (p. 372)
- Animal Science (Science) - Bachelor of Science in Agriculture (p. 374)
- Applied and Agricultural Biology (Applied Biology) - Bachelor of Science in Agriculture (p. 387)
- Applied and Agricultural Biology (Applied Microbiology) - Bachelor of Science in Agriculture (p. 389)
- Applied and Agricultural Biology (Entomology) - Bachelor of Science in Agriculture (p. 390)
- Applied and Agricultural Biology (Environmental Biology) - Bachelor of Science in Agriculture (p. 391)
- Applied and Agricultural Biology (Invasive Pest Biology and Management) - Bachelor of Science in Agriculture (p. 393)
- Biology (Secondary Education) - Bachelor of Arts (p. 569)
- Biology - Bachelor of Arts (p. 571)
- Biology - Bachelor of Science (p. 573)
- Computer Science - Bachelor of Arts (p. 642)
- Conservation Ecology - Bachelor in Conservation Ecology (p. 575)
- Conservation Ecology - Bachelor of Science in Conservation Ecology (p. 436)
- Environmental Science - Bachelor of Science in Environmental Science (p. 460)
- Fisheries and Wildlife Science (Aquatic Ecology and Management) - Bachelor of Science in Fish, Wildlife and Conservation Ecology (p. 437)
- Fisheries and Wildlife Science (Wildlife Ecology and Management) - Bachelor of Science in Fish, Wildlife and Conservation Ecology (p. 440)
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Undergraduate Admissions and Orientation

Contact Information

Undergraduate Admissions
MSC 3A
New Mexico State University
P.O. Box 30001
Las Cruces, NM 88003-8001
(575) 646-3121
https://admissions.nmsu.edu/

Under the policies and conditions set forth below, a student may be accepted for undergraduate admission to NMSU as either:

- A degree-seeking student
- A non-degree student

Degree-Seeking Students

How to Apply as a First-Time in College Student

Requirements for admission as a degree-seeking student:

- Application for admission, accompanied by a one-time $25 nonrefundable application fee
- Students are required to self-report their high school cumulative grade point average (GPA) on the application. Students can also provide an unofficial high school transcript.
- SAT and/or ACT scores are optional for admission. However, the scores provided will be used for scholarship consideration and for Math and English placement.

All applicants with tentative admission must submit a final, official high school transcript showing a graduation date before a final admission decision is granted. If the student also attended a non-NMSU system post-secondary institution during high school (dual credit/concurrent enrollment), official transcripts from each institution are required. If the institution attended was outside of the United States, a professional foreign credential evaluation from a NACES company is required.

Admission Requirements

Students who meet the minimum high school course requirements of the state from which they receive their high school diploma must meet one of the following criteria to be admitted:

- Cumulative high school GPA of 2.50
- SAT score of 1060 or ACT composite score of 21
- Ranked in the top 20 percent of their high school graduating class
- A GED cumulative score of 480 or HiSET cumulative score of 45

We encourage all students to apply for admission to NMSU. Applicants who meet at least one of the above criteria will be admitted to NMSU. An applicant who does not meet admission requirements will be given automatic admission to one of our system community colleges through Aggie Pathway.

Note for students about scholarships: Home school students who are New Mexico residents must submit proof to the Undergraduate Admissions Office of registration with the New Mexico Public Education Department to qualify for the Lottery Success Scholarship and other institutional scholarships. Similarly, the SAT or ACT scores are required for out-of-state students for competitive scholarships.

More information about scholarships is available at https://fa.nmsu.edu/scholarships

Aggie Pathway

In the Aggie Pathway program, the NMSU system works together to assist students who do not meet the admission requirements to the university or choose to start at one of the system's community colleges.

Aggie Pathway students begin at one of NMSU's community college campuses. They may transition to the university campus upon meeting the following requirements:

- Successful completion of 24 credits
- 2.0 cumulative college GPA

Students enrolling through Doña Ana Community College campus also have access to NMSU Las Cruces campus housing and dining.

More information about Aggie Pathway is available at https://aggiepathway.nmsu.edu/.

How to Apply as a Transfer Student

Requirements for admission as a degree-seeking student:

- Application for admission, accompanied by a one-time $25 nonrefundable application fee
- Students are required to disclose all post-secondary institutions they have previously attended.
- Transfer students must provide official transcripts from each institution attended. For college transcripts to be considered official, they must be sent directly from the institution’s student records office to NMSU Undergraduate Admissions or delivered in person only if in a sealed envelope from the granting institution and with the current issue date. Official transcripts must be received before the date of registration. Applications for admission that include the transfer of credits earned at a non-U.S. university must include a professional foreign credit evaluation report from a member institution of the National Association of Credential Evaluation Services (NACES) for every transcript.
- Students who have not earned credit for the first semester of college English or Math may submit official ACT or SAT scores directly to NMSU Undergraduate Admissions. If ACT or SAT scores are not available, students must take the English Placement Questionnaire and/or Math Placement Exam provided by NMSU.

Admission Requirements

- Cumulative grade point average (GPA) of at least 2.0 with 24* or more completed college credit hours.
- Students with fewer than 24 completed college credit hours must fulfill the transfer and first-time in college admission requirements.
- Must be eligible to return to their last college or university.
- Students who conceal they attended another college or university without submitting a transcript for each

institution, whether or not credit was earned, will be subject to immediate suspension.

- NMSU will uphold academic and judicial suspensions from other colleges and universities.

* The types of credits listed below are not counted toward the 24 completed credit hour requirement:

- Courses taken for college credit while in high school
- Credits by examination (i.e. CLEP, IB, AP, etc.)
- Credits from a non-regionally accredited institution
- Credits from institutions that do not provide grades
- Credits from experience such as a Joint Services Transcript

How to Apply for Readmission

Former students of the NMSU system, who have been out of school for more than two consecutive semesters, are required to apply for readmission. Applications should be submitted to Undergraduate Admissions before the start date of the semester for which the student plans to enroll.

A student who has attended other post-secondary institutions during an absence must have official transcripts from those other post-secondary institutions sent directly to Undergraduate Admissions. They must be eligible to return to the institution they last attended. Transcripts must be received before the date of registration. Academic standing at the time of readmission will be determined by previous NMSU academic standing. However, academic performance at other institutions attended during the applicant's absence from NMSU may be considered when determining the student's admission status.

New Student Orientation

Orientation is mandatory for all new students seeking their first bachelor's degree. During NMSU's New Student Orientation (NSO), students attend information sessions, learn about campus resources and college life, meet with an Academic Advisor, and register for courses.

If students have taken the SAT or ACT, they must submit official scores before attending an NSO program, as these scores are used to place students into courses during academic advising. If test scores are unavailable, students will be asked to take the Math Placement Exam and English Placement Questionnaire before orientation.

More information about New Student Orientation is available at https://awo.nmsu.edu/.

Non-degree Seeking Students

How to Apply as a Non-degree Seeking Student

Non-degree admission is designed to meet the needs of students who do not wish to pursue a degree at NMSU. Courses taken in this status may not be used to meet university admission requirements. Students interested in using non-degree credit for initial teacher certification or certification in a new field must contact the College of Health, Education, and Social Transformation.

Non-degree students are ineligible to:

- Receive financial aid or student employment
- Participate in student government or intercollegiate athletics
- Receive benefits from military, veteran, and dependent financial assistance programs.

Transcripts may be required for non-degree seeking students who have not completed a bachelor's degree to ensure readiness for university-level courses. A $25 one-time, nonrefundable application fee is required.

Non-degree students are subject to the same university regulations as degree-seeking students.

Changing from Non-degree Status

A non-degree student in good academic standing at NMSU must submit an application for admission as a degree-seeking student. Requirements for regular admission must be met. Non-degree students may not transfer more than 30 credits from this status to any undergraduate degree program except for students participating in a high school concurrent enrollment program. If a student has graduated from NMSU, they will automatically be switched to a non-degree status. If that student intends to pursue another degree from NMSU, they will need to submit an application for admission as a degree-seeking student.

Opportunities for High Schools Students

Dual Credit for High School Students

The Dual Credit program is designed to give high school students an opportunity to enroll at NMSU before high school graduation. A student must be either a junior or senior in high school and enrolled at least half-time in high school courses. Under a Statewide Dual Credit Master Agreement between NMSU and the school district, students enrolled in approved dual credit courses are eligible to have the total cost of tuition and general fees waived.

Eligibility Requirements

- High school junior or senior enrolled at least half-time at their high school
- High School cumulative GPA of at least a 3.0, or 3.2 if student has not taken the PSAT, ACT or SAT.
- ACT composite score of 21 or SAT total score of 1060
- If you have not taken the ACT or SAT, the first semester requirements may be met with a qualifying PSAT score of 860 or above. Continued enrollment in the program will be based on successful progress or completion of your first dual credit course and high school GPA.
- Obtain approval from high school guidance counselor

- Obtain approval from parent or guardian

Enrollment Process

- Completion of required documentation
- Meet with an NMSU Dual Credit Advisor
- Attend Dual Credit Orientation before the first day of classes (first semester only)
- First time students are limited to one course. After successful completion, students may take a maximum of two courses per semester thereafter.

See Dual Credit for details and required paperwork to get started. https://dualcredit.nmsu.edu/get-started/index.html (https://dualcredit.nmsu.edu/get-started/)

Out-of-State Students and Legal Jurisdiction

By applying for admission/enrollment, both the student and parents agree that New Mexico law prevails, and all litigation will be in federal or state court in New Mexico.

Applying for Admission

Application Materials

All documents submitted as part of the official admissions process become the property of NMSU and will not be returned to the student. Application materials are retained for one calendar year for students who apply but do not attend.

Application Deadlines

NMSU's priority deadline for completing the entire admission process is the Friday before the first day of class each semester. Completing the admission process includes, but is not limited to:

- Completing an application for admission
- Submitting all official documents
- Receiving an admission decision
- Completing orientation (if required)
- Taking placement exams
- Enrolling in courses

Completing all the above steps requires multiple business days; NMSU encourages all interested students to plan accordingly. In addition, international applicants have additional steps to complete and have earlier deadlines related to visa timelines. Moreover, some academic programs have specific application deadlines that students must meet.

The deadline to apply for NMSU's Nursing program is February 1st for the fall semester and September 1st for the spring semester.

Transfer Students

Overview

NMSU evaluates eligible courses for NMSU transfer equivalency from postsecondary institutions that are regionally accredited or are candidates for regional accreditation. Credits from non-accredited institutions may be evaluated by the student's academic college, after the student has shown acceptable performance at NMSU for two semesters of full-time enrollment. Academic colleges, within NMSU, may have additional requirements for course transfer. Please contact the College Dean's Office for more information.

Transfer students are subject to the same graduation requirements as all NMSU baccalaureate-degree (bachelor's) seeking students. Thirty (30) of the last 36 credit hours for every degree to be awarded from NMSU must be earned at NMSU.

Community/Junior College Transfers

Community/Junior college transfer students may be admitted and classified on the basis of acceptable credits earned at a two-year institution. However, transfer students are subject to the same graduation requirements as all NMSU-Las Cruces campus baccalaureate-seeking students. This includes the required minimum number of 48 upper division credit hours from courses numbered 300 or above and the requirement that 30 of the last 36 credit hours must be earned through this university.

NOTE: Students currently enrolled at an NMSU Community College (Alamogordo, Dona Ana or Grants) are not considered transfer students. If a student wants to change campuses, they must submit a Change of Campus form.

Transfer Students- Admission Requirements

- Transfer students must provide official transcripts from each institution attended. For college transcripts to be considered official, they must be sent directly from the institution's student records office to NMSU Undergraduate Admissions or delivered in person only if in a sealed envelope from the granting institution and with the current issue date. Official transcripts must be received before the date of registration. Applications for admission that include the transfer of credits earned at a non-U.S. university must include a professional foreign credit evaluation report from a member institution of the National Association of Credential Evaluation Services (NACES) for every transcript.
    - Students who have not earned credit for the first semester of college English or Math may submit official ACT or SAT scores directly to NMSU Undergraduate Admissions. If ACT or SAT scores are not available, students must take the English Placement Questionnaire and/or Math Placement Exam provided by NMSU.
    - Students with 24* or more completed college credit hours must have a cumulative grade point average (GPA) of at least 2.0.

- Students with fewer than 24 completed college credit hours must fulfill the transfer and first-year admission requirements.
- Students must be eligible to return to their last college or university.
- Any student who conceals the fact that they attended another college or university and has not submitted a transcript for each institution, whether or not credit was earned, will be subject to immediate suspension.
- NMSU will uphold academic and judicial suspensions from other colleges and universities.

* The types of credits listed below are not counted toward the 24 completed credit hour requirement:

- Courses taken for college credit while in high school.
- Credits by examination (i.e. CLEP, IB, AP, etc.).
- Credits from a non-regionally accredited institution.
- Credits from institutions that do not provide grades.
- Credits from experience such as a Joint Services Transcript.

Transfer of International Credit

Applications for admission that include the transfer of credits earned at a non-U.S. university must include a professional foreign credit evaluation report from a member institution of the National Association of Credential Evaluation Services (NACES) for every transcript from a foreign secondary school and/or university attended.

General Requirements for Transfer Credits

Credit will be awarded for transfer courses as follows:

- Grades earned in courses taken at other institutions are not included in the calculation of the NMSU GPA, except for grades earned by approved National Student Exchange students.
- A grade of D or better is required to grant NMSU credit for courses identified as having an NMSU equivalent.
- Colleges or departments may require a grade of C- or higher for courses required in their programs.
- Each college determines which transferred courses are applicable toward a degree or a minor.
- Transcripts may need to be reevaluated when students transfer from one NMSU campus or College to another.
- Currently enrolled students must obtain prior approval from their academic department head and dean before courses taken at another institution will be applied toward meeting NMSU graduation requirements.

Student Responsibility

Planning for effective transfer with maximum efficiency is ultimately the student's responsibility. Responsible transfer planning includes early and regular consultation with the intended degree-granting institution to assure that all pre-transfer coursework will meet the requirements of the desired degree.

NMSU maintains a database (https://miniapps.nmsu.edu/transfer/) of commonly transferred courses from numerous institutions. Courses included in the database at the time the student is admitted to NMSU will automatically transfer to NMSU, provided the student follows all guidelines (see Currently Enrolled NMSU Students below). If a transferred course does not exist in the database, it is the student's responsibility to provide the departmental faculty with sufficient materials (e.g. catalog description, syllabi, etc.) to determine if any of the department's courses may be equivalent to the credits being transferred.

Currently Enrolled NMSU Students

Currently enrolled students must obtain prior approval from their academic department head and dean before courses taken at another institution will be applied toward meeting NMSU graduation requirements.

Religious Center Courses in Religion

Courses in religion, offered by the various religious centers through higher educational institutions with which they are affiliated, are open to all students and these or similar courses from other colleges/universities may be transferred for elective credit ("E") to NMSU. Registration for these courses is separate from the NMSU System's registration and is conducted by the religious center offering the course.

No more than 6 credits in such courses may be transferred to NMSU. To transfer earned credits to NMSU, the student must do the following:

- Obtain written approval from the student's department head and academic dean prior to registration for the course.
- Count the credit in the course as part of the total semester load.
- Upon completion of the course, request that the institution granting the credit send a transcript of the credit to the Undergraduate Admissions Office at NMSU-Las Cruces.

Graduate Transfer Credits

For more information about transferring graduate credits please visit the Graduate School section of this catalog.

Evaluation of Transfer Credits

NMSU has three levels of course credit transfer. Once a student has been admitted to NMSU, they are awarded credit for equivalent courses accordingly. Following award of credit as described in Levels 1 and 2 (below), application of any additional credit transfer via specific program articulation agreements will be approved by the student's academic department and dean, including additional courses in the major that

may count toward a degree or a minor but, are not included in a program articulation.

Level 1

Automatic course-to-course equivalency credit transfer from colleges/universities in the state of New Mexico, per the New Mexico Higher Education Department (NM HED) articulation modules. Eligible credits for Level 1 transfers will be automatically applied to the student's transcript, provided minimal grade requirements are met.

Level 1 equivalency includes:

- New Mexico State Common Core general education courses.
- New Mexico State articulated academic programs (e.g. Business, Early Childhood Education, and NM Nursing Education Curriculum).

Level 2

Faculty established NMSU course-to-course equivalency transfer:

- Equivalency is determined by the designated departmental faculty in the department/program in which the equivalent course is offered, and may include a review of course description, syllabus and/or interaction with the other institution. If a course equivalency does not exist in the database, it is the student's responsibility to provide departmental faculty with sufficient materials to determine if any of the department's courses may be equivalent to the credits being transferred.
- Credit for courses transcripted with NMSU equivalency may/will count toward the degree/major.
- Credit for courses with no NMSU equivalenceequivalent will be transcripted as 100E (lower level) or 300E (upper level) and may or may not count as credit toward a specific degree. Departmental faculty may accept the "E" course as elective credit toward the degree, or as a substitute for a course not applied universally.
- Transfer Credit and Credit Conversion Policy

  For students transferring courses from institutions that operate on a quarter system, credit hours will be converted to the semester system. Unless otherwise specified, the standard conversion formula is:

  Semester Credit Hours = Quarter Credit Hours × 0.67.

Level 3

Specific program articulation between an NMSU program/department and a program/department at another institution.

- Program articulation with other institutions is monitored at the department/program level in accordance with articulation agreements and may include credit transfers that are applicable only to the specific degree articulated (i.e. credit for courses may change depending on degree student declares).
- Level 3 transfer credit is degree specific; therefore, transcripts must be re-evaluated when a student changes their major or college- Level 3 transfer credits are not applied universally.

National Student Exchange (NSE)

Courses transferred back to the NMSU System by students participating in the National Student Exchange (NSE) Program will be evaluated as NMSU (system) courses and recorded on the student's academic record. All computable grades earned will be included in calculating the student's cumulative grade point average.

Transfer Credit Appeal Process

All New Mexico public post-secondary institutions are required to establish policies and practices for receiving and resolving complaints from students or from other complainants regarding the transfer of coursework from other public institutions in the state. A copy of NMSU's transfer credit policy may be obtained from the University Student Records Office or from the Deputy Secretary for Academic Affairs, Higher Education Department, 2048 Galisteo St., Santa Fe, New Mexico 87505-2100.

Military and Veterans Programs (MVP)

About MVP

New Mexico State University (NMSU) is a military and veteran-friendly university that strives to provide the best possible service for to for our military, veterans, and their dependents as they pursue their educational goals. NMSU Military and Veterans Programs promotes lifelong learning and professional development by offering:

- In-state tuition rates for active-duty military and their dependents stationed at regional military installations (including Ft. Bliss); or those eligible for U.S. Department of Defense (DoD) Tuition Assistance (TA) or U.S. Department of Veterans Affairs (VA) education benefits
- Transferable military credits that count toward degrees at NMSU
- Facilitation of MyCAA Scholarship for military spouses benefits and DoD TA education benefits
- Advocacy from admission to graduation
- Student Veteran Housing for student veterans and their families
- Priority registration for military and veteran students
- Aggies Green Zone Training, educating faculty and staff about our military and veteran students and the unique value they bring to campus
- SALUTE National Honor Society for student veterans
- Connection with the Student Veterans Organization (SVO) of NMSU
- Scholarships and Internship opportunities
- Veteran Mentorship Program, helping first-year student veterans transition to an academic setting successfully
- Processing of TA and VA education benefits
- Student Computer Lab and Lounge

NMSU degree programs are approved by the State Approving Agency (SAA) at the New Mexico Higher Education Department. Eligible students may receive education benefits from the U.S. Department of Defense or the U.S. Department of Veterans Affairs.

For further information contact:

Military and Veterans Programs
MSC 4740, PO Box 30001
Las Cruces, NM 88003-8001
(575) 646-4524
http://mvp.nmsu.edu

MVP Student Computer Lab and Lounge

The MVP Student Computer Lab is available to military, veteran, and dependent students. The lab has six computers with several common access card (CAC) readers. A CAC reader enables students to access military websites to complete their TA requests. The Computer Lab is open from 8 a.m. - 5 p.m. Monday through Friday. We offer free copying and printing services to accommodate our students. The MVP Student Lounge has comfortable furniture, a coffee station, a kitchen (microwave/refrigerator) area, and a place to study and relax between classes. Students enjoy free coffee while doing their homework and networking with like-minded students.

Costs

Active-Duty

Active-duty military personnel (U.S. Armed Forces) stationed in New Mexico or at Fort Bliss, Texas, must complete a "Resident Tuition Application for Active Military, Veterans and Dependents of the U.S. Armed Forces" waiver to qualify for in-state tuition. Spouses and children of active-duty personnel stationed in New Mexico and Fort Bliss, Texas, who are not otherwise entitled to claim in-state residency, may apply for in-state tuition by submitting a "Resident Tuition Application for Active Military, Veterans and Dependents of the U.S. Armed Forces" waiver to the Military and Veterans Programs. Waivers are available at http://mvp.nmsu.edu (under the Forms tab) or through the University Student Records Office. Please contact MVP for the required documents needed to complete the waiver application.

NMSU Global Campus

NMSU Global Campus (https://global.nmsu.edu) includes 100% online bachelor's, master's, graduate certificate, and doctoral programs within the NMSU system. NMSU Global Campus programs are designed to serve students who may not be able to pursue an education through traditional means. Active-Duty students admitted to NMSU Global Campus must provide Military and Veterans Programs with supporting documentation to be assessed the Active Military $250 per credit hour fixed rate. Please visit the Active Military Rate page from MVP or contact NMSU Global Campus at globaladmissions@nmsu.edu or 575-232-3718 for more information.

Dependents Receiving VA Educational Benefits

Per NM 2015 HB 427:

A spouse or child of a veteran of the United States Armed Forces is entitled to pay tuition and fees at the rate provided for New Mexico residents; provided that the spouse or child is eligible for benefits pursuant to the federal Post-9/11 Veterans Educational Assistance Act of 2008 or any other federal law authorizing educational benefits for a veteran and the dependents of a veteran. Students may complete a "Resident Tuition Application for Active Military, Veterans and Dependents of the U.S. Armed Forces" waiver to qualify for in-state tuition. Waivers are available at http://mvp.nmsu.edu (under the Forms tab), or through the University Student Records Office. Please contact MVP for the required documents needed to complete the waiver application.

Veterans

Veterans who are eligible for the U.S. Department of Veterans Affairs education benefits qualify for in-state tuition through the Veterans In-State Tuition Act by submitting a "Resident Tuition Application for Active Military, Veterans and Dependents of the U.S. Armed Forces" waiver to the Military and Veterans Programs. Waivers are available at http://mvp.nmsu.edu (under the Forms tab) or through the University Student Records Office. For further information concerning approved programs and the application process, eligible persons should contact Military and Veterans Programs.

Veteran students enrolled under the following programs are responsible for their tuition and fees in the same manner as a nonveteran student:

- Montgomery GI Bill®-Active Duty (Chapter 30)
- Survivors' and Dependents' Educational Assistance (Chapter 35)
- Montgomery GI Bill®-Selected Reserve (Chapter 1606)

GI Bill® is a registered trademark of the U.S. Department of Veterans Affairs (VA). More information about education benefits offered by the VA is available at the official U.S. government website at https://www.benefits.va.gov/gibill.

Allowing Veterans to Attend or Participate in Courses Pending VA Payment

Background

Section 103 of Public Law (PL) 115-407, 'Veterans Benefits and Transition Act of 2018,' amends Title 38 US Code 3679 by adding a new subsection (e) that requires disapproval of courses of education, beginning August 1, 2019, at any educational institution that does not have a policy in place that will allow an individual to attend or participate in a course of education, pending VA payment, providing the individual submits a certificate of eligibility for entitlement to educational assistance under Chapter 31 or 33.

Pending Payment Compliance

In accordance with Title 38 US Code 3679(e), New Mexico State University adopts the following additional provisions for any students using U.S. Department of Veterans Affairs (VA) Post-9/11 G.I. Bill® (Chapter 33) or Veteran Readiness and Employment (Chapter 31) benefits, while payment to the institution is pending from VA. New Mexico State University will not:

- Prevent the student's enrollment;
- Assess a late penalty fee to the student;
- Require the student to secure alternative or additional funding;
- Deny the student's access to any resources (access to classes, libraries, or other institutional facilities) available to other students who have satisfied their tuition and fee bills to the institution.

However, to qualify for this provision, such students may be required to:

- Provide a written request to be certified;
- Provide additional information needed to properly certify the enrollment as described in other institutional policies

GI Bill® is a registered trademark of the U.S. Department of Veterans Affairs (VA). More information about education benefits offered by the VA is available at the official U.S. government website at https://www.benefits.va.gov/gibill.

Responsibility of Students Receiving VA Education Benefits

Students must pursue a degree in an approved program to be eligible for VA education benefits. Admission procedures for veterans and other eligible persons are the same for all students. Students must submit their degree plans or Student Academic Requirements (STAR) Degree Audit Report and Student Schedule to Military and Veterans Programs to be certified. Students must submit their degree plans or STAR Degree Audit Report and Student Schedule to MVP every semester they plan to use VA education benefits for continued certification.

Students using VA Education Benefits must notify MVP when any of the following occur:

- Dropping or adding course(s)
- Withdrawing from course(s)
- Withdrawing from the University
- Discontinuing regular class attendance
- Changing programs (academic majors/minors)

VA education benefits are payable for regular attendance in courses required by the student's program (major/minor) curriculum. VA education benefits are not payable for:

- Classes not attended regularly
- Repeating a course for which a passing grade meets degree requirements
- Classes for which credit is received through successful completion of a proficiency test or grade by examination
- Classes taken on an audit basis
- Classes that are dropped or withdrawn from
- Classes taken that are not required by the student's program (major/minor) curriculum

Tuition Assistance

Federal Tuition Assistance

Federal Tuition Assistance (TA) is a benefit paid to eligible members of the Army, Navy, Marine Corps, Air Force, Space Force, and Coast Guard. The Department of Defense (DoD) has authorized each service to pay up to $250 per semester credit hour in tuition costs (excluding fees) per fiscal year (1 October to 30 September). TA must be requested and approved before the start date of the course. Refer to your military portal for specific TA deadlines and procedures. TA is paid directly to the school by the individual services.

Service members must first be admitted to NMSU before enrolling in any classes at NMSU. Before applying, speak with your military service or Educational Services Officer (ESO) to know your education options and make an informed decision. Please be aware of the following NMSU admission and registration process:

1. Service members must Apply Online (https://apply.nmsu.edu/apply/?sr=f0ef65ec-60a5-445e-abbd-4b9ef76dab10) to be admitted.,
2. Login to my.NMSU.edu to register for classes, and
3. Create an Account and Apply for TA with your military portal. Each service has its own criteria for eligibility, obligated service, the application process, and restrictions. Refer to our website for service login information: https://mvp.nmsu.edu/military-members/federal-tuition-assistance.html

It is important to request TA for the same class and section number as enrolled in NMSU for tuition and grading purposes. Only enrollments requested and approved through their service portal will be eligible for TA. Refer to our website for further information or contact the Military and Veterans Programs for assistance.

MyCAA Spouse Scholarship

The My Career Advancement Account (MyCAA) Scholarship Program is a career development and employment assistance program. MyCAA is a program that provides financial assistance formilitary spouses who would like to pursue a license, certification, or up to an associate degree (excluding Associate Degrees in General Studies, Liberal Studies, and Interdisciplinary Studies that do not have a concentration). MyCAA provides a maximum education benefit of up to $4,000 with an annual fiscal year (1 October to 30 September) cap of $2,000 to assist eligible military spouses. Refer to our website for MyCAA eligibility and procedures at https://mvp.nmsu.edu/military-members/mycaa-spouse-scholarship.html or contact Military and Veterans Programs for assistance.

Regulations

Note: These regulations apply to all campuses of NMSU and are effective with the publication of this catalog. Tuition amounts, fees, and related items subject to annual review and change are all effective with the current catalog.

Credit for Military Service

New Mexico State University will award academic credit to United States military personnel for courses and Military Occupational Specialties (MOS), based on the American Council of Education Guide (ACE) as well as through national standardized tests, such as CLEP, AP, PEP, and DANTES. Credit for military training is in accordance with NMSU Faculty Senate Legislation Proposition 24-07/08, passed in May 2008. Military Training and Military Occupational Specialties (MOS) must have a recommendation evaluation by ACE (in the ACE Guide) for credit to be awarded. Courses accepted for transfer credit become part of the student's official NMSU transcript and academic record. If a student wishes to appeal a decision about accepting military training/education and/or MOS for academic credit, they must submit a written statement of appeal to the Dean of the College to which they applied. The Dean will review the merits of the appeal and render a decision. The decision of the Dean is final.

Only Primary MOS (s) are eligible for academic credit in the initial review and evaluation. Credit for Duty and/or Secondary MOS is eligible for academic credit if the student petitions the College's Associate Dean. Primary MOS is the primary specialty of a soldier and reflects the broadest and most in-depth scope of military experience. Veterans, active-duty personnel, National Guard, and Reservists who are current students or students applying for admission to New Mexico State University may be granted academic credit on a case-by-case basis upon evaluation of military transcripts - the Joint Services Transcript (https://jst.doded.mil/jst) and the Community College of the Air Force or Air University transcripts. Course equivalencies and credit hours

awarded for a particular NMSU degree are determined by colleges and/or academic departments. The credit hours for specific courses toward degree requirements, or as elective credit, may be awarded. The college and/or academic department determine the number of credit hours awarded.

Students submitting military transcripts for credit evaluation must meet the Maximum Time Frame policy, see the Financial Aid Section for more information.

According to Title 38, Code of Federal Regulations, Sections 21.4253(d)(3) and 21.4254(C)(4), the Department of Veterans Affairs requires all veterans receiving Veterans Affairs education benefits to submit their military transcripts - Joint Services Transcript and the Community College of the Air Force or Air University - to the New Mexico State University (NMSU) Admissions Office or NMSU Graduate School.

Graduate Student Status (Training Time)

VA education benefits are determined by the number of graduate credit hours of enrollment for a given semester. Listed below are the credit hours to determine the student status (training time) for graduate students.

Fall and Spring semesters, for 16-week terms, full-time enrollment is 9 or more credit hours: three-fourths time enrolled is 7 to 8 credit hours: half-time enrollment is 5 to 6 credit hours. Students enrolled less than 5 credit hours are reimbursed for tuition and allowable fees only.

For an 8-week term, full-time enrollment is 5 or more credit hours; three-fourths time enrollment is 4 credit hours: half-time enrollment is 3 credit hours. Students enrolled in less than 1-2 credit hours are reimbursed for tuition and allowable fees only.

Summer consists of 5 terms: 10-week term, 2 – 8 week terms, 2 – 5 week terms. The 10-week summer session, full-time enrollment is 6 or more credit hours; three-fourths time enrollment is 4 to 5 credit hours; half-time enrollment is 3 credit hours. Students enrolled in less than 1-2 credit hours are reimbursed for tuition and allowable fees only.

For the 8-week summer session, full-time enrollment is 5 or more credit hours; three-fourths time enrollment is 4 credit hours; half-time enrollment is 3 credit hours. Students enrolled in less than 1-2 credit hours are reimbursed for tuition and allowable fees only.

For the 5-week summer session, full-time enrollment is 4 or more credit hours; three-fourths time enrollment is 3 credit hours; half-time enrollment is 2 credit hours. Students enrolled in 1 credit hour are reimbursed for tuition and allowable fees only.

Veterans' Attendance and Satisfactory Progress

The U.S. Department of Veterans Affairs requires all veterans receiving VA education benefits to make satisfactory progress and systematic advancement toward an educational objective or be liable for overpayments. Satisfactory progress and regular class attendance are expected of students.

If a veteran receiving benefits gets suspended for academic reasons, benefits are terminated and will be restored only after readmission to NMSU.

If the university has liability claims filed against it because of a veteran failing to meet compliance requirements of the U.S. Department of Veterans Affairs, the university will not release any academic records (transcripts) on the veteran until the veteran has reimbursed the federal government for funds drawn in violation of those requirements.

A student receiving VA education benefits pursuing a degree program offered by New Mexico State University should adhere to the program curriculum. Failure to do so will result in the student being certified for less than full-time status or becoming liable for an overpayment.

Military Withdrawal

New Mexico State University understands that our military students may be called to active duty, specialized training, or disaster relief efforts with little notice. U.S. active-duty military students wishing to withdraw from all their classes must present their orders and their request for full withdrawal, as indicated below. However, the below policy does not pertain to a student's basic and/or annual training. A student who has an order for training is encouraged to formally request, through the proper military chain of command, a postponement of their orders until the summer or the end of the semester they are currently enrolled in. If a student's request for postponement is denied, the student may then follow the steps below but must provide documentation that their postponement request was formally denied.

All NMSU students called for active duty must take the following steps to withdraw from all their classes:

1. **Military and Veterans Programs (MVP):** TA/VA students ordered to Active Duty must provide a copy of orders to the MVP office, in Corbett Center Student Union, Room 244, or by email mvp@nmsu.edu. To assist in reporting accurate information to their military service or the VA Regional Office, the student should also provide, in writing, the last day of class attendance.

1. **NMSU University Student Records:** All students presenting their orders to the University Student Records, (575) 646-3411, or records@nmsu.edu, will receive a military withdrawal from classes and full tuition and fees refund for that semester.

1. **Bookstore:** Students who still have their receipts for textbooks purchased the semester in which they are called to active duty will be given a full refund for these textbook purchases when they present their orders. Please contact the bookstore for assistance at (575) 646-4431 or nmsu@bkstr.com.

Military Readmission Policy

New Mexico State University (NMSU) acknowledges that students may be temporarily unable to attend classes or be required to suspend their studies to perform military service. NMSU encourages such students to resume their education once a military service obligation has ended and adopts this policy to ensure the timely readmission of such students.

In accordance with federal regulations, 34 C.F.R. § 668.18 and the Department of Defense (DoD) Voluntary Education Partnership Memorandum of Understanding (MOU), the university will promptly readmit service members who seek readmission to a program that was interrupted due to a uniformed service obligation.

Eligibility

This policy shall apply to (1) service members who are unable to attend classes for more than 30 consecutive days, and (2) service members who are unable to attend classes for less than 30 days (about 4 and a half weeks) when such an absence would result in a withdrawal from NMSU.

A student is eligible for readmission under this policy if, during an absence, the student performs uniformed service, voluntary or involuntary, in the Armed Forces, including the National Guard or Reserve, active duty, active duty for training, or full-time National Guard (under federal authority). The cumulative length of all absences for uniformed service (service time only) must not exceed five years.

Notification of Military Service
The student (or an appropriate officer of the armed forces or official of the Department of Defense) must give written notice of such service to the school as far in advance as is reasonable under the circumstances. Such notice does not need to indicate when the student will return to NMSU.

Notification of Intent to Return
The student must also give written notice of Intent to Return and supporting official military obligation documentation to University Student Records within three years after the completion of the period of service.

Tuition and Fees
If the student is readmitted to the same program, NMSU will assess the tuition and fee charges that would have been assessed for the academic year during which the student left (first academic year only). However, if veterans' education benefits or other service member education benefits will pay the higher tuition and fee charges that other students in the program are paying for the year, NMSU will assess those charges to the student.

Readmission Requirements

A returning student will be permitted to reenroll in the next class(es) scheduled in the same academic program unless the student requests a later date of re-enrollment or agrees to a different program. A returning student will be readmitted into the same academic program they were enrolled in before the military service obligation. If the exact program no longer exists, the student must be admitted to the program that is most similar, unless the student requests or agrees to admission to a different program. Returning students will be reenrolled with the same enrollment status, number of completed credit hours, and academic standing as the last academic year of attendance.

If NMSU determines that a returning student is not prepared to resume the program with the same academic status or is unable to complete the degree, NMSU will make reasonable efforts to enable the student to resume or complete the program at no additional cost to the student.

NMSU is not required to readmit the student if it determines:

- that there are no reasonable efforts it can take to prepare the student to resume the program at the point where they left off or to enable them to complete the program, or

- that after it makes reasonable efforts (those that do not place an undue hardship on the institution), the student is not prepared to resume or complete the program.

"Undue hardship" means an action requiring significant difficulty or expense considering the overall financial resources of NMSU and the impact of such action on its operation. NMSU has the burden to prove by a preponderance of the evidence that the student is not prepared to resume the program with the same academic status at the point where they left off or that they will not be able to complete the program.

In accordance with federal regulations, returning students who receive a dishonorable or bad conduct discharge, general court-martial, or federal or state prison sentence from the Armed Forces (including the National Guard and Reserves) are not eligible for readmission#under this policy.

Students are encouraged to speak with Military and Veterans Programs regarding any absence due to military service. For more information, please contact mvp@nmsu.edu.

Military Experience Waiver

Before graduating, during the student's junior and/or senior year, NMSU students are required to take two 3-credit Viewing a Wider World (VWW) upper-division (300-400 level) courses. These courses emphasize the international character and multicultural influences in study and strengthen information retrieval skills. There are two options that NMSU allows for replacing one of the two courses (3 credits) of VWW requirement with another form of educational experience, these are: (Study Abroad Experience or Military Experience for students who have served at least four weeks of U.S. Military Foreign/Sea Service in a foreign country.

Steps needed to request a Military Experience Waiver (replacing 3 credits of VWW):

1. Obtain a copy of your DD-214 or Memo from your Commanding Officer proving your 4-week deployment

1. Provide the above copy to your college academic advisor to request a waiver

1. Wait for your college to approve and confirm

Note: Credits are not being waived, only one of the two courses is being waived within the requirement. You may still need to complete three credits in consultation with your academic advisor. Please contact the MVP or your academic advisor for questions and concerns.

Resources

Veteran Mentorship Program

Many students who make the transition from the Military to Higher Education suddenly experience a shift in lifestyles and cultures. This culture shift during their first year is a crucial time in their lives, and the NMSU Veteran Mentorship Program will help foster a smooth transition.

Vision: The NMSU Veteran Mentorship Program will help our first-year student veterans make a smooth transition and succeed academically.

Goals:

- Help first-year student veterans successfully transition to an academic setting.

- Help first-year student veterans be aware of various financing options.
- Help first-year student veterans understand the process needed to receive VA education benefits.
- Help first-year student veterans be aware of various resources at NMSU and in the community.

For more information on the Veteran Mentorship Program, or to speak with our Mentor, please visit: https://mvp.nmsu.edu/veteran-mentorship-program.html

Military and Veteran Housing

New Mexico State University is one of the first in the nation to offer on-campus housing specifically designated for student veterans and their families transitioning out of the military and into student life. The Department of Housing & Residential Life has worked in conjunction with the Student Veterans Organization of NMSU to offer affordable housing on campus to student veterans attending the university.

For more information, please contact Housing and Residential Life: (575) 646-3202, housing@nmsu.edu, http://housing.nmsu.edu.

Service Members Opportunity Consortium (SOC)

The NMSU system has been designated a Servicemembers Opportunity Colleges (SOC) Consortium university. As a member of SOC, NMSU has committed itself to fully supporting and complying with SOC principles and criteria, ensuring that service members and their families share in the postsecondary educational opportunities available to other citizens. Those eligible are provided with appropriately accredited educational programs, courses, and services. The flexibility of programs and procedures particularly in admissions, counseling, credit transfer, course articulation, recognition of other applicable learning experiences, including those gained in the military, scheduling, course format, and residency requirements are provided to enhance access of service members and their families to undergraduate education programs. All SOC rules and regulations apply, including:

- Credit for military training and experience – NMSU recognizes and uses ACE Guide in evaluating military training experiences
- Reduced academic residency requirements – 25% maximum for most programs; 30% for 100% online programs
- No final year or semester requirement
- Credit for nationally recognized testing programs such as CLEP (General and Subject exams), DSST (DANTES Standardized Subject Tests)

For further assistance contact:

Military and Veterans Programs
MSC 4740, PO Box 30001
Las Cruces, NM 88003-8001
(575) 646-4524
http://mvp.nmsu.edu

Reserve Officer Training Corps (ROTC)

The Reserve Officer Training Corps is a commissioning program designed to attract, motivate, and train qualified students for military service as officers. The ROTC program is represented on the NMSU campus by the Department of Military Science (U.S. Army) and the Department of Aerospace Studies (U.S. Air Force).

Curricula in the Departments of Military Science and Aerospace Studies are divided into basic and advanced courses of two years each. Enrollment in the basic course is voluntary and involves no obligation. Participation in the advanced courses is on a contractual basis and leads to military service as a commissioned officer. Elective academic credit is granted by the University for ROTC classes.

Students with prior military service or Junior ROTC experience may receive credit, although not academic credit, for all or portions of the basic courses.

All qualified cadets enrolled in ROTC receive a stipend that varies depending upon the year the cadet is in the program. Scholarships, which pay full college tuition and various laboratory, textbook, and incidental fees, are available competitively.

For more detailed information about the ROTC programs, see the College of Arts and Sciences departments of Aerospace Studies and Military Science in this catalog. Additional information may be obtained by contacting the departments directly at:

(575) 646-4030 (Army)
(575) 646-2136 (Air Force)

Aggies Green Zone

The Green Zone is defined as a military zone that has been secured as a "safe" place for military personnel. Military and Veterans Programs created the Aggies Green Zone to help foster a safe and supportive environment where students feel welcomed and trusted during their transition from the military and throughout their educational journey. The Aggies Green Zone training program aims to help faculty and staff understand the needs, experiences, and cultural issues affecting military and veteran students.

Aggies Green Zone Allies

Aggies Green Zone Allies are sympathetic faculty and staff members who military, veteran, and dependent students can reach for support. Allies are not expected to be experts in military and veteran matters, but they can make a positive impact by lending a sympathetic ear and connecting students with appropriate resources.

Faculty and Staff receive an Allies designation after participating in the Aggies Green Zone online and workshop training programs, to have their contact information listed on the MVP website. For more information, please visit: https://mvp.nmsu.edu/aggies-green-zone/green-zone-allies.html

International Students

International students are a vital component of the New Mexico State University (NMSU) community. After a student is admitted to a degree seeking program ISSS office may issue an I-20 after the

student submits the required documents. Based on the I-20 students may apply for an F-1 visa in their home country. The US consulate officer determines the eligibility of F-1 visa of a student.

International students are admitted to the United States primarily in F-1 (student) and J-1 (exchange visitor/student) nonimmigrant classifications and are subject to federal immigration laws and regulations administered by the U.S. Department of Homeland Security (DHS) through the Student and Exchange Visitor Program (SEVP), as well as by the U.S. Department of State for J-1 exchange visitors/students. The Office of International Student and Scholar Services (ISSS) under the umbrella of the International Programs and Compliance (IPC) serves as the University's designated office for SEVP compliance and is responsible for advising international students on their immigration-related responsibilities.

Federal Regulations

The Department of Homeland Security through the Student and Exchange Visitor Program (SEVP) has established rules for students in non-immigrant status, such as those with F-1 or J-1 visa types. Some of these rules include the following:

1. Enrollment requirements

   For immigration purposes, each student must maintain full-time student status

   - Undergraduate - Full-time status for fall and spring semesters is defined as 12 or more credits for undergraduates (only three online credits can apply to the full-time requirement).
   - Graduate - Full-time status for fall and spring semesters is defined as 9 or more credits for graduate students (only three online credits can apply to the full-time requirement).
   - Summer- Generally students are not required to enroll in classes during summer semester, as it is considered as a break time. The exception being when:
     - When students are admitted in summer semester. They are required to be full time student. Full-time status for summer is defined according to NMSU requirements.
     - Students graduating in the summer semester are required to enroll in at least one in-person class. Exceptions possible for final semester. Consult ISSS officials for more details.

   2. Employment:

   - On-campus employment: Students can work 20 hours per week on campus during Fall and Spring semester. Students can work upto 40 hours per week during break. Example Summer break, spring break etc.Students on valid I-20's with F-1 visas are eligible to work on campus while studying in the U.S. Students may only work on campus while they maintain status. A valid I-20, F-1 visa and I-94 document serve as proof of work eligibility for on-campus employment.
   - Off -campus employment: International students are generally not eligible to work off-campus but maybe eligible to not work off campus with withoutprior authorization from ISSS office.
     - CPT – Students are generally eligible to apply for CPT after they complete one academic year as an F-1 student. But CPT must be authorized by ISSS office prior to working. Working without prior authorization is a violation of immigration status and the students I-20 maybe terminated for "unauthorized employment".
     - OPT – Students are eligible to apply for OPT if they are in valid F-1 status for an academic year. Student can generally apply for OPT 90 days prior to their graduation date or within 60 days of graduation.
     - STEM OPT – Students must be in active OPT Status with employment with an e-verified employer and must have received a degree in a STEM field. Students are eligible to apply for STEM OPT 90 days before their OPT expires.

   For additional eligibility requirements about CPT,OPT or STEM OPT please contact ISSS office.

   3. Maintaining Status:

   - All international students must maintain their most current USA address and phone number in their NMSU account and notify within 10 days of change their new address.
   - Maintain valid passport and visa
   - Have a valid I-20 reflecting the students current major and educational level at all times.

University Procedures for International Students

Undergraduate Admission

International students are subject to the same admissions standards as all other NMSU students, but some additional requirements apply. This section addresses those additional requirements. Visit https://isss.nmsu.edu/new-students/undergraduate-admissions/step-1.html for more information.

Applications for admission that include the transfer of credits earned at a non-U.S. university must include a professional Foreign Credential Evaluation (FCE) report from a member institution of the National Association of Credential Evaluation Services (NACES) for every transcript from a foreign secondary school and/or post-secondary institution attended. The ISSS office highly recommends that applicants consider using The Evaluation Company (TEC) for their FCE. NMSU has worked with TEC to provide applicants with a clear understanding of which evaluation is needed. TEC provides an applicant portal to track and access evaluations. TEC is a long-standing member of NACES. For more information, please visit https://spanside.my.salesforce-sites.com/SpantranApplication?Id=945ec224-f79e-4171-8888-8c452728aafb

Undergraduate – New

- GPA requirement of 2.75 or higher
- Minimum TOEFL of 68 iBT, or 6.0 IELTS, or Duolingo 95 or higher
- Secondary school equivalency with a minimum 2.75 GPA or ACT composite score of 21 or SAT score of 1060 or Ranked in the top 20 percent of their high school graduating class or a GED cumulative score of 480 or HiSET cumulative score of 45.

Undergraduate – Transfer

- 2.00 or better GPA on transfer college or university credits.

- Students transferring from a two-year college, community college, or university in the United States who have earned a minimum of 30 acceptable semester credits (45 acceptable quarter credits) with a GPA of 2.0 or better (acceptable credit means classes that require a high proficiency in both written and oral English).

English Language Proficiency Requirements

For undergraduate admission to the university, NMSU requires a score of 68 (internet-based) or better on the Test of English as a Foreign Language (TOEFL) or a score of 6.0 on the International English Language Testing System (IELTS), or a score of 95 on the Duolingo English Test (DET) for international students for both non-degree and degree seeking. International students attending another US institution and having a valid I-20 may enroll as a non-degree seeking student and take course(s) at the undergraduate level.

Students who are citizens from one of the following countries will be exempt from providing a TOEFL, IELTS, or DET score for admission purposes. NMSU requires all admitted international students to take the English Language Placement Test (ELPT) for placement purposes.

> Anguilla, Antigua, Australia, Bahamas, Barbados, Barbuda, Belize, Bermuda, Botswana, Caicos Islands, Cameroon (Anglophone), Canada (except Quebec), Cayman Islands, Christmas Islands, Cook Island, Dominica, England, Eritrea, Fiji, Gambia, Ghana, Grand Cayman Islands, Grenada, Grenada and the Grenadines, Guernsey, Guyana, Ireland, Israel, Jamaica, Jersey, Kenya, Kiribati Islands, Lesotho, Liberia, Malawi, Malta, Mauritius, Micronesia (Federated States of), Montserrat, Namibia, Nauru, New Zealand, Nigeria, Norfolk Island, Papua New Guinea, Philippines, Scotland, Sierra Leone, Singapore, Solomon Islands, South Africa, St. Christopher, St. Helena, St. Kitts and Nevis, St. Lucia, St. Vincent & Grenadines, Swaziland, Tanzania, Trinidad & Tobago, Tristan da Cunha Island, Turks & Caicos Islands, Uganda, Virgin Islands, Wales, Zambia, Zimbabwe

For students not from the countries listed above, a waiver of the TOEFL/ IELTS/DET requirement may be considered for:

1. Students completing high school in the United States who have attended the high school for at least two full years.
2. Students transferring from an institutional accredited two-year college, community college, or university in the United States who have earned a minimum of 24 semester credits or 36 quarter credits (all classes having English as the language of instruction) with a GPA of 2.0.
3. The university reserves the right to require any prospective international student to meet the TOEFL, IELTS or DET requirement.

All application material, transcripts, national examination scores, transcripts from colleges or universities (with an English translation), and test scores (including the TOEFL or IELTS) should be sent directly to the NMSU Undergraduate Admissions at admissions@nmsu.edu. Please note that transcripts, test scores, and foreign credential evaluations sent directly from an applicant/student to NMSU will be considered unofficial. To be considered official, transcripts, test scores and foreign credential evaluations must come directly from the school, testing agency, or evaluation agency. All documents should be emailed to admissions@nmsu.edu.

Admission Restrictions

Admissions to summer terms in not available to new undergraduate international students due to the limited number of face-to-face course offerings.

Admission Deadlines

For full consideration for undergraduate admission, applicants are subject to the following deadlines:

July 1 (application initiated)	Fall Semester
July 15th (all documents submitted)	Fall Semester
October 1st* (Study Abroad)	Spring Semester
November 15th (application initiated)	Spring Semester
December 1st (all documents submitted)	Spring Semester

Post Admission

Immigration Document Requirement (I-20) to be submitted to ISSS office

1. Valid passport for six months or more (from the date of entry into USA).
2. International student must submit a current financial support document to the ISSS office. This document must show that:
    - The financial support document/ bank statement - Availability offinancial document/bank statement must be within the last 3 months on the letter head of the bank and reflect the account holders name, account number, type of bank account and the available balance. The bank statement must be from an account where the funds are readily available to use to support the student's education and other related expenses such as tuition expenses, living expenses, insurance, other expenses for at least one academic year.
3. Complete the Affidavit of Support Form provided by ISSS office.
4. All official communication and I-20 will be sent to the students NMSU email address

Post Arrival

1. New Student Orientation

Orientation for all new Undergraduate first-time and transfer students is mandatory. At NMSU's New Student Orientation programs, students will attend information sessions, learn about campus resources and college life, meet with an academic advisor, and register for courses.

More information about New Student Orientation is available at https://awo.nmsu.edu/.

2. English Language Placement Test

Placement in writing classes for international students is determined by the results of the English Language Placement Test (ELPT).

Based on the results of the ELPT, the student is either assigned to ENGL 1105M (a bridge course designed to ensure success in ENGL 1110M) or is allowed to enroll directly in ENGL 1110M (for multilingual students). Please note that these classes are only available on NMSU's Las Cruces Campus. International students excused from ENGL 1105M will be required to take ENGL 1110M. The student may then be required to complete one or more regular English classes as required for a particular degree. Completing basic English courses at other U.S. institutions does not automatically satisfy the ENGL 1110M requirement. Equivalencies for ENGL 1105M and equivalencies for ENGL 1110M or ENGL 1110G are determined by the University Student Records Office, who may refer exceptional cases to the English Department in the College of Arts and Sciences.

In cases of dramatic discrepancies between TOEFL/ IELTS scores and the ELPT, the ELPT results shall determine placement.

3. Mandatory SEVIS check-in

SEVIS check-in is another orientation for all new and transfer international students admitted for the semester and it is federally mandatory to attend. This is a federal requirement for students to comply. Mandatory SEVIS check-in MUST be completed by all new and transfer students ideally one day before classes begin depending on the semester they are admitted to. The location of the Sevis check-in will be communicated by the ISSS office.

4. Canvas Course & Document Upload Portal

The Canvas Course & Document Upload Portal is where a student uploads their documents such as passport, F-1 visa, I-94, along with US address, phone number and emergency contact information. Students will receive an email invitation to the Canvas course 2 weeks before the semester begins. Students can access this Canvas course using their NMSU email address. All official communication will be sent to the students NMSU email address.

*** All the 4 items listed above must be completed by New and Transfer International students.

Graduate International Students

For information about admission process, eligibility and deadlines please visit the Graduate School section of this catalog.

https://gradschool.nmsu.edu/future-students/international-graduate-students-processing-steps.html

Post Admission of graduate student:

Immigration Document Requirement (I-20) to be submitted to ISSS office

1. Passport valid for six months or more.
2. International student must submit a current financial support document/ Assistantship offer to ISSS office. This document must show that:
    - If submitting financial support document - The Bank statement with transactions must be on the letter head within the last 3 months of the bank and reflect the account holder's name, account number, date and the available balance. The bank statement must be from an account where the funds are readily available to use to support the student's education and other related expenses such as tuition expenses, living expenses, insurance, other expenses for at least one academic year.
    - Assistantship offer- The offer must be on the department letterhead reflecting the students name, Aggie #, the semester/s student will be offered assistantship, amount in funding the student will receive and other benefits, if any.
3. Complete the Affidavit of Support Form provided by ISSS office.
4. All official communication and I-20 will be sent to the students NMSU email address.

Post Arrival

1. Mandatory SEVIS check-in

SEVIS check-in is orientation for all new and transfer international students admitted for the semester and attendance is federally mandated. This is a federal requirement for students to comply. Mandatory SEVIS check-in MUST be completed by all new and transfer students at least one day before classes begin depending on the semester they are admitted to. The location of the SEVIS check-in will be communicated by the ISSS office.

2. Canvas Course & Document Upload Portal

The Canvas Course & Document Upload Portal is where student upload their documents such as passport, F-1 visa, I-94, US address, phone number and emergency contact information. Students will receive an email invitation to the course 2 weeks before the semester begins. Students can access this Canvas course using their respective NMSU email address.

*** All the 2 items listed above must be completed by New and Transfer International students.

3. Enrolling in Classes:

- Fall and Spring semester: Full-time status for fall and spring semesters is defined as 9 or more credits for graduate students (only three online credits can apply to the full-time requirement).
- Summer semester: Students admitted to summer semester must enroll in full course load. Full-time status for summer is defined according to NMSU requirements.
- Students graduating in summer semester must register for at least one in-person class.

Employment:

- On-campus employment: Students on valid I-20's and F-1 visas are eligible to work on campus while studying in the U.S. Students may only work on campus while they maintain status. A valid I-20, F-1 visa and I-94 document serves as proof of work eligibility for on-campus employment.
- Off-campus employment: International students may not work off campus without prior authorization from ISSS office.

Miscellaneous Regulations

Health Insurance

New Mexico State University (NMSU) requires all F-1 international students studying at NMSU to have university mandated health insurance coverage. It is the student's responsibility to enroll in health insurance coverage offered by NMSU. The health insurance coveragemust cover the student while they are physically present in the U.S. including summer and winter breaks. NMSU will provide an educative canvas course whereby NMSU will inform international students with their option/s for obtaining health insurance plan along with the advantages and disadvantages of each option and allow the students to make an informed decision on their own.

Canvas Health Insurance Course - All new international students at NMSU are required to complete the Canvas Health Insurance Course. Students will be sent a link to the course after they have enrolled in classes. Participation in the course is mandatory. Completion of the course acknowledges that you have been provided with the information necessary to make an informed decision regarding the purchase of your health insurance coverage. It acknowledges that you understand the pros and cons of the plan you selected, including **taxes and potential complications during subsequent change of status procedures.**

1. UG students: New and transfer international students are permitted to enroll in classes after they complete Aggie Welcome and Orientation and taking the English Language Placement Test (when applicable, see English Language Proficiency Requirements section). All international students, are required to the campus to which they were admitted. The following are the offices that a student may need to report to:

Las Cruces campus: International Student & Scholar Services, Suite 101 of the Educational Services Building (575) 646-2834, isss@nmsu.edu.

- a. Doña Ana Community College: International Student & Scholar Services, Suite 101 of the Educational Services Building (575) 646-2834, isss@nmsu.edu.
- b. Alamogordo Community College: Office of Student Services, Student Services Building, second floor
- c. Grants Community College: Office of Student Services, Walter Martinez Building, Main Office Complex

2. All international students are required to registerto undergo a TB test or submit results of a current TB test done in the home country within a week of arriving. Guidelines will be provided by the Aggie Health and Wellness Center.

TB test done in the home country within a week of arriving. Guidelines will be provided by the Aggie Health and Wellness Center.

International Exchange Students

An Exchange Student is defined as a visiting student who is coming to NMSU for one semester to one Academic Year but is not seeking a degree. An Exchange Student typically comes to NMSU from one of NMSU's partner universities or one of NMSU's partner consortiums.

All international exchange students are required to be enrolled in NMSU-approved health insurance. Education Abroad & National Student Exchange will enroll the students and bill the insurance amount to the student's account.

Exchange Students are required to attend a mandatory Orientation before courses begin. Orientation will be scheduled and facilitated by the Education Abroad & National Student Exchange, abiding by guidelines set forth by the US government per J-1 visa requirements.

Exchange students are subject to the same English Language Proficiency policies outlined in the section on University Procedures for International Students.

Application Process for International Exchange Students

Prior to admission to NMSU, a prospective international exchange student must be nominated from their home university, complete an application with Education Abroad & National Student Exchange and submit their required documents. The process is as follows:

1. Nomination for exchange must be submitted by the Home University to the Incoming Exchange Coordinator by March 15 for Fall semester and September 15 for Spring semester. Please see your home university exchange coordinator for more information and to complete the nomination process.
2. Once a nomination is received, students will be directed to make an account at: https://educationabroad.nmsu.edu/incoming-exchange-students.html.
3. The student is then required to complete the Exchange Student Nomination Form Questionnaire and upload the following documents:
   a. Passport
   b. Transcripts (in English)
   c. Financial document showing proof of $8,000 per semester attended.
4. Current TOEFL scores (2 years or less). See below for acceptable scores. Information on current test scores can be found at Education Abroad & National Student Exchange's website: https://educationabroad.nmsu.edu/exchange-students-application-deadlines-and-processes.html. All international students, regardless of status, must apply for Admissions to NMSU. Education Abroad & National Student Exchange staff will send the students specific instructions on how to apply non-degree, guest matriculant to NMSU.

Academic Restrictions

The majority of the NMSU catalog applies to Exchange Students, with the following exceptions:

- Courses must be taken at the Main Campus only. Community college courses, including DACC, are not available to Exchange Students.
- The Nursing Department and the Creative Media Institute (CMI) areis the only departments strictly off limits to exchange students, with case-by-case exception by the departments, and this would have to be approved well in advance of the student being nominated. The English Department also has restrictions on the courses available to exchange students. Please contact the Education Abroad office for more information.
- Exchange students are required to abide by all pre-requisite requirements and class size restrictions (i.e., if a course is closed when the student goes to register, an exception cannot be made).
- Online courses are restricted due to visa requirements (no more than three credits can be taken online. Additional fees will apply.

Tuition, Fees & Other Expenses

All costs are given for one term/semester. The university reserves the right to change any of the charges without notice.

Campus Tuition Rates

For a full listing of all tuition rates from the NMSU System please see the University Accounts Receivable website.

Additional Fees

Additional Fees

Undergraduate admission application fee	$25.00
New student orientation fee - virtual session	$99.00
New student orientation fee - in-person session	$165.00
International student admission application fee	$50.00
International student orientation fee	$50.00
Academic Services Fee (per credit)	$20.00
Course Delivery Fee (per credit)—(Grants Only)	$25.00
ASNMSU Fee (Fall/Spring 1-11 credit enrollment)	$33.50
ASNMSU Fee (Summer 1-8 credit enrollment)	$12.40
Graduate Wellness/Fitness fee—(Fall/Spring 9+ credits)	$159.30
Graduate Wellness/Fitness fee—(Summer 6+ credits)	$141.60
Certificate degree fee	$10.00
Bachelor or Associate degree fee	$35.00
Master or Doctorate degree fee	$45.00
Degree application late filing fee	$50.00
Late Registration Fee Base Cost	$25.00
Engineering Technology Fee	$36.00-145.00

Course Fees (Fees Assessed Per Course)

- See the Course Fee (https://uar.nmsu.edu/tuition-fees/)page for a list of courses with additional fees.
- Applied Music courses - see Music section of catalog
- Graduate MBA Course Fee: $250.00
- For more information, please visit the MBA Online Program website: https://business.nmsu.edu/masters-programs/mba/mba-program/mba-online

Mandatory International Student Fees

International Student Health Insurance

New Mexico State University (NMSU) requires all F-1 international students studying at NMSU to have health insurance coverage. It is the student's responsibility to purchase and maintain health insurance coverage while enrolled at NMSU. The health insurance coverage must cover the student while they are physically present in the U.S. including summer and winter breaks. NMSU will provide an educative role whereby NMSU will inform international graduate students with their options for obtaining health insurance along with the advantages and disadvantages of each option and allow the students to make an informed decision on their own.

- Canvas Health Insurance Course - All new international students at NMSU are required to complete the Canvas Health Insurance Course. Students will be sent a link to the course after they have enrolled in classes and activated their NMSU email address. Participation in the course is mandatory. Completion of the course acknowledges that you have been provided with the information necessary to make an informed decision regarding the purchase of your health insurance coverage. It acknowledges that you understand the pros and cons of the plan you selected, including **taxes and potential complications during subsequent change of status procedures.**

Other Fees

Wellness/Fitness Fee

The Wellness/Fitness fee is included in tuition for full-time students at the Las Cruces Campus. Options for part-time students enrolled at Las Cruces Campus include:

Tuition, Fees, and Other Expenses

	Wellness	Fitness
Term pass for student enrolled in 6-11 credits	$81.00	$40.00
Term pass for student enrolled in 1-5 credits	$105.00	$53.00
Single visit for student enrolled in 1-11 credits	$35.00	N/A
Tuition, Fees, and Other Expenses		

The Wellness fee grants access to the Student Health Center with charges accruing for medications, lab work, testing or procedures. The Fitness fee grants access to the Student Activity Center.

Health Insurance

Students who have access to the Campus Health Center may choose to purchase a commercial insurance policy offered through the Health Insurance Marketplaces established by the Affordable Care Act (ACA). These exchanges are intended to provide consumers with a new way to shop for, compare costs and coverage benefits, and enroll in insurance coverage. For more information visit: www.healthcare.gov or www.bewellnm.com

- **Housing Services**

See the Students Resources section for room descriptions, accommodations, application process, deposit requirement, regulations and eligibility.

For current rate information, please visit our website at: http://housing.nmsu.edu/.

- **Dining Services**

See the Dining Services section for meal plan descriptions & pricing, application process, deposit requirement, regulations and eligibility. Freshmen living on campus must choose between Aggie Unlimited and Aggie Choice Plans.

Late Registration Fee

A late registration fee of $25 is imposed if registration has not been completed before the late-registration period begins. Failure to make scheduled payments with the University Accounts Receivable on due dates will result in additional liability.

Payment of Charges

By enrolling in classes at NMSU, a student makes a financial commitment to pay the tuition and fee charges associated with his/her enrollment. The enrollment action constitutes a financial obligation between the student and NMSU and that all proceeds of this agreement will be used for education purposes and constitute an education loan pursuant to 11 U.S.C 523(a) (8). Terms and Conditions of Course Registration are posted on the University Accounts Receivable (UAR) website and available at time of Registration. Payments can be made by mail, web, telephone, or in person at University Accounts Receivable. Cash, checks, money orders, 529 Savings Plan, International payments, and limited types of credit cards are accepted. All financial aid received must be paid towards balances owed. Additional penalty charges will be assessed for failure to make payments when due. The University reserves the right to cancel registration of any student who fails to pay, when due, any indebtedness to the institution if not completed by the deadlines as outlined on the UAR website under important dates related to your Student Account. Students are prohibited from registering for a term/semester until all previous debts due to the University are paid in full.

Payment Plan

For current information, please visit the Payment Plan website at https://uar.nmsu.edu/payment-plan/.

Tuition Adjustments, Refunds and Forfeitures

Students officially withdrawing from all courses or dropping a course(s) during a semester or term are eligible for a 100-percent refund of tuition and fees through the deadlines listed online as outlined on the University Student Records website under Important Dates for Students for each term. Students withdrawing from a course(s) after that deadline will not be eligible for a refund and will remain liable for payment of full tuition and fee charges. Non-attendance does not constitute an official course drop or withdrawal. It is the student's responsibility to withdraw from the university and/or drop a course if he/she decides to not attend once enrollment has taken place. All charges due to NMSU must be paid before refunds or adjustments will be permitted.

In cases of academic or disciplinary suspension, eligibility for tuition refunds and adjustments will depend on the conditions of the suspension and will be entirely at the option of the institution. Should unforeseen circumstances beyond the reasonable control of New Mexico State University result in curtailing classes, closing residence facilities, or otherwise withdrawing services that are a normal function of the institution, refunds of any nature will be at the discretion of the college/university administration.

Residence hall rentals and dining hall charges may be refunded in accordance with schedules adopted by these departments.

Delinquent and Prior-Term Balances

NMSU reserves the right to cancel the registration of any student who fails to pay, when due, any indebtedness to the institution. Diplomas will be withheld until all financial obligations are paid in full.

Dishonored Financial Transactions - Checks, Credit Cards, ACH Transactions

The University charges a penalty on all dishonored cash instruments. Personal checks will not be accepted from students who have had previously dishonored checks.

Estimating Other Expenses

In addition to the direct costs stated above, other expenses per semester may include such items as textbooks, supplies, and personal expenses.

Cooperative Education

Students participating in the Cooperative Education Program who receive academic credit pay the same tuition and fees as regularly enrolled students. Work phase students who are assigned to campus or a nearby off-campus workstation may pay for the student wellness/fitness as if they were a part-time student enrolled in 1-5 credits.

Ways to Qualify for Lower Tuition Rates

Resident or nonresident status is determined in accordance with a uniform definition established for all New Mexico institutions by the Higher Education Department, State of New Mexico, NM Administrative Code (NMAC) 5.7.18. The University Student Records Office administers residency. Information on the following programs and offices that administer the reduced rate program may be obtained from the University Admissions, the University Financial Aid and Scholarship Services.

- American Indian Agreement
- Athletic Grant
- Colorado-Arizona Reciprocal Agreement
- Dual Credit
- Fire Fighter and Peace Officer Survivor Scholarship

- Foreign Military Dependent
- Foreign Military Spouse
- Foreign Military Stationed in New Mexico
- Foster Care
- Graduate Assistantship
- Immigrant Student (NM HS GRAD)
- Military Dependent
- Military Spouse
- Military Stationed in New Mexico
- NM Competitive Scholarship
- Part-time Students
- Senior Citizen Waiver
- Summer Session
- Texas 135
- Veteran Waiver
- WRGP
- Western Undergraduate Exchange

WUE states include Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, Utah, Washington, Wyoming and the Commonwealth of the Northern Mariana Islands. For more information about any of the above ways to qualify for lower tuition rates please contact the University Accounts Receivable Office or the University Student Records Office.

Contact Information

For more information, contact:

University Accounts Receivable, MSC 4570
New Mexico State University
PO Box 30001
Las Cruces, NM 88003-4570
Phone: (575) 646-4911
uar.nmsu.edu

Financial Aid & Scholarship Services

University Financial Aid and Scholarship Services administers a broad spectrum of grants, scholarships, work-study funds, and loans in an attempt to meet the financial need of NMSU students.

Students applying for financial aid must complete the Free Application for Federal Student Aid (FAFSA). Students must submit the FAFSA every year. The information reported on the FAFSA calculates the Student Aid Index (SAI). The SAI is an eligibility index number used to determine your eligibility for federal financial aid. The formula that establishes the SAI is instituted by law and is a result of the information provided on the FASFA.

NMSU uses the SAI to determine your financial aid award. Some college scholarships also require an SAI. All information provided to the University Financial Aid and Scholarship Services is confidential.

Students can begin applying for financial aid by submitting a FAFSA through **studentaid.gov (https://studentaid.gov/)**. Please refer to the NMSU-Las Cruces, Financial Aid and Scholarship Services web site for more information on awards and policies at **fa.nmsu.edu**.

General Eligibility Requirements

To receive financial aid you must be admitted to NMSU as a degree-seeking student in an eligible degree or certificate program and demonstrate that you are qualified to obtain an education by:

- Having a high school diploma or recognized equivalent such as a General Education Development (GED) certificate or
- Completing a high school education in a home-school setting approved under state law or
- Achieving a passing score on an independently administered ATB test approved by the Education Department as a student who first enrolled in an eligible program of study *prior* to July 1, 2012 without a high school diploma, recognized equivalent, or did not complete home schooling, and could continue to qualify based on completing 6 credit hours from that eligible program.
- Being a U.S. citizen or eligible noncitizen (state funded scholarships are available to undocumented students).
- Having a valid Social Security number. If you do not have a Social Security number, you can find out more about applying for one at ssa.gov (http://www.ssa.gov/).
- Meeting satisfactory academic progress (SAP).
- Signing a statement on the FAFSA certifying that you will use Federal student aid only for educational purposes.
- Certifying that you are not in default on a loan under any title IV or HEA loan program, and have not exceeded annual or aggregate loan limits, and you are not liable for grant overpayment.

Financial Aid Awards

All financial aid awards are based on information provided by the student and/or parents, availability of funds, and eligibility requirements. Any award may be revised based on changes in enrollment, cost of attendance, application for graduation, family contribution or satisfactory academic progress. Withdrawals or reductions in enrollment may affect an award or any future awards. Financial Aid will not pay for audited courses or some repeats.

Grants

The Federal Pell Grant is a federal grant available to undergraduate students with documented financial need. If the Pell Grant is insufficient to pay educational expenses, the student may be eligible to receive other types of aid, including a Federal Supplemental Educational Opportunity Grant (SEOG) or Leveraging Education Assistance Partnership Program Grant (LEAP), and/or other miscellaneous grants. These grants are offered to undergraduate students who demonstrate exceptional financial need. Funds are limited and are awarded based on need and the priority date. For more information, contact University Financial Aid and Scholarship Services or visit the university's financial aid website at: fa.nmsu.edu/. (http://fa.nmsu.edu/) Generally, grants do not have to be repaid.

Work-Study Programs

Work-study is a federal or state-funded financial aid program that provides funds for part-time employment to students. Students earn their semester work-study award through hourly pay within on-campus or academic-related jobs. These awards are based on early FAFSA submission, financial need as determined by FAFSA, and funding availability, so students are encouraged to apply before the March 1st priority deadline. Work-study jobs are a great opportunity for students to earn income and work within a professional career-oriented position. Students can apply for work-study positions using the NMSU Handshake application at **nmsu.joinhandshake.com/**. For more information on the U.S. Department of Education student aid programs, go to **studentaid.gov** or visit the NMSU Financial Aid web site at **fa.nmsu.edu**.

Scholarships and Other Aid

Many students finance part of their education with scholarships, which may be awarded for academic achievement, special skills, talent and/or based on the applicant's calculated financial need.

The NMSU System offers a variety of scholarships to incoming freshman, transfer, continuing and graduate students. State, institutional and private scholarships may also be available but amounts, deadlines and eligibility requirements vary. For more information, contact University Financial Aid and Scholarship Services or visit the university's scholarship web site at fa.nmsu.edu/scholarships (http://fa.nmsu.edu/scholarships/)

To be considered for most scholarships through the NMSU System you are required to apply online through Scholar Dollar$, at scholarships.nmsu.edu (https://scholarships.nmsu.edu/) each academic year. One scholarship application serves all students in the NMSU system, regardless of campus.

Federal Direct Subsidized Loans

This is a loan program for eligible undergraduate students who demonstrate financial need. The U.S. Department of Education pays the interest on a Direct Subsidized Loan while the student is enrolled in school at least half-time (six-credit hours).

All undergraduate students who borrow for the first time after July 1, 2013 are subject to a maximum-time period to receive Federal Direct Subsidized Loans. Students may not receive Federal Direct Subsidized Loans for more than 150% of the published length of their academic program (measured in academic years). A complete explanation of Subsidized Loan usage limits is available at: fa.nmsu.edu/loans/federal-direct-loans. (https://fa.nmsu.edu/loans/)

Federal Direct Unsubsidized Loans

Loans that are not need-based and offered to eligible undergraduate and graduate students. Unlike other federal loans, interest accrues while the student is attending school.

Federal Direct Loan Requirements

Students receiving a subsidized or unsubsidized Federal Direct Loan, must complete an online Entrance Counseling session and a Master Promissory Note (MPN) before NMSU will issue the funds. In addition, students are required to complete the Student Loan Acknowledgment every academic year. Once Federal Loan Borrowers graduate, or withdraw from the institution, they must complete the Exit Counseling to avoid delays in receiving their transcripts or diplomas. Students may complete all these requirements at studentaid.gov (https://studentaid.gov).

Repayment of a Federal Direct loan begins six months after graduation or six months after enrollment drops below half time (less than six credits for undergraduate students and less than 5 credits for graduate students).

Withdrawals

Recipients of financial aid grants and loans who stop attending class, drop credit hours, or withdraw may be required to return all or a portion of awarded Title IV funds. Further information regarding the Return of Title IV funds is available on the NMSU-Las Cruces web site at fa.nmsu.edu/return-of-title-iv-funds (https://fa.nmsu.edu/title-iv/).

Financial Aid Satisfactory Academic Progress

Federal regulations require that financial aid recipients meet certain academic standards to be eligible for federal aid. The NMSU Office of Financial Aid will review the Satisfactory Academic Progress of financial aid recipients at the end of each payment term/semester to ensure continued eligibility. When evaluating SAP, all enrollment periods are considered regardless of whether the student received financial aid during those terms. For transfer students, credits accepted for their NMSU-degree program are counted toward Maximum Timeframe, but the transfer GPA is not calculated in the cumulative GPA for the Completion Rate. The Financial Aid SAP standards are not the same as the NMSU System's Academic Standards of Progress criteria. Students may learn more by visiting **fa.nmsu.edu/sap.**

Elements of Financial Aid Satisfactory Academic Progress

- Federal regulations require all students receiving financial aid to meet minimum qualitative and quantitative standards in order to maintain their eligibility for aid. Below are the minimum standards for SAP. The qualitative component of SAP measures a student's academic achievement by their cumulative GPA. The quantitative component is comprised of two parts: Completion Rate and Maximum Timeframe. Below are the descriptions of each SAP standard:

  Grade Point Average (GPA)

- Undergraduate students must maintain a 2.0 cumulative GPA or greater on all hours attempted at NMSU. This is equivalent to an average letter grade of "C" or better.
- Graduate students must maintain a 3.0 cumulative GPA or greater. This is equivalent to an average letter grade of "B" or better.
- **Completion Rate: Pace of Progression**

- All students, both undergraduate and graduate are required to pass and complete 70% of all classes attempted.
- Grades of F, W, U, I or RR will be considered hours attempted but not completed.
- **Maximum Time Frame: Pace of Progression**
- Students must attain their degree within 150% of the published credits required for a degree program.
- Transfer-credit hours counted towards the student's degree program will be included in the maximum timeframe.
- Limited developmental coursework will not count in the maximum timeframe.

Financial Aid Warning

"Warning" is a status assigned to a student who fails to meet satisfactory academic progress at the end of the payment term/semester. A student on Financial Aid warning may continue to receive financial aid for one payment term while in this status. If the student has not returned to satisfactory standing after this additional semester, they will be suspended from further financial assistance until the satisfactory progress standards are met.

Financial Aid Suspension

Students who do not meet the SAP standards will be placed on Financial Aid Suspension. Students who have their financial aid revoked due to the failure to meet the SAP standards are ineligible to receive financial aid and are responsible for payment of their own tuition and fees. Students will remain on financial aid suspension until they are able to meet both the quantitative and qualitative SAP standards, or have an appeal approved by the campus' Financial Aid Office.

The Appeal Process

Students suspended from financial aid may appeal the suspension if there are extenuating circumstances affecting their progress. Students who would like to appeal the suspension must submit an appeal form, available at: fa.nmsu.edu (http://fa.nmsu.edu). They must also submit all supporting documentation to University Financial Aid and Scholarship Services.

A committee will review the appeal and may grant reinstatement of financial aid based on the extenuating circumstances that directly contributed to the deficient academic performance. To receive timely decisions from the committee, students are encouraged to submit appeals and supporting documentation by the priority date found at fa.nmsu.edu/sap (https://fa.nmsu.edu/sap/).

Contact Information

For more information, contact:

Las Cruces Campus University Financial Aid and Scholarship Services
MSC 5100
PO Box 30001
Las Cruces, NM 88003-8001
Phone: (575) 646-4105

Email: financialaid@nmsu.edu

http://fa.nmsu.edu/ (http://fa.nmsu.edu)

The Graduate School

New Mexico State University (NMSU) has a long history of providing formal graduate study. The first master's degree from NMSU was awarded in 1896. In 1921, the NMSU president appointed a committee to oversee graduate study. The Graduate School was formally established in 1956 with a full-time dean, and in the same year, 57 master's degrees were awarded.

The Graduate School mission is to provide affordable access to high-quality educational experiences, new modes of graduate education, and works with dedicated faculty to help students from diverse cultural and economic backgrounds reach graduate school success. Our vision is to empower students to succeed and excel while pursuing a meaningful education. In doing so, we cultivate the collaboration of academic, professional, and personal skills while helping students graduate in a timely manner.

Statement of an inclusive environment

NMSU is a proud land-grant institution that is one of the few high-research universities supporting the state's population. NMSU's graduate students come from an array of lived realities across the world that reflect rich national and international cultural identities. The Graduate School is committed to supporting students by ensuring equitable and inclusive practices that create opportunities for their success and their ability to thrive.

Policies

Since graduate degrees are awarded for attainment in scholarship, the requirements stated in this catalog are to be considered as minimal. The major department or the dean of the graduate school may make additional requirements as deemed necessary for each candidate. Responsibility for securing approval of the proposed degree plan rests with the student and is subject to the approval of the respective department head or program director. Frequent consultation with the advisor is essential to satisfactory progress toward degree completion.

Graduate Degree Programs

For a full listing of the Graduate Programs offered at New Mexico State University, please visit the future students page of our website: https://nmsu.edu/degree-programs/

Admission for Graduate Students

Formal application is required of all prospective students, including graduates of NMSU who seek admission to a graduate program. Current NMSU graduate students who are seeking to add a concurrent or secondary degree program such as a graduate certificate or master's degree on route to a doctoral degree must submit a new application. A student seeking admission to graduate school at NMSU must hold a minimum of a bachelor's degree or an advanced degree from an institutional accrediting entity. The academic program of the completed degree should be equivalent to a comparable NMSU degree's requirements.

Application materials:

- Students must submit a complete Application for Admission (https://apply.nmsu.edu/apply/).
- Other supplemental documents required by the academic department, may include but are not limited to, unofficial college transcripts, test scores (i.e., TOEFL, IELTS, Duolingo, GRE,

GMAT), statement of purpose, writing samples, and letters of recommendation.

Students must send official transcripts and official test scores from all prior colleges or universities previously attended directly to the Graduate School, if offered tentative admission.

No student is officially admitted into a graduate program until an official letter of admission has been issued by the Graduate School. The Graduate School considers the official letter of admission valid for a one-year period. Some academic departments may require re-application if the applicant does not enroll in the semester noted in the admission letter. A formal application is required for all admissions, including current graduate students who are seeking to add a concurrent or secondary degree program such as a graduate certificate or master's degree on route to a doctoral degree.

Categories of Graduate Students

A student seeking admission to a graduate program is assigned one of the following categories based upon previous academic performance. All graduate students must matriculate within coursework and programs of study which satisfy the c**ampus residency requirement**. **Click here** for complete regulatory information within the different programs of study:

Doctoral Regular

To be considered for admission to a doctoral program, an applicant must have a minimum grade-point average of 3.0 on a 4.0 scale. Some doctoral degree programs also require a master's degree or its equivalent. NMSU does not admit doctoral students on a provisional basis.

Master's Regular

An applicant whose scholastic record is satisfactory will be admitted as a regular student. The classification for a Master's Regular student includes:

1. An applicant whose grade-point average is at least 3.0 on a 4.0 scale.
2. An international applicant whose grade-point average (or its equivalent) is greater than or equal to 3.0 on a 4.0 scale, from a four-year bachelor's degree or its equivalent.
3. A continuing graduate student whose grade-point average is greater than or equal to 3.0 on a 4.0 scale.
4. A student with prior graduate work at another institution whose minimum grade-point average is 3.0 on a 4.0 scale.

Master's Provisional

An applicant whose scholastic record does not meet the Master's Regular standards can be admitted provisionally. Students admitted as a Master's Provisional include:

1. A transferring graduate student whose cumulative grade-point average is less than a 3.0 on a 4.0 scale.
2. Students whose grade-point average the last half of undergraduate work is less than a 3.0 but has a minimum grade-point average of 2.5 on a 4.0 scale.

A student admitted provisionally must complete their first three courses, a total of 9 credits of graduate work, with a minimum grade-point average of a 3.0. A provisional student who does not meet the 3.0 grade-point average after 9 graduate credits hours is subject to dismissal.

A student admitted on a provisional basis is prohibited from working as a Graduate Teaching Assistant or Graduate Assistant-Other. However, they may work as a Graduate Research Assistant or as a grader for one semester.

Master's Undeclared

An applicant that has not decided on a specific graduate degree program and has an undergraduate minimum grade-point average of 2.5 on a 4.0 scale may be considered for admission as an undeclared master student. International students with an F-1 visa are not eligible for undeclared master status.

Undeclared Student Enrollment Restrictions

- Undeclared students are restricted to enrolling in a maximum of 9 graduate credit hours. To continue enrollment the student must apply and be admitted into a degree-seeking program.
- Course restrictions placed by the graduate department may constrain enrollment by an undeclared student.
- An undeclared master's student is restricted to transferring 9 graduate credit hours to a degree program.
- Undeclared students are not eligible to receive any graduate assistantship position.

Only undeclared regular status students who meet all Title IV eligibility requirements are eligible to receive federal financial aid for one consecutive 12-month period beginning the first term of enrollment. For questions about financial aid, undeclared master's students should contact Financial Aid and Scholarship Services.

Transfers from Master's Undeclared to a Degree Program

Students transferring from an undeclared master's to a degree program must submit a new Application for Admission.

- If the student has 9 completed graduate credit hours, the cumulative minimum grade-point average must be at least 3.0 on a 4.0 scale for the application to be considered.
- If the student transferring to a degree program has fewer than 9 completed graduate credit hours their admission is based on their undergraduate GPA (between 2.50 to 2.99 is Master's provisional and 3.00 or greater is Master's regular).

Graduate Certificate Program Students

Graduate certificate programs are designed to develop specific skill training and enhance a student's expertise to meet employment needs locally, regionally, nationally, and globally. A graduate certificate is a focused collection of courses, consisting of 12-18 credits, in a given discipline or a set of related disciplines.

A graduate certificate is not an official graduate degree of NMSU. A student that successfully completes a certificate program at the graduate level will receive a certificate of completion statement on their official transcript and a formal certificate from the Graduate School. A student has three years to complete a graduate certificate program and must file their application to receive the graduate certificate during their final semester in order for the graduate certificate to be conferred.

The graduate certificate program is offered to both currently enrolled, degree-seeking students and students who enroll solely to obtain a certificate. Students currently enrolled in degree programs must apply separately to the graduate certificate program. Students wishing to enroll only in a graduate certificate program must meet all admissions criteria. Successful completion of a certificate program does not guarantee

admission into a graduate degree program. A student enrolled in a certificate program must apply and be accepted into a graduate degree program in order to continue matriculating as a graduate student. International students cannot be admitted *only* to a graduate certificate program.

A student enrolled in a graduate certificate program cannot transfer credits from another institution towards the completion of the certificate. However, transfer credits taken in a graduate certificate program may be applied towards an NMSU graduate degree program in the same focus area. The number of transfer credits will be determined by the program's degree audit. The time limit on transfer credits is 5 years after the completion of the certificate.

Students enrolled in a graduate certificate program *only* are not eligible for any type of graduate assistantship.

Master's Accelerated Program (MAP)

Master's Accelerated Program (MAP) provide the opportunity for academically qualified undergraduate students to begin working on a master's degree during their junior and senior years of undergraduate study. A graduate program has the discretion to use up to 12 credits of NMSU coursework (450/4500 level or higher) towards the completion of a master's degree. To be eligible for MAP, NMSU students must have a minimum GPA of 2.75 (Departments can require a higher GPA). MAP students must complete 60 credit hours of undergraduate work of which 25 credit hours must be completed at NMSU. To receive graduate credit for the 12 credit hours, students must receive a grade of B or higher. You can find more details about the MAP Policy and application process **here**.

Application Dates and Deadlines

Contact the graduate degree program for published application deadlines. If the graduate program does not publish a deadline, the Graduate School encourages the applicant to apply by March 15th for fall enrollment and by October 15th for spring enrollment to be considered for financial support. The Graduate School will continue to accept applications 30 days before the first day of classes. No application materials will be returned to the applicant.

Transcripts

An applicant is required to have one official transcript from each institution attended sent directly to the Graduate School.

If the applicant's undergraduate coursework is not complete at the time of application, they must submit an official transcript showing the completion of the course work directly after the degree has been granted.

Standardized Tests

Certain graduate programs may require standardized test scores for admission. An applicant may be required to take one or more of the following examinations as determined by the academic department: Graduate Record Examination, the Miller Analogies Test, or the Graduate Management Admission Test.

See academic department program description for required testing.

Readmission

An NMSU student who has been out of school for more than two consecutive academic terms is required to submit a formal application for readmission to NMSU. The application will be reviewed by the Graduate School and academic department. The application should be submitted at least 30 days before the start of the semester.

A student who has attended other institutions during their absence is required to submit official transcripts to the Graduate School before the date of registration and be eligible to return to the college or university last attended. Students' readmission status and academic standing will be determined by previous NMSU academic standing, taking into consideration their academic performance at other institutions during the applicant's absence from NMSU.

Renewal of Application for Admission

The admission credentials for an applicant who does not register for the semester admitted are retained at the Graduate School for a period of one calendar year from the date of application. At the end of this period, credentials are discarded. A student wishing to renew their application after the one-year lapse must submit a new application.

Denied Admission

The Graduate School or the department may deny admission if the scholastic record or prior degree program is judged inadequate. If denied admission by a specific academic department, the applicant may be eligible to seek undeclared status as described in Categories of Graduate Students. If denied by the department, the student may wish to contact the department for additional information.

Admission may be denied to an otherwise qualified applicant when the desired program lacks resources to accommodate additional enrollment.

A student who is denied admission to one program and wishes to be considered for another program must complete a new application for the second program and pay applicable fees.

Application documents are retained by the Graduate School for one calendar year.

Non-Degree Admission

Non-degree admission is designed to meet the needs of an applicant who does not wish to pursue a degree or who has not yet completed the application process to a specific department. No more than 9 graduate credits earned in non-degree status may be transferred to a graduate degree program. Academic advising for non-degree students is obtained from the academic department. NMSU only recognizes graduate credit transfers for non-degree work from the University of New Mexico (UNM). Transfer credit is restricted to 6 credits with the approval of the appropriate department, the college dean, and the graduate dean.

A student classified as non-degree is not eligible to receive financial aid, student employment, or institutional tuition waivers; to participate in student government or intercollegiate athletics; and to receive benefits from veterans' programs.

Visiting Student

A visiting student is a student taking graduate credit to transfer to his or her home institution. An Application for Admission to the Graduate School must be submitted 30 days before registration. The student is required to submit unofficial transcripts. The academic department admits a visiting student. Visiting students are not eligible for undeclared status or for graduate assistantships.

Out-of-State Students and Legal Jurisdiction

By applying for admission/enrollment, both the student and parents agree that New Mexico law prevails, and all litigation will be held in New Mexico federal court or state court in Dona Ana County, New Mexico.

Contact Information

Graduate School, MSC 3-GS
New Mexico State University
PO Box 30001
Las Cruces, NM 88003-8001
Phone: (575) 646-5746

gradinfo@nmsu.edu
http://gradschool.nmsu.edu/

International Graduate Students

A graduate international student must hold at minimum a four-year bachelor's degree or its equivalent and is able to demonstrate English proficiency, both written and oral by submitting an official Duolingo, IELTS, or TOEFL score report.

English Proficiency for Admission

Doctoral students must provide official proof of an English Proficiency minimum score as follows:

- TOEFL Internet-Based Test (iBT) 79 (For exams taken before Jan. 21, 2026) or 4 (For exams taken on or after Jan. 21, 2026)
- IELTS 6.5
- Duolingo 105

International students can be admitted into a master's degree program with lower English Proficiency scores, as follows:

- TOEFL 68 to 78 Internet-Based Test (iBT) (For exams taken before Jan. 21, 2026) or 3.5 (For exams taken on or after Jan. 21, 2026)
- IELTS 6.0
- Duolingo 95 to 104

Students with scores in this range are required to sit for the English Placement Exam prior to beginning academic coursework. If the results of the English Placement Exam do not meet the requirements for academic coursework, the student may be required to take additional academic English classes as part of the degree requirements (**ENGL 1105M** Introduction to Academic Writing For Multilingual Students and/or **ENGL 471 M** Scholarly Writing for International Graduate Students).

The university reserves the right to require any prospective international student to meet the TOEFL, IELTS, or Duolingo test requirement.

Enrollment

All international graduate students on F-1 or J-1 visas are required to comply with Department of Homeland Security regulations governing maintenance of status related to full-time enrollment and making normal progress toward completing a degree. Therefore, all international graduate students are required to enroll in 9 or more credits (exclusive of audited work) during fall and spring semesters. Only one online or distance learning class can count towards a full course of study for international students during each semester or term.

Transfer of Graduate Credits into a Degree Program

Graduate credits taken at NMSU as undergraduate electives may be transferred to the student's graduate program at NMSU. Graduate credits from another university may be transferred to NMSU, provided the credits were earned on the campus of an accredited institution. Transferred coursework (credit and hours) is maintained separately from NMSU coursework. Transfer credits must meet the same time-limit requirements (seven years) as graduate classes, including master's and doctoral coursework, at NMSU.

Immediately after initial enrollment in a graduate program, students must submit a Transfer of Credit request form from the Application Portal (https://apply.nmsu.edu/apply/status/) to obtain formal permission from their advisor, department head, and the Graduate School dean to transfer graduate-level course work. The department has the responsibility to accept or reject transferred credits depending on various conditions, such as the course credit fits logically into an NMSU degree program, accreditation requirements, level of course work, grades, and other conditions deemed relevant by the department. The department may also require work to be validated by examination or until the work done at another institution is proven by satisfactory work in residence. All graduate coursework, including master's level and doctoral, must be taken within the last seven years.

Special conditions:

- Graduate Certificates - Students enrolled in certificate programs may not transfer credits from another institution towards the completion of the certificate program offered by NMSU. However, they can transfer credits taken in a graduate certificate program at NMSU into a graduate degree program at NMSU, provided that the courses will lead towards a graduate degree in the focused area of the certificate program. The number of transfer credits will be determined by the degree audit. The time limit on course transfer is five years after the completion of the graduate certificate.
- Master's degree - A minimum of 30 semester graduate course credits is required for the master's degree. Master's programs involving a thesis include no more than six and no fewer than four credits of thesis. At least 15 credits for the master's degree must be for work in courses in the department in which the student was admitted. To meet residency requirements, master's students must take at least 50 percent of their required coursework at NMSU.
- Master of Fine Arts - Before consideration for candidacy, the department head and the graduate advisor will determine the number of transferable credits from a previous graduate program.
- Specialist in Education Degree - A maximum of 6 graduate credits earned at another approved institution may apply to the Specialist in Education degree. Transfer credits must have been earned during the five-year period prior to completion of the specialist in education degree.
- Doctoral degree - The doctoral degree requires significant scholarly study beyond the master's. The doctoral degree requires a minimum of 30 graduate course credits beyond the master's. If the Doctoral degree requires a dissertation, at least 18-credits of dissertation work must be included. The professional doctoral degree includes a practicum or special project that culminates in a written report which demonstrates a command of the relevant scholarly literature and links it to the specific clinical or practical experience. To meet residency requirements, doctoral students must take at least 50

percent of their required coursework at NMSU. Students may transfer course work that the departments deem as logically fits into the degree plan. Doctoral students must work closely with their program directors to understand the programmatic limitations on transfers of credit.

Funding Opportunities for Graduate Students

The Graduate School offers assistantships and scholarships to qualified graduate students. All awards require nominations from either faculty, Graduate Program Directors, Department Heads, or Deans. Continuing and newly admitted students can request the appropriate nominator as indicated above to nominate them for the Graduate School awards. The student must be admitted to the Graduate School before a request for an assistantship or scholarship will be considered by the department or the Graduate School.

In selecting individuals for any assistantship or scholarship and in the administration of appointments, New Mexico State University does not discriminate on grounds of age, ancestry, color, disability, gender identity, genetic information, national origin, race, religion, retaliation, serious medical condition, sex (including pregnancy), sexual orientation, spousal affiliation, or veteran status. The University limits the number of years a student may be supported on Instruction and General (I&G) funds from the state of New Mexico. Departments may place additional limitations on the years of support. For detailed information, application process, and deadlines please see the link, **here**.

Assistantships

Graduate assistantships, including teaching and research, offered by New Mexico State University, are awarded primarily by the students' academic department. Employment guidelines may be found at: **Guidelines on Employment for Graduate Assistants. Additional resources may be found at: Graduate Assistant Resources. Graduate assistantships are governed by the NMSU and United Electrical, Radio and Machine Workers of America - Collective Bargaining Agreement.**

Students with assistantships must maintain full-time status by enrolling in and successfully completing 9 credit hours each semester. Students must also maintain a 3.0 grade-point-average. Courses taken for audit do not count in the minimum graduate assistant course load requirement. Graduate assistants should take no more than 15 course credits per semester. During their first semester at NMSU, if course deficiencies are identified, the student can register for 3 undergraduate credits and a minimum of 6 graded graduate credits to be eligible for a graduate assistantship. The graduate assistantship duties typically require students to work 20 hours per week (full-time, fall, and spring).

Graduate Teaching Assistantships

A student seeking appointment as a Graduate Teaching Assistant will be required to demonstrate proficiency in communication skills necessary for satisfactory service in the classroom. All graduate students awarded a Teaching Assistantship must complete the online mandatory orientation offered by the Graduate School. Departments may require students to complete additional workshops or orientations to qualify for teaching assistantships.

Eligibility for teaching assistantships includes:

- Acceptance by and subsequent registration in the Graduate School and academic department,
- Classification as a "Regular" graduate student,
- Enroll in at least nine graded credit hours per semester, and
- Maintain a 3.0 grade-point average.

Teaching Assistantships for International Students

All international students seeking a teaching assistantship must demonstrate proficiency in English and competency in pedagogy. Prior to their first semester as a teaching assistantship, international students must undergo the NMSU International Teaching Assistant Screening (ITAS) administered by the NMSU English Department on behalf of the Graduate School. International graduate students wishing to hold a teaching assistantship should check with their department to determine when they should arrive on campus to meet the screening requirement. The ITAS can be waived for international students who hold a degree from an accredited university in the United States, or a country where English is the official language of instruction. Departments also have the discretion to allow waivers for special circumstances.

The ITAS requires that a teaching assistant candidate deliver a short, ten-minute teaching demonstration of an introductory undergraduate level course in a topic relevant to their area of studies. The demonstration is observed by English Department faculty and an undergraduate student. Based on the results of the screening, the English Department observers present a report of findings to the department head where the graduate student will be a teaching assistant. Students who pass the screening exam are immediately eligible for assignment to a teaching assistantship.

Those that do not pass the ITAS are required to enroll in and successfully complete course **ENGL 485 M (https://catalogs.nmsu.edu/search/?search=ENGL+485+M&fscaturl=%2Fnmsu%2F&gscaturl=%2Fnmsu%2F)** International Teaching Assistant Development. International Teaching Assistants are recommended to complete this requirement prior to their first teaching appointment. Students may be hired as a Research Assistant (RA) or GA-Other the semester, they are enrolled in **ENGL 485 M (https://catalogs.nmsu.edu/search/?search=ENGL+485+M&fscaturl=%2Fnmsu%2F&gscaturl=%2Fnmsu%2F)**.

Assistantships for Provisional Graduate Students

Graduate students accepted on a provisional basis cannot serve as Graduate Teaching Assistants or Graduate Assistant-Other. However, they can serve as Graduate Research Assistants. Eligibility includes:

- Acceptance by and subsequent registration in the Graduate School and academic department,
- Classification as a "Provisional" graduate student,
- Enroll in 9 graded credits with a minimum of 3.0 GPA, and
- Funded on research projects of the faculty of NMSU.

Provisional students can also be hired as graders for one semester. The department must hire the student as a Graduate Assistant-Other at the time of completing the hiring path, so that the student is allowed to work as a grader.

Assistantships and Scholarships

The Graduate School maintains a **Awards and Funding Information webpage** providing a database of assistantships and scholarships provided by the Graduate School. Most graduate assistantships offered by New Mexico State University are awarded by the student's academic department. Please contact your department of study to receive information on graduate assistantships and scholarships. The student must be admitted to the Graduate School before a request for an assistantship or scholarship will be considered by the department or the Graduate School.

The university limits the number of years a student may be supported on funds from the state of New Mexico. A student should check the **Guidelines on Employment for Graduate Assistants**. Departments may place additional limitations on the years of support.

Graduate Assistants Salaries and Tax Withholding Guidelines

Internal Revenue Service tax withholding guidelines require graduate students employed through NMSU to maintain at least 6 credits of course work during the fall and spring semesters and 3 credits of course work for summer sessions to be eligible for the student FICA tax exemption. Student employees who do not meet this requirement during any given pay period will be subject to Social Security taxes and Medicare taxes. Salaries for the three salary levels of graduate can be found **here**.

Level I (G1) - Applies to regularly enrolled students pursuing a master's degree. This level is also for a first-year student seeking a doctoral degree who does not currently hold a master's degree. Once the doctoral student becomes a second-year student and passes their qualifying exam, they can obtain support as a Level II (G2) student.

Level II (G2) - Applies to students pursuing the Education Specialist or Doctoral degree who have passed the qualifying exam or who have a master's degree. This also applies for a student who currently holds a master's degree and is entering another master's degree program.

Level III (G3) - Applies to a doctoral student who has passed the comprehensive examination and has advanced to candidacy.

Graduate assistants employed at least ten hours per week will be given in-state tuition during the first 12 months of tenure if the Graduate School approves of the hiring process prior to census date (stated by the University Student Records Office as the third Friday of the semester each spring and fall semester).

If New Mexico resident status has not been established by the time of any reappointment, the graduate assistant may be subject to non-resident tuition rates.

Information regarding applications for state residency may be obtained from the University Student Records website **here**.

Social Security Numbers in Student Records

As required by law, social security numbers are collected from prospective and current students who

1. Plan to seek employment on campus or
2. Wish to receive financial aid.
3. In addition, the university is mandated by federal tax regulations to provide tuition and fee payment information to the student and the Internal Revenue Service, so that applicable educational tax credits may be computed. The social security number will be necessary to submit this tax reporting. The social security number is a confidential record and is maintained as such by the university in accordance with the Family Educational Rights and Privacy Act.

In order to be employed by New Mexico State University all students must have obtained a social security number within eight weeks of being hired or risk losing their assistantship.

When an official social security number is issued to an international student, it is the student's responsibility to inform Human Resources or the University Student Records Office as soon as possible.

Hourly Work

Eligibility for student payroll requires that a graduate student

1. Be admitted to the Graduate School as well as to a department,
2. Maintain a minimum cumulative GPA of 3.0, and
3. Be enrolled for at least 9 graded credits.
4. A student may not work more than 20 hours per week during the academic year. Students looking for current job postings should check with Office of Experiential Learning here (https://oel.nmsu.edu/handshake/handshakeinfo.html).

Students not classified as residents of New Mexico but working at an hourly rate are not eligible to receive in-state tuition.

Contact Information

For more information, contact:

Graduate School, MSC 3-GS
New Mexico State University
PO Box 30001
Las Cruces, NM 88003-8001
Phone: (575) 646-5746

gradinfo@nmsu.edu
http://gradschool.nmsu.edu/

Postdoctoral Fellowships

Those individuals who are exemplary scholars, who have recently been awarded a doctoral degree, but who wish to continue their education and research experience under the direction of a professor at New Mexico State University are classified as postdoctoral fellows. The postdoctoral fellowship is a regular professional appointment normally granted for one or two years. Under no circumstances will an individual remain in this classification for more than three years.

Postdoctoral fellowships are advertised by, and applications are submitted to the hiring department in compliance with the guidelines for hiring professional staff, but without the requirement for a position description questionnaire. An "E-Hire" staffing authorization request must be submitted to the office of Human Resources by the hiring department. No offer of employment may be made until approval has been given by Human Resources. Persons classified as postdoctoral fellows pay Social Security and make contributions to New Mexico State Educational Retirement.

A postdoctoral fellow has the following privileges:

- May take 6 credits in spring and fall semesters and 4 credits per summer session without tuition,
- Is eligible to purchase an employee parking permit,
- Is eligible for other employee benefits available to regular employees, including annual and sick leave, as well as health, dental, and life insurances
- May purchase athletic tickets, activity tickets, and gymnasium privileges
- Is eligible for library privileges

Research Facilities

The University recognizes and supports the concept of off-campus study and research as a valuable experience for graduate students. These experiences may take the form of internships, intensive study

of specialized techniques with personnel at other institutions, and the conducting of research at specialized research facilities. Arrangements for such off-campus activities should be made with the student's committee and the graduate dean and should represent opportunities not normally available at this university. When the bulk of a student's research is to be conducted off-campus, both on- and off-campus advisors should be appointed and periodic meetings with the student's committee held to ensure timely progress. Such opportunities offer students considerable flexibility in their training and promote valuable contacts between the student, the university, industry, and research institutions. Students are encouraged to pursue these opportunities with their advisors and the graduate dean.

Agricultural Experiment Station

The Agricultural Experiment Station is the research division of the College of Agricultural, Consumer and Environmental Sciences. Faculty, professional personnel, and graduate students conduct basic and applied research concerned with biological, physical, and economic phases of food and fiber production, processing, and distribution; consumer health and nutrition; and the social and economic aspects of rural living. Energy, environmental, and natural resource conservation aspects of these broad disciplines offer many opportunities for the graduate student to undertake meaningful research investigations in both the laboratory and the field.

There are eight academic departments on the main campus with excellent laboratory facilities for research. In addition, the station maintains 13 field research centers and laboratories including eight agricultural science centers, a forestry research center, a livestock research center, an animal insect lab, and two research ranches.

The station provides financial support to graduate research assistants and cooperates with research institutes at the university and with various state and federal agencies in providing opportunities for graduate research programs covering a wide scope of student interests. For further information, contact **aesdean@nmsu.edu** or visit **https://aes.nmsu.edu/**.

Analytical Geochemistry Research Laboratory

The Department of Geological Sciences houses a number of analytical instruments, all of which are available for use by graduate students, undergraduate researchers, and faculty. The department houses a Laser-Ablation Multi-Collector Inductively Coupled Plasma Mass Spectrometer (LA-MC-ICPMS) for analysis of isotopic ratios of microsamples, an X-ray fluorescence spectrometer for geochemical analysis of rocks and other solid materials, a thermal ionization mass spectrometer for analysis of isotopic ratios of solids and liquids, and a laser-induced breakdown spectrometer for the analysis of solid materials. Sample preparation equipment is available to support research on these instruments. In addition, mineral separation equipment including a jaw crusher, Gemini shaker table, Franz magnetic separator, and heavy liquids, is available for geochronologic or other mineralogic research projects.

Contact: Dr. Nancy McMillan (**nmcmilla@nmsu.edu**)

Apache Point Observatory-Astrophysical Research Consortium (APO-ARC)

Apache Point Observatory (APO) is located in the mountains of south-central New Mexico and is operated by New Mexico State University. The observatory is a major astronomical research facility that is home to four telescopes. The largest is a fully equipped 3.5-meter telescope that can be used for optical and infrared imaging, photometry, and spectroscopy. Apache Point Observatory is also the site of the Sloan Digital Sky Survey 2.5-meter telescope, which is running several different wide-field surveys touching on many facets of astronomy. NMSU owns and operates a 1-meter telescope at APO for wide field imaging. There is also a 0.5-meter telescope at the site.

Apache Point Observatory is owned by the Astrophysical Research Consortium (ARC). The consortium members include New Mexico State University, the University of Colorado - Boulder, the University of Oklahoma, University of Wyoming, University of Virginia, the University of Washington, Georgia State University, Brigham Young University, and Johns Hopkins University. NMSU manages and operates the observatory for the ARC consortium. Astronomy faculty and graduate students use the facility for various research projects. For further information, e-mail **astro@nmsu.edu**.

Arts and Sciences Research Center

The research center is the coordinating office for all scholarly activities within the College of Arts and Sciences. The primary functions are service to departments and faculty members, and the administration of grants and contracts. The center encourages and stimulates individual research and creative efforts in all areas of the college, and it facilitates the development of potential research programs within the college, and with other colleges, institutes, the Physical Science Laboratory, and external organizations. The center assists individual faculty members by providing small grants of "seed" money. Typically, support services fall within, but are not limited to, the following areas:

- Location of funding sources
- Administration of grants and contracts
- Financial management of grants and contracts
- Liaison with the Office of the Vice President for Research

Contact: Dr. Michele Shuster, Associate Dean, Research (**mshuster@nmsu.edu**)

For further information, see: **https://artsci.nmsu.edu/faculty-and-staff/research-center.html**

Bioinformatics Research Lab

The bioinformatics research lab develops efficient computational and statistical methods to model mechanisms of complex biological systems. The lab's work rigorously evaluates both the theoretical and practical effectiveness of computational methods for characterizing molecular interactions from high-throughput measurements such as next generation sequencing data. The lab's long-term goal is to invent advanced computational technology to expedite quantitative understanding of the complexity of life processes.

Contact: Dr. Joe Song (**joemsong@nmsu.edu**)
For further information, see: **https://www.cs.nmsu.edu/~joemsong/group.shtml**

Biology Research Facilities

The Department of Biology houses multiple core facilities and individually faculty-maintained research laboratories that have been successful in the acquisition of millions of dollars in research grants from the NIH, NSF, and other agencies. The facilities and equipment include cell culture facilities, insect and invertebrate rearing and microbiology culturing facilities, next generation DNA sequencing instruments, wide-field and confocal microscopes as well as a well-maintained herbarium and vertebrate museum holding more than 100,000 specimens from our region and beyond. Individual research laboratories are equipped

to employ a diverse array of molecular, physiologic, behavioral, and computational tools to address research questions related to organismal and microbial evolutionary mechanisms and physiology; vaccine development; host-symbiont interactions; cell and developmental biology; neuronal and muscular tissues; animal vocalization and behavior; computational modeling of biological phenomena; and molecular systematics.

Contact: Dr. Charles Shuster (**cshuster@nmsu.edu**)

Bureau of Business Research and Services

Founded in 1969, the bureau has two basic objectives. The first is to provide business and economic research services to both public and private sectors of the state, the region, and the nation. Research capabilities in the behavioral and managerial sciences, business systems, economic and social sciences, marketing, statistical design and analysis and regional planning can be applied to problems relating to economic growth, business development, and community needs in New Mexico.

The second objective of the bureau is to provide management training services to business organizations and associations, to government agencies, and to the public as well. Management development seminars, training programs, and analytical services are designed to meet specific organizational needs.

The Bureau of Business Research and Services is a member of the Association for University Business and Economic Research. For more information, see: **https://business.nmsu.edu/research-centers-and-programs/centers/bbrs/bureau-of-business-research-and-service.html**.

Center for Excellence in Sustainable Food and Agricultural Systems (CESFAS)

The Center for Excellence in Sustainable Food and Agricultural Systems (CESFAS) is a state-funded research institute in the College of Agricultural, Consumer, and Environmental Sciences. CESFAS goal is to advance sustainable agriculture through interdisciplinary research with contributions from researchers from animal, food, plant, and social sciences in partnership with industry to develop new knowledge and technologies for New Mexico.

Contact: Dr. F. Omar Holguín (**frholgui@nmsu.edu**)

For more information, see: **https://aces-cesfas.nmsu.edu/**.

Center for Latin American and Border Studies

The Center for Latin American and Border Studies (CLABS) was established in 1979 by the College of Arts and Sciences through generous grants from the Nason Family and other sources and is located at the Nason House. CLABS supports the collection at the NMSU library, travel for faculty to conferences, language training in Spanish and Portuguese, lectures by visiting speakers, curriculum development for teachers, the student Latin American organization, and other outreach activities. It has a faculty governance organization and helps administer the Nason foundation fund. In recent years, the center has pursued an active program of research on U.S.-Mexico border policy issues, in cooperation with several universities in the United States and Mexico.

Contact: Dr. David Ortiz (**dgortiz@nmsu.edu**)

For more information, see: **https://clabs.nmsu.edu**

Chemistry and Biochemistry Research Facilities

The Department of Chemistry and Biochemistry has a comprehensive equipment base that supports research in nearly all phases of chemistry. It also has instrumentation dedicated to the department's teaching mission. Major instruments supporting both missions include five nuclear magnetic resonance (NMR) spectrometers ranging from low field (200 MHz) to high field (500 MHz), two atomic absorption spectrometers, several UV-Vis spectrometers, two mass spectrometers (LC/MS) and four gas chromatograph instruments. Details about all instruments located in the department's facilities can be accessed at **https://chemistry.nmsu.edu/research/research-facilities.html**.

Contact Instrumentation Facilities: **chembche@nmsu.edu**

Cooperative Extension Service

As a land-grant institution, New Mexico State University has a tripartite mission—instruction, research, and extension. The three parts of this mission are closely interrelated and mutually reinforcing. New Mexico State University's Cooperative Extension Service serves a unique role in New Mexico. As the state's land-grant university, and as mandated by its charter, it is the "leading object" for agriculture, home economics, engineering, business, health sciences, as well as educational programs in the liberal arts and natural sciences. NMSU's uniqueness arises from its vision of teaching/learning, research, and extension/outreach functions—interdependent, mutually supportive, and central to its land-grant mission.

The extension aspect of the university's mission is the process of extending the intellectual expertise and resources of the university through teaching and applied research to address the social, civic, economic, and environmental challenges and opportunities facing our state, region, nation, and global community. Extension entails an organized and planned program of activities; these activities bring the resources of the university to bear in a coherent and strategic fashion for the benefit of the citizens of New Mexico and the nation. Many faculty have split appointments with the Agricultural Experiment Station and serve as graduate advisors for students interested in extension as a career. For more information, see: **http://extension.nmsu.edu/**.

Crimson Research

Crimson Research is designed to assist researchers, agency directors, business leaders, and policy makers in all aspects of survey research and program evaluation. Housed in the College of Health, Education, and Social Transformation, the Center has state-of-the-art hardware and software for conducting phone and internet surveys of any type and length as well as facilities for conducting face-to-face interviews and focus groups. Crimson Research provides a wide array of services: questionnaire design, sampling, data collection, and statistical analysis for telephone, mail, and internet surveys. Center staff are also able to assist and conduct all forms of program evaluation from formative to summative approaches, including process, outcome, and impact evaluations. Bilingual (Spanish/English) questionnaire translation and interviewing are also available.

Contact: Dr. Joe Tomaka (**tomaka@nmsu.edu**)

For more details, see: **https://publichealth.nmsu.edu/research_and_outreach/crimson_reasearch.html**.

Engineering Research Centers

The mission of the College of Engineering's Engineering Research Centers (ERC) is to support the faculty and staff of the college in

building research programs of nationally and internationally recognized excellence. The ERC assist faculty and staff in their pursuit of research funding, management of their research, and in ensuring research activities are in compliance with all relevant laws and regulations.

The ERC disseminates information to the college regarding state, national and international research trends, programs, and policies. The ERC identifies potential funding opportunities and calls for proposals that may be a fit for college faculty and staff. The ERC works with the Office of the Vice President for Research and the other NMSU colleges to bring together multi-disciplinary teams.

Engineering Research Center consists of: Center for Bio-Mediated and Bio-Inspired Geotechnics (CBBG), Carlsbad Environmental Monitoring & Research Center (CEMRC), Interdisciplinary Center of Research Excellence in Design of Intelligent Technologies for Smart Grids (iCREDITS), National Alliance for Water Innovation (NAWI), New Mexico Produced Water Resource Network (NMPWRC) , Re-inventing the Nation's Urban Water Infrastructure (ReNUWIt), Southwest Technology Development Institute (SWTDI), and Transportation Consortium of South-Central States (Tran-SET).

For proposal preparation, the Office of Engineering Research (OER) pre-award team assists the faculty with interpretation of sponsor guidelines, development of the proposal budget, completion of standardized forms, review of the proposal for adherence to sponsor requirements, and submission to the NMSU Office of Research Administration Services (RAS) for their review and final submission. The post-award staff assist the faculty and staff with award management, including working with the NMSU Sponsored Projects Accounting office. The ERC is responsible for financial management of college grants and contracts.

Contact: Dr. Satyajayant "Jay" Misra (misra@nmsu.edu)

For more information, visit: **https://engr.nmsu.edu/Research/page-five.html**

Food Safety Laboratory

The laboratory was founded in 2007 and is comprised of three primary functional research units:

1. Chemical Analysis and Instrumentation Laboratory maintains high-end analytical instrumentation, which is available to support collaborative research within NMSU, the State of New Mexico and other educational or industrial partners.
2. Food Safety Microbiology Laboratory specializes in research and development of foodborne pathogen detection and control; food product testing, including microbiological analyses, pH, aw; process evaluation of acidified foods, inoculation studies, shelf-life testing, and contracting to establish food safety plans (e.g., HACCP plans, *Listeria* control programs).
3. Veterinary Entomology Research Laboratory provides a state-of-the-art large animal research facility located on 45 acres, with a 5000 sq. ft. large animal laboratory, capable of housing 24 animals individually in environmentally controlled rooms. The laboratory maintains multiple insect rearing facilities for major ectoparasites including house flies, stable flies, horn flies, face flies, mosquitoes, lice, mites, and ticks. The facility has outdoor housing for 60 large animals in covered, individual outdoor stanchions, in addition to housing for wildlife species including: deer, elk, bighorn sheep and rabbits.

For further information, see: https://fsl.nmsu.edu/.

Director: Dr. Luis Sabillón (lsabillo@nmsu.edu)

Knowledge Discovery and Data Mining (KDD) Research Laboratory

The Knowledge Discovery and Data Mining (KDD) research laboratory aims at advancing techniques for the effective management and analysis of complex data (e.g., sequence data, graph data, semi-structured data). The laboratory conducts research in modeling, storing, querying, and mining large amounts of complex data at both theory and application levels. The laboratory keeps active collaborations with scientists from other Computer Science areas and scientific disciplines to broaden the usage of data management and data mining techniques. The laboratory is located in Science Hall, Room 153.

Contact: Dr. Huiping Cao (**hcao@nmsu.edu**)

For more information, see: **https://kddlab.nmsu.edu/**

Networks and Systems Optimization Lab (NSOL)

The Networks and Systems Optimization Laboratory (NSOL) supports research in networking and communication including, but not limited to wireless networks, the Internet, supercomputing networks, and online social networks. This research includes optimization problems, protocol design and development, hardware design and development, and mechanisms for improving security and privacy of communications (including cybersecurity). The lab has a 24-core blade server (RAID-10) that is used for extended simulations and back-up, five desktops, five laptops, and four smartphones, which form a networking testbed.

Contact: Dr. Satyajayant "Jay" Misra (**misra@nmsu.edu**)
For more information, visit: **https://computerscience.nmsu.edu/research/groups-labs.html**

New Mexico Department of Agriculture

The New Mexico Department of Agriculture (NMDA), under the control of the NMSU Board of Regents, is responsible for administering laws and regulations that daily affect the lives of every citizen of the state. These laws and regulations (concerning the production, preparation, processing, sale, and use of agricultural products; weights and measures; and petroleum products) are designed to assist producers, processors, and consumers. NMDA's marketing program provides guidance to commodity groups in the promotion of agricultural products. A broad consumer service in many areas other than agriculture is provided by the department. NMDA's director is New Mexico's secretary of agriculture and serves on the governor's cabinet as a liaison between state government and the agricultural industry. For further information, e-mail: nmagsec@nmda.nmsu.edu. NMDA's web site is at **http://www.nmda.nmsu.edu**

New Mexico State University Library

The New Mexico State University Library is a Destination for Discovery that offers access to rich content and research-level collections in two library facilities located in the heart of the campus. Zuhl and Branson libraries house over 1.8 million items and provide electronic access to scholarly journals and databases for both general academic and discipline-specific research. View the large geological collection and artworks on display at Zuhl Library and explore historical collections within the Archives and Special Collections Department at Branson Library. Reference assistance and research support are provided by a team of faculty and staff dedicated to student learning and success. There are a variety of study areas available including quiet and group spaces, some of which can be reserved. Over 100 PCs, scanners, laptops,

and other resources are available for students to use. More detailed information may be found at **http://lib.nmsu.edu**.

New Mexico Water Resources Research Institute

The New Mexico Water Resources Research Institute (WRRI) at NMSU, established in 1963, was one of the first of 54 water institutes in the United States. The WRRI program encompasses all state universities in New Mexico and public agencies sponsoring water research. The institute serves as a coordinator, assisting researchers in obtaining funds, working with granting agencies, and serving as the administrator for projects. The annual budget of approximately $1.5 million is made available from federal, state, and/or private sources through a variety of grants and contracts. All research projects administered by the institute encourage graduate student participation. As a result, about 30 students a year receive scientific training through institute-sponsored projects. WRRI also sponsors the Annual New Mexico Water Conference, which has provided a public forum for state water issues since 1956. Public participation helps the institute focus its research program on areas of greatest need. The WRRI publishes research results of every project it administers and other miscellaneous reports. The WRRI also maintains a water resources reference room with 2,000 books and documents and the ability to link to 10,000 water-related documents on water issues facing the state and the nation. E-mail may be sent to **nmwrri@nmsu.edu**. The WRRI's homepage address is **http://nmwrri.nmsu.edu/**.

Oak Ridge Associated Universities Program (ORAU)

Since 1991, students and faculty of New Mexico State University benefited from its membership in Oak Ridge Associated Universities (ORAU). ORAU is a consortium of more than 150 sponsoring institutions and 26 associate members and a contractor for the U.S. Department of Energy (DOE) located in Oak Ridge, Tennessee. ORAU works with its member institutions to help their students and faculty gain access to federal research facilities throughout the country; to keep its members informed about opportunities for fellowship, scholarship, and research appointments; and to organize research alliances among its members.

Through the Oak Ridge Institute for Science and Education (ORISE), the DOE facility that ORAU operates, undergraduates, graduates, postgraduates, as well as faculty enjoy access to a multitude of opportunities for study and research. Students can participate in programs covering a wide variety of disciplines including business, earth sciences, epidemiology, engineering, physics, geological sciences, pharmacology, ocean sciences, biomedical sciences, nuclear chemistry, and mathematics. Appointment and program length range from one month to four years. Many of these programs are especially designed to increase the numbers of underrepresented minority students pursuing degrees in science- and engineering-related disciplines. A comprehensive listing of these programs and other opportunities, their disciplines, and details on locations and benefits can be found in the ORISE Catalog of Education and Training Programs, which is available at **http://www.orau.org**.

ORAU's Office of Partnership Development seeks opportunities for partnerships and alliances among ORAU's members, private industry, and major federal facilities. Activities include faculty development programs, such as the Ralph E. Powe Junior Faculty Enhancement Awards, the Visiting Industrial Scholars Program, consortium research funding initiatives, faculty research, and support programs as well as services to chief research officers.

For more information about ORAU and its programs, contact:

Dr. Patricia Sullivan, Interim Vice President for Research, Creativity and Economic Development, vpr@nmsu.edu, (575) 646-3771.

ORAU Research & University Partnerships (865) 576-6513; or visit the ORAU Home Page at: **http://www.orau.org**.

Physics Research Facilities

The Department of Physics operates a PANalytical Empyrean x-ray diffractometer for low-resolution powder diffraction, high-resolution diffraction, reciprocal space mapping with a triple-axis crystal, and x-ray reflectance. It also operates a J. A. Woollam variable angle of incidence ellipsometer (VASE) with a computer-controlled Berek waveplate compensator for measurements from 190 to 2500 nm, at room temperature and from 80 to 800 K. Both instruments are available to the campus community and off-campus users for a fee. See **https://phys.nmsu.edu/research/research-programs.html** for more information.

Contact: Dr. Stefan Zollner (**zollner@nmsu.edu**).

Programming Languages Environments and Software Engineering (PLEASE) Laboratory

The PLEASE lab pursues research in the practical aspects of software development, including programming languages, programming environments, and software engineering. The laboratory is housed in Science Hall 167 and includes workstations and workspace for graduate students pursuing research in relevant areas.

Contact: Dr. Jonathan Cook (joncook@nmsu.edu)

For more information, see **http://www.cs.nmsu.edu/please**.

Psychology Research Facilities

The Department of Psychology emphasizes research in social psychology, engineering psychology, and cognitive psychology. Faculty investigate such issues as mother-infant interactions and the impact of cortisol responses to stress upon development; visual search; human factors research; auditory perception; prospective memory; emotion and social decision-making; evolutionary psychology; skill acquisition; social cognition; perception and action; embodied cognition; cognitive neuroscience (control of attention, neural dynamics; and brain-computer interfaces); and research and statistical analysis methods.

All faculty have designated labs with a large central area and 3-4 smaller adjacent rooms. This facilitates data collection from small groups or individuals. Research using the department's subject pool is managed with an online system.

The department has specialist facilities that include an EyeLink 1000 eye tracking system with experiment builder software; two 128 channel Biosemi ActiView-2 EEG systems and two shielded rooms; eight analysis workstations; and a Neuroconn DC Stimulator Plus tDCS stimulator. The lab collaborates with the Mind Research Network that has access to a Siemens 3T Trio research MR scanner, a Magvis 132 channel MEG system, and Biosemi and Geodysics EEG systems. The Auditory Perception Lab has a remote-controlled robot with binocular vision and stereo audition that is used to assess auditory performances in applied settings; another remote-controlled robot to test perceptual interfaces for remotely-operated vehicles; a 30-element speaker array to simulate real-world auditory environments; and two portable eye trackers housed in the PACMANE (Perception, Action and Cognition in Mediated, Artificial and Naturalistic Environments) lab.

For more information: **https://psychology.nmsu.edu/**.

Research Cores Program

The Research Cores Program is a campus-wide, core facility providing all levels of technical support and consultation for investigators needing analytical and routine transmission, scanning electron microscopy, and light microscopy services. The integrated imaging facility is administered through the Office of the Vice President for Research and is considered a core research facility. The facility was established to furnish state-of-the-art microscopy instrumentation and techniques and other infrastructure facilities to investigators and their students for research and training.

Contact: Dr. Tanner Schaub (**tschaub@nmsu.edu**)

For more details, see **https://research.nmsu.edu/RCP.html.**

Research Initiatives in the College of Health, Education, and Social Transformation

The College of Health, Education, and Social Transformation (HEST) has research initiatives and laboratories in the following areas:

- The Kinesiology Department offers laboratory space for the study of biomechanics, sport psychology & motor learning, applied and basic physiology, healthy aging, physical education curriculum, and kinesthetic learning.
- The Speech and Hearing Center's Benfer for voice and speech science research.
- The Special Education unit and Communication Disorders Department's Autism Research Initiative.
- Alliance for the Advancement of Teaching and Learning in collaboration with the Southwest Regional Educational Lab REL (Institute for Educational Services, IES) provides research for partner school district practitioners on accountability, special education/ response to intervention, literacy, leadership development, math and science achievement, and program evaluation.
- The Institute for Mathematics and Science Education oversees multiple mathematics and science grants as well as serving as the STEM Outreach Center for K-12 education.
- The Counseling and School Psychology Training and Research Center provides counseling services for students, training for graduate students in counseling, school psychology, and counseling psychology, and conducts research on counseling outcomes and processes.
- A Reading Research Center is housed in the NMSU Children's Village and provides reading diagnostic services including analysis of reading using eye-tracking software.

Southwest Institute for Health Disparities Research

To address the substantial health disparities that exist in Southern New Mexico and the U.S./Mexican Border Region, New Mexico State University has recently established the Southwest Institute for Health Disparities Research within the College of Health Education, and Social Transformation. The purpose of the Institute is to assist faculty to secure external funding and conduct research which has the potential to reduce health disparities and improve minority health, provide health related community outreach programming, provide training for researchers, lay groundwork for additional funded research, and attract highly qualified minority faculty and graduate students to NMSU.

Contact: Dr. Jill A. McDonald (**jillmcd@nmsu.edu**)

For more details, see: **https://swihdr.nmsu.edu**.

Spatial Applications and Research Center (SpARC)

The SpARC laboratory was established in 1982 as an applied contract research laboratory for the NMSU Geography Department. SpARC provides a variety of services including planning and research, GIS, image processing, modeling, and training. The original purpose of the laboratory was to undertake externally funded projects under the direction of geography faculty and employ students within the department. Thirty-four years later, the laboratory continues to do project related work. It has employed more than 150 students and provided assistance to more than 35 faculty members inside and outside the Geography Department. The primary clients of the lab have been federal state and local government agencies, with an emphasis on applied transportation, water resource, and environmental research projects. The laboratory houses 11 high performance workstations, a range of mapping grade GPS units, and a large scanner/plotter. Software available for use includes database software, ENVI image processing software, TransCAD, and the entire suite of Esri GIS software. For more details, visit: **http://smiley.nmsu.edu/SparcWebsite/BGIS2Index_2012.html**

Contact: Dr. Christopher Brown (**brownchr@nmsu.edu**)

University Museum

Established in 1959, the New Mexico State University Museum has provided over 65 years of service to the university and community. The University Museum assists NMSU in providing quality education, advancing knowledge through research, and celebrating the culture and history of the southwest and the University. The Museum serves the community as a repository and exhibitor of local and regional history and culture. Through its care and maintenance of donated ethnographic, historic, and prehistoric objects, it preserves an important part of Southwestern and Border region culture and history. The Museum encourages faculty and student research using our diverse cultural materials.

The Museum's collections are primarily anthropological (archaeological and ethnographic) with secondary collections in history and the natural sciences. Anthropological collections document the cultural diversity of the border in the Greater Southwest and northern Mexico. The Museum preserves and catalogs collections to promote research and access to cultural materials. Exhibits are developed by students and staff as well as brought in from other institutions.

Director: Dr. Kelly Jenks (**kljenks@nmsu.edu**)

Curator: Dr. Heather Para (**hpara@nmsu.edu**)

For more details, see: **https://univmuseum.nmsu.edu**.

Masters Degrees

A

- Accounting - Master of Accountancy (p. 93)
- Aerospace Engineering - Master of Engineering in Aerospace Engineering (p. 95)
- Aerospace Engineering - Master of Science (p. 96)
- Agricultural and Extension Education (Agricultural Strategic Communications) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/agricultural-extension-education-agricultural-strategic-comm-ma-online/)
- Agricultural and Extension Education - Master of Arts (p. 99)

- Agricultural and Extension Education - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/agricultural-extension-education-ma-online/)
- Agricultural Economics - Master of Science (p. 102)
- Agriculture (Agribusiness) - Master of Agriculture (p. 97)
- Agriculture (Agribusiness) - Master of Agriculture (Online) (https://catalogs.nmsu.edu/global/nmsu-global/agriculture-agribusiness-mag-online/)
- Agriculture (Domestic Animal Biology) - Master of Agriculture (p. 98)
- Agriculture (Domestic Animal Biology) - Master of Agriculture (Online) (https://catalogs.nmsu.edu/global/nmsu-global/agriculture-domestic-animal-biology-master-agriculture-online/)
- Animal Science - Master of Science (p. 104)
- Anthropology - Master of Arts (p. 106)
- Applied and Agricultural Biology - Master of Science (p. 101)
- Applied Statistics - Master of Science (p. 107)
- Art - Master of Arts (p. 108)
- Astronomy - Master of Science (p. 109)
- Athletic Training - Master of Science (p. 103)

B

- Bioinformatics - Master of Science (p. 112)
- Biology - Master of Science (p. 114)
- Business Administration (Agribusiness) - Master of Business Administration (p. 117)
- Business Administration (Finance) - Master of Business Administration (p. 119)
- Business Administration (Health Services Management) - Master of Business Administration (p. 120)
- Business Administration (Health Services Management) - Master of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/business-administration-health-services-mgt-mba-online/)
- Business Administration (Information Systems) - Master of Business Administration (p. 121)
- Business Administration (Information Systems) - Master of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/business-administration-information-systems-mba-online/)
- Business Administration (Public Utility Regulations) - Master of Business Administration (p. 123)
- Business Administration (Public Utility Regulations) - Master of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/business-administration-public-utility-regulations-mba-online/)
- Business Administration - Master of Business Administration (p. 115)
- Business Administration - Master of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/business-administration-mba-online/)

C

- Chemical Engineering - Master of Engineering in Chemical Engineering (p. 124)
- Chemical Engineering - Master of Engineering in Chemical Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/chemical-engineering-master-engineering-chemical-engineering-online/)
- Chemical Engineering - Master of Science in Chemical Engineering (p. 126)
- Chemistry (Biochemistry) - Doctor of Philosophy (p. 210)
- Chemistry (Biochemistry) - Master of Science (p. 127)
- Chemistry - Master of Science (p. 127)
- Civil Engineering - Master of Engineering in Civil Engineering (p. 128)
- Civil Engineering - Master of Engineering in Civil Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/civil-engineering-mece-online/)
- Civil Engineering - Master of Science in Civil Engineering (p. 130)
- Clinical Mental Health Counseling - Master of Arts (p. 132)
- Clinical Psychopharmacology - (Postdoctoral) - Master of Science (Online) (https://catalogs.nmsu.edu/global/nmsu-global/clinical-psychopharmacology-postdoctoral-ms-online/)
- Communication Disorders - Master of Arts (p. 133)
- Communication Studies (Analysis and Decision-Making) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/communication-studies-analysis-decision-making-ma-online/)
- Communication Studies (Leadership Communication) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/communication-studies-leadership-communication-ma-online/)
- Communication Studies - Master of Arts (p. 134)
- Computer Science - Master of Science (p. 137)
- Counseling and Guidance (Educational Diagnostics) - Master of Arts (p. 139)
- Creative Writing - Master of Fine Arts (p. 139)
- Criminal Justice - Master of Criminal Justice (p. 141)
- Criminal Justice - Master of Criminal Justice (Online) (https://catalogs.nmsu.edu/global/nmsu-global/criminal-justice-mcj-online/)

D

- Data Analytics (Digital Agriculture) - Master of Data Analytics (Online) (https://catalogs.nmsu.edu/global/nmsu-global/data-analytics-digital-agriculture-mda-online/)
- Data Analytics - Master of Data Analytics (p. 143)
- Data Analytics - Master of Data Analytics (Online) (https://catalogs.nmsu.edu/global/nmsu-global/data-analytics-mda-online/)

E

- Economics (Econometrics) - Master of Arts (p. 145)
- Economics (Public Policy) - Master of Arts (p. 145)
- Economics (Public Utility Policy and Regulation) - Master of Arts (p. 146)
- Economics (Public Utility Policy and Regulation) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/economics-public-utility-policy-regulation-ma-online/)
- Economics - Master of Arts (p. 144)
- Economics - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/economics-ma-online/)
- Education (Bilingual Education) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-bilingual-education-master-arts-online/)

- Education (Curriculum & Instruction) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-curriculum-instruction-ma-online/)
- Education (Early Childhood Education Plus Licensure) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-early-childhood-ed-plus-licensure-ma-online/)
- Education (Early Childhood Education) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-early-childhood-ed-ma-online/)
- Education (Educational Learning Technologies) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-educational-learning-technologies-ma-online/)
- Education (Elementary Licensure Prep) - Master of Arts (p. 146)
- Education (Elementary Licensure Prep) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-elementary-licensure-prep-ma-online/)
- Education (Elementary Mathematics and Science) - Master of Arts (p. 148)
- Education (Language, Literacy & Culture) - Master of Arts (p. 148)
- Education (Language, Literacy & Culture) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-language-literacy-culture-ma-online/)
- Education (Secondary Licensure Prep) - Master of Arts (p. 149)
- Education (Secondary Licensure Prep) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-secondary-licensure-prep-ma-online/)
- Education (Spanish) - Master of Arts in Teaching (https://catalogs.nmsu.edu/nmsu/graduate-school/education-spanish-master-arts-teaching/)
- Education (Spanish) - Master of Arts in Teaching (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-spanish-master-arts-teaching-online/)
- Education (Teaching English to Speakers of Other Languages) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-teaching-english-speakers-other-languages-master-arts-online/)
- Educational Leadership & Administration (Higher Education Administration) - Master of Arts (p. 151)
- Educational Leadership & Administration (Higher Education Administration) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/educational-leadership-administration-higher-ed-admin-ma-online/)
- Educational Leadership & Administration (Pk-12 Administration) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/educational-leadership-administration-pk12-admin-ma-online/)
- Electrical Engineering - Master of Engineering in Electrical Engineering (p. 151)
- Electrical Engineering - Master of Engineering in Electrical Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/electrical-engineering-meee-online/)
- Electrical Engineering - Master of Science in Electrical Engineering (p. 153)
- Electrical Engineering - Master of Science in Electrical Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/electrical-engineering-msee-online/)
- English (Technical and Professional Communication) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/english-technical-professional-communication-ma-online/)
- English - Master of Arts (p. 156)
- Environmental Engineering - Master of Science in Environmental Engineering (p. 158)
- Experimental Psychology - Master of Arts (p. 159)

F

- Family and Consumer Sciences (Couples, Marriage and Family Therapy) - Master of Science (p. 159)
- Family and Consumer Sciences (Food Science and Technology) - Master of Science (p. 159)
- Family and Consumer Sciences (Hotel, Restaurant and Tourism Management) - Master of Science (p. 160)
- Family and Consumer Sciences (Hotel, Restaurant and Tourism Management) - Master of Science (Online) (https://catalogs.nmsu.edu/global/nmsu-global/family-consumer-sciences-hrtm-ms-online/)
- Fine Arts - Master of Fine Arts (p. 162)
- Fish, Wildlife and Conservation Ecology - Master of Science (p. 162)

G

- Geographic Information Science and Technology - Graduate Minor (p. 257)
- Geography - Master of Applied Geography (p. 163)
- Geology - Master of Science (p. 166)

H

- History (Public History) - Master of Arts (p. 167)
- History - Master of Arts (p. 166)
- Horticulture - Master of Science (p. 168)

I

- Industrial Engineering - Master of Engineering in Industrial Engineering (p. 169)
- Industrial Engineering - Master of Engineering in Industrial Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/industrial-engineering-meie-online/)
- Industrial Engineering - Master of Science in Industrial Engineering (p. 170)
- Industrial Engineering - Master of Science in Industrial Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/industrial-engineering-msie-online/)
- Information Technology - Master of Information Technology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/information-technology-mit-online/)

M

- Master of Public Health/Master of Social Work - Dual Degree (https://catalogs.nmsu.edu/nmsu/graduate-school/master-public-health-master-social-work-dual-degree/)
- Mathematics - Graduate Minor (p. 259)
- Mathematics - Master of Science (p. 172)
- Mechanical Engineering - Master of Engineering in Mechanical Engineering (p. 173)
- Mechanical Engineering - Master of Science in Mechanical Engineering (p. 174)
- Molecular Biology - Master of Science (p. 175)

- MPA-MCJ Program - Dual Degree (p. 176)
- Music (Collaborative Piano) - Master of Music (p. 176)
- Music (Conducting) - Master of Music (p. 177)
- Music (Music Education) - Master of Music (p. 177)
- Music (Music Education) - Master of Music (Online) (https://catalogs.nmsu.edu/global/nmsu-global/music-music-education-mm-online/)
- Music (Performance) - Master of Music (p. 178)

N

- Nursing Leadership and Administration - Master of Science in Nursing (Online) (https://catalogs.nmsu.edu/global/nmsu-global/nursing-leadership-administration-msn-online/)

P

- Physics - Master of Science (p. 179)
- Plant and Environmental Science - Master of Science (p. 180)
- Political Science - Master of Arts (p. 180)
- Public Administration - Master of Public Administration (p. 181)
- Public Health (Health Behavior & Health Promotion) - Master of Public Health (Online) (https://catalogs.nmsu.edu/global/nmsu-global/public-health-health-behavior-health-promotion-mph-online/)
- Public Health (Health Behavior and Health Promotion) - Master of Public Health (p. 182)
- Public Health (Health Management, Administration & Policy) - Master of Public Health (p. 184)
- Public Health (Health Management, Administration & Policy) - Master of Public Health (Online) (https://catalogs.nmsu.edu/global/nmsu-global/public-health-health-mgt-admin-policy-mph-online/)
- Public History and Public Administration - Dual M.A. Degree (p. 185)

R

- Range Science - Master of Science (p. 185)
- Reading - Specialist in Education (p. 244)

S

- Social Work - Master of Social Work (Full-Time Advanced) (p. 188)
- Social Work - Master of Social Work (Full-Time Advanced) (Online) (https://catalogs.nmsu.edu/global/nmsu-global/social-work-msw-full-time-advanced-online/)
- Social Work - Master of Social Work (Full-Time) (p. 187)
- Social Work - Master of Social Work (Full-Time) (Online) (https://catalogs.nmsu.edu/global/nmsu-global/social-work-msw-online/)
- Social Work - Master of Social Work (Part-Time) (p. 189)
- Social Work - Master of Social Work (Part-Time) (Online) (https://catalogs.nmsu.edu/global/nmsu-global/social-work-msw-part-time-online/)
- Sociology - Master of Arts (p. 190)
- Sociology - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/sociology-ma-online/)
- Spanish - Master of Arts (p. 191)
- Spanish - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/spanish-ma-online/)
- Special Education - Master of Arts (p. 193)
- Special Education - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/special-education-ma-online/)

T

- Teaching English to Speakers of Other Languages - Graduate Certificate (p. 252)
- Teaching Spanish for Heritage Language Learners - Graduate Certificate (p. 253)

W

- Water Science and Management (Agricultural Water Resources) - Master of Science (p. 196)
- Water Science and Management (International Water Resilience) - Master of Science (p. 196)
- Water Science and Management (Water Economics and Policy) - Master of Science (p. 197)
- Water Science and Management (Water Informatics) - Master of Science (p. 197)
- Water Science and Management (Water Quality and Treatment) - Master of Science (p. 198)
- Water Science and Management (Watersheds and Aquatic/Riparian Wetlands) - Master of Science (p. 199)
- Water Science and Management - Master of Science (p. 195)

Advanced Manufacturing - Concentration

The graduate concentration in advanced manufacturing educates students and creates a skilled workforce for the growing needs of new technologies and advanced products in the 21st century. The program provides hands-on experience on designing, adapting, and building parts using advanced materials by including new processes, changing the supply chain, and adapting business models. It also includes the design optimization, materials selection and characterization, process parameter mapping, data analytics, software development, and final part inspection among other concepts. This concentration is maintained by the College of Engineering but is open to any Master's level major/degree.

Prefix	Title	Credits
Required Courses		
I E 575	Advanced Manufacturing Processes	3
I E 571	Advanced Quality Control	3
C E 510	Introduction to Nondestructive Testing	3
CHME 564	Polymer Science & Engineering	3
CHME 491/AGRO 450	Undergraduate Special Topics (AGRO 450 CHME 491 Development of Agricultural Technologies)	3
Electives		
5 Electives (Select 500 Level Courses from EE, CHME, IE, CE, or MAE) [1]		15
Total Credits		**30**

[1] With Approval of the advisor and instructor

Selection of Advisor

Newly admitted graduate students will be assigned a temporary advisor for the first semester, but they must select a degree option and permanent advisor before registering for the second semester.

In considering a decision about option and advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of study to discuss specific educational objectives. The student can use these meetings to become familiar with faculty interests and research projects currently in progress. The faculty member must agree (in writing) to serve as the student's advisor.

Although there is no oral exam, students will be required to complete an exit-interview with one of Advanced Manufacturing concentration and one graduate faculty member from the master of engineering they select to study.

Doctoral Degrees

A

- Aerospace Engineering - Doctor of Philosophy (p. 200)
- Animal Science - Doctor of Philosophy (p. 200)
- Applied and Agricultural Biology - Doctor of Philosophy (p. 201)
- Applied Statistics - Doctor of Philosophy (p. 203)
- Astronomy - Doctor of Philosophy (p. 204)

B

- Biology - Doctor of Philosophy (p. 208)
- Business Administration (Management) - Doctor of Philosophy (p. 208)
- Business Administration (Marketing) - Doctor of Philosophy (p. 209)

C

- Chemistry (Biochemistry) - Doctor of Philosophy (p. 210)
- Chemistry - Doctor of Philosophy (p. 210)
- Computer Science - Doctor of Philosophy (p. 210)
- Counseling Psychology - Doctor of Philosophy (p. 211)
- Curriculum and Instruction - Doctor of Philosophy (p. 213)
- Curriculum and Instruction - Doctor of Philosophy (Online) (https://catalogs.nmsu.edu/global/nmsu-global/curriculum-instruction-phd-online/)

E

- Economic Development - Doctor of Economic Development (p. 214)
- Education (Language, Literacy & Culture) - Master of Arts (p. 148)
- Educational Leadership & Administration (Higher Education Administration) - Doctor of Education (p. 215)
- Educational Leadership & Administration (Higher Education) - Doctor of Philosophy (p. 216)
- Educational Leadership & Administration (Pk-12 Administration) - Doctor of Education (p. 217)
- Educational Leadership & Administration (Pk-12 Education) - Doctor of Philosophy (p. 218)
- Engineering (Chemical Engineering) - Doctor of Philosophy (p. 219)
- Engineering (Civil Engineering) - Doctor of Philosophy (p. 220)
- Engineering (Electrical Engineering) - Doctor of Philosophy (p. 221)
- Engineering (Industrial Engineering) - Doctor of Philosophy (p. 223)
- Engineering (Mechanical Engineering) - Doctor of Philosophy (p. 224)
- Experimental Psychology - Doctor of Philosophy (p. 225)

F

- Food Science - Doctor of Philosophy (p. 225)

G

- Geographic Information Science and Technology - Graduate Minor (p. 257)
- Geography - Doctor of Philosophy (p. 226)

H

- Health Equity Sciences - Doctor of Philosophy (p. 228)

K

- Kinesiology - Doctor of Philosophy (p. 229)

M

- Mathematics - Doctor of Philosophy (p. 230)
- Mathematics - Graduate Minor (p. 259)
- Molecular Biology - Doctor of Philosophy (p. 231)
- Music (Collaborative Piano) - Master of Music (p. 176)

N

- Nursing Practice (Family Nurse Practitioner) - Doctor of Nursing Practice (Online) (https://catalogs.nmsu.edu/global/nmsu-global/nursing-practice-family-nurse-practitioner-dnp-online/)
- Nursing Practice (Nurse Anesthesiology) - Doctor of Nursing Practice (p. 232)
- Nursing Practice (Population Health Leadership) - Doctor of Nursing Practice (Online) (https://catalogs.nmsu.edu/global/nmsu-global/nursing-practice-population-health-leadership-dnp-online/)
- Nursing Practice (Psychiatric/Mental Health) - Doctor of Nursing Practice (Online) (https://catalogs.nmsu.edu/global/nmsu-global/nursing-practice-psychiatric-mental-health-dnp-online/)

P

- Physics - Doctor of Philosophy (p. 233)
- Plant and Environmental Science - Doctor of Philosophy (p. 233)

R

- Range Science - Doctor of Philosophy (p. 234)
- Rhetoric and Professional Communication - Doctor of Philosophy (p. 234)

S

- School Psychology - Doctor of Philosophy (p. 235)

T

- Teaching English to Speakers of Other Languages - Graduate Certificate (p. 252)
- Teaching Spanish for Heritage Language Learners - Graduate Certificate (p. 253)
- Transborder and Global Human Dynamics - Doctor of Philosophy (p. 236)

W

- Water Science and Management (Agricultural Water Resources) - Doctor of Philosophy (p. 239)
- Water Science and Management (International Water Resilience) - Doctor of Philosophy (p. 240)
- Water Science and Management (Water Economics and Policy) - Doctor of Philosophy (p. 240)
- Water Science and Management (Water Informatics) - Doctor of Philosophy (p. 241)
- Water Science and Management (Water Quality Treatments) - Doctor of Philosophy (p. 241)
- Water Science and Management (Watershed and Aquatic/Riparian Wetlands) - Doctor of Philosophy (p. 242)
- Water Science and Management - Doctor of Philosophy (p. 239)
- Wildlife and Fisheries Ecology - Doctor of Philosophy (p. 242)

Graduate Certificates

- Autism and Spectrum Disorders - Graduate Certificate (p. 245)
- Autism and Spectrum Disorders - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/autism-spectrum-disorders-gr-certificate-online/)
- Bilingual Education - Graduate Certificate (p. 245)
- Bilingual Education - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/bilingual-education-gr-certificate-online/)
- Borderlands and Ethnic Studies - Graduate Certificate (p. 245)
- Chemistry (Biochemistry) - Doctor of Philosophy (p. 210)
- Collaborative Piano - Graduate Certificate (p. 246)
- Cultural Resource Management - Graduate Certificate (p. 246)
- Digital Communications - Graduate Certificate (https://catalogs.nmsu.edu/nmsu/graduate-school/digital-communications-graduate-certificate/)
- Digital Signal Processing - Graduate Certificate (https://catalogs.nmsu.edu/nmsu/graduate-school/digital-signal-processing-graduate-certificate/)
- Early Childhood Alternative Licensure - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/early-childhood-alt-licensure-gr-cert-online/)
- Education (Language, Literacy & Culture) - Master of Arts (p. 148)
- Electric Energy Systems - Graduate Certificate (https://catalogs.nmsu.edu/nmsu/graduate-school/electric-energy-systems-graduate-certificate/)
- Elementary Education Alternative Licensure - Graduate Certificate (p. 247)
- Family Nurse Practitioner - Post-Masters Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/family-nurse-practitioner-pm-certificate-online/)
- Finance - Graduate Certificate (p. 248)
- Geographic Information Science and Technology - Graduate Minor (p. 257)
- Mathematics - Graduate Minor (p. 259)
- Museum Studies - Graduate Certificate (p. 248)
- Music (Collaborative Piano) - Master of Music (p. 176)
- Music Pedagogy and Performance - Graduate Certificate (p. 249)
- Music Performance - Graduate Certificate (p. 249)
- Online Teaching and Learning - Graduate Certificate (p.)
- Online Teaching and Learning - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/online-teaching-learning-gr-certificate-online/)
- Principal Licensure - Graduate Certificate (p. 249)
- Psychiatric/Mental Health Nurse Practitioner - Post-Masters Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/psychiatric-mental-health-nurse-practitioner-pmc-online/)
- Public Health - Graduate Certificate (p. 249)
- Public Health - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/public-health-gr-certificate-online/)
- Public Utility Regulation and Economics - Graduate Certificate (p. 250)
- Public Utility Regulation and Economics - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/public-utility-regulation-economics-gr-certificate-online/)
- School Social Work: Special Education Related Services - Graduate Certificate (p. 250)
- School Social Work: Special Education Related Services - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/school-social-work-special-education-related-services-graduate-certificate-online/)
- Secondary Education Alternative Licensure - Graduate Certificate (p. 251)
- Special Education Alternative Licensure - Graduate Certificate (https://catalogs.nmsu.edu/nmsu/graduate-school/special-education-alternative-licensure-graduate-certificiate/)
- Sustainability - Graduate Certificate (p. 251)
- Systems Engineering - Graduate Certificate (p. 252)
- Systems Engineering - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/systems-engineering-gr-certificate-online/)
- Teaching English to Speakers of Other Languages - Graduate Certificate (p. 252)
- Teaching English to Speakers of Other Languages - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/tesol-gr-certificate-online/)
- Teaching Spanish for Heritage Language Learners - Graduate Certificate (p. 253)
- Telemetry - Graduate Certificate (https://catalogs.nmsu.edu/nmsu/graduate-school/telemetry-graduate-certificate/)
- Telemetry - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/telemetry-graduate-certificate-online/)

Graduate Minors

- Advanced Manufacturing - Graduate Minor (p. 253)
- Agribusiness - Graduate Minor (p. 254)
- Agricultural and Extension Education - Graduate Minor (p. 254)
- Animal Science - Graduate Minor (p. 254)
- Anthropology - Graduate Minor (p. 254)
- Applied Statistics - Graduate Minor (p. 254)
- Archaeology - Graduate Minor (p. 254)
- Bioinformatics (with Computer Science) - Graduate Minor (p. 254)
- Chemistry (Biochemistry) - Doctor of Philosophy (p. 210)
- Communication Studies - Graduate Minor (p. 255)

- Computer Science - Graduate Minor (p. 255)
- Decolonial Research - Graduate Minor (p. 1246)
- Economics - Graduate Minor (p. 255)
- Educational Administration (Doctoral) - Graduate Minor (p. 255)
- Educational Administration (Higher Ed.) - Graduate Minor (p. 255)
- Educational Administration (Pk-12) - Graduate Minor (p. 255)
- Fish, Wildlife and Conservation Ecology - Graduate Minor (p. 255)
- Food Studies - Graduate Minor (p. 256)
- Gender and Sexuality Studies - Graduate Minor (p. 256)
- Geographic Information Science and Technology - Graduate Minor (p. 257)
- Gerontology - Graduate Minor (p. 257)
- History - Graduate Minor (p. 257)
- Information Systems - Graduate Minor (p. 257)
- Integrated Behavioral Health Care - Graduate Minor (p. 258)
- Materials Engineering - Graduate Minor (p. 259)
- Mathematics - Graduate Minor (p. 259)
- Molecular Biology - Graduate Minor (p. 259)
- Music (Collaborative Piano) - Master of Music (p. 176)
- Native American Studies - Graduate Minor (p. 260)
- Physics - Graduate Minor (p. 260)
- Psychology - Graduate Minor (p. 260)
- Range Science - Graduate Minor (p. 260)
- Security Studies - Graduate Minor (p. 261)
- Sociology - Graduate Minor (p. 261)
- Spanish Counseling - Graduate Minor (p. 261)
- Special Education - Graduate Minor (p. 262)
- Teaching English to Speakers of Other Languages - Graduate Certificate (p. 252)
- Teaching Spanish for Heritage Language Learners - Graduate Certificate (p. 253)
- U.S.-Mexico Border Health Issues - Graduate Minor (p. 262)

Accounting - Master of Accountancy

The Master of Accountancy program (MAcc) is recommended for students wishing to fulfill the Certified Public Accountant (CPA) 150-hour education requirement which most states, including New Mexico, have adopted.

Admission Requirements

Admission requirements of the NMSU Graduate School must be met before the applicant may be admitted to the Master of Accountancy program.

Consideration for admission to the Master of Accountancy program is dependent on an applicant's undergraduate record. The Graduate Management Admissions Test (GMAT) is also required, unless the student meets one of the GMAT waiver conditions listed below:

1. The student graduated with an undergraduate degree in accounting from a US AACSB accredited business school with at least a 3.25 GPA overall and a 3.25 GPA in their upper division accounting courses; or
2. The student is a graduate of NMSU's undergraduate accounting program with at least a 3.25 GPA overall and a 3.0 GPA in core upper division accounting classes; or
3. The student holds a recognized professional accounting credential (such as a CPA, CMA, CIA, CFE); or
4. The student holds a post baccalaureate degree (such as an MBA, MS, MA, JD) from an approved, US AACSB-accredited university with a minimum 3.0 GPA in graduate course work.

In addition to the aforementioned entrance requirements, an applicant's GPA in accounting prerequisites must be at least 3.0. For those students not receiving their undergraduate accounting degree at NMSU, it is expected that substantially all of the accounting prerequisite classes be from a **US AACSB accredited business school** or the application will need to be approved by the Master of Accountancy Admissions Committee. In this case the Admissions Committee may require that some of these prerequisite courses be retaken at an US AACSB institution such as NMSU.

Accounting Prerequisites (18 Credits)

Each applicant must complete, at a minimum, the following 18 credits of accounting courses from a US AACSB accredited business school prior to being considered as a candidate for the Master of Accountancy degree:

Prefix	Title	Credits
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
ACCT 301	Financial Accounting I	3
ACCT 302	Financial Accounting II	3
ACCT 403	Federal Taxation I	3
ACCT 451	Auditing Theory and Practices	3
Total Credits		**18**

No coursework applied toward the MAcc degree, including the prerequisite requirements, may be taken on an S/U basis.

Master of Accountancy Requirements

Candidates with an undergraduate degree in accounting must successfully complete a minimum of 30 graduate credits. Candidates with an undergraduate degree in a field other than accounting must complete additional prerequisites upon previous courses taken.

Prefix	Title	Credits
Required Courses (9 credits)		
ACCT 555	Federal Tax Research [1]	3
or ACCT 564	Financial Accounting Research	
ACCT 559	Ethics and Professionalism in Accounting	3
ACCT 510	Technical and Professional Communication for Accountants	3
Electives in ACCT from the following for a total of 5 courses (1 course may be from upper division Accounting courses numbered 450-498) (15 credits)		
ACCT 530	Advanced Accounting	3
ACCT 544	Financial Statement Analysis and Valuation	3
ACCT 551	Advanced Auditing Theory and Practice	3
ACCT 560	Taxation of Corporations and Shareholders Advanced	3
ACCT 580	Professional Accountancy	3
Other Courses for a total of 2 courses (6 credits approved by MAcc Program Director)		
Elective 1		3
Elective 2		3
Total Credits		**30**

[1] If an accounting research course is not used to fulfill the research requirement, a student may take the course to fulfill an elective requirement.

MAcc Courses

Each student must complete 21 credits in accounting courses numbered above 520. These courses must include a research class (either ACCT 555 Federal Tax Research or ACCT 564 Financial Accounting Research) and Ethics in Accounting (ACCT 559 Ethics and Professionalism in Accounting). In addition, three of the credits may be in upper division undergraduate elective accounting courses numbered 450 or higher. Other specific courses to be completed by each candidate will be determined in the advisement process.

Other Courses

All students must also complete a total of 9 credits in other courses. Three of the credits must be ACCT 510 Technical and Professional Communication for Accountants, and the rest must be approved electives. Neither ACCT 503 Accounting for Managers nor any course fulfilling the foundation requirement may be included. Any student wishing to be waived from any of the above requirements may submit a petition in writing to the MAcc Director. Each request will be considered individually by the Master of Accountancy Committee.

Comprehensive Examination

There is no comprehensive examination requirement. However, satisfactory performance on a graduate portfolio assignment is a requirement for completing the Master of Accountancy degree.

Thesis: *No thesis is required; however, under special approval, a candidate may elect to write a thesis under ACCT 599 Master's Thesis. Up to 6 credits may be earned for the thesis.*

General

Graduate degrees require a cumulative graduate GPA of 3.0 or higher. The Department of Accounting and Information Systems requires, in addition, that every candidate for the Master of Accountancy degree maintain at least a 3.0 grade-point average in all accounting courses used to satisfy the core and elective course requirement. Master of Accountancy students may not retake 500-level accounting courses for which they have previously received a grade without the approval of the Master of Accountancy Admissions Committee.

First Year		
Fall		**Credits**
ACCT 544	Financial Statement Analysis and Valuation	3
ACCT 551	Advanced Auditing Theory and Practice	3
ACCT 555	Federal Tax Research [1]	3
ACCT 559	Ethics and Professionalism in Accounting	3
	Credits	**12**
Spring		
ACCT 510	Technical and Professional Communication for Accountants	3
ACCT 530	Advanced Accounting	3
ACCT 580	Professional Accountancy	3
Elective Course		3
	Credits	**12**
Summer		
ACCT 560	Taxation of Corporations and Shareholders Advanced	3
ACCT 564	Financial Accounting Research [1]	3
	Credits	**6**
	Total Credits	**30**

[1] If an accounting research course is not used to fulfill the research requirement, a student may take the course to fulfill an elective requirement.

New Mexico State University master's accelerated program (MAP) provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to a faculty advisor about your MAP plan and develop a course plan in consultation with the advisor. The faculty advisor should preferably be from the area of your interest.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The overall grade point average must be at a minimum of 3.0. At least four upper level accounting courses (ACCT 300+) including ACCT 301 Financial Accounting I and ACCT 302 Financial Accounting II I need to have the combined grade point average of at least 3.5. A student must have at least a B in both ACCT 301 Financial Accounting I and ACCT 302 Financial Accounting II.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

Upon approved enrollment to the Master of Accountancy MAP Program, the following courses may be taken in the undergraduate program of study.

Prefix	Title	Credits
ACCT 451	Auditing Theory and Practices	3
ACCT 455	Federal Taxation II	3
ACCT 456	Accounting for Nonprofit Organizations	3
ACCT 458	Accounting Data Analytics	3
ACCT 498	Independent Study	1-3
BCIS 485	Enterprise Resource Planning	3

Aerospace Engineering - Master of Engineering in Aerospace Engineering

Admission Requirements: See https://mae.nmsu.edu/academic-programs/grad/admission.html.

Coursework Option

Prefix	Title	Credits
Requirements		
M E 570	Engineering Analysis I	3
Core Courses		
Select one course from each of the following 4 topic areas: [1]		12
Aerodynamics		
Select one from the following:		
M E 530	Intermediate Fluid Mechanics	
M E 533	Numerical Methods for Fluid Mechanics and Heat Transfer	
Structural Dynamics and Control		
Select one from the following:		
M E 511	Dynamics	
M E 512	Vibrations	
Solid Mechanics		
Select one from the following:		
M E 502	Elasticity I	
M E 504	Continuum Mechanics	
Engineering Analysis		
Select one from the following:		
M E 518	Applied Finite Elements	
M E 527	Linear Systems Theory	
Thermal Science		
Select one from the following:		
M E 503	Thermodynamics	
M E 540	Intermediate Heat Transfer	
Additional Requirements		
Select three courses (500 level or above) from any departments and two courses (500 level or above) from any college: [2, 3]		12
A E 598	Special Research Programs [4]	3
Total Credits		**30**

1. Graduate M E courses may be substituted for A E courses with the approval of the Graduate Program Coordinator.
2. If course is not in A E or M E program, approval of the Graduate Program Coordinator is required.
3. If M E 510 Special Topics or A E 510 Special Topics is taken, it must be a regular course with a proper course title taught in class. Any 510 course as an independent study would never be counted.
4. Professional degree students must complete an Integrative Learning Experience that allows them to demonstrate a synthesis of foundational and concentration competencies. A E 598 Special Research Programs serves that purpose as the final exam for Graduate School Requirements.

Academic Advisor and Final Exit Survey

Newly admitted Aerospace Engineering Masters of Engineering students will be assigned the Graduate Program Coordinator as an academic advisor.

All students must take Professional Master's Degree Exit Survey to graduate, which will be conducted by the Graduate Program Coordinator and will be taken after completing all coursework.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to an MAE faculty advisor about your MAP plan and develop a course plan in consultation with the advisor. The faculty advisor should preferably be from the MAE area of your interest.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
A E 451	Aircraft Design	3
A E 464	Advanced Flight Dynamics and Controls	3
A E 469	Hypersonic Aerothermodynamics	3
M E 452	Control System Design	3
M E 456	Experimental Modal Analysis	3
M E 457	Engineering Failure Analysis	3
M E 458	Properties and Mechanical Behavior of Materials	3
M E 460	Applied Finite Elements	3
M E 481	Alternative and Renewable Energy	3
M E 483	Introduction to Combustion	3
M E 486	Introduction to Robotics	3
M E 487	Mechatronics	3
M E 502	Elasticity I	3
M E 503	Thermodynamics	3

M E 504	Continuum Mechanics	3
M E 510	Special Topics [1]	1-6
M E 511	Dynamics	3
M E 512	Vibrations	3
M E 530	Intermediate Fluid Mechanics	3
M E 533	Numerical Methods for Fluid Mechanics and Heat Transfer	3
M E 540	Intermediate Heat Transfer	3
A E 510	Special Topics [1]	1-6
A E 575	Propulsion	3

[1] A E 510 Special Topics must be a regular course with a proper course title taught in class, usually cross-listed with A E 405 Special Topics. Any 510 course as an independent study would never be counted.

Aerospace Engineering - Master of Science

Admission Requirements: See https://mae.nmsu.edu/academic-programs/grad/admission.html.

Thesis Option

Prefix	Title	Credits
Requirements		
M E 570	**Engineering Analysis I**	**3**
Select one course from each of the following 3 topic areas		**9**
Aerodynamics		
Select on from the following:		
M E 530	Intermediate Fluid Mechanics	
M E 533	Numerical Methods for Fluid Mechanics and Heat Transfer	
Structural Dynamics and Control		
Select one from the following:		
M E 511	Dynamics	
M E 512	Vibrations	
Solid Mechanics		
Select one from the following:		
M E 502	Elasticity I	
M E 504	Continuum Mechanics	
Thermal Science		
Select one from the following:		
M E 503	Thermodynamics	
M E 540	Intermediate Heat Transfer	
Engineering Analysis		
Select one from the following:		
M E 518	Applied Finite Elements	
M E 527	Linear Systems Theory	
Select 9 credits of A E graduate courses [1, 2]		**9**
Master's Thesis Research		**9**
A E 599	Master's Thesis	
A E 509	Individualized Study	
Total Credits		**30**

[1] All course must be 500 level or above. Up to 6 credits of M E graduate courses may be substituted with the approval of the Graduate Coordinator.

[2] If A E 510 Special Topics or M E 510 Special Topics Special Topics is taken, it must be a regular course with a proper course title taught in class. Any 510 course as an independent study would never be counted.

Publication Requirement

A refereed conference paper accepted or a refereed journal article in review or accepted by graduation. The M.S. thesis can be a reformatted version of this paper. Exceptions may be made on a case by case basis by the department head.

Selection of Permanent Advisor

Newly admitted graduate students will be assigned a temporary advisor for the first semester, but they must select a degree option and permanent advisor before registering for the second semester.

In considering a decision about option and advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of study to discuss specific educational objectives. The student can use these meetings to become familiar with faculty interests and research projects currently in progress. The faculty member must agree (in writing) to serve as the student's advisor.

All students must pass a final examination. The final examination is to be conducted by the student's advisory committee and is taken after completing all coursework and thesis work.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to an MAE faculty advisor about your MAP plan and develop a course plan in consultation with the advisor. The faculty advisor should preferably be from the MAE area of your interest.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the

additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
A E 451	Aircraft Design	3
A E 464	Advanced Flight Dynamics and Controls	3
A E 469	Hypersonic Aerothermodynamics	3
M E 452	Control System Design	3
M E 456	Experimental Modal Analysis	3
M E 457	Engineering Failure Analysis	3
M E 458	Properties and Mechanical Behavior of Materials	3
M E 460	Applied Finite Elements	3
M E 481	Alternative and Renewable Energy	3
M E 483	Introduction to Combustion	3
M E 486	Introduction to Robotics	3
M E 487	Mechatronics	3
M E 502	Elasticity I	3
M E 503	Thermodynamics	3
M E 510	Special Topics [1]	1-6
M E 511	Dynamics	3
M E 512	Vibrations	3
M E 530	Intermediate Fluid Mechanics	3
M E 533	Numerical Methods for Fluid Mechanics and Heat Transfer	3
M E 540	Intermediate Heat Transfer	3
A E 510	Special Topics [1]	1-6
A E 575	Propulsion	3

[1] 510 Special Topics must be a regular course with a proper course title taught in class, usually cross-listed with 405 Special Topics. Any 510 course as an independent study would never be counted.

Agriculture (Agribusiness) - Master of Agriculture

The Master's of Agriculture with Concentration in Agribusiness degree provides students with the skills and knowledge necessary to successfully manage modern businesses operating in the food and fiber supply chain. The program curriculum has been developed with an emphasis on providing economic and business analytical knowledge and skills for students and industry professionals with a broad range of disciplinary backgrounds.

Candidates for the Master of Agriculture (MAG) with a concentration in Agribusiness must successfully complete a minimum of 33 graduate credits.

All students in the MAG program must successfully complete the following:

Prefix	Title	Credits
Required Courses		
AEEC 5110	Introduction to Quantitative Methods	3
AEEC 5150	Economic and Financial Analysis of Agribusiness	3
AEEC 5220	Financial Derivative Markets	3
or BFIN 511	Financial Derivative Markets	
AEEC 5140	Agricultural Policy	3
AEEC 5320	Microcomputer Applications in Agriculture	3
AEEC 5330	Agribusiness Marketing	3
AEEC 5340	Agribusiness Management	3
AEEC 5996	Special Topics (Global Food Supply Chain Management)	3
Technical Courses (6) [1]		**6**
Technical Course 1		
Technical Course 2		
Creative Component or Thesis (3-6 hrs) [2]		**3-6**
AEEC 5994	Creative Component Project	
AEEC 5999	Master's Thesis	
Total Credits		**33-36**

[1] Students in consultation with their Graduate Committee Chair and with the approval of the Department Graduate Committee Chair, select two technical agriculture courses. These courses may come from another discipline or college or maybe taught within the Department of Agricultural Economics and Agricultural Business.

[2] In lieu of AEEC 5994 Creative Component Project or AEEC 5999 Master's Thesis, students can take 2 additional courses approved by their committee chair and the Department's Graduate Committee chairperson.

A thesis (AEEC 5999 Master's Thesis, 4-6 credits) is not required but can replace the creative component. The course AEEC 5997 Individual Study can be included as one of the 3-4 elective choices for 3 credits with any additional credits in AEEC 5997 Individual Study having approval of the student's graduate chair. An oral defense must be scheduled and completed as prescribed by the Graduate School. The defense must be preceded by a seminar to present major findings of the creative component or thesis research to faculty, fellow students, and the interested public.

A Study Suggested Plan of Study

First Year		
Fall		**Credits**
AEEC 5110	Introduction to Quantitative Methods	3
AEEC 5320	Microcomputer Applications in Agriculture	3
AEEC 5150	Economic and Financial Analysis of Agribusiness	3
	Credits	**9**
Spring		
AEEC 5220	Financial Derivative Markets	3
AEEC 5996	Special Topics (Global Food Supply Chain Management)	3
Technical Course [1]		3
	Credits	**9**
Second Year		
Fall		
AEEC 5140	Agricultural Policy	3
AEEC 5994	Creative Component Project	3
Technical Course [1]		3
	Credits	**9**
Spring		
AEEC 5330	Agribusiness Marketing	3
AEEC 5340	Agribusiness Management	3

AEEC 5994	Creative Component Project [3]	3
	Credits	**9**
	Total Credits	**36**

MAP Requirements

Master's Accelerated Program Information- Master of Agriculture-Agribusiness

The Master's Accelerated Program allows qualifying NMSU students to complete four graduate courses while still an undergraduate. Those courses may count toward both their undergraduate degree and the Master of Agriculture with a Concentration in Agribusiness.

Up to 12 hours of coursework can be applied toward the completion of the master's degree. To receive graduate credit for the 12 credit hours, students must receive a B- or higher grade.

Students' qualifications

- The student must be classified as a Junior or Senior (a minimum of 25 semester credit hours must be completed at NMSU).
- The cumulative grade point average must be a minimum of 3.0.

Accepted AEAB MAP courses

Upon approved enrollment to the AEAB MAP Program, the following courses may be taken in the undergraduate program of study. Any other courses may be considered after a consultation with an advisor and the department head.

Prefix	Title	Credits
AEEC 4550	Real Estate Appraisal	3
AEEC 5110	Introduction to Quantitative Methods	3
AEEC 5140	Agricultural Policy	3
AEEC 5220	Financial Derivative Markets	3
AEEC 5340	Agribusiness Management	3

Agriculture (Domestic Animal Biology) - Master of Agriculture

The Department of Animal and Range Sciences at New Mexico State University offers a non thesis coursework Master of Agriculture degree with a Concentration in Domestic Animal Biology (MAG-DAB) which provides students with graduate training in animal nutrition and physiology. The degree is earned after satisfactory completion of 32 credit hours of upper division and graduate-level courses. The curriculum is completed in two or three academic semesters and includes a creative component which can be met in several ways.

Students having an undergraduate degree in an area of agriculture or a related field may consider the MAG-DAB as an alternative to a Master of Science which traditionally involves preparation of a thesis. Students who may benefit from this program include those in need of additional advanced science-based coursework in preparation for applying to a professional program in veterinary medicine. Other individuals may be interested in careers in the cooperative extension service, education, or the feed and pharmaceutical industries where an advanced degree may be of benefit to advancement. The curriculum outlined below will assist students in preparing for a number of career opportunities.

Admission to the Program

The MAG-DAB program is administered through the Department of Animal and Range Sciences and is coordinated by the Animal Science Graduate Committee. Admission to the program requires acceptance by the NMSU Graduate School as well as the Department of Animal and Range Sciences. Basic requirements include an undergraduate degree in an agricultural or a related major from an accredited college or university and an undergraduate GPA of 3.0.

Depending on undergraduate training, some individuals may need to complete deficiency classes. In addition, the graduate school may require international students to complete one or more English language courses. Applications to the Department should include three letters of reference, a resume, and a statement of interest in advanced graduate training.

Once admitted to the program, each student will work with an advisor to develop a course work plan of study. The advisor and the student will also select an advisory committee consisting of two departmental faculty members and a third member from outside the department who will normally serve as the Dean's representative to the committee.

Inquiries about the MAG-DAB Program should be directed to the Chair of the Animal Science Graduate Committee.

For the Master of Agriculture with a concentration in Domestic Animal Biology, students must complete 32 credit hours of graduate courses which include 2 credits of ANSC 598 Special Research Programs for the creative component.

Prefix	Title	Credits
All students in the MAG-DAB Program will complete the following classes:		
ANSC 484	Ruminant Nutrition	3
ANSC 501	Advanced Animal Nutrition	3
ANSC 509	Endocrinology of Domestic Animals	3
ANSC 512	Research Methods in Animal Science	4
ANSC 515	Graduate Seminar [1]	1
ANSC 580	Environmental Physiology of Domestic Animals	3
Elective Courses		
In consultation wiht their graduate advisor, students choose at least 12 credits from the following list of core courses (other classes may be considered on an individual basis):		12
ANSC 462	Parasitology	
ANSC 507	Laboratory Techniques in Nutrition	
ANSC 520	Advanced Nutritional Management I: Feedlot	
ANSC 521	Advanced Nutritional Management II: Cow Calf/Stocker	
ANSC 560	Rumen Microbiology	
ANSC 602	Advanced Reproductive Physiology	
ANSC 604	Hypothalamo-Hypophyseal-Pineal Endocrinology	
ANSC 605	Gonadal and Uterine Endocrinology	
ANSC 606	Endocrinology of Pregnancy, Parturition, and Lactation	
ANSC 621	Metabolic Functions and Dysfunctions	

[1] must take two semesters of seminar

Creative Component

The creative component of the program involves completing at least two credits of ANSC 598 Special Research Programs. This requirement can be met in one of two ways. In consultation with the advisor, the student can select a topic of importance in domestic animal biology and prepare a comprehensive literature review covering that topic. An alternative way to meet this requirement is for the student, in consultation with the advisor, to conduct a research project and prepare a written manuscript for evaluation by the advisory committee. In either case, the student will present results of the project in the graduate Seminar (ANSC 515) and then be examined by the advisory committee.

In certain cases, the student may request approval from the Advisory Committee to complete two additional graduate courses (at least six credits) in lieu of one of the reports described above. If this approach is approved, the oral examination at the end of the program will cover all the courses completed during the MAG-DAB Program. Students pursuing this option must also prepare and present a topical seminar in ANSC 515 at some time during the program.

First Year		
Fall		**Credits**
ANSC 484	Ruminant Nutrition	3
ANSC 580	Environmental Physiology of Domestic Animals	3
Choose 3 credits from elective list:		3
ANSC 602	Advanced Reproductive Physiology	
ANSC 604	Hypothalamo-Hypophyseal-Pineal Endocrinology	
ANSC 605	Gonadal and Uterine Endocrinology	
ANSC 606	Endocrinology of Pregnancy, Parturition, and Lactation	
ANSC 621	Metabolic Functions and Dysfunctions	
	Credits	**9**
Spring		
ANSC 501	Advanced Animal Nutrition	3
ANSC 509	Endocrinology of Domestic Animals	3
Choose 1 of the following electives		3
ANSC 520	Advanced Nutritional Management I: Feedlot	
ANSC 521	Advanced Nutritional Management II: Cow Calf/Stocker	
ANSC 560	Rumen Microbiology	
	Credits	**9**
Second Year		
Fall		
ANSC 515	Graduate Seminar	1
ANSC 598	Special Research Programs	1-4
Choose 6 credits from elective list:		6
ANSC 602	Advanced Reproductive Physiology	
ANSC 604	Hypothalamo-Hypophyseal-Pineal Endocrinology	
ANSC 605	Gonadal and Uterine Endocrinology	
ANSC 606	Endocrinology of Pregnancy, Parturition, and Lactation	
ANSC 621	Metabolic Functions and Dysfunctions	
	Credits	**8-11**
Spring		
ANSC 512	Research Methods in Animal Science	4
ANSC 598	Special Research Programs	1-4
ANSC 515	Graduate Seminar	1
Choose 1 of the following electives		3
ANSC 520	Advanced Nutritional Management I: Feedlot	
ANSC 521	Advanced Nutritional Management II: Cow Calf/Stocker	
ANSC 560	Rumen Microbiology	
	Credits	**9-12**
	Total Credits	**35-41**

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 3.0.
- Students may take 12 credits from the following courses
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit.

Prefix	Title	Credits
ANSC 480	Environmental Physiology of Domestic Animals	3
ANSC 484	Ruminant Nutrition	3
ANSC 501	Advanced Animal Nutrition	3
ANSC 509	Endocrinology of Domestic Animals	3
ANSC 522	Animal Nutrition	3

Agricultural and Extension Education - Master of Arts

Thesis Option

Prefix	Title	Credits
Required Coursework		
AXED 5999	Master's Thesis	6
AXED 5110	Management of Change, Diffusion, and Adoption of Innovations	3
AXED 5165	History and Philosophy of Agricultural and Extension Education	3
AXED 5510	Research Methods	3
AXED 5515	Data Collection and Analysis	3
Approved Electives		*12*
AXED 5320	Risk and Crisis Communications in Agricultural, Consumer, and Environmental Sciences	
AXED 5150	Strategic Communications Campaigns and Evaluation	
AXED 5155	Youth Program Development and Management	
AXED 5310	New Mexico Water Issues	
AXED 5515	Data Collection and Analysis	
AXED 4520	Methods in Career and Technical Laboratory Instruction	

AXED 4610	Leadership On Agricultural and Natural Resource Issues
AXED 4710	4-H Youth Development
AXED 4997	Independent Study in Agricultural, Extension, or Technology Education
AXED 5105	Introduction to Special Education in Career and Technical Education
AXED 5130	Advanced Agricultural Mechanization
AXED 5160	Teaching Adults in Nonformal Settings
AXED 5170	Keys for Agricultural and Rural Development
AXED 5210	Curriculum Development and Assessment in Agricultural Education
AXED 5215	Developing Excellent Programs in Career and Technical Education
AXED 5220	Methods for Teaching Agricultural and Technology Education
AXED 5235	Directed Teaching in Extension Education
AXED 5330	Content Area Literacies
AXED 5230	Directed Teaching in Agricultural or Technology Education
AXED 5160	Teaching Adults in Nonformal Settings
AXED 5155	Youth Program Development and Management
AXED 5170	Keys for Agricultural and Rural Development
AXED 5210	Curriculum Development and Assessment in Agricultural Education
AXED 5215	Developing Excellent Programs in Career and Technical Education
AXED 5220	Methods for Teaching Agricultural and Technology Education
AXED 5230	Directed Teaching in Agricultural or Technology Education
AXED 5235	Directed Teaching in Extension Education
AXED 5610	Leadership on Agricultural and Natural Resource Issues
AXED 5615	Effective Management of Volunteer Programs
AXED 5993	Workshops in Agricultural, Extension, and Technology Education
AXED 5994	Creative Component
AXED 5996	Special Topics
AXED 5998	Internship/Cooperative Experience
AXED 5310	New Mexico Water Issues
AXED 5610	Leadership on Agricultural and Natural Resource Issues
AXED 5615	Effective Management of Volunteer Programs
AXED 5993	Workshops in Agricultural, Extension, and Technology Education
AXED 5996	Special Topics
AXED 5998	Internship/Cooperative Experience
AXED 4330	Content Area Literacies
or AXED 5330	Content Area Literacies
AXED 4510	Introduction to Research Methods
AXED 4510	Introduction to Research Methods
AXED 4520	Methods in Career and Technical Laboratory Instruction
AXED 4620	Methods of Teaching Biological, Earth and Physical Sciences in Agriculture
AXED 4715	The FFA Organization: An Overview
AXED 4620	Methods of Teaching Biological, Earth and Physical Sciences in Agriculture
AXED 4710	4-H Youth Development
AXED 4715	The FFA Organization: An Overview
AXED 5110	Management of Change, Diffusion, and Adoption of Innovations
AXED 5510	Research Methods
AXED 5515	Data Collection and Analysis
AXED 5999	Master's Thesis
AXED 4997	Independent Study in Agricultural, Extension, or Technology Education
AXED 4610	Leadership On Agricultural and Natural Resource Issues
Total Credits	**30**

Non-Thesis (Creative Component)

Prefix	Title	Credits
Required Coursework		
AXED 5994	Creative Component	4
AXED 5110	Management of Change, Diffusion, and Adoption of Innovations	3
AXED 5165	History and Philosophy of Agricultural and Extension Education	3
AXED 5510	Research Methods	3
AXED 5515	Data Collection and Analysis	3
Approved Electives		*14*
AXED 5150	Strategic Communications Campaigns and Evaluation	
AXED 5155	Youth Program Development and Management	
AXED 5215	Developing Excellent Programs in Career and Technical Education	
AXED 5320	Risk and Crisis Communications in Agricultural, Consumer, and Environmental Sciences	
AXED 5310	New Mexico Water Issues	
AXED 5998	Internship/Cooperative Experience	
AXED 5996	Special Topics	
AXED 5993	Workshops in Agricultural, Extension, and Technology Education	
AXED 5610	Leadership on Agricultural and Natural Resource Issues	
AXED 5615	Effective Management of Volunteer Programs	
AXED 5160	Teaching Adults in Nonformal Settings	
AXED 5105	Introduction to Special Education in Career and Technical Education	
AXED 5130	Advanced Agricultural Mechanization	
AXED 5155	Youth Program Development and Management	
AXED 5170	Keys for Agricultural and Rural Development	
AXED 5210	Curriculum Development and Assessment in Agricultural Education	
AXED 5220	Methods for Teaching Agricultural and Technology Education	
AXED 5230	Directed Teaching in Agricultural or Technology Education	
AXED 5235	Directed Teaching in Extension Education	
AXED 5330	Content Area Literacies	
AXED 4997	Independent Study in Agricultural, Extension, or Technology Education	
AXED 4715	The FFA Organization: An Overview	
AXED 4710	4-H Youth Development	
AXED 4620	Methods of Teaching Biological, Earth and Physical Sciences in Agriculture	

AXED 4610	Leadership On Agricultural and Natural Resource Issues
AXED 4510	Introduction to Research Methods
AXED 4330	Content Area Literacies
or AXED 5330	Content Area Literacies
AXED 4520	Methods in Career and Technical Laboratory Instruction
AXED 4510	Introduction to Research Methods
AXED 4520	Methods in Career and Technical Laboratory Instruction
AXED 4610	Leadership On Agricultural and Natural Resource Issues
AXED 4620	Methods of Teaching Biological, Earth and Physical Sciences in Agriculture
AXED 4710	4-H Youth Development
AXED 4715	The FFA Organization: An Overview
AXED 4997	Independent Study in Agricultural, Extension, or Technology Education
AXED 5110	Management of Change, Diffusion, and Adoption of Innovations
AXED 5160	Teaching Adults in Nonformal Settings
AXED 5170	Keys for Agricultural and Rural Development
AXED 5210	Curriculum Development and Assessment in Agricultural Education
AXED 5215	Developing Excellent Programs in Career and Technical Education
AXED 5220	Methods for Teaching Agricultural and Technology Education
AXED 5230	Directed Teaching in Agricultural or Technology Education
AXED 5235	Directed Teaching in Extension Education
AXED 5510	Research Methods
AXED 5310	New Mexico Water Issues
AXED 5515	Data Collection and Analysis
AXED 5610	Leadership on Agricultural and Natural Resource Issues
AXED 5615	Effective Management of Volunteer Programs
AXED 5996	Special Topics
AXED 5993	Workshops in Agricultural, Extension, and Technology Education
AXED 5998	Internship/Cooperative Experience
Total Credits	**30**

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. Students can take up to 12 credits of AXED graduate courses and get dual course credit that can be applied to both an undergraduate and master's degree.

You can also check the NMSU catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

AXED Courses Eligible for MAPS:

Upon approved enrollment to the AXED MAP Program, the following courses may be taken in the undergraduate program of study.

Prefix	Title	Credits
AXED 4520	Methods in Career and Technical Laboratory Instruction	2
AXED 4620	Methods of Teaching Biological, Earth and Physical Sciences in Agriculture	3
AXED 5105	Introduction to Special Education in Career and Technical Education	3
AXED 5110	Management of Change, Diffusion, and Adoption of Innovations	3
AXED 5150	Strategic Communications Campaigns and Evaluation	3
AXED 5155	Youth Program Development and Management	3
AXED 5165	History and Philosophy of Agricultural and Extension Education	3
AXED 5215	Developing Excellent Programs in Career and Technical Education	3
AXED 5220	Methods for Teaching Agricultural and Technology Education	3
AXED 5320	Risk and Crisis Communications in Agricultural, Consumer, and Environmental Sciences	3
AXED 5510	Research Methods	3
AXED 5330	Content Area Literacies	3

Applied and Agricultural Biology - Master of Science

The Master of Science degree program in Agricultural Biology is designed to produce graduates with the academic and research background needed to facilitate effective, innovative, and environmentally sound protection of plants and animals from a wide and varied spectrum of pests.

Students are prepared for careers in research, extension, teaching, private consulting, industry, and government or to continue in a broad range of Doctoral programs. Specific career opportunities include positions as agricultural consultants, technical and sales representatives for industry, state departments of agriculture and USDA specialists, agricultural extension agents, industry research and environmental technicians.

Prefix	Title	Credits
Program Requirements		
EPWS 590	Graduate Seminar [2]	2
Electives [2]		*12*
Experimental Statistics [3]		*3*

Courses within EPPWS		*13*
EPWS 462	Parasitology	
EPWS 471	Plant Mineral Nutrition	
EPWS 486	Plant Virology	
EPWS 492	Diagnosing Plant Disorders	
EPWS 502	General Entomology	
EPWS 505	Advanced Integrated Pest Management	
EPWS 511	Introduction to Weed Science (f)	
EPWS 514	Plant Physiology	
EPWS 520	Environmental Behavior of Pesticides (so)	
EPWS 525	Advanced Scientific Writing	
EPWS 549	Special Problems	
EPWS 551	Special Topics [4]	
EPWS 560	Ecology and Management of Invasive Plant Species	
EPWS 573	Fungal Biology	
EPWS 599	Master's Thesis [5]	
Total Credits		**30**

1 All graduate students are required to enroll in two (2) credits of Entomology, Plant Pathology and Weed Science seminars. Typically, a student will take one seminar credit during the first semester of graduate school and present their thesis proposal plan. Each student will take the second seminar credit in their last semester and present a public exit seminar just prior to the defense of their thesis work

2 *Outlines for M.S. degree plans are generated by the student in consultation with the major professor and with input from the student's assigned graduate committee.*

3 Exact course is selected with professor and/ or committee based off previous statistics experience.

4 Maximum of 4 credits per semester. No more than 9 credits toward a degree.

5 Maximum of 9 credits per semester. No more than 6 credits toward a degree.

Additional Requirements- Outlines for Master of Science degree plans are generated by the student in consultation with the major professor and with input from the student's assigned graduate committee.

- A minimum of 30 credit hours of graduate work is required of which:
  a. At least 15 credits must be in courses numbered 500 or above.
  b. At least 15 credits must be in EPWS courses.
  c. At least half of the credits (exclusive of thesis) must be taken with other than a single professor.
- Designated hours to be completed:

1. Students must take at least four but not more than six credits in EPWS 599 Master's Thesis. Students enrolled in EPWS 599 may be asked to present progress updates.
2. At least three credit hours in graduate-level Experimental Statistics (A ST 505 Statistical Inference I, A ST 506 Statistical Inference II, A ST 509 Statistical Models for Complex Data Structures, A ST 511 Statistical Methods for Data Analytics, A ST 515 Statistical Analysis with R, A ST 540 Predictive Analytics).

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to a faculty advisor about your MAP plan and develop a course plan in consultation with the advisor.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
EPWS 511	Introduction to Weed Science (f)	4
EPWS 514	Plant Physiology	3
EPWS 520	Environmental Behavior of Pesticides (so)	3
EPWS 505	Advanced Integrated Pest Management	3
EPWS 573	Fungal Biology	3

Agricultural Economics - Master of Science

Students entering the MS program are required to have completed

- intermediate microeconomics and intermediate macroeconomics (completed with a B grade or better),
- a college-level calculus class, and
- a course in statistics that included linear regression analysis.

Students that have not completed these courses may be admitted with the requirement that they take them as deficiencies at the beginning of their graduate program. Prospective graduate students must have at least a 3.0 undergraduate GPA. Students with a GPA less than 3.25 must complete the GRE or the GMAT exam.

Completion of the Master of Science degree in agricultural economics requires completion of a minimum of 33 graduate credit hours. Twenty-one of the credits must have one of the following three prefixes: AEEC, ECON, or ECDV. Twenty- four of the credits must be associated with course numbers greater than 500/5000. All students in the MS program must successfully complete the following core courses:

Prefix	Title	Credits
M.S. CORE (16-18 credits)		
AEEC 5120	Microeconomic Theory	3
AEEC 5130	Macroeconomic Theory	3
AEEC 5240	Econometrics	3
AEEC 5360	Production Economics	3
AEEC 5999	Master's Thesis [1]	6
Choose 3 Classes from AEAB Block (9 hrs) [2]		**9**
AEEC 5220	Financial Derivative Markets	
or BFIN 511	Financial Derivative Markets	
AEEC 5210	International Agricultural Trade Theory and Policy	
AEEC 5320	Microcomputer Applications in Agriculture	
AEEC 5330	Agribusiness Marketing	
AEEC 5340	Agribusiness Management	
AEEC 5140	Agricultural Policy [2]	
AEEC 5350	Economics of Water Resource Management and Policy	
AEEC 5996	Special Topics	
AEEC 5997	Individual Study	
Additional Graduate Courses (~6 hs) [3]		**6**
Total Credits		**33**

1. AEEC 5999 minimum hours required by the Graduate School are 4 with a maximum of 6 toward the degree. If a students elects to complete the minimum of 4 hours, they will need to take an additional course to meet the 33 hours required for the degree.
2. AEEC 5140 must be taken as part of this AEAB Block if not previously completed as an undergraduate under AEEC 3140V.
3. One of these two choices may include three (3) additional hours of AEEC 5997. In lieu of these 2 additional graduate courses, a student may select a justifiable minor (9+ hours) per Graduate School policy and only 2 courses (6 hours) from the AEAB Block.

MS students are generally required to write a thesis (AEEC 5999 Master's Thesis (4-6 credits). Non-thesis options that include a non-thesis research project (AEEC 5991 Non-Thesis Research Project, 3 credits) or an internship (AEEC 5998 Internship, 3 credits) must have approval from the student's committee and the graduate chairman. Students pursuing the MS degree may not complete the graduate program with more than one C grade in the core courses. If a student receives C grades in two of these core classes one of the classes must be repeated with a grade of at least B. In addition to core courses, nine additional credits must be completed from an agricultural economics and agricultural business (AEAB) course block. AEEC 5140 Agricultural Policy must be taken in the graduate program if an agricultural policy course was not taken as an undergraduate. Individual study (AEEC 5997 Individual Study) is limited to 6 credits hours toward a the degree. An oral defense is required of all master's candidates and will be scheduled and completed according to the guidelines of the Graduate School. The oral defense must be preceded by an open seminar to present major research findings to faculty, fellow students and the interested public.

New Mexico State University master's accelerated program provides the **opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to a faculty advisor about your MAP plan and develop a course plan in consultation with the advisor.

Up to 12 hours of coursework can be applied toward the completion of the master's degree. To receive graduate credit for the 12 credit hours, students must receive a grade of B- or higher.

Students' Qualifications
The student must be classified as a Junior or Senior (a minimum of 25 semester credit hours must be completed at NMSU).
The cumulative grade point average must be a minimum of 3.0.

Accepted MAP Courses
Upon approved enrollment to the AEAB MAP Program, the following courses may be taken in the undergraduate program of study. Any other courses may be considered after a consultation with an advisor and the department head.

Prefix	Title	Credits
AEEC 4550	Real Estate Appraisal	3
AEEC 5110	Introduction to Quantitative Methods	3
AEEC 5140	Agricultural Policy	3
AEEC 5220	Financial Derivative Markets	3
AEEC 5340	Agribusiness Management	3
ECON 457	Mathematical Economics	3

Athletic Training - Master of Science

The Master of Science in Athletic Training (MSAT) program at NMSU comprises 60 credit hours of coursework through traditional and hybrid courses. The MSAT is a 2-year (24-month) professional degree program that starts in June and prepares students to sit for the Board of Certification (BOC) exam leading to the ATC credential. The MSAT program is accredited by the Commission on Accreditation of Athletic Training Education (CAATE). Admissions are competitive, and applications are managed via the ATCAS (https://atcas.cas.myliaison.com/applicant-ux/) central application system. Review of applications begins on October 1st with rolling admissions until all seats are filled. Interested students can contact the Athletic Training Program Director, Kim O'Connell (kbrock@nmsu.edu) (575-646-5744), for further information.

The MSAT program at NMSU will consist of a minimum of 60 credit hours of coursework to be completed in the home department of Kinesiology at NMSU through both traditional and hybrid courses. The program provides a two-year (24-month) comprehensive exposure to Athletic Training designed to prepare individuals to become competent, independent clinicians who will enhance the quality of patient health care and advance the profession of athletic training through the application of evidence-based practice and translational research.

Theoretical coursework in the areas of injury prevention and care, injury evaluation and treatment, and therapeutic interventions of athletic injuries are included, as are clinical components that provide a progressive approach with observation, integrative and immersive experiences in clinical settings both on and off-campus.

Upon completion of the MSAT, students will be eligible to sit for the national Board of Certification (BOC) exam required to practice as an athletic trainer, leading to the ATC credential.

Enrollment in graduate courses in Athletic Training is limited to students who have been accepted into the MSAT program. To complete this course of study, each student is expected to meet the program's academic and clinical competency criteria, which are aligned with CAATE accreditation standards.

Instructions on application procedures for the MSAT can be found on the Kinesiology Department webpage. Questions may be directed to Kim O'Connell (kbrock@nmsu.edu) the Program Director for Athletic Training.

Prefix	Title	Credits
Theoretical Coursework		
SPMD 4805	Emergency Response	2
SPMD 5005	Foundations of Athletic Training	3
SPMD 5205	Evidence Based Practice	2
SPMD 5510	Psychology of Sport	3
SPMD 6005	Athletic Training Research I	2
SPMD 6010	Organization and Administration in Athletic Training	2
Clinical Coursework		
SPMD 5010	Clinical & Functional Anatomy in Athletic Training	2
SPMD 5120	Lower Extremity Injury Evaluation + Lab	4
SPMD 5220	Upper Extremity Injury Evaluation + Lab	4
SPMD 6020	Evaluation of the Head, Neck, Spine and Torso	3
SPMD 6280	General Medical Conditions & Therapeutic Medications	4
SPMD 5180	Therapeutic Interventions I	4
SPMD 5280	Therapeutic Interventions II	4
SPMD 5050	Clinical Education I	3
SPMD 5150	Clinical Education II	3
SPMD 5250	Immersive Clinical Experience	3
SPMD 6050	Clinical Education III	3
SPMD 6150	Clinical Education IV	3
Capstone Coursework		
SPMD 6110	Professional Preparation	3
SPMD 6999	Capstone Project I	3
Optional Electives		**0-3**
SPMD 5310	Inferential Statistics in Sports and Exercise Science	
SPMD 5350	Principles of Strength and Conditioning	
SPMD 5410	Biomechanics	
SPMD 6350	Advanced Exercise Physiology	
Total Credits		**60-63**

A Suggested Plan of Study:

The program follows a cohort model, with students progressing through the required
coursework in a specific sequence. Below is a proposed plan of study for the MSAT:

First Year		
Semester 1		**Credits**
SUMMER		
SPMD 4805	Emergency Response	2
SPMD 5005	Foundations of Athletic Training	3
SPMD 5010	Clinical & Functional Anatomy in Athletic Training	2
	Credits	**7**
Semester 2		
FALL		
SPMD 5050	Clinical Education I	3
SPMD 5120	Lower Extremity Injury Evaluation + Lab	4
SPMD 5180	Therapeutic Interventions I	4
	Credits	**11**
Semester 3		
SPRING		
SPMD 5150	Clinical Education II	3
SPMD 5220	Upper Extremity Injury Evaluation + Lab	4
SPMD 5280	Therapeutic Interventions II	4
SPMD 5510	Psychology of Sport	3
	Credits	**14**
Second Year		
Semester 1		
SUMMER		
SPMD 6010	Organization and Administration in Athletic Training	2
SPMD 5205	Evidence Based Practice	2
SPMD 5250	Immersive Clinical Experience	3
**SPMD 5250 Immersive Clinical Experience may be taken in any semester of the 2nd year following approval from the coordinator of clinical education		
	Credits	**7**
Semester 2		
FALL		
SPMD 6050	Clinical Education III	3
SPMD 6280	General Medical Conditions & Therapeutic Medications	4
SPMD 6020	Evaluation of the Head, Neck, Spine and Torso	3
SPMD 6005	Athletic Training Research I	2
	Credits	**12**
Semester 3		
SPMD 6150	Clinical Education IV	3
SPMD 6110	Professional Preparation	3
SPMD 6999	Capstone Project I	3
	Credits	**9**
	Total Credits	**60**

Animal Science - Master of Science

General Requirements

Graduate students must maintain at least a 3.0 grade point average. A minimum of 30 credit hours of graduate work if required, the following parameters must be met within those credits but can overlap.

1. At least 15 credits must be in courses numbered 500 or above
2. At least 15 credits must be in Animal Science courses
3. At least 15 credits (exclusive of ANSC 598) must be taken with other than a single professor

Prefix	Title	Credits
Required Courses		
ANSC 512	Research Methods in Animal Science	3-4
or A ST 512	Quantitative Analysis for Business Decisions	
Graduate Seminar		2
ANSC 515	Graduate Seminar	

ANSC 599	Master's Thesis	6
Choose 18-19 credits from the following, ensuring the above parameters are met:		18-19
ANSC 480	Environmental Physiology of Domestic Animals	
ANSC 484	Ruminant Nutrition	
ANSC 501	Advanced Animal Nutrition	
ANSC 507	Laboratory Techniques in Nutrition	
ANSC 509	Endocrinology of Domestic Animals	
ANSC 510	Range Nutrition Techniques	
ANSC 512	Research Methods in Animal Science	
ANSC 515	Graduate Seminar	
ANSC 520	Advanced Nutritional Management I: Feedlot	
ANSC 521	Advanced Nutritional Management II: Cow Calf/Stocker	
ANSC 522	Animal Nutrition	
ANSC 560	Rumen Microbiology	
ANSC 580	Environmental Physiology of Domestic Animals	
ANSC 602	Advanced Reproductive Physiology	
ANSC 604	Hypothalamo-Hypophyseal-Pineal Endocrinology	
ANSC 605	Gonadal and Uterine Endocrinology	
ANSC 606	Endocrinology of Pregnancy, Parturition, and Lactation	
ANSC 621	Metabolic Functions and Dysfunctions	
ANSC 625	Nutrient Metabolism I: Mineral, Vitamin, and Nitrogen Metabolism	
ANSC 626	Nutrient Metabolism II: Carbohydrates, Lipids, and Energetics	
Total Credits		**30**

Graduate Assistants

1. All graduate assistants must enroll as full-time students taking at least 9 graded graduate credits (courses numbered 450 and above). No audits can be taken as part of the 9 minimum credits. Only 3 of the 9 credits may be taken as an S/U option.
2. A graduate assistant may not enroll for more than 15 credits each semester.
3. If a student needs to take deficiency courses as part of the 9 credits, then a memo from the advisor or department head should be submitted to the Graduate School. If approved, the student can register for 3 undergraduate credits and a minimum of 6 graded graduate credits during their first semester at New Mexico State University.
4. Enrollment during summer sessions is not required.

Additional Requirements

1. A maximum of six credits in S/U courses may be taken during a Master's program
2. A maximum of six credits (four in a single semester) in ANSC 598 (Special Research Programs) may be taken during a Master's program.
3. If a minor is declared, a minimum of eight credits in this discipline must be completed and approved by that department.
4. In certain instances, deficiency courses may be required.
5. Attendance at graduate seminars is urged.
6. Graduate students are encouraged to adapt their thesis data for submission as a scientific journal article, an Experiment Station Bulletin, or research report.

The Masters Committee

The Masters Committee is appointed by the student's advisor with the approval of the Department Head and consists of four members including three from the animal science area and one representative from the Graduate School.

The Masters Final Examination

The Masters Final Oral Examination is primarily concerned with the thesis research conducted by the student but it may also extend over the entire discipline. Candidates for a Masters Degree are expected to demonstrate a thorough understanding of their research topic including how it was conducted, the results that were found, and what the results mean. They should also demonstrate knowledge of the general discipline of Animal Science.

First Year		
Fall		**Credits**
ANSC 484	Ruminant Nutrition	3
ANSC 580	Environmental Physiology of Domestic Animals	3
ANSC Elective: Student chooses 3 credits of elective courses		3
ANSC 602	Advanced Reproductive Physiology	
ANSC 604	Hypothalamo-Hypophyseal-Pineal Endocrinology	
ANSC 605	Gonadal and Uterine Endocrinology	
ANSC 606	Endocrinology of Pregnancy, Parturition, and Lactation	
ANSC 621	Metabolic Functions and Dysfunctions	
	Credits	**9**
Spring		
ANSC 501	Advanced Animal Nutrition	3
ANSC 509	Endocrinology of Domestic Animals	3
ANSC Elective: Student chooses 3 credits of elective courses		3
ANSC 520	Advanced Nutritional Management I: Feedlot	
ANSC 521	Advanced Nutritional Management II: Cow Calf/Stocker	
ANSC 560	Rumen Microbiology	
	Credits	**9**
Second Year		
Fall		
ANSC 515	Graduate Seminar	1
ANSC 598	Special Research Programs	1-4
Choose 6 credits from elective list		6
ANSC 602	Advanced Reproductive Physiology	
ANSC 604	Hypothalamo-Hypophyseal-Pineal Endocrinology	
ANSC 605	Gonadal and Uterine Endocrinology	
ANSC 606	Endocrinology of Pregnancy, Parturition, and Lactation	
ANSC 621	Metabolic Functions and Dysfunctions	
	Credits	**8-11**
Spring		
ANSC 515	Graduate Seminar	1
ANSC 598	Special Research Programs	1-4

ANSC 512	Research Methods in Animal Science	4
Choose 1 of the following electives		3
ANSC 520	Advanced Nutritional Management I: Feedlot	
ANSC 521	Advanced Nutritional Management II: Cow Calf/Stocker	
ANSC 560	Rumen Microbiology	
	Credits	**9-12**
	Total Credits	**35-41**

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- students may take 12 credits from the following courses
- The grade point average must be at a minimum of 3.0.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit.

Prefix	Title	Credits
ANSC 480	Environmental Physiology of Domestic Animals	3
ANSC 484	Ruminant Nutrition	3
ANSC 501	Advanced Animal Nutrition	3
ANSC 509	Endocrinology of Domestic Animals	3
ANSC 522	Animal Nutrition	3

Anthropology - Master of Arts

The Anthropology M.A. program is designed for students who are interested in the traditional sub-disciplines of anthropology, as well as such related fields as cultural resource management, food studies, medical anthropology, and museum studies. The program is directed to both students planning to complete a professional M.A. degree and students planning to enter a Ph.D. program. In addition to the M.A. in Anthropology, our program offers graduate minors in anthropology, archaeology, and food studies, as well as Graduate Certificates in cultural resource management and museum studies. The faculty encourage all graduate students to develop graduate minors and certificates, enhancing their specialized training in anthropology.

Program Outcomes:

1. Develop and execute a problem-oriented anthropological study using appropriate theoretical and methodological perspectives in at least one sub-field of anthropology. The study may focus on applied/practicing work or standard academic research, and will report the results in the form of a master's thesis, professional internship report, or professional research project report. The final thesis or report must show substantive data analysis by the student, directed toward an explicit anthropological research question.
2. Demonstrate effective written and verbal communication skills in professional settings.
3. Demonstrate professional engagement with peers, faculty, staff, researchers, and other professionals in anthropology.

An undergraduate anthropology degree is not required for entry into the M.A. program. Applicants who lack the equivalent of ANTH 301, ANTH 315, and ANTH 355 may be required to take these courses or corresponding sections of ANTH 502. ANTH 350 or the equivalent is recommended. Applicants without an undergraduate degree in anthropology are encouraged to contact the Graduate Advisor before applying to the M.A. program in anthropology.

The M.A. Program in Anthropology at NMSU is enrolled as an eligible graduate program under the Western Regional Graduate Program (https://www.wiche.edu/tuition-savings/wrgp/) (WRGP). WRGP allows master's, graduate certificate, and doctoral students who are residents of Western Interstate Commission for Higher Education (WICHE) member states to enroll in graduate programs outside of their home state and pay in-state resident tuition. Residents of the following states and territories are eligible to attend the M.A. Program in Anthropology at NMSU for in-state tuition rates: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, North Dakota, Oregon, South Dakota, U.S. Pacific Territories and Freely Associate States, Utah, Washington, and Wyoming. Interested graduate applicants should apply directly to the NMSU Graduate School and *identify themselves as WICHE WRGP applicants*. WRGP applicants must meet NMSU's WRGP admission requirements and deadlines. If you have further questions about the WRGP program and your eligibility, please contact Kathryn Olszowy at kolszowy@nmsu.edu.

Admission Requirements

To apply to the Anthropology Masters Degree program the following materials are required:

- Graduate School application form and fees
- Official undergraduate and graduate transcripts from all colleges and universities attended, with a 3.0 GPA minimum.
- A letter from the candidate addressing his or her interests and graduate school objectives
- Letters of recommendation from three persons familiar with the candidate's academic record

All the above items should be submitted through the Graduate School's central admission system at: https://gradschool.nmsu.edu/

NOTE: The GRE is not required.

NOTE: In addition to the above, **international applicants** also need to view the requirements of admission to the university and provide additional documentation online, at this page: https://isss.nmsu.edu/index-2/ (https://isss.nmsu.edu/)

NOTE: students may matriculate in either August or January. If a student wishes to be considered for a Graduate Assistantship, the application must be completed by **February 15** for admission in the fall semester. Assistantships are not usually offered for students matriculating in January, but they may be considered in subsequent semesters for an award.

For more information about the Anthropology Graduate Program contact:

Dr. Kathryn Olszowy, Anthropology Graduate Advisor
at: kolszowy@nmsu.edu

Dr. Lois Stanford, Anthropology Department Head at: lstanfor@nmsu.edu

The Anthropology M.A. program is designed for students who are interested in archaeology, cultural anthropology, and biological anthropology, as well as such related fields as cultural resource management (CRM), food studies, medical anthropology, and museum studies. The program is directed to both students planning to complete a professional M.A. degree and students planning to enter a Ph.D. program.

An undergraduate anthropology degree is not required for entry into the M.A. program. Applicants who lack the equivalent of ANTH 301, ANTH 315, and ANTH 355 may be required to take these courses or corresponding sections of ANTH 502. ANTH 350 or the equivalent is recommended. Prospective applicants without undergraduate degrees in anthropology are encouraged to contact the Graduate Advisor before applying.

Program Requirements

Students selecting the thesis option must complete 30 hours of basic course work, plus 6 hours of thesis credit. Students selecting the non-thesis option must complete 36 hours of course work including an internship or special research project for 6 credits. The credits required for students selecting either the thesis or non-thesis options are distributed as follows:

Prefix	Title	Credits
Core Graduate Courses [1]		**6**
ANTH 503	Anthropological Theory	
ANTH 505	Issues in Anthropological Practice	
Additional Courses		**24**
Select additional topical, methodological, and area courses in anthropology in consultation with graduate faculty committee [1]		
Students may count six graduate credits from disciplines outside of anthropology toward the total 24 credits of additional courses		
Thesis or Non-Thesis Options		
Select either a Thesis or Non-Thesis Track:		6
Thesis		
ANTH 599	Master's Thesis	
Non-Thesis		
ANTH 597	Internship	
or ANTH 598	Special Research Problems	
Total Credits		**36**

[1] earning a grade of B or better

A Suggested Plan of Study

The following road map is a guide for full-time students (9 or more credits/semester) to earn the Master of Anthropology degree within two years. We expect that each student will create a unique, customized degree plan in consultation with their graduate faculty committee.

First Year		
Fall		**Credits**
ANTH 505	Issues in Anthropological Practice	3
Elective Classes (2)		6
Non-Curricular Recommendations		
Join the Anthropology Graduate Student Organization (GSO)		
Identify a committee chair		
Begin to develop your MA project		
	Credits	**9**
Spring		
ANTH 503	Anthropological Theory	3
Elective Classes (2)		6
Non-Curricular Recommendations		
Work with your committee chair to develop your degree plan		
Finalize your graduate committee		
Complete your MA project proposal		
Hold your MA proposal hearing		
	Credits	**9**
Summer		
OPTIONAL: 3-6 credits of field training, field research, directed readings, or internship		
ANTH 522	Archaeological Field School	
ANTH 587	Field Work in Latin America	
ANTH 596	Readings	
ANTH 597	Internship	
Non-Curricular Recommendations		
Run STAR degree audit to check degree progress		
Begin research or data collection for MA project		
	Credits	**0**
Second Year		
Fall		
MA Thesis		3
ANTH 599 or ANTH 598	Master's Thesis or Special Research Problems	
Elective Classes (2)		6
Non-Curricular Recommendations		
Complete research/data collection for MA project		
Develop MA thesis/report outline with committee chair		
Begin writing MA thesis/report		
	Credits	**9**
Spring		
MA Thesis		3
ANTH 599 or ANTH 598	Master's Thesis or Special Research Problems	
Remaining elective classes (3–6 cr, or more if needed them to complete graduate minor/graduate certificate requirements)		3-6
Non-Curricular Recommendations		
Apply to graduate from degree (and certificate programs, if applicable) before the deadline listed on the Graduate School calendar		
Submit a complete draft of your MA thesis/report to your chair for review, and make revisions as needed		
With the approval of your chair, submit a final draft of your MA thesis/report to your full committee		
Schedule your and hold your final exam		
Submit your MA thesis to Proquest (and to your committee chair) before the deadline. If you completed a MA report, submit that final report to your committee members and the Department Head.		
	Credits	**6-9**
	Total Credits	**33-36**

Applied Statistics - Master of Science

The Department of Economics, Applied Statistics and International Business offers the Master of Science (MS) degree in applied statistics. The applied statistics program produces graduates proficient in the

practice of statistics and prepared to enter directly into positions in government or industry. Students in the program receive instruction in both the theory and the application of statistics, with an emphasis on experimental design and modeling. Statistical software packages, which are necessary for modern data analysis, are used throughout the curriculum. The program culminates in a capstone course in which students gain experience in analyzing real-world data.

Students from a variety of disciplines, including mathematics, psychology, engineering, and the natural sciences, have successfully completed the MS in applied statistics.

Admission

Requirements for regular admission to the MS in applied statistics include the following:

- A minimum 3.0-grade point average overall or in the last two years of study. Complete graduate and undergraduate transcripts must be supplied.
- Two semesters of calculus, equivalent to NMSU courses MATH 1511G Calculus and Analytic Geometry I MATH 1521G Calculus and Analytic Geometry II, and one semester of Linear Algebra equivalent to NMSU course MATH 2415 Introduction to Linear Algebra, completed with grades of B or better.
- Three letters of reference from former professors or others able to evaluate the student's academic potential.
- A one- to two-page typewritten letter of application, discussing academic objectives, professional plans, and specific reasons for selecting statistics as a field for advanced study.

In addition to the formal requirements above, some experience in computer programming is strongly recommended.

Applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL). Fluency in written and spoken English is essential to successful completion of the program. Further information regarding the TOEFL can be obtained from https://isss.nmsu.edu/ (https://gradschool.nmsu.edu/future-students/requirements/english-proficiency-transcript-evaluation.html).

Students must choose one of two options to complete the course requirements: the research option or the coursework-only option.

Research Option

Under the research option, the combined research (A ST 598 or A ST 599) and elective credits must equal six. The number of research credits may vary from four to six, with the remaining credits fulfilled with electives.

Prefix	Title	Credits
Theory		
A ST 565	Statistical Analysis I	3
A ST 566	Statistical Analysis II	3
Methods		
A ST 503	SAS Basics	3
A ST 505	Statistical Inference I	4
A ST 506	Statistical Inference II	3
A ST 507	Advanced Regression	3
A ST 509	Statistical Models for Complex Data Structures	3
A ST 515	Statistical Analysis with R	3
Research		
A ST 598	Special Research Problems	4-6
or A ST 599	Master's Thesis	
Electives		
Electives sufficient to bring total credits to 34		2-0
Capstone		
A ST 554	Practicum in Statistics	3
Total Credits		**34**

Coursework Only Option

Prefix	Title	Credits
Theory		
A ST 565	Statistical Analysis I	3
A ST 566	Statistical Analysis II	3
Methods		
A ST 503	SAS Basics	3
A ST 505	Statistical Inference I	4
A ST 506	Statistical Inference II	3
A ST 507	Advanced Regression	3
A ST 509	Statistical Models for Complex Data Structures	3
A ST 515	Statistical Analysis with R	3
Electives		
Electives sufficient to bring total credits to 34		6
Capstone		
A ST 554	Practicum in Statistics	3
Total Credits		**34**

Art - Master of Arts

Emphasis: Art History

An emphasis in art history requires a minimum of 33 credits of art history courses, 6 of which must be thesis credits. Additionally, 3 credits of related courses outside the Art Department must be taken with the approval of the department head and the student's major advisor.

Reading proficiency in a foreign language is also required and should be acquired prior to the beginning of thesis research for which it will be employed. A reading proficiency exam will be arranged in conjunction with the major advisor. Admission to the MA program with an emphasis in art history is based on an accredited BA or BS degree (or equivalent), including at least 18 credits in art history, museum studies, visual studies, or related disciplines. Undergraduate deficiencies must be completed before advancement to candidacy.

Prefix	Title	Credits
ARTH 579	Methodologies and Historiography of Art History and Art Theory	3
ARTH 599	Art History Thesis	6
Six 500-level ARTH Courses [1]		24
One 450 and above level course outside of the Department of Art		3
Total Credits		**36**

[1] ARTS 576 Museum/Gallery Research Internship may also be used once to fulfill this requirement

Candidacy and Thesis Committee Selection

Upon satisfactory completion of all required course work (except thesis credits) and foreign language requirement, the student will prepare a thesis proposal under the direction of the major professor. The student will then select the second member of his or her thesis committee

and submit the proposal to this committee member for approval. With the backing of these two advisors, the student must then present the proposal to the department faculty. After a successful presentation, the student will advance to candidacy and select the third committee member, who may be from outside the art department.

Astronomy - Master of Science

The Astronomy Department at NMSU offers programs leading to the Master of Science and the Doctor of Philosophy degrees. Graduate courses (http://astronomy.nmsu.edu/?page_id=2503) cover topics in astrophysics, stellar atmospheres, observational techniques, the interstellar medium, galactic structure, star formation and evolution, extragalactic objects, cosmology, and solar system studies. Students also take courses in other relevant fields to broaden their knowledge and capabilities.

Upon successful completion of the written and oral portions of the PhD comprehensive exam, it is the intention of the department that a student be awarded an Master of Science degree in Astronomy. Other students may elect to pursue a Terminal Master's degree rather than a Doctor of Philosophy upon the advice of their committee.

Terminal Masters: Thesis track

The rules for a Terminal Master of Science: Thesis track are outlined below.

For the Terminal Master of Science degree in Astronomy, the student must satisfy the requirements of the Department as well as those established by the Graduate School. The Department requires a minimum of 33 credits of which six are generally for Master's Thesis research.

The MINIMUM course requirements for a Thesis MS will include

Prefix	Title	Credits
ASTR 500	Seminar (3 credits (1 per semester)) [5]	3
Choose five courses from the following ASTR courses [6]		15
ASTR 503	Fundamentals of Astrophysics	
ASTR 506	Dynamics and Hydrodynamics	
ASTR 530	Gas and Radiative Processes	
ASTR 535	Observational Techniques	
ASTR 545	Stellar Spectroscopy	
ASTR 555	Galaxies I	
ASTR 565	Stellar Interiors	
ASTR 605	Interstellar Medium	
ASTR 616	Galaxies II	
ASTR 620	Planetary Processes	
ASTR 621	Planetary System Formation	
ASTR 630	Advanced Methods in Astrophysics	
ASTR 670	Heliophysics, Space Plasmas, and Space Weather	
ASTR 698	Special Topics.	
Select additional two courses from ASTR courses above, OR from the courses below [7]		6
PHYS 462	Intermediate Electricity and Magnetism II	
PHYS 511	Mathematical Methods of Physics I	
PHYS 554	Quantum Mechanics I	
PHYS 562	Electromagnetic Theory II	
PHYS 571	Advanced Experimental Optics	
PHYS 576	Advanced Computational Physics I	
E E 528	Fundamentals of Photonics	
E E 577	Fourier Methods in Electro-Optics	
CSCI 5996	Special Topics	
Special Research Programs [4]		
ASTR 598	Special Research Programs	3
Masters Research		
ASTR 599	Master's Thesis	6
Total Credits		**33**

[4] ASTR 598 Special Research Programs is generally taken in the student's 2nd year (fall or spring) and is intended to provide a semi-formal introduction to doing a research project. It may involve research that subsequently develops into a thesis project.

[5] ASTR 500 Seminar is 1-credit course. It should be taken each semester, for 3 total credits over this track

[6] Any 15 credits (5 courses) selected from these. Each course may only be taken for 3 credits.

[7] In addition to 5 courses from above, students should select another 2 courses (3 credits each, 6 credits total). This can be either another two astronomy graduate classes from above (which will make 7 total different astronomy courses) OR student may opt to take up to 2 out-of-department classes to fulfill the overall credit requirements if these classes are deemed by the student's committee to be appropriate to the student's program-of-study.
A maximum of one 3-credit course numbered between 450 and 499 can be applied to the out-of-department course/credit-hour requirement, and only with the approval of the student's Committee. Otherwise, out of department classes must be at the 500 or greater level.
If more than 6 credits of out-of-department classes are taken, they may potentially count toward the required total courses/credit hours, but only with the approval of the student's Committee. Traditionally, these have been in the area of PHYS, E E and CSCI, as listed. Other Physics courses, or courses offered by other departments such as Engineering, Geology, or Math, are also viable as out-of-department courses. Additionally, for those students intending to specialize in planetary science, courses taught in the Geology department and Geophysics courses taught in the Physics department should be considered.

Terminal Masters: Coursework-only track

The rules for a Terminal Master of Science: Coursework-only track are outlined below.

A thesis is nearly always required for a Terminal Master of Science degree. However, under some exceptional circumstances, the thesis requirement may be waived, in which case the credit requirements must be satisfied in formal course work. Such a waiver requires agreement by both the student's committee and the Department Head. In all cases, the student seeking a Terminal Master of Science degree must pass a final oral examination covering course and any relevant research work. Any regular Terminal Master of Science degree program will require a thesis.

For a student who has decided and been approved to pursue a Course-work only Master of Science Astronomy degree, the MINIMUM course requirements are:

Prefix	Title	Credits
ASTR 500	Seminar (3 credits (1 per semester)) [5]	3
Choose seven courses from the following ASTR courses [8]		21

ASTR 503	Fundamentals of Astrophysics	
ASTR 506	Dynamics and Hydrodynamics	
ASTR 530	Gas and Radiative Processes	
ASTR 535	Observational Techniques	
ASTR 545	Stellar Spectroscopy	
ASTR 555	Galaxies I	
ASTR 565	Stellar Interiors	
ASTR 605	Interstellar Medium	
ASTR 616	Galaxies II	
ASTR 620	Planetary Processes	
ASTR 621	Planetary System Formation	
ASTR 630	Advanced Methods in Astrophysics	
ASTR 670	Heliophysics, Space Plasmas, and Space Weather	
ASTR 698	Special Topics.	
Select additional two courses from ASTR courses above, OR from the courses below [9]		6
PHYS 462	Intermediate Electricity and Magnetism II	
PHYS 511	Mathematical Methods of Physics I	
PHYS 554	Quantum Mechanics I	
PHYS 562	Electromagnetic Theory II	
PHYS 571	Advanced Experimental Optics	
PHYS 576	Advanced Computational Physics I	
E E 528	Fundamentals of Photonics	
E E 577	Fourier Methods in Electro-Optics	
CSCI 5996	Special Topics	
Special Research Programs [4]		
ASTR 598	Special Research Programs	3
Total Credits		**33**

[5] ASTR 500 Seminar is 1-credit course. It should be taken each semester, for 3 total credits over this track

[8] Any 21 credits (7 courses) selected from these. Each course may only be taken for 3 credits.

[9] In addition to 7 courses from above, students should select another 2 courses (3 credits each, 6 credits total). This can be either another two astronomy graduate classes from above (which will make 9 total different astronomy courses) OR student may opt to take up to 2 out-of-department classes to fulfill the overall credit requirements if these classes are deemed by the student's committee to be appropriate to the student's program-of-study.
A maximum of one 3-credit course numbered between 450 and 499 can be applied to the out-of-department course/credit-hour requirement, and only with the approval of the student's Committee. Otherwise, out of department classes must be at the 500 or greater level.
If more than 6 credits of out-of-department classes are taken, they may potentially count toward the required total courses/credit hours, but only with the approval of the student's Committee.
Traditionally, these have been in the area of PHYS, E E and CSCI, as listed. Other Physics courses, or courses offered by other departments such as Engineering, Geology, or Math, are also viable as out-of-department courses. Additionally, for those students intending to specialize in planetary science, courses taught in the Geology department and Geophysics courses taught in the Physics department should be considered.

[4] ASTR 598 Special Research Programs is generally taken in the student's 2nd year (fall or spring) and is intended to provide a semi-formal introduction to doing a research project. It may involve research that subsequently develops into a thesis project.

Masters degree: Upon completion of PhD comprehensive exam track

The requirements for the Masters track are for the student to have completed their PhD comprehensive exam, and the following credits:

Prefix	Title	Credits
ASTR 500	Seminar (4 credits (1 per semester)) [1]	4
Choose nine courses from the following ASTR courses [2]		27
ASTR 503	Fundamentals of Astrophysics	
ASTR 506	Dynamics and Hydrodynamics	
ASTR 530	Gas and Radiative Processes	
ASTR 535	Observational Techniques	
ASTR 545	Stellar Spectroscopy	
ASTR 555	Galaxies I	
ASTR 565	Stellar Interiors	
ASTR 605	Interstellar Medium	
ASTR 616	Galaxies II	
ASTR 620	Planetary Processes	
ASTR 621	Planetary System Formation	
ASTR 630	Advanced Methods in Astrophysics	
ASTR 670	Heliophysics, Space Plasmas, and Space Weather	
ASTR 698	Special Topics.	
Select additional two courses from ASTR courses above, OR from the courses below [3]		6
PHYS 462	Intermediate Electricity and Magnetism II	
PHYS 511	Mathematical Methods of Physics I	
PHYS 554	Quantum Mechanics I	
PHYS 562	Electromagnetic Theory II	
PHYS 571	Advanced Experimental Optics	
PHYS 576	Advanced Computational Physics I	
E E 528	Fundamentals of Photonics	
E E 577	Fourier Methods in Electro-Optics	
CSCI 5996	Special Topics	
Special Research Programs [4]		
ASTR 598	Special Research Programs	3
Pre-dissertation Research [5]		
ASTR 600	Pre-dissertation Research	6
Total Credits		**46**

[1] ASTR 500 Seminar is 1-credit course. It should be taken each semesters, for 4 total credits over the program

[2] Any 27 credits (9 courses) selected from these. Each course may only be taken for 3 credits.

[3] In addition to 9 courses from above, students should select another 2 courses (3 credits each, 6 credits total). This can be either another two astronomy graduate classes from above (which will make 7 total different astronomy courses) OR student may opt to take up to 2 out-of-department classes to fulfill the overall credit requirements if these classes are deemed by the student's committee to be appropriate to the student's program-of-study.
A maximum of one 3-credit course numbered between 450 and 499 can be applied to the out-of-department course/credit-hour requirement, and only with the approval of the student's Committee. Otherwise, out of department classes must be at the 500 or greater level.

If more than 6 credits of out-of-department classes are taken, they may potentially count toward the required total courses/credit hours, but only with the approval of the student's Committee. Traditionally, these have been in the area of PHYS, E E and CSCI, as listed. Other Physics courses, or courses offered by other departments such as Engineering, Geology, or Math, are also viable as out-of-department courses. Additionally, for those students intending to specialize in planetary science, courses taught in the Geology department and Geophysics courses taught in the Physics department should be considered.

[4] ASTR 598 Special Research Programs is generally taken in the student's 2nd year (fall or spring) and is intended to provide a semi-formal introduction to doing a research project. It may involve research that subsequently develops into a thesis project.

Year A

A Suggested Plan of Study For Students

A typical roadmap for the Masters Thesis track program, including course and credit-hour minimum requirements, is summarized in the following table. Note there is some flexibility for each of these components, so students should confirm all their selections directly with their advisor. Most regular graduate courses (501-597, 601-699) are offered on a 2 year rotation. So specific courses will depend on whether a student is on a year A or Year B cycle. ASTR 503 Fundamentals of Astrophysics is offered each fall and should be taken by all students in their first year only. Students may opt for up to 2 courses (6 credits) from outside the department (See Course Requirements). ASTR 598 Special Research Programs and ASTR 599 Master's Thesis are offered every semester, as one-on-one research credits with an advisor.

For a student on wishing to pursue a Master Coursework-only track, they may substitute the 6 credits of 599 credits for any of the regular Yr A or Yr B courses

First Year		
Fall		**Credits**
ASTR 500	Seminar [1]	1
ASTR 503	Fundamentals of Astrophysics	3
Choose two courses from the following:		6
ASTR 535	Observational Techniques	
ASTR 565	Stellar Interiors	
ASTR 605	Interstellar Medium	
	Credits	**10**
Spring		
ASTR 500	Seminar [1]	1
Choose three courses from the following		9
ASTR 621	Planetary System Formation	
ASTR 630	Advanced Methods in Astrophysics	
ASTR 670	Heliophysics, Space Plasmas, and Space Weather	
	Credits	**10**
Second Year		
Fall		
ASTR 500	Seminar [1]	1
Choose one from the following: [2]		3
ASTR 555	Galaxies I	
ASTR 620	Planetary Processes	
ASTR 698	Special Topics.	
Research Programs Course [2]		0-3
ASTR 598	Special Research Programs [2]	
ASTR 599	Master's Thesis [3,4]	3
	Credits	**7-10**
Spring		
ASTR 599	Master's Thesis [3, 4]	3-9
Choose one from the following:		3
ASTR 506	Dynamics and Hydrodynamics	
ASTR 545	Stellar Spectroscopy	
ASTR 616	Galaxies II	
Research Programs Course [2]		0-3
ASTR 598	Special Research Programs [2]	
	Credits	**6-15**
	Total Credits	**33-45**

[1] Students must take ASTR 500 Seminar as 1-credit in each of their first 3 semesters, for a total of 3 credits over 2 years

[2] Students must take ASTR 598 Special Research Programs for 3 credits during fall of Yr2 or spring of Yr2.

[3] Students on a Thesis track must take 6 total credits of ASTR 599 Master's Thesis in Yr 2. Students on a coursework-only track may substitute any 6 credits of regular Yr2 course in place of 599 credits

[4] Students on a Thesis track who have completed 10 credits in each of their first 3 semesters, including 3 ASTR 598 Special Research Programs and 3 ASTR 599 Master's Thesis in fall of Yr2 only require 3 credits of ASTR 599 in spring of Yr2 in order to meet minimum requirements as detailed in Course Requirements above. Students on a Coursework-only track who have completed 10 credits in each of their first 3 semester, including 3 ASTR 598, only require 3 more regular course credits in spring of Yr2. However graduate students must enroll in 9 credits each semester in order to remain full time and retain eligibility for an GA. For students in their final semester of dissertation writing, it is possible to petition the Graduate School for permission to enroll in fewer credits, for that one semester only, to reduce tuition expenses. For students who do not complete their Masters in 2 years, they should continue to enroll in ASTR 599 in future semesters.

Year B

A Suggested Plan of Study For Students

A typical roadmap for the Masters Thesis track program, including course and credit-hour minimum requirements, is summarized in the following table. Note there is some flexibility for each of these components, so students should confirm all their selections directly with their advisor. Most regular graduate courses (501-597, 601-699) are offered on a 2 year rotation. So specific courses will depend on whether a student is on a year A or Year B cycle. ASTR 503 Fundamentals of Astrophysics is offered each fall and should be taken by all students in their first year only. Students may opt for up to 2 courses (6 credits) from outside the department (See Course Requirements). ASTR 598 Special Research Programs and ASTR 599 Master's Thesis are offered every semester, as one-on-one research credits with an advisor.

For a student on wishing to pursue a Master Coursework-only track, they may substitute the 6 credits of 599 credits for any of the regular Yr A or Yr B courses

First Year		
Fall		**Credits**
ASTR 500	Seminar [1]	1
ASTR 503	Fundamentals of Astrophysics	3
Choose two courses from the following:		6
ASTR 555	Galaxies I	
ASTR 620	Planetary Processes	
ASTR 698	Special Topics.	
	Credits	**10**
Spring		
ASTR 500	Seminar [1]	1
Choose three from the following:		9
ASTR 506	Dynamics and Hydrodynamics	
ASTR 545	Stellar Spectroscopy	
ASTR 616	Galaxies II	
	Credits	**10**
Second Year		
Fall		
ASTR 500	Seminar [1]	1
Choose one from the following: [2]		3
ASTR 535	Observational Techniques	
ASTR 565	Stellar Interiors	
ASTR 605	Interstellar Medium	
Research Programs Course [2]		0-3
ASTR 598	Special Research Programs	
ASTR 599	Master's Thesis [3,4]	3
	Credits	**7-10**
Spring		
ASTR 599	Master's Thesis [3, 4]	3
Choose one from the following:		3
ASTR 621	Planetary System Formation	
ASTR 630	Advanced Methods in Astrophysics	
Research Programs Course [2]		0-3
ASTR 598	Special Research Programs	
	Credits	**6-9**
	Total Credits	**33-39**

1 Students must take ASTR 500 Seminar as 1-credit in each of their first 3 semesters, for a total of 3 credits over 2 years

2 Students must take ASTR 598 Special Research Programs for 3 credits during fall of Yr2 or spring of Yr2.

3 Students on a Thesis track must take 6 total credits of ASTR 599 Master's Thesis in Yr 2. Students on a coursework-only track may substitute any 6 credits of regular Yr2 course in place of 599 credits

4 Students on a Thesis track who have completed 10 credits in each of their first 3 semesters, including 3 ASTR 598 Special Research Programs and 3 ASTR 599 Master's Thesis in fall of Yr2 only require 3 credits of ASTR 599 in spring of Yr2 in order to meet minimum requirements as detailed in Course Requirements above. Students on a Coursework-only track who have completed 10 credits in each of their first 3 semester, including 3 ASTR 598, only require 3 more regular course credits in spring of Yr2. However graduate students must enroll in 9 credits each semester in order to remain full time and retain eligibility for an GA. For students in their final semester of dissertation writing, it is possible to petition the Graduate School for permission to enroll in fewer credits, for that one semester only, to reduce tuition expenses. For students who do not complete their Masters in 2 years, they should continue to enroll in ASTR 599 in future semesters.

Master's Accelerate Program (MAP)

MAP Requirements

In addition to the requirements of the NMSU Graduate School, admission into the Astronomy MAP program requires:

A minimum GPA of 3.5
Student be classified as a rising junior
Completion of the MAP Referral Form and submission with all necessary signatures and anticipated course registrations prior to the first Friday of classes in the junior year.
Students may enroll in up to 12 credits of coursework at the 450+ level and count these credits toward their MS. At least 6 of these credits must come from graduate-level (500+) Astronomy courses, while the other 6 credits may be from outside the Astronomy Department (see below). A final grade of B or higher is required for a course to count toward the Astronomy MS. Students who complete all 12 credits with a final grade of B or higher may apply to the Astronomy MS program, but are not guaranteed admission. MAP-MS students must pass a final oral comprehensive exam toward the end of their MS year.

Students admitted to the Astronomy MAP-MS program will be considered for funding at 20 hours/week through Teaching Assistantships.

Prefix	Title	Credits
PHYS 471	Modern Experimental Optics	3
PHYS 476	Computational Physics	3
PHYS 480	Thermodynamics	3
PHYS 495	Mathematical Methods of Physics I	3

Bioinformatics - Master of Science

The Master of Bioinformatics degree has two tracks, a track for students without a BS/BA in computer science or equivalent degree (Track: *Non-Computing Background*) and a track for students with a BS/BA in computer science or equivalent degree (Track: *Computer Science Background*). In each of the track, two options are available, one with **thesis or project** option and a **course-work only** option.

- For **Thesis/Project option's students**: the requirements are listed in the tables below.
- For **Course-Work Only option's students:** Each student following this option is not required to complete a Thesis/Project but needs to take, in addition to the basic requirement (Core + Elective courses), **9 credits** of graduate courses that are listed for each track with the following restrictions:
  - One course can only be used to satisfy one requirement (e.g., if a course used to satisfy the core requirement category, it cannot be counted towards satisfying the requirements on **9 credits**).
  - At most 6 credits of CSCI 5996 Special Topics with different topics (i.e., with different subtitles) can be counted towards the degree program of the student.
  - No independent research or thesis/project (e.g., Computer Science course numbered > 5888) can be counted towards the degree program.

Track: Non-Computing Background

Prefix	Title	Credits
Required Courses		
Core Courses		
BIOL 550	Special Topics (Command Line Genomics)	3
A ST 505	Statistical Inference I	4
CSCI 4520	Python Programming I	3
BIOL 550	Special Topics (R for ecological sciences)	3
or CSCI 4530	R Programming I	
CSCI 5310	Bioinformatics Programming	3
Select one of the following		**3**
CSCI 5415	Introduction to Data Mining	
CSCI 5420	Applied Machine Learning I	
CSCI 5860	Algorithms in Systems Biology	
Elective Courses (2 from the following list)		*6*
CSCI 4545	Object Oriented Programming Transition	
CSCI 5305	Bioinformatics	
CSCI 5860	Algorithms in Systems Biology	
GENE 452	Applied Bioinformatics	
or BIOL 566	Advanced Bioinformatics and NCBI Database	
A ST 550	Special Topics (Statistical bioinformatics course)	
A ST 550	Special Topics (Current topics in bioinformatics - open issues)	
Master's Project/Thesis/Internship [1]		*6*
CSCI 5994	Master's Project	
or CSCI 5999	Master's Thesis	
Total Credits		**31**

[1] A student can write a thesis (CSCI 5999 Master's Thesis), undertake a research project (CSCI 5994 Master's Project, or participate in an internship related to the degree. In each case, six graduate credits are required and a written approval from the student's advisor must be obtained before the student undertakes this part of the study. For students with thesis or project, the students are required to sustain a final exam, covering the thesis/research project.

Track: Computer Science Background

Prefix	Title	Credits
Required Courses [2]		
CSCI 5415	Introduction to Data Mining	3
CSCI 5310	Bioinformatics Programming	3
CSCI 5505	Analysis of Algorithms	3
CSCI 5860	Algorithms in Systems Biology	3
CSCI 5810	Advanced Software Engineering	3
Select one from the following:		3
CSCI 5305	Bioinformatics	
GENE 452	Applied Bioinformatics	
BIOL 566	Advanced Bioinformatics and NCBI Database	
Elective Courses (2 from the following list)		*6*
A ST 505	Statistical Inference I	
A ST 506	Statistical Inference II	
BCHE 546	Biochemistry II: Central and Intermediary Metabolism	
BCHE 649	Topics in Biochemistry	
BIOL 474	Immunology	
BIOL 475	Virology	
BIOL 478	Molecular Biology of Microorganisms	
BIOL 490	Neurobiology	
BIOL 520	Molecular Cell Biology	
BIOL 566	Advanced Bioinformatics and NCBI Database	
CSCI 5140	Database Management Systems I	
CSCI 5405	Artificial Intelligence I	
CSCI 5305	Bioinformatics	
CSCI 5215	Parallel Programming	
CSCI 5750	Artificial Intelligence II	
CSCI 5820	Database Management Systems II	
GENE 452	Applied Bioinformatics	
GENE 486	Genes and Genomes	
MOLB 542	Biochemistry I	
MOLB 546	Biochemistry II	
MOLB 590	Discussions in Molecular Biology	
Master Thesis/Project/Internship [1]		*6*
CSCI 5999	Master's Thesis	
or CSCI 5994	Master's Project	
Total Credits		
Total Credits		**30**

[1] A student can write a thesis (CSCI 5999 Master's Thesis), undertake a research project (CSCI 5994 Master's Project), or participate in an internship related to the degree. In each case, six graduate credits are required and a written approval from the student's advisor must be obtained before the student undertakes this part of the study. For students with thesis or project, the students are required to sustain a final exam, covering the thesis/research project.

Degree Road Map

- **For students with non-computing background**
  - Semester 1: BIOL 550 Special Topics (Command Line Genomics), CSCI 4530 R Programming I, A ST 505 Statistical Inference I
  - Semester 2: CSCI 4520 Python Programming I one elective course, CSCI 5310 Bioinformatics Programming
  - Semester 3: CSCI 5860 Algorithms in Systems Biology, Master's project/thesis/internship (3 credits), one elective
  - Semester 4: Master's project/thesis/internship (3 credits)
  - For students following the **Course Work Only** option, the Master's project/thesis/internship course in Semester 3 and 4 should be changed to a course on the list and an extra course in Semester 4.
- **For students with Computer Science background**
  - Semester 1: CSCI 5505 Analysis of Algorithms, CSCI 5305 Bioinformatics, A ST 505 Statistical Inference I
  - Semester 2: CSCI 5310 Bioinformatics Programming, CSCI 5415 Introduction to Data Mining ,CSCI 5810 Advanced Software Engineering
  - Semester 3: Master's project/thesis/internship (3 credits), CSCI 5860 Algorithms in Systems Biology, and an elective
  - Semester 4: Master's project/thesis/internship (3 credits)
  - For students following the **Course Work Only** option, the Master's project/thesis/internship course in Semester 3 and 4 should be

changed to a course on the list and an extra course in Semester 4.

A Suggested Plan of Study for Students (with non-computing background)

It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Semester 1		Credits
CSCI 4530	R Programming I	3
A ST 505	Statistical Inference I	4
BIOL 550	Special Topics (Command Line Genomics)	1-3
	Credits	**8-10**
Semester 2		
CSCI 4520	Python Programming I	3
CSCI 5310	Bioinformatics Programming	3
Elective Course		3
	Credits	**9**
Semester 3		
CSCI 5415	Introduction to Data Mining	3
CSCI 5860	Algorithms in Systems Biology	3
Master's Project/Thesis or Internship		3
	Credits	**9**
Semester 4		
Master's project/thesis or internship		3
	Credits	**3**
	Total Credits	**29-31**

A Suggested Plan of Study for Students (with a Computer Science background)

It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Semester 1		Credits
CSCI 5415	Introduction to Data Mining	3
CSCI 5310	Bioinformatics Programming	3
BIOL 566	Advanced Bioinformatics and NCBI Database	3
	Credits	**9**
Semester 2		
CSCI 5305	Bioinformatics	3
CSCI 5505	Analysis of Algorithms	3
GENE 452	Applied Bioinformatics	3
	Credits	**9**
Semester 3		
CSCI 5810	Advanced Software Engineering	3
CSCI 5860	Algorithms in Systems Biology	3
Elective Course [1]		3
	Credits	**9**
Semester 4		
Master's project/thesis or internship		3
Elective Course [1]		3
	Credits	**6**
	Total Credits	**33**

Biology - Master of Science

The Master of Science degree can be obtained through either a thesis option or a non-thesis option. Both options require 30 credits of course work. The non-thesis option can be completed as an accelerated (one-year) program concentrating in biotechnology or through an individual degree plan in consultation with the student's Master of Science committee.

Master of Science Non-Thesis Option.
There are two formal course requirements for the MS non-thesis option as listed below.

Prefix	Title	Credits
Course Requirements		
BIOL 510	Current Topics in Biology	3
BIOL 540	Science and Ethics	1-3
Elective courses - courses with level from 450 - 598		24-26
At least 15 of the 30 credits should come from BIOL courses numbered 450 and above.		
Total Credits		**30**

Biotechnology Program

This is an accelerated (one year) non-thesis Master of Science degree in Biology that focuses on biotechnology. The program requires 30 hours of course work. The courses in this program are designed to prepare students for biotechnology-related careers in basic and applied research; in product development and testing; and in policy-making, regulation and law enforcement. The program of study includes practical training in molecular biology, genomics and bioinformatics, statistical analysis, business, bioethics and professional development skills. Additional graduate course work will provide students with further expertise in their individual areas of interest, including cell, molecular, and microbial biology; environmental, ecological and evolutionary biology; and general and integrative biology. Students who complete this training will be prepared for successful employment in academic, corporate, and government settings.

Prefix	Title	Credits
BIOL 510	Current Topics in Biology	3
BIOL 540	Science and Ethics	1-3
BIOL 541	Professional Development Seminar	1-3
MGMT 503	Organizational Behavior and Management Processes	3
A ST 505	Statistical Inference I	3-4
or BIOL 455	Biometry	
BIOL 509	Guided Biological Research Lab	3
or BIOL 550 Special Topics - Molecular Biology Techniques Lab		
BIOL 566	Advanced Bioinformatics and NCBI Database	3
or GENE 452	Applied Bioinformatics	
or BIOL 562	Advanced Genomics Technology	
Biological Knowledge Electives		8-13
At least 15 of the 30 credits should come from BIOL courses numbered 450 and above.		
Optional Internship [1]		
Total Credits		**30**

Master of Science - Thesis Option. There are three formal course requirements for the MS thesis option as listed below

Prefix	Title	Credits
BIOL 510	Current Topics in Biology	3
BIOL 540	Science and Ethics	1-3
Master's Thesis (4-6 Hours)		4-6
BIOL 599	Master's Thesis	
Elective courses - courses with level 450-598		18-22
At least 15 of the 30 credits should come from BIOL courses numbered 450 and above.		
Total Credits		**30**

For research toward the Master of Science degree, students can choose among the Department's three areas of emphasis:

1. Behavioral, Ecological and Evolutionary Biology
The Behavioral, Ecological and Evolutionary Biology program is appropriate for graduate students who wish to specialize in areas of biology that study the various processes that encompass the behavior, ecology, and evolution of living and extinct taxa.

2. Cell and Organismal Biology
The Cell and Organismal Biology program is appropriate for all Graduate students who wish to emphasize those areas of biology that integrate function and structure in cells, tissues, and organisms. This emphasis focuses in faculty areas of expertise in cell and molecular biology, neurobiology, developmental biology, and physiology.

3. Microbiology
The Microbiology curriculum is appropriate for graduate students who wish to specialize in areas of biology that study the various processes that occur in microbes (bacteria, viruses, fungi, and protists) such as their physiology, ecology, development or evolution.

All graduate students should develop their curriculum plan in consultation with the faculty advisor and graduate committee. Details of sample course sequences within the different emphases are described in the Biology Graduate Handbook available for download from the Graduate Student section of the Biology website https://bio.nmsu.edu/students/grads.html.

Graduate students may also earn a minor in other graduate departments and programs.

[1] This may include a research internship in a biotechnology company or in a biological research laboratory at NMSU or other research institutions. From 1 to 6 credits earned as BIOL 598 during an internship may count towards the required elective credits.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to a faculty advisor about your MAP plan and develop a course plan in consultation with the advisor. The faculty advisor should preferably be from the area of your interest.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
BIOL 450	Special Topics	1-3
BIOL 455	Biometry	3
BIOL 459	Darwinism Versus Creationism	3
BIOL 467	Evolution	3
BIOL 474	Immunology	3
BIOL 475	Virology	3
BIOL 479	Medical Microbiology	3
BIOL 490	Neurobiology	3

Business Administration - Master of Business Administration

The Master of Business Administration (MBA) program is a professional program designed to provide students with a solid background in business practices and the problem-solving and people skills needed to become successful leaders in the global business environment. Program graduates are prepared for administrative or managerial positions in a wide variety of organizations, both private and governmental. The business and accounting programs at NMSU, including the MBA program, are accredited by AACSB International - The Association to Advance Collegiate Schools of Business.

The MBA program is offered in a traditional classroom with some online delivery and in a cohort-based distance program with a synchronous online component.

Details are available at http:\\business.nmsu.edu/mba (https://business.nmsu.edu/masters-programs/mba/).

Admissions

Applicants must meet the basic admission requirements of the Graduate School before they are considered for admission to the MBA program. To be considered for admission to the MBA program, applicants must meet one of the following criteria:

1. Have an undergraduate degree with a GPA of at least 3.0 from a regionally accredited U.S. College or University; or
2. Have achieved a minimum Graduate Management Admission Test (GMAT) score of 400 and a combined GMAT score and undergraduate GPA such that (GPA x 200)+ GMAT is greater than or equal to 1050; or
3. Have a graduate degree from a regionally accredited U.S. college or university; or
4. Have a Professional Certification in one of the following: Certified Public Accountant (CPA): Certified Management Account (CMA), Chartered Financial Analyst (CFA), Certified Financial Planner (CFP), or Project Management Professional (PMP) with an official copy of the certificate; or
5. Have completed at least five years of relevant, full-time, post-degree, professional work experience with an undergraduate GPA of at least 2.50 from a regionally accredited U.S. college or university.

As an alternative to the GMAT, students may submit a GRE score which can be converted to the equivalent GMAT score. (Information about the GMAT can be found at www.mba.com.) If a GMAT score is required, the official score must be submitted to the MBA Program Office at least one month prior to initial enrollment in the program. GRE scores are sent directly to the NMSU Graduate School.

A maximum of 9 credit hours of the required MBA courses may be completed prior to the student's acceptance into the MBA degree program.

Note: Regardless of the pathway to admission, all students must have an undergraduate degree.

Background Knowledge

The MBA program is designed to encourage participation by students with a variety of educational backgrounds, therefore changes to the background knowledge requisite have been implemented. Students entering the MBA program are no longer required to have the background knowledge requirements completed prior to starting the program. The courses in the MBA program will be taught in a manner where you would not need the prerequisites, however the student has the choice to take the courses. The courses are undergraduate courses and offered in fall, spring and summer semesters. See MBA Advisor.

Program Requirements (36 credits)

The MBA program consists of twelve courses. Eleven are required courses, and one approved elective.

Prefix	Title	Credits
Required Courses		
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
BLAW 502	Legal Environment of Business	3
ECON 503	Managerial Economics	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MGMT 590	Strategic Management	3
A ST 512	Quantitative Analysis for Business Decisions	3
MKTG 503	Marketing Management	3
B A 590	Professional Paper/Presentation	3
Elective course [1]		3
Total Credits		**36**

[1] MBA students may fulfill their elective requirement by selecting any 500-level or higher course within the College of Business or any approved concentration course

The Graduate School requires that students maintain a minimum cumulative GPA of 3.0 in all courses taken as a graduate student at NMSU. The MBA program requires, in addition, that every candidate for the MBA degree must graduate with at least a minimum cumulative GPA of 3.0 in all courses required for the General MBA degree.

The following course sequencing requirements must be satisfied:

1. B A 590 Professional Paper/Presentation must be completed during the final term of the student's program and is only open to students who have been accepted into the MBA degree program. ACCT 503 Accounting for Managers, BLAW 502 Legal Environment of Business, BFIN 503 Financial Management and MKTG 503 Marketing Management must be completed prior to enrollment in B A 590 Professional Paper/Presentation.
2. MGMT 590 Strategic Management must be completed at the end of the student's program of study and is only open to students who have been accepted into the MBA degree program. All MBA coursework other than B A 590 Professional Paper/Presentation must be completed prior to or during the same term as MGMT 590 Strategic Management.

Students requesting transfer credit for any graduate courses taken before admission to the MBA program must submit appropriate written justification, including course descriptions, syllabi, transcripts, etc. Up to nine credits of transfer work can be applied to meet MBA requirements if the credits were earned in a program accredited by AACSB International. Transfer credits for courses taken after admission to the program are generally not permitted, but advance approval should be requested and may be granted in exceptional situations.

Final Examination for the Degree:

A student may satisfy the Graduate School's requirement for a final exam by completing the General MBA Degree's necessary coursework that includes B A 590. Professional Paper/Presentation and supplemented or modified requirements for the concentration selected. The following two criteria must be met by the end of their final semester or at the end of a subsequent semester during which graduate-level courses are taken or retaken to meet the specified cumulative GPA.

(1) The student must have a minimum cumulative GPA of 3.0 based on all courses taken as a graduate student at NMSU, including those taken as part of the MBA program (required courses, elective course(s), and courses to fulfill the requirements of an MBA concentration or approved course substitution).

(2) The student must complete all required courses (36 credit hours) with a minimum cumulative GPA of 3.0 for the General MBA (11 required courses and 1 elective course, approved course substitutions, and any approved transfer courses).

A student who fails to meet one or both previous criteria may, during one or more subsequent semesters, take or retake additional graduate-level or

MBA-specific courses to increase the cumulative GPA, thereby satisfying the Graduate School's requirement for a final exam.

Note 1: The General MBA program (excluding concentrations) consists of eleven required courses and one elective course (totaling 36 credits). The MBA elective course consists of 1 graduate business elective (numbered 500 or above) as listed on the MBA web page.

Note 2: The College of Business reserves the right to change the published requirements. Any such changes will be announced and will not be retroactive. Currently, MBA courses are offered once each year except for the elective and some concentration courses. Always consult an academic advisor or department head before registering for classes.

A thesis is not required. With special approval, however, a degree candidate may elect to write a thesis with at least 6 credit hours earned under B A 599 (https://catalogs.nmsu.edu/search/?P=B%20A%20599) Master's Thesis in lieu of B A 590 (https://catalogs.nmsu.edu/search/?P=B%20A%20590) Professional Paper/Presentation.

Concentrations: Students in the on-campus MBA program may elect to pursue one of several MBA concentrations:

- Agribusiness (p. 117)
- Finance (p. 119)
- Heath Services Management (p. 120)
- Information Systems (p. 121)
- Public Utility Regulation (p. 123)

Master's Accelerated Program Information

The Master's Accelerated Program allows qualifying NMSU business students to complete four MBA courses while still an undergraduate and may count those courses toward both their undergraduate degree and the Master of Business Administration (MBA).

Up to 12 hours of graduate course work can be applied toward the completion of the master's degree. To receive graduate credit for the 12 credit hours, students must receive a grade of B or higher. MAP courses completed with a grade of B- or lower are not eligible for graduate credit.

Student Qualifications

- The student must be classified as a Junior or Senior and may not have previously earned a Bachelor's Degree.
- The cumulative grade point average (GPA) must be a minimum of **3.75** to participate in the **Junior Year**.
- The cumulative grade point average (GPA) must be a minimum of **3.50** to participate in the **Senior Year**.

Accepted MAP Courses

Students may take any four of the following courses to count for both the MBA degree and as the required courses to meet their upper division business course and MBA course. Any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
ECON 503	Managerial Economics	3
BLAW 502	Legal Environment of Business	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MKTG 503	Marketing Management	3

Please see the MBA webpage for a list of approved electives. [1]

[1] Courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Interested students may complete the required application for the program by contacting the MBA advisor at mbaprog@nmsu.edu or 575-646-8003.

Business Administration (Agribusiness) - Master of Business Administration

Program Requirements (36 credits)

The MBA program consists of twelve courses. Eleven are required courses, and one approved elective.

Prefix	Title	Credits
Required Courses		
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
BLAW 502	Legal Environment of Business	3
ECON 503	Managerial Economics	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MGMT 590	Strategic Management	3
A ST 512	Quantitative Analysis for Business Decisions	3
MKTG 503	Marketing Management	3
B A 590	Professional Paper/Presentation	3
Elective course [1]		3
Total Credits		**36**

[1] MBA students may fulfill their elective requirement by selecting any 500-level or higher course within the College of Business or any approved concentration course

The Graduate School requires that students maintain a minimum cumulative GPA of 3.0 in all courses taken as a graduate student at NMSU. The MBA program requires, in addition, that every candidate for the MBA degree must graduate with at least a minimum cumulative GPA of 3.0 in all courses required for the General MBA degree.

The following course sequencing requirements must be satisfied:

1. B A 590 Professional Paper/Presentation must be completed during the final term of the student's program and is only open to students who have been accepted into the MBA degree program. ACCT 503 Accounting for Managers, BLAW 502 Legal Environment of

Business, BFIN 503 Financial Management and MKTG 503 Marketing Management must be completed prior to enrollment in B A 590 Professional Paper/Presentation.

2. MGMT 590 Strategic Management must be completed at the end of the student's program of study and is only open to students who have been accepted into the MBA degree program. All MBA coursework other than B A 590 Professional Paper/Presentation must be completed prior to or during the same term as MGMT 590 Strategic Management.

Students requesting transfer credit for any graduate courses taken before admission to the MBA program must submit appropriate written justification, including course descriptions, syllabi, transcripts, etc. Up to nine credits of transfer work can be applied to meet MBA requirements if the credits were earned in a program accredited by AACSB International. Transfer credits for courses taken after admission to the program are generally not permitted, but advance approval should be requested and may be granted in exceptional situations.

Final Examination for the Degree:

A student may satisfy the Graduate School's requirement for a final exam by completing the General MBA Degree's necessary coursework that includes B A 590. Professional Paper/Presentation and supplemented or modified requirements for the concentration selected. The following two criteria must be met by the end of their final semester or at the end of a subsequent semester during which graduate-level courses are taken or retaken to meet the specified cumulative GPA.

(1) The student must have a minimum cumulative GPA of 3.0 based on all courses taken as a graduate student at NMSU, including those taken as part of the MBA program (required courses, elective course(s), and courses to fulfill the requirements of an MBA concentration or approved course substitution).

(2) The student must complete all required courses (36 credit hours) with a minimum cumulative GPA of 3.0 for the General MBA (11 required courses and 1 elective course, approved course substitutions, and any approved transfer courses).

A student who fails to meet one or both previous criteria may, during one or more subsequent semesters, take or retake additional graduate-level or MBA-specific courses to increase the cumulative GPA, thereby satisfying the Graduate School's requirement for a final exam.

Note 1: The General MBA program (excluding concentrations) consists of eleven required courses and one elective course (totaling 36 credits). The MBA elective course consists of 1 graduate business elective (numbered 500 or above) as listed on the MBA web page.

Note 2: The College of Business reserves the right to change the published requirements. Any such changes will be announced and will not be retroactive. Currently, MBA courses are offered once each year except for the elective and some concentration courses. Always consult an academic advisor or department head before registering for classes.

A thesis is not required. With special approval, however, a degree candidate may elect to write a thesis with at least 6 credit hours earned under B A 599 (https://catalogs.nmsu.edu/search/?P=B%20A%20599) Master's Thesis in lieu of B A 590 (https://catalogs.nmsu.edu/search/?P=B%20A%20590) Professional Paper/Presentation.

Students in the on - campus MBA program may elect to pursue a concentration in AgriBusiness and must take the following set of five AEEC courses in substitution of four courses included in the required MBA: ECON 503 Managerial Economics, MGMT 502 Operations Management, A ST 512 Quantitative Analysis for Business Decisions, MKTG 503 Marketing Management.

Prefix	Title	Credits
AEEC 5220	Financial Derivative Markets	3
AEEC 5210	International Agricultural Trade Theory and Policy	3
AEEC 5330	Agribusiness Marketing	3
AEEC 5110	Introduction to Quantitative Methods	3
AEEC 5150	Economic and Financial Analysis of Agribusiness	3
AEEC 5140	Agricultural Policy	3
AEEC 5340	Agribusiness Management	3
Total Credits		**21**

The five AEEC courses collectively substitute for the following five required MBA courses:

Prefix	Title	Credits
ECON 503	Managerial Economics	3
MGMT 502	Operations Management	3
MKTG 503	Marketing Management	3
A ST 512	Quantitative Analysis for Business Decisions	3
Total Credits		**12**

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Master's Accelerated Program Information

The Master's Accelerated Program allows qualifying NMSU business students to complete four MBA courses while still an undergraduate and may count those courses toward both their undergraduate degree and the Master of Business Administration (MBA).

Up to 12 hours of graduate course work can be applied toward the completion of the master's degree. To receive graduate credit for the 12 credit hours, students must receive a grade of B or higher. MAP courses completed with a grade of B- or lower are not eligible for graduate credit.

Student Qualifications

- The student must be classified as a Junior or Senior and may not have previously earned a Bachelor's Degree.
- The cumulative grade point average (GPA) must be a minimum of **3.75** to participate in the **Junior Year**.
- The cumulative grade point average (GPA) must be a minimum of **3.50** to participate in the **Senior Year**.

Accepted MAP Courses

Students may take any four of the following courses to count for both the MBA degree and as the required courses to meet their upper division business course and MBA course. Any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3

ECON 503	Managerial Economics	3
BLAW 502	Legal Environment of Business	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MKTG 503	Marketing Management	3

Please see the MBA webpage for a list of approved electives. [1]

[1] Courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Interested students may complete the required application for the program by contacting the MBA advisor at mbaprog@nmsu.edu or 575-646-8003.

Business Administration (Finance) - Master of Business Administration

Program Requirements (36 credits)

The MBA program consists of twelve courses. Eleven are required courses, and one approved elective.

Prefix	Title	Credits
Required Courses		
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
BLAW 502	Legal Environment of Business	3
ECON 503	Managerial Economics	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MGMT 590	Strategic Management	3
MKTG 503	Marketing Management	3
A ST 512	Quantitative Analysis for Business Decisions	3
B A 590	Professional Paper/Presentation	3
Elective course [1]		3
Total Credits		**36**

[1] MBA students may fulfill their elective requirement by selecting any 500-level or higher course within the College of Business or any approved concentration course

The Graduate School requires that students maintain a minimum cumulative GPA of 3.0 in all courses taken as a graduate student at NMSU. The MBA program requires, in addition, that every candidate for the MBA degree must graduate with at least a minimum cumulative GPA of 3.0 in all courses required for the General MBA degree.

The following course sequencing requirements must be satisfied:

1. B A 590 Professional Paper/Presentation must be completed during the final term of the student's program and is only open to students who have been accepted into the MBA degree program. ACCT 503 Accounting for Managers, BLAW 502 Legal Environment of Business, BFIN 503 Financial Management and MKTG 503 Marketing Management must be completed prior to enrollment in B A 590 Professional Paper/Presentation.
2. MGMT 590 Strategic Management must be completed at the end of the student's program of study and is only open to students who have been accepted into the MBA degree program. All MBA coursework other than B A 590 Professional Paper/Presentation must be completed prior to or during the same term as MGMT 590 Strategic Management.

Students requesting transfer credit for any graduate courses taken before admission to the MBA program must submit appropriate written justification, including course descriptions, syllabi, transcripts, etc. Up to nine credits of transfer work can be applied to meet MBA requirements if the credits were earned in a program accredited by AACSB International. Transfer credits for courses taken after admission to the program are generally not permitted, but advance approval should be requested and may be granted in exceptional situations.

Final Examination for the Degree: A student may satisfy the Graduate School's requirement for a final exam by completing the General MBA Degree's necessary coursework that includes B A 590 Professional Paper/Presentation. Professional Paper/Presentation and supplemented or modified requirements for the concentration selected. The following two criteria must be met by the end of their final semester or at the end of a subsequent semester during which graduate-level courses are taken or retaken to meet the specified cumulative GPA.

(1) The student must have a minimum cumulative GPA of 3.0 based on all courses taken as a graduate student at NMSU, including those taken as part of the MBA program (required courses, elective course(s), and courses to fulfill the requirements of an MBA concentration or approved course substitution).

(2) The student must complete all required courses (36 credit hours) with a minimum cumulative GPA of 3.0 for the General MBA (11 required courses and 1 elective course, approved course substitutions, and any approved transfer courses).

A student who fails to meet one or both previous criteria may, during one or more subsequent semesters, take or retake additional graduate-level or MBA-specific courses to increase the cumulative GPA, thereby satisfying the Graduate School's requirement for a final exam.

Note 1: The General MBA program (excluding concentrations) consists of eleven required courses and one elective course (totaling 36 credits). The MBA elective course consists of 1 graduate business elective (numbered 500 or above) as listed on the MBA web page.

Note 2: The College of Business reserves the right to change the published requirements. Any such changes will be announced and will not be retroactive. Currently, MBA courses are offered once each year except for the elective and some concentration courses. Always consult an academic advisor or department head before registering for classes.

A thesis is not required. With special approval, however, a degree candidate may elect to write a thesis with at least 6 credit hours earned under B A 599 Master's Thesis in lieu of B A 590 Professional Paper/Presentation.

Students in the on-campus MBA program may elect to pursue a concentration in Finance. To fulfill this concentration, a student must take BFIN 535 and three additional 500-level BFIN courses (excluding BFIN 503 Financial Management which is a required course for the General MBA) for a total of 12 credits. These courses can be used as

substitutes for B A 590 (https://catalogs.nmsu.edu/search/?P=B%20A%20590) Professional Paper/Presentation.

Master's Accelerated Program Information

The Master's Accelerated Program allows qualifying NMSU business students to complete four MBA courses while still an undergraduate and may count those courses toward both their undergraduate degree and the Master of Business Administration (MBA).

Up to 12 hours of graduate course work can be applied toward the completion of the master's degree. To receive graduate credit for the 12 credit hours, students must receive a grade of B or higher. MAP courses completed with a grade of B- or lower are not eligible for graduate credit.

Student Qualifications

- The student must be classified as a Junior or Senior and may not have previously earned a Bachelor's Degree.
- The cumulative grade point average (GPA) must be a minimum of **3.75** to participate in the **Junior Year**.
- The cumulative grade point average (GPA) must be a minimum of **3.50** to participate in the **Senior Year**.

Accepted MAP Courses

Students may take any four of the following courses to count for both the MBA degree and as the required courses to meet their upper division business course and MBA course. Any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
ECON 503	Managerial Economics	3
BLAW 502	Legal Environment of Business	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MKTG 503	Marketing Management	3
Please see the MBA webpage for a list of approved electives. [1]		

[1] Courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Interested students may complete the required application for the program by contacting the MBA advisor at mbaprog@nmsu.edu or 575-646-8003.

Business Administration (Health Services Management) - Master of Business Administration

Program Requirements (42 credits)

The MBA program consists of twelve courses. Eleven are required courses, and one approved elective.

Prefix	Title	Credits
Required Courses		
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
BLAW 502	Legal Environment of Business	3
ECON 503	Managerial Economics	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MGMT 590	Strategic Management	3
A ST 512	Quantitative Analysis for Business Decisions	3
MKTG 503	Marketing Management	3
B A 590	Professional Paper/Presentation	3
Elective Course [1]		3
Total Credits		**36**

[1] MBA students may fulfill their elective requirement by selecting any 500-level or higher course within the College of Business or any approved concentration course

The Graduate School requires that students maintain a minimum cumulative GPA of 3.0 in all courses taken as a graduate student at NMSU. The MBA program requires, in addition, that every candidate for the MBA degree must graduate with at least a minimum cumulative GPA of 3.0 in all courses required for the General MBA degree.

The following course sequencing requirements must be satisfied:

1. B A 590 (https://catalogs.nmsu.edu/search/?P=B%20A%20590) Professional Paper/Presentation must be completed during the final term of the student's program and is only open to students who have been accepted into the MBA degree program. ACCT 503 (https://catalogs.nmsu.edu/search/?P=ACCT%20503) Accounting for Managers, BLAW 502 (https://catalogs.nmsu.edu/search/?P=BLAW%20502) Legal Environment of Business, BFIN 503 (https://catalogs.nmsu.edu/search/?P=BFIN%20503) Financial Management and MKTG 503 (https://catalogs.nmsu.edu/search/?P=MKTG%20503) Marketing Management must be completed prior to enrollment in B A 590 (https://catalogs.nmsu.edu/search/?P=B%20A%20590) Professional Paper/Presentation.
2. MGMT 590 (https://catalogs.nmsu.edu/search/?P=MGMT%20590) Strategic Management must be completed at the end of the student's program of study and is only open to students who have been accepted into the MBA degree program. All MBA coursework other than B A 590 (https://catalogs.nmsu.edu/search/?P=B%20A%20590) Professional Paper/Presentation must be completed prior to or during the same term as MGMT 590 (https://catalogs.nmsu.edu/search/?P=MGMT%20590) Strategic Management.

Students requesting transfer credit for any graduate courses taken before admission to the MBA program must submit appropriate written justification, including course descriptions, syllabi, transcripts, etc. Up to nine credits of transfer work can be applied to meet MBA requirements if the credits were earned in a program accredited by AACSB International. Transfer credits for courses taken after admission to the program are

generally not permitted, but advance approval should be requested and may be granted in exceptional situations.

Final Examination for the Degree: A student may satisfy the Graduate School's requirement for a final exam by completing the General MBA Degree's necessary coursework that includes B A 590. Professional Paper/Presentation and supplemented or modified requirements for the concentration selected. The following two criteria must be met by the end of their final semester or at the end of a subsequent semester during which graduate-level courses are taken or retaken to meet the specified cumulative GPA.

(1) The student must have a minimum cumulative GPA of 3.0 based on all courses taken as a graduate student at NMSU, including those taken as part of the MBA program (required courses, elective course(s), and courses to fulfill the requirements of an MBA concentration or approved course substitution).

(2) The student must complete all required courses (36 credit hours) with a minimum cumulative GPA of 3.0 for the General MBA (11 required courses and 1 elective course, approved course substitutions, and any approved transfer courses).

A student who fails to meet one or both previous criteria may, during one or more subsequent semesters, take or retake additional graduate-level or MBA-specific courses to increase the cumulative GPA, thereby satisfying the Graduate School's requirement for a final exam.

Note 1: The General MBA program (excluding concentrations) consists of eleven required courses and one elective course (totaling 36 credits). The MBA elective course consists of 1 graduate business elective (numbered 500 or above) as listed on the MBA web page.

Note 2: The College of Business reserves the right to change the published requirements. Any such changes will be announced and will not be retroactive. Currently, MBA courses are offered once each year except for the elective and some concentration courses. Always consult an academic advisor or department head before registering for classes.

A thesis is not required. With special approval, however, a degree candidate may elect to write a thesis with at least 6 credit hours earned under B A 599 (https://catalogs.nmsu.edu/search/?P=B%20A%20599) Master's Thesis in lieu of B A 590 (https://catalogs.nmsu.edu/search/?P=B%20A%20590) Professional Paper/Presentation.

MBA Students who want to have a concentration in Health Services Management must complete 3 Public Health Courses (one of which fulfills the MBA required elective) .

Prefix	Title	Credits
Required Courses		
PHLS 5340	Public Health Law and Ethics	3
PHLS 5140	Health Services System: Administration and Organization	3
PHLS 5820	Health Informatics	3
PHLS 5160	Public Health Policy Analysis	3
PHLS 5310	Principles of Health Program Management	3
PHLS 5330	Public Health Finance and Budget Management	3
Total Credits		**18**

Master's Accelerated Program Information

The Master's Accelerated Program allows qualifying NMSU business students to complete four MBA courses while still an undergraduate and may count those courses toward both their undergraduate degree and the Master of Business Administration (MBA).

Up to 12 hours of graduate course work can be applied toward the completion of the master's degree. To receive graduate credit for the 12 credit hours, students must receive a grade of B or higher. MAP courses completed with a grade of B- or lower are not eligible for graduate credit.

Student Qualifications

- The student must be classified as a Junior or Senior and may not have previously earned a Bachelor's Degree.
- The cumulative grade point average (GPA) must be a minimum of **3.75** to participate in the **Junior Year**.
- The cumulative grade point average (GPA) must be a minimum of **3.50** to participate in the **Senior Year**.

Accepted MAP Courses

Students may take any four of the following courses to count for both the MBA degree and as the required courses to meet their upper division business course and MBA course. Any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
ECON 503	Managerial Economics	3
BLAW 502	Legal Environment of Business	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MKTG 503	Marketing Management	3

Please see the MBA webpage for a list of approved electives. [1]

[1] Courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Interested students may complete the required application for the program by contacting the MBA advisor at mbaprog@nmsu.edu or 575-646-8003.

Business Administration (Information Systems) - Master of Business Administration

Program Requirements (36 credits)

The MBA program consists of twelve courses. Eleven are required courses, and one approved elective.

Prefix	Title	Credits
Required Courses		
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
BLAW 502	Legal Environment of Business	3
ECON 503	Managerial Economics	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MGMT 590	Strategic Management	3
A ST 512	Quantitative Analysis for Business Decisions	3
MKTG 503	Marketing Management	3
B A 590	Professional Paper/Presentation	3
Elective course [1]		3
Total Credits		**36**

[1] MBA students may fulfill their elective requirement by selecting any 500-level or higher course within the College of Business or any approved concentration course

The Graduate School requires that students maintain a minimum cumulative GPA of 3.0 in all courses taken as a graduate student at NMSU. The MBA program requires, in addition, that every candidate for the MBA degree must graduate with at least a minimum cumulative GPA of 3.0 in all courses required for the General MBA degree.

The following course sequencing requirements must be satisfied:

1. B A 590 Professional Paper/Presentation must be completed during the final term of the student's program and is only open to students who have been accepted into the MBA degree program. ACCT 503 Accounting for Managers, BLAW 502 Legal Environment of Business, BFIN 503 Financial Management and MKTG 503 Marketing Management must be completed prior to enrollment in B A 590 Professional Paper/Presentation.
2. MGMT 590 Strategic Management must be completed at the end of the student's program of study and is only open to students who have been accepted into the MBA degree program. All MBA coursework other than B A 590 Professional Paper/Presentation must be completed prior to or during the same term as MGMT 590 Strategic Management.

Students requesting transfer credit for any graduate courses taken before admission to the MBA program must submit appropriate written justification, including course descriptions, syllabi, transcripts, etc. Up to nine credits of transfer work can be applied to meet MBA requirements if the credits were earned in a program accredited by AACSB International. Transfer credits for courses taken after admission to the program are generally not permitted, but advance approval should be requested and may be granted in exceptional situations.

Final Examination for the Degree:

A student may satisfy the Graduate School's requirement for a final exam by completing the General MBA Degree's necessary coursework that includes B A 590. Professional Paper/Presentation and supplemented or modified requirements for the concentration selected. The following two criteria must be met by the end of their final semester or at the end of a subsequent semester during which graduate-level courses are taken or retaken to meet the specified cumulative GPA.

(1) The student must have a minimum cumulative GPA of 3.0 based on all courses taken as a graduate student at NMSU, including those taken as part of the MBA program (required courses, elective course(s), and courses to fulfill the requirements of an MBA concentration or approved course substitution).

(2) The student must complete all required courses (36 credit hours) with a minimum cumulative GPA of 3.0 for the General MBA (11 required courses and 1 elective course, approved course substitutions, and any approved transfer courses).

A student who fails to meet one or both previous criteria may, during one or more subsequent semesters, take or retake additional graduate-level or MBA-specific courses to increase the cumulative GPA, thereby satisfying the Graduate School's requirement for a final exam.

Note 1: The General MBA program (excluding concentrations) consists of eleven required courses and one elective course (totaling 36 credits). The MBA elective course consists of 1 graduate business elective (numbered 500 or above) as listed on the MBA web page.

Note 2: The College of Business reserves the right to change the published requirements. Any such changes will be announced and will not be retroactive. Currently, MBA courses are offered once each year except for the elective and some concentration courses. Always consult an academic advisor or department head before registering for classes.

A thesis is not required. With special approval, however, a degree candidate may elect to write a thesis with at least 6 credit hours earned under B A 599 (https://catalogs.nmsu.edu/search/?P=B%20A%20599) Master's Thesis in lieu of B A 590 (https://catalogs.nmsu.edu/search/?P=B%20A%20590) Professional Paper/Presentation.

Students in the on-campus MBA program may elect to pursue a concentration in Information Systems and must take additional coursework beyond that required to complete the MBA degree program. BCIS 502 (https://catalogs.nmsu.edu/search/?P=BCIS%20502) Business Information Systems is a required MBA course and a prerequisite for each of the courses in the concentration.

Any of these courses may also be used to fulfill the MBA elective requirement.

Prefix	Title	Credits
Required Courses		
Select four from the following:		12
BCIS 550	Information Systems Analysis and Design	
BCIS 561	Business Analytics I	
BCIS 566	Business Analytics II	
BCIS 575	Database Management Systems	
BCIS 580	Introduction to Cybersecurity: Exploring Computer, Network, and Data Security Principles	
BCIS 582	Management of Information Security	
Total Credits		**12**

Students are encouraged to seek advising from the MBA Office or the Information Systems faculty in making course selections.

Master's Accelerated Program Information

The Master's Accelerated Program allows qualifying NMSU business students to complete four MBA courses while still an undergraduate and may count those courses toward both their undergraduate degree and the Master of Business Administration (MBA).

Up to 12 hours of graduate course work can be applied toward the completion of the master's degree. To receive graduate credit for the 12 credit hours, students must receive a grade of B or higher. MAP courses completed with a grade of B- or lower are not eligible for graduate credit.

Student Qualifications

- The student must be classified as a Junior or Senior and may not have previously earned a Bachelor's Degree.
- The cumulative grade point average (GPA) must be a minimum of **3.75** to participate in the **Junior Year**.
- The cumulative grade point average (GPA) must be a minimum of **3.50** to participate in the **Senior Year**.

Accepted MAP Courses

Students may take any four of the following courses to count for both the MBA degree and as the required courses to meet their upper division business course and MBA course. Any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
ECON 503	Managerial Economics	3
BLAW 502	Legal Environment of Business	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MKTG 503	Marketing Management	3

Please see the MBA webpage for a list of approved electives. [1]

[1] Courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Interested students may complete the required application for the program by contacting the MBA advisor at mbaprog@nmsu.edu or 575-646-8003.

Business Administration (Public Utility Regulations) - Master of Business Administration

Program Requirements (36 credits)

The MBA program consists of twelve courses. Eleven are required courses, and one approved elective.

Prefix	Title	Credits
Required Courses		
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
BLAW 502	Legal Environment of Business	3
ECON 503	Managerial Economics	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MGMT 590	Strategic Management	3
A ST 512	Quantitative Analysis for Business Decisions	3
MKTG 503	Marketing Management	3
B A 590	Professional Paper/Presentation	3
Elective course [1]		3
Total Credits		**36**

[1] MBA students may fulfill their elective requirement by selecting any 500-level or higher course within the College of Business or any approved concentration course

The Graduate School requires that students maintain a minimum cumulative GPA of 3.0 in all courses taken as a graduate student at NMSU. The MBA program requires, in addition, that every candidate for the MBA degree must graduate with at least a minimum cumulative GPA of 3.0 in all courses required for the General MBA degree.

The following course sequencing requirements must be satisfied:

1. B A 590 Professional Paper/Presentation must be completed during the final term of the student's program and is only open to students who have been accepted into the MBA degree program. ACCT 503 Accounting for Managers, BLAW 502 Legal Environment of Business, BFIN 503 Financial Management and MKTG 503 Marketing Management must be completed prior to enrollment in B A 590 Professional Paper/Presentation.
2. MGMT 590 Strategic Management must be completed at the end of the student's program of study and is only open to students who have been accepted into the MBA degree program. All MBA coursework other than B A 590 Professional Paper/Presentation must be completed prior to or during the same term as MGMT 590 Strategic Management.

Students requesting transfer credit for any graduate courses taken before admission to the MBA program must submit appropriate written justification, including course descriptions, syllabi, transcripts, etc. Up to nine credits of transfer work can be applied to meet MBA requirements if the credits were earned in a program accredited by AACSB International. Transfer credits for courses taken after admission to the program are generally not permitted, but advance approval should be requested and may be granted in exceptional situations.

Final Examination for the Degree:

A student may satisfy the Graduate School's requirement for a final exam by completing the General MBA Degree's necessary coursework that includes B A 590. Professional Paper/Presentation and supplemented or modified requirements for the concentration selected. The following two criteria must be met by the end of their final semester or at the end of a

subsequent semester during which graduate-level courses are taken or retaken to meet the specified cumulative GPA.

(1) The student must have a minimum cumulative GPA of 3.0 based on all courses taken as a graduate student at NMSU, including those taken as part of the MBA program (required courses, elective course(s), and courses to fulfill the requirements of an MBA concentration or approved course substitution).

(2) The student must complete all required courses (36 credit hours) with a minimum cumulative GPA of 3.0 for the General MBA (11 required courses and 1 elective course, approved course substitutions, and any approved transfer courses).

A student who fails to meet one or both previous criteria may, during one or more subsequent semesters, take or retake additional graduate-level or MBA-specific courses to increase the cumulative GPA, thereby satisfying the Graduate School's requirement for a final exam.

Note 1: The General MBA program (excluding concentrations) consists of eleven required courses and one elective course (totaling 36 credits). The MBA elective course consists of 1 graduate business elective (numbered 500 or above) as listed on the MBA web page.

Note 2: The College of Business reserves the right to change the published requirements. Any such changes will be announced and will not be retroactive. Currently, MBA courses are offered once each year except for the elective and some concentration courses. Always consult an academic advisor or department head before registering for classes.

A thesis is not required. With special approval, however, a degree candidate may elect to write a thesis with at least 6 credit hours earned under B A 599 (https://catalogs.nmsu.edu/search/?P=B%20A%20599) Master's Thesis in lieu of B A 590 (https://catalogs.nmsu.edu/search/?P=B%20A%20590) Professional Paper/Presentation.

Students in the on-campus MBA program may elect to pursue a concentration in Public Utility Regulation and must take the following courses. One of these courses will serve as the elective in the MBA program and two of the courses will substitute for courses A ST 512 and B A 590 (https://catalogs.nmsu.edu/search/?P=B%20A%20590) in the standard MBA program (because the learning objectives of the utility regulation courses meet the learning objectives of the two basic MBA courses).

Prefix	Title	Credits
Required Courses		
ECON 571	Regulatory Policy and Industry Analysis: Electricity I	3
ECON 572	Regulatory Policy and Industrial Analysis: Water and Natural Gas	3
ECON 573	Regulatory Policy and Industry Analysis: Electricity II	3
ECON 574	Advanced Seminar Regulatory Policy and Industry Analysis	3
Total Credits		**12**

Master's Accelerated Program Information

The Master's Accelerated Program allows qualifying NMSU business students to complete four MBA courses while still an undergraduate and may count those courses toward both their undergraduate degree and the Master of Business Administration (MBA).

Up to 12 hours of graduate course work can be applied toward the completion of the master's degree. To receive graduate credit for the 12 credit hours, students must receive a grade of B or higher. MAP courses completed with a grade of B- or lower are not eligible for graduate credit.

Student Qualifications

- The student must be classified as a Junior or Senior and may not have previously earned a Bachelor's Degree.
- The cumulative grade point average (GPA) must be a minimum of **3.75** to participate in the **Junior Year**.
- The cumulative grade point average (GPA) must be a minimum of **3.50** to participate in the **Senior Year**.

Accepted MAP Courses

Students may take any four of the following courses to count for both the MBA degree and as the required courses to meet their upper division business course and MBA course. Any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ACCT 503	Accounting for Managers	3
BCIS 502	Business Information Systems	3
ECON 503	Managerial Economics	3
BLAW 502	Legal Environment of Business	3
BFIN 503	Financial Management	3
MGMT 502	Operations Management	3
MGMT 503	Organizational Behavior and Management Processes	3
MKTG 503	Marketing Management	3

Please see the MBA webpage for a list of approved electives. [1]

[1] Courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Interested students may complete the required application for the program by contacting the MBA advisor at mbaprog@nmsu.edu or 575-646-8003.

Chemical Engineering - Master of Engineering in Chemical Engineering

The Master of Engineering in Chemical Engineering is a 30 credit hour coursework and/or project-based degree with flexibility of program design for professionals seeking advanced coursework in chemical engineering. Individual degree plans are based on consultation between the student and their advisor. Master of Engineering in Chemical Engineering requirements are as follows:

Prefix	Title	Credits
CHME Coursework		
A minimum of 15 credits of CHME 500+ courses (select from CHME 501 to CHME 594) (courses 450+ may also count up to 12 credits):		15

CHME 501	Graduate Thermodynamics for Chemical Engineers
CHME 506	Graduate Transport Phenomena(s)
CHME 516	Graduate Numerical Methods in Chemical Engineering
CHME 542	Graduate Reactor Analysis and Design (s)
CHME 548	Industrial Safety
CHME 564	Polymer Science & Engineering
CHME 565	Rheology and Viscoelasticity
CHME 567	Nanoscience and Nanotechnology
CHME 570	Introduction to Nuclear Energy
CHME 571	Health Physics
CHME 574	Power Plant Design
CHME 576	Nuclear Fuel Cycles
CHME 578	Electrochemistry: Basics & Applications
CHME 590	Graduate Seminar
CHME 591	Graduate Special Topics
CHME 593	Graduate Special Projects
CHME 594	Professional Communication in Chemical Engineering
Open Electives	
Students are expected to take an additional minimum of 15 credits of electives from any areas such as chemical engineering, other engineering, business, economics, fundamental sciences, environmental sciences, etc., to be consistent with their personal ME theme or emphasis. Thesis, research, or dissertation credits do not count.	15
Optional Engineering Project Sequence or CHME Coursework [1]	
CHME 595	Chemical Process Design and Business Analysis
CHME 596	Chemical Process Industries Research
CHME 597	Advanced Chemical Process Industry Analysis
Total Credits	**30**

[1] Students will define and execute an engineering project through their employer while taking the following 3-semester course sequence. This may replace 6 credit hours of CHME coursework.

First Year	
Fall	**Credits**
CHME Elective	3
CHME Elective	3
CHME Elective	3
Credits	**9**
Spring	
CHME Elective	3
CHME Elective	3
Open Elective [1]	3
Credits	**9**
Second Year	
Fall	
Open Elective [1]	3
Open Elective [1]	3
Open Elective [1]	3
Credits	**9**
Spring	
Open Elective [1]	3
Credits	**3**
Total Credits	**30**

[1] Students are expected to take a minimum of 15 credits of open electives from any areas such as chemical engineering, other engineering, business, economics, fundamental sciences, environmental sciences, etc., to be be consistent with their personal ME theme or emphasis.

[2] Students interested in a Chemical Process Industries emphasis may replace 6 credits of courses with the following sequence: CHME 595 Chemical Process Design and Business Analysis, CHME 596 Chemical Process Industries Research, CHME 597 Advanced Chemical Process Industry Analysis.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.

Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program. Other courses may be considered after a consultation with the program advisor.

Prefix	Title	Credits
CHME 451	Intellectual Property for Engineers and Scientists	3
CHME 452	Chemical Process Design & Economic Evaluation	3
CHME 455	Chemical Plant Design	3
CHME 455 L	Chemical Plant Simulation	1
CHME 461	Calculation of Material and Molecular Properties	3
CHME 464	Polymer Science & Engineering	3
CHME 467	Nanoscience and Nanotechnology	3
CHME 470	Introduction to Nuclear Energy	3
CHME 471	Health Physics	3
CHME 474	Power Plant Design	3
CHME 476	Nuclear Fuel Cycles	3
CHME 478	Electrochemistry: Basics & Applications	3
CHME 479	Corrosion and Degradation of Materials	3
CHME 481	Biomedical Engineering and Engineering Healthcare	3
CHME 495	Brewing Science & Engineering	3
CHME 495 L	Brewing Science & Technology Lab	1
CHME 501	Graduate Thermodynamics for Chemical Engineers	3

CHME 506	Graduate Transport Phenomena(s)	3
CHME 516	Graduate Numerical Methods in Chemical Engineering	3
CHME 542	Graduate Reactor Analysis and Design (s)	3
CHME 548	Industrial Safety	3
CHME 564	Polymer Science & Engineering	3
CHME 565	Rheology and Viscoelasticity	3
CHME 567	Nanoscience and Nanotechnology	3
CHME 570	Introduction to Nuclear Energy	3
CHME 571	Health Physics	3
CHME 574	Power Plant Design	3
CHME 576	Nuclear Fuel Cycles	3
CHME 578	Electrochemistry: Basics & Applications	3
CHME 591	Graduate Special Topics	1-3
CHME 593	Graduate Special Projects	1-3
CHME 594	Professional Communication in Chemical Engineering	2
CHME 595	Chemical Process Design and Business Analysis	3
CHME 596	Chemical Process Industries Research	1
CHME 597	Advanced Chemical Process Industry Analysis	2

Chemical Engineering - Master of Science in Chemical Engineering

The program of study leading to the Master of Science in Chemical Engineering consists of 32 credits which includes:

- Required CHME core graduate courses (14 credits)
- CHME elective courses numbered 455-589 (3 credits)
- Other graduate elective courses (9 credits)
- Thesis as CHME 599 Master's Thesis (6 credits)

Prefix	Title	Credits
Required Core Courses		
CHME 501	Graduate Thermodynamics for Chemical Engineers	3
CHME 506	Graduate Transport Phenomena(s) (Spring semester course)	3
CHME 516	Graduate Numerical Methods in Chemical Engineering	3
CHME 542	Graduate Reactor Analysis and Design (s) (Spring semester course)	3
CHME 594	Professional Communication in Chemical Engineering	2
Electives		
CHME electives (select from CHME 455-CHME 594 except CHME 498)		3
Electives [1]		9
Master's Thesis		
CHME 599	Master's Thesis (minimum 6 credit hours before the thesis defense)	6
Total Credits		**32**

[1] Elective courses are intended to supplement the research work of each graduate student. These courses must be numbered 450 or above and must be approved by the thesis advisor.

First Year

Fall		**Credits**
CHME 501	Graduate Thermodynamics for Chemical Engineers	3
CHME 516	Graduate Numerical Methods in Chemical Engineering	3
CHME Elective		3
	Credits	**9**
Spring		
CHME 506	Graduate Transport Phenomena(s)	3
CHME 542	Graduate Reactor Analysis and Design (s)	3
CHME 594	Professional Communication in Chemical Engineering	2
CHME 599	Master's Thesis	1
	Credits	**9**
Second Year		
Fall		
CHME 599	Master's Thesis	3
Grad Electives		6
	Credits	**9**
Spring		
CHME 599	Master's Thesis	2
Grad Elective		3
	Credits	**5**
	Total Credits	**32**

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.

Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program. Other courses may be considered after a consultation with the program advisor.

Prefix	Title	Credits
CHME 452	Chemical Process Design & Economic Evaluation	3
CHME 455	Chemical Plant Design	3
CHME 455 L	Chemical Plant Simulation	1
CHME 461	Calculation of Material and Molecular Properties	3
CHME 464	Polymer Science & Engineering	3
CHME 467	Nanoscience and Nanotechnology	3
CHME 470	Introduction to Nuclear Energy	3
CHME 471	Health Physics	3
CHME 474	Power Plant Design	3

CHME 476	Nuclear Fuel Cycles	3
CHME 478	Electrochemistry: Basics & Applications	3
CHME 479	Corrosion and Degradation of Materials	3
CHME 481	Biomedical Engineering and Engineering Healthcare	3
CHME 486	Biofuels	3
CHME 495	Brewing Science & Engineering	3
CHME 495 L	Brewing Science & Technology Lab	1
CHME 501	Graduate Thermodynamics for Chemical Engineers	3
CHME 506	Graduate Transport Phenomena(s)	3
CHME 516	Graduate Numerical Methods in Chemical Engineering	3
CHME 542	Graduate Reactor Analysis and Design (s)	3
CHME 548	Industrial Safety	3
CHME 564	Polymer Science & Engineering	3
CHME 565	Rheology and Viscoelasticity	3
CHME 567	Nanoscience and Nanotechnology	3
CHME 570	Introduction to Nuclear Energy	3
CHME 571	Health Physics	3
CHME 574	Power Plant Design	3
CHME 576	Nuclear Fuel Cycles	3
CHME 578	Electrochemistry: Basics & Applications	3
CHME 591	Graduate Special Topics	1-3
CHME 593	Graduate Special Projects	1-3
CHME 594	Professional Communication in Chemical Engineering	2
CHME 595	Chemical Process Design and Business Analysis	3
CHME 596	Chemical Process Industries Research	1
CHME 597	Advanced Chemical Process Industry Analysis	2

Chemistry (Biochemistry) - Master of Science

The Master of Science in Chemistry with a concentration in Biochemistry can be obtained through either a thesis option or a non-thesis option. Both options require at least 30 credits of course work. The thesis option program is designed to teach students modern approaches to chemistry and biochemistry (courses), experimental methods to problem–solving (research), and communication skills in the discipline (seminars and colloquia). All M.S. candidates are required to complete the courses below. Thesis-option students must also pass a qualifying exam at the end of the first year and a final comprehensive examination which includes a written thesis. Non-thesis option students must pass a final exam, the format and content of which will be decided by a departmental committee.

Prefix	Title	Credits
Required Courses		
CHEM 475	Central Concepts in Chemistry - Safety	1
CHEM 476	Central Concepts in Chemistry - Research Ethics	1
CHEM 477	Central Concepts in Chemistry - ProfessionalDevelopment (Required Courses)	1
CHEM 510	Graduate Student Seminar [1]	3
BCHE 542	Biochemistry I	3
BCHE 545	Molecular and Biochemical Genetics	3
BCHE 546	Biochemistry II: Central and Intermediary Metabolism	3
BCHE 600	Research [2]	9-12
Additional Graduate-level courses [3]		*6-12*
Total Credits		**30-39**

1. Only 3 credits of CHEM 510 Graduate Student Seminar will count toward the M.S. degree. For the thesis option, at least one credit of CHEM 510 Graduate Student Seminar must be taken for a letter grade of B- or better. The remaining CHEM 510 Graduate Student Seminar credits for the thesis option and all credits for the non-thesis option may be taken as S/U.
2. Required only for thesis-option.
3. Additional courses are chosen based on major emphasis area, through consultation with the thesis committee or an advisor and can include research credits. These courses may include any course numbered 450 or above in the following subject areas: CHEM, BCHE, PHYS, MATH, CSCI, BIOL, A ST, CHME, GENE, MOLB, SOCI, EDUC, EPWS, ENVS, ANSC.

Chemistry - Master of Science

The Master of Science in Chemistry is offered in the major emphasis areas of analytical, inorganic, organic, and physical chemistry, and biochemistry. The M.S. degree can be obtained through either a thesis option or a non-thesis option. Both options require at least 30 credits of course work. 15 of these credits must be taken at NMSU. The thesis option program is designed to teach students modern approaches to chemistry and biochemistry (courses), experimental methods to problem–solving (research), and communication skills in the discipline (seminars and colloquia). All M.S. candidates are required to complete the courses below. Thesis-option students must also pass a qualifying exam at the end of the first year and a final comprehensive examination which includes a written thesis. Non-thesis option students must pass a final exam, the format and content of which will be decided by a departmental committee.

Prefix	Title	Credits
Required Courses		
CHEM 475	Central Concepts in Chemistry - Safety	1
CHEM 476	Central Concepts in Chemistry - Research Ethics	1
CHEM 477	Central Concepts in Chemistry - ProfessionalDevelopment (Required Courses)	1
CHEM 501	Central Concepts in Chemistry - Energy	3
CHEM 502	Central Concepts in Chemistry - Structure	3
CHEM 503	Central Concepts in Chemistry - Dynamics	3
CHEM 504	Central Concepts in Chemistry - Measurements	3
CHEM 510	Graduate Student Seminar [1]	3
CHEM 600	Research [2]	9
Additional required course [3]		*3*
Total Credits		**30**

1. Only 3 credits of CHEM 510 will count toward the M.S. degree. For the thesis option, at least one credit of CHEM 510 must be taken for a letter grade of B- or better. The remaining CHEM 510 credits for the thesis option and all credits for the non-thesis option may be taken as S/U.
2. Required only for thesis-option.
3. Additional courses are chosen based on major emphasis area, through consultation with the thesis committee or an advisor and can include research credits. These courses may include any course numbered 450

or above in the following subject areas: CHEM, BCHE, PHYS, MATH, C S, BIOL, A ST, CHME, GENE, MOLB, SOCI, EDUC, EPWS, ENVS, ANSC.

Civil Engineering - Master of Engineering in Civil Engineering

The Master of Engineering degree in Civil Engineering (M.E. in CE) is a coursework only degree and several courses are offered online. The M.E. in CE degree requires a total of 30-31 credit hours consisting of one general elective course (3 credit hours); seven technical electives in Civil, Environmental, and/or Agricultural Engineering (21-22 credit hours); and two electives from engineering disciplines outside the department and/or other areas of interest outside the college (6 credit hours).

Prefix	Title	Credits
General elective course		**3**
C E 490	Introduction to Artificial Intelligence for Civil Engineers [1]	
C E 510	Introduction to Nondestructive Testing [1]	
C E 514	Numerical Methods in Civil Engineering [1]	
C E 535	Technical Communication for Engineers [1]	
CE, ENVE, and A EN elective courses [2]		**21-22**
Seven courses to be selected from the following list of courses (numbered 450-599) [3]		
Environmental Engineering		
ENVE 456	Environmental Engineering Design	
ENVE 459	Environmental Microbiology [1]	
ENVE 487	Air Pollution Control Systems Design [1]	
ENVE 550	Aquatic Chemistry [1]	
ENVE 551	Unit Processes/Operation of Water Treatment [1]	
ENVE 552	Unit Processes/Operation of Wastewater Treatment [1]	
ENVE 557	Surface Water Quality Modeling [1]	
Geotechnical Engineering		
C E 457	Foundation Design	
C E 460	Site Investigation	
C E 470	Design of Municipal and Hazardous Waste Landfills	
C E 479	Pavement Analysis and Design [1]	
C E 485	Design of Earth Dams	
C E 507	Design of Earth Retaining Structures [1]	
C E 508	Advanced Soil Behavior	
C E 509	Deep Foundations [1]	
C E 579	Ground Improvement [1]	
C E 585	Slope Stability Analysis and Design	
Structural Engineering		
C E 469	Structural Systems	
C E 501	Advanced Mechanics of Materials [1]	
C E 502	Advanced Mechanics of Steel Structures [1]	
C E 515	Finite Element Methods [1]	
C E 544	Advanced Design of Steel Structures [1]	
C E 545	Advanced Concrete Design [1]	
C E 554	Wood Design [1]	
C E 555	Masonry Design	
C E 547	Bridge Engineering	
C E 571	Structural Dynamics [1]	
Water Resources and Agricultural Engineering		
C E 452	Geohydrology [1]	
C E 482	Hydraulic Structures	
C E 483	Surface Water Hydrology	
C E 531	Open Channel Hydraulics	
C E 557	Water Resources Development [1]	
C E 581	Ground Water Hydrology [1]	
C E 582	Statistical Hydrology	
A EN 459	Groundwater, Wells & Pumps	
A EN 478	Irrigation and Drainage Engineering	
Transportation and Construction		
C E 471	Transportation Engineering [1]	
C E 477	Engineering Economics and Construction Management [1]	
MECE elective courses [4]		**6**
Two courses to be selected from the following list of courses (numbered 450-599) [3]		
Chemical and Materials Engineering		
CHME 479	Corrosion and Degradation of Materials	
CHME 567	Nanoscience and Nanotechnology [1]	
Engineering Technology		
E T 455	Cost Estimating and Scheduling	
E T 459	Construction Technology and Management	
E T 472	Intelligent Transportation Systems (ITS) [1]	
E T 480	Innovation and Product Development	
SUR 451	Spatial Data Adjustment II	
SUR 452	Surveying Practicum	
SUR 461 & 461L	GNSS Positioning and GNSS Positioning Lab	
SUR 464	Legal Principles and Boundary Law II	
SUR 485	Emerging Techniques in Geospatial Technologies	
Industrial Engineering		
I E 459	Systems Thinking and Decision Making [1]	
I E 515	Stochastic Processes Modeling [1]	
I E 523	Advanced Engineering Economy [1]	
I E 533	Linear Programming [1]	
I E 534	Nonlinear Programming [1]	
I E 535	Discrete Optimization [1]	
I E 537	Large Scale Systems Engineering [1]	
I E 561	Advanced Safety Engineering [1]	
I E 563	Topics in Engineering Administration [1]	
Mechanical Engineering		
M E 456	Experimental Modal Analysis	
M E 502	Elasticity I [1]	
M E 504	Continuum Mechanics [1]	
M E 530	Intermediate Fluid Mechanics	
M E 533	Numerical Methods for Fluid Mechanics and Heat Transfer	
M E 557	Engineering Failure Analysis [1]	
M E 570	Engineering Analysis I [1]	
Total Credits		**30-31**

1 Course offered online in the Fall, Spring, or Summer semester

2 Electives should be chosen from at least 2 different areas (e.g., geotechnical and structural, environmental and water resources/agricultural)

[3] Up to 12 credit hours of undergraduate courses numbered 450-499 may be applied towards the M.E. in CE degree (excess of this limit requires approval of department head)

[4] Courses listed represent only a partial list of engineering electives that may be taken outside the department; courses in other areas of interest outside the college may be taken including, but not limited to, environmental science, mathematics, statistics, geography, soil science, geology, business, economics, and management (all M.E. in CE electives must be approved by graduate advisor and department head)

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to an CE faculty advisor about your MAP plan and develop a course plan in consultation with the advisor. The faculty advisor should preferably be from the CE area of your interest.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

For students completing their BSCE degree under the **Geotechnical** option:

Prefix	Title	Credits
C E 457	Foundation Design	3
C E 460	Site Investigation	3
C E 470	Design of Municipal and Hazardous Waste Landfills	3
C E 471	Transportation Engineering	3
C E 477	Engineering Economics and Construction Management	3
C E 479	Pavement Analysis and Design	3
C E 485	Design of Earth Dams	3
C E 507	Design of Earth Retaining Structures	3
C E 508	Advanced Soil Behavior	3

For students completing their BSCE degree under the **Structural** option:

Prefix	Title	Credits
C E 457	Foundation Design	3
C E 460	Site Investigation	3
C E 469	Structural Systems	3
C E 471	Transportation Engineering	3
C E 477	Engineering Economics and Construction Management	3
C E 501	Advanced Mechanics of Materials	3
C E 510	Introduction to Nondestructive Testing	3
C E 514	Numerical Methods in Civil Engineering	3
C E 515	Finite Element Methods	3
C E 554	Wood Design	3
C E 555	Masonry Design	3
C E 547	Bridge Engineering	3

For students completing their BSCE degree under the **Environmental** option:

Prefix	Title	Credits
C E 457	Foundation Design	3
C E 470	Design of Municipal and Hazardous Waste Landfills	3
C E 477	Engineering Economics and Construction Management	3
ENVE 550	Aquatic Chemistry	3
ENVE 551	Unit Processes/Operation of Water Treatment	3
ENVE 552	Unit Processes/Operation of Wastewater Treatment	3

For students completing their BSCE degree under the **Water Resources** option:

Prefix	Title	Credits
A EN 459	Groundwater, Wells & Pumps	3
A EN 478	Irrigation and Drainage Engineering	3
C E 452	Geohydrology	3-4
C E 457	Foundation Design	3
C E 477	Engineering Economics and Construction Management	3
C E 482	Hydraulic Structures	3
C E 483	Surface Water Hydrology	3
C E 531	Open Channel Hydraulics	3
C E 557	Water Resources Development	3

For students completing a BS degree in **Engineering Technology** or **Geomatics**:

Prefix	Title	Credits
E T 455	Cost Estimating and Scheduling	3
E T 459	Construction Technology and Management	3
E T 471	Transportation Engineering and Technology	3
E T 472	Intelligent Transportation Systems (ITS)	3
E T 480	Innovation and Product Development	3
SUR 451	Spatial Data Adjustment II	3
SUR 461 & 461L	GNSS Positioning and GNSS Positioning Lab	3
SUR 464	Legal Principles and Boundary Law II	3

SUR 485	Emerging Techniques in Geospatial Technologies	3

NOTE: No more than 4 courses from any of the lists above can be applied in the MAP for the Master of Engineering in Civil Engineering (MECE) degree.

Civil Engineering - Master of Science in Civil Engineering

In support of the mission and vision statements for the graduate program, the department adopts the following goals for the Master of Science (M.S.) in Civil Engineering degree:

1. Prepare students to fulfill the academic prerequisites specified by the Americans Society of Civil Engineers (ASCE) for Licensure and Professional Practice in Civil Engineering.
2. Prepare students to attain the Body of Knowledge specified by ASCE necessary for entry into the practice of civil engineering at the professional level.
3. Prepare students in conducting applied research in areas relevant to the practice of civil engineering.
4. Prepare students for advanced graduate studies towards a terminal degree.

Students may choose from the geotechnical, structural, or water resources engineering options following the Thesis or Non-Thesis track, requirements of which are specified below. Exceptions to these requirements must be approved by the head of the department. Further information related to the M.S. degree may be found under the Academic Programs of Study (p. 31) section of the catalog.

Option: Geotechnical Engineering

Thesis Track

Prefix	Title	Credits
Background Courses [4]		
C E 357	Soil Mechanics	
C E 457	Foundation Design	
GEOL 1110G	Physical Geology (or higher-level courses)	
C E 445	Reinforced Concrete Design (or higher-level courses based on ACI)	
Core Courses [1]		**9**
Select three from the following:		
C E 508	Advanced Soil Behavior	
C E 509	Deep Foundations	
C E 579	Ground Improvement	
Optional Courses		**12-13**
Select four from the following:		
C E 452	Geohydrology	
C E 460	Site Investigation	
C E 470	Design of Municipal and Hazardous Waste Landfills	
C E 479	Pavement Analysis and Design	
C E 485	Design of Earth Dams	
C E 507	Design of Earth Retaining Structures	
C E 585	Slope Stability Analysis and Design	
Select 3 credits from courses outside the area or department (450 or higher) [2]		**3**
Research Credits		**6**
C E 599	Master's Thesis [3]	
Total Credits		**30-31**

1. A course listed as core may be taken as one of the four optional courses if it is not counted already as one of the three core courses.
2. The selected course outside the area or department must be previously approved by the academic advisor or student's Graduate Committee.
3. A maximum of 6 credits are counted toward the Master's Degree program.
4. A course listed as background provides fundamental knowledge to pursue graduate studies in geotechnical engineering but does not satisfy the course requirements for the MS degree (exception: CE 457).

Total credits needed for the Thesis Track are 24 credits of coursework and 6 credits of C E 599 Master's Thesis research.

Non-Thesis Track

The background and core courses for the Non-Thesis Track in Geotechnical Engineering are the same as those listed under the Thesis Track. Under optional courses, Non-Thesis students must select one additional course (i.e., total of five optional courses) from the list provided for the Thesis Track. In addition, Non-Thesis students must complete 3 credits of CE 598 - Special Research Programs in place of 6 credits of CE 599 and pass a final exit exam covering coursework and their research project.

Total credits needed for the Non-Thesis Track are 27 credits of coursework and 3 credits of C E 598 Special Research Programs.

Option: Structural Engineering

Thesis Track

Prefix	Title	Credits
Background Courses [2]		
C E 315	Structural Analysis	
C E 444	Elements of Steel Design (based on AISC)	
C E 445	Reinforced Concrete Design (based on ACI)	
Core Courses		**15**
C E 501	Advanced Mechanics of Materials	
C E 515	Finite Element Methods	
C E 544	Advanced Design of Steel Structures	
C E 545	Advanced Concrete Design	
C E 571	Structural Dynamics	
Optional Courses [3]		**9**
Select three from the following:		
C E 490	Introduction to Artificial Intelligence for Civil Engineers	
C E 502	Advanced Mechanics of Steel Structures	
C E 504	Advanced Engineering Design	
C E 507	Design of Earth Retaining Structures	
C E 509	Deep Foundations	
C E 510	Introduction to Nondestructive Testing	
C E 514	Numerical Methods in Civil Engineering	
C E 547	Bridge Engineering	
C E 554	Wood Design	
C E 555	Masonry Design	
C E 590	Advanced Artificial Intelligence for Civil Engineers	
Research Credits		**6**

C E 599	Master's Thesis [1]	
Total Credits		**30**

[1] A maximum of 6 credits are counted toward the Master's Degree program.

[2] A course listed as background provides fundamental knowledge to pursue graduate studies in structural engineering but does not satisfy the course requirements for the MS degree.

[3] A course listed as optional may replace one of the five core courses if it is not counted already as one of the three optional courses (requires department head approval)

Total credits needed for the Thesis Track are 24 credits of coursework and 6 credits of C E 599 Master's Thesis research.

Non-Thesis Track

The background and core courses for the Non-Thesis Track in Structural Engineering are the same as those listed under the Thesis Track. Under optional courses, Non-Thesis students must select one additional course (i.e., total of four optional courses) from the list provided for the Thesis Track. In addition, Non-Thesis students must complete 3 credits of CE 598 - Special Research Programs in place of 6 credits of CE 599 and pass a final exit exam covering coursework and their research project.

Total credits needed for the Non-Thesis Track are 27 credits of coursework and 3 credits of C E 598 Special Research Programs.

Option: Water Resources Engineering

Thesis Track

Prefix	Title	Credits
Requirements		
Core courses		12
Statistics		3
Area of Interest Courses		9
C E 599	Master's Thesis	6
Total Credits		**30**

Non-Thesis Track

Prefix	Title	Credits
Requirements		
Core courses		12
Statistics		3
Area of Interest Courses		15
Total Credits		**30**

Foundation Requirements

1. ABET- Accredited BS in Civil, Agricultural, Geological Engineering, or closely related field or equivalent (as per existing Civil Engineering Department regulations)
2. One course in surface water hydrology
3. One course in hydrogeology or geohydrology
4. At least three semesters of hydraulics and hydraulic design

Core Courses

Prefix	Title	Credits
Core Courses		**12**
C E 531	Open Channel Hydraulics	
C E 557	Water Resources Development	
C E 581	Ground Water Hydrology	
C E 582	Statistical Hydrology	
Statistics		**3**
A ST 505	Statistical Inference I (or advanced statistics class if student is qualified)	
Total Credits		**15**

Area of Interest Courses (Flexible)

Agricultural/ Civil/ Environmental Engineering

Prefix	Title	Credits
A EN 459	Groundwater, Wells & Pumps	
A EN 478	Irrigation and Drainage Engineering	
C E 452	Geohydrology	
C E 482	Hydraulic Structures	
C E 483	Surface Water Hydrology	
C E 485	Design of Earth Dams	
C E 503	Special Design and Analysis Program	
C E 504	Advanced Engineering Design	
C E 682	Topics in Hydrodynamics II	
ENVE 557	Surface Water Quality Modeling	
ENVE 630	Fate and Transport of Environmental Contaminants	
SOIL 652	Advanced Soil Physics	

Modeling/ Fluid Mechanics

Prefix	Title	Credits
M E 530	Intermediate Fluid Mechanics	
M E 533	Numerical Methods for Fluid Mechanics and Heat Transfer	

Management/Optimization

Prefix	Title	Credits
I E 533	Linear Programming	
I E 534	Nonlinear Programming	
I E 535	Discrete Optimization	

Electives outside College of Engineering: A ST, AEEC, GEOG, GEOL, MATH, STAT, and SOIL (must be approved by the Advisor and Committee Members).

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Notes:

1. International students may be required to take English language courses to show proficiency in English.
2. At least half of the credits of the Master's Degree program must be 500 level or higher.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to an CE faculty advisor about your MAP plan and develop a course plan in consultation with the advisor. The faculty advisor should preferably be from the CE area of your interest.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

For students completing their BSCE degree under the **Geotechnical** option:

Prefix	Title	Credits
C E 457	Foundation Design	3
C E 460	Site Investigation	3
C E 470	Design of Municipal and Hazardous Waste Landfills	3
C E 471	Transportation Engineering	3
C E 477	Engineering Economics and Construction Management	3
C E 479	Pavement Analysis and Design	3
C E 485	Design of Earth Dams	3
C E 507	Design of Earth Retaining Structures	3
C E 508	Advanced Soil Behavior	3

For students completing their BSCE degree under the **Structural** option:

Prefix	Title	Credits
C E 457	Foundation Design	3
C E 460	Site Investigation	3
C E 469	Structural Systems	3
C E 471	Transportation Engineering	3
C E 477	Engineering Economics and Construction Management	3
C E 501	Advanced Mechanics of Materials	3
C E 510	Introduction to Nondestructive Testing	3
C E 514	Numerical Methods in Civil Engineering	3
C E 515	Finite Element Methods	3
C E 547	Bridge Engineering	3
C E 554	Wood Design	3
C E 555	Masonry Design	3

For students completing their BSCE degree under the **Environmental** option:

Prefix	Title	Credits
C E 457	Foundation Design	3
C E 470	Design of Municipal and Hazardous Waste Landfills	3
C E 477	Engineering Economics and Construction Management	3
ENVE 456	Environmental Engineering Design	3
ENVE 459	Environmental Microbiology	3
ENVE 487	Air Pollution Control Systems Design	3
ENVE 550	Aquatic Chemistry	3
ENVE 551	Unit Processes/Operation of Water Treatment	3
ENVE 552	Unit Processes/Operation of Wastewater Treatment	3

For students completing their BSCE degree under the **Water Resources** option:

Prefix	Title	Credits
A EN 459	Groundwater, Wells & Pumps	3
A EN 478	Irrigation and Drainage Engineering	3
C E 452	Geohydrology	3-4
C E 457	Foundation Design	3
C E 477	Engineering Economics and Construction Management	3
C E 482	Hydraulic Structures	3
C E 483	Surface Water Hydrology	3
C E 531	Open Channel Hydraulics	3
C E 557	Water Resources Development	3

NOTE: No more than 2 courses from any of the lists above can be applied in the MAP for the Master of Science in Civil Engineering (MSCE) degree.

Clinical Mental Health Counseling - Master of Arts

The CEP department offers a Clinical Mental Health Counseling program which leads to a Masters of Arts degree (M.A.). The program is accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP). It prepares professional counselors to perform mental health counseling in agencies, hospitals, and private practice. Successful completion of the Clinical Mental Health Counseling program qualifies students to pursue licensure as clinical mental health counselors with the New Mexico Counseling and Therapy Practice Board.

For more information on program application requirements and process, see Clinical Mental Health Counseling, M.A., program website (https://cep.nmsu.edu/academic-programs/counseling-guidance-m-a.html).

Requirements

The 60-credit counseling curriculum requires two years full-time study or three years part time study on campus, and covers the following areas: human development, appraisal; diagnosis and treatment planning; individual, family and group counseling; consultation; career/life planning; research; and professional issues. Specialized training and

supervised experience is offered in mental health agencies, hospitals, and in schools.

Program of Study

Prefix	Title	Credits
CEPY 5120	Human Development	3
CEPY 5130	Multicultural Counseling	3
CEPY 5170	Professional Issues in Mental Health Counseling	3
CEPY 5180	Addictions Counseling	3
CEPY 5210	Research Methods	3
CEPY 5220	Testing, Assessment, and Psychometric Theory	3
CEPY 5230	Counseling Theory and Technique	3
CEPY 5240	Child and Adolescent Counseling Theory and Technique	3
CEPY 5250	Family Therapy Theory and Technique	3
CEPY 5260	Group Work Theory and Technique	3
CEPY 5270	Diagnosis and Treatment Planning	3
CEPY 5280	Primary Care Psychology	3
CEPY 5320	Career/Life Planning and Vocational Assessment	3
CEPY 5985	Counseling Practicum	3
CEPY 5998	Counseling Internship	12
Elective Classes		6
CEPY 5150	The Art & Science of Mindfulness for Helping Professionals	
CEPY 5160	Organization and Administration of School Counseling Services	
CEPY 5990	Advanced Counseling Practicum	
CEPY 5997	Special Research Programs (Behavioral Health Practicum - with or without bilingual component)	
CEPY 6220	Spanish for Mental Health Professionals	
MSW 597	Special Topics (Child Welfare Interventions)	
SPAN 547	Advanced Hispanic Film	
or SPAN 548	Advanced U.S.-Hispanic Film	
SPAN 567	Advanced Study in Chicano Literature	
Total Credits		**60**

First Year		
Semester 1		**Credits**
Summer		
CEPY 5120	Human Development	3
CEPY 5130	Multicultural Counseling	3
	Credits	**6**
Semester 2		
Fall		
CEPY 5230	Counseling Theory and Technique	3
CEPY 5170	Professional Issues in Mental Health Counseling	3
CEPY 5270	Diagnosis and Treatment Planning	3
	Credits	**9**
Semester 3		
Spring		
CEPY 5220	Testing, Assessment, and Psychometric Theory	3
CEPY 5260	Group Work Theory and Technique	3
CEPY 5210	Research Methods	3
	Credits	**9**
Second Year		
Semester 1		
Summer		
CEPY 5250	Family Therapy Theory and Technique	3
CEPY 5180	Addictions Counseling	3
	Credits	**6**
Semester 2		
Fall		
CEPY 5280	Primary Care Psychology	3
CEPY 5240	Child and Adolescent Counseling Theory and Technique	3
CEPY 5985	Counseling Practicum	3
	Credits	**9**
Semester 3		
Spring		
Grad Electives		3
CEPY 5320	Career/Life Planning and Vocational Assessment	3
	Credits	**6**
Third Year		
Semester 1		
Summer		
Grad Electives		3
	Credits	**3**
Semester 2		
Fall		
CEPY 5998	Counseling Internship	12
	Credits	**12**
	Total Credits	**60**

Please reach out to the Program Director for other advising plans, to include, if available, part-time enrollment.

Communication Disorders - Master of Arts

Students entering the graduate program with an undergraduate major in Communication Disorders/Speech and Hearing Sciences can expect to complete the program in two years if they enroll full-time or in three years if they enroll part-time and be awarded a Masters of Arts in Communication Disorders with a specialization in Speech-Language Pathology. The graduate program for students without a Communication Disorders background is generally one year longer because one year of leveling coursework is required. Enrollment in graduate courses in Communication Disorders is limited to students who have been accepted into the graduate program in Communication Disorders. To complete this course of study, each student is expected to meet the program's academic and clinical competency criteria which are aligned with the requirements of state and national certifying bodies for licensure and clinical certification. Details regarding certification are available from the American Speech-Language-Hearing Association (http://www.asha.org/certification/) (ASHA), and the New Mexico Regulations & Licensing Department (http://www.rld.state.nm.us/boards/speech_language_pathology_audiology_and_hearing_aid_dispensing_practices.aspx

The residential Master of Arts education program in speech-language pathology at New Mexico State University is accredited by the Council on

Academic Accreditation in Audiology and Speech-Language Pathology of the American Speech-Language-Hearing Association (ASHA), 2200 Research Boulevard, #310, Rockville, MD 20850, 800-498-2071 or 301-296-5700.

Program Requirements

The traditional Master's degree plan requires a minimum of 63 graduate credit hours and the completion of at least 400 clinical hours.

Prefix	Title	Credits
Required Courses		
SPHS 5110	Research Methods	3
SPHS 5120	Assessment of Communication Disorders	3
SPHS 5130	Pediatric Language and Disorders	3
SPHS 5210	School Age Language and Disorders	3
SPHS 5140	Speech Sound Disorders	3
SPHS 5220	Adult Neurogenic Language Disorders	3
SPHS 5350	Voice Disorders/Head and Neck Anomalies	3
SPHS 5230	Fluency Disorders	3
SPHS 5330	Dysphagia	3
SPHS 5340	Motor Speech Disorders	3
SPHS 5410	Professional Issues and Multicultural Practices in Communication Disorders	3
SPHS 5988	Clinical Education	2
SPHS 5990	Practicum in Speech-Language Pathology (SPHS 5999 may replace up to 4 of the 13 credit hours of SPHS 5990)	13
or SPHS 5999	Master's Thesis	
SPHS 5989	Externship in Communication Disorders	9
Elective Courses - Choose a minimum of 6 credits from the following:		6
SPHS 5320	Cognitive Communication Disorders	
SPHS 5335	Swallowing and its Disorders in the Pediatric Population	
SPHS 5310	Introduction to Augmentative and Alternatice Communication	
SPHS 5360	Communication Disorders in Neurodiverse Populations	
SPHS 5520	Best Practices in Bilingual/Multicultural Assessment for Practitioners	
SPHS 5996	Special Topics	
Total Credits		**63**

Leveling Program

The Leveling Program is designed for students with an undergraduate degree in an area other than Communication Disorders. The courses to be taken during the leveling year are listed below. In addition to these courses, students who did not complete at least one 3-credit hour course in all of the following subjects: Biology, Physics or Chemistry, and Statistics before starting the leveling program should also plan on completing these courses.

Prefix	Title	Credits
SPHS 5010	Phonetics	3
or SPHS 4510	Phonetics	
SPHS 5015	Audiology	3
or SPHS 4520	Audiology	
SPHS 5020	Language Acquisition	3
or SPHS 4610	Language Acquisition	
SPHS 5025	Language Disorders Across the Life Span	3
or SPHS 4715	Language Disorders Across the Life Span	
SPHS 5030	Anatomy and Physiology of Speech Mechanisms	3
or SPHS 4720	Anatomy and Physiology of Speech Mechanisms	
SPHS 5035	Speech and Hearing Science	3
or SPHS 4620	Speech and Hearing Science	
SPHS 5040	Speech Disorders Across the Lifespan	3
or SPHS 4710	Speech Disorders Across the Lifespan	
SPHS 5045	Clinical Methods and Procedures	3
or SPHS 4810	Clinical Methods and Procedures	
SPHS 5050	Neural Bases of Communication Disorders	3
or SPHS 4820	Neural Bases of Communication Disorders	
SPHS 5055	Aural Rehabilitation	3
or SPHS 4830	Aural Rehabilitation	
Total Credits		**30**

First Year		Credits
SPHS 5110	Research Methods	3
SPHS 5120	Assessment of Communication Disorders	3
SPHS 5130	Pediatric Language and Disorders	3
SPHS 5140	Speech Sound Disorders	3
SPHS 5210	School Age Language and Disorders	3
SPHS 5220	Adult Neurogenic Language Disorders	3
SPHS 5230	Fluency Disorders	3
SPHS 5310	Introduction to Augmentative and Alternatice Communication	3
SPHS 5988	Clinical Education	2
SPHS 5990	Practicum in Speech-Language Pathology	10
	Credits	**36**
Second Year		
SPHS 5330	Dysphagia	3
SPHS 5340	Motor Speech Disorders	3
SPHS 5350	Voice Disorders/Head and Neck Anomalies	3
SPHS 5990	Practicum in Speech-Language Pathology	3
Elective Courses (select at least one):		3
SPHS 5360	Communication Disorders in Neurodiverse Populations	
SPHS 5320	Cognitive Communication Disorders	
SPHS 5520	Best Practices in Bilingual/Multicultural Assessment for Practitioners	
SPHS 5410	Professional Issues and Multicultural Practices in Communication Disorders	3
SPHS 5989	Externship in Communication Disorders	9
	Credits	**27**
	Total Credits	**63**

Communication Studies - Master of Arts

Master of Arts - Communication Studies

The department offers a thesis, comprehensive exam, and applied project options in its Master of Arts program. All options require a minimum of 36 credits. The thesis option requires 30 credits of coursework, 6 credits of thesis hours (COMM 5999 Master's Thesis), and an oral defense of the thesis and coursework. The non-thesis applied project option requires 30 credits of coursework, 6 credits of project hours **(COMM 5994 MA Project).** The non-thesis project option does not require an oral

defense of the project and coursework**.** The non-thesis comprehensive exam option requires 36 credits of coursework and 4 hours of written examination, followed by an oral defense of the student's written examination and coursework. All options require a minimum of 30 credit hours of Communication Studies courses. The oral exam committee necessary for the thesis and non-thesis comprehensive exams will consist of at least two graduate faculty members from the Department of Communication Studies and one graduate faculty member from any other NMSU department serving as the Graduate School's Dean's Representative.

Program Requirements

All tracks (thesis, project, and comprehensive exams) require 36 credits, 30 of which must be in COMM. A grade of B- or higher must be earned in all COMM courses, and a minimum GPA of 3.0 or higher is required to graduate. Two courses (6 credits) with numbers 4500+ can be counted toward the degree, and 2 courses (6 credits) may be taken in a related field of study, but courses outside of COMM are not required. Up to 6 graduate course credits can be accepted for transfer at the discretion of the Department Head.

Students must earn a B- or better in all COMM coursework and earn a GPA of 3.0 or higher in all graduate coursework at NMSU to graduate. Additional information can be found on the department website (https://comm.nmsu.edu).

Graduate Course Rotation:

Fall

COMM 5110 Theories of Communication

COMM 5140 Qualitative Research Methods in Communication

COMM 5510 Organizational Communication

Spring

COMM 5130 Quantitative Research Methods

COMM 5710 Communication and Culture

COMM 5610 Interpersonal Communication

Admissions

Applicants must meet the following admission requirements of the Graduate School.

1. Have an undergraduate degree with a GPA of at least 3.0 on a 4.0 scale from an accredited College or University; or
2. Have a graduate degree with a GPA of at least 3.0 on a 4.0 scale from an accredited College or University; or
3. A minimum of five years of relevant, full-time professional work experience with an undergraduate GPA of at least 2.5 on a 4.0 scale from an accredited College or University. Students with a GPA below 3.0 can be admitted on probationary status, but can not work as a Graduate Assistant until their earned GPA at NMSU is 3.0 or higher.

International students must also apply through the International Student Services (https://isss.nmsu.edu/) program. GPA requirements of 3.0 on a 4.0 scale are not negotiable for international students. Standardized test scores and results from language proficiency exams are not required, but submitting such scores may enhance your ability to secure a Graduate Teaching Assistantship. International students must meet graduate school application deadlines set by the International Students Services program. These deadlines are typically the last day of February and the last day of September.

The Graduate Record Exam (GRE) General Test is not required for admission; however, existing GRE scores that are high will strengthen a candidate's application and are highly regarded in the awarding of Graduate Assistantships.

Application Materials

Applicants are required to submit the following materials:

1. A letter of application including a statement of purpose discussing why and what you want to study in the program.
2. Current Resume or Vita
3. A scholarly writing sample of 20 to no more than 30 pages
4. Three letters of recommendation submitted separately. Candidates need only to supply contact information for referees.
5. Official Transcripts from all previous educational institutions, undergraduate and graduate.
6. Applicants interested in a Graduate Assistantship must respond to the application prompt and upload a letter addressing the following question: What about being a Graduate Teaching Assistant interests you?

A small number of Graduate Teaching Assistantships are available. These assistantships are the only source of funding for the graduate program. All Graduate Teaching Assistants are responsible for teaching COMM 1115G Introduction to Communication. As such, applicants with an undergraduate degree in Communication or a closely related field will receive primary consideration for assistantships.

The Department of Communication Studies is not able to waive any application fees. The first application to the NMSU Graduate School is free. Fees are only charged for additional applications. It is highly advised to only apply to one graduate program.

Thesis Option:

Prefix	Title	Credits
Degree Requirements [1]		**18**
COMM 5110	Theories of Communication	
COMM 5130	Quantitative Research Methods	
COMM 5140	Qualitative Research Methods in Communication	
COMM 5510	Organizational Communication	
COMM 5610	Interpersonal Communication	
COMM 5710	Communication and Culture	
Electives [2]		
Select 6-12 credits of COMM Electives		6-12
Select 0-6 credits from courses in a Related Fields (outside of COMM)		0-6
Thesis [3]		
COMM 5999	Master's Thesis	6
Total Credits		**36**

1. Students must receive a minimum grade of B- or better in all COMM courses and an overall GPA of 3.0 or higher. Any students earning a grade of C+ or below in a COMM course will have to retake the class.
2. In order to graduate, students will need a total of 36 credits, of which 30 credits must be from COMM coursework. Students may take up to 6 credits in a related field of study, but students are not required to take any courses outside of the department. Please consult with your

advisor about your specific requirements and how to complete them in order to graduate.

[3] Upon completion of the thesis and with the advisor's approval, students will send their thesis to the committee consisting of the student's advisor, at least one additional graduate faculty member from the Department of Communication Studies, and one additional Graduate Faculty member from any other department at NMSU who serves as the Dean's Representative. Students must follow the guidelines from the Graduate School and the Department of Communication Studies, all found in the Graduate Student Handbook.

Comprehensive Exam Option:

Prefix	Title	Credits
Degree Requirements [1]		**18**
COMM 5110	Theories of Communication	
COMM 5130	Quantitative Research Methods	
COMM 5140	Qualitative Research Methods in Communication	
COMM 5510	Organizational Communication	
COMM 5610	Interpersonal Communication	
COMM 5710	Communication and Culture	
Electives [2]		
Select 12-18 credits of COMM Electives		12-18
Select 0-6 credits from courses in a Related Fields (outside of COMM)		0-6
Total Credits		**36**

[1] Students must receive a minimum grade of B- or better in all COMM courses and an overall GPA of 3.0 or higher. Any students earning a grade of C+ or below in a COMM course will have to retake the class.

[2] Students will need a total of 36 credits, of which 30 credits must be from COMM coursework. Students may take up to 6 credits in a related field of study, but are not required to take any courses outside of the department. Please consult with your advisor about your specific requirements and how to complete them in order to graduate.

Applied Project Option:

Prefix	Title	Credits
Degree Requirements [1]		**18**
COMM 5110	Theories of Communication	
COMM 5130	Quantitative Research Methods	
COMM 5140	Qualitative Research Methods in Communication	
COMM 5510	Organizational Communication	
COMM 5710	Communication and Culture	
COMM 5610	Interpersonal Communication	
Electives [2]		
Select 6-12 credits of COMM Electives		6-12
Select 0-6 credits from courses in a Related Fields (outside of COMM)		0-6
Project Option		
COMM 5994	MA Project	6
Total Credits		**36**

[1] Students must receive a minimum grade of B- or better in all COMM courses and an overall GPA of 3.0 or higher. Any students earning a grade of C+ or below in a COMM course will have to retake the class.

[2] Students will need a total of 36 credits, of which 30 credits must be from COMM coursework. Students may take up to 6 credits in a related field of study, but are not required to take any courses outside of the department. Please consult with your advisor about your specific requirements and how to complete them in order to graduate.

The Graduate School requires students to maintain a minimum cumulative GPA of 3.0 in all courses taken as a graduate student at NMSU. The Department of Communication Studies requires that a grade of B- or higher must be earned in all COMM courses and that a minimum GPA of 3.0 or higher is required to graduate.

Students requesting transfer credit for any graduate courses taken from another institution must submit a written justification, including course syllabi and transcripts to the department head during their first semester of studies. Up to six credits can be accepted for transfer at the discretion of the Department Head. All students must take COMM 5110 Theories of Communication, COMM 5130 Quantitative Research Methods, and COMM 5140 Qualitative Research Methods in Communication from the Department of Communication Studies at NMSU. Transfers for these courses will not be accepted or approved.

Final Examination for the Degree:

A student will satisfy the Graduate School's requirement for a final exam by completing the Organizational Communication concentration's necessary coursework for the Thesis, Project, or Comprehensive Exam option.

1. The student must have a minimum cumulative GPA of 3.0 on all courses taken as a graduate student at NMSU, including those taken in COMM and approved electives taken in other departments at NMSU, and courses to fulfill the requirements of the concentration or MA or approved course substitutions including any MAP courses used to satisfy the graduate degree or concentration.
2. The student must complete all required and elective courses or approved course substitutions including any MAP courses used to satisfy the graduate degree or concentration with a B- or better and have a minimum GPA of 3.0 or higher.
   a. The thesis student must successfully complete all coursework, pass six credits of COMM 5999 Master's Thesis, and successfully pass a committee oral defense*.
   b. The comprehensive exam student must successfully complete all coursework, pass four hours of comprehensive exams, and successfully pass a committee oral defense*.
   c. The project student must successfully complete all coursework and pass six credits of COMM 5994 MA Project. Projects are directed by the students advisor and satisfactory completion of 6 or more credits of COMM 5994 MA Project. By completeing a professional project and oral presentation of the students project, the project serves as culmination of the program required for graduateion and thus along with earning a B- in all coursework and a GPA of 3.0 or higher has met and satisfied the Graduate School's requirement for a final exam. Non-thesis project students do not need to defend thier project to a committee, successful completion of 6 project hours and an oral presentation of at least 15 minutes that is approved by their advisor meets the Graduate School's requirement for a final exam. Project students do not have to complete or submit the Master's Final Examination Form in order to graduate.

A student who fails to meet any of the criteria may, during one or more subsequent semesters, take or retake additional graduate-level courses

to increase their cumulative GPA, thereby satisfying the Graduate School's requirement for a final exam.

* Thesis and non-thesis comprehensive exam students must defend their thesis or written questions during a committee including their advisor from the Department of Communication Studies, one additional Graduate Faculty member from the Department of Communication Studies, and a Graduate Faculty member from any department outside of the Department of Communication Studies. Students must submit the Master's Final Examination Form (https://gradschool.nmsu.edu/current-students/graduate-forms.html) with all necessary signatures to the Graduate School at least ten working days before their oral defense. oral defense. Project students do not need to defend to a committee or submit the Master's Final Examination Form in order to meet the Graduate School's requirement for a final exam.

Note: The Department of Communication Studies and the College of Arts and Sciences reserve the right to change the published requirements. Any such changes will be announced and will not be retroactive without the consent of the Department Head of Communication Studies. Currently, all required courses are offered once each year except for some electives. Always consult with the Graduate Coordinator for NMSU Global, the Graduate Student Advisor, or the Department Head of Communication Studies.

New Mexico State University's Master's Accelerated Program (MAP) provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. A bachelor's degree typically four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs. The MAP program allows undergraduate students to take graduate courses and count up to twelve credits toward both undergraduate and graduate degrees in COMM.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and subsequently count those same courses toward graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework, of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 3.25.
- Students must receive a grade of B- or higher in this coursework to receive graduate credit. If a grade of C+ or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program; any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
COMM 5210	Political Communication	3
COMM 5220	Communication Technologies	3
COMM 5230	Strategic Communication	3
COMM 5310	Sports Communication	3
COMM 5530	Leadership Communication	3
COMM 5550	Case Studies in Leadership Communication	3
COMM 5560	Ethics & Diversity in Leadership Communication	3
COMM 5630	Family Communication	3
COMM 5640	Nonverbal Communication	3
COMM 5996	Special Topics	1-9
COMM 5997	Independent Study	1-6
COMM 5998	Communication Internship for Graduate Students	3

Enrollment in graduate courses requires the Department Head's approval and a completed MAP form before the first week of the semester when taking MAP courses for dual credit. Please meet with the Department Head or the Graduate Advisor for more information.

Computer Science - Master of Science

The Master of Computer Science degree has two tracks, one with thesis or project track and a course-work only track. For all master's students, the following apply:

- Each master's student must complete 12 credits of **the basic requirements (p. 138)**(see table below).
- Each master's student is expected to register for CSCI classes numbered 5000 or above, except for CSCI 5110 Data Structure and Algorithms Transition or deficiencies which are 46x courses (Transition Courses) or CSCI 4105 Programming Language Structure I or CSCI 4120 Operating Systems I.
- Courses not in Computer Science can be included in the student's program of study only if prior written approval has been obtained from the student's advisor and the departmental Graduate Committee. Further details can be found in the on-line Graduate Handbook (https://computerscience.nmsu.edu/).
- **For Thesis/Project track's students**: each student following this track needs to complete the following three requirements:
  - ***Courses***: each student *needs to take*, in addition to the basic requirement, **15 credits** of Computer Science graduate courses (courses numbered > 5000) with the following restrictions:
    - One course can only be used to satisfy one requirement (e.g., if CSCI 5510 Automata, Languages, Computability is used to satisfy the requirement for the **Theories** category, it cannot be counted towards satisfying the requirements on ***Courses***).
    - At most 6 credits of CSCI 5996 Special Topics with different topics (i.e., with different subtitles) can be counted towards the degree program of the student.
    - At most 6 credits of CSCI 5991 Special Research Problems can be counted towards the degree program of the student.
    - No credit of course numbered > 5999 can be counted towards the degree program.
  - ***Thesis/Project***: each student *must write a thesis* (CSCI 5999 Master's Thesis) or *undertake a research project* (CSCI 5994 Master's Project) for **6 credits**.

- ***Master Final Exam***: each student *is required to sustain a final exam,* covering the thesis/research project and the graduate course-work. The two parts of the exam bring equal weight.

- **For Course-Work Only track's students:** Each student following this track needs to take, in addition to the basic requirement, **24 credits** of Computer Science graduate courses (courses numbered > 5000) with the following restrictions:
  - One course can only be used to satisfy one requirement (e.g., if CSCI 5510 Automata, Languages, Computability is used to satisfy the requirement for the **Theories** category, it cannot be counted towards satisfying the requirements on **Courses**).
  - At most 6 credits of CSCI 5996 Special Topics with different topics (i.e., with different subtitles) can be counted towards the degree program of the student.
  - No credit of course numbered > 5888 can be counted towards the degree program.

Basic Requirements

Prefix	Title	Credits
Basic		**3**
CSCI 5110	Data Structure and Algorithms Transition [1]	
or CSCI 5505	Analysis of Algorithms	
Theories		**3**
CSCI 5510	Automata, Languages, Computability	
CSCI 5505	Analysis of Algorithms	
CSCI 5860	Algorithms in Systems Biology	
Systems		**3**
CSCI 5605	Operating Systems II	
CSCI 5820	Database Management Systems II	
CSCI 5840	Computer Networks II	
Applications		**3**
CSCI 5410	Computer Graphics I	
CSCI 5415	Introduction to Data Mining	
CSCI 5310	Bioinformatics Programming	
CSCI 5205	Computer Security	
CSCI 5210	Introduction to Smart Grids	
CSCI 5250	Human-Centered Computing	
CSCI 5305	Bioinformatics	
CSCI 5255	Digital Game Design	
CSCI 5260	Visual Programming	
CSCI 5420	Applied Machine Learning I	
CSCI 5215	Parallel Programming	
CSCI 5220	Cloud and Edge Computing	
CSCI 5225	Introduction to Cryptography	
CSCI 5265	Modern Web Technologies	
CSCI 5425	Introduction to Deep Learning	
CSCI 5430	Graph Data Mining	
CSCI 5240	Software Reverse Engineering	
CSCI 5435	Text Mining and Natural Language Processing	
CSCI 5235	Cellular Networks and Mobile Computing	
CSCI 5440	Generative Artificial Intelligence	
CSCI 5750	Artificial Intelligence II	
CSCI 5810	Advanced Software Engineering	
Total Credits		**12**

[1] Students who earned a B (or better) in CSCI 3720 Data Structures and Algorithms are not required to take this course.

A roadmap for a student without deficiencies study can be as follows:

- **First semester**: CSCI 5110 Data Structure and Algorithms Transition and two elective courses (courses > 5000 but not in the **theories** or **systems** group) .
- **Second semester**: take one course in the basic requirements (**theories** or **systems** or **application** group) and two elective courses.
- **Third semester**: take one course in the basic requirements (**theories** or **systems** or **application** group) and one elective course and a thesis/project course.
- **Fourth semester**: take one course in the basic requirements (**theories** or **systems** or **application** group) and a thesis/project course.

For **course work only option,** the student should replace the thesis/project course with an elective course and add an additional elective course to the last semester.

First Year		
Semester 1		**Credits**
CSCI 5110	Data Structure and Algorithms Transition	3
Elective Course 1		3
Elective Course 2		3
	Credits	**9**
Semester 2		
Theories/Systems/Applications 1		3
Elective 3		3
Elective 4		3
	Credits	**9**
Semester 3		
Theories/Systems/Applications 2		3
Elective 5		3
CSCI 5994	Master's Project	3
or CSCI 5994	or Master's Project	
	Credits	**9**
Semester 4		
Theories/Systems/Applications 3		3
CSCI 5999	Master's Thesis	3
or CSCI 5994	or Master's Project	
	Credits	**6**
	Total Credits	**33**

Master Accelerated Program

New Mexico State University master's accelerated program provides the **opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. Students can take up to 12 credits of Computer Science graduate courses and get dual course credit that can be applied to both an undergraduate and master's degree. Additional information can be found in the NMSU catalog.

MAP Admission

1. First, students will apply to the Computer Science department to receive approval for the MAP program. The student submits the pre-application when he/she is within 48 credits of earning a BS in Computer Science; an application form is provided on the department website. Qualification for the MAP program will be based on the cumulative (non-grade replaced) grade point average in Computer Science and Math courses taken up to that point (at least 3.3), including at least two of the following: CSCI 3730 Compilers and Automata Theory, CSCI 3710 Software Development and CSCI 3720 Data Structures and Algorithms , and recommendations by faculty members listed on the departmental application. Additional factors might be taken into account when available (e.g., GRE scores). Students having a grade point average below 3.3 but at least 2.75 may be admitted to MAP on a case-by-case basis, depending on faculty recommendations and evaluations of the individual academic and professional history.
2. Once the Computer Science department has notified the applicant of acceptance in MAP, the applicant must then formally apply to the graduate school (https://apply.nmsu.edu/apply/?id=1c3c41ea-b5f9-48ef-83c3-b085794ba277) for formal admission to the graduate program. This application to the graduate school is made during the semester of graduation from the BS in Computer Science.

Computer Science Courses Eligible for MAP

All courses in the Computer Science program that are cross-listed for undergraduate and graduate studies in the catalog are eligible for MAP. Students must receive a grade of B or higher in this coursework to be counted for graduate credits. If a grade of B- or lower is earned, it will not count toward the graduate degree. The courses are listed below.

Student should take four MAP eligible courses and CSCI 3720 Data Structures and Algorithms in their BS study program and earned a B (or better) grade. A roadmap for the last year of their study can be as follows:

- **First semester**: take two courses in the basic requirements and a master thesis/project course.
- **Second semester**: take the remaining courses in the basic requirements and a master thesis/project course. Add an elective course if necessary.

Prefix	Title	Credits
CSCI 5110	Data Structure and Algorithms Transition	3
CSCI 5140	Database Management Systems I	3
CSCI 5205	Computer Security	3
CSCI 5206	Hardware Security	3
CSCI 5210	Introduction to Smart Grids	3
CSCI 5215	Parallel Programming	3
CSCI 5220	Cloud and Edge Computing	3
CSCI 5225	Introduction to Cryptography	3
CSCI 5235	Cellular Networks and Mobile Computing	3
CSCI 5245	Computer Networks I	3
CSCI 5240	Software Reverse Engineering	3
CSCI 5250	Human-Centered Computing	3
CSCI 5255	Digital Game Design	3
CSCI 5260	Visual Programming	3
CSCI 5265	Modern Web Technologies	3
CSCI 5305	Bioinformatics	3
CSCI 5310	Bioinformatics Programming	3
CSCI 5405	Artificial Intelligence I	3
CSCI 5410	Computer Graphics I	3
CSCI 5415	Introduction to Data Mining	3
CSCI 5420	Applied Machine Learning I	3
CSCI 5425	Introduction to Deep Learning	3
CSCI 5430	Graph Data Mining	3
CSCI 5435	Text Mining and Natural Language Processing	3
CSCI 5440	Generative Artificial Intelligence	3
CSCI 5505	Analysis of Algorithms	3
CSCI 5510	Automata, Languages, Computability	3
CSCI 5996	Special Topics	1-6

Counseling and Guidance (Educational Diagnostics) - Master of Arts

The CEP Department offers a degree in Counseling and Guidance (M.A.) specializing in Educational Diagnostics; however, this is **not a stand-alone program**. The only candidates admitted to this degree are those graduate students who are admitted to the Specialist in Education (Ed.S.) or Ph.D. School Psychology Programs. Graduate students admitted to a school psychology program will have an opportunity to complete this MA degree before the completion of the Ed.S. or Ph.D. degree. *If you are interested in this degree, **please review program information for the school psychology programs** (*https://cep.nmsu.edu/academic-programs/grad-programs.html*) and admission's requirements as only students admitted to these programs are considered for this degree, no exceptions.*

Candidates admitted to the Specialist in Education (Ed.S.) or Ph.D. School Psychology Programs can complete this MA degree prior to the completion of the Ed.S. or Ph.D. degree. **This program is only open to students in the Specialist in Education (Ed.S.) or Ph.D. School Psychology Programs.**

Prefix	Title	Credits
Required Coursework		
Core Courses		
CEPY 6130	Psychology of Multiculturalism	3
CEPY 6140	Cognitive & Affective Basis of Behavior	3
CEPY 6265	Diagnostic Class	3
CEPY 6120	Human Development	3
SPED 6170	School Intervention and Organization in a Diverse Society	3
Concentration Coursework		
CEPY 5310	Academic Assessment And Intervention	3
CEPY 6330	Behavior Assessment and Intervention	3
CEPY 6340	Appraisal of Cognitive Functioning	3
CEPY 6510	Practicum in School Psychology: Psychoeducational	3
CEPY 6520	Field Experience in Educational Diagnostics	3
Total Credits		**30**

Creative Writing - Master of Fine Arts

Graduate Program Information

The MFA Creative Writing Program is housed in the Creative Media Institute.

The Master of Fine Arts Degree in Creative Writing is a 3-year program. Students choose a major genre: poetry or fiction, though classes in nonfiction, writing, screenwriting and others are offered. Students must complete 54 hours of graduate-level course work, submit a creative writing thesis, give a public reading from the thesis, and pass an oral examination.

Our mission is to emphasize the creation and critical analysis of literature, so that our students can be part of the national conversation about writing, graduating with a publishable manuscript. By providing our students with a set of skills, we prepare them to contribute to their communities as writers, publishing professionals and teachers.

Creative Writing - Master of Fine Arts

Students pursuing the MFA in Creative Writing devote themselves to concentrated study and development of a chosen genre: poetry or fiction. Students

- complete 54 hours of graduate-level coursework,
- participate and pass (as of Fall 27) in a third-semester review,
- present a book-length thesis of original work with an introduction or afterward,
- perform a public reading from the thesis, and
- pass an oral examination in the final semester.

All MFA courses are restricted to students accepted into the MFA program.

Prefix	Title	Credits
Required Coursework		
FDMA 570	MFA Workshop (4 FDMA 570 workshops in the genre of poetry or fiction for which the student was admitted to study AND 1 FDMA 570 workshop in a second genre.) [1]	15
FDMA 550	MFA Form & Technique	9
FDMA 592	MFA Theory, Practice and Professionalism [2]	3
FDMA 594	MFA Thesis Workshop [3]	6
Thesis Credits		
FDMA 599	MFA Thesis [4]	6
Required Electives		15
Graduate-level courses in any of the following:		
FDMA Courses Offered by the Creative Media Institute: [5]		
FDMA 422	Environmental Filmmaking	
FDMA 480	Screenwriting II	
FDMA 490	Advanced Screenwriting	
FDMA 500	Graduate Problems in Creative Media	
FDMA 501	Special Topics	
FDMA 550	MFA Form & Technique (Additional credits may be counted toward electives only after the completion of 9 credits of FDMA 550.)	
FDMA 570	MFA Workshop (Additional credits may be counted toward electives only after the completion of 15 credits of FDMA 570.)	
FDMA 592	MFA Theory, Practice and Professionalism (Additional credits may be counted toward electives only after the completion of 3 credits of FDMA 592.)	
FDMA 595	Master of Fine Arts Graduate Internship	
Courses offered by Journalism and Media Studies:		
JOUR 463	Public Relations for Social Impact	
JOUR 470	Environmental, Social, & Governance Public Relations	
JOUR 494	Special Topics	
JOUR 495	Media Theory	
Additional Approved Elective Courses [6]		
Courses from the Art Department:		
ARTS 494	Special Topics in Studio	
ARTS 495	Studio Core IV: Thesis Production & Display	
ARTS 496	Fundamentals of Studio Management	
ARTS 499	Problems in Studio Art	
ARTS 501	Museum Conservation Techniques I	
ARTS 550	Drawing and Painting Workshop	
ARTS 555	Graphic Design	
ARTS 565	Sculpture Media	
ARTS 570	Photography Seminar	
ARTS 575	Ceramic Arts	
ARTH 500	Special Topics in Art History	
ARTH 511	Art of China I: Neolithic to Song Dynasty	
ARTH 536	Race and Art	
ARTH 542	Global Modernisms	
ARTH 543	Contemporary Global Art Practices	
ARTH 544	Gender, Sexuality, and Art in the Americas	
ARTH 545	Latin American Film	
ARTH 546	Museum and Curatorial Studies	
ARTH 578	Seminar in Art History	
ARTH 579	Methodologies and Historiography of Art History and Art Theory	
Courses from the Borderlands and Ethnic Studies Program:		
BEST 5105	Foundations in Borderlands & Ethnic Studies	
BEST 5110	Decolonial Research I: Overview	
BEST 5120	Theories in Borderlands and Ethnic Studies	
BEST 5125	Decolonial Research II: Methodologies	
BEST 5135	Decolonial Research III: Data Analysis and Publication	
Courses from the department of Communication Studies:		
COMM 5110	Theories of Communication	
COMM 5220	Communication Technologies	
COMM 5230	Strategic Communication	
Courses from the Department of English:		
ENGL 501	Online Publishing	
ENGL 505	Graduate Study in Chaucer	
ENGL 508	Graduate Study in Shakespeare I	
ENGL 509	Graduate Study in Shakespeare II	
ENGL 517	Graduate Study in Critical Theory	
ENGL 521	Graduate Study in a Literary Period or Movement	
ENGL 522	Graduate Study in a Literary Form or Genre	
ENGL 523	Graduate Study of a Major Author	
ENGL 524	Graduate Study in a Major Text	
ENGL 525	Graduate Study in Comparative Literature	
ENGL 526	Special Topics in Critical Theory	
ENGL 527	Graduate Study in Film and Digital Media	
ENGL 533	Victorian Literature	
ENGL 542	Modern and Contemporary American Poetry	
ENGL 543	Multimedia Theory and Production	
ENGL 544	Modern British Fiction	
ENGL 545	Postmodern Fiction	

ENGL 552	Graduate Study in History of the English Language
ENGL 553	World Literatures
ENGL 555	Graduate Study in Rhetoric of Scientific Literature
ENGL 558	Latino/a Literature and Culture
ENGL 560	Proposal and Grant Writing
ENGL 563	Graduate Study in English Literature
ENGL 567	Documentary Film Theory and Criticism
ENGL 569	Graduate in American Literature
ENGL 571	Composition Pedagogy and Practicum
ENGL 581	Women's Literature
ENGL 582	Gender and Popular Culture
ENGL 583	Critical Writing Studies
ENGL 589	Cultural Studies: Literature and Theory
Courses from the Gender and Sexuality Studies Program - check GNDR site for 2-year course rotations if planning to complete a graduate minor in GNDR.	
GNDR 501	Advanced Women & Immigration
GNDR 502	Advanced Transnational Feminisms
GNDR 505	Advanced Alternative Genders and Sexualities
GNDR 506	Advanced Women and Human Rights
GNDR 507	Advanced Gender and Graphic Narrative
GNDR 508	Advanced Feminist Food Studies
GNDR 511	Advanced Gender and Migration
GNDR 512	Advanced Gender and Film Studies
GNDR 533	Advanced Issues in Sex, Gender, and Culture
GNDR 550	Race and Gender in Film
GNDR 554	Advanced Issues in Women Crossing Borders
GNDR 565	Advanced Sex, Gender & the Body
GNDR 571	Advanced Seminar in Feminist and Queer Theories
GNDR 582	Gender and Popular Culture
GNDR 584	Women's Literature
Courses from the Department of History:	
HIST 511	Making the American West
HIST 514	The Constitution and U.S. History
HIST 527	Labor History
HIST 535	War and Revolution
HIST 538	Special Topics in European History
HIST 543	Special Topics in Asian History
HIST 545	Special Topics in United States History
HIST 568	Urban History
HIST 570	The Cold War in Latin America
HIST 571	China through the Ming Dynasty
HIST 572	China in the Modern World
HIST 573	History of Japan
HIST 575	History of the Global Political Economy
HIST 579	Oral History
Total Credits	**54**

1 Subtitles will vary for both FDMA 550 MFA Form & Technique and FDMA 570 MFA Workshop. Select the section that matches your genre requirements or elective choice.

2 After completion of 36 hours, requires concurrent enrollment in FDMA 594 MFA Thesis Workshop. MFA candidates may be advised to repeat FDMA 592 MFA Theory, Practice and Professionalism (for additional elective credits) to better prepare for completion of the thesis.

3 After completion of 36 hours, requires concurrent enrollment in FDMA 592 MFA Theory, Practice and Professionalism. After completion of 45 credits, concurrent enrollment in FDMA 592 MFA Theory, Practice and Professionalism is no longer required.

4 In the semester of thesis defense, it is university policy that degree candidates must enroll in thesis hours. Should an MFA candidate still need to reschedule a thesis defense after the completion of 6 credits, it is university policy that the candidate must enroll in an additional 1 credit hour of thesis during the calendar session of the defense. Thesis hours earned beyond the 6 required for the MFA degree cannot be used for elective credits.

5 Graduate students may enroll in FDMA or JOUR courses numbered below 450 for graduate credit by enrolling in a cross listed FDMA 500 Graduate Problems in Creative Media or FDMA 501 Special Topics. Requests to offer an FDMA 500 Graduate Problems in Creative Media or FDMA 501 Special Topics must be approved by the CMI Director of Graduate Studies and filed with the department no later than 14 business days before registration opens for graduate students. The course instructor must approve setting up a graduate section that will require additional work appropriate for graduate-level study.

6 These courses should be carefully selected in consultation with your advisor to ensure career, disciplinary, or artistic relevance to your study in Creative Writing. Most of these courses will require permission of instructor. For students with financial aid, be aware that courses taken for a graduate minor must also count toward the MFA in Creative Writing and that requested degree exceptions must be processed by the census date of that semester (for more information visit https://fa.nmsu.edu/cpos/index.html (https://fa.nmsu.edu/cpos/)). To enroll in coursework below FDMA 450 Advanced 2D Animation, graduate students may enroll (with permission from instructor and advisor) for graduate credit in a “special topic” shell within that department or enroll in a cross listed FDMA 500 Graduate Problems in Creative Media or FDMA 501 Special Topics. See note “v” for deadlines and approval process.

Criminal Justice - Master of Criminal Justice

All candidates, regardless of chosen degree option, must complete a final examination. Examination requirements vary by degree option. Please contact the director of the MCJ program or consult the Department of Criminal Justice website (http://crimjust.nmsu.edu/criminal-justice-graduat/) for details.

Thesis Option (33 Credits)

Thesis students must submit a thesis proposal to their faculty committee for approval and subsequently complete the approved thesis project. An approved thesis proposal is one wherein the thesis committee determines the student demonstrates a comprehensive understanding of the nexus of theory, method, and policy as it applies to the proposed thesis project. At the discretion of the thesis committee the proposal may be considered inadequate and the student is required to revise and resubmit the thesis proposal until the committee determines the proposal is satisfactory. The final examination minimally includes a defense of the completed thesis, but may also include a general examination based upon the candidate’s program of study. The minimum coursework requirements are displayed below.

Prefix	Title	Credits
Required Courses		**15**
CJUS 501	Research Methods in Criminal Justice	
CJUS 502	Statistics in Criminal Justice	
CJUS 511	Nature of Crime	
CJUS 514	Advanced Race, Crime, and Justice	
CJUS 525	Issues in Ethics, Law, and Criminal Justice	
Master's Thesis Credits		
CJUS 599	Master's Thesis	6
General Electives		
Select 12 credits from General Electives. [1]		12
Total Credits		**33**

[1] Students may not count CJUS 593 Internship or CJUS 592 Independent Research credit toward their elective requirement. No more than three total credits of CJUS 591 Directed Readings in Criminal Justice coursework may be used as electives; a minimum of 3 of the 12 credit general elective requirement must come from the Department of Criminal Justice.

A minor is optional (contact the director of the MCJ program or consult the Department of Criminal Justice web site, https://crimjust.nmsu.edu/, for details) and may result in more than 33 total credits for the degree.

Focused Coursework Option (36 Credits)

Focused coursework students must pass a written comprehensive examination following completion of the required courses. Students not passing the examination will be required to wait until the following semester to retake the examination. The minimum course requirements are displayed below.

Prefix	Title	Credits
Required Courses		**15**
CJUS 501	Research Methods in Criminal Justice	
CJUS 502	Statistics in Criminal Justice	
CJUS 511	Nature of Crime	
CJUS 514	Advanced Race, Crime, and Justice	
CJUS 525	Issues in Ethics, Law, and Criminal Justice	
CJus Electives		
Select 12 credits from electives from courses offered by the Department of Criminal Justice, to be selected in consultation with a student's advisor. [1]		12
General Electives/Minor		
An additional 9 credits of electives, to be selected in consultation with a student's advisor. [2]		9
Total Credits		**36**

[1] No more than three total credits of CJUS 593 Internship or CJUS 591 Directed Readings in Criminal Justice courses may be used as Criminal Justice electives. CJUS 592 Independent Research may not be used as Criminal Justice Electives for this option.

[2] No more than three credits of C J 593 Internship or C J 591 Directed Readings may be used to fulfill the general elective requirement. C J 592 Independent Research may not be used as Criminal Justice Elective for this option.

A minor is optional (contact the director of the MCJ program or consult the Department of Criminal Justice web site, https://crimjust.nmsu.edu/, for details) and may result in more than 36 total credits for the degree.

Minimum Grade Requirement

Students must earn a minimum B- grade in all required core courses, excluding elective credits. This applies to both options: Thesis and Focused Coursework as well as to both programs: On-Campus (traditional) and Online.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. Students can take up to 12 credits of CJUS graduate courses and get dual course credit that can be applied to both an undergraduate and master's degree. You can also check the NMSU catalog for additional information.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 3.00.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

MAP Roadmap

Prefix	Title	Credits
CJUS 453	Women and Justice	3
CJUS 454	Human Trafficking	3
CJUS 456	Police and the Community	3
CJUS 4750V	International Criminal Law, War Crimes, Genocide, & Crimes Against Humanity	3
CJUS 484	Hate Crimes & Groups	3
CJUS 501	Research Methods in Criminal Justice	3
CJUS 502	Statistics in Criminal Justice	3
CJUS 511	Nature of Crime	3
CJUS 514	Advanced Race, Crime, and Justice	3
CJUS 515	A Course on Punishment	3
CJUS 520	Advanced Girls, Women & Crime	3
CJUS 525	Issues in Ethics, Law, and Criminal Justice	3
CJUS 527	Advanced Race & Crime in Film	3
CJUS 528	Advanced Mexican-Americans and Issues of Social Justice	3
CJUS 529	Advanced Immigration & Justice	3
CJUS 531	Advanced Family Violence and the Law	3
CJUS 532	Advanced Issues in Criminal Justice (f, s, sum)	3
CJUS 537	Advanced Wrongful Convictions	3
CJUS 541	Seminar in Criminal Justice Policy Analysis and Planning	3

CJUS 545	Advanced Victimology	3
CJUS 560	Juvenile Justice Systems	3
CJUS 581	Community Policing	3
CJUS 591	Directed Readings in Criminal Justice	3

Consult with the CJUS Department Academic Advisor to choose classes that work for you and the MAP program.

Data Analytics - Master of Data Analytics

Data analytics is an inherently interdisciplinary discipline, dealing with methods and systems to synthesize knowledge or insights from large quantities of data collected from heterogeneous sources and diverse spatial and time scales. Data analytics employs theories, methodologies, and tools drawn from many fields, within the broad areas of mathematics, statistics, and computer and information sciences, and applies them to a diversity of data-rich domains, such as life sciences, medicine, physical sciences, social sciences, engineering, business, and education.

The PMS in Data Analytics will provide students with a strong foundation in data management and analysis, the computational and statistical thinking, and understanding of computer systems. After completing this program, students will have gained the skills and ability to:

- Analyze real-life data from diverse sources and domains
- Effectively apply analytics tools to large data sets
- Apply mathematical and statistical models to data analysis problems
- Apply computational thinking to develop effective data analytics solutions
- Apply programming and debugging skills to problem solving
- Understand and use computer technology and software in solving real-life data analysis problems
- Understand and address unfamiliar problems related to data analytics
- Develop effective instrument to communicate solutions to diverse audiences

Program

The professional focus of the degree will prepare students for success in the workplace, with an emphasis on enriching the preparation of students who are already in the workplace and are seeking technical skills to advance their careers in the data analytics domain.

Program Features

- Degree granted from New Mexico State University
- Asynchronous courses delivery to accommodate student schedules & needs
- 30 credits [3 semesters and a summer, 9 credits/semester; students may enroll part time]
- In person courses are permissible
- Industry experience encouraged

Curriculum

The curriculum for the degree program is composed of 30 graduate credits. It is divided into different categories. One course can be used to satisfy only one category.

Prefix	Title	Credits
Foundation		
CSCI 4520	Python Programming I	3
or CSCI 4525	Python Programming II	
A ST 511	Statistical Methods for Data Analytics Can be replaced by A ST 505 and A ST 507	3
Select one of the following courses		3
CSCI 4530	R Programming I	
A ST 515	Statistical Analysis with R	
Methodologies		
CSCI 5415	Introduction to Data Mining	3
CSCI 5420	Applied Machine Learning I	3
or E E 565	Machine Learning I	
Select one of the following courses		3
CSCI 5140	Database Management Systems I	
BCIS 575	Database Management Systems	
ICT 458	Web Development and Database Applications	
Advanced Topics and Applications		
Choose nine credits from the following:		9
A ST 555	Applied Multivariate Analysis	
A ST 616	Computational Statistics	
ASTR 630	Advanced Methods in Astrophysics	
ASTR 671	Solar Astrophysics	
BIOL 566	Advanced Bioinformatics and NCBI Database	
BCIS 566	Business Analytics II	
BCIS 585	Enterprise Resource Planning & Business Processes	
CSCI 4525	Python Programming II	
CSCI 4540	Computer Science I Transition	
CSCI 4550	Introduction to Data Structures Transition	
CSCI 5310	Bioinformatics Programming	
CSCI 5305	Bioinformatics	
CSCI 5410	Computer Graphics I	
CSCI 5820	Database Management Systems II	
E E 540	Photovoltaic Devices and Systems	
E E 590	Selected Topics (Numerical Computational Methods for Smart Grid)	
E E 596	Digital Image Processing	
ENGL 543	Multimedia Theory and Production	
or COMM 5220	Communication Technologies	
I E 545	Characterizing Time-Dependent Engineering Data	
or BCIS 561	Business Analytics I	
I E 515	Stochastic Processes Modeling	
or I E 522	Queuing Systems	
I E 567	Design and Implementation of Discrete-Event Simulation	
MATH 5220	Fourier Series and Boundary Value Problems	
or STAT 5230	Elementary Stochastic Processes	
RGSC 585	Land Cover Analysis for Natural Resources	
SOCI 5150	Seminar in Social Networks	
SOCI 5155	Seminar in Text Analysis for the Social Sciences	
SOCI 5160	Seminar in Data Visualization	
Capstone Experience		
Select one of the following courses Can be replaced by one course from the Advanced Topics and Applications group		3
CSCI 5994	Master's Project	

CSCI 5991	Special Research Problems	
MATH 5999	Master's Thesis	
A ST 596	Independent Study	
A ST 598	Special Research Problems	
BCIS 598	Independent Study	
E E 598	Master's Technical Report	
I E 598	Special Research Programs	
SOCI 5991	Special Research Problems	
Internship		
Total Credits		**30**

A Suggested Plan of Study

Additional classes may be needed based on placement test results and course prerequisites. Visit with an advisor for help with creating a customized plan.

First Year		
Fall		**Credits**
A ST 511	Statistical Methods for Data Analytics	3
CSCI 4520	Python Programming I	3
CSCI 5415	Introduction to Data Mining	3
	Credits	**9**
Spring		
CSCI 5420	Applied Machine Learning I	3
CSCI 4530	R Programming I	3
One Elective Course from the list of Advanced Topics and Applications courses		3
	Credits	**9**
Second Year		
Fall		
Two Elective Courses from the list of Advanced Topics and Applications courses		6
CSCI 5140 or ICT 458	Database Management Systems I or Web Development and Database Applications	3
	Credits	**9**
Spring		
One from the Capstone experience group or one course from Advanced Topics and Applications		3
	Credits	**3**
	Total Credits	**30**

Economics - Master of Arts

Economics - Master of Arts (no Concentration)

Candidates for the Master of Arts in economics must successfully complete a minimum of 30 graduate credits (concentrations may require more than 30 graduate credits). At least 12 credits beyond the core courses (AEEC 5120 Microeconomic Theory, AEEC 5130 Macroeconomic Theory, AEEC 5240 Econometrics) must be earned by taking courses taught by economics faculty members in the Department of Economics, Applied Statistics and International Business. At least two of the three core courses must be completed at NMSU. Twenty-one of the credits must have one of the four following prefixes: AEEC, ECON, ECDV, or AG E. At least twenty-four of the credits must be associated with courses numbered 500/5000 or above. All students must meet the requirements specified in the general regulations and requirements for admission to the Graduate School and to candidacy. Students preparing to enter the program are encouraged to complete the following:

1. one course in intermediate microeconomic theory and one course in macroeconomic theory with minimum grades of B;
2. one course in college-level calculus; and
3. one course in statistics, including simple regression.

Those students not having completed these courses may be admitted with the requirement that the deficiencies be completed at the beginning of the graduate program.

The Master of Arts in Economics (regulatory economics) may be completed either face-to-face or online

All students in the program must successfully complete a minimum of 30 credits including the following:

Prefix	Title	Credits
Required Courses		
AEEC 5120	Microeconomic Theory	3
AEEC 5130	Macroeconomic Theory	3
AEEC 5240	Econometrics	3
Electives, subject to the restrictions above.		21
Total Credits		**30**

Notes:

1. *No more than one course with a grade less than B can be used to fulfill the requirements for the MA Econ degree.*
2. *ECON 503 Managerial Economics cannot be counted toward the major in Economics.*
3. *A maximum of nine hours of approved transfer credit (with minimum grades of A) may be applied toward the degree.*

Teaching and research assistantships are available to qualified applicants; however, admission to the program does not imply or guarantee an assistantship. It is not necessary to have an undergraduate degree in economics to enter the graduate program or to receive financial assistance.

The Masters of Arts in Economics (no concentration) may be completed either face-to-face or online.

The Master's Accelerated Program allows qualifying NMSU undergraduate economics students to take up to **6** graduate credits—two upper-level economics courses (450 and above)—while completing their undergraduate degree. These courses can be applied toward both their undergraduate and master's degrees.

Qualifications: Juniors with a minimum cumulative **GPA of 3.5** and seniors with a minimum cumulative **GPA of 3.25** are eligible to participate in this program, provided they have completed the following courses with a grade of B or higher.

1. ECON 2110G Macroeconomic Principles
2. ECON 2120G Principles of Microeconomics Honors
3. ECON 304 Money and Banking
4. ECON 311 Intermediate Macroeconomic Theory
5. ECON 312 Intermediate Microeconomic Theory
6. ECON 405 Introductory Econometrics

Eligible courses: Students may select any two of the following courses to count toward both the master's degree and the required upper-division courses for their undergraduate degree:

Prefix	Title	Credits
ECON 450	International Economics	3
ECON 457	Mathematical Economics	3
ECON 471	Electricity Economics	3
ECON 498	Independent Study (ECON 498 is to be substituted for ECON 489 Senior Economics Seminar.)	1-3

Or any ECON courses 450 and above

Note: ECON 503 Managerial Economics is a core course for the NMSU College of Business MBA Program. It is NOT approved as a course in the MA-ECON Program.

General Information: For tuition purposes, students will be considered undergraduates for tuition purposes until they complete their undergraduate degree requirements. During this time, they will continue to be charged tuition and fees at the undergraduate rate and remain eligible for undergraduate scholarships. Students are encouraged to contact their financial aid advisor to discuss federal aid eligibility and how participation in the program may affect their financial aid package. Additionally, students must meet all application deadlines and program requirements for both their undergraduate and graduate programs to remain eligible for the Master's Accelerated Program.

Economics (Econometrics) - Master of Arts

Candidates for the Master of Arts in economics must successfully complete a minimum of 30 graduate credits (concentrations may require more than 30 graduate credits). At least 12 credits beyond the core courses (AEEC 5120 Microeconomic Theory, AEEC 5130 Macroeconomic Theory, AEEC 5240 Econometrics) must be earned by taking courses taught by economics faculty members in the Department of Economics, Applied Statistics and International Business. At least two of the three core courses must be completed at NMSU. Twenty-one of the credits must have one of the four following prefixes: AEEC, ECON, ECDV, or AG E. At least twenty-four of the credits must be associated with courses numbered 500/5000 or above. All students must meet the requirements specified in the general regulations and requirements for admission to the Graduate School and to candidacy. Students preparing to enter the program are encouraged to complete the following:

1. one course in intermediate microeconomic theory and one course in macroeconomic theory with minimum grades of B;
2. one course in college-level calculus; and
3. one course in statistics, including simple regression.

Those students not having completed these courses may be admitted with the requirement that the deficiencies be completed at the beginning of the graduate program. Those students interested in the concentration in regulatory economics are advised to complete two courses in college-level statistics.

Teaching and research assistantships are available to qualified applicants; however, admission to the program does not imply or guarantee an assistantship. It is not necessary to have an undergraduate degree in economics to enter the graduate program nor to receive financial assistance.

All students in the program must successfully complete a minimum of 30 credits including the following:

Prefix	Title	Credits
Required Courses		
AEEC 5120	Microeconomic Theory	3
AEEC 5130	Macroeconomic Theory	3
AEEC 5240	Econometrics	3
Electives, subject to the restrictions above.		21
Total Credits		**30**

Notes:

1. *No more than one course with a grade less than B can be used to fulfill the requirements for the MA Econ degree.*
2. *ECON 503 cannot be counted toward the major in Economics.*
3. *A maximum of nine hours of approved transfer credit (with minimum grades of A) may be applied toward the degree.*

Prefix	Title	Credits
Additional Required Courses for a Concentration in Econometrics		
AEEC 5240	Econometrics	3
ECON 545	Econometrics II	3
Select 6 graduate credits of A ST (Applied Statistics) at the 500 level [1]		6
Total Credits		**12**

[1] Excluding A ST 505 Statistical Inference I, independent study, thesis, project and dissertation credits.

Economics (Public Policy) - Master of Arts

Candidates for the Master of Arts in economics must successfully complete a minimum of 30 graduate credits (concentrations may require more than 30 graduate credits). At least 12 credits beyond the core courses (AEEC 5120 Microeconomic Theory, AEEC 5130 Macroeconomic Theory, AEEC 5240 Econometrics) must be earned by taking courses taught by economics faculty members in the Department of Economics, Applied Statistics and International Business. At least two of the three core courses must be completed at NMSU. Twenty-one of the credits must have one of the four following prefixes: AEEC, ECON, ECDV, or AG E. At least twenty-four of the credits must be associated with courses numbered 5000 or above. All students must meet the requirements specified in the general regulations and requirements for admission to the Graduate School and to candidacy. Students preparing to enter the program are encouraged to complete the following:

1. one course in intermediate microeconomic theory and one course in macroeconomic theory with minimum grades of B;
2. one course in college-level calculus; and
3. one course in statistics, including simple regression.

Those students not having completed these courses may be admitted with the requirement that the deficiencies be completed at the beginning of the graduate program. Those students interested in the concentration

in regulatory economics are advised to complete two courses in college-level statistics.

Teaching and research assistantships are available to qualified applicants: however, admission to the program does not guarantee an assistantship. It is not necessary to have an undergraduate degree in economics for admission to the graduate program nor to receive financial assistance.

Prefix	Title	Credits
Required Courses		
AEEC 5120	Microeconomic Theory	3
AEEC 5130	Macroeconomic Theory	3
AEEC 5240	Econometrics	3
Electives, subject to the restrictions above.		21
Total Credits		**30**

Notes:

1. *No more than one course with a grade less than B can be used to fulfill the requirements for the MA Econ degree.*
2. *ECON 503 cannot be counted toward the major in Economics.*
3. *A maximum of nine hours of approved transfer credit (with minimum grades of A) may be applied toward the degree.*

Prefix	Title	Credits
Additional Required Courses for a Concentration in Public Policy		
AEEC 5230	Public Sector Economics	3
POLS 530	Seminar in Public Policy	3
Select one from the following:		3
POLS 537	Issues in Public Policy	
POLS 540	Seminar in Public Administration	
POLS 541	Public Budgeting	
POLS 544	Public Policy Analysis	
Total Credits		**9**

Economics (Public Utility Policy and Regulation) - Master of Arts

Candidates for the Master of Arts in economics must successfully complete a minimum of 30 graduate credits (concentrations may require more than 30 graduate credits). At least 12 credits beyond the core courses (AEEC 5120 Microeconomic Theory, AEEC 5130 Macroeconomic Theory, AEEC 5240 Econometrics) must be earned by taking courses taught by economics faculty members in the Department of Economics, Applied Statistics and International Business. At least two of the three core courses must be completed at NMSU. Twenty-one of the credits must have one of the four following prefixes: AEEC, ECON, ECDV, or AG E. At least twenty-four of the credits must be associated with courses numbered 5000 or above. All students must meet the requirements specified in the general regulations and requirements for admission to the Graduate School and to candidacy. Students preparing to enter the program are encouraged to complete the following:

1. one course in intermediate microeconomic theory and one course in macroeconomic theory with minimum grades of B;
2. one course in college-level calculus; and
3. one course in statistics, including simple regression.

Those students not having completed these courses may be admitted with the requirement that the deficiencies be completed at the beginning of the graduate program.

Teaching and research assistantships are available to qualified applicants; however, admission to the program does not imply or guarantee an assistantship. It is not necessary to have an undergraduate degree in economics to be admitted to the graduate program nor to receive financial assistance.

The Masters of Arts in Economics (regulatory economics) may be completed either face-to-face or online.

Prefix	Title	Credits
Required Courses		
AEEC 5120	Microeconomic Theory	3
AEEC 5130	Macroeconomic Theory	3
AEEC 5240	Econometrics	3
Electives, subject to the restrictions above.		21
Total Credits		**30**

Notes:

1. *No more than one course with a grade less than B can be used to fulfill the requirements for the MA Econ degree.*
2. *ECON 503 cannot be counted toward the major in Economics.*
3. *A maximum of nine hours of approved transfer credit (with minimum grades of A) may be applied toward the degree.*

Prefix	Title	Credits
Additional Required Courses for a Concentration in Regulatory Economica		
ECON 571	Regulatory Policy and Industry Analysis: Electricity I	3
ECON 572	Regulatory Policy and Industrial Analysis: Water and Natural Gas	3
ECON 573	Regulatory Policy and Industry Analysis: Electricity II	3
ECON 574	Advanced Seminar Regulatory Policy and Industry Analysis	3
Total Credits		**12**

Education (Elementary Licensure Prep) - Master of Arts

Elementary Licensure Prep

The School of Teacher Preparation, Administration, and Leadership (TPAL) at New Mexico State University offers an Elementary Teacher Education Program for individuals who have completed a bachelor's degree. The program is designed to meet the professional education course requirements for teacher licensure as a part of a Master of Arts in Education degree program.

All students wishing to complete a degree in Elementary Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of Education Educational Support and Resource Center or on the departmental website (https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ece.html). A 3.0 minimum GPA is required for admission to the Teacher Education Program, and a 3.0 minimum GPA must be maintained

for graduation. *Students must earn a "C-" or better in all education, TEP prerequisite, endorsement, and teaching field courses.*

Program Completion Requirements:

1. Apply through NMSU Graduate School main webpage (https://gradschool.nmsu.edu/). Select Intended major "Education (Elementary Licensure Prep)" as this is the concentration you will pursue
2. After you receive official notification of acceptance from the Graduate School, contact your faculty advisor within the first semester of enrollment
3. Complete the MATH 5110 Fundamentals of Elementary Mathematics I course
4. Complete the Core Courses listed below, before admission into the Teaching Education Program

Admission to the Teacher Education Program (TEP):

1. Obtain application information at https://tpal.nmsu.edu/admissions/tep-admission/ (https://tpal.nmsu.edu/admissions/tep-admission.html)
2. Make an appointment with the program director for a program of study before TEP portfolio
3. Submit TEP application no later than 12:00 pm (MST) on the 3rd Friday in February for Spring or the 3rd Friday in September for Fall. TEP portfolio must be successfully reviewed before enrolling in Teaching Methods Courses.

Completing Teaching Methods Block Courses:

1. Fall Block (see below)
2. Spring Block (see below)
3. Earn a grade of B or better in all courses

Student Teaching Entry Portfolio (STEP)

1. Obtain application information at https://tpal.nmsu.edu/degree-programs/undergraduate-programs/stia.html
2. Make an appointment with the Program Director for a program of study
3. Submit Student Teaching Packet (STEP) on the 1st Friday in March for Spring and the 1st Friday in October in Fall.

Student Teaching Internship- must be completed during the final semester

1. Take EDUC 5811 and EDUC 5810 concurrently during student teaching (16-week Student Teaching Internship and Seminar)
2. Defend Evidence of Student Learning project during student teaching semester in EDUC 5811
3. Additional Praxis exams are required for NM State Licensure: Principles of Learning and Teaching: Grades K-6 (https://praxis.ets.org/on/demandware.store/Sites-ETS-Praxis-Site/en_US/Product-Show/?pid=5622)5622, Elementary Education: Curriculum, Instruction, and Assessment (https://praxis.ets.org/on/demandware.store/Sites-ETS-Praxis-Site/en_US/Product-Show/?pid=5017) 5017, **and Teaching Reading: Elementary (https://praxis.ets.org/on/demandware.store/Sites-ETS-Praxis-Site/en_US/Product-Show/?pid=5205) 5205**

Prefix	Title	Credits
Course List		
TPAL Core Courses		
SPED 5105	Introduction to Special Education in a Diverse Society (TEP Prerequisite)	3
EDUC 5120	Multicultural Education (TEP Prerequisite)	3
EDUC 5110	Exploration in Education (TEP Prerequisite)	3
EDUC 5160	Curriculum and Pedagogy (TEP Prerequisite)	3
EDUC 5130	Technology and Pedagogy	3
EDUC 5140	Research in Curriculum and Pedagogy	3
Teaching Methods Block Courses		
Fall Block		
READ 5320	Elementary School Literacy II	3
EDUC 5330	Methods of Teaching Elementary School Social Studies	3
Spring Block		
READ 5310	Elementary School Literacy I	3
EDUC 5310	Methods of Teaching Elementary School Science	3
EDUC 5320	Methods of Teaching Elementary School Mathematics	3
Student Teaching Block		
EDUC 5811	Teaching Methods Laboratory	3
EDUC 5810	Student Teaching	6
Total Credits		**42**

Full-time

All block Fall & Spring must be taken as a block in the same section.

First Year		
Fall		**Credits**
MATH 5110	Fundamentals of Elementary Mathematics I (Prerequisite Course)	
EDUC 5120	Multicultural Education	3
SPED 5105	Introduction to Special Education in a Diverse Society	3
	Credits	**6**
Spring		
Apply to Teacher Education Program (TEP). These courses are pre/corequisites for TEP application.		
EDUC 5110	Exploration in Education	3
EDUC 5160	Curriculum and Pedagogy	3
EDUC 5140	Research in Curriculum and Pedagogy	3
	Credits	**9**
Second Year		
Fall		
Take Elementary Education: Curriculum, Instruction, and Assessment. RDG 5320 and EDUC 5330 require acceptance into TEP.		
READ 5320	Elementary School Literacy II	3
EDUC 5330	Methods of Teaching Elementary School Social Studies	3
EDUC 5130	Technology and Pedagogy	3
	Credits	**9**
Spring		
Submit STEP Packet. These courses require acceptance into TEP.		
READ 5310	Elementary School Literacy I	3
EDUC 5310	Methods of Teaching Elementary School Science	3
EDUC 5320	Methods of Teaching Elementary School Mathematics	3
	Credits	**9**

Third Year		
Fall		
EDUC 5811	Teaching Methods Laboratory	3
EDUC 5810	Student Teaching	6
	Credits	**9**
	Total Credits	**42**

Education (Elementary Mathematics and Science) - Master of Arts

The College of Health, Education, and Social Transformation's School of Teacher Preparation, Administration and Leadership at New Mexico State University offers a 34 credit Master of Arts in Education in Elementary Mathematics and Science for individuals who have completed a Bachelor's degree and already licensed teachers. The program is designed to prepare teachers to be specialists in mathematics and science teaching and learning, and to prepare them to be leaders.

A part-time student enrolling in 6 credit hours per semester, including the summer, will complete this program in 2 years. The program follows a cohort model.

Eligible Participants must:

- Have completed a bachelor's degree in a closely related field with a cumulative GPA of 2.80 or higher
- Be admitted to the NMSU Graduate School
- Be admitted to Curriculum & Instruction

Program Delivery: Main Campus; Face-to-face

Prefix	Title	Credits
Program Requirements		
Core Courses		
EDUC 5120	Multicultural Education	3
EDUC 5140	Research in Curriculum and Pedagogy	3
Elementary Mathematics and Science Course Work (28 credits)		
EDUC 5520	Elementary Mathematics Development I	3
MATH 5170	Using Number Throughout the Curriculum	3
EDUC 5530	Elementary Mathematics Development 2	3
MATH 5140	From Number to Algebra	3
E T 490	Selected Topics	3
BIOL 565	Biology In The K-6 Curriculum	3
MATH 5160	From Measurement to Geometry	3
EDUC 5510	Elementary Science Development	3
EDUC 5540	Leadership Advocacy in Elementary Mathematics and Science	3
EDUC 5997	Capstone Research Project	1
Total Credits		**34**

Observations of teaching, technology, and multicultural education are integrated into all coursework.

First Year		
Fall		**Credits**
EDUC 5520	Elementary Mathematics Development I	3
MATH 5170	Using Number Throughout the Curriculum	3
	Credits	**6**
Spring		
EDUC 5530	Elementary Mathematics Development 2	3
MATH 5140	From Number to Algebra	3
	Credits	**6**
Summer		
EDUC 5120	Multicultural Education	3
E T 490	Selected Topics	3
	Credits	**6**
Second Year		
Fall		
BIOL 565	Biology In The K-6 Curriculum	3
MATH 5160	From Measurement to Geometry	3
	Credits	**6**
Spring		
EDUC 5510	Elementary Science Development	3
EDUC 5140	Research in Curriculum and Pedagogy	3
	Credits	**6**
Summer		
EDUC 5540	Leadership Advocacy in Elementary Mathematics and Science	3
EDUC 5997	Capstone Research Project	1
	Credits	**4**
	Total Credits	**34**

Education (Language, Literacy & Culture) - Master of Arts

The program with a concentration in Language, Literacy and Culture (Reading, without licensure) prepares educational leaders and scholars who understand reading, language and literacy education in complex and diverse ways; particularly as these relate to issues of social justice and equity. This program emphasizes the development of critical and expansive perspectives on language and multiculturalism with a focus on the relevance of these for PreK-12 public school students from diverse ethno-linguistic backgrounds. Participants are encouraged to engage in leadership and research activities in a variety of settings at local, state and federal levels.

- To add a Reading Endorsement to a New Mexico Teaching license, students need 24 credits in reading or related area. Please see specific requirements set forth by New Mexico Public Education Department (https://webnew.ped.state.nm.us/)
- Courses with RDG prefix are not offered every semester. Please check with your faculty advisor to plan accordingly
- For additional information about the LLC program visit the program website (https://tpal.nmsu.edu/degree-programs/concentrations/llc.html)

Prefix	Title	Credits
Course Requirements		
TPAL Core Courses		
EDUC 5120	Multicultural Education	3
EDUC 5160	Curriculum and Pedagogy	3
EDUC 5140	Research in Curriculum and Pedagogy	3
EDUC 5170	Action Research Projects [2]	3
Language, Literacy & Culture Courses [1]		
READ 5350	Adult and Family Literacy	3
READ 5340	Literacy Assessment and Evaluation	3
READ 5360	Digital Literacies	3
READ 5210	Language and Literacy Acquisition	3

READ 5410	Theory and Pedagogy of Literature for Children and Adolescents	3
READ 5220	Sociopsycholinguistics of Reading	3
READ 5420	Theory and Pedagogy of Writing	3
Total Credits		**33**

[1] Students seeking a Reading Endorsement can use an upper level reading course from their undergraduate degree as part of the required 24 reading credits. Please check with your faculty advisor to plan accordingly.

[2] This course is the final core course that students are required to take. EDUC 5120 Multicultural Education, EDUC 5160 Curriculum and Pedagogy, and EDUC 5140 Research in Curriculum and Pedagogy are prerequisites to taking EDUC 5170 Action Research Projects.

Education (Secondary Licensure Prep) - Master of Arts

Secondary Licensure Prep

The School of Teacher Preparation, Administration and Leadership (TPAL) at New Mexico State University (NMSU) offers a Secondary Teaching Education Program for individuals who have completed a bachelor's degree and wish to seek Secondary Education licensure. This program meets the State of New Mexico Public Education Department's education requirements for initial teacher licensure as part of the Master of Arts in Education degree program.

Program Admission Requirements:

1. Apply through NMSU Graduate School's main webpage (https://gradschool.nmsu.edu (https://gradschool.nmsu.edu/)). Select the intended major "Education (Secondary Licensure Prep)" as the concentration you will pursue.
2. After you receive official notification of acceptance from the Graduate School, contact your faculty advisor within the first semester of enrollment.
3. Complete the TEP pre-requisites first before specialized admission to the Teacher Education Program.

Teaching Field & Other Course Completion Requirements:

1. Secondary teaching fields can be selected from English Language Arts, Social Studies, Mathematics, or General Science.
2. Applicants need a bachelor's degree aligned to one of the Secondary teaching fields, or closely related field.
3. In addition to a bachelor's degree, students' transcripts will be evaluated for a minimum of 24 credits in the teaching field (12 credits must be upper division).
4. Teaching field deficiencies will require extra coursework beyond the Secondary Licensure Prep degree program.
5. All teaching field deficiencies and all degree coursework (see below) must be completed before the Student Teaching internship semester.

Admission to the Teacher Education Program (TEP):

1. Obtain application information at https://tpal.nmsu.edu/admissions/tep-admission/ (https://tpal.nmsu.edu/admissions/tep-admission.html)
2. Submit the TEP portfolio no later than 12:00 pm (MST) on the 3rd Friday in February for Spring and the 3rd Friday in September for Fall. TEP portfolio must be successfully reviewed before enrolling in Teaching Methods Courses.

Student Teaching Entry Portfolio (STEP)- one semester before student teaching

1. Obtain application information at https://tpal.nmsu.edu/degree-programs/undergraduate-programs/stia.html
2. Submit Student Teaching Packet (STEP) on the 1st Friday in March for Spring and the 1st Friday in October for Fall.

Student Teaching Internship- must be completed during the final semester

1. Take EDUC 5811 and EDUC 5810 concurrently during student teaching (16-week Student Teaching Internship and Seminar).
2. Complete all coursework (see below) and teaching field deficiencies before the Student Teaching courses. No additional courses may be taken during student teaching.
3. Before completion of the program and recommendation for initial licensure, the candidate must pass the Evidence of Student Learning Portfolio during student teaching as a State of NM licensure requirement.

Prefix	Title	Credits
Course List		
TEP Pre-Requisites		
SPED 5105	Introduction to Special Education in a Diverse Society (TEP Prerequisite) [1]	3
EDUC 5120	Multicultural Education (TEP Prerequisite) [1]	3
EDUC 5110	Exploration in Education (TEP Prerequisite) [1, 2]	3
TPAL Core Courses		
EDUC 5160	Curriculum and Pedagogy	3
EDUC 5130	Technology and Pedagogy	3
EDUC 5140	Research in Curriculum and Pedagogy	3
Graduate Electives (3 graduate level credits from any department) [3]		*3*
Teaching Methods Courses		
READ 5330	Content Area Literacy [4]	3
Choose one Teaching Methods Course based on the Teaching Field (3 credits) - Fall only		3
EDUC 5410	Teaching Science at the Middle and High School Level [2, 4]	
EDUC 5420	Teaching Mathematics at the Middle and High School Level [2, 4]	
EDUC 5430	Teaching Social Studies at the Middle and High School Level [2, 4]	
EDUC 5440	Teaching Language Arts at the Middle and High School Level [2, 4]	
Choose one cross-curricular teaching methods course based on the Teaching Field (3 credits) - Spring only		3
EDUC 4530	Computational Thinking in STEM Education	
READ 5530	Teaching Secondary ELA & Social Studies Using Primary Sources, Memoir & Autobiography	
Student Teaching Block		
EDUC 5810	Student Teaching [5]	6
EDUC 5811	Teaching Methods Laboratory [5]	3
Total Credits		**39**

[1] Courses are prerequisites/co-requisites for TEP

[2] Field Experience is required. You must complete a background check and fingerprinting process at the beginning of the semester to obtain district clearance. Fliers will be posted each semester in O'Donnell Hall.
[3] Graduate level electives can be selected from any department with the program director's approval.
[4] Courses require admission to TEP
[5] Courses require admission to TEP and STEP

Fall Start

First Year		
Fall		**Credits**
EDUC 5120	Multicultural Education [1]	3
EDUC 5110	Exploration in Education [1, 2]	3
SPED 5105	Introduction to Special Education in a Diverse Society [1]	3
Elective course (3 credits) [3]		3
*Apply to TEP [4]		
	Credits	**12**
Spring		
EDUC 5130	Technology and Pedagogy	3
EDUC 5160	Curriculum and Pedagogy	3
Choose one cross-curricular teaching methods course based on the Teaching Field (Spring only)		3
EDUC 4530	Computational Thinking in STEM Education	
READ 5530	Teaching Secondary ELA & Social Studies Using Primary Sources, Memoir & Autobiography	
	Credits	**9**
Second Year		
Fall		
Choose one teaching methods course based on the Teaching Field (Fall only)		3
EDUC 5410	Teaching Science at the Middle and High School Level [2, 5]	
EDUC 5420	Teaching Mathematics at the Middle and High School Level [2, 5]	
EDUC 5430	Teaching Social Studies at the Middle and High School Level [2, 5]	
EDUC 5440	Teaching Language Arts at the Middle and High School Level [2, 5]	
READ 5330	Content Area Literacy [5]	3
EDUC 5140	Research in Curriculum and Pedagogy	3
*Apply for STEP before final Student Teaching semester [6]		
	Credits	**9**
Spring		
Student Teaching Internship [7]		
EDUC 5810	Student Teaching [8]	6
EDUC 5811	Teaching Methods Laboratory [8]	3
	Credits	**9**
	Total Credits	**39**

Spring Start

First Year		
Fall		**Credits**
Choose one teaching methods course based on the Teaching Field (Fall only)		3
EDUC 5410	Teaching Science at the Middle and High School Level [2, 5]	
EDUC 5420	Teaching Mathematics at the Middle and High School Level [2, 5]	
EDUC 5430	Teaching Social Studies at the Middle and High School Level [2, 5]	
EDUC 5440	Teaching Language Arts at the Middle and High School Level [2, 5]	
READ 5330	Content Area Literacy [5]	3
EDUC 5130	Technology and Pedagogy	3
	Credits	**9**
Spring		
EDUC 5120	Multicultural Education [1]	3
EDUC 5110	Exploration in Education [1, 2]	3
SPED 5105	Introduction to Special Education in a Diverse Society [1]	3
Elective course (3 credits) [3]		3
*Apply to TEP		
	Credits	**12**
Second Year		
Fall		
Student Teaching Internship [7]		
EDUC 5810	Student Teaching [8]	6
EDUC 5811	Teaching Methods Laboratory [8]	3
	Credits	**9**
Spring		
EDUC 5160	Curriculum and Pedagogy	3
EDUC 5140	Research in Curriculum and Pedagogy	3
Choose one cross-curricular teaching methods course based on the Teaching Field (Spring only)		3
EDUC 4530	Computational Thinking in STEM Education	
READ 5530	Teaching Secondary ELA & Social Studies Using Primary Sources, Memoir & Autobiography	
*Apply for STEP before final Student Teaching semester [6]		
	Credits	**9**
	Total Credits	**39**

[1] Courses are pre-requisites/co-requisites for TEP
[2] Field experience required
[3] Select graduate-level electives with Program Director's approval.
[4] To apply for TEP see the TPAL website (https://tpal.nmsu.edu/)
[5] Requires admission to TEP
[6] Requires admission to STEP. To apply for STEP see the TPAL website (https://tpal.nmsu.edu/)
[7] Student Teaching must be taken during the final semester, after all other coursework is completed
[8] Requires admission to STEP

The Master's in Education plus Secondary Education Licensure program allows for highly qualified undergraduate students to begin their master's level education coursework while still completing their bachelor's degree through the Masters Accelerated Program (MAP). Students interested in earning their teaching license in English, Social Studies, General Science, Math, or Computer Science at the graduate level might benefit from the 12 credit MAP in order to get a head-start on their licensure degree.
The MA plus Secondary Licensure is a hybrid graduate program that is available through both the Main Campus and NMSU-Global campus, and includes face-to-face/hybrid and online coursework. This program also requires field experience for several courses, where students obtain real-world teaching experience in a public-school classroom. This program is

an internship-based program, where the final semester of the MA includes a full-time student teaching internship.

Specialized admission into the Teacher Education Program (TEP) is required during the 2nd semester of the MA plus Secondary Licensure program. Three classes in the MAP (EDUC 5120 Multicultural Education, EDUC 5110 Exploration in Education, and SPED 5105 Introduction to Special Education in a Diverse Society) are used for the TEP pre-requisites allowing for students to apply for the TEP at the conclusion of the MAP in order to make academic progress into the rest of the MA plus Secondary Licensure.

Prefix	Title	Credits
EDUC 5120	Multicultural Education [1]	3
EDUC 5110	Exploration in Education [1,2]	3
SPED 5105	Introduction to Special Education in a Diverse Society [1]	3
Select one from the following		
EDUC 5130	Technology and Pedagogy	
EDUC 5160	Curriculum and Pedagogy	
Graduate Level Elective (3 credits)		

1 TEP pre-requisite course.
2 Requires field experience.

Educational Leadership & Administration (Higher Education Administration) - Master of Arts

Prerequisite

Students interested in higher education administration must have a bachelor's degree.

Application Deadline

This program begins in the spring semester only. All materials for this program must be received by the deadline specified on the School of TPAL website. Admission requirements are available from the School of TPAL, or on the website here (https://tpal.nmsu.edu/admissions/all-programs.html). Students will be informed upon their formal acceptance into the program.

Program Delivery

There is a mandatory face-to-face orientation in Las Cruces prior to the start of the spring semester, January. All other classes are 100% online, distance delivery.

Prefix	Title	Credits
Course Requirements		
ELAD 5220	Management of Educational Change: Higher Education	3
ELAD 5215	Higher Education Administration	3
or ELAD 5210	Community College Administration	
ELAD 5230	Higher Education Finance and Funding	3
ELAD 5240	Management of Student Services in Higher Education	3
ELAD 5250	Higher Education Law	3
ELAD 5260	Administration of Adult and Continuing Education	3
ELAD 5270	Basing Decision on Data: Higher Education.	3
ELAD 5280	Internship: Higher Education Part I	3
ELAD 5285	Internship: Higher Education Part II	3
ELAD 5310	Leadership for Social Justice and Equity	3
ELAD 5510	Elements of Research	3
Total Credits		**33**

A Suggested Plan of Study

The Master of Arts in Educational Administration with a Concentration in Higher Education Administration begin enrollment in the Spring semester and has Summer coursework. Students will complete the program in a Spring-Summer-Fall format.

First Year		
Semester 1		**Credits**
ELAD 5210 or ELAD 5215	Community College Administration or Higher Education Administration	3
ELAD 5510	Elements of Research	3
	Credits	**6**
Semester 2		
ELAD 5220	Management of Educational Change: Higher Education	3
ELAD 5230	Higher Education Finance and Funding	3
	Credits	**6**
Semester 3		
ELAD 5240	Management of Student Services in Higher Education	3
ELAD 5250	Higher Education Law	3
	Credits	**6**
Second Year		
Semester 1		
ELAD 5310	Leadership for Social Justice and Equity	3
ELAD 5280	Internship: Higher Education Part I	3
	Credits	**6**
Semester 2		
ELAD 5260	Administration of Adult and Continuing Education	3
ELAD 5270	Basing Decision on Data: Higher Education.	3
	Credits	**6**
Semester 3		
ELAD 5285	Internship: Higher Education Part II	3
	Credits	**3**
	Total Credits	**33**

Electrical Engineering - Master of Engineering in Electrical Engineering

Requirements and Options for the MEEE Degree

The Program Educational Objectives for the Master of Engineering Program in Electrical Engineering are:

1. That graduates successfully apply advanced skills and techniques in one or more areas of emphasis.

2. That graduates obtain relevant, productive employment with the private sector or in government and/or pursue additional advanced degrees.

The MEEE is a coursework-only option for obtaining a master's degree. The requirement is a total of 30 credits of graduate course work, including passing with a grade of B or better six Graduate Expanded Core Courses from at least three different areas of emphasis. No oral exam is required for the MEEE. All students in the MEEE program who receive support as GAs are expected to take 9 credits of coursework toward the MEEE degree each semester.

Prefix	Title	Credits
Graduate Expanded Core Courses: choose 6 from at least 3 different areas [1]		**18-21**
Electromagnetics		
E E 521	Microwave Engineering	
E E 541	Antennas and Radiation	
E E 548	Introduction to Radar	
E E 549	Smart Antennas	
Microelectronics/VLSI		
E E 510	Introduction to Analog and Digital VLSI	
E E 512	ASIC Design	
E E 523	Analog VLSI Design [2]	
E E 567	ARM SOC Design	
Photonics		
E E 528	Fundamentals of Photonics [2]	
E E 577	Fourier Methods in Electro-Optics	
E E 578	Optical System Design	
Electric Energy Systems		
E E 502	Electricity Markets	
E E 503	Numerical Computational Methods for Smart Grid	
E E 504	Smart Grid Technologies	
E E 505	Application of Optimization Techniques in Power Systems	
E E 507	Data Analytics and AI for the Smart Grid	
E E 533	Power System Operation	
E E 534	Power System Relaying	
E E 537	Power Electronics	
E E 540	Photovoltaic Devices and Systems	
E E 542	Power System Analysis	
E E 543	Power System Faults and Stability [2]	
E E 544	Distribution Systems	
Digital Signal Processing		
E E 545	Digital Signal Processing II [2]	
E E 565	Machine Learning I [3]	
E E 576	Geometric Algebra [3]	
E E 587	Deep Learning for Image Processing	
E E 588	Advanced Image Processing	
E E 596	Digital Image Processing [2,3]	
E E 597	Neural Signal Processing	
Computer Engineering		
E E 506	Quantum Computing	
E E 556	Hardware & Software Codesign	
E E 558	Hardware Security and Trust	
E E 562	Computer Systems Architecture [2]	
E E 563	Computer Performance Analysis I	
E E 590	Selected Topics (Applications of Parallel Computing XSEDE Collaborative Course)	
Communications		
E E 571	Random Signal Analysis [2]	
E E 572	Modern Coding Theory	
E E 573	Signal Compression	
E E 581	Digital Communication Systems I	
E E 583	Wireless Communications	
E E 586	Information Theory	
Controls & Robotics		
E E 551	Control Systems Synthesis [2]	
E E 553	Noncooperative Game Theory	
E E 565	Machine Learning I [3]	
E E 576	Geometric Algebra [3]	
E E 596	Digital Image Processing [3]	
Graduate Electives: choose 3 to 4 courses [4]		**12-9**
Total Credits		**30**

1 The graduate expanded core courses must be passed with a grade of B or better. Note--a grade of B- (or lower) in a graduate expanded core course will not satisfy completion of that course for the MEEE.

2 This course is one of the MSEE Graduate Core Courses. Students pursuing the MEEE who wish to pursue the Ph.D. in the future are encouraged to select three courses from this subset of courses to satisfy one of the requirements for the Ph.D. Qualifying exam (see https://ece.nmsu.edu/grad-study/phd-qualifying.html) for more information.

3 This course is included in multiple areas of emphasis. Students may use this course to satisfy **one** area of emphasis.

4 E E courses must be at the 500 level or higher. Non-E E courses must be at the 450 level or higher. Credits of E E 590 Selected Topics which are not subtitled are limited to a total of 6.

Other limitations and requirements that apply to all master's degrees are described elsewhere in this catalog.

Included Prefixes

Graduate course work credits from the following prefixes are permitted for the MEEE degree. If a graduate course outside this list of prefixes logically fits into the MEEE program, see your graduate advisor about requesting an exception; note that exceptions must be approved before taking the class.

Prefix	Title	Credits
College of Agriculture/Consumer/Environmental Sciences		
AEEC		
ENVS		
GENE		
College of Arts and Sciences		
ASTR		
BCHE		
BIOL		
CSCI		
CHEM		
GEOL		
GPHY		
LING		
MATH		
MOLB		

PHYS	
STAT	
College of Business	
ECON	
MGMT	
College of Engineering	
A E	
A EN	
CHME	
E E	
ENVE	
I E	
M E	
SUR	

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. Students can take up to 12 credits of E E graduate courses and get dual course credit that can be applied to both an undergraduate and master's degree.

You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

Please see further information about the MAP program on the graduate school website at https://gradschool.nmsu.edu/current-students/masters-accelerated-program.html.

Accepted MAP Courses

The following courses are accepted for use in the MAP program. Any other E E 500 level may be considered after a consultation with an advisor. E E 450 level courses are not eligible for MAP credit. The following course list specifies which undergraduate BSEE concentration electives may count toward the MAP. Courses are listed according to the most relevant BSEE concentration, but some courses may count toward multiple concentrations; please refer to the corresponding BSEE concentrations in the NMSU catalog for more details on concentration courses.

Prefix	Title	Credits
Artificial Intelligence, Machine Learning, & Data Science		
E E 506	Quantum Computing	3
E E 565	Machine Learning I	3
Communications and Signal Processing		
E E 545	Digital Signal Processing II	3
E E 571	Random Signal Analysis	3
E E 572	Modern Coding Theory	3
E E 573	Signal Compression	3
E E 581	Digital Communication Systems I	3
E E 583	Wireless Communications	3
E E 586	Information Theory	3
E E 587	Deep Learning for Image Processing	3
E E 588	Advanced Image Processing	3
E E 596	Digital Image Processing	3
E E 597	Neural Signal Processing	3
Computers and Microelectronics		
E E 510	Introduction to Analog and Digital VLSI	3
E E 512	ASIC Design	3
E E 523	Analog VLSI Design	3
E E 556	Hardware & Software Codesign	3
E E 558	Hardware Security and Trust	3
E E 562	Computer Systems Architecture	3
E E 563	Computer Performance Analysis I	3
E E 564	Architectural Concepts II	3
E E 567	ARM SOC Design	3
Controls & Robotics		
E E 551	Control Systems Synthesis	3
E E 576	Geometric Algebra	3
Electromagnetics and Photonics		
E E 521	Microwave Engineering	3
E E 528	Fundamentals of Photonics	4
E E 541	Antennas and Radiation	4
E E 548	Introduction to Radar	3
E E 549	Smart Antennas	3
E E 577	Fourier Methods in Electro-Optics	3
E E 578	Optical System Design	3
Power		
E E 502	Electricity Markets	3
E E 503	Numerical Computational Methods for Smart Grid	3
E E 504	Smart Grid Technologies	3
E E 505	Application of Optimization Techniques in Power Systems	3
E E 507	Data Analytics and AI for the Smart Grid	3
E E 533	Power System Operation	3
E E 534	Power System Relaying	3
E E 537	Power Electronics	3
E E 540	Photovoltaic Devices and Systems	3
E E 542	Power System Analysis	3
E E 543	Power System Faults and Stability	3
E E 544	Distribution Systems	3

Electrical Engineering - Master of Science in Electrical Engineering

Requirements and Options for the MSEE degree

The Program Learning Objectives for the Master of Science in Electrical Engineering are:

1. That graduates successfully apply advanced skills and techniques in one or more areas of emphasis.
2. That graduates obtain relevant, productive employment with the private sector or in government and/or pursue additional advanced degrees.

Note–the following degree requirement tables outline the **minimum** requirements for an MSEE. As many students must register for a minimum of 9 credits each semester to remain full time, a student will often take more than the minimum of 6 credits of E E 599 Master's Thesis or 3 credits of E E 598 Master's Technical Report to complete their degree. All students in the MSEE program who receive support as GAs

are expected to take 9 credits of coursework toward the MSEE degree each semester.

Thesis Option:

Prefix	Title	Credits
Graduate Core Courses (choose 2-3 from 2-3 different areas) [1]		**6-10**
Microelectronics/VLSI		
E E 523	Analog VLSI Design	
Photonics/Optics		
E E 528	Fundamentals of Photonics	
Electric Energy Systems		
E E 543	Power System Faults and Stability	
Digital Signal Processing		
E E 545	Digital Signal Processing II	
or E E 596	Digital Image Processing	
Computer Engineering		
E E 562	Computer Systems Architecture	
Communications		
E E 571	Random Signal Analysis	
Controls & Robotics		
E E 551	Control Systems Synthesis	
Graduate Breadth Elective (choose 1-0 courses) from a third area [1]		**4-0**
Electromagnetics		
E E 541	Antennas and Radiation	
Microelectronics/VLSI		
E E 512	ASIC Design	
Electric Energy Systems		
E E 537	Power Electronics	
Digital Signal Processing		
E E 565	Machine Learning I	
E E 587	Deep Learning for Image Processing	
E E 588	Advanced Image Processing	
E E 597	Neural Signal Processing	
Communications		
E E 581	Digital Communication Systems I	
Controls & Robotics		
E E 576	Geometric Algebra	
Graduate Electives [2]		**13-15**
Master's Thesis		
E E 599	Master's Thesis	
Complete and defend master's thesis [3]		
Total Credits		**30**

1 Students must take at least two core courses from two different areas of emphasis. In addition, either a third graduate core course OR one graduate breadth elective must be taken from a third area of emphasis. Students pursuing the MSEE who wish to pursue the Ph.D. in the future are encouraged to select three courses from the graduate core courses to satisfy one of the requirements for the Ph.D. Qualifying exam (see https://ece.nmsu.edu/grad-study/phd-qualifying.html) for more information.

2 E E courses must be at the 500 level or higher. Non-E E courses must be at the 450 level or higher. The total number of E E credits, including the graduate core and/or graduate breadth electives and excluding credits of E E 599 Master's Thesis must be at least 12. Credits of E E 590 Selected Topics which are not subtitled are limited to a total of 6.

3 The thesis must be completed and orally defended.

Other limitations and requirements that apply to all master's degrees are described elsewhere in this catalog.

Technical Report Option:

Prefix	Title	Credits
Graduate Core Courses (choose 2-3 from 2-3 different areas) [1]		**6-10**
Microelectronics/VLSI		
E E 523	Analog VLSI Design	
Photonics/Optics		
E E 528	Fundamentals of Photonics	
Electric Energy Systems		
E E 543	Power System Faults and Stability	
Digital Signal Processing		
E E 545	Digital Signal Processing II	
or E E 596	Digital Image Processing	
Computer Engineering		
E E 562	Computer Systems Architecture	
Communications		
E E 571	Random Signal Analysis	
Controls & Robotics		
E E 551	Control Systems Synthesis	
Graduate Breadth Elective (choose 1-0 courses from a third area [1]		**4-0**
Electromagnetics		
E E 541	Antennas and Radiation	
Microelectronics/VLSI		
E E 512	ASIC Design	
Electric Energy Systems		
E E 537	Power Electronics	
Digital Signal Processing		
E E 565	Machine Learning I	
E E 587	Deep Learning for Image Processing	
E E 588	Advanced Image Processing	
E E 597	Neural Signal Processing	
Communications		
E E 581	Digital Communication Systems I	
Controls & Robotics		
E E 576	Geometric Algebra	
Graduate Electives [2]		**16-18**
Master's Technical Report		
E E 598	Master's Technical Report	
Complete and defend master's technical report [3]		
Total Credits		**30**

1 Students must take at least two core courses from two different areas of emphasis. In addition, either a third graduate core course OR one graduate breadth elective must be taken from a third area of emphasis. Students pursuing the MSEE who wish to pursue the Ph.D. in the future are encouraged to select three courses from the graduate core courses to satisfy one of the requirements for the Ph.D. Qualifying exam (see https://ece.nmsu.edu/grad-study/phd-qualifying.html) for more information.

2 E E courses must be at the 500 level or higher. Non-E E courses must be at the 450 level or higher. The total number of E E credits, including the graduate core and/or graduate breadth electives and excluding credits of E E 598 Master's Technical Report must be at least 12.

Credits of E E 590 Selected Topics which are not subtitled are limited to a total of 6.

[3] The technical report must be completed and orally defended.

Other limitations and requirements that apply to all master's degrees are described elsewhere in this catalog.

Included Prefixes

Graduate course work credits from the following prefixes are permitted for the MSEE degree. If a graduate course outside this list of prefixes logically fits into the MSEE program, see your graduate advisor about requesting an exception; note that exceptions must be approved before taking the class.

Prefix	Title	Credits
College of Agriculture/Consumer/Environmental Sciences		
AEEC		
ENVS		
GENE		
College of Arts and Sciences		
ASTR		
BCHE		
BIOL		
CSCI		
CHEM		
GEOL		
GPHY		
LING		
MATH		
MOLB		
PHYS		
STAT		
College of Business		
ECON		
MGMT		
College of Engineering		
A E		
A EN		
CHME		
E E		
ENVE		
I E		
M E		
SUR		

New Mexico State University master's accelerated program provides the opportunity for academically qualified undergraduate students to begin working on a master's degree during their junior and senior years while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. Students can take up to 12 credits of E E graduate courses and get dual course credit that can be applied to both an undergraduate and master's degree.

You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

Please see further information about the MAP program on the graduate school website at https://gradschool.nmsu.edu/current-students/masters-accelerated-program.html.

Accepted MAP Courses

The following courses are accepted for use in the MAP program. Any other E E 500 level course that is taught concurrently with an E E 400 level course may be considered after a consultation with an advisor. E E 450 level courses are not eligible for MAP credit nor are E E 500 level courses that are not taught concurrently with an E E 400 level course. The following course list specifies which undergraduate BSEE concentration electives may count toward the MAP. Courses are listed according to the most relevant BSEE concentration, but some courses may count toward multiple concentrations; please refer to the corresponding BSEE concentrations in the NMSU catalog for more details on concentration courses.

Prefix	Title	Credits
Artificial Intelligence, Machine Learning, & Data Science		
E E 506	Quantum Computing	3
E E 565	Machine Learning I	3
Communications and Signal Processing		
E E 573	Signal Compression	3
E E 545	Digital Signal Processing II	3
E E 571	Random Signal Analysis	3
E E 572	Modern Coding Theory	3
E E 581	Digital Communication Systems I	3
E E 583	Wireless Communications	3
E E 586	Information Theory	3
E E 587	Deep Learning for Image Processing	3
E E 588	Advanced Image Processing	3
E E 596	Digital Image Processing	3
E E 597	Neural Signal Processing	3
Computers and Microelectronics		
E E 510	Introduction to Analog and Digital VLSI	3
E E 512	ASIC Design	3
E E 523	Analog VLSI Design	3
E E 556	Hardware & Software Codesign	3
E E 558	Hardware Security and Trust	3
E E 562	Computer Systems Architecture	3
E E 563	Computer Performance Analysis I	3
E E 564	Architectural Concepts II	3
E E 567	ARM SOC Design	3
Controls & Robotics		
E E 551	Control Systems Synthesis	3
E E 576	Geometric Algebra	3
Electromagnetics and Photonics		
E E 521	Microwave Engineering	3
E E 528	Fundamentals of Photonics	4
E E 541	Antennas and Radiation	4
E E 548	Introduction to Radar	3
E E 549	Smart Antennas	3
E E 577	Fourier Methods in Electro-Optics	3
E E 578	Optical System Design	3
Power		
E E 502	Electricity Markets	3

E E 503	Numerical Computational Methods for Smart Grid	3
E E 504	Smart Grid Technologies	3
E E 505	Application of Optimization Techniques in Power Systems	3
E E 507	Data Analytics and AI for the Smart Grid	3
E E 533	Power System Operation	3
E E 534	Power System Relaying	3
E E 537	Power Electronics	3
E E 540	Photovoltaic Devices and Systems	3
E E 542	Power System Analysis	3
E E 543	Power System Faults and Stability	3
E E 544	Distribution Systems	3

English - Master of Arts

New Mexico State University offers MA programs in two areas of emphasis; each one requires 33 hours of graduate-level work.

Emphasis: Literature

Students electing this emphasis can choose to work in various areas of literature, criticism and film. Students are required to

- complete 33 hours of coursework while satisfying area requirements (in early and modern literatures, in British and American Literatures, and in critical theory) with advisor-approved courses;
- demonstrate competency in a foreign language;
- deliver a public presentation on their research;
- write a master essay or thesis; and
- complete their program by passing an oral examination.

See advisor for list of courses satisfying theory and distribution requirements.

Prefix	Title	Credits
Required Coursework [1]		
Critical Theory		**3**
Advisors may approve another Literature course to fulfill this requirement as appropriate, based on subtitle		
ENGL 517	Graduate Study in Critical Theory	
ENGL 526	Special Topics in Critical Theory	
ENGL 589	Cultural Studies: Literature and Theory	
Literature		**18**
Must include both early and late periods, and both British and American Literature. Courses listed below under each category automatically fulfill that requirement. Advisors may approve other Literature courses to fit each requirement based on subtitle.		
Early		
ENGL 405	Chaucer	
ENGL 408	Shakespeare I	
ENGL 409	Shakespeare II	
ENGL 533	Victorian Literature	
Late		
ENGL 542	Modern and Contemporary American Poetry	
ENGL 544	Modern British Fiction	
ENGL 545	Postmodern Fiction	
ENGL 558	Latino/a Literature and Culture	
British		
ENGL 505	Graduate Study in Chaucer	
ENGL 508	Graduate Study in Shakespeare I	
ENGL 509	Graduate Study in Shakespeare II	
ENGL 533	Victorian Literature	
ENGL 544	Modern British Fiction	
ENGL 563	Graduate Study in English Literature	
American		
ENGL 542	Modern and Contemporary American Poetry	
ENGL 558	Latino/a Literature and Culture	
ENGL 569	Graduate in American Literature	
Literature courses to complete the 18 credits		
ENGL 505	Graduate Study in Chaucer	
ENGL 508	Graduate Study in Shakespeare I	
ENGL 509	Graduate Study in Shakespeare II	
ENGL 517	Graduate Study in Critical Theory	
ENGL 521	Graduate Study in a Literary Period or Movement	
ENGL 522	Graduate Study in a Literary Form or Genre	
ENGL 523	Graduate Study of a Major Author	
ENGL 524	Graduate Study in a Major Text	
ENGL 525	Graduate Study in Comparative Literature	
ENGL 526	Special Topics in Critical Theory	
ENGL 527	Graduate Study in Film and Digital Media	
ENGL 533	Victorian Literature	
ENGL 542	Modern and Contemporary American Poetry	
ENGL 544	Modern British Fiction	
ENGL 545	Postmodern Fiction	
ENGL 553	World Literatures	
ENGL 558	Latino/a Literature and Culture	
ENGL 563	Graduate Study in English Literature	
ENGL 567	Documentary Film Theory and Criticism	
ENGL 569	Graduate in American Literature	
ENGL 581	Women's Literature	
ENGL 589	Cultural Studies: Literature and Theory	
Elective courses in English Department		**9-12**
Master's Thesis or Master Essay		
ENGL 599	Master's Thesis [2]	3-6
or ENGL 598	Master's Essay	
Total Credits		**33-39**

[1] Graduate assistants must take 3 hours of ENGL 571 Composition Pedagogy and Practicum, during their first semester of teaching.

[2] Students must take 6 credits of ENGL 599 Master's Thesis to complete this requirement.

Emphasis: Rhetoric and Professional Communication

Students electing this emphasis take core courses across a wide range of topics within rhetoric and professional communication and choose from one of four areas of specialization:

- Composition,
- Critical/Cultural Studies,
- Rhetoric and
- Professional and Technical Communication.

Students conclude their program by writing a thesis, composing a portfolio of work completed in the program, or writing a master essay and by passing an oral examination. Students develop individualized plans of study in consultation with an advisor.

Prefix	Title	Credits
Required Coursework		
Proseminar		**3**
ENGL 510	Proseminar in Rhetoric and Professional Communication	
Methods Course		**3**
Select one from the following:		3
ENGL 548	Graduate Study in Empirical Research	
ENGL 601	Qualitative Research	
ENGL 604	Digital Research Methods	
Elective Course		**3**
Advisor-approved elective in English and/or related field		
Internship		**3**
Note: with advisor approval, student may substitute an elective for the Internship course		
ENGL 597	Internship in Technical and Professional Communication	
Capstone Course		**3-6**
Select one from the following: [2]		
ENGL 585	Advanced Writing Workshop: RPC Capstone	
ENGL 598	Master's Essay	
ENGL 599	Master's Thesis [1]	
Core Courses		**12**
Select two core courses from area of specialization.		
Select two core courses from any of the other three core areas		
Core Composition Courses		
ENGL 550	Graduate Study in Literacy	
ENGL 564	History and Theory of Composition Studies	
ENGL 571	Composition Pedagogy and Practicum [3]	
ENGL 583	Critical Writing Studies	
Core Critical/Cultural Studies Courses		
ENGL 517	Graduate Study in Critical Theory	
ENGL 568	Rhetoric and Cultural Studies	
ENGL 583	Critical Writing Studies	
Core Professional and Technical Communication Courses		
ENGL 502	Critical Conversations in Technical and Professional Communication	
ENGL 543	Multimedia Theory and Production	
ENGL 572	Technical-Professional Communication Pedagogies	
Core Rhetoric Courses		
ENGL 518	History of Rhetoric	
ENGL 519	Graduate Study in Modern Rhetorical Theory	
ENGL 568	Rhetoric and Cultural Studies	
ENGL 590	Master's Seminar in Rhetoric	
Specialized Courses		**9**
Select three additional courses in area of specialization determined in consultation with an advisor. [4]		
Total Credits		**39-42**

[1] Students must take 6 credits of ENGL 599 Master's Thesis to complete this requirement. ENGL 599 Master's Thesis: in lieu of portfolio or master essay.

[2] Graduate assistants must take 3 hours of ENGL 571 Composition Pedagogy and Practicum, during their first semester of teaching.

[3] Students may take either ENGL 570 Graduate Study in Approaches to Composition or ENGL 571 Composition Pedagogy and Practicum as a core course. Taking a second course will count under the area of specialization.

[4] Specialization may occur in any of the four core areas; students choose appropriate coursework for their area of specialization in consultation with an advisor.

Master's Accelerated Program in English with an Emphasis in Literature

The Master's Accelerated Program is an opportunity for qualified, advanced undergraduate students to begin graduate study while still enrolled as an undergraduate student. Students accepted into the program will be able to take up to 12 credits that can be applied to a Master's degree in English at New Mexico State University (just over one third of the required credits to obtain a graduate degree in English at NMSU).

Student Qualifications

Potential MAP students must meet the minimum qualifications for the program as outlined in the Graduate School policy concerning MAP programs.

In addition to these qualifications, students must meet the following requirements in order to be eligible for application to the MAP program.

- Must have a GPA of 3.0 or higher
- Must apply to the program with sufficient time to take the 12 credit hours that will be applied toward the overall program of study. Students will not be able to retroactively apply credits to MAP program.
- Must participate in the Developing New Scholars Program (DSNP), offered by the Graduate School and Honor's College.
- Consult with the Director of Undergraduate Studies on courses eligible and complete the Graduate School MAP form.
- Meet with their financial aid advisor, if they receive financial aid, as financial aid awards may have to be adjusted based on course registration.
- Completed 60 credits, including at least one (1) 400-level literature class and one (1) of the following courses ENGL 301 Theory and Criticism: Rhetoric and Culture, ENGL 302 Theory and Criticism: Literature and Culture, ENGL 303 Theory and Criticism: Film, Media and Culture, or ENGL 310 Critical Writing.

Applying for the MAP

To apply for the MAP fill out the the English Application to the Master's Accelerated Program and a scholarly writing sample (a course paper that showcases your skills in literary analysis). Send these materials to the Director of Undergraduate Studies, Dr. Tyson Stolte, at tmstolte@nmsu.edu. Applicants will also need to fill out the Graduate School's MAP form.

Approved MAP Courses:

The courses below can count toward the 12 credits toward an MA degree available to MAP students.

Prefix	Title	Credits
ENGL 453	World Literatures	3
ENGL 469	Advanced Study in American Literature	3
ENGL 505	Graduate Study in Chaucer	3
ENGL 508	Graduate Study in Shakespeare I	3
ENGL 509	Graduate Study in Shakespeare II	3
ENGL 533	Victorian Literature	3

Environmental Engineering - Master of Science in Environmental Engineering

Environmental engineering at New Mexico State University provides unique educational and research opportunities at the graduate level in the fields of water quality, aquatic chemistry, environmental microbiology, water treatment, water pollution control, wastewater treatment reclamation and reuse, desalination, membrane processes, industrial, hazardous, and solid waste management, groundwater remediation, contaminant fate and transport, resource recovery from waste streams, air pollution control, and nanotechnologies in environmental applications. Therefore, course offerings emphasize basic engineering and scientific principles, as well as the design and application of environmental engineering unit operations and processes. Special topics and thesis research are closely matched with faculty expertise and the professional goals of graduate students. The programs of study are specifically designed for individual students, taking advantage of not only the program capabilities, but also of the complementary activities of the university as a whole as well as the student's professional experience and work environment.

Graduate students satisfy degree requirements in environmental engineering by completing specific core course work. Course work in the graduate program includes the following:

- water and wastewater treatment
- solid and hazardous waste systems design
- environmental chemistry
- environmental microbiology
- environmental contaminant analysis
- industrial pollution control
- fate and transport of pollutants in engineered and natural systems
- water quality in surface water and groundwater systems
- advanced water treatment

Additional topics of interest to the students are offered through special topics classes and by courses taught outside of the College of Engineering.

The Master of Science (M.S.) program in Environmental Engineering requires either a thesis or non-thesis practice-oriented experience. The thesis track consists of a minimum of 30 semester credit hours, including 6 credit hours of thesis. The non-thesis track is designed primarily for students who are working full-time in engineering practice, but is also available to students working part-time. This track consists of 30 semester credit hours, including 6 credit hours of an engineering practicum (ENVE 598 Special Research Programs) of which up to 3 credit hours can be earned for a professional engineering design experience. Transfer credit for courses taken elsewhere is evaluated on an individual basis. Up to 6 semester hours of graduate level courses may be used to satisfy M.S. degree requirements provided that the credits were not used towards another degree.

Required Curriculum

The graduate environmental engineering program of the Civil Engineering Department expects all M.S. students to meet certain requirements in pursuit of an advanced degree. Some of these requirements are related to the quantity, level, and quality of coursework. This Graduate Catalog details what is expected as a minimum for graduation, but it is up to the student and his/her advisor and graduate committee to determine the program of study for the student. The student and his/her advisor will create this program of study in the first semester of graduate work.

Students desiring to work toward an advanced degree in environmental engineering must have completed undergraduate preparation similar to that required for a Bachelor of Science degree in an ABET accredited engineering program or must have adequate background, as determined by the graduate faculty of the program. The background courses listed below may be required if the student did not take a similar course at the undergraduate level, as determined by the graduate faculty of the program.

Environmental engineering faculty will form a committee for every entering student. The faculty will evaluate the student's record and determine which deficiencies or core courses, if any, are needed by the student. The required curriculum consists of 12 credit hours of core courses, 6 credit hours of Master's Thesis (thesis track) or Special Research Programs (non-thesis track), and 12 credit hours of elective courses. For all professional non-thesis programs, the department head will review the committee's decision.

Prefix	Title	Credits
Background Courses		
C E 356	Fundamentals of Environmental Engineering	
C E 382	Hydraulic and Hydrologic Engineering	
ENVE 456	Environmental Engineering Design	
Core Courses		**12**
ENVE 550	Aquatic Chemistry	
ENVE 551	Unit Processes/Operation of Water Treatment	
ENVE 552	Unit Processes/Operation of Wastewater Treatment	
ENVE 557	Surface Water Quality Modeling	
Thesis or Professional Experience [1]		**6**
ENVE 598	Special Research Programs	
or ENVE 599	Master's Thesis	
Elective Courses [2]		**12**
Total Credits		**30**

1. ENVE 598 Special Research Programs: practicum for students pursuing the non-thesis track. ENVE 599 Master's Thesis: required for students pursuing the thesis track.
2. Elective courses may be taken from any department and must be approved by the student's advisor and graduate committee.

Professional Development Electives for the Non-Thesis Track (outside the College of Engineering)

For students pursuing the non-thesis track, a minimum of 6 credit hours in graduate-level communications, management, economics, or other

relevant disciplines are required as part of the 12 elective credit hour requirement. These courses will be selected by the student and must be approved by the student's advisor and graduate committee.

Experimental Psychology - Master of Arts

The department offers an MA degree in general experimental psychology. The program provides students with sufficient electives to emphasize a particular sub-area of experimental psychology. The program is designed to provide graduates with the tools and knowledge necessary for further training at the doctoral level or for employment in industry or government.

MA students are required to complete:

Prefix	Title	Credits
First Year Research Project		**4-6**
PSYC 5991	Special Research Programs	
Core Course (corresponding to the student's area of study):		**3**
PSYC 5320	Cognition	
PSYC 5330	Social Psychology	
PSYC 5310	Engineering Psychology	
Two other Content Courses:		**6**
PSYC 5340	Learning and Memory	
PSYC 5350	Sensation and Perception	
PSYC 540	History and Systems of Psychology	
The Quantitative/Computer Methods Sequence:		**9**
PSYC 5110	Quantitative Methods in Psychology I	3
PSYC 5120	Quantitative Methods in Psychology II	3
PSYC 5210	Computer Methodology	3
Research Thesis:		
PSYC 5999	Master's Thesis	6

[1] Students are also encouraged to register for one credit of PSYC 5910 Research Seminar in Psychology each semester.

When offered, PSYC 5996 Special Topics may be considered content, quantitative methods, or experimental methods, depending on the specific course content.

Family and Consumer Sciences (Food Science and Technology) - Master of Science

The Department of Family and Consumer Sciences offers a Master of Science degree with a concentration in Food Science and Technology. The degree is earned satisfactorily after completing 30 credit hours of upper-division and graduate-level courses. The curriculum is completed in four academic semesters and includes a creative component. Once admitted to the program, each student will work with an advisor to develop an academic plan of study. The major advisor and the student will also select an advisory committee consisting of an additional departmental faculty member and a third member from outside the department.

Prefix	Title	Credits
Require Core Courses		
Statistics [1]		3-4
AXED 5515	Data Collection and Analysis	
A ST 503	SAS Basics	
A ST 505	Statistical Inference I	
Research Methods [2]		3-4
AXED 5510	Research Methods	
ANSC 512	Research Methods in Animal Science (s)	
FCSC 5999	Master's Thesis (Creative Component) [3]	6
Choose 18 credits from the following (in consultation with advisor):		18
FSTE 4150	Food Safety	
FSTE 4997	Special Problems	
FSTE 5110	Food Microbiology	
FSTE 5120	Food Chemistry	
FSTE 5230	Food Processing Technologies	
FSTE 5250	Sensory Evaluation of Foods	
FSTE 5140	Food Analysis	
FSTE 5130	Food Preservation	
FSTE 5210	Cereal Technology	
FSTE 5241	Processed Meats	
FSTE 5997	Special Research Programs	
FCSC 5996	Special Topics	
Total Credits		**30-32**

[1] Any statistics course that is approved by major advisor

[2] Any research methods course that is approved by major advisor

[3] The creative component of the program involves completing at least 6 credits of FCSC 5999 Master's Thesis. This requires the student, in consultation with the advisory committee, to conduct a research project and prepare a written manuscript. The student will present results of the project in the graduate seminar and then be examined by the advisory committee.

Family and Consumer Sciences (Couples, Marriage and Family Therapy) - Master of Science

Prefix	Title	Credits
Required Courses		
Human Development Course		*9*
FCST 5140	Adult Development and Aging	
FCST 5230	Parenting and Child Guidance	
Human Development Course that has been approved by an advisor		
Professional Studies		
FCST 5210	Family Law and Ethics	3
Marital and Family Therapy		
FCST 5310	Family Dysfunction and Diagnosis	3
FCST 5320	Theories of Marriage and Family Therapy	3
FCST 5330	Strategies in Family Therapy	3
FCST 5220	The Business and Practice of Marriage and Family Therapy	1
Marital and Family Studies		
FCST 5410	Sexuality and Family Dynamics	3
FCST 5430	Family Crises and Rehabilitation	3
FCST 5340	The Family System	3

FCST 5420	Contemporary Marriage and Family Issues	3
Multicultural		
FCST 5120	Family Ethnicities and Subcultures	3
Research and Statistics		
Any graduate statistics course that is approved by the Director of the Marriage and Family Therapy Program		3
Practicum		*3*
FCST 5990	Supervised Clinical Practice	
Any graduate research methods course that is approved by the Director of the Marriage and Family Therapy Program		9
Can take one of the following:		
STAT 5210	Probability: Theory and Applications	
AXED 5510	Research Methods	
Can take one of the following:		
AXED 5220	Methods for Teaching Agricultural and Technology Education	
AXED 5515	Data Collection and Analysis	
Total Credits		**52**

First Year

Fall		**Credits**
FCST 5310	Family Dysfunction and Diagnosis	3
FCST 5320	Theories of Marriage and Family Therapy	3
FCST 5340	The Family System	3
	Credits	**9**
Spring		
FCST 5330	Strategies in Family Therapy	3
Human Development Course		3
FCST 5420	Contemporary Marriage and Family Issues	3
	Credits	**9**
Summer		
FCST 5210	Family Law and Ethics	3
	Credits	**3**
Second Year		
Fall		
FCST 5990	Supervised Clinical Practice	3
Human Development Course [1]		3
FCST 5230	Parenting and Child Guidance	
FCST 5430	Family Crises and Rehabilitation	3
Statistics Course [1]		3
	Credits	**12**
Spring		
FCST 5990	Supervised Clinical Practice	3
FCST 5220	The Business and Practice of Marriage and Family Therapy	1
FCST 5410	Sexuality and Family Dynamics	3
FCST 5120	Family Ethnicities and Subcultures	3
EDUC 519	Research in Curriculum and Pedagogy	3
	Credits	**13**
Summer		
FCST 5990	Supervised Clinical Practice	3
Human Development Course [1]		3
	Credits	**6**
	Total Credits	**52**

[1] Must be approved with an advisor

Family and Consumer Sciences (Hotel, Restaurant and Tourism Management) - Master of Science

The concentration in Hotel, Restaurant and Tourism Management combines both coursework and research to expand the student's knowledge, abilities, and problem-solving skills. Students begin the program by learning about the current trends in a wide range of hotel, restaurant and tourism academic research areas. Students also take graduate classes that apply to their chosen area of specialization. Some students focus on general hospitality management. However, most choose an area of interest such as tourism, foodservice, hotel operations, culinary arts, destination management, revenue management, sales and marketing, hospitality or culinary education, beverage management, vacation ownership, hospitality information systems, or human resource management/training.

Thesis Option

Prefix	Title	Credits
Departmental/Program Requirements		
Graduate Level Statistics [1]		3
Graduate Level Research Methods [2]		3
HRTM Graduate Courses		
HRTM 5120	Hospitality Services Management	3
HRTM 5210	The Hospitality Industry and Sustainable Competitive Strategy	3
HRTM 5220	Contemporary Global Issues in Hospitality	3
HRTM Graduate Electives		
Students must take two HRTM specific graduate electives		6
Specialized Graduate Electives		
Students can select from HRTM, AXED, AEEC, FCSC, FCST, FSTE, PES, ENGL 471 M, ENGL 485 M, or approved Business or Education classes based on their personal learning objectives. [3]		6
HRTM 5999	Master's Thesis	3
Total Credits		**30**

[1] **Graduate Level Statistics Class**: AXED 5515 Data Collection and Analysis, STAT 5220 Statistics: Theory and Applications, A ST 505 Statistical Inference I, A ST 511 Statistical Methods for Data Analytics, A ST 512 Quantitative Analysis for Business Decisions, STAT 515 Probability: Theory and Applications, or Other Approved Course

[2] **Graduate Level Research Methods Class**: HRTM 5420 Hospitality Research Methods & Analysis,AXED 5510 Research Methods, AGRO 505 Research Orientation, or Other Approved Course

[3] HRTM 5991 Special Research Programs is recommended as an additional research methods course

Non-Thesis Option

Prefix	Title	Credits
Departmental/Program Requirements		
Graduate Level Statistics [1]		3
Graduate Level Research Methods [2]		3
HRTM Graduate Courses		
HRTM 5210	The Hospitality Industry and Sustainable Competitive Strategy	3
HRTM 5120	Hospitality Services Management	3

HRTM 5220	Contemporary Global Issues in Hospitality	3
HRTM Graduate Electives		
Students must take 2 HRTM Specific Graduate Electives		6
Specialized Graduate Electives		
Students can select from HRTM, AXED, AEEC, FCSC, FCST, FSTE, PES, ENGL 471 M, ENGL 485 M, or approved Business or Education classes based on their personal learning objectives.		6
Non-Thesis		
HRTM 5992	Applied Management Project	3
Total Credits		**30**

1 **Graduate Level Statistics Class**: AXED 5515 Data Collection and Analysis, STAT 5220 Statistics: Theory and Applications, A ST 505 Statistical Inference I, A ST 511 Statistical Methods for Data Analytics, A ST 512 Quantitative Analysis for Business Decisions, STAT 515 Probability: Theory and Applications, or Other Approved Course

2 **Graduate Level Research Methods Class**: HRTM 5420 Hospitality Research Methods & Analysis, AXED 5510 Research Methods, AGRO 505 Research Orientation or Other Approved Course

Suggested Plan of Study

Thesis Option

Semester 1		**Credits**
HRTM 5210	The Hospitality Industry and Sustainable Competitive Strategy	3
Graduate Level Research Methods Course		3
HRTM Graduate Elective		3
	Credits	**9**
Semester 2		
HRTM 5120 or HRTM 5220	Hospitality Services Management or Contemporary Global Issues in Hospitality	3
Graduate Level Statistics Course		3
HRTM Graduate Elective		
	Credits	**6**
Semester 3		
HRTM 5120 or HRTM 5220	Hospitality Services Management or Contemporary Global Issues in Hospitality	3
HRTM 5999	Master's Thesis	3
HRTM or Specialized Elective		3
	Credits	**9**
Semester 4		
HRTM 5999	Master's Thesis	3
HRTM or Specialized Electives		3
	Credits	**6**
	Total Credits	**30**

Suggested Plan of Study

Non-Thesis Option

Semester 1		**Credits**
HRTM 5210	The Hospitality Industry and Sustainable Competitive Strategy	3
Graduate Level Research Methods Course		3
HRTM Graduate Elective		3
	Credits	**9**
Semester 2		
HRTM 5120 or HRTM 5220	Hospitality Services Management or Contemporary Global Issues in Hospitality	3
Graduate Level Statistics Course		3
HRTM Elective		3
	Credits	**9**
Semester 3		
HRTM 5120 or HRTM 5220	Hospitality Services Management or Contemporary Global Issues in Hospitality	3
HRTM or Specialized Electives		3
	Credits	**6**
Semester 4		
HRTM 5992	Applied Management Project	3
HRTM or Specialized Electives		3
	Credits	**6**
	Total Credits	**30**

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to your HRTM Faculty Mentor about your MAP plan and develop a course plan in consultation with the advisor.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 3.00.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
HRTM Required and Elective Classes Taken At Graduate Level [1]		
HRTM 5145	Resort Management	3
HRTM 5140	Hotel Revenue and Sales Management	3
HRTM 5240	Sustainability in the Hospitality Industry	3

HRTM 5310	Beverage Management	3
HRTM 5410	Hospitality Cost Control	3
HRTM 5996	Special Topics	1-4

[1] Other courses may be used for the MAP requirements with the consent of instructor, including HRTM 5210 The Hospitality Industry and Sustainable Competitive Strategy, HRTM 5220 Contemporary Global Issues in Hospitality, and HRTM 5991 Special Research Programs but will require a degree audit exception through the department/graduate school.

For additional information, please see MAP requirements at:

https://gradschool.nmsu.edu/current-students/masters-accelerated-program.html.

Fine Arts - Master of Fine Arts

Emphasis: Studio Art

Art requirements for an MFA degree with an emphasis in studio art include a minimum of 60 credits of academic work, usually completed in three years. Of those 60 credits,

- 15 in 500-level ARTS classes
- 9 must be taken in art history,
- 6 in non-art courses numbered 450 or above,
- 3 in ARTH 579 Methodologies and Historiography of Art History and Art Theory
- 15 in ARTS 596 Graduate Studio Seminar
- 3 in ARTS 493 Studio Core III
- 3 in ARTS 495 Studio Core IV
- 6 in ARTS 598 Studio Thesis
-

In order to remain in good standing in the MFA program, a student must maintain an average GPA of 3.0. Any grade lower than B- in an Art Department graduate course is considered failing. In the event that a student fails a required course, they must repeat the class in order to get credit for it. If a student is awarded a graduate assistantship, he or she must maintain an average GPA of 3.0.

Prefix	Title	Credits
Program Requirements		
ARTH 579	Methodologies and Historiography of Art History and Art Theory	3
ARTS 596	Graduate Studio Seminar	15
Non-ARTS/Non-ARTH 450 level or higher courses		6
Studio Art Electives (ARTS 500-level)		15
Art History Electives (ARTH 500-level)		9
ARTS 493	Studio Core III: Professional Practices	3
ARTS 495	Studio Core IV: Thesis Production & Display	3
ARTS 598	Studio Thesis	6
Total Credits		**60**

Semester Reviews

At the end of the first two semesters, each graduate student's creative production will be reviewed by the assembled faculty. Participation in semester reviews are required for successful completion of graduate level studio courses.

Candidacy

Candidacy occurs during the third semester of study in residency. Candidacy consists of a formal review of the student's work by the assembled graduate faculty. The graduate faculty advances the student to his or her final 3 semesters of study by a majority vote. If the faculty does not advance the student, candidacy may be repeated one additional time at the end of the next consecutive semester. The final three semesters of thesis work will commence from that point. Students who are not successful in their second candidacy attempt will be dis-enrolled from the MFA program.

MFA Capstone Committee

At the end of the third semester and after a successful candidacy the student will propose his or her MFA capstone committee, consisting of two department of art graduate faculty members, and one graduate faculty member from outside the department.

MFA Capstone Exhibition

The studio thesis will culminate in an exhibition of the candidate's creative works and a written artist statement. A successful oral examination and defense of the statement and exhibition is required for graduation. Two copies of the artist statement and a photographic record of the final exhibition are required; other requirements may be determined by the graduate faculty. Students who do not satisfactorily complete their oral examination may not participate in the MFA capstone exhibition.

Capstone exhibitions for the MFA degree will be held in the spring semester in the University Art Museum. Students who wish to graduate at mid-year are obligated to find an exhibition space other than the NMSU Art Museum that meets with the approval of the graduate committee. In this case the student is responsible for making all arrangements for the MFA capstone exhibition.

Fish, Wildlife and Conservation Ecology - Master of Science

The Department of Fish, Wildlife and Conservation Ecology (FWCE) offers graduate work leading to the Master of Science degree with a major in Fish, Wildlife and Conservation Ecology. Faculty members in the department also may advise Ph.D. candidates through the graduate program in the Department of Biology, Department of Animal and Range Sciences, Department of Plant and Environmental Sciences, as well as other Ph.D. granting departments. For additional information, please see the graduate catalog entries for the respective departments.

For the Master of Science degree, a minimum of 30 semester credits of graduate work in the major and related subjects is required, together with a thesis for most students. Of these credits, at least 15 must be in courses numbered 500 or above, and at least 15 must be for courses with the FWCE prefix. Students electing a minor in FWCE are required to take at least 9 credits in the minor field. A nonthesis option is available to some students, depending on prior training and experience, and subject to approval by the advisor and department head.

All students in the program must complete the following requirements:

- A minimum of 6 credits of Quantitative Foundations (eligible courses listed below),

- A minimum of 3 courses (9-12 credits) from Ecological Concepts, Organismal Biology, Ecological Techniques (eligible courses listed below),
  - In addition, courses taught as special topics (FWCE 535 Special Topics) may apply to the Quantitative Foundations or Ecological Concepts, Organismal Biology, Ecological Techniques with approval from the supervisory committee and Department Head.
- 4 to 12 credits from the Independent Study category (eligible courses listed below).
  - Programs involving a thesis should include 4 to 6 credits of (FWCE 599 Master's Thesis). A maximum of 6 credits of (FWCE 599 Master's Thesis) will count towards the 30 credit hour requirement.

The lists below show typical courses that meet minimum Departmental and Graduate School course requirements for the Master's degree, as determined by the faculty and Department Head. Graduate-level courses other than those listed below may be used to fulfill course requirements with permission from the supervisory committee and Department Head.

Prefix	Title	Credits
Quantitative Foundations: Eligible Courses [1]		
Select minimum of 6 credits from the following:		6
A ST 503	SAS Basics	
A ST 505	Statistical Inference I (or equivalent)	
A ST 506	Statistical Inference II	
A ST 507	Advanced Regression	
A ST 509	Statistical Models for Complex Data Structures	
A ST 540	Predictive Analytics	
A ST 555	Applied Multivariate Analysis	
A ST 568	Applied Linear Models II	
A ST 550	Special Topics	
BIOL 455	Biometry	
FWCE 457	Ecological Biometry	
FWCE 509	Population Ecology	
GEOG 585	Spatial Analysis and Modeling	
**Other courses may be eligible to fulfill course requirements with consent of the advisory committee and department head		
Ecological Concepts, Organismal Biology, Ecological Techniques: Eligible courses		
Select a minimum of 3 courses (9-12 credits) from the following:		9
BIOL 467	Evolution	
BIOL 484	Animal Communication	
BIOL 488	Principles of Conservation Genetics	
BIOL 568	Communities and Ecosystems	
BIOL 587	Behavioral and Evolutionary Ecology	
FWCE 464	Fish and Wildlife Management, Law, and Policy	
FWCE 530	Large Mammal Ecology, Conservation and Management (Fall Odd years)	
FWCE 531	Mammalogy	
FWCE 535	Special Topics	
FWCE 537	Wildlife Damage Management	
FWCE 540	Wildlife Habitat Relationships (Fall even years)	
FWCE 559	Aquatic Ecology	
FWCE 567	Herpetology	
FWCE 571	GIS for Natural Resource Scientists	
FWCE 582	Ichthyology	
GEOG 557	Biogeography	
RGSC 452	Vegetation Measurements for Rangeland Assessment	
RGSC 585	Land Cover Analysis for Natural Resources	
RGSC 518	Watershed Methods and Management	
**Other courses may be eligible to fulfill course requirements with consent of the advisory committee and department head.		
Independent Study: Eligible courses		
Select 4-12 credits from the following:		4
FWCE 548	Graduate Problems	
FWCE 598	Special Research Programs	
FWCE 599	Master's Thesis	
**Other courses may be eligible to fulfill course requirements with consent of the advisory committee and department head		
To meet the 30 credit hour requirements of the MS program, completion of further course work in addition to the requirements described above will be necessary. The additional course(s) must be approved by the graduate student's supervisory committee.		11
Total Credits		**30**

[1] Other courses, particularly in Applied Statistics, may be eligible with consent of the advisory committee.

Graduate work in the department is intended to prepare students for careers in research, teaching, extension and management. Facilities available to graduate students include two ranches of approximately 90,000 acres, a large suite of shared laboratories, and a large fish-culture facility. We actively cooperate with state and federal natural resource management agencies, and graduate students have access to national forests and extensive public lands, as well as the Jornada Basin Long-Term Ecological Research site and associated databases. Additional research opportunities for graduate students are available in the New Mexico Cooperative Fish and Wildlife Research Unit, located in the department since 1988.

Additional information on the graduate program and faculty is available at https://aces-academics.nmsu.edu/.

Geography - Master of Applied Geography

Overview

The Master of Applied Geography (MAG) program at New Mexico State University's Department of Geography & Environmental Studies provides students with a flexible, interdisciplinary graduate education that prepares them for careers in both academic and professional settings. The program offers two pathways to completion:

Thesis Option (30 credits)

This option is designed for students interested in original research, this track requires coursework, the development of a master's thesis, and a thesis defense. Students work closely with faculty advisors and a thesis committee to produce a significant scholarly contribution to the field.

Non-Thesis (Residency) Option (30 credits)

This option is ideal for students pursuing applied, practice-based careers, this track replaces the thesis with a residency experience in an external organization, an applied residency report, and a final examination.

A Flexible and Interdisciplinary Approach

The MAG program is highly customizable, allowing students to tailor their studies to align with their academic interests and professional goals. Core coursework ensures a strong foundation in geographic theory, integrative research design, and advanced methodologies, while elective courses—drawn from geography and affiliated disciplines—enable students to develop specialized expertise in areas such as geographic information science and technology, environmental policy and planning, conservation and natural resource management, urban and regional planning, and emergency and disaster management.

Funding and Assistantships

Most MAG students receive financial support through teaching or research assistantships, which provide stipends and tuition coverage while offering valuable teaching and research experience. Additional funding opportunities are available through departmental scholarships, external grants, and professional partnerships.

Who Can Apply?

A background in geography is not required to enter the program. However, students without prior coursework in geography may be required to take preparatory courses to ensure success in graduate-level geography coursework. Prospective students are encouraged to consult with the Graduate Program Director to determine optimal pathways for meeting prerequisite requirements.

Career Pathways

Graduates of the MAG program secure careers in diverse professional and academic fields, including data and information management, cultural and natural resource management, environmental consulting, urban and regional planning, education and outreach, emergency management, and public health.

Program Learning Outcomes

Upon completion of the Master of Applied Geography, students will be able to:

1. Apply advanced geographic concepts and methods to assess human and/or environmental problems.
2. Propose ethical solutions to complex and dynamic human and/or environmental problems using critical thinking.
3. Conduct all stages of an independent research project, including conceptualization, planning, implementation, management, and communication through a research report.

More Information

See the Requirements tab for details on course and credit expectations for earning the Master of Applied Geography, and the Roadmap tab for a suggested course sequence.

Course and Credit Requirements

General Information

The Department of Geography and Environmental Studies (GES) at NMSU offers students two options for earning a Master of Applied Geography (MAG): a thesis option and a non-thesis option. The thesis option (30 credits) represents the traditional path for earning a MAG degree and entails the completion of coursework and the writing and defense of a master's thesis. The master's thesis is a piece of original scholarship developed under the direction of an advisor and typically two thesis committee members. The non-thesis option (30 credits) is an alternative path for earning a MAG degree and requires the completion of coursework, the writing of a residency report, and the passing of a final exam. The residency report is a document developed during an internship or residency under the direction of a field supervisor at an agency or firm.

Undergraduate Preparation

An undergraduate geography degree is not required for entry into the MAG program. However, applicants who lack the equivalent of GEOG 1110G Physical Geography, GEOG 1130G Human Geography, and/or GEOG 2130 Map Analysis & Interpretation may be required to take these or similar courses to prepare for the graduate-level work in geography. Applicants without an undergraduate geography degree are strongly encouraged to contact the GES Graduate Program Director and their Graduate Advisor to identify optimal strategies for satisfying basic course requirements.

Prefix	Title	Credits
GEOG 1110G	Physical Geography	4
GEOG 1130G	Human Geography	3
GEOG 2130	Map Analysis & Interpretation	3

Credit, Course, and Grade Requirements

The MAG program aims at offering students flexibility in designing their desired course of graduate study while at the same time ensuring that all students have graduate-level core competencies in geographic concepts and methods. To that end, all students pursuing the MAG degree are required to complete a minimum of 30 graduate credits, including 9 core course credits, 6 thesis credits (thesis option) or 6 residency credits (non-thesis option), and 15 elective credits. Of the 30 graduate credits, at least 15 credits must be in geography and at least 15 credits must be at the 500-level or above. All MAG students must earn a grade of B- or better in the 3 core courses (GEOG 501 Geographic Theory and Application, GEOG 502 Integrative Research Design, and GEOG 584 Qualitative, Critical, and Creative Methodologies or GEOG 585 Spatial Analysis and Modeling). All candidates are moreover required to maintain an overall GPA or 3.00 or higher.

Prefix	Title	Credits
Core Geography Courses [1]		**9**
GEOG 501	Geographic Theory and Application	3
GEOG 502	Integrative Research Design	3
GEOG 584	Qualitative, Critical, and Creative Methodologies	3
or GEOG 585	Spatial Analysis and Modeling	
Elective Courses [2]		**15**
Select additional courses in geography and/or other disciplines.		
At least 6 of the elective credits must be in geography.		
At least 6 of the elective credits must be at the 500-level or above.		
Thesis / Residency Credits [3]		**6**
GEOG 599	Master's Thesis	6
or GEOG 596	Residency	

1. Students must earn a grade of B- or better in all 3 core courses.
2. Students may be required to take additional courses that their committee deems necessary for the successful completion of the thesis research.
3. For more information regarding the master's thesis requirement, please visit **this GES website**.

A Suggested Plan of Study for Students

The following road map is a guide for full-time students (9 credits/semester for graduate assistants and/or graduate students receiving financial aid) to earn the Master of Applied Geography (MAG) degree and achieve the following MAG program learning outcomes:

1. Apply advanced geographic concepts and methods to assess human and/or environmental problems.
2. Propose ethical solutions to complex and dynamic human and/or environmental problems using critical thinking.
3. Conduct all stages of an independent research project, including conceptualization, planning, implementation, management, and communication through a research report.

The road map assumes that each student will create a customized plan for degree completion in consultation with their graduate faculty committee. We realize that students may deviate from the road map for various reasons but expect that they diligently attempt to meet the milestones outlined below.

First Year, Fall Semester

First Year		
Fall		**Credits**
GEOG 501	Geographic Theory and Application	3
GEOG 584	Qualitative, Critical, and Creative Methodologies	3
or GEOG TBD Elective Course		
Elective Course		3
	Credits	**9**
	Total Credits	**9**

Non- Curricular Recommendations

- Select your Graduate Faculty Advisor.
- Clarify your academic and professional goals and align your curricular path with the MAG program learning outcomes noted above.
- Establish a preliminary thesis / residency topic.
- Identify extracurricular service and outreach opportunities such as leadership in student organizations, community engagement, or peer mentoring.
- Identify professional development opportunities such as conference attendance, workshop participation, or internships.

First Year, Spring Semester

First Year		
Spring		**Credits**
GEOG 502	Integrative Research Design	3
GEOG 585	Spatial Analysis and Modeling	3
or GEOG TBD Elective Course		
Elective Course		3
	Credits	**9**
	Total Credits	**9**

Non- Curricular Recommendations

- Finalize your Graduate Faculty Committee and file the Graduate Research Committee form.
- Propose your thesis / residency project to the Graduate Faculty Committee.
- File the “Thesis / Residency Proposal Form.”
- File the “Program of Study for Masters Students Form.”
- Discuss opportunities for disseminating your scholarly and creative activities via presentations, publications, and other strategies.
- Engage in extracurricular service and outreach activities.
- Take advantage of professional development opportunities.
- Plan for fieldwork, internships, or other activities during the summer.

First Year, Summer Semester

Non- Curricular Recommendations

- Conduct field, archive, and other data collection work for your thesis or residency.
- Conduct data analyses for your thesis or residency.
- Begin writing your thesis or residency report.

Second Year, Fall Semester

Second Year		
Fall		**Credits**
Elective Course		3
Elective Course		3
GEOG 599 or GEOG 596	Master's Thesis or Residency	3
	Credits	**9**
	Total Credits	**9**

Non- Curricular Recommendations

- Finish your data collection and analysis.
- Continue writing your thesis or residency report.
- Disseminate your scholarly and creative activities via presentations, publications, and other strategies.
- Engage in extracurricular service and outreach activities.
- Take advantage of professional development opportunities.

Second Year, Spring Semester

Second Year		
Spring		**Credits**
Elective Course		3
Elective Course		3
GEOG 599 or GEOG 596	Master's Thesis or Residency	3
	Credits	**9**
	Total Credits	**9**

Non- Curricular Recommendations

- Finish writing your thesis or residency report.
- Study the NMSU Graduate School webpages and make sure you meet all deadlines for degree application, form submissions, etc..
- Schedule and hold your thesis defense or oral exam.
- Share your final thesis or residency report as well as all thesis / residency data and metadata with your Graduate Faculty Advisor.

- Disseminate your scholarly and creative activities via presentations, publications, and other strategies.
- Engage in extracurricular service and outreach activities.
- Take advantage of professional development opportunities.

Geology - Master of Science

A candidate for a master's degree must:

- Complete a minimum of 30 graduate credits, including a minimum of 6 credits for thesis (GEOL 599 Master's Thesis).
  - No more than 5 thesis credits may be taken in any one semester. Early selection of a research advisor is encouraged.
- A thesis proposal must be approved by the advisor and the candidate's committee before registering for thesis credits.
- At least 15 credits must be earned in courses numbered 500 or above, and at least 15 credits must be earned in geology.
- Students are expected to participate in the department's colloquium each semester.

The department offers excellent laboratory facilities for research in mineralogy, igneous petrology, geochemistry, stratigraphy, geochronology, and sedimentology. Available are a large, fully equipped rock preparation laboratory, mineral separation laboratory, plus computer, geochemical and petrographic labs. Major equipment includes a Gemeni heavy mineral separation table, X-Ray Fluorescence Spectrometry (XRF), Laser-Induced Breakdown Spectroscopy (LIBS), a class 1000 clean lab, Thermal Ionization Mass Spectrometry (TIMS) and Laser-Ablation Multi-Collector Inductively Coupled Plasma Mass Spectrometry (LA-MC-ICP-MS). The department maintains its own fleet of field vehicles. Also available are computing facilities that include an HP color plotter and GIS system. Financial support is available to graduate students in geology through teaching and research assistantships and scholarships. Inquiries regarding financial aid should be directed to the graduate advisor.

History - Master of Arts

Thesis Program

Thirty-six credits (27 of which must be at the 500 level) are required for the thesis program:

Prefix	Title	Credits
Select at least 3 credits from Public History courses above the 500 level		3
HIST 579	Oral History	
HIST 583	Advanced Historic Preservation	
HIST 586	Interpreting Historic Places for the Public	
HIST 594	Public History Seminar	
Select two from the following:		6
HIST 590	Reading Seminar: Borders, Boundaries and Frontiers	
HIST 591	Reading Seminar: Modernity and its Discontents	
HIST 592	Reading Seminar: Nature and Society	
HIST 596	Research Seminar	3
HIST 598	Craft of History: Historical Theories, Methods, and Criticism (f)	3
Select a maximum of 6 credits in related fields outside the Department of History [1]		6
Select 9 credits at the 500-level or above in the Department of History		9
HIST 599	Master's Thesis	6
Total Credits		**36**

[1] With permission of the graduate advisor, a maximum of 6 credits may be taken in related fields from courses numbered 450 and above outside the Department of History.

A student choosing the thesis program must receive permission for his/her thesis by passing a thesis proposal defense after earning 12 graduate credits in History. The department will provide guidelines for the thesis defense. Students who choose the thesis program must pass a final oral examination over their graduate course work and their thesis. All graduate students will be required to present a research paper in a public forum approved by the department's Graduate Director.

Dual Track M.A. (Public History and Thesis)

Students choosing to pursue both the thesis track and Public History concentration must complete the course hours required for the public history concentration, perform an internship, and defend the proposed thesis before undertaking it using guidelines provided by the department, present the public history portfolio at a public presentation, complete the thesis, and defend their course work, thesis and public history portfolio at a final oral examination. In order to satisfactorily complete both programs, such students would complete 39 credits, including three hours of internship credit and six hours of thesis work.

Prefix	Title	Credits
Select four History Graduate Seminars including the following:		
HIST 594 Public History		3
HIST 598 Craft of History		3
HIST 596 Research Seminar		3
Select one from the following:		3
HIST 590	Reading Seminar: Borders, Boundaries and Frontiers	
HIST 591	Reading Seminar: Modernity and its Discontents	
HIST 592	Reading Seminar: Nature and Society	
HIST 585	Public History Internship	3
Select a maximum of 9 credits (450-and above) outside the Department of History [2]		9
Preparation of an article of scholarly quality		3
Select 3 credits at the 500 level from courses in the Department of History		3
HIST 599	Master's Thesis	6
Total Credits		**36**

Master's Accelerated Program (MAP)

Master's Accelerated Program (MAP)

The Master's Accelerated Program allows academically qualified Undergraduate students to complete up to 12 credit hours towards a Master's degree during their junior and/or senior years while still completing the Bachelor's degree. The courses only apply to classes they would take within the Master of Arts program in History.

NMSU General Eligibility:

Must have completed 60 hours of undergraduate coursework (minimum 25 hours at NMSU). GPA larger or equal to 3.00.

NMSU MAP Regulations/Stipulations:

Courses will count toward both degrees; they will show on Undergraduate and Graduate transcripts and count toward both GPAs. Graduate level courses included in the Master's Accelerated Program are those courses numbered 450 and above or those chosen by the graduate academic departments. Students must receive a grade of B or higher in all MAP coursework to be counted as Graduate credit. Students apply for the Graduate program in their final semester or second to last semester of their Undergraduate degree, depending upon the deadlines set forth by the Department of History. Acceptance of MAP credits does not imply acceptance into the Department of History Master's program. Final admissions and acceptance into the Graduate program are based on academic performance at the Undergraduate level and completion of the eligible Undergraduate degree. Tuition is based on the level of the student, not the course. Students may become ineligible for MAP if their undergraduate or graduate GPA drops below 3.0. Students who are accepted into the Master's Accelerated Program must participate in the Developing New Scholars Program (DNSP), offered by the Graduate School. Students must be advised each semester for the MAP program by their potential graduate program and cleared for registration in Graduate courses by the Graduate School.

How to Apply to the MAP Program:

A student may apply, or the department may invite students to participate in MAP. Departments accept students based on the Master's Accelerated Program requirements as set by the department. A History faculty member, Graduate Coordinator, or Department Head will forward the Master's Accelerated Program Letter of Intent Slate Form to the Graduate School. Graduate School will hold the application until the student has completed their undergraduate degree. This application will be used as part of the graduate school's final admissions into the master's program. The following courses are eligible for the History MAP Program. Other courses may be considered after consultation with the Graduate Coordinator. An exception will need to be made to the degree audit for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
HIST 474	Gender in East Asian History	3
HIST 478	History of Transportation: Planes, Trains and Automobiles	3
HIST 500	Special Topics	1-9
HIST 511	Making the American West	3
HIST 514	The Constitution and U.S. History	3
HIST 527	Labor History	3
HIST 535	War and Revolution	3
HIST 538	Special Topics in European History	3
HIST 543	Special Topics in Asian History	3
HIST 545	Special Topics in United States History	3
HIST 549	Graduate Readings	1-3
HIST 568	Urban History	3
HIST 570	The Cold War in Latin America	3
HIST 571	China through the Ming Dynasty	3
HIST 572	China in the Modern World	3
HIST 573	History of Japan	3
HIST 575	History of the Global Political Economy	3
HIST 579	Oral History	3
HIST 583	Advanced Historic Preservation	3
HIST 585	Public History Internship	3
HIST 586	Interpreting Historic Places for the Public	3
HIST 590	Reading Seminar: Borders, Boundaries and Frontiers	3
HIST 591	Reading Seminar: Modernity and its Discontents	3
HIST 592	Reading Seminar: Nature and Society	3
HIST 594	Public History Seminar	3
HIST 596	Research Seminar	3
HIST 597	Public History Article	1-9
HIST 598	Craft of History: Historical Theories, Methods, and Criticism (f)	3
HIST 599	Master's Thesis	1-15

History (Public History) - Master of Arts

Thirty-six credits (27 of which must be at the 500 level) are required for the Public History concentration:

Prefix	Title	Credits
Select four History Graduate Seminars including the following:		
HIST 594 Public History		3
HIST 598 Craft of History		3
HIST 596 Research Seminar		3
Select one from the following:		3
HIST 590	Reading Seminar: Borders, Boundaries and Frontiers	
HIST 591	Reading Seminar: Modernity and its Discontents	
HIST 592	Reading Seminar: Nature and Society	
HIST 585	Public History Internship	3
Select a maximum of 9 credits (numbered 450 and above) outside the Department of History [1]		9
Preparation of an article of scholarly quality		3
Select 9 credits from courses numbered 500 and above in the Department of History		9
Total Credits		**36**

[1] Requires the permission of the Director of the Public History Program

Students in the Public History concentration must collectively pass 18 credits of nonpublic history courses, including the nonpublic history seminars noted above. They must collectively pass 18 credits in public history, which must include the public history seminar, the internship, and the article. The scholarly article is developed through work in the internship and will be of peer reviewed journal quality. The public history credits may include a maximum of 9 graduate level (450 -and-above) credits outside the Department of History with permission of the Director of the Public History Program. A student choosing the Public History concentration must pass an article proposal defense about the proposed scholarly article during the first semester after completion of the internship. The department will provide guidelines for the article defense. A student choosing the Public History specialization must give a public presentation of a portfolio that includes his/her work and the scholarly article, and must pass an oral examination over graduate course work, the internship, and the article. Students who receive a Master's degree

in this track will have a specialization in Public History added to their transcripts.

Master's Accelerated Program (MAP)

The Master's Accelerated Program allows academically qualified Undergraduate students to complete up to 12 credit hours towards a Master's degree during their junior and/or senior years while still completing the Bachelor's degree. The courses only apply to classes they would take within the Master of Arts program in History.

NMSU General Eligibility:

Must have completed 60 hours of undergraduate coursework (minimum 25 hours at NMSU). GPA larger or equal to 3.00.

NMSU MAP Regulations/Stipulations:

Courses will count toward both degrees; they will show on Undergraduate and Graduate transcripts and count toward both GPAs. Graduate level courses included in the Master's Accelerated Program are those courses numbered 450 and above or those chosen by the graduate academic departments. Students must receive a grade of B or higher in all MAP coursework to be counted as Graduate credit. Students apply for the Graduate program in their final semester or second to last semester of their Undergraduate degree, depending upon the deadlines set forth by the Department of History. Acceptance of MAP credits does not imply acceptance into the Department of History Master's program. Final admissions and acceptance into the Graduate program are based on academic performance at the Undergraduate level and completion of the eligible Undergraduate degree. Tuition is based on the level of the student, not the course. Students may become ineligible for MAP if their undergraduate or graduate GPA drops below 3.0. Students who are accepted into the Master's Accelerated Program must participate in the Developing New Scholars Program (DNSP), offered by the Graduate School. Students must be advised each semester for the MAP program by their potential graduate program and cleared for registration in Graduate courses by the Graduate School.

How to Apply to the MAP Program:

A student may apply, or the department may invite students to participate in MAP. Departments accept students based on the Master's Accelerated Program requirements as set by the department. A History faculty member, Graduate Coordinator, or Department Head will forward the Master's Accelerated Program Letter of Intent Slate Form to the Graduate School. Graduate School will hold the application until the student has completed their undergraduate degree. This application will be used as part of the graduate school's final admissions into the master's program. The following courses are eligible for the History MAP Program. Other courses may be considered after consultation with the Graduate Coordinator. An exception will need to be made to the degree audit for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
HIST 474	Gender in East Asian History	3
HIST 478	History of Transportation: Planes, Trains and Automobiles	3
HIST 500	Special Topics	1-9
HIST 511	Making the American West	3
HIST 514	The Constitution and U.S. History	3
HIST 527	Labor History	3
HIST 535	War and Revolution	3
HIST 538	Special Topics in European History	3
HIST 543	Special Topics in Asian History	3
HIST 545	Special Topics in United States History	3
HIST 549	Graduate Readings	1-3
HIST 568	Urban History	3
HIST 570	The Cold War in Latin America	3
HIST 571	China through the Ming Dynasty	3
HIST 572	China in the Modern World	3
HIST 573	History of Japan	3
HIST 575	History of the Global Political Economy	3
HIST 579	Oral History	3
HIST 583	Advanced Historic Preservation	3
HIST 585	Public History Internship	3
HIST 586	Interpreting Historic Places for the Public	3
HIST 590	Reading Seminar: Borders, Boundaries and Frontiers	3
HIST 591	Reading Seminar: Modernity and its Discontents	3
HIST 592	Reading Seminar: Nature and Society	3
HIST 594	Public History Seminar	3
HIST 596	Research Seminar	3
HIST 597	Public History Article	1-9
HIST 598	Craft of History: Historical Theories, Methods, and Criticism (f)	3
HIST 599	Master's Thesis	1-15

Horticulture - Master of Science

This degree emphasizes the creative use of plants by humans, and studies on the technical advancements in the husbandry of economic commodity groups of fruits, vegetables, or ornamentals, and turfgrass management. Emphasis may be in breeding and genetics of chile or onions, plant growth and development, nutrition, plant stress response, fruit and vegetable physiology, forestry, and turfgrass. Students will be prepared for successful employment in diverse horticulture private industries, educational institutions, and government agencies. Candidates for this degree must successfully conduct original research in one of the above areas and complete a minimum of 30 graduate credits based on a program of study approved by the student's graduate committee.

The Master of Science degree can be obtained through either a thesis option (recommended) or a non-thesis option. Prerequisite to major graduate work is completion of a curriculum essentially equivalent to that required by the department for the BS degree at New Mexico State University. Qualifications for admission will be reviewed by the departmental graduate faculty.

Minimum Grade Point Average and Credit Hour Requirements: Your Master's degree requires a minimum of 30 completed degree hours and a minimum cumulative GPA of 3.00 in all course work.

Degree residency requirement: 15 credits must be completed at NMSU.

Thesis Option

Prefix	Title	Credits
Departmental Requirements		
Selection of courses should be based on consultation with the student's graduate committee		

AGRO/HORT/SOIL 590	Graduate Seminar (taken final semester)	1
Complete sufficient credits numbered 450 or above, including at least 15 credits at the 500-level or above, to bring total graduate credits to 30		23-25
AGRO/HORT/ENVS 599	Master's Thesis (taken during final year)	4-6
Complete a final oral defense of the written thesis and a general examination of the student's field of study		
Total Credits		**30**

See the PES Graduate Handbook (https://pes.nmsu.edu/documents/NMSU_PES_GraduateStudiesHandbook_final83020221.pdf) for additional details.

Non-Thesis Option

Prefix	Title	Credits
Departmental Requirements		
Selection of courses should be based on consultation with the student's graduate committee		
AGRO/HORT/SOIL 590	Graduate Seminar (taken final semester)	1
Complete sufficient credits numbered 450 or above, including at least 15 credits at the 500-level or above, to bring total graduate credits to 30		29
Complete a written research report on an area of investigation conducted by the student.		
Complete a final oral defense of the written report and a general examination of the student's field of study		
Total Credits		**30**

Industrial Engineering - Master of Engineering in Industrial Engineering

The Department of Industrial Engineering offers the Master of Engineering in Industrial Engineering (M.E. in IE) as a coursework-only degree. It is a Professional Master's degree targeting a working professional who wants to pursue a Master's degree in Industrial Engineering at New Mexico State University.

The program of study leading to the Master of Engineering in Industrial Engineering (M.E. in IE) degree consists of 30 credits. At least 50% of the coursework must be taken from the Approved IE Department Course List. This means that students can take up to five electives from engineering disciplines outside the department and/or other areas of interest outside the college.

The M.E in IE degree is also offered by distance education for qualified applicants. The courses with section numbers M70 - M79 are designated as online.

Although there is no oral exam, students will be required to complete an exit interview with an Industrial Engineering faculty member.

Note that NMSU reserves the right to change the program requirements without prior notice. Information in the NMSU Graduate Catalog takes precedence over any other information.

Selection of Advisor

During the first 12 credit hours in the Industrial Engineering Graduate Program, all master's degree students must select a permanent advisor. This must be done prior to registration for the fifth course the student takes. In selecting an advisor, the student should communicate with several members of our graduate faculty to discuss specific program objectives. The student should also use these contacts to become familiar with faculty research projects that are currently in progress. The faculty member must consent to serve as the student's advisor in writing. A list of the graduate faculty of the department with their areas of interest is found on the IE web page at https://ie.nmsu.edu/.

Prefix	Title	Credits
Approved IE Department Course List (Note that courses are listed under their area of primary focus but may address other areas. See course descriptions for more details.)		
Operations Research		
I E 515	Stochastic Processes Modeling	3
I E 522	Queuing Systems	3
I E 525	Systems Synthesis and Design	3
I E 533	Linear Programming	3
I E 534	Nonlinear Programming	3
I E 535	Discrete Optimization	3
I E 567	Design and Implementation of Discrete-Event Simulation	3
Applied Statistics		
I E 460	Evaluation of Engineering Data	3
I E 466	Reliability	3
I E 545	Characterizing Time-Dependent Engineering Data	3
Design and Manufacturing		
I E 478	Facilities Planning and Design	3
I E 524	Advanced Production and Inventory Control	3
I E 571	Advanced Quality Control	3
I E 575	Advanced Manufacturing Processes	3
Engineering Management		
I E 523	Advanced Engineering Economy	3
I E 530	Environmental Management Seminar	1
I E 537	Large Scale Systems Engineering	3
I E 561	Advanced Safety Engineering	3
I E 563	Topics in Engineering Administration	3
Depending on contents, the following course is applicable to any of the above four areas:		
I E 590	Selected Topics	1-3
Optional Electives [1]		
E E 500-level (With approval of advisor and instructor)		
M E 500-level (With approval of advisor and instructor)		
C E 500-level (With approval of advisor and instructor)		
ACCT 500-level (With approval of advisor and instructor)		
BCIS 500-level (With approval of advisor and instructor)		
BFIN 500-level (With approval of advisor and instructor)		
MGMT 500-level (With approval of advisor and instructor)		
ECON 500-level (With approval of advisor and instructor)		
CSCI 5000-level (With approval of advisor and instructor)		
MATH 5000-level (With approval of advisor and instructor)		
STAT 5000-level (With approval of advisor and instructor)		
A ST 500-level (With approval of advisor and instructor)		

[1] The optional courses outside the department and/or the college should be previously approved by the academic advisor. See your advisor for more detailed information about selecting elective courses.

New Mexico State University's master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin

working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. Students can take up to 12 credits of approved IE courses and get dual course credits that can be applied to both an undergraduate and master's degree. You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute their graduate courses for required or elective courses in an undergraduate degree program, and then subsequently count those same courses as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other I E 500+ courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
I E 451	Engineering Economy	3
I E 456	Large Scale Systems Engineering	3
I E 459	Systems Thinking and Decision Making	3
I E 460	Evaluation of Engineering Data	3
I E 466	Reliability	3
I E 467	Discrete-Event Simulation Modeling	3
I E 478	Facilities Planning and Design	3
I E 490	Selected Topics	3
I E 515	Stochastic Processes Modeling	3
I E 522	Queuing Systems	3
I E 523	Advanced Engineering Economy	3
I E 524	Advanced Production and Inventory Control	3
I E 525	Systems Synthesis and Design	3
I E 533	Linear Programming	3
I E 534	Nonlinear Programming	3
I E 535	Discrete Optimization	3
I E 537	Large Scale Systems Engineering	3
I E 545	Characterizing Time-Dependent Engineering Data	3
I E 561	Advanced Safety Engineering	3
I E 563	Topics in Engineering Administration	3
I E 567	Design and Implementation of Discrete-Event Simulation	3
I E 571	Advanced Quality Control	3
I E 575	Advanced Manufacturing Processes	3
I E 590	Selected Topics	3

Industrial Engineering - Master of Science in Industrial Engineering

The Department of Industrial Engineering offers a Master of Science (M.S.) in Industrial Engineering with focus areas of manufacturing, operations research, and engineering management. Students may choose one of two options for completing their M.S. degree and the requirements for each option are listed below:

- **Thesis option:** 24 credits of coursework plus 6 credits of I E 599 Master's Thesis.
- **Project Option:** 27 credits of coursework plus 3 credits of I E 598 Special Research Programs.

Whether students write a thesis or complete a project, the program of study leading to the M.S. degree consists of 30 credits. At least 50% of the coursework must be taken from the Approved IE Department Course List. This means that students can take up to five electives from engineering disciplines outside the department and/or other areas of interest outside the college.

Note that NMSU reserves the right to change the program requirements without prior notice. Information in the NMSU Graduate Catalog takes precedence over any other information.

Selection of Advisor

During the first 12 credit hours in the Industrial Engineering Graduate Program, all master's degree students must select a permanent advisor. This must be done prior to registration for the fifth course that the student takes. In selecting an advisor, the student should communicate with several members of the IE graduate faculty to discuss specific program objectives. The student should also use these contacts to become familiar with faculty research projects that are currently in progress. The faculty member must consent to serve as the student's advisor in writing. A list of the department graduate faculty along with their areas of interest is found on the IE web page (https://ie.nmsu.edu/).

Prefix	Title	Credits
Mater's Thesis		**6**
I E 599	Master's Thesis	
Master's Project		**3**
I E 598	Special Research Programs	
Approved IE Department Course List (Note that courses are listed under their area of primary focus but may address other areas. See course descriptions for more details.)		
Operations Research		
I E 515	Stochastic Processes Modeling	
I E 522	Queuing Systems	
I E 525	Systems Synthesis and Design	
I E 533	Linear Programming	
I E 534	Nonlinear Programming	
I E 535	Discrete Optimization	
I E 567	Design and Implementation of Discrete-Event Simulation	
Applied Statistics		
I E 460	Evaluation of Engineering Data	
I E 466	Reliability	

I E 545	Characterizing Time-Dependent Engineering Data
Design and Manufacturing	
I E 478	Facilities Planning and Design
I E 524	Advanced Production and Inventory Control
I E 571	Advanced Quality Control
I E 575	Advanced Manufacturing Processes
Engineering Management	
I E 523	Advanced Engineering Economy
I E 530	Environmental Management Seminar
I E 537	Large Scale Systems Engineering
I E 561	Advanced Safety Engineering
I E 563	Topics in Engineering Administration
Depending on contents, the following two courses are applicable to any of the above four areas:	
I E 505	Directed Readings
I E 590	Selected Topics
Optional Electives [1]	
E E 500-level (With approval of advisor and instructor)	
M E 500-level (With approval of advisor and instructor)	
C E 500-level (With approval of advisor and instructor)	
ACCT 500-level (With approval of advisor and instructor)	
BCIS 500-level (With approval of advisor and instructor)	
BFIN 500-level (With approval of advisor and instructor)	
MGMT 500-level (With approval of advisor and instructor)	
ECON 500-level (With approval of advisor and instructor)	
C S 500-level (With approval of advisor and instructor)	
MATH 500-level (With approval of advisor and instructor)	
STAT 500-level (With approval of advisor and instructor)	
A ST 500-level (With approval of advisor and instructor)	

[1] The optional courses outside the department and/or the college should be previously approved by the academic advisor. See your advisor for more detailed information about selecting elective courses.

Requirements for Graduation

It is the responsibility of the student to complete all forms before submitting them to the IE department. Blank forms will not be accepted.

1. **Application for Diploma (Degree)** At the start of the semester in which you are to graduate you must file an Application for Diploma (Degree) and fee with the NMSU Registrar Office. To find the application as well as deadlines, log onto MyNMSU (https://my.nmsu.edu/) and click on the Student and Financial Aid tab, then under QuickLinks select Student Records. Filing dates are on the Graduate School Calendar that is maintained on the Graduate School website.
2. **Program of Study** – After completing 12 NMSU credits of graduate coursework, every student is required to complete a form entitled "Program of Study for Masters Students", and submit it to their advisor. This form is found on the NMSU Graduate School (https://gradschool.nmsu.edu/) web page: Under the "Current Students" pull-down menu at the top, choose "Graduate Forms". A final version of this form must be submitted to the Graduate School during the student's final semester.
3. **Schedule Your Master's Exam** – Whether you write a thesis, complete a project, or take all coursework, you must schedule a final examination during the last semester of your coursework/research. Examination committee rules are in the Graduate Catalog: You should plan to have your adviser, a second IE graduate faculty member, and an external (outside the IE department) faculty member. The external member will also serve as the Dean of the Graduate School's Representative. To ensure that a Faculty Member is currently a member of the Graduate Faculty and their appointment expiration date please visit the Graduate Faculty & Staff Directory on the Graduate School (https://gradschool.nmsu.edu/) web page: Under the "Faculty and Staff" pull-down menu at the top, choose "Graduate Faculty & Staff Directory". The schedule dates are found on the Graduate School (https://gradschool.nmsu.edu/) web page: Under the "Current Students" pull-down menu at the top, choose "Graduate School Calendar".
4. **Other Forms** – Additional forms can be found on the Graduate School website (http://gradschool.nmsu.edu/).

To schedule and take your exam:

- Schedule a 2-hour time block that is convenient for you and your selected faculty committee. **Students are responsible for contacting and scheduling their committee members.**
- Schedule use of the IE Conference Room, Room 279 EC III, with the Industrial Engineering Secretary. At that time, if you are presenting a project or thesis, schedule the use of any equipment you may require such as the In Focus projector, laptop, etc.
- Complete the Masters Final Examination Form. The exam form is also available on the Graduate School (https://gradschool.nmsu.edu/) website. You must schedule your exam a minimum of 10 working days in advance. This means your form must be at the Graduate School at that time.
- Consult with your adviser to discuss your examination. This can be by phone or e-mail.
- Be on time for your examination. If you're using equipment for presenting research, you should arrive early to set up.

Please plan to attend, with your family and friends, the College of Engineering's Sociedad de Ingenieros ceremony that is held to recognize our engineering graduates. This ceremony is held the Friday evening before Graduation.

New Mexico State University's master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. Students can take up to 12 credits of approved I E courses and get dual course credits that can be applied to both an undergraduate and master's degree. You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same courses as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.

- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other I E 500+ courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
I E 451	Engineering Economy	3
I E 456	Large Scale Systems Engineering	3
I E 459	Systems Thinking and Decision Making	3
I E 460	Evaluation of Engineering Data	3
I E 466	Reliability	3
I E 467	Discrete-Event Simulation Modeling	3
I E 478	Facilities Planning and Design	3
I E 490	Selected Topics	3
I E 515	Stochastic Processes Modeling	3
I E 522	Queuing Systems	3
I E 523	Advanced Engineering Economy	3
I E 524	Advanced Production and Inventory Control	3
I E 525	Systems Synthesis and Design	3
I E 533	Linear Programming	3
I E 534	Nonlinear Programming	3
I E 535	Discrete Optimization	3
I E 537	Large Scale Systems Engineering	3
I E 545	Characterizing Time-Dependent Engineering Data	3
I E 561	Advanced Safety Engineering	3
I E 563	Topics in Engineering Administration	3
I E 567	Design and Implementation of Discrete-Event Simulation	3
I E 571	Advanced Quality Control	3
I E 575	Advanced Manufacturing Processes	3
I E 590	Selected Topics	3

Mathematics - Master of Science

The Master's degree is designed to increase one's knowledge and understanding of mathematics beyond the Bachelor's degree level. It also prepares a student for future graduate work.

A candidate for a master's degree may select up to two minors in addition to the major. A minimum of 8 credits of graduate work is necessary for a minor.

In addition to standard Graduate School requirements, the program requires:

1. Letters of Recommendation (3).
2. A personal statement or letter of interest covering academic background and career goals.

Minimum Requirements for the Master's Degree

1. In fulfillment of the Graduate School requirement of a minimum of 30 semester credits of course work, the student must take at least 24 credits of mathematics or statistics from the courses listed below.
2. The student's program of study must be approved by the departmental Graduate Studies Committee.
3. The student must successfully complete a master's written examination and final master's oral examination.

Prefix	Title	Credits
Minimum Requirements		
Complete each of the following (12 credits):		
MATH 5350	Advanced Linear Algebra	3
MATH 5340	Abstract Algebra I: Groups and Rings	3
MATH 5360	Introduction to Real Analysis I	3
MATH 5365	Introduction to Real Analysis II	3
Complete two of the following:		*6*
MATH 5310	Introduction to Topology	
MATH 5320	Logic and Set Theory	
MATH 5410	Complex Analysis	
STAT 5210	Probability: Theory and Applications	
STAT 5220	Statistics: Theory and Applications	
STAT 5230	Elementary Stochastic Processes	
Complete two of the following		*6*
MATH 5420	Topology I	
MATH 5425	Topology II	
MATH 5430	Mathematical Structures in Logic	
MATH 5435	Universal Algebra and Model Theory	
MATH 5440	Partial Differential Equations I	
MATH 5445	Partial Differential Equations II	
MATH 5450	Abstract Algebra II: Fields, Rings and Modules	
MATH 5453	Module Theory and Homological Algebra	
MATH 5450	Abstract Algebra II: Fields, Rings and Modules	
MATH 5455	Introduction to Commutative Algebra and Algebraic Geometry	
MATH 5460	Measure and Integration	
MATH 5463	Real Analysis	
MATH 5465	Introduction to Functional Analysis	
STAT 5310	Foundations of Probability	
STAT 5330	Continuous Multivariate Analysis	
STAT 5335	Linear Models	
STAT 5340	Advanced Theory of Statistics I	
STAT 5345	Advanced Theory of Statistics II	
Total Credits		**24**

The Master's Written Examination

Candidates for the Master's in Mathematics must pass a written exam, offered at the end of the Fall and Spring semesters, based on the content of MATH 5350 and MATH 5360. Full-time students need to pass the written Master's exam no later than the Summer following their completion of MATH 5350 and MATH 5360, or the start of their fourth semester in the program, whichever comes first. Graduate assistants must adhere to this timetable. Any second try must be passed within one semester of the first.

The Master's Final Examination

The Master's final examination is an oral examination administered by the student's committee. The exam consists of a short presentation made by the student on a topic covered in the student's coursework, followed by an examination by the committee based on the presentation and related coursework in the student's program of study. When a Master's thesis has been written, the presentation and examination is based on the student's thesis. The student's committee consists of at least three departmental members and a Graduate faculty member from another department who serves as the Dean's representative. The oral exam must be completed at least 10 days prior to the end of the semester in which the candidate wishes to receive the degree.

Master's Accelerated Program (MAP)

Master's Accelerated Program (MAP)

The Master's Accelerated Program allows academically qualified Undergraduate students to complete up to 12 credit hours towards a Master's degree during their junior and/or senior years while still completing the Bachelor's degree.

How to Apply to the MAP Program:

A student may apply, or the department may invite students to participate in MAP. Departments accept students based on the Master's Accelerated Program requirements as set by the department.

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
MATH 5310	Introduction to Topology	3
MATH 5320	Logic and Set Theory	3
MATH 5340	Abstract Algebra I: Groups and Rings	3
MATH 5350	Advanced Linear Algebra	3
MATH 5360	Introduction to Real Analysis I	3
MATH 5365	Introduction to Real Analysis II	3
STAT 5210	Probability: Theory and Applications	3
STAT 5220	Statistics: Theory and Applications	3

Mechanical Engineering - Master of Engineering in Mechanical Engineering

The Mechanical Engineering Masters of Engineering degree is a coursework-based graduate degree that requires neither a thesis nor a project.

(30 credits)

Prefix	Title	Credits
Requirements		
M E 570	Engineering Analysis I	3
Core Courses		
Select one course from each of the following 4 topic areas: [1]		12
Solid Mechanics		
Select one from the following:		
M E 502	Elasticity I	
M E 504	Continuum Mechanics	
Thermal Science		
Select one from the following:		
M E 503	Thermodynamics	
M E 540	Intermediate Heat Transfer	
Fluids		
Select one from the following:		
M E 530	Intermediate Fluid Mechanics	
M E 533	Numerical Methods for Fluid Mechanics and Heat Transfer	
Dynamics and Vibrations		
Select one from the following:		
M E 511	Dynamics	
M E 512	Vibrations	
Engineering Analysis and Control		
Select one from the following:		
M E 518	Applied Finite Elements	
M E 527	Linear Systems Theory	
Additional Requirements		
Select three courses (500 level or above) from any departments and two courses (500 level or above) from any college: [2, 3]		12
M E 598	Special Research Programs [4]	3
Total Credits		**30**

1. Graduate A E courses may be substituted for M E courses with the approval of the Graduate Program Coordinator.
2. If course is not in A E or M E program, approval of the Graduate Program Coordinator is required.
3. If M E 510 Special Topics or A E 510 Special Topics is taken, it must be a regular course with a proper course title taught in class. Any 510 course as an independent study would never be counted.
4. Professional degree students must complete an Integrative Learning Experience that allows them to demonstrate a synthesis of foundational and concentration competencies. M E 598 Special Research Programs serves that purpose as the final exam for Graduate School Requirements.

Academic Advisor and Final Exit Survey

Newly admitted Mechanical Engineering Masters of Engineering students will be assigned the Graduate Program Coordinator as an academic advisor.

All students must take Professional Master's Degree Exit Survey to graduate, which will be conducted by the Graduate Program Coordinator and will be taken after completing all coursework.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to an MAE faculty advisor about your MAP plan and develop a course plan in consultation with the advisor. The faculty advisor should preferably be from the MAE area of your interest.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
M E 452	Control System Design	3
M E 456	Experimental Modal Analysis	3
M E 457	Engineering Failure Analysis	3
M E 458	Properties and Mechanical Behavior of Materials	3
M E 460	Applied Finite Elements	3
M E 481	Alternative and Renewable Energy	3
M E 483	Introduction to Combustion	3
M E 486	Introduction to Robotics	3
M E 487	Mechatronics	3
A E 451	Aircraft Design	3
A E 464	Advanced Flight Dynamics and Controls	3
A E 469	Hypersonic Aerothermodynamics	3
M E 502	Elasticity I	3
M E 503	Thermodynamics	3
M E 510	Special Topics [1]	1-6
M E 511	Dynamics	3
M E 512	Vibrations	3
M E 530	Intermediate Fluid Mechanics	3
M E 533	Numerical Methods for Fluid Mechanics and Heat Transfer	3
M E 540	Intermediate Heat Transfer	3
A E 510	Special Topics [1]	1-6
A E 575	Propulsion	3

[1] A E 510 Special Topics must be a regular course with a proper course title taught in class, usually cross-listed with A E 405 Special Topics. Any 510 course as an independent study would never be counted.

Mechanical Engineering - Master of Science in Mechanical Engineering

Admission Requirements: See https://mae.nmsu.edu/academic-programs/grad/admission.html.

Thesis Option (30 credits)

Prefix	Title	Credits
Requirements		
M E 570	**Engineering Analysis I**	**3**
Select one course from each of the following 3 topic areas		**9**
Solid Mechanics		
Select one from the following:		
M E 502	Elasticity I	
M E 504	Continuum Mechanics	
Thermal Science		
Select one from the following:		
M E 503	Thermodynamics	
M E 540	Intermediate Heat Transfer	
Fluid Mechanics		
Select one from the following:		
M E 530	Intermediate Fluid Mechanics	
M E 533	Numerical Methods for Fluid Mechanics and Heat Transfer	
Dynamics and Vibrations		
Select one from the following:		
M E 511	Dynamics	
M E 512	Vibrations	
Engineering Analysis and Control		
Select one from the following:		
M E 518	Applied Finite Elements	
M E 527	Linear Systems Theory	
Select 9 credits of other M E graduate courses [1, 2]		**9**
Master's Thesis Research		**9**
M E 599	Master's Thesis	
M E 509	Individualized Study	
Total Credits		**30**

[1] All course must be 500 level or above. Up to 6 credits of A E graduate courses may be substituted with the approval of the Graduate Coordinator.

[2] If M E 510 Special Topics or A E 510 Special Topics Special Topics is taken, it must be a regular course with a proper course title taught in class. Any 510 course as an independent study would never be counted.

Publication Requirement

A refereed conference paper accepted or a refereed journal article in review or accepted by graduation. The M.S. thesis can be a reformatted version of this paper. Exceptions may be made on a case by case basis by the department head.

Selection of Permanent Advisor

Newly admitted graduate students will be assigned a temporary advisor for the first semester, but they must select a degree option and a permanent advisor before registering for the second semester.

When considering a decision about a degree option and an advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of study to discuss specific educational objectives. The student can use these meetings to become familiar with faculty interests and research projects currently in progress. The faculty member must agree (in writing) to serve as the student's advisor.

All students must pass a final examination. The final examination is to be conducted by the student's advisory committee and is taken after completing all thesis work.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to an MAE faculty advisor about your MAP plan and develop a course plan in consultation with the advisor. The faculty advisor should preferably be from the MAE area of your interest.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
M E 452	Control System Design	3
M E 456	Experimental Modal Analysis	3
M E 457	Engineering Failure Analysis	3
M E 458	Properties and Mechanical Behavior of Materials	3
M E 460	Applied Finite Elements	3
M E 481	Alternative and Renewable Energy	3
M E 483	Introduction to Combustion	3
M E 486	Introduction to Robotics	3
M E 487	Mechatronics	3
A E 451	Aircraft Design	3
A E 464	Advanced Flight Dynamics and Controls	3
A E 469	Hypersonic Aerothermodynamics	3
M E 502	Elasticity I	3
M E 503	Thermodynamics	3
M E 504	Continuum Mechanics	3
M E 510	Special Topics [1]	1-6
M E 511	Dynamics	3
M E 512	Vibrations	3
M E 530	Intermediate Fluid Mechanics	3
M E 533	Numerical Methods for Fluid Mechanics and Heat Transfer	3
M E 540	Intermediate Heat Transfer	3
A E 510	Special Topics [1]	1-6
A E 575	Propulsion	3

[1] 510 Special Topics must be a regular course with a proper course title taught in class, usually cross-listed with 405 Special Topics. Any 510 course as an independent study would never be counted.

Molecular Biology - Master of Science

The Microbiology program offers curricula leading to the MS and Ph.D. degrees in the areas of biochemistry, molecular genetics, molecular biology, cell biology, bioinformatics, and microbiology. Admission to the MB Program without deficiency is based on an undergraduate program essentially equivalent to that pursued by an undergraduate major in chemistry, biology, agronomy, horticulture, biochemistry, or microbiology at this university. An entering student is required to complete the Graduate Record Examination (General Aptitude). Undergraduate deficiency courses must be passed with a minimum grade of B.

Applicants are strongly encouraged to contact at least three individual program faculty before applying to identify a prospective advisor and laboratory in which to pursue graduate research. Previous course records and GPA standings (typically minimum of 3.3/4.0), GRE scores (typically minimum of 300 combined verbal and quantitative), TOEFL scores of foreign applicants (typically minimum of 550 on the paper-based or 213 on the computer-based), a letter of interest from the applicant that identified faculty laboratories of interest, and three letters of reference regarding research performance or potential are weighted heavily during the selection process.

Students with a BS degree in one of the disciplines listed above can expect to earn the MS degree in about 30 credits, including at least 6 credits of thesis research. Because research is central in both the MS and Ph.D. curricula, early selection of a research advisor is required. The master's committee is organized to assist in planning a program appropriate to the background and goals of the student. A final, formal presentation and oral defense of the original research documented in the MS thesis completes the degree requirements.

MS candidates must enroll in MOLB 599 Master's Thesis for 6 credits. May register for additional credits to maintain full-time status.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs. The MAP program allows undergraduate students to take graduate courses and count up to twelve credits toward both undergraduate and graduate degrees in COMM.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in

an undergraduate degree program and then subsequently count those same courses as fulfilling graduate requirements in a related graduate program.

- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 3.25.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

Undergraduate students majoring in Genetics, Biochemistry, and Biology would be the most qualified to enter the Masters Accelerated Program. The courses that can be taken during the student's last two years of their BS degree program prior to graduation, and as a full graduate student are listed below. Students may only take a maximum of 12 credit hours towards their MAP.

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
Students may count a maximum of two of the following 450-499 level courses towards their MAP		
BIOL 470	Developmental Biology	
BIOL 474	Immunology	
BIOL 475	Virology	
BIOL 478	Molecular Biology of Microorganisms	
EPWS 486	Plant Virology	
GENE 486	Genes and Genomes	
Courses 500-599 level that may be taken for MAP		
BIOL 540	Science and Ethics	
MOLB 542	Biochemistry I	
MOLB 520	Molecular Cell Biology	
MOLB 550	Topics in Molecular Biology	

Qualifications for students entering the MAP program include all NMSU guidelines including a GPA of 3.2. Students who complete MAP in Molecular Biology will be expected to meet all of the requirements of the program for entry into the Molecular Biology and Interdisciplinary Program Graduate Program to complete their graduate degree. (GRE score will be waived for MAP.) These requirements can be found at https://molb.nmsu.edu/how-to-apply/. The MOLB-ILS program does not have a non-thesis option so all MS students in the program perform research that culminates to a published thesis.

MPA-MCJ Program - Dual Degree

The MPA-MCJ joint degree option requires completion of a minimum of 57 credits of approved course work from the Departments of Government and Criminal Justice. Students interested in this option should meet with the MPA director or criminal justice graduate advisor for additional information.

Music (Collaborative Piano) - Master of Music

Prefix	Title	Credits
Requirements		
MUSC 471	Graduate Theory Review [1]	3
MUSC 477	Graduate Music History Review [1]	3
Applied		8
MUSC 450	Research Methods	3
MUSC 580	Ensemble Performance	1
or MUSC 581	The Collaborative Pianist	
MUSC 540	Graduate Recital/Analytical Paper	4
MUSC 581	The Collaborative Pianist must be taken a minimum of 3 semesters	3
MUSC 533	Vocal Literature for Piano	2
MUSC 532	21st Century Piano Skills	1
MUSC 534	Instrumental Sonatas and Duo Repertoire for Piano	2
MUSC 511	Survey of Traditional Harmony	3
or MUSC 513	Twentieth Century Art Music	
or MUSC 518	Seminar in Music Theory	
MUSC 513	Twentieth Century Art Music	3
or MUSC 521	Music of the Baroque Era: History and Literature	
or MUSC 522	Music of the Classical Era: History and Literature	
or MUSC 523	Music of the Romantic Era: History and Literature	
or MUSC 529	Opera History and Literature	
or MUSC 513	Twentieth Century Art Music	
Total Credits		**36**

[1] Students must make a B or better before taking additional music theory/music history courses.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 3.00.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Enrollment in graduate courses requires the approval of the Department Head and a completed MAP form before the first semester to take MAP courses for dual credit. Please meet with Department Head or Graduate Advisor for more information.

Prefix	Title	Credits
MUSC 471	Graduate Theory Review	3
MUSC 477	Graduate Music History Review	3
MUSC 486	Applied Music Pedagogy and Literature II	2

Undergraduate Students will be able to count MUSC 477 Graduate Music History Review as an upper-level music history course and fulfill the Master's requirement.
• Undergraduate Students will be able to count MUSC 471 Graduate Theory Review as a 400-level elective and fulfill the Master's requirement.
• Undergraduate Students will be able to count MUSC 486 Applied Music Pedagogy and Literature II as an upper level elective (or fulfill the 486 degree requirement for the piano performance BM), and fulfill the Master's requirement.

Music (Conducting) - Master of Music

Prefix	Title	Credits
Required Courses		
MUSC 471	Graduate Theory Review [1]	3
MUSC 477	Graduate Music History Review [1]	3
MUSC 578	Advanced Choral Literature	2
or MUSC 579	Advanced Instrumental Literature	
Music Theory		3
Music History and Literature		3
Conducting		9
MUSC 450	Research Methods	3
MUSC 580	Ensemble Performance	1
MUSC 540	Graduate Recital/Analytical Paper	4
Total Credits		**31**

[1] Students must make a B or better before taking additional music theory/music history courses.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 3.00.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Enrollment in graduate courses requires the approval of the Department Head and a completed MAP form before the first semester to take MAP courses for dual credit. Please meet with Department Head or Graduate Advisor for more information.

Prefix	Title	Credits
MUSC 471	Graduate Theory Review	3
MUSC 477	Graduate Music History Review	3
MUSC 486	Applied Music Pedagogy and Literature II	2

- Undergraduate Students will be able to count MUSC 477 Graduate Music History Review as an upper-level music history course and fulfill the Master's requirement.
- Undergraduate Students will be able to count MUSC 471 Graduate Theory Review as a 400-level elective and fulfill the Master's requirement.
- Undergraduate Students will be able to count MUSC 486 Applied Music Pedagogy and Literature II as an upper level elective (or fulfill the 486 degree requirement for the piano performance BM), and fulfill the Master's requirement.

Music (Music Education) - Master of Music

Requirements

Students must make the grade of B or better in a course for it to count toward degree completion.

Prefix	Title	Credits
Required Courses		
MUSC 471	Graduate Theory Review [1]	3
MUSC 477	Graduate Music History Review [1]	3
Music Theory		3
Music History and Literature		3
Music Education		9
Approved Elective		3
MUSC 450	Research Methods	3
MUSC 598	Special Research Programs	4
or MUSC 599	Master's Thesis	
Total Credits		**31**

[1] Students must make a B or better before taking additional music theory/music history courses.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 3.00.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Enrollment in graduate courses requires the approval of the Department Head and a completed MAP form before the first semester to take MAP courses for dual credit. Please meet with Department Head or Graduate Advisor for more information.

Prefix	Title	Credits
MUSC 471	Graduate Theory Review	3
MUSC 477	Graduate Music History Review	3
MUSC 486	Applied Music Pedagogy and Literature II	2

Undergraduate Students will be able to count MUSC 477 Graduate Music History Review as an upper-level music history course and fulfill the Master's requirement.
Undergraduate Students will be able to count MUSC 471 Graduate Theory Review as a 400-level elective and fulfill the Master's requirement.
Undergraduate Students will be able to count MUSC 486 Applied Music Pedagogy and Literature II as an upper level elective (or fulfill the 486 degree requirement for the piano performance BM), and fulfill the Master's requirement.

Music (Performance) - Master of Music

Prefix	Title	Credits
Requirements		
MUSC 471	Graduate Theory Review [1]	3
MUSC 477	Graduate Music History Review [1]	3
MUSC 513	Twentieth Century Art Music	3
or MUSC 511	Survey of Traditional Harmony	
or MUSC 518	Seminar in Music Theory	
Applied Music		8
MUSC 582	Applied Music	
MUSC 450	Research Methods	3
MUSC 521	Music of the Baroque Era: History and Literature	3
or MUSC 513	Twentieth Century Art Music	
or MUSC 519	Seminar in Music History	
or MUSC 522	Music of the Classical Era: History and Literature	
or MUSC 523	Music of the Romantic Era: History and Literature	
or MUSC 529	Opera History and Literature	
MUSC 486	Applied Music Pedagogy and Literature II	2
MUSC 586	Applied Music Pedagogy and Literature III	2
Ensemble Performance [2]		2
MUSC 580	Ensemble Performance [2]	
or MUSC 581	The Collaborative Pianist	
MUSC 540	Graduate Recital/Analytical Paper	4
MUSC 532	21st Century Piano Skills (Piano Majors Only) [2]	1
Vocal Performance Majors will be required to pass a diction proficiency exam or will be required to take MUSC 476 Graduate Diction Review		
Total Credits		**34**

[1] Students must make a B or better before taking additional music theory/music history courses.
[2] Requirement only applies to Piano Majors.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 3.00.

- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Enrollment in graduate courses requires the approval of the Department Head and a completed MAP form before the first semester to take MAP courses for dual credit. Please meet with Department Head or Graduate Advisor for more information.

Prefix	Title	Credits
MUSC 471	Graduate Theory Review	3
MUSC 477	Graduate Music History Review	3
MUSC 486	Applied Music Pedagogy and Literature II	2

Undergraduate Students will be able to count MUSC 477 Graduate Music History Review as an upper-level music history course and fulfill the Master's requirement.
Undergraduate Students will be able to count MUSC 471 Graduate Theory Review as a 400-level elective and fulfill the Master's requirement.

Undergraduate Students will be able to count MUSC 486 Applied Music Pedagogy and Literature II as an upper level elective (or fulfill the 486 degree requirement for the piano performance BM), and fulfill the Master's requirement.

Physics - Master of Science

The Master's degree requires that students either pass the qualifying examination at the Master's level or identify a research advisor during the first semester of study, form a Graduate Committee, and write a thesis. For the master's degree, students must also successfully complete or transfer at least 30 course credits and pass a final oral examination or the doctoral comprehensive examination. Of these 30 credits, at least 21 must be in physics, at most 3 may be for individual study or other informal courses, at most 6 may be for a thesis, and at most 9 may be numbered between 450 and 499. Students must successfully complete

Prefix	Title	Credits
PHYS 576	Advanced Computational Physics I	3
or PHYS 476	Computational Physics	
Select 3 credits from the following:		3
PHYS 571	Advanced Experimental Optics	
PHYS 575	Advanced Physics Laboratory	
PHYS 593	Advanced Experimental Nuclear Physics	

A Master's thesis is optional for students who have passed the qualifying examination. PHYS 599 Master's Thesis credits will not count toward the 21 credits in physics and can only be counted toward the 30 credits for a Master's degree if a student selects the thesis option and successfully defends a Master's thesis. PHYS 700 Doctoral Dissertation credits can be used as a substitute for PHYS 599 Master's Thesis credits.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner.

Students enrolled in the master's accelerated program are allowed to apply up to nine credits of their undergraduate courses numbered 450 and above and up to twelve credits total towards the completion of a master's degree. This program provides students with an opportunity to complete a master's degree in one year (and perhaps one summer term to write and defend a master's thesis). Students wishing to enroll in the master's accelerated program should talk to their Physics or Engineering Physics faculty advisor and develop a course plan in consultation with the advisor.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with a Physics or Engineering Physics faculty advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
PHYS 451	Intermediate Mechanics I	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 462	Intermediate Electricity and Magnetism II	3
PHYS 480	Thermodynamics	3
PHYS 488	Introduction to Condensed Matter Physics	3
PHYS 450	Selected Topics	1-3
or PHYS 520	Selected Topics	
PHYS 468	Intermediate X-ray Diffraction	3
or PHYS 568	Elements of X-ray Diffraction	
PHYS 471	Modern Experimental Optics	3
or PHYS 571	Advanced Experimental Optics	
PHYS 475	Advanced Laboratory Practices for Materials	3
or PHYS 575	Advanced Physics Laboratory	
PHYS 476	Computational Physics	3
or PHYS 576	Advanced Computational Physics I	
PHYS 489	Introduction to Modern Materials	3
or PHYS 589	Modern Materials	
PHYS 493	Experimental Nuclear Physics	3
or PHYS 593	Advanced Experimental Nuclear Physics	

PHYS 495	Mathematical Methods of Physics I	3
or PHYS 511	Mathematical Methods of Physics I	

Plant and Environmental Science - Master of Science

This degree is designed to train students in sustainable crop production, plant breeding and genetics, soil science, and sustainability of diverse environmental systems. Students will be prepared for successful employment in commercial companies, educational institutions, governmental agencies, and private production enterprises that are engaged in agronomy, environmental science, soil science, water management, and natural resources management. Candidates for this degree must successfully conduct original research in one of the above areas and complete a minimum of 30 graduate credits based on a program of study approved by the student's graduate committee.

The Master of Science degree can be obtained through either a thesis option (recommended) or a non-thesis option. Prerequisite to major graduate work is completion of a curriculum essentially equivalent to that required by the department for the BS degree at New Mexico State University. Qualifications for admission will be reviewed by the departmental graduate faculty.

Minimum Grade Point Average and Credit Hour Requirements: Your Master's degree requires a minimum of 30 completed degree hours and a minimum cumulative GPA of 3.00 in all course work.

Degree residency requirement: 15 credits must be completed at NMSU.

Thesis Option

Prefix	Title	Credits
Departmental Requirements		
Selection of courses should be based on consultation with the student's graduate committee		
AGRO/HORT/SOIL 590	Graduate Seminar (taken in final semester)	1
Complete sufficient credits numbered 450 or above, including at least 15 credits at the 500-level or above, to bring total graduate credits to 30		23-25
AGRO/HORT/ENVS 599	Master's Thesis (taken in final year)	4-6
Complete a written thesis		
Complete a final oral defense of the written thesis and a general examination of the student's field of study		
Total Credits		**30**

See the PES Graduate Handbook (https://pes.nmsu.edu/documents/NMSU_PES_GraduateStudiesHandbook_final83020221.pdf) for additional details.

Non-Thesis Option

Prefix	Title	Credits
Departmental Requirements		
Selection of courses should be based on consultation with the student's graduate committee		
AGRO/HORT/SOIL 590	Graduate Seminar (taken in final semester)	1
Complete sufficient credits numbered 450 or above, including at least 15 credits at the 500-level or above, to bring total graduate credits to 30		29
Complete a written research report on an area of investigation conducted by the student.		
Complete a final oral defense of the research report and a general examination of the student's field of study.		
Total Credits		**30**

See the PES Graduate Handbook (https://pes.nmsu.edu/documents/NMSU_PES_GraduateStudiesHandbook_final83020221.pdf) for additional details.

Political Science - Master of Arts

The Master of Arts program provides general course work in each of the major fields of political science. Students may choose either the thesis option, under which they complete 30 credits of course work plus 6 thesis credits (POLS 599 Master's Thesis), or the nonthesis option, with 30 credits of course work plus 6 hours of special research credit (POLS 598 Special Research Programs) or 6 hours of approved internship credit (POLS 510 Internship). Both the thesis and nonthesis options require a final oral examination; the non thesis option requires a written examination as well. The program provides a broad-based foundation in political science while allowing students to pursue specific areas of interest.

Requirements

Flexibility in planning a program of study is permitted to meet the educational needs of a diverse student population. Structured areas of emphasis are available in several topical areas, including Latin American and international affairs. Students may also take a graduate minor in Security Studies. Information on these areas and the graduate minor may be obtained from the Department of Government. No more than 9 credits taken outside the department will be counted toward the degree.

Prefix	Title	Credits
Requirements		
POLS 502	Research Methods in Government	3
or POLS 503	Qualitative Research Methods	
Select three from the following:		9
POLS 530	Seminar in Public Policy	
POLS 550	Seminar in American Politics	
POLS 560	Seminar in International Relations Theory	
POLS 570	Seminar in Comparative Politics	
POLS 580	Seminar in Political Theory	
Additional credits subject to advisor approval [1]		18
Thesis/Non-Thesis		
Select one from the following:		6
POLS 599	Master's Thesis	
POLS 598	Special Research Programs	
or POLS 510	Internship	
Total Credits		**36**

[1] The remaining credits required for the degree are selected subject to advisor approval to satisfy particular academic interests or career goals.

Master's Accelerated Program (MAP)

The MAP program encourages qualified undergraduate students to consider taking graduate level courses in their junior or senior years. Eligible students can count up to 12 graduate-level credits by

applying them to their BA degree as well as to the graduate degree if they are later admitted to either the Master of Arts in Political Science or the Masters in Public Administration (MPA). Students are advised to not attempt more than 3 credits of graduate coursework in one semester.

Students must earn a grade of B or higher to have graduate credits count under the MAP program. Graduate courses completed with a B- or lower are not eligible for MAP credit. By taking some graduate-level courses in the Department of Government, students can get a good idea of whether they wish to pursue a Masters degree. They can also complete a Masters degree in a shorter time period if they are admitted to their chosen degree program. Coursework tends to include a broader set of readings and more extensive research papers. Students seeking to go further in their understanding of a particular issue or debate can gain experience in developing an original research question, exploring relevant literature and in analyzing new data.

Students admitted to the MAP program continue to pay undergraduate tuition rates and remain eligible for undergraduate scholarships. Students should talk with their financial aid adviser prior to registering for graduate classes under MAP. Students are not guaranteed admission to a graduate program by participating in the MAP program. They will still need to submit an application for admission if they wish to complete an MA or MPA degree in the Department of Government. Students may be able to transfer graduate credits to programs at other universities but the program directors and Graduate Schools of those universities will have their own rules and policies regarding transfer credit and may not accept graduate credits earned at NMSU.

Student Qualifications:

Undergraduate students may participate in the Master's Accelerated Program (MAP) in the Department of Government after:

- Completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at New Mexico State University and apply towards the undergraduate major
- The grade point average must be at a minimum of 3.5
- May not have previously earned a Bachelor's Degree
- Students have removed any Incomplete grades or holds at the time that they request admission to a graduate-level class.
- Honors Credit: Undergraduate students who obtain a grade of B or higher in graduate level classes can count their credits as Honors credits. Undergraduate students who earn a grade of B or higher in two 3-credit graduate classes will automatically graduate with an Honors Certificate.

Accepted MAP Courses:

Students can count any four (4) graduate-level elective - up to 12 graduate-level credits (courses numbered POLS 450 or above). Sometimes these classes are cross-listed with undergraduate sections. Students who register for the MAP program will take the graduate section and complete the same requirements that are expected of graduate students in these classes. Any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees. Eligible undergraduates may take any of the following graduate courses under the MAP rules as established by the NMSU Graduate School and with the written approval of the course instructor, the MA Program Chair or MPA Director, as appropriate, and the Head of the Department of Government.

Prefix	Title	Credits
POLS 524	Introduction to the Nonprofit Sector	3
POLS 527	Issues in Public Management	3
POLS 536	Public Policy and Indigenous Communities	3
POLS 537	Issues in Public Policy	3
POLS 550	Seminar in American Politics	3
POLS 563	Issues in International Relations	3
POLS 564	Advanced National Security Policy	3
POLS 565	Advanced Issues in Security Studies	3
POLS 567	Advanced Issues in Terrorism	3
POLS 569	Advanced Issues in Globalization	3
POLS 570	Seminar in Comparative Politics	3
POLS 574	Contemporary Comparative Studies	3
POLS 578	Seminar in the U.S.-Mexican Border	3
POLS 579	Seminar in Mexican Politics	3
POLS 580	Seminar in Political Theory	3
POLS 587	Seminar in Religion and Politics	3
POLS 593	Issues in Public Law	3
POLS 596	International Law	3

Public Administration - Master of Public Administration

The Master of Public Administration (MPA) program is accredited by NASPAA. The MPA is designed to provide students with the managerial and analytical skills, in addition to ethical and professional values, necessary to meet the increased demand for skilled public administrators. Candidates who follow this professional program must complete a minimum of 42 credits, consisting of core courses, electives and either an internship or a thesis.

Requirements

Because students have divergent career goals, a thesis or internship option is offered. The thesis option requires an additional 18 credits of course work, 6 credits of thesis (POLS 599 Master's Thesis), and a written examination covering the thesis and course work. The internship option also requires an additional 18 credits of course work, 3 credits of internship (POLS 510 Internship), and a written examination covering the internship and course work. Students who fail their written examination must take an oral exam. As part of the course work, students selecting the internship option must take POLS 519 Proseminar in Public Administration (3 credits that count toward the 42 total) during the latter part of their studies, and are required to earn a B- grade or higher in that course.

With approval, students may include up to 12 credits of relevant course work from other departments to be counted toward the total credits required for the MPA. These credits may be selected to form a graduate minor in another academic discipline.

Prefix	Title	Credits
Core Courses		
POLS 502	Research Methods in Government	3
POLS 541	Public Budgeting	3
POLS 542	Public Sector Human Resources Management	3
POLS 544	Public Policy Analysis	3

POLS 547	Government Organizations	3
POLS 549	Ethics in Government	3
Thesis Option		
Select one from the following:		24
Thesis		
POLS 599	Master's Thesis	
Select 18 credits of additional course work		
Internship and Capstone Option 2		
POLS 510	Internship	
Select 18 credits of additional course work		
POLS 519	Proseminar in Public Administration	
Total Credits		**42**

Candidates with inadequate preparation for graduate study in public administration may be required to take appropriate undergraduate and graduate courses as part of, or in addition to, a regular program of study. Applicants to the MPA program will be advised of any such requirements at the time of admission.

Master's Accelerated Program Information

The Master's Accelerated Program (MAP) provides the opportunity for qualified undergraduate students to begin taking graduate-level courses in their junior or senior years. Eligible students can count **up to 12 graduate-level credits** by applying them to their undergraduate degree and the Master of Public Administration (MPA) degree. This allows students to complete their graduate degree in a much shorter period of time. Students also benefit by making progress towards a graduate degree while paying undergraduate tuition rates.

Students interested in MAP should contact Dr. Neil Harvey, Department Head, at nharvey@nmsu.edu. Students must earn a grade of **B or higher** to have graduate credits count under the MAP program. Graduate courses completed with a B- or lower are not eligible for MAP credit.

Student Qualifications

- The student may apply for MAP after completing 60 credit hours towards their Bachelor's Degree.
- The student applying for MAP must have a minimum cumulative grade point average (GPA) of **3.25.**
- As a prerequisite, students may participate in MAP if they receive a **B or higher** in POLS 330 Introduction to Public Administration.

Accepted MAP Courses

Students can take any four of the following courses to count towards both the MPA degree and their bachelor's degree. Any other courses may be considered after consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
POLS 524	Introduction to the Nonprofit Sector	3
POLS 526	Performance Management of Public and Nonprofit Organizations	3
POLS 530	Seminar in Public Policy	3
POLS 540	Seminar in Public Administration	3
POLS 542	Public Sector Human Resources Management	3
POLS 547	Government Organizations	3
POLS 549	Ethics in Government	3

Students interested in enrolling in graduate courses as part of MAP should contact Dr. Neil Harvey, Department Head, at nharvey@nmsu.edu for additional information and approval.

Public Health (Health Behavior and Health Promotion) - Master of Public Health

Students completing the Health Behavior & Health Promotion concentration are eligible to sit for the Certified Health Education Specialist (CHES) examination and/or for the Certified Public Health (CPH) examination.

Non-Thesis Option

Prefix	Title	Credits
Public Health Core Courses		
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5120	Biostatistical Applications in Public Health	3
PHLS 5130	Epidemiological Approaches to Disease Control and Prevention	3
PHLS 5140	Health Services System: Administration and Organization	3
PHLS 5150	Environmental Public Health Issues	3
PHLS 5160	Public Health Policy Analysis	3
PHLS 5170	Qualitative Methods in Public Health	3
Concentration: Health Behavior & Health Promotion		
PHLS 5210	Foundations & Techniques of Public Health Education	3
PHLS 5240	Health Program Planning	3
PHLS 5250	Evaluative Approaches in Public Health	3
PHLS 5260	Research and Resources in Community Health	3
Cultural Foundation Course		
Select 3 credits from the cultural foundation series numbered PHLS 5610-PHLS 5690		3
Additional Requirements		
PHLS 5998	Applied Practice Experience	3
PHLS 5995	Integrative Learning Experience	3
Total Credits		**42**

Thesis Option

Prefix	Title	Credits
Public Health Core Courses		
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5120	Biostatistical Applications in Public Health	3
PHLS 5130	Epidemiological Approaches to Disease Control and Prevention	3
PHLS 5140	Health Services System: Administration and Organization	3
PHLS 5150	Environmental Public Health Issues	3
PHLS 5160	Public Health Policy Analysis	3
PHLS 5170	Qualitative Methods in Public Health	3
Health Behavior & Health Promotion Concentration		

PHLS 5210	Foundations & Techniques of Public Health Education	3
PHLS 5240	Health Program Planning	3
PHLS 5250	Evaluative Approaches in Public Health	3
PHLS 5260	Research and Resources in Community Health	3
Cultural Foundation Course		
Select 3 credits from the cultural foundation series numbered PHLS 5610-PHLS 5690		3
Additional Requirements		
PHLS 5998	Applied Practice Experience	3
PHLS 5999	Master's Thesis	6
Total Credits		**45**

Some PHLS 5000-level courses are cross-listed with PHLS 4000-level courses (e.g.). Students who have previously taken one of these 4000-level courses at NMSU may not take the corresponding 5000-level PHLS course for degree completion credit.

Non-Thesis students must complete an Integrative Learning Experience that allows them to demonstrate a synthesis of foundational and concentration competencies. This also serves as the final exam for Graduate School Requirements.

Final examination for the thesis option consists of an oral defense of the thesis and related coursework.

Non-Thesis Option

A Suggested Plan of Study

Additional classes may be needed based on placement test results and course prerequisites. Visit with an advisor for help with creating a customized plan.

First Year		
Fall		**Credits**
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5120	Biostatistical Applications in Public Health	3
PHLS 5140	Health Services System: Administration and Organization	3
	Credits	**9**
Spring		
PHLS 5130	Epidemiological Approaches to Disease Control and Prevention	3
PHLS 5210	Foundations & Techniques of Public Health Education	3
PHLS 5260	Research and Resources in Community Health	3
	Credits	**9**
Summer		
PHLS 5998	Applied Practice Experience	3
Cultural Foundation Course		3
	Credits	**6**
Second Year		
Fall		
PHLS 5250	Evaluative Approaches in Public Health [2]	3
PHLS 5240	Health Program Planning	3
PHLS 5995	Integrative Learning Experience	3
	Credits	**9**
Spring		
PHLS 5150	Environmental Public Health Issues	3
PHLS 5170	Qualitative Methods in Public Health	3
PHLS 5160	Public Health Policy Analysis	3
	Credits	**9**
	Total Credits	**42**

1. Some PHLS 5000-level courses are cross-listed with PHLS 4000-level courses (e.g., PHLS 4610 and PHLS 5610). Students who have previously taken one of these 4000-level courses at NMSU may not take the corresponding 5000-level course for degree completion credit. Selected elective and optional courses may also be available during summer sessions.
2. Select three credits from the cultural foundation series numbered PHLS 5610-PHLS 5690.

Thesis Option

A Suggested Plan of Study

Visit with an advisor for help with creating a customized plan.

New Mexico State University's master's accelerated program allows **academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to the PHS Graduate Coordinator about your MAP plan and develop a course plan in consultation with that person.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same courses as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework, of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 3.00.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a B- or lower grade is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the PHS MAP program; other courses may be considered after consultation with the Graduate Coordinator. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees. Other Cultural Foundation courses (PHLS 5600-5699) may be substituted when offered.

Prefix	Title	Credits
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5120	Biostatistical Applications in Public Health	3
PHLS 5150	Environmental Public Health Issues	3

PHLS 5210	Foundations & Techniques of Public Health Education	3
PHLS 5610	Health Disparities: Determinants and Interventions	3
PHLS 5620	Cross-Cultural Aspects of Health	3

Public Health (Health Management, Administration & Policy) - Master of Public Health

Non-Thesis Option:

Prefix	Title	Credits
Public Health Core Courses		
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5120	Biostatistical Applications in Public Health	3
PHLS 5130	Epidemiological Approaches to Disease Control and Prevention	3
PHLS 5140	Health Services System: Administration and Organization	3
PHLS 5150	Environmental Public Health Issues	3
PHLS 5160	Public Health Policy Analysis	3
PHLS 5170	Qualitative Methods in Public Health	3
Health Management, Administration and Policy Concentration		
PHLS 5310	Principles of Health Program Management	3
PHLS 5330	Public Health Finance and Budget Management	3
PHLS 5340	Public Health Law and Ethics	3
PHLS 5250	Evaluative Approaches in Public Health	3
Cultural Foundation Course		
Select 3 credits from the cultural foundation series numbered PHLS 5610-PHLS 5690		3
Additional Requirements		
PHLS 5998	Applied Practice Experience	3
PHLS 5995	Integrative Learning Experience	3
Total Credits		**42**

Thesis Option:

Prefix	Title	Credits
Public Health Core Courses		
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5120	Biostatistical Applications in Public Health	3
PHLS 5130	Epidemiological Approaches to Disease Control and Prevention	3
PHLS 5140	Health Services System: Administration and Organization	3
PHLS 5150	Environmental Public Health Issues	3
PHLS 5160	Public Health Policy Analysis	3
PHLS 5170	Qualitative Methods in Public Health	3
Health Management, Administration and Policy Concentration		
PHLS 5310	Principles of Health Program Management	3
PHLS 5330	Public Health Finance and Budget Management	3
PHLS 5340	Public Health Law and Ethics	3
PHLS 5250	Evaluative Approaches in Public Health	3
Cultural Foundation Course		
Select 3 credits from the cultural foundation series numbered PHLS 5610-PHLS 5690		3
Additional Requirements		
PHLS 5998	Applied Practice Experience	3
PHLS 5999	Master's Thesis	6
Total Credits		**45**

Some PHLS 5000-level courses are cross-listed with PHLS 4000-level courses (e.g.). Students who have previously taken one of these 4000-level courses at NMSU may not take the corresponding 5000-level PHLS course for degree completion credit.

Non-Thesis students must complete an Integrative Learning Experience that allows them to demonstrate a synthesis of foundational and concentration competencies. This also serves as the final exam for Graduate School Requirements.

Final examination for the thesis option consists of an oral defense of the thesis and related coursework.

Non-Thesis Option:

First Year		
Fall		**Credits**
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5140	Health Services System: Administration and Organization	3
	Credits	**6**
Spring		
PHLS 5160	Public Health Policy Analysis	3
PHLS 5170	Qualitative Methods in Public Health	3
	Credits	**6**
Summer		
Cultural Foundation Course		3
	Credits	**3**
Second Year		
Fall		
PHLS 5120	Biostatistical Applications in Public Health	3
PHLS 5310	Principles of Health Program Management	3
	Credits	**6**
Spring		
PHLS 5130	Epidemiological Approaches to Disease Control and Prevention	3
PHLS 5150	Environmental Public Health Issues	3
	Credits	**6**
Summer		
PHLS 5998	Applied Practice Experience	3
	Credits	**3**
Third Year		
Fall		
PHLS 5340	Public Health Law and Ethics	3
PHLS 5250	Evaluative Approaches in Public Health	3
PHLS 5995	Integrative Learning Experience	3
	Credits	**9**

Spring		
PHLS 5330	Public Health Finance and Budget Management	3
	Credits	**3**
	Total Credits	**42**

Thesis Option:

Visit with an advisor for help with creating a customized plan.

New Mexico State University's master's accelerated program allows **academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

Please talk to the PHS Graduate Coordinator about your MAP plan and develop a course plan in consultation with that person.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same courses as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework, of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 3.00.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a B- or lower grade is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the PHS MAP program; other courses may be considered after consultation with the Graduate Coordinator. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees. Other Cultural Foundation courses (PHLS 5600-5699) may be substituted when offered.

Prefix	Title	Credits
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5120	Biostatistical Applications in Public Health	3
PHLS 5150	Environmental Public Health Issues	3
PHLS 5210	Foundations & Techniques of Public Health Education	3
PHLS 5610	Health Disparities: Determinants and Interventions	3
PHLS 5620	Cross-Cultural Aspects of Health	3

Public History and Public Administration - Dual M.A. Degree

The Department of History and the Department of Government offer a dual degree in which students who are accepted into both of these programs may simultaneously earn both a Master of Arts in History degree with the Public History specialization, and a Master of Public Administration degree. The dual degree requires 57 total credits, while students who pursued both degrees as separate degrees would need to pass at least 72 credits. Students earning the dual degrees must pass a joint oral examination after passing required courses and completing internship credits in both programs. Students interested in the dual degree program should consult with the Director of the Public History Program and the Director of the Master of Public Administration Program.

Range Science - Master of Science

A GPA of 3.0 or higher is required for admission. GRE exam is not required. Prerequisite for admission as a regular graduate student in the department is the completion of a curriculum substantially equivalent to that required of undergraduate students. Therefore, deficiency courses may be required after admission to the program, as determined by the admissions committee and the student's graduate committee and advisor.

Graduate Program with the Thesis (Research) Option

- Coursework
  - A minimum of 30 credits of graduate work is required to graduate.
  - At least 15 credits must be in courses numbered 500 or above.
  - At least 15 credits must be from the Range Science program.
  - Not more than 6 nor fewer than 4 thesis credits (RGSC 599 Master's Thesis) may be counted toward the requirements for a master's degree.
  - Two semesters of RGSC 515 Graduate Seminar (Seminar) are required. One may be taken from another department with the permission of the student's graduate committee.
  - At least one advanced statistics course or equivalent is required, as determined by the student's graduate committee.
- Thesis
  - The thesis research project must be approved by the student's graduate committee.
  - Every effort should be made to publish the thesis as a scientific journal article or Experiment Station publication.

Prefix	Title	Credits
Two Semesters of Seminar		2
RGSC 515	Graduate Seminar	
Choose from the following		28
RGSC 452	Vegetation Measurements for Rangeland Assessment	
RGSC 460	Rangeland and Natural Resource Planning and Management	
RGSC 509	Approaches to Rangeland Research	
RGSC 516	Arid Land Management	
RGSC 518	Watershed Methods and Management	
RGSC 520	Arid Land Plant Herbivore Interactions	
RGSC 525	Advanced Rangeland Restoration Ecology	

RGSC 550	Special Topics	
RGSC 551	Earth Data Retrieval	
RGSC 557	Advanced Grass Taxonomy and Identification	
RGSC 575	Climate Studies, Water and Society	
RGSC 585	Land Cover Analysis for Natural Resources	
RGSC 589	Landscape Hydrology Modeling	
RGSC 599	Master's Thesis	
Two Credits of Research (non-thesis Option)		0-2
RGSC 598	Special Research Program	
Total Credits		**30-32**

Graduate Program with the Non-Thesis Option

- Coursework
  - A minimum of 32 credits of graduate work is required to graduate.
  - At least 15 credits must be in courses numbered 500 or above.
  - At least 15 credits must be from the Range Science program.
  - RGSC 599 Master's Thesis (Thesis) may not be taken.
  - Two credits of RGSC 598 Special Research Program (subtitled Non-Thesis Report) are required for the written report.
  - Two semesters of RGSC 515 Graduate Seminar (Seminar) are required. One may be taken from another department with the permission of the student's graduate committee.
- Written Report
  - The report will be on a topic approved by the student's graduate committee.
  - Research for the report may involve field work and data gathering but should also be strongly library- and literature-based.
  - The report should be of graduate quality and content and should follow graduate school thesis format or the format of an acceptable scholarly journal. Final approval and acceptance of the report will be provided by the student's graduate committee.
  - Every effort should be made to publish the report in an appropriate outlet (journal article, Experiment Station bulletin or report, Extension bulletin, etc.)
  - Copies of the report will be bound and placed in the university and departmental libraries.

First Year

Fall		**Credits**
Choose 9 credits from designated elective list:		9
RGSC 452	Vegetation Measurements for Rangeland Assessment	
RGSC 516	Arid Land Management	
RGSC 520	Arid Land Plant Herbivore Interactions	
RGSC 550	Special Topics	
RGSC 551	Earth Data Retrieval	
RGSC 575	Climate Studies, Water and Society	
	Credits	**9**

Spring		
Choose 9 credits from designated elective list:		9
RGSC 460	Rangeland and Natural Resource Planning and Management	
RGSC 509	Approaches to Rangeland Research	
RGSC 518	Watershed Methods and Management	
RGSC 585	Land Cover Analysis for Natural Resources	
RGSC 525	Advanced Rangeland Restoration Ecology	
RGSC 550	Special Topics	
RGSC 557	Advanced Grass Taxonomy and Identification	
RGSC 589	Landscape Hydrology Modeling	
	Credits	**9**

Second Year

Fall		
RGSC 515	Graduate Seminar	1
Choose 4 credits from elective list:		4
RGSC 516	Arid Land Management	
RGSC 520	Arid Land Plant Herbivore Interactions	
RGSC 550	Special Topics	
RGSC 551	Earth Data Retrieval	
RGSC 575	Climate Studies, Water and Society	
RGSC 599	Master's Thesis	
RGSC 598	Special Research Program (Non-Thesis Route)	0-1
	Credits	**5-6**

Spring		
RGSC 515	Graduate Seminar	1
Choose 6 credits from elective list:		6
RGSC 518	Watershed Methods and Management	
RGSC 525	Advanced Rangeland Restoration Ecology	
RGSC 550	Special Topics	
RGSC 557	Advanced Grass Taxonomy and Identification	
RGSC 585	Land Cover Analysis for Natural Resources	
RGSC 589	Landscape Hydrology Modeling	
RGSC 599	Master's Thesis	
RGSC 598	Special Research Program (Non-Thesis Route)	0-1
	Credits	**7-8**
	Total Credits	**30-32**

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- students may take 12 credits from the following courses.
- The grade point average must be at a minimum of 3.0.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit.

Prefix	Title	Credits
RGSC 518	Watershed Methods and Management	3
RGSC 520	Arid Land Plant Herbivore Interactions	3
RGSC 525	Advanced Rangeland Restoration Ecology	3
RGSC 557	Advanced Grass Taxonomy and Identification	3
RGSC 585	Land Cover Analysis for Natural Resources	3
EPWS 514	Plant Physiology	3

Social Work - Master of Social Work (Full-Time)

The requirements for the Master of Social Work degree include 60 credits of designated graduate courses; a cumulative grade-point average of at least 3.0 on a 4.0 scale in all courses and practicums.

Note that all social work courses must be taken in sequence. Successful completion of course work for each semester is a prerequisite for the course work of the following semester.

An integral part of a graduate social work program is completing practicums. For those enrolled in the two-year and three-year programs, two practicum placements totaling 950 hours will be required. For those students entering the program with advanced standing, one practicum placement is required, totaling 500 hours in the field. Students are offered a wide range of practicum sites from which to choose. Students should be prepared to travel some distance and be responsible for their own transportation costs.

Application Deadlines

The priority deadline for completed applications is January 15 for fall admission. Applications received after January 15 will only be reviewed on a space-available basis. Please apply by January 15 for full consideration.

Course of Study

Full-Time Program (60 credits)

First Year		
Fall		**Credits**
SOWK 5110	Sociocultural Concepts and Populations of the Southwest	3
SOWK 5135	Human Behavior in the Social Environment	3
SOWK 5165	Generalist Social Work Practice	3
SOWK 5180	Generalist Practicum Experience I	3
SOWK 5181	Generalist Practicum Seminar I	3
	Credits	**15**
Spring		
SOWK 5230	Applied Social Work Research	3
SOWK 5320	Practice with Individuals	3
SOWK 5155	Social Policy Issues, Analysis and Change	3
SOWK 5190	Generalist Practicum Experience II	3
SOWK 5191	Generalist Practicum Seminar II	3
	Credits	**15**
Second Year		
Fall		
SOWK 5330	Practice with Groups	3
SOWK 5310	Social Work Mental Health Practice	3
SOWK 5260	Leadership Action Project [1]	1
SOWK 5280	Advanced Generalist Practicum Experience I	3
SOWK 5281	Advanced Generalist Practicum Seminar I	2
5000-level graduate elective [2]		3
	Credits	**15**
Spring		
SOWK 5340	Practice with Families	3
SOWK 5350	Practice with Organizations and Communities	3
SOWK 5994	Final Exit Project	1
SOWK 5290	Advanced Generalist Practicum Experience II	3
SOWK 5291	Advanced Generalist Practicum Seminar II	2
5000-level graduate elective [2]		3
	Credits	**15**
	Total Credits	**60**

1. This course may be replaced by HEST 5110 Interprofessional Education and Learning
2. This requirement can be completed with either an SOWK 5000-level course or any active 5000-level course (for any prefix) within the catalog with approval.

Related Outside Elective Examples (choose one graduate level)

MSW elective courses not listed above, Sociology, Anthropology, Psychology, Education, Special Education, Health Science, Family and Consumer Science, Counseling and Education Psychology, Economics, Management, Government, Statistics, Women's Studies, Criminal Justice.

First Year		
Fall		**Credits**
SOWK 5110	Sociocultural Concepts and Populations of the Southwest	3
SOWK 5135	Human Behavior in the Social Environment	3
SOWK 5165	Generalist Social Work Practice	3
SOWK 5180	Generalist Practicum Experience I	3
SOWK 5181	Generalist Practicum Seminar I	3
	Credits	**15**
Spring		
SOWK 5230	Applied Social Work Research	3
SOWK 5320	Practice with Individuals	3
SOWK 5155	Social Policy Issues, Analysis and Change	3
SOWK 5190	Generalist Practicum Experience II	3
SOWK 5191	Generalist Practicum Seminar II	3
	Credits	**15**
Second Year		
Fall		
SOWK 5330	Practice with Groups	3
SOWK 5310	Social Work Mental Health Practice	3
SOWK 5260	Leadership Action Project [1]	1
SOWK 5280	Advanced Generalist Practicum Experience I	3
SOWK 5281	Advanced Generalist Practicum Seminar I	2
5000-level graduate elective [2]		3
	Credits	**15**
Spring		
SOWK 5340	Practice with Families	3
SOWK 5350	Practice with Organizations and Communities	3
SOWK 5994	Final Exit Project	1
SOWK 5290	Advanced Generalist Practicum Experience II	3
SOWK 5291	Advanced Generalist Practicum Seminar II	2
5000-level graduate elective [2]		3
	Credits	**15**
	Total Credits	**60**

1. This course may be replaced by HEST 5110 Interprofessional Education and Learning

[2] This requirement can be completed with either an SOWK 5000-level course or any active 5000-level course (for any prefix) within the catalog with approval.

Social Work - Master of Social Work (Full-Time Advanced)

The requirements for the Master of Social Work degree include 30 credits of designated graduate courses for those accepted for advanced standing; a cumulative grade-point average of at least 3.0 on a 4.0 scale in all courses and practicums.

Note that all social work courses must be taken in sequence. Successful completion of course work for each semester is a prerequisite for the course work of the following semester.

An integral part of a graduate social work program is completing practicums. For those enrolled in the two-year and three-year programs, two practicum placements totaling 950 hours will be required. For those students entering the program with advanced standing, one practicum placement is required, totaling 500 hours in the field. Students are offered a wide range of practicum sites from which to choose. Students should be prepared to travel some distance and be responsible for their own transportation costs.

Application Deadlines

The priority deadline for completed applications is January 15 for fall admission. Applications received after January 15 will only be reviewed on a space-available basis. Please apply by January 15 for full consideration.

Course of Study

Full-Time Advanced Standing (33 credits)

Full-Time Advanced Standing begins in summer with three one-credit bridge courses followed by all advanced generalist core requirements and one graduate elective.

First Year		
Semester 1		**Credits**
SUMMER		
SOWK 5270	Social Work Ethics [3]	1
SOWK 5271	Social Work Policy [3]	1
SOWK 5272	Social Work Research [3]	1
	Credits	**3**
Semester 2		
FALL		
SOWK 5260	Social Work Professional Readiness [2]	1
SOWK 5330	Advanced Practice with Groups	3
SOWK 5310	Social Work Mental Health Practice	3
SOWK 5280	Advanced Generalist Practicum Experience I	3
SOWK 5281	Advanced Generalist Practicum Seminar I	2
5000-level Elective [1]		3
	Credits	**15**
Semester 3		
SPRING		
SOWK 5320	Advanced Practice with Individuals	3
SOWK 5340	Advanced Practice with Families	3
SOWK 5350	Advanced Practice with Communities and Organizations	3
SOWK 5290	Advanced Generalist Practicum Experience II	3
SOWK 5291	Advanced Generalist Practicum Seminar II	2
SOWK 5994	Final Exit Project	1
	Credits	**15**
	Total Credits	**33**

[1] This requirement can be completed with either an SOWK 5000-level course or any active 5000-level course (for any prefix) within the catalog with approval.

[2] This course may be replaced by HEST 5110 Interprofessional Education and Learning

[3] Taken summer before first fall semester

Related Outside Elective Examples (choose one graduate level)

MSW elective courses not listed above, Sociology, Anthropology, Education, Special Education, Psychology, Health Science, Family and Consumer Science, Counseling and Education Psychology, Economics, Management, Government, Statistics, Women's Studies, Criminal Justice.

A Suggested Plan of Study for Students

First Year		
Semester 1		**Credits**
SUMMER		
SOWK 5270	Social Work Ethics [3]	1
SOWK 5271	Social Work Policy [3]	1
SOWK 5272	Social Work Research [3]	1
	Credits	**3**
Semester 2		
FALL		
SOWK 5260	Social Work Professional Readiness [1]	1
SOWK 5330	Advanced Practice with Groups	3
SOWK 5310	Social Work Mental Health Practice	3
SOWK 5280	Advanced Generalist Practicum Experience I	3
SOWK 5281	Advanced Generalist Practicum Seminar I	2
5000-level Elective [2]		3
	Credits	**15**
Semester 3		
SPRING		
SOWK 5320	Advanced Practice with Individuals	3
SOWK 5340	Advanced Practice with Families	3
SOWK 5350	Advanced Practice with Communities and Organizations	3
SOWK 5290	Advanced Generalist Practicum Experience II	3
SOWK 5291	Advanced Generalist Practicum Seminar II	2
SOWK 5994	Final Exit Project	1
	Credits	**15**
	Total Credits	**33**

[1] This requirement can be completed with either an SOWK 5000-level course or any active 5000-level course (for any prefix) within the catalog with approval.

[2] This course may be replaced by HEST 5110 Interprofessional Education and Learning

[3] Taken summer before first fall semester

Social Work - Master of Social Work (Part-Time)

The requirements for the Master of Social Work degree include 60 credits of designated graduate courses; a cumulative grade-point average of at least 3.0 on a 4.0 scale in all courses and practicums.

Note that all social work courses must be taken in sequence. Successful completion of course work for each semester is a prerequisite for the course work of the following semester.

An integral part of a graduate social work program is completing practicums. For those enrolled in the two-year and three-year programs, two practicum placements totaling 950 hours will be required. For those students entering the program with advanced standing, one practicum placement is required, totaling 500 hours in the field. Students are offered a wide range of practicum sites from which to choose. Students should be prepared to travel some distance and be responsible for their own transportation costs.

Application Deadlines

The priority deadline for completed applications is January 15 for fall admission. Applications received after January 15 will only be reviewed on a space-available basis. Please apply by January 15 for full consideration.

Course of Study
Part-Time Program (60 credits)

Prefix	Title	Credits
SOWK 5110	Sociocultural Concepts and Populations of the Southwest	3
SOWK 5135	Human Behavior in the Social Environment	3
SOWK 5155	Social Policy Issues, Analysis and Change	3
SOWK 5165	Generalist Social Work Practice	3
SOWK 5180	Generalist Practicum Experience I	3
SOWK 5181	Generalist Practicum Seminar I	3
SOWK 5190	Generalist Practicum Experience II	3
SOWK 5191	Generalist Practicum Seminar II	3
SOWK 5230	Applied Social Work Research	3
SOWK 5320	Practice with Individuals	3
SOWK 5330	Practice with Groups	3
SOWK 5340	Practice with Families	3
SOWK 5260	Leadership Action Project [2]	1
SOWK 5280	Advanced Generalist Practicum Experience I	3
SOWK 5281	Advanced Generalist Practicum Seminar I	2
SOWK 5290	Advanced Generalist Practicum Experience II	3
SOWK 5291	Advanced Generalist Practicum Seminar II	2
SOWK 5310	Social Work Mental Health Practice	3
SOWK 5350	Practice with Organizations and Communities	3
SOWK 5994	Final Exit Project	1
5000-Level Graduate Electives [1]		6
Total Credits		**60**

[1] This requirement can be completed with either an SOWK 5000-level course or any active 5000-level course (for any prefix) within the catalog with approval.

[2] This course can be replaced with HEST 5110 Interprofessional Education and Learning.

Related Outside Elective Examples (choose one graduate level)

MSW elective courses not listed above: Sociology, Anthropology, Education, Special Education, Psychology, Health Science, Family and Consumer Science, Counseling and Education Psychology, Economics, Management, Government, Statistics, Women's Studies, and Criminal Justice.

A Suggested Plan of Study for Students
A Suggested Plan of Study

First Year		
Fall		**Credits**
SOWK 5110	Sociocultural Concepts and Populations of the Southwest	3
SOWK 5135	Human Behavior in the Social Environment	3
SOWK 5165	Generalist Social Work Practice	3
	Credits	**9**
Spring		
SOWK 5320	Practice with Individuals	3
SOWK 5155	Social Policy Issues, Analysis and Change	3
SOWK 5230	Applied Social Work Research	3
	Credits	**9**
Second Year		
Fall		
SOWK 5180	Generalist Practicum Experience I	3
SOWK 5181	Generalist Practicum Seminar I	3
SOWK 5330	Practice with Groups	3
5000-level graduate elective [1]		3
	Credits	**12**
Spring		
SOWK 5340	Practice with Families	3
SOWK 5190	Generalist Practicum Experience II	3
SOWK 5191	Generalist Practicum Seminar II	3
5000-level graduate elective [1]		3
	Credits	**12**
Third Year		
Fall		
SOWK 5310	Social Work Mental Health Practice	3
SOWK 5280	Advanced Generalist Practicum Experience I	3
SOWK 5281	Advanced Generalist Practicum Seminar I	2
SOWK 5260	Leadership Action Project [2]	1
	Credits	**9**
Spring		
SOWK 5350	Practice with Organizations and Communities	3
SOWK 5290	Advanced Generalist Practicum Experience II	3
SOWK 5291	Advanced Generalist Practicum Seminar II	2
SOWK 5994	Final Exit Project	1
	Credits	**9**
	Total Credits	**60**

[1] This requirement can be completed with either an SOWK 5000-level course or any active 5000-level course (for any prefix) within the catalog with approval.

[2] This course can be replaced with HEST 5110 Interprofessional Education and Learning.

Sociology - Master of Arts

Thesis Program Requirements

In addition to the successful completion of an acceptable master's thesis, students who choose this option will take a minimum of 30 credit hours of graduate work distributed as follows:

Prefix	Title	Credits
Required Courses:		**6**
SOCI 5110	Perspectives on Sociology [1]	
SOCI 5163	Issues in Advanced Quantitative Analysis [1]	
Choose one methods course from the following:		**3**
SOCI 5150	Seminar in Social Networks [1]	
SOCI 5153	Seminar in Sociological Research [1]	
SOCI 5155	Seminar in Text Analysis for the Social Sciences [1]	
SOCI 5157	Seminar in Qualitative Research Methods [1]	
SOCI 5158	Seminar in Visual Ethnographic Methodology [1]	
Choose one social theory course from the following:		**3**
SOCI 5165	Foundations of Social Theory [1]	
SOCI 5166	Seminar in Contemporary Theory [1]	
Masters Thesis Credits:		**6**
SOCI 5999	Master's Thesis	
Select an additional 12 credits from 5000 level Sociology course work to be taken in consultation with the sociology graduate student's advisor.		**12**
Final master's oral examination covering all general coursework and the thesis.		
Total Credits		**30**

[1] To be taken within the first 27 hours of graduate credit. A grade of B- or better is required to receive credit for each of these core courses.

Non-Thesis Program Requirements: Coursework Only

Students who choose this option will take a minimum of 30 credit hours of graduate work distributed as follows:

Prefix	Title	Credits
Required courses		**6**
SOCI 5110	Perspectives on Sociology [1]	
SOCI 5163	Issues in Advanced Quantitative Analysis [1]	
Choose one methods course from the following:		**3**
SOCI 5150	Seminar in Social Networks [1]	
SOCI 5153	Seminar in Sociological Research [1]	
SOCI 5155	Seminar in Text Analysis for the Social Sciences [1]	
SOCI 5157	Seminar in Qualitative Research Methods [1]	
SOCI 5158	Seminar in Visual Ethnographic Methodology [1]	
Choose one social theory course from the following:		**3**
SOCI 5165	Foundations of Social Theory [1]	
SOCI 5166	Seminar in Contemporary Theory [1]	
Select an additional 18 credits from 5000 level Sociology course work to be taken in consultation with the sociology graduate student's advisor.		**18**
Final master's written examination covering all general coursework.		
Total Credits		**30**

[1] To be taken within the first 27 hours of graduate credit. A grade of B- or better is required to receive credit for each of these core courses.

Admission Requirements

To apply for admission to the Sociology MA Program and the Graduate School, applicants must meet the following criteria and submit the following through https://apply.nmsu.edu/apply/

- Application form and fees
- An undergraduate cumulative GPA of at least 2.75 on a 4.0 scale.
- A record of professional, ethical, and collegial behavior.
- Official undergraduate and graduate transcripts from all colleges and universities attended.
- A well written statement of purpose from the candidate addressing graduate school objectives and interests.

Failure to meet any of the above criteria may result in the student not being accepted into our program. However, in cases when an otherwise outstanding student does not meet the GPA requirements, the student may be accepted provisionally into the program.

The GRE is not required for admission. Students may be required to take prerequisites prior to gaining admission.

The department admits students on a rolling basis. For graduate assistantship consideration, the priority deadline for application is *April 1st*.

Master's Accelerated Program (MAP) Guidelines

The Masters Accelerated Program allows academically qualified undergraduate students to complete up to 12 credit hours towards a master's degree during their junior and/or senior years while still completing the bachelor's degree. The courses only apply to classes they would take within the Master of Arts program in Sociology.

NMSU GENERAL ELIGIBILITY

- Must have completed 60 hours of undergraduate coursework (minimum 25 hours at NMSU)
- GPA larger or equal to 3.00
- Complete MAP Referral Form

NMSU MAP REGULATIONS/STIPULATIONS

- Courses will count toward both degrees; they will show on undergraduate and graduate transcripts and count towards both GPAs.
- Graduate level courses included in the master's accelerated program are those courses numbered 5000 and above *or those chosen by the graduate academic departments.*
- Students must receive a grade of B- or higher in all MAP coursework to be counted as graduate credit.

- Students apply for the graduate program in their final semester or second to last semester of their undergraduate degree. Depending upon the deadlines set forth by the Department of Sociology.
- Acceptance of MAP credits does not imply acceptance into the Department of Sociology master's program.

Final admissions and acceptance into the graduate program are based on academic performance at the undergraduate level and completion of the eligible undergraduate degree.

- Tuition is based on the level of the student, not the course
- Students may become ineligible for MAP if their undergraduate or graduate GPA drops below 3.0
- Students accepted into the master's accelerated program must participate in the Developing New Scholars Program (DNSP), offered by the Graduate School.
- Students must be advised each semester for the MAP program by their potential graduate program and cleared for registration in graduate courses by the Graduate School.

How to Apply to the MAP Program:

1. A student may apply, or the department may invite students to participate in MAP.
2. *Departments accept students based on the Master's Accelerated Program requirements as set by the department.*
3. A Sociology graduate faculty member, Graduate Coordinator, or Department Head will forward the Master's Accelerated Program Referral Form to the graduate school.
4. Graduate School will hold the referral form until the student has completed their undergraduate degree.
5. The referral form will be used as part of the graduate school's final admissions into the master's program.
6. The following courses are eligible for the Sociology MAP Program:

MAP Courses

In accordance with the Higher Learning Commission (HLC), CRRT.B.10.020.B1c, an institution may allow well-prepared advanced students to substitute its graduate courses for required or elective courses in an undergraduate degree program *and then subsequently count those same courses as fulfilling graduate requirements in a related graduate program that the institution offers*. A graduate program has the discretion to use up to 12 credits of NMSU Sociology coursework (5000 level or higher) that can be applied towards the completion of the master's program of study. Students must receive a grade of B- or higher in this coursework to be counted for graduate credit.

Accepted MAP Courses

The following courses are accepted for use in the Sociology MAP program; other courses may be considered after consultation with the Graduate Coordinator. An exception will need to be made to the degree audit for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
SOCI 5110	Perspectives on Sociology	3
SOCI 5150	Seminar in Social Networks	3
SOCI 5153	Seminar in Sociological Research	3
SOCI 5155	Seminar in Text Analysis for the Social Sciences	3
SOCI 5157	Seminar in Qualitative Research Methods	3
SOCI 5158	Seminar in Visual Ethnographic Methodology	3
SOCI 5163	Issues in Advanced Quantitative Analysis	3
SOCI 5165	Foundations of Social Theory	3
SOCI 5166	Seminar in Contemporary Theory	3

Spanish - Master of Arts

The degree plan requires a minimum of 36 credits in Spanish. The expectation is that all 36 credits will be earned at the 500 level or above; however, a student may complete no more than 6 credits at the 450-499 level. These, and any other exceptions, should be discussed with the graduate advisor. The credits for the Additional Language Requirement (see below) do not count as part of the 36 credits in the degree plan. The courses should be concentrated in the student's chosen area of study (linguistics or literature) as each student will be tested on a reading list that corresponds to each area study. A thesis is optional. Students authorized to complete a thesis may count a maximum of 6 credits of thesis work toward the degree. At the present time, the thesis option is not available for online-only students. There are no required core courses at this time and a student should work closely with his/her advisor and the Graduate Director to establish an appropriate individual degree plan.

All students in either the on-campus or online program may complete a minor at the master's level by taking 9 credits (3 courses) at the 500 level or above, in another area (department) of study, or within the department itself. For instance, a student studying linguistics may wish to obtain a minor in literature or a student studying literature may wish to obtain a minor in linguistics. In either case, the minor credits count as part of the 36 total credits required for the degree. In all cases, the student should work closely with the Graduate Director to ensure his/her particular plan of study is acceptable to the program.

Area of Study: Linguistics

Prefix	Title	Credits
Choose 12 from the following:		36
SPAN 502	Sentipensar Pedagogy: Anzaldúa and Other Theorists	
SPAN 503	Critical Language Awareness in Teaching SHL	
SPAN 504	Culturally Sensitive Teaching in SHL: Teaching Spanish as a Heritage Language in the United States	
SPAN 507	Technology Enhanced Language Learning	
SPAN 509	Teaching Culture with Technology	
SPAN 510	Assessing the National Standards	
SPAN 540	Introduccion a la Linguistica	
SPAN 545	Advanced Dialectos del Espanol	
SPAN 558	Bilinguismo	
SPAN 561	Advanced Spanish Phonetics	
SPAN 562	Advanced Spanish Phonology	
SPAN 570	Advanced Study in Technical Translation	
SPAN 574	Advanced Pragmatics	
SPAN 576	Advanced Semantics	
SPAN 580	Research Methodology in Spanish Linguistics	
SPAN 584	Spanish Morphosyntax	
SPAN 589	Spanish Sociolinguistics	
SPAN 591	Advanced Study in History of the Spanish Language	
SPAN 592	Advanced Structure of Spanish	
SPAN 594	Theory and Methodology of Spanish Pedagogy	

SPAN 595	Advanced Topics in Applied Spanish Linguistics
SPAN 597	Advanced Strategies for Teaching Spanish for Heritage/Native Speakers
Total Credits	**36**

Area of Study: Literature

Prefix	Title	Credits
Choose 12 from the following:		36
SPAN 500	Methods of Research and Literary Criticism	
SPAN 512	Contemporary Spanish-American Poetry	
SPAN 514	Coyolxauhqui: La literatura chicana femenil	
SPAN 520	Adv. The Art of Storytelling	
SPAN 521	Advanced Culture and Literature of New Mexico	
SPAN 522	Adv. Cultural Production of Hispanic Revolutions and Wars	
SPAN 523	Colonial Legacy: Representations in Chican@ Literature & Culture	
SPAN 528	Advanced U.S. Latino Culture and Literature	
SPAN 542	Adv. Formation of Hispanic National Identities	
SPAN 544	Adv. Body Studies	
SPAN 546	Adv. Speculative Fiction	
SPAN 547	Advanced Hispanic Film	
SPAN 548	Advanced U.S.-Hispanic Film	
SPAN 550	Advanced Chicana and Chicano Studies	
SPAN 551	Advanced Hispanic Cultures	
SPAN 563	Advanced Study in Mexican Literature	
SPAN 564	Advanced Post-Modern Hispanic Literature	
SPAN 566	Contemporary Spanish-American Novel	
SPAN 567	Advanced Study in Chicano Literature	
SPAN 573	Advanced Study in Creative Writing	
SPAN 583	Advanced Study in Spanish-American Women Writers	
SPAN 586	Contemporary Spanish-American Essay	
SPAN 587	Contemporary Spanish-American Short Story	
SPAN 588	Contemporary Spanish-American Drama	

Courses that may apply to either area include SPAN 590 Advanced Special Topics (see subtitles in schedule of courses to confirm subject of the course) SPAN 598 Independent Reading, Research, and/or Creative Writing, SPAN 599 Master's Thesis (both courses require a course proposal and prior approval).

Additional Language Requirement

For both the on-campus and online degrees, the department requires that students fulfill a second language requirement (in addition to English and Spanish) by following an approved course of study. Typically, this is completed by taking a four-semester course of study, but may vary according to the languages available.

Options for completing this requirement include taking classes at a local Community College or University, or online. Some students have met this requirement by studying abroad through NMSU. Students should consult the Graduate Director to establish a plan and discuss how this requirement will be met. *Note: evidence of fulfilling the second language requirement must be provided to the Graduate Director BEFORE taking final examinations.*

Additional Notes

In addition to standard Graduate School requirements, the program requires *CV or resume; * Writing Sample; *Letters of Recommendation (3); * Statement of Interest or Purpose.

Final Examinations

Students must successfully complete a final department examination (generally during the final semester of coursework) that is partially written and partially oral. Please consult the Graduate Director for specific information on dates and format for these exams. Final examinations are only available during the Fall and Spring semesters.

Areas of Interest/Reading List

As stated previously, each student needs to select an area of interest: Linguistics or Literature. At the end of the student's degree, the final examinations (written and oral) will be based on the readings from the readings list in the student's selected area of study. For example, a student that has opted to specialize in literature is responsible for reading all the materials on the Literature Reading List. Likewise, a student that has opted to specialize in linguistics is responsible for reading all the materials on the Linguistics Reading List. The student is responsible for the reading list that was in place the year he or she started the program.

Each student is responsible for covering the reading materials listed. Please contact the Graduate Director for a detailed reading. Note that the list is dated, so make sure to refer to the correct list that covers the year/semester the student started the program. The student is responsible for covering ALL the readings even if the student did not cover them as part of work done in class.

Graduate Assistantships

For the on-campus program only, the department awards graduate assistantships to qualified students. For this financial assistance, the student works up to 20 hours a week in departmental programs, chiefly in the teaching of elementary and intermediate Spanish courses in either the Heritage Language sequence or Spanish as a second Language sequence. Students interested in being considered for an assistantship should clearly state this interest in their introduction letter during the application process. The department offers a limited number of assistantships, and students should remember that not everyone that applies for this award receives one. Maintaining the award depends on the student's successful performance both academically and in the classes he/she teaches and is evaluated on a semester-by-semester basis. Students who receive an assistantship are required to take SPAN 594 Theory and Methodology of Spanish Pedagogy (see course description) as part of their degree plan in order to help them prepare for teaching classes at NMSU.

The Master of Arts in Spanish program participates in the **Master's Accelerated Program (MAP)** at NMSU.

The MAP program is the chance to take up to 12 graduate credits **(courses numbered SPAN 450 level and higher)** as part of your undergrad program that can, then, also apply towards a Master's degree.

In order to take advantage of this opportunity, you **must apply for the MAP program BEFORE taking ANY classes at this level.**

Please visit the Graduate School web page for more information about the steps and to APPLY (open this link: https://gradschool.nmsu.edu/current-students/masters-accelerated-program.html)

You will see a link at the bottom of the page that says "Apply to the MAP program." That's the best place to start.

Spanish Courses Eligible for the MAP

All the courses listed below are eligible for MAP. Students must receive a grade of B- or higher in this coursework to be counted for graduate credits. If a grade lower than a B- is earned, it will not count toward the graduate degree. Students should consult with the graduate program coordinator regularly to ensure they are on the correct pathway.

Prefix	Title	Credits
SPAN 500	Methods of Research and Literary Criticism	3
SPAN 502	Sentipensar Pedagogy: Anzaldúa and Other Theorists	3
SPAN 503	Critical Language Awareness in Teaching SHL	3
SPAN 504	Culturally Sensitive Teaching in SHL: Teaching Spanish as a Heritage Language in the United States	3
SPAN 507	Technology Enhanced Language Learning	3
SPAN 508	Teaching Literature with Technology	3
SPAN 509	Teaching Culture with Technology	3
SPAN 510	Assessing the National Standards	3
SPAN 512	Contemporary Spanish-American Poetry	3
SPAN 514	Coyolxauhqui: La literatura chicana femenil	3
SPAN 520	Adv. The Art of Storytelling	3
SPAN 521	Advanced Culture and Literature of New Mexico	3
SPAN 522	Adv. Cultural Production of Hispanic Revolutions and Wars	3
SPAN 523	Colonial Legacy: Representations in Chican@ Literature & Culture	3
SPAN 528	Advanced U.S. Latino Culture and Literature	3
SPAN 540	Introduccion a la Linguistica	3
SPAN 542	Adv. Formation of Hispanic National Identities	3
SPAN 544	Adv. Body Studies	3
SPAN 545	Advanced Dialectos del Espanol	3
SPAN 546	Adv. Speculative Fiction	3
SPAN 547	Advanced Hispanic Film	3
SPAN 548	Advanced U.S.-Hispanic Film	3
SPAN 550	Advanced Chicana and Chicano Studies	3
SPAN 551	Advanced Hispanic Cultures	3
SPAN 558	Bilinguismo	3
SPAN 564	Advanced Post-Modern Hispanic Literature	3
SPAN 566	Contemporary Spanish-American Novel	3
SPAN 567	Advanced Study in Chicano Literature	3
SPAN 570	Advanced Study in Technical Translation	3
SPAN 574	Advanced Pragmatics	3
SPAN 576	Advanced Semantics	3
SPAN 580	Research Methodology in Spanish Linguistics	3
SPAN 583	Advanced Study in Spanish-American Women Writers	3
SPAN 584	Spanish Morphosyntax	3
SPAN 586	Contemporary Spanish-American Essay	3
SPAN 587	Contemporary Spanish-American Short Story	3
SPAN 588	Contemporary Spanish-American Drama	3
SPAN 589	Spanish Sociolinguistics	3
SPAN 590	Advanced Special Topics	3
SPAN 591	Advanced Study in History of the Spanish Language	3
SPAN 592	Advanced Structure of Spanish	3
SPAN 594	Theory and Methodology of Spanish Pedagogy	3
SPAN 595	Advanced Topics in Applied Spanish Linguistics	3
SPAN 597	Advanced Strategies for Teaching Spanish for Heritage/Native Speakers	3

Special Education - Master of Arts

Enrollment in graduate licensure program courses with field experiences in Special Education is limited to persons who have been accepted into the graduate program in Special Education. For other special education graduate courses, enrollment of students outside of the special education program is contingent upon meeting prerequisites and availability after enrollment of Special Education graduate students. To complete a course of study, each student must meet the program's academic and field-based competency criteria, including a grade of B or higher in each course in the program of study, satisfactory evaluation in field experiences for those seeking licensure, and a passing score on the MA Comprehensive Exam or Capstone. The Master of Arts in Special Education has pathways to meet the varied needs of students pursuing graduate education and can be completed in two years for full-time students.

Master of Arts in Special Education (Plus Licensure)

This route is 42 credits including student teaching and provides preparation for the New Mexico pre-K-12 Special Education license. Candidates must be admitted to the Teacher Education Program before completing practicum and student teaching experiences.

Prefix	Title	Credits
Course Requirements		
SPED 5105	Introduction to Special Education in a Diverse Society	3
SPED 5230	Advanced Curriculum for Diverse Exceptional Learners	3
SPED 5210	Introduction to Assessment of Diverse Exceptional Learners	3
SPED 5120	High Incidence Disabilities in a Diverse Society	3
SPED 5110	Low Incidence Disabilities in a Diverse Society	3
SPED 5130	Reading for Elementary Exceptional Learners in a Diverse Society, K-6	3
SPED 5860	Current Issues in Special Education for Teaching in Culturally Responsive Society	3
SPED 5140	Reading for Secondary Exceptional Learners in a Diverse Society, 7-12	3
SPED 5160	Technology and Exceptionality in a Diverse Society	3
or EDUC 5130	Technology and Pedagogy	
SPED 5811	Field Experience in Education, Equity & Cultural Diversity	3
SPED 5220	Classroom Management for Diverse Learners	3
SPED 5810	Student Teaching SPED	6
Special Education Student Teaching Seminar Courses (based on concentration) [3]		*3*
SPED 5830	Special Education/Elementary Student Teaching Seminar	
SPED 5840	Special Education/Secondary Student Teaching Seminar	
Total Credits		**42**

1 Admittance to TEP is required before registering for SPED 5811 Field Experience in Education, Equity & Cultural Diversity, which must be taken the semester before student teaching.
2 Admittance to STEP is required before registering for SPED 5810 Student Teaching SPED and SPED 5830/SPED 5840, which are the culminating courses.
3 A capstone project is completed during this course in lieu of a Master's exam to meet NM licensure requirements.

Master of Arts in Special Education (Scholarly Route)

This route requires 30 credits of special education coursework and is for students who are not seeking licensure or who already have a license and are seeking additional depth of knowledge. A Master's exam during the culminating semester is required for program completion.

There are two course prerequisites that may be required, SPED 5105 Introduction to Special Education in a Diverse Society and SPED 5230 Advanced Curriculum for Diverse Exceptional Learners. If these are required they must be taken in the first semester they are offered.

Prefix	Title	Credits
Course Required		
SPED 5850	Current Research in Special Education	3
SPED 5860	Current Issues in Special Education for Teaching in Culturally Responsive Society	3
SPED Elective Courses [1]		24
Total Credits		**30**

1 Electives are selected in consultation with an advisor, who will make recommendations based on prior coursework and individual student interests.

Master of Arts in Special Education (emphasis in Visual Impairment)

This route requires 30-36 credit hours in visual impairment and special education coursework and prepares for licensure in teaching school-aged children/infants/toddlers and/or orientation and mobility. Students who meet qualifications and are interested in visual impairment may elect to pursue licensure only, rather than a master's degree, with 15-27 credits leading to a Blind and Visually Impaired Teaching License or National Certification in Orientation and Mobility. We provide two different areas of focus. One focus is for Teachers of Students with Visual Impairments/ Visual Impairment Focus (TSVIs/VI Focus) and the other focus is for Certified Orientation and Mobility Specialists (COMSs). A Master's exam during the culminating semester is required for program completion.

TSVI/VI Focus Coursework

Prefix	Title	Credits
SPED 5405	Foundations of Visual Impairment	3
SPED 5410	Functional Implications of Low Vision	3
SPED 5420	Strategies for Teaching Students with Visual and Multiple Impairments	3
SPED 5450	Strategies for Teaching Students with Visual Impairments	3
SPED 5460	Introduction to Orientation and Mobility	3
SPED 5430	Braille I: Literacy for Students with Visual Impairments	3
SPED 5440	Braille II: Numeracy for Students with Visual Impairments	3
SPED 5105	Introduction to Special Education in a Diverse Society	3
SPED 5860	Current Issues in Special Education for Teaching in Culturally Responsive Society	3
SPED 5996	Topics in Special Education	3

COMS Focus Coursework

Prefix	Title	Credits
SPED 5405	Foundations of Visual Impairment	3
SPED 5410	Functional Implications of Low Vision	3
SPED 5420	Strategies for Teaching Students with Visual and Multiple Impairments	3
SPED 5460	Introduction to Orientation and Mobility	3
SPED 5470	Beginning Orientation and Mobility	3
SPED 5480	Intermediate Orientation and Mobility	3
SPED 5490	Advanced Orientation and Mobility	3
SPED 5105	Introduction to Special Education in a Diverse Society	3
SPED 5860	Current Issues in Special Education for Teaching in Culturally Responsive Society	3
SPED 5996	Topics in Special Education	3

Master of Arts in Special Education (Scholarly Route)

First Year		
Semester 1		**Credits**
SPED 5850	Current Research in Special Education	3
SPED 5860	Current Issues in Special Education for Teaching in Culturally Responsive Society	3
	Credits	**6**
Semester 2		
SPED Electives 6 of 24 recommended [1]		6
	Credits	**6**
Semester 3		
SPED Electives 6 of 24 recommended [1]		6
	Credits	**6**
Second Year		
Semester 1		
SPED Electives 6 of 24 recommended [1]		6
	Credits	**6**
Semester 2		
SPED Electives 6 of 24 recommended [1]		6
	Credits	**6**
	Total Credits	**30**

1 Electives are selected in consultation with an advisor, who will make recommendations based on prior coursework and individual student interests.

Master of Arts in Special Education (Visual Impairment Program - TSVI/ VI Path)

First Year		
Fall		**Credits**
SPED 5410	Functional Implications of Low Vision	3
	Credits	**3**

Spring		
SPED 5420	Strategies for Teaching Students with Visual and Multiple Impairments	3
	Credits	**3**
Summer		
SPED 5405	Foundations of Visual Impairment	3
	Credits	**3**
Second Year		
Fall		
SPED 5430	Braille I: Literacy for Students with Visual Impairments	3
	Credits	**3**
Spring		
SPED 5440	Braille II: Numeracy for Students with Visual Impairments	3
	Credits	**3**
Summer		
SPED 5450	Strategies for Teaching Students with Visual Impairments	3
SPED 5460	Introduction to Orientation and Mobility	3
	Credits	**6**
Third Year		
Fall		
SPED 5860	Current Issues in Special Education for Teaching in Culturally Responsive Society	3
	Credits	**3**
Spring		
SPED 5996	Topics in Special Education	3
	Credits	**3**
Summer		
SPED 5105	Introduction to Special Education in a Diverse Society	3
	Credits	**3**
	Total Credits	**30**

Master of Arts in Special Education (Visual Impairment Program - COMS Path)

First Year		
Fall		**Credits**
SPED 5410	Functional Implications of Low Vision	3
	Credits	**3**
Spring		
SPED 5420	Strategies for Teaching Students with Visual and Multiple Impairments	3
	Credits	**3**
Summer		
SPED 5405	Foundations of Visual Impairment	3
	Credits	**3**
Second Year		
Fall		
SPED 5480	Intermediate Orientation and Mobility	3
	Credits	**3**
Spring		
SPED 5490	Advanced Orientation and Mobility	3
	Credits	**3**
Summer		
SPED 5460	Introduction to Orientation and Mobility	3
SPED 5470	Beginning Orientation and Mobility	3
	Credits	**6**
Third Year		
Fall		
SPED 5860	Current Issues in Special Education for Teaching in Culturally Responsive Society	3
	Credits	**3**
Spring		
SPED 5996	Topics in Special Education	3
	Credits	**3**
Summer		
SPED 5105	Introduction to Special Education in a Diverse Society	3
	Credits	**3**
	Total Credits	**30**

Water Science and Management - Master of Science

This degree is designed primarily for students who wish to complement their primary discipline by obtaining scientific, technical, and managerial expertise in water. The Master's degree can be earned with 26 credits of formal course work, plus 6 additional thesis research credits, as detailed below. The degree also has five available concentrations.

Prefix	Title	Credits
Core Courses		
AEEC 5350	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
Select one from the following: [1]		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modeling	
Seminar Credit OR Select one from the following: [2]		1
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Introduction to Geographic Theory and Application	
Electives chosen in consultation with the student's committee (enough to meet the required minimum of 32 credits)		**16**
Thesis		
WSAM 599	Masters Thesis	6
Total Credits		**32-33**

1. With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modeling may be used as a substitute.
2. Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Introduction to Geographic Theory and Application.

Water Science and Management (Agricultural Water Resources) - Master of Science

This degree is designed primarily for students who wish to complement their primary discipline by obtaining scientific, technical, and managerial expertise in water. The Master's degree can be earned with 26 credits of formal course work, plus 6 additional thesis research credits, as detailed below. The degree also have five available concentrations.

Prefix	Title	Credits
Core Courses		
AEEC 5350	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
Select one from the following: [1]		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modeling	
Seminar Credit OR Select one from the following: [2]		1
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Introduction to Geographic Theory and Application	
Concentration Electives		
Students must work with their committee to select 12 credits of elective courses that would meet the Agricultural Water Resources concentration		12
Electives chosen in consultation with the student's committee (enough to meet the required minimum of 32 credits)		**4**
Thesis		
WSAM 599	Masters Thesis	6
Total Credits		**32-33**

[1] With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modeling may be used as a substitute.

[2] Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Introduction to Geographic Theory and Application.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ENVS 462	Sampling and Analysis of Environmental Contaminants	3
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation	3
SOIL 456	Irrigation and Drainage	3
C E 452	Geohydrology	3-4
C E 483	Surface Water Hydrology	3
A ST 505	Statistical Inference I	4
AEEC 5350	Economics of Water Resource Management and Policy	3
GEOG 481	Fundamentals of GIS	4

Water Science and Management (International Water Resilience) - Master of Science

Prefix	Title	Credits
Course Requirements		
AEEC 5350	Economics of Water Resource Management and Policy	3
A ST 505	Statistical Inference I	4
RGSC 518	Watershed Methods and Management (Lab Required - RGSC 318 M1A or M1B)	3
or SOIL 456	Irrigation and Drainage	
POLS 537	Issues in Public Policy	3
Seminar (4 Credits)		4
WSAM 595	Hands-On Transboundary Aquifer and Community System Convergence Seminar	
WSAM 590	System Dynamics	3
WSAM 598	Internship	3
Choose one course from the following:		3
GEOG 481	Fundamentals of GIS	
ANTH 579	Qualitative Data Analysis and Interpretation	
POLS 502	Research Methods in Government	
POLS 503	Qualitative Research Methods	
SOCI 5157	Seminar in Qualitative Research Methods	
SOCI 5163	Issues in Advanced Quantitative Analysis	
SOCI 5153	Seminar in Sociological Research	
WSAM 599	Masters Thesis	6
Total Credits		**32**

Water Science and Management (Water Economics and Policy) - Master of Science

This degree is designed primarily for students who wish to complement their primary discipline by obtaining scientific, technical, and managerial expertise in water. The Master's degree can be earned with 26 credits of formal course work, plus 6 additional thesis research credits, as detailed below. The degree also has five available concentrations.

Prefix	Title	Credits
Core Courses		
AEEC 5350	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
Select one from the following: [1]		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modeling	
Seminar Credit OR Select one from the following: [2]		1
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Geographic Theory and Application	
Concentration courses		
ECON 457	Mathematical Economics	3
AEEC 5240	Econometrics	3
or ECON 545	Econometrics II	
AEEC 5120	Microeconomic Theory	3
Students must work with their committee to select 3 credits of elective course(s) that would meet the Water Economics and Policy concentration		3
Electives chosen in consultation with the student's committee (enough to meet the required minimum of 32 credits)		**4**
Thesis		
WSAM 599	Masters Thesis	6
Total Credits		**32-33**

1 With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modeling may be used as a substitute.

2 Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Geographic Theory and Application.

Ideas for Water Economics & Policy Electives

- AEEC 5350 Economics of Water Resource Management and Policy
- PHLS 4130 Environmental Health
- ECDV 661 Regional Economic Modeling
- ECDV 664 Population Economics
- ECDV 668 Economic Development Finance
- ECDV 671 Sustainable Economic Development
- PHLS 5150 Environmental Public Health Issues
- PHLS 5640 Rural Health Issues
- PHLS 5660 U.S.-Mexico Border Health Issues

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ENVS 462	Sampling and Analysis of Environmental Contaminants	3
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation	3
SOIL 456	Irrigation and Drainage	3
C E 452	Geohydrology	3-4
C E 483	Surface Water Hydrology	3
A ST 505	Statistical Inference I	4
GEOG 481	Fundamentals of GIS	4

Water Science and Management (Water Informatics) - Master of Science

This degree is designed primarily for students who wish to complement their primary discipline by obtaining scientific, technical, and managerial expertise in water. The Master's degree can be earned with 26 credits of formal course work, plus 6 additional thesis research credits, as detailed below. The degree also have five available concentrations.

Prefix	Title	Credits
Core Courses		
AEEC 5350	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	

Select one from the following: [1]		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modeling	
Seminar Credit OR Select one from the following: [2]		1
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Introduction to Geographic Theory and Application	
Concentration Electives		
Students must work with their committee to select 12 credits of elective course(s) that would meet the Water Informatics concentration		12
Electives chosen in consultation with the student's committee (enough to meet the required minimum of 32 credits)		**4**
Thesis		
WSAM 599	Masters Thesis	6
Total Credits		**32-33**

1 With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modeling may be used as a substitute.

2 Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Introduction to Geographic Theory and Application.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ENVS 462	Sampling and Analysis of Environmental Contaminants	3
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation	3
SOIL 456	Irrigation and Drainage	3
C E 452	Geohydrology	3-4
C E 483	Surface Water Hydrology	3
A ST 505	Statistical Inference I	4
GEOG 481	Fundamentals of GIS	4

Water Science and Management (Water Quality and Treatment) - Master of Science

This degree is designed primarily for students who wish to complement their primary discipline by obtaining scientific, technical, and managerial expertise in water. The Master's degree can be earned with 26 credits of formal course work, plus 6 additional thesis research credits, as detailed below.

Prefix	Title	Credits
Core Courses		
AEEC 5350	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
Select one from the following: [1]		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modeling	
Seminar Credit OR Select one from the following: [2]		1
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Introduction to Geographic Theory and Application	
Concentration Electives		
Students must work with their committee to select 12 credits of elective course(s) that would meet the Water Quality and Treatment concentration		12
Electives chosen in consultation with the student's committee (enough to meet the required minimum of 32 credits)		**4**
Thesis		
WSAM 599	Masters Thesis	6
Total Credits		**32-33**

1 With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modeling may be used as a substitute.

2 Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Introduction to Geographic Theory and Application.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two

years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ENVS 462	Sampling and Analysis of Environmental Contaminants	3
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation	3
SOIL 456	Irrigation and Drainage	3
C E 452	Geohydrology	3-4
C E 483	Surface Water Hydrology	3
AEEC 5350	Economics of Water Resource Management and Policy	3
A ST 505	Statistical Inference I	4
GEOG 481	Fundamentals of GIS	4

Water Science and Management (Watersheds and Aquatic/Riparian Wetlands) - Master of Science

This degree is designed primarily for students who wish to complement their primary discipline by obtaining scientific, technical, and managerial expertise in water. The Master's degree can be earned with 26 credits of formal course work, plus 6 additional thesis research credits, as detailed below.

Prefix	Title	Credits
Core Courses		
AEEC 5350	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
Select one from the following: [1]		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modeling	
Seminar Credit OR Select one from the following: [2]		1
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Introduction to Geographic Theory and Application	
Concentration Electives		
Students must work with their committee to select 3 credits of elective course(s) that would meet the Watersheds and Aquatic/Riparian Wetlands concentration		12
Electives chosen in consultation with the student's committee (enough to meet the required minimum of 32 credits)		**4**
Thesis		
WSAM 599	Masters Thesis	6
Total Credits		**32-33**

1. With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modeling may be used as a substitute.
2. Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Introduction to Geographic Theory and Application.

New Mexico State University master's accelerated program provides **the opportunity for academically qualified undergraduate students** to begin working on a master's degree **during their junior and senior years** while completing a bachelor's degree. Typically, a bachelor's degree requires four years to complete, and a master's degree requires an additional two years. The master's accelerated programs allow students the opportunity to complete a graduate program in an accelerated manner. You can also check NMSU's catalog for additional information about our programs.

MAP Requirements

- The Graduate School allows qualified junior or senior students to substitute its graduate courses for required or elective courses in an undergraduate degree program and then subsequently count those same course as fulfilling graduate requirements in a related graduate program.
- Undergraduate students may apply for acceptance to the accelerated master's program after completing 60 semester hours of undergraduate coursework of which a minimum of 25 semester credit hours must be completed at NMSU.
- The grade point average must be at a minimum of 2.75.
- Students must receive a grade of B or higher in this coursework to be counted for graduate credit. If a grade of B- or lower is earned, it will not count toward the graduate degree.

Accepted MAP Courses

The following courses are accepted for use in the MAP program, any other courses may be considered after a consultation with an advisor. An exception will need to be made to the degree audit in order for the additional course(s) to be included on both the Undergraduate and Graduate degrees.

Prefix	Title	Credits
ENVS 462	Sampling and Analysis of Environmental Contaminants	3
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation	3

SOIL 456	Irrigation and Drainage	3
C E 452	Geohydrology	3-4
C E 483	Surface Water Hydrology	3
A ST 505	Statistical Inference I	4
AEEC 5350	Economics of Water Resource Management and Policy	3
GEOG 481	Fundamentals of GIS	4

Aerospace Engineering - Doctor of Philosophy

Requirements for Ph.D. Degree

The student's academic program is not judged satisfactory unless it prepares the student to contribute to the advancement of knowledge in the field of Aerospace Engineering. The degree of Doctor of Philosophy is indicative of distinguished achievement in the areas of scholarship and original research. Therefore, a dissertation of high quality is required of all doctoral students in Aerospace Engineering. Students must follow the degree requirements listed below to complete the Ph.D. course of study.

The Ph.D. program is open to students with a master's degree. Exceptionally well qualified students may petition for direct entry to the Ph.D. program without first obtaining a master's degree.

A student is required to have one refereed journal paper accepted and a second one accepted or in review by graduation. The Ph.D. dissertation can be a compilation and reformatted version of these published or accepted journal papers. Exceptions may be made on case-by-case basis by the Department Head.

Prefix	Title	Credits
Pass Qualifying Exam [1]		
Graduate Coursework (Credits beyond the Bachelor's Degree) [2]		36
Pass Comprehensive Exam [3]		
Doctoral Dissertation (24 credits) [4]		24
A E 700	Doctoral Dissertation	
Complete and Defend Doctoral Dissertation		
Total Credits		**60**

1. It is expected that students will take the qualifying exam within one year of entering the Ph.D. program.
2. Both M E and A E courses are accepted to fulfill this requirement. At least 18 of graduate coursework must support the student's research. The program of study may include up to 6 credits of M E 510 or A E 510 (special topics courses offered formally on a one-time basis) with the approval of the Graduate Coordinator.
3. The candidate must pass a comprehensive examination after the completion of adequate coursework and demonstration of satisfactory progress toward the doctoral dissertation. The specific format of the exam is at the discretion of the examination committee. The candidate may submit the proposal for the dissertation research that includes the candidate's current research, planned research directions, and a reasonable timeline for completing the candidate's proposed research if the committee requires.
4. This may include a maximum of 6 credit hours of A E 600 (https://catalogs.nmsu.edu/search/?P=M%20E%20600) Doctoral Research. A E 600 (https://catalogs.nmsu.edu/search/?P=M%20E%20600) Doctoral Research is intended for those students who have not completed the qualification examination, a prerequisite for A E 700 (https://catalogs.nmsu.edu/search/?P=M%20E%20700) Doctoral Dissertation.

Admission Requirements

For PhD Program, the Mechanical and Aerospace Engineering department asks for the following documents: Transcript, Three Recommendation Letters, Statement of Purpose, Resume, Writing Sample, and GRE. Also NMSU requires English Proficiency Tests such as TOEFL, IELTS, or Duolingo English Test for international students.

Ph.D. Program Transfer Credits

A student who has completed a Master of Science degree in M E, A E, or a closely related field may transfer up to 24 credits of graduate coursework, approved by the student's advisor, into a Ph.D. program of study.

Selection of Permanent Ph.D. Advisor

Newly admitted graduate students will be assigned a temporary advisor for the first semester. The student must select a permanent advisor before registering for the second semester. In selecting a permanent advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of enrollment to discuss specific objectives. The student should use these meetings to become familiar with faculty research interests and research projects currently in progress. The faculty member must consent (in writing) to serve as the student's advisor.

Policies governing the Ph.D. written qualifying examination, the Ph.D. written and oral comprehensive examination, the student's Ph.D. committee, and the Ph.D. dissertation are contained in the department's Graduate Program website.

Additional Requirements

Ph.D. candidates in the College of Engineering, who have successfully completed their Ph.D. Qualifier Examination after January 1, 2018, must satisfy a publication requirement which requires two papers:

> Paper #1: An archival paper accepted or published in any journal listed in the source publication list for the Web of Science, or a refereed Journal or Conference Proceeding approved by the student's doctoral committee and the cognizant Department Head(s), before the Doctorate of Philosophy final examination. The candidate should be listed as the lead author in Paper #1.
>
> Paper #2: An additional archival paper submitted, accepted, or published in any journal listed in the source publication list for the Web of Science. Alternatively, one conference paper accepted or published in a national or international conference proceedings.

Animal Science - Doctor of Philosophy

Requirements for Ph.D. Degree in Animal Science

Admission

1. GPA of 3.0 or greater.
2. Three letters of recommendation.
3. Completion of the form, "Application for Graduate Admission in Animal Science" including a brief letter (personal statement) outlining the student's background, career goals, and research interest.

4. Resume
5. Favorable evaluation for admission will be by consensus of the Animal Science Graduate Committee and will be contingent on availability of an advisor and research funding.
6. A requirement for admission as a doctoral graduate student in the department is completion of a curriculum substantially equivalent to that required of undergraduate students. Therefore, deficiency courses may be required after admission to the program, as determined initially by the Animal Science Graduate Committee.
7. Non- thesis MS degrees are not acceptable although some of the courses may be transferred if deemed appropriate by the student's Doctoral Committee.

General Requirements

1. Graduate students must maintain at least a 3.0 grade point average.
2. A minimum of 90 credit hours of graduate work is required of which:
   a. At least 30 credits must be in courses numbered 600 or above.
   b. At least 18 credits must be in ANSC 700 (Doctoral Dissertation).
3. All graduate assistants must enroll as full-time students taking at least 9 graded graduate credits (courses numbered 450 and above). No audits can be taken as part of the 9 minimum credits. Only 3 of the 9 credits may be taken as an S/U option.
   a. A graduate assistant may not enroll for more than 15 credits each semester.
   b. If a student needs to take deficiency courses as part of the 9 credits, then a memo from the advisor or department head should be submitted to the Graduate School. If approved, the student can register for 3 undergraduate credits and a minimum of 6 graded graduate credits during their first semester at New Mexico State University.
   c. Enrollment during summer sessions is not required.
4. Students admitted to the Doctoral program (passed qualifying exam) must continue to enroll in three credits of graduate work each semester (exclusive of summer sessions) until the dissertation is approved by the Graduate School.
5. In certain instances, deficiency courses may be required.
6. Two semesters of ANSC 515(Graduate Seminar) are required and students are urged to attend seminar every semester that they are in residence.
7. No more than 6 credits of ANSC 698 may apply toward graduation.
8. The “Program of Study and Committee for Doctoral Students” form listing the graduate committee and courses to be taken, should be filed with the Graduate School after completion of 12 credits and after the qualifying exam, and before registering for additional courses.

Qualifying Examination

1. The Animal and Range Sciences Department may allow the M.S. Final examination to serve as a Ph.D. qualifying exam for students receiving an M.S. in Animal Science at NMSU. See “Guidelines for Graduate Studies” for further details.
2. Doctoral students must take a qualifying exam before completion of one semester of graduate work. The exam is scheduled by the student’s advisor and administered by a provisional committee of at least 3 regular Animal Science faculty members in the student's area of concentration (reproductive physiology or ruminant nutrition). Its purpose is to evaluate the student’s strengths and weaknesses, determine deficiency courses, and discuss a possible program of study (coursework).
3. After successful completion of this exam, a Doctoral Committee is appointed.

Doctoral Committee

1. The student’s Doctoral Committee is selected by the student and the student’s advisor, with approval of the Department Head and the Graduate Dean. The committee will consist of five or more members, as follows:
   a. The committee chair (advisor) and at least two other members must be from the regular Animal Science faculty in the student's concentration area (reproductive physiology or ruminant nutrition).
   b. One member must be from the Related Area.
   c. One member from the Research Tool Area.
   d. The member from the Related or Research Tool Area may serve as the Representative of the Graduate Dean.
2. Duties of the Doctoral Committee
   a. Prepare and file a preliminary program of study with the Graduate Dean
   b. Provide counsel for the student during the program
   c. Attend the comprehensive oral examination and the final dissertation defense.

NOTE: Changes in committee membership must be approved by the Graduate Dean.

Applied and Agricultural Biology - Doctor of Philosophy

Program Requirements

Prefix	Title	Credits
EPWS 525	Advanced Scientific Writing	3
or EPWS 613	Introduction to Scientific Writing	
EPWS 613	Introduction to Scientific Writing	3
or EPWS 525	Advanced Scientific Writing	
EPWS 690	Doctoral Seminar	1
EPWS 6991	Doctoral Research (maximum of 6 count toward degree)	3
EPWS 7000	Doctoral Dissertation	1,15
BIOL 540	Science and Ethics	3
Students will take at least 12 credits from the following		12
EPWS 525	Advanced Scientific Writing	
or EPWS 613	Introduction to Scientific Writing	
EPWS 640	Tropical Insect Ecology	
EPWS 660	Ecology and Management of Invasive Plant Species	
EPWS 662	Parasitology	
EPWS 675	Urban Entomology	
EPWS 6996	Advanced Topics	
Students are required to take at least 6 credits from the following:		6
A ST 503	SAS Basics	
A ST 504	Statistical Software Applications	
A ST 505	Statistical Inference I	
A ST 506	Statistical Inference II	
A ST 509	Statistical Models for Complex Data Structures	
A ST 511	Statistical Methods for Data Analytics	
A ST 515	Statistical Analysis with R	

A ST 540	Predictive Analytics	
BIOL 562	Advanced Genomics Technology	
BIOL 566	Advanced Bioinformatics and NCBI Database	
CSCI 4140	Database Management Systems I	
PLEN 6425	Biometrical Genetics and Plant Breeding	
PLEN 6610	Introduction to Environmental and Ecological Modeling	
Courses, including special topics, can be substituted with advisor's approval. Additionally, new approved graduate level courses may be submitted with advisor's approval. Students can take a combination of the following to complete their degree:		
AGRO 516	Molecular Analysis of Complex Traits	
PLEN 6110	Arid Land Water Resources	
PLEN 6120	Instrumentation in Agronomy	
PLEN 6320	Advanced Soil Physics	
PLEN 6415	Breeding for Plant Disease Resistance	
PLEN 6420	Advanced Crop Breeding	
ANSC 602	Advanced Reproductive Physiology (fo)	
ANSC 621	Metabolic Functions and Dysfunctions (fe)	
BCHE 546	Biochemistry II	
BCHE 647	Physical Biochemistry	
BIOL 527	Symbiosis	
BIOL 536	Advanced Disease Vector Biology	
BIOL 568	Communities and Ecosystems	
BIOL 582	Advanced Plant Signalling and Development	
BIOL 587	Behavioral and Evolutionary Ecology	
GEOG 542	Programming for GIS	
GEOG 552	Landscape Ecology	
GEOG 573	Introduction to Remote Sensing	
GEOG 578	Fundamentals of GIS	
GEOG 585	Spatial Analysis and Modeling	
MOLB 520	Molecular Cell Biology	
MOLB 545	Molecular and Biochemical Genetics	
MOLB 542	Biochemistry I	
RGSC 509	Approaches to Rangeland Research	
RGSC 513	Advanced Rangeland Ecology	
RGSC 516	Arid Land Management	
RGSC 518	Watershed Methods and Management	
RGSC 520	Arid Land Plant Herbivore Interactions	
RGSC 575	Climate Studies, Water and Society	
Additional Coursework for students with only a B.S. degree:		
EPWS 511	Introduction to Weed Science (f)	4
EPWS 502	General Entomology	4
EPWS 551	Special Topics	1-4
EPWS 505	Advanced Integrated Pest Management	3
EPWS 551	Special Topics	1-4
Additional 3 credits from experimental design/statistical analyses.		3

Candidates are accepted into the department to work with a specific faculty member that serves as their major advisor and committee chair. They will develop a dissertation committee in collaboration with their advisor that includes at least two other members of the graduate faculty, at least one of which must be from the same department, and a Dean's representative who must come from outside the department. The committee should be established during the second semester of study.

Students will select classes with the help of their major advisor based on background and interests. Students with a M.S. degree are expected to complete their degree in 3-4 years, but may be allowed up to 7 years to complete the requirements if they begin with a B.S.

For students with a M.S. degree, a minimum of 30 credits of graduate course work plus 18 credits of dissertation (7000) is required to graduate. This is 48 credits to graduate. Students with a B.S. degree must have at least an additional 12 credits, for a total of 60 credits beyond the B.S. degree.

Ph.D. students must do the following:

· Complete a minimum of 6 semesters, with at least two occurring after the comprehensive exam.

· Complete a minimum of 30 credits of graduate work plus 18 credits of dissertation (EPWS 7000 Doctoral Dissertation).

· At least 15 credits must be in courses numbered 500 or above.

· At least 15 credits must be from the EPWS program.

· No more than 6 credits of EPWS 6991 Doctoral Research may apply toward graduation.

· At least 3 credits of EPWS 690 Doctoral Seminar.

· Complete a minimum of 9 hours of course work numbered above 600, exclusive of research and dissertation credit.

· Maintain a minimum grade point average of 3.0.

· Complete the degree within 7 years of admission.

· Enroll in at least 1 credit/semester or 9 credits if full time.

- Full time students may petition to enroll for only 1 credit during their final semester if all other credit requirements have been fulfilled.

· Enroll in seminar classes and present at least 3 seminars.

· Complete annual Student Progress Report.

· Successfully complete a qualifying exam, comprehensive exam, and dissertation defense. (see below)

Ph.D. candidates are recommended to do the following:

· Gain experience as a teaching assistant for at least two semesters.

· Present research at least once in a poster or oral format at a regional, national, or international conference.

· Submit at least one manuscript as first author for publication in a peer-reviewed journal.

Exams

Qualifying exam – Students with a M.S. degree will take the qualifying exam at the end of the first year and after completion of at least 12 course credits. Students with a B.S. degree will take the qualifying exam at the end of the second year and after completion of at least 18 course credits. The qualifying exam will consist of a short proposal or a list of curated questions, and an oral exam in coordination with the students committee. There will be no additional qualifying exam requirements for students with B.S. degrees. If a student does not pass the qualifying exam, they will have the opportunity to continue their research and

pursue a M.S. degree. For M.S. degree holding students, note options below.

Comprehensive exam –This exam covers all phases of the major and minor fields of study and is given after completion of the agreed-upon course work, and when sufficient progress has been made toward fulfilling agreed upon research goals. The examination must contain both written and oral portions. The written portion may be in the form of a proposal or it may consist of questions presented by individual committee members. The student must satisfy the graduate committee's expectation on the written portion before moving on to the oral portion. If a student does not meet the committee's expectation on the written or oral portion, they may be required to re-take a portion or the entire exam. Students must pass the examination within 36 months of passing the qualifying exam and may not register for 7000 level courses until both parts of the comprehensive have been passed. If a student does not pass the comprehensive exam, they will have the opportunity to continue their research and pursue a M.S. degree. For M.S. degree holding students note options below.

Final dissertation defense – this is taken after completing all other degree requirements. The student will complete 18 credits of doctoral dissertation prior to the defense. There is a minimum of one year between the comprehensive exam and the defense. If a student does not pass the final defense, they may be given the opportunity to convert their dissertation into a thesis and pursue a M.S. degree. For M.S. degree holding students note options below.

Note that for each of the exam stages (i.e., qualifying exam, comprehensive exam, and dissertation defense), when an M.S degree holding student does not pass they may not be allowed to continue in the program. Such a case will be dealt with on an individual basis with active participation from the graduate dean.

Students should consult the Graduate School website for specific information regarding the completion of the degree and submission of the dissertation.

Applied Statistics - Doctor of Philosophy

The Applied Statistics doctoral program provides graduates with the knowledge of a range of applied statistical methods, both basic and advanced, sufficient to independently solve complex data problems in a collaborative research environment, to teach these methods at the undergraduate level, and to contribute substantively to the development of grant proposals and applied research publications.

Additional information regarding the Applied Statistics doctoral program is available at https://business.nmsu.edu/academic-departments/easib/.

Students entering the program with a bachelor's degree, or a master's degree in a field other than statistics, will need to complete a total of 70 credit hours – 52 credit hours of coursework and 18 credit hours of dissertation research.

As part of the required 52 credit hours of coursework, students must complete 12 credit hours of A ST electives at the 500 level or higher. Students may concentrate on a substantive area in economics, marketing, finance, or information systems by choosing quantitative electives from that area. The student's committee will determine whether these courses are acceptable substitutes for A ST electives. In addition, as part of the required 52 credit hours of coursework, students must complete 12 credit hours of A ST courses at the 600 level or higher.

Students must complete at least 18 credit hours of dissertation research. The dissertation is expected to consist of three chapters that are standalone manuscripts that may be submitted to applied journals. Additional chapters in the dissertation may provide background of the problem, literature review, and simulations to support the main topic of research. Deviation from this format will be allowed at the discretion of the student's advisor.

Students entering the program with a master's degree in statistics or biostatistics will need to complete a minimum of 36 credit hours. Eighteen of these credit hours are coursework - 12 credit hours of A ST courses at the 600 level or higher and 6 credit hours of A ST electives at the 500 level or higher, as described above. The remaining 18 credit hours consist of dissertation research, as described above. Additional coursework may be necessary to make up for deficiencies in the student's prior master's degree.

Students will be required to pass a written qualifying exam after completing at least 12 credit hours of A ST courses at the 500 level or above, typically at the end of their first year in the doctoral program. Students who enter with a master's degree in statistics or biostatistics may elect to take the qualifying exam earlier. The exam will cover the first year of required theory and methods coursework. The exam will be assigned one of three grades: PhD pass, which enables the student to continue in the second year of the doctoral program; Master's pass, indicating that the student has the requisite knowledge for the master's degree in Applied Statistics but has deficiencies that prevent them from continuing in the doctoral program; and fail. Doctoral students who fail the exam or receive a Master's pass on their first attempt will be allowed one opportunity to re-take the exam. Upon completion of their coursework (typically at the end of their third year), students in the doctoral program will be required to pass a comprehensive exam that has both oral and written components. Students who do not pass the comprehensive exam on their first attempt will be allowed a second opportunity to take the exam after a lapse of at least one semester.

Student's entering the program with a bachelor's degree or a master's degree in a field other than statistics

Prefix	Title	Credits
A ST 565	Statistical Analysis I	3
A ST 566	Statistical Analysis II	3
A ST 609	Linear Model Theory	3
A ST 665	Bayesian Theory	3
A ST 503	SAS Basics	3
or A ST 515	Statistical Analysis with R	
A ST 616	Computational Statistics	3
A ST 505	Statistical Inference I	4
A ST 506	Statistical Inference II	3
A ST 507	Advanced Regression	3
A ST 509	Statistical Models for Complex Data Structures	3
A ST 540	Predictive Analytics	3
A ST 645	Time Series Methods	3
A ST 554	Practicum in Statistics	3
Electives – Additional A ST courses at the 500 level or higher or in other areas as determined by student's committee		12
A ST 700	Doctoral Dissertation (Dissertation)	18
Total Credits		**70**

Student's entering the program with a master's degree in statistics or biostatistics*

Prefix	Title	Credits
A ST 609	Linear Model Theory	3
A ST 665	Bayesian Theory	3
A ST 616	Computational Statistics	3
A ST 645	Time Series Methods	3
Electives -- Additional A ST courses at the 500 level or higher or in other areas as determined by student's committee		6
Doctoral Dissertation		18
A ST 700	Doctoral Dissertation	
Total Credits		36

*Additional coursework may be necessary to make up for deficiencies in the student's prior master's degree

A Suggested Plan of Study

First Year		
Fall		**Credits**
A ST 565	Statistical Analysis I	3
A ST 503 or A ST 515	SAS Basics or Statistical Analysis with R	3
A ST 505	Statistical Inference I	4
	Credits	**10**
Spring		
A ST 566	Statistical Analysis II	3
A ST 507	Advanced Regression	3
Elective		3
	Credits	**9**
Second Year		
Fall		
A ST 509	Statistical Models for Complex Data Structures	3
A ST 506	Statistical Inference II	3
Elective		3
	Credits	**9**
Spring		
A ST 616	Computational Statistics	3
A ST 540	Predictive Analytics	3
A ST 554	Practicum in Statistics	3
	Credits	**9**
Third Year		
Fall		
A ST 665	Bayesian Theory	3
A ST 609	Linear Model Theory	3
Elective		3
	Credits	**9**
Spring		
A ST 645	Time Series Methods	3
Elective		3
Dissertation research		3
	Credits	**9**
Fourth Year		
Fall		
A ST 700	Doctoral Dissertation (Dissertation)	9
	Credits	**9**
Spring		
Dissertation research		6
	Credits	**6**
	Total Credits	**70**

Astronomy - Doctor of Philosophy

The Astronomy Department at NMSU offers programs leading to the Master of Science and the Doctor of Philosophy degrees. Graduate courses (http://astronomy.nmsu.edu/?page_id=2503) cover topics across all of astrophysics, including stellar atmospheres, observational techniques, the interstellar medium, galactic structure, extragalactic objects, cosmology, the Sun, and planets. Students may also take courses in other relevant fields to broaden their knowledge and capabilities. NOTE: This table is only a minimum. As students must register for minimum 9 credits per semester to remain full time, a student will usually obtain more than the minimum 6 credits of ASTR 600 Pre-dissertation Research and 18 credits of ASTR 700 Doctoral Dissertation in order to complete their thesis.

Requirements

In order to complete the comprehensive exam by preparing a Doctor of Philosophy proposal.

The student will normally submit their proposed thesis title, and then complete their written and oral thesis proposal, as the final part of their comprehensive exam in Year 3. The following table can be used to run a Degree Audit at this stage. Student must have already completed the written coursework comprehensive and oral coursework comprehensive components. After the completion of their comprehensive through passing the PhD proposal, the student will normally apply for and obtain a masters and continue with their progress on the PhD track.

Prefix	Title	Credits
ASTR 500	Seminar ((Take the 1 credit course four times))	4
Choose nine courses from among the following ASTR graduate courses [2]		27
ASTR 503	Fundamentals of Astrophysics	
ASTR 506	Dynamics and Hydrodynamics	
ASTR 530	Gas and Radiative Processes	
ASTR 535	Observational Techniques	
ASTR 545	Stellar Spectroscopy	
ASTR 555	Galaxies I	
ASTR 565	Stellar Interiors	
ASTR 605	Interstellar Medium	
ASTR 616	Galaxies II	
ASTR 620	Planetary Processes	
ASTR 621	Planetary System Formation	
ASTR 630	Advanced Methods in Astrophysics	
ASTR 670	Heliophysics, Space Plasmas, and Space Weather	
ASTR 698	Special Topics.	
Select additional six credits from the ASTR courses above OR from the courses below [3]		6
PHYS 462	Intermediate Electricity and Magnetism II	
PHYS 511	Mathematical Methods of Physics I	
PHYS 554	Quantum Mechanics I	
PHYS 562	Electromagnetic Theory II	
PHYS 571	Advanced Experimental Optics	

PHYS 576	Advanced Computational Physics I	
E E 528	Fundamentals of Photonics	
E E 577	Fourier Methods in Electro-Optics	
CSCI 5994	Master's Project	
Special Research Programs [4]		
Pre-dissertation Research [5]		
ASTR 600	Pre-dissertation Research	6
ASTR 598	Special Research Programs	3
Total Credits		**46**

1. ASTR 500 Seminar is 1-credit course. It should be taken each of the first 4 semesters, for 4 total credits over the program
2. Any 27 credits (9 courses) selected from these. Each course may only be taken for 3 credits.
3. In addition to 9 courses from above, students should select another 2 courses (3 credits each, 6 credits total). This can be either another two astronomy graduate classes from above (which will make 11 total different astronomy courses) OR student may opt to take up to 2 out-of-department classes to fulfill the overall credit requirements if these classes are deemed by the student's committee to be appropriate to the student's program-of-study.
   A maximum of one 3-credit course numbered between 450 and 499 can be applied to the out-of-department course/credit-hour requirement, and only with the approval of the student's Committee. Otherwise, out of department classes must be at the 500 or greater level.
   If more than 6 credits of out-of-department classes are taken, they may potentially count toward the required total courses/credit hours, but only with the approval of the student's Committee. Traditionally, these have been in the area of PHYS, E E and CSCI, as listed. Other Physics courses, or courses offered by other departments such as Engineering, Geology, or Math, are also viable as out-of-department courses. Additionally, for those students intending to specialize in planetary science, courses taught in the Geology department and Geophysics courses taught in the Physics department should be considered.
4. ASTR 598 Special Research Programs is generally taken in the student's 2nd year (fall or spring) and is intended to provide a semi-formal introduction to doing a research project. It may involve research that subsequently develops into a thesis project.
5. Generally, ASTR 600 Pre-dissertation Research credits are prior to completion of the thesis proposal. A student may take anywhere from 1-9 credits of these in a semester. Students typically take 9 credits of this course each semester until they have completed their thesis proposal. However, only a minimum of 6 are actually required over the program. ASTR 600 Pre-dissertation Research credits may be in progress.

In order to complete a PhD thesis defense

The MINIMUM course and credit-hour requirements of the NMSU Department of Astronomy toward completion of the Ph.D. program are

Prefix	Title	Credits
Requirements		
ASTR 500	Seminar (Take the 1 credit course four times)	4
Choose nine courses from among the following ASTR graduate courses [2]		27
ASTR 503	Fundamentals of Astrophysics	
ASTR 506	Dynamics and Hydrodynamics	
ASTR 530	Gas and Radiative Processes	
ASTR 535	Observational Techniques	
ASTR 545	Stellar Spectroscopy	
ASTR 555	Galaxies I	
ASTR 565	Stellar Interiors	
ASTR 605	Interstellar Medium	
ASTR 616	Galaxies II	
ASTR 620	Planetary Processes	
ASTR 621	Planetary System Formation	
ASTR 630	Advanced Methods in Astrophysics	
ASTR 670	Heliophysics, Space Plasmas, and Space Weather	
ASTR 671	Solar Astrophysics	
ASTR 698	Special Topics.	
Select additional six credits from the ASTR courses above OR from the courses below [3]		6
PHYS 462	Intermediate Electricity and Magnetism II	
PHYS 511	Mathematical Methods of Physics I	
PHYS 554	Quantum Mechanics I	
PHYS 562	Electromagnetic Theory II	
PHYS 571	Advanced Experimental Optics	
PHYS 576	Advanced Computational Physics I	
E E 528	Fundamentals of Photonics	
E E 565	Machine Learning I	
E E 577	Fourier Methods in Electro-Optics	
CSCI 5996	Special Topics	
Special Research Programs [4]		
ASTR 598	Special Research Programs	3
Pre-dissertation Research [5]		
ASTR 600	Pre-dissertation Research	6
Doctoral Dissertation [6]		*18*
ASTR 700	Doctoral Dissertation	1-15
Total Credits		**65-79**

1. ASTR 500 Seminar is 1-credit course. It should be taken each of the first 4 semesters, for 4 total credits over the program
2. Any 27 credits (9 courses) selected from these. Each course may only be taken for 3 credits.
3. In addition to 9 courses from above, students should select another 2 courses (3 credits each, 6 credits total). This can be either another two astronomy graduate classes from above (which will make 11 total different astronomy courses) OR student may opt to take up to 2 out-of-department classes to fulfill the overall credit requirements if these classes are deemed by the student's committee to be appropriate to the student's program-of-study.
   A maximum of one 3-credit course numbered between 450 and 499 can be applied to the out-of-department course/credit-hour requirement, and only with the approval of the student's Committee. Otherwise, out of department classes must be at the 500 or greater level.
   If more than 6 credits of out-of-department classes are taken, they may potentially count toward the required total courses/credit hours, but only with the approval of the student's Committee. Traditionally, these have been in the area of PHYS, E E and CSCI, as listed. Other Physics courses, or courses offered by other departments such as Engineering, Geology, or Math, are also viable as out-of-department courses. Additionally, for those students intending to specialize in planetary science, courses taught in the Geology department and Geophysics courses taught in the Physics department should be considered.

[4] ASTR 598 Special Research Programs is generally taken in the student's 2nd year (fall or spring) and is intended to provide a semi-formal introduction to doing a research project. It may involve research that subsequently develops into a thesis project.

[5] Generally, ASTR 600 Pre-dissertation Research credits are prior to completion of the thesis proposal. A student may take anywhere from 1-9 credits of these in a semester. Students typically take 9 credits of this course each semester until they have completed their thesis proposal. However, only a minimum of 6 are actually required over the program.

[6] Generally, ASTR 700 Doctoral Dissertation credits are taken after the thesis proposal is done. A student may take anywhere from 1-9 credits of these in a semester. Typically a student will do 9 credits of this per semester while completing their thesis research, in order to remain full time. However a student may register for fewer in their final semester of completing their thesis, after confirming with their advisor as to how that affects their eligibility at the graduate school. A minimum of 18 credits are required over the program

Year A
A Suggested Plan of Study For Students

A typical roadmap for the PhD program, including course and credit-hour minimum requirements, towards completion of the Ph.D. program are summarized in the following table. Note there is some flexibility for each of these components, so students should confirm all their selections directly with their advisor. Most regular graduate courses (501-597, 601-699) are offered on a 2 year rotation. So specific courses will depend on whether a student is on a year A or Year B cycle. ASTR 503 Fundamentals of Astrophysics is offered each fall and should be taken by all students in their first year only. Students may opt for up to 2 courses (6 credits) from outside the department (See Course Requirements). ASTR 598 Special Research Programs, ASTR 600 Pre-dissertation Research and ASTR 700 Doctoral Dissertation are offered every semester, as one-on-one research credits with an advisor

First Year		
Fall		**Credits**
ASTR 500	Seminar [1]	1
ASTR 503	Fundamentals of Astrophysics	3
Choose two from the following:		6
ASTR 535	Observational Techniques	
ASTR 565	Stellar Interiors	
ASTR 605	Interstellar Medium	
	Credits	**10**
Spring		
ASTR 500	Seminar [1]	1
Choose three from the following:		9
ASTR 621	Planetary System Formation	
ASTR 630	Advanced Methods in Astrophysics	
ASTR 670	Heliophysics, Space Plasmas, and Space Weather	
	Credits	**10**
Second Year		
Fall		
ASTR 500	Seminar [1]	1
Choose three of the following [2]		9
ASTR 555	Galaxies I	
ASTR 620	Planetary Processes	
ASTR 698	Special Topics.	
Research Programs Course [2]		0-3
ASTR 598	Special Research Programs [2]	
	Credits	**10-13**
Spring		
ASTR 500	Seminar [1]	1
Choose three of the following: [2]		9
ASTR 506	Dynamics and Hydrodynamics	
ASTR 545	Stellar Spectroscopy	
ASTR 616	Galaxies II	
Research Programs Course [2]		0-3
ASTR 598	Special Research Programs [2]	
ASTR 671	Solar Astrophysics	
	Credits	**10-13**
Third Year		
Fall		
ASTR 600	Pre-dissertation Research [3]	6-9
ASTR 698	Special Topics. [5]	1
	Credits	**7-10**
Spring		
ASTR 600 or ASTR 700	Pre-dissertation Research [4] or Doctoral Dissertation	6-9
	Credits	**6-9**
Fourth Year		
Fall		
ASTR 700	Doctoral Dissertation [4]	3-9
	Credits	**3-9**
Spring		
ASTR 700	Doctoral Dissertation [4]	3-9
	Credits	**3-9**
Fifth Year		
Fall		
ASTR 700 [4]		3-9
	Credits	**3-9**
Spring		
ASTR 700 [4]		3-9
	Credits	**3-9**
Sixth Year		
Fall		
ASTR 700 as required to complete the PhD [6]		-
	Credits	**0**
Spring		
ASTR 700 as required to complete the PhD [6]		-
	Credits	**0**
	Total Credits	**65-101**

[1] Students **must** take ASTR 500 Seminar as 1-credit in each of their first 4 semesters, for a total of 4 credits over 2 years

[2] Students **must** takeASTR 598 Special Research Programs for 3 credits during fall of Yr2 or Spring of Yr2

[3] Students **must** continue taking ASTR 600 Pre-dissertation Research until their have completed their Comprehensive Exam. Once a student had completed their Comprehensive Exam, they should start taking ASTR 700 Doctoral Dissertation the following semester. The **minimum total number** of ASTR 600 Pre-dissertation Research credits for Course Requirements is 6, but students must enroll in 9 credits each semester in order to remain full time and retain eligibility for an GA.

Usually students will take 8 ASTR 600 Pre-dissertation Research and 1 ASTR 698 Special Topics. in Fall of Yr 3.

[4] Assumes a student has completed their Comprehensive Exam - see footnote 3. The minimum number of ASTR 700 Doctoral Dissertation credits for Course Requirements is 18, but students must enroll in 9 credits each semester in order to remain full time and retain eligibility for an GA.

[5] ASTR 698 Special Topics. in Yr 3 Fall is a 1-credit Thesis Preparation class for all students who are also taking ASTR 600 Pre-dissertation Research that semester

[6] For students who do not complete their PhD in 5 years, they must continue to enroll in 9 credits of ASTR 700 Doctoral Dissertation each semester in order to remain full time and retain eligibility for an GA. For students in their final semester of dissertation writing, it is possible to petition the Graduate School for permission to enroll in fewer credits, for that one semester only, to reduce tuition expenses.

Year B
A Suggested Plan of Study For Students

A typical roadmap for the PhD program, including course and credit-hour minimum requirements, towards completion of the Ph.D. program are summarized in the following table. Note there is some flexibility for each of these components, so students should confirm all their selections directly with their advisor. Most regular graduate courses (501-597, 601-699) are offered on a 2 year rotation. So specific courses will depend on whether a student is on a year A or Year B cycle. ASTR 503 Fundamentals of Astrophysics is offered each fall and should be taken by all students in their first year only. Students may opt for up to 2 courses (6 credits) from outside the department (See Course Requirements). ASTR 598 Special Research Programs, ASTR 600 Pre-dissertation Research and ASTR 700 Doctoral Dissertation are offered every semester, as one-on-one research credits with an advisor

First Year		
Fall		**Credits**
ASTR 500	Seminar [1]	1
ASTR 503	Fundamentals of Astrophysics	3
Choose two from the following:		6
ASTR 555	Galaxies I	
ASTR 620	Planetary Processes	
ASTR 698	Special Topics.	
	Credits	**10**
Spring		
ASTR 500	Seminar [1]	1
Choose three from the following:		9
ASTR 506	Dynamics and Hydrodynamics	
ASTR 545	Stellar Spectroscopy	
ASTR 616	Galaxies II	
ASTR 598	Special Research Programs	
	Credits	**10**
Second Year		
Fall		
ASTR 500	Seminar [1]	1
ASTR 555	Galaxies I	-
Choose three from the following:		9
ASTR 535	Observational Techniques	
ASTR 565	Stellar Interiors	
ASTR 605	Interstellar Medium	
ASTR 598	Special Research Programs [1]	3
	Credits	**13**
Spring		
ASTR 500	Seminar [1]	1
Choose two from the following: [2]		6
ASTR 621	Planetary System Formation	
ASTR 630	Advanced Methods in Astrophysics	
ASTR 670	Heliophysics, Space Plasmas, and Space Weather	
ASTR 598	Special Research Programs	1-6
	Credits	**8-13**
Third Year		
Fall		
ASTR 600	Pre-dissertation Research [3]	6-9
ASTR 698	Special Topics.	1
	Credits	**7-10**
Spring		
ASTR 700 or ASTR 600	Doctoral Dissertation [4] or Pre-dissertation Research	6-9
	Credits	**6-9**
Fourth Year		
Fall		
ASTR 700	Doctoral Dissertation [4]	3-9
	Credits	**3-9**
Spring		
ASTR 700	Doctoral Dissertation [4]	3-9
	Credits	**3-9**
Fifth Year		
Fall		
ASTR 700	Doctoral Dissertation [4]	3-9
	Credits	**3-9**
Spring		
ASTR 700	Doctoral Dissertation [4]	3-9
	Credits	**3-9**
Sixth Year		
Fall		
ASTR 700 as required to complete the PhD [6]		-
	Credits	**0**
Spring		
ASTR 700 as required to complete the PhD [6]		-
	Credits	**0**
	Total Credits	**66-101**

[1] Students **must** take ASTR 500 Seminar as 1-credit in each of their first 4 semesters, for a total of 4 credits over 2 years

[2] Students **must** takeASTR 598 Special Research Programs for 3 credits during fall of Yr2 or Spring of Yr2

[3] Students **must** continue taking ASTR 600 Pre-dissertation Research until their have completed their Comprehensive Exam. Once a student had completed their Comprehensive Exam, they should start taking ASTR 700 Doctoral Dissertation the following semester. The **minimum total number** of ASTR 600 Pre-dissertation Research credits for Course Requirements is 6, but students must enroll in 9 credits each semester in order to remain full time and retain eligibility for an GA. Usually students will take 8 ASTR 600 Pre-dissertation Research and 1 ASTR 698 Special Topics. in Fall of Yr 3.

[4] Assumes a student has completed their Comprehensive Exam - see footnote 3. The minimum number of ASTR 700 Doctoral Dissertation

credits for Course Requirements is 18, but students must enroll in 9 credits each semester in order to remain full time and retain eligibility for an GA.

[5] ASTR 698 Special Topics. in Yr 3 Fall is a 1-credit Thesis Preparation class for all students who are also taking ASTR 600 Pre-dissertation Research that semester

[6] For students who do not complete their PhD in 5 years, they must continue to enroll in 9 credits of ASTR 700 Doctoral Dissertation each semester in order to remain full time and retain eligibility for an GA. For students in their final semester of dissertation writing, it is possible to petition the Graduate School for permission to enroll in fewer credits, for that one semester only, to reduce tuition expenses.

Biology - Doctor of Philosophy

The Department of Biology offers graduate study leading to the Doctor of Philosophy degree. Our goal is to prepare students for careers in the various fields in biology through formal coursework and research experiences as well as through seminars and discussion groups.

There are three formal course requirements for Biology PhD students. These core courses are:

Prefix	Title	Credits
Course Requirements		
BIOL 510	Current Topics in Biology	3
BIOL 540	Science and Ethics	1-3
Dissertation		18
BIOL 700	Doctoral Dissertation	
Elective courses - courses with level from 450-600		24-26
At least 15 of the 48 credits should come from BIOL courses numbered 450 and above.		
Total Credits		**48**

Doctor of Philosophy students can choose among the Department's three areas of emphasis:

1. Behavioral, Ecological and Evolutionary Biology
The Behavioral, Ecological and Evolutionary Biology program is appropriate for graduate students who wish to specialize in areas of biology that study the various processes that encompass the behavior, ecology, and evolution of living and extinct taxa.

2. Cell and Organismal Biology
The Cell and Organismal Biology program is appropriate for all Graduate students who wish to emphasize those areas of biology that integrate function and structure in cells, tissues, and organisms. This emphasis focuses in faculty areas of expertise in cell and molecular biology, neurobiology, developmental biology, and physiology.

3. Microbiology
The Microbiology curriculum is appropriate for graduate students who wish to specialize in areas of biology that study the various processes that occur in microbes (bacteria, viruses, fungi, and protists) such as their physiology, ecology, development or evolution.

All graduate students should develop their curriculum plan in consultation with their faculty advisor and graduate committee. Details of sample course sequences within the different emphases are described in the Biology Graduate Handbook available for download from the Graduate Student section of the Biology website (https://bio.nmsu.edu/students/grads.html): https://bio.nmsu.edu/students/grads.html.

Graduate students may also earn a minor in other graduate departments and programs.

Business Administration (Management) - Doctor of Philosophy

Phone: (575) 646-1201

http://business.nmsu.edu/academics/graduate-programs/mgt-phd/ (https://business.nmsu.edu/phd-management/)

The College of Business offers a program leading to a Doctor of Philosophy in Business Administration with a concentration in Management. Our program meets the requirements of the Association to Advance Collegiate Schools of Business (AACSB) International by providing students with advanced management-related theoretical, research, and applied knowledge and skills. We are committed to educating researchers, teachers, and scholars who will lead and shape business and organizational life in the decades to come. We prepare you to understand the complexities of business and its social and international contexts while you develop a specialized area of expertise. Our program is flexible in order to align programs of study with job opportunities and students' interest areas. Research skills are developed through coursework and mentoring relationships, as you will work with faculty to pursue joint research according to your interests and faculty members' expertise. Our faculty prepare students for academic research and teaching careers in managerial and organizational sciences; consulting careers with industrial, governmental, health, or educational institutions; or leadership careers in organizational management and administration.

Program Requirements

- Complete coursework in a major field of concentration chosen from the department of management in the College of Business;
- Demonstrate competency in statistics and research methods;
- Complete coursework in a minor field of concentration or interest area that supports the student's research, teaching, and career goals;
- Pass the first-year qualifying exam, annual progress reviews, and the comprehensive exam; and
- Complete and successfully defend a doctoral dissertation.

Prefix	Title	Credits
Management Courses		
MGMT 645	Seminar in Human Resources Management	3
MGMT 650	Seminar in Organizational Behavior	3
MGMT 660	Research Design and Methodology	3
MGMT 670	Seminar in Operations Management	3
MGMT 675	Seminar in Strategic Management	3
Marketing Courses		
MKTG 640	Measurement and Structural Equation Modeling	3
Choose one class from the following options:		
MKTG 601	Marketing Management	
MKTG 620	Contemporary Marketing Readings	
MKTG 625	Consumer Behavior	

MKTG 670	Marketing Theory	
Research Methods Courses		
A ST 505	Statistical Inference I	4
or PSYC 5110	Quantitative Methods in Psychology I	
A ST 506	Statistical Inference II	3
or PSYC 5120	Quantitative Methods in Psychology II	
A ST 507	Advanced Regression	3
A ST 555	Applied Multivariate Analysis	3
Choose one of the following (May be replaced by a 500+ level course in research methods upon program director approval):		
PSYC 5230	Methods in Social Psychology	
ELAD 6220	Qualitative Research I	
SOCI 5155	Seminar in Text Analysis for the Social Sciences	
Dissertation Work		
MGMT 600	Doctoral Research [These credit hours could be replaced with other seminar or research methods courses approved by faculty advisor]	6
Doctoral Dissertation		18
MGMT 700	Doctoral Dissertation	
Total Credits		**55**

First Year		
Fall		**Credits**
MGMT 650	Seminar in Organizational Behavior	3
MGMT 660	Research Design and Methodology	3
A ST 505	Statistical Inference I	4
	Credits	**10**
Spring		
MGMT 645	Seminar in Human Resources Management	3
A ST 506	Statistical Inference II	3
MGMT 600	Doctoral Research [Other coursework with approval]	3
	Credits	**9**
Second Year		
Fall		
MGMT 675	Seminar in Strategic Management	3
A ST 507	Advanced Regression	3
MGMT 600	Doctoral Research [Other coursework with approval]	3
	Credits	**9**
Spring		
MGMT 670	Seminar in Operations Management	3
A ST 555	Applied Multivariate Analysis	3
MGMT 600	Doctoral Research [Other research methods course with approval]	3
	Credits	**9**
Third Year		
Fall		
MGMT 700	Doctoral Dissertation (In Year 3 and 4 students must complete at total of 18 MGMT 700 credit hours. Other coursework upon approval.) [Other coursework with approval]	18
	Credits	**18**
	Total Credits	**55**

Business Administration (Marketing) - Doctor of Philosophy

https://business.nmsu.edu/phd-marketing (https://business.nmsu.edu/phd-marketing/)

The College offers a program leading to a Doctor of Philosophy (PhD) degree. The faculty of the PhD Program in Business Administration are committed to training researchers and educators who will shape business scholarship, practice and pedagogy. The program emphasizes preparing candidates to understand the complexities of modern business while they develop a specialized area of expertise in marketing or management. The PhD in Business Administration provides graduates with the opportunity to pursue a variety of career paths within academia and within industry. Currently concentrations are offered in management and marketing, and each admits students independently.

Program Requirements

- demonstrate competency in statistics and research methods;
- complete studies in a major field of concentration chosen from the departments of management or marketing in the College of Business;
- complete studies in a minor field of concentration or interest area that supports the student's research, teaching and/or career goals;
- pass qualifying exams consisting of a First-Year Paper and a Second-Year Paper, and pass the comprehensive exam; and
- complete and successfully defend a doctoral dissertation.

Required Courses

Prefix	Title	Credits
Marketing Courses		
MKTG 601	Marketing Management	3
MKTG 620	Contemporary Marketing Readings	3
MKTG 625	Consumer Behavior	3
MKTG 640	Measurement and Structural Equation Modeling	3
MKTG 670	Marketing Theory	3
Management Courses		
Six (6) credits from the following:		6
MGMT 650	Seminar in Organizational Behavior	
MGMT 660	Research Design and Methodology	
MGMT 661	Qualitative Research Methods	
MGMT 670	Seminar in Operations Management	
MGMT 675	Seminar in Strategic Management (Seminar in Strategic Management)	
Research Methods Courses		
Choose one from the following:		3-4
A ST 505	Statistical Inference I (Recommended.)	
PSYC 5120	Quantitative Methods in Psychology II (Requires Marketing Department approval.)	
A ST 506	Statistical Inference II (May be replaced by PSYC 508 with Marketing Department approval.)	3
A ST 507	Advanced Regression (May be replaced by PSYC 509 with Marketing Department approval.)	3
A ST 555	Applied Multivariate Analysis	3
PSYC 5230	Methods in Social Psychology (May be replaced by a 500+ level course in research methods with Marketing Department approval.)	3

Dissertation Work		**18**
MKTG 700	Doctoral Dissertation	
Total Credits		**54-55**

Chemistry - Doctor of Philosophy

The Ph.D. in chemistry is offered in the major emphasis areas of analytical, inorganic, organic, and physical chemistry and biochemistry. The graduate program is designed to teach students modern approaches to chemistry and biochemistry (courses), experimental methods to problem–solving (research), and communication skills in the discipline (seminars and colloquia). Ph.D. candidates are required to complete the courses below, pass a qualifying exam after the first year, pass both a written and oral comprehensive exam before the fourth year, and prepare a written thesis and pass a final oral examination. A minimum of 24 of the required credits must be taken at NMSU.

Prefix	Title	Credits
CHEM 475	Central Concepts in Chemistry - Safety	1
CHEM 476	Central Concepts in Chemistry - Research Ethics	1
CHEM 477	Central Concepts in Chemistry - ProfessionalDevelopment	1
CHEM 501	Central Concepts in Chemistry - Energy	3
CHEM 502	Central Concepts in Chemistry - Structure	3
CHEM 503	Central Concepts in Chemistry - Dynamics	3
CHEM 504	Central Concepts in Chemistry - Measurements	3
CHEM 510	Graduate Student Seminar [1]	5-11
CHEM 520	Comprehensive Literature Review Seminar for Graduate Students [2]	1
Additional Required Courses [3]		*6*
Research Credits [4]		*24-54*
Total Credits		**51-87**

1. Beginning in the second semester, all Ph.D. students must enroll in 1 credit of CHEM 510 Graduate Student Seminar, attending each semester. At least two credits of CHEM 510 must be taken for a letter grade of B- or better. The remaining CHEM 510 credits may be taken as S/U.
2. CHEM 520 Comprehensive Literature Review Seminar for Graduate Students is given on a topic of the student's choice as part of the Comprehensive Exam and will be assigned a letter grade. A grade of C + or lower will require the student to repeat the course a maximum of once.
3. Additional courses in subsequent years are chosen based on major emphasis area, through consultation with the thesis committee. These courses may include any course numbered 450 or above in the following subject areas: CHEM, BCHE, PHYS, MATH, CSCI, BIOL, A ST, CHME, GENE, MOLB, SOCI, EDUC, EPWS, ENVS, ANSC.
4. At least 18 credits must be either CHEM 700 Doctoral Dissertation or BCHE 700 Doctoral Dissertation. 700-level research credits are taken after the completion of the comprehensive exam. Remaining credits can be CHEM 600 Research or BCHE 600 Research.

Chemistry (Biochemistry) - Doctor of Philosophy

The Doctor of Philosophy in Chemistry with a concentration in Biochemistry is designed to teach students modern approaches to chemistry and biochemistry (courses), experimental methods to problem–solving (research), and communication skills in the discipline (seminars and colloquia). Ph.D. candidates are required to complete the courses below, pass a qualifying exam after the first year, pass both a written and oral comprehensive exam before the fourth year, and prepare a written thesis and pass a final oral examination.

Prefix	Title	Credits
Required Courses		
CHEM 475	Central Concepts in Chemistry - Safety	1
CHEM 476	Central Concepts in Chemistry - Research Ethics	1
CHEM 477	Central Concepts in Chemistry - ProfessionalDevelopment (Required Courses)	1
Graduate Seminar (5-11 Credits)		5-11
CHEM 510	Graduate Student Seminar [1]	
CHEM 520	Comprehensive Literature Review Seminar for Graduate Students [2]	1
BCHE 542	Biochemistry I	3
BCHE 545	Molecular and Biochemical Genetics	3
BCHE 546	Biochemistry II: Central and Intermediary Metabolism	3
BCHE 647	Physical Biochemistry	3
Additional Graduate-level courses [3]		*3-9*
Research Credits [4]		24-54
Total Credits		**48-90**

1. Beginning in the second semester, all Ph.D. students must enroll in 1 credit of CHEM 510 Graduate Student Seminar attending each semester. At least two credits of CHEM 510 Graduate Student Seminar must be taken for a letter grade of B- or better. The remaining CHEM 510 Graduate Student Seminar credits may be taken as S/U.
2. CHEM 520 Comprehensive Literature Review Seminar for Graduate Students is given on a topic of the student's choice as part of the Comprehensive Exam and will be assigned a letter grade. A grade of C+ or lower will require the student to repeat the course a maximum of once.
3. Additional courses in subsequent years are chosen based on major emphasis area, through consultation with the thesis committee. These courses may include any course numbered 450 or above in the following subject areas: CHEM, BCHE, PHYS,MATH, CSCI, BIOL, A ST, CHME, GENE, MOLB, SOCI, EDUC, EPWS, ENVS, ANSC.
4. At least 18 credits must be either CHEM 700 Doctoral Dissertation or BCHE 700 Doctoral Dissertation. 700-level research credits are taken after the completion of the comprehensive exam. Remaining credits can be CHEM 600 Research or BCHE 600 Research.

Computer Science - Doctor of Philosophy

Doctoral students may specialize in any of the areas in which computer science faculty members have active research interests. Through interdisciplinary arrangements with other doctoral departments at New Mexico State University, doctoral students may also specialize in such areas as computational biology, computer networks and architectures and cognitive science.

Doctoral students are expected to join the program with a preparation equivalent to that required for the Master's degree in computer science at New Mexico State University. The requirements for the degree are as

specified in the NMSU graduate catalog, with the following additional considerations:

- Take and pass the Ph.D. Qualifying Exam. It is expected that students will take the qualifying exam within one year of entering the Ph.D. program or one year after finishing their deficiencies. In the qualifying exam, a student is expected to present a written and oral synthesis of a topical literature review. For more details on the qualifying exam, see the departmental document.
- Students who are enrolled in the Computer Science MS program and complete a Master's thesis can use a successful thesis defense as the qualification exam if the Master's thesis advisor is willing to take the student as a PhD student.
- The comprehensive examination evaluates depth of knowledge in the specific research area selected by the candidate with the consent of their graduate committee. It includes: a written part, in the form of an extensive survey paper; an annotated bibliography; and an oral examination.
- The student is required to submit and defend a prospectus, at the same time or after completing the comprehensive examination. The prospectus describes and motivates the specific research problem to be addressed in the doctoral dissertation.
- A PhD student is required to take at least one course each in the following three areas (theories, systems, and applications)

Graduation Requirements

Prefix	Title	Credits
Theories		
Select at least one from the following:		3
CSCI 5510	Automata, Languages, Computability	
CSCI 5505	Analysis of Algorithms	
CSCI 5860	Algorithms in Systems Biology	
Systems		
Select at least one from the following:		3
CSCI 5605	Operating Systems II	
CSCI 5840	Computer Networks II	
CSCI 5820	Database Management Systems II	
Applications		
Select at least one from the following:		3
CSCI 5410	Computer Graphics I	
CSCI 5415	Introduction to Data Mining	
CSCI 5310	Bioinformatics Programming	
CSCI 5205	Computer Security	
CSCI 5210	Introduction to Smart Grids	
CSCI 5250	Human-Centered Computing	
CSCI 5305	Bioinformatics	
CSCI 5255	Digital Game Design	
CSCI 5260	Visual Programming	
CSCI 5420	Applied Machine Learning I	
CSCI 5215	Parallel Programming	
CSCI 5220	Cloud and Edge Computing	
CSCI 5225	Introduction to Cryptography	
CSCI 5265	Modern Web Technologies	
CSCI 5425	Introduction to Deep Learning	
CSCI 5430	Graph Data Mining	
CSCI 5750	Artificial Intelligence II	
CSCI 5810	Advanced Software Engineering	
Other		
Other computer science graduate credit to meet NMSU requirements *		21
Dissertation		18
CSCI 7000	Doctoral Dissertation	
Total Credits		**48**

Only courses from the Master of Science-Computer Science program from NMSU can be used to waive this requirement.

*Graduate credits from other departments could be approved if they are required for the program study of the student. The student needs to get approval prior to taking the courses.

Students should contact the department for information on additional graduation requirements, or visit the on-line Graduate Handbook (https://computerscience.nmsu.edu/).

Counseling Psychology - Doctor of Philosophy

The CEP Department offers a doctoral program that leads to a Ph.D. in Counseling Psychology. The program is accredited by the American Psychological Association. For more information on this accreditation contact

The Office of Program Consultation and Accreditation
American Psychological Association
750 1st Street, NE
Washington, DC 20002
Phone: (202) 336-5979.

The program is based on the scientist-practitioner model through which both research and service delivery skills are acquired. Graduates of the program are prepared to conduct research, provide service, teach, and supervise. The program prepares students for licensure as psychologists (http://psybook.asppb.org/). The two aims of the program are:

1. To prepare entry-level counseling psychologists who are self-reflective and competent in both the practice and science of the profession.
2. To prepare counseling psychologists who think critically about the socio-cultural context of their work and promote social justice

For more information on program application requirements and process, see Counseling Psychology, Ph.D., program website (https://cep.nmsu.edu/academic-programs/counseling-psych-phd/counseling-psychology-phd.html).

Program Requirements

CEP faculty conduct periodic reviews of students' progress in the programs, including their academic performance, counseling and psycho-educational skills, professionalism and ethics. Deficits identified through faculty reviews may result in recommendations that students engage in remedial work or that they pursue alternative career goals.

Program of Study

Prefix	Title	Credits
CEPY 5180	Addictions Counseling	3
CEPY 5280	Primary Care Psychology	3
CEPY 6120	Human Development	3
or CEPY 5120	Human Development	
CEPY 6130	Psychology of Multiculturalism	3

CEPY 6140	Cognitive & Affective Basis of Behavior	3
CEPY 6150	Social Psychology	3
CEPY 6160	History and Systems of Psychology	3
CEPY 6180	Physiology of Behavior	3
CEPY 6190	Ethical/Professional Issues in Counseling Psychology	3
CEPY 6270	Diagnosis and Treatment Planning	3
or CEPY 5270	Diagnosis and Treatment Planning	
CEPY 6320	Career/Life Planning and Vocational Assessment	3
or CEPY 5320	Career/Life Planning and Vocational Assessment	
CEPY 6340	Appraisal of Cognitive Functioning	3
CEPY 6350	Appraisal of Personality	3
CEPY 6420	Psychometrics	3
CEPY 6425	Counseling Psychology Research	3
CEPY 6430	Advanced Statistics	3
CEPY 6410	Introduction to Qualitative Research	3
or EDUC 6440	Qualitative Research I	
CEPY 6440	Multivariate Statistics	3
CEPY 6450	Educational Experimentation	3
CEPY 6590	Behavioral Health Practicum	3
CEPY 6550	Counseling Psychology Theory/Practicum	3
CEPY 6560	Group Work Theory/Practicum	3
CEPY 6570	Advanced Counseling Psychology Practicum	6
CEPY 6580	Supervision Theory and Practicum	3
CEPY 6620	Internship in Counseling Psychology I	18
CEPY 6630	Internship in Counseling Psychology II	2
Doctoral Dissertation		*18*
CEPY 7000	Doctoral Dissertation	
Electives (6 elective credits are required)		*6*
CEPY 5150	The Art & Science of Mindfulness for Helping Professionals (or 2 credits + 1 credit CEPY 6996)	
CEPY 5240	Child and Adolescent Counseling Theory and Technique	
or CEPY 6240	Child and Adolescent Counseling Theory and Technique	
CEPY 5250	Family Therapy Theory and Technique	
or CEPY 6250	Family Therapy Theory and Technique	
CEPY 6220	Spanish for Mental Health Professionals	
BEST 510	Foundations in Borderlands & Ethnic Studies	
BEST 5110	Decolonial Research I: Methodologies	
BEST 5120	Theories in Borderlands and Ethnic Studies	
BEST 5999	Capstone in Borderlands and Ethnic Studies	
SPAN 485	Literature and Mental Health	
SPAN 528	Advanced U.S. Latino Culture and Literature	
Total Credits		**119**

First Year

Semester 1		**Credits**
Summer		
CEPY 5120	Human Development	3
or CEPY 6120	or Human Development	
CEPY 6130	Psychology of Multiculturalism	3
	Credits	**6**
Semester 2		
Fall		
CEPY 6420	Psychometrics	3
CEPY 5270	Diagnosis and Treatment Planning	3
or CEPY 6270	or Diagnosis and Treatment Planning	
CEPY 6190	Ethical/Professional Issues in Counseling Psychology	3
CEPY 6550	Counseling Psychology Theory/Practicum	3
	Credits	**12**
Semester 3		
Spring		
CEPY 6430	Advanced Statistics	3
CEPY 6560	Group Work Theory/Practicum	3
CEPY 6425	Counseling Psychology Research	3
CEPY 6320	Career/Life Planning and Vocational Assessment	3
	Credits	**12**
Second Year		
Semester 1		
Summer		
CEPY 5180	Addictions Counseling	3
CEPY 6150	Social Psychology	3
	Credits	**6**
Semester 2		
Fall		
CEPY 6410	Introduction to Qualitative Research	3
or EDUC 6440	or Qualitative Research I	
CEPY 6340	Appraisal of Cognitive Functioning	3
CEPY 6570	Advanced Counseling Psychology Practicum	3
CEPY 6180	Physiology of Behavior	3
	Credits	**12**
Semester 3		
Spring		
CEPY 6440	Multivariate Statistics	3
CEPY 6350	Appraisal of Personality	3
CEPY 6570	Advanced Counseling Psychology Practicum	3
CEPY 6450	Educational Experimentation	3
	Credits	**12**
Third Year		
Semester 1		
Summer		
Grad Electives		3
CEPY 6140	Cognitive & Affective Basis of Behavior	3
	Credits	**6**
Semester 2		
Fall		
CEPY 6580	Supervision Theory and Practicum	3
CEPY 5280	Primary Care Psychology	3
CEPY 6160	History and Systems of Psychology	3
CEPY 7000	Doctoral Dissertation	4
	Credits	**13**
Semester 3		
Spring		
CEPY 6590	Behavioral Health Practicum	3
CEPY 7000	Doctoral Dissertation	4
Grad Electives		3
	Credits	**10**
Fourth Year		
Semester 1		
Fall		

CEPY 6620	Internship in Counseling Psychology I	9
CEPY 7000	Doctoral Dissertation	5
	Credits	**14**
Semester 2		
Spring		
CEPY 6620	Internship in Counseling Psychology I	9
CEPY 7000	Doctoral Dissertation	5
	Credits	**14**
Semester 3		
Summer		
CEPY 6630	Internship in Counseling Psychology II	2
	Credits	**2**
	Total Credits	**119**

Please reach out to the Program Director for other advising plans, to include, if available, part-time enrollment.

Curriculum and Instruction - Doctor of Philosophy

The Doctorate of Philosophy (PhD) are rigorous degrees requiring an intellectual and personal commitment. The academic course of study for both degrees is the same. The PhD doctoral program requires students to demonstrate competency in the computer tools or second language sequence. (See below in program descriptions). For the PhD program 66 credit hours is only the minimum and students may be asked to complete additional hours as per their advisor and committee recommendations.

The degree require a dissertation based on original research, inextricably grounded with an array of primary and secondary sources. The degree has required courses of study, but are additionally individualized based on those scholarly and academic expectations set by the doctoral student in collaboration with their Dissertation Committee.

Options and Concentration

Currently there are four Options and one concentration for the Doctoral Program of the Department of Curriculum & Instruction. These are:

Options:

1. Bilingual/TESOL
2. Critical Pedagogies
3. Early Childhood Education
4. Language, Literacy & Culture

Concentration:

1. Educational Learning Technologies

To Apply

- Apply to the NMSU Graduate School (https://tpal.nmsu.edu/degree-programs/doctoral-programs/ci-doctoral-program.html) (Select Intended major "Curriculum and Instruction" and then concentration you will pursue);
- Apply to C&I by submitting your Application Portfolio by December 15th (via the Graduate School Application portal)
  - See the sections, “Applying to the Doctoral Program,” “Doctoral Intake Application Instructions” and the “C&I Doctoral Student Checklist” in the Doctoral Handbook (https://tpal.nmsu.edu/_files/documents/CI_Doc_Handbook_Campus_22.pdf).
  - NMSU Doc Portfolio Example – C&I (https://tpal.nmsu.edu/student-forms-handbooks%20/students_forms_and_handbook.html) (If the Sample portfolio does not open automatically, try a different browser or try saving the portfolio to your desktop before opening it.)

NOTE: Potential students who have written successful portfolios will be invited to interview with the Doctoral Qualifying Committee (a committee of C&I faculty)

Once Applicants Are Accepted

- Attend the applicable Doctoral Orientation Meeting your first semester of classes
- Meet with your Interim Advisor during your first semester of classes
- Get to know our faculty (https://tpal.nmsu.edu/faculty-directory/)
- Read the Doctoral Handbook (https://tpal.nmsu.edu/_files/documents/CI_Doc_Handbook_Campus_22.pdf) and the sections of the NMSU Graduate Catalog that apply to you (this is your responsibility)
- Follow the Doctoral Program Checklist from the C&I Doctoral Handbook (https://tpal.nmsu.edu/_files/documents/CI_Doc_Handbook_Campus_22.pdf)

First Year

Fall		**Credits**
EDUC 6110	Curriculum for a Diverse Society	3
EDUC 6440	Qualitative Research I	3
Choose one of the following:		3
EDLT 6230	Technology, Society, and Education	
BLED 6110	Acquiring Emancipatory Discourses: TESOL/BIL	
EDUC 6220	Praxis and Reflexivity	
ECED 6110	History and Philosophy of Early Childhood Education	
READ 6110	Critical Issues in Literacy Education	
	Credits	**9**
Spring		
EDUC 6120	Pedagogy of Learning in a Diverse Society	3
EDUC 6420	Evaluation of Quantitative Research in Education	3
Choose one of the following:		3
EDLT 6210	Current Research in Learning and Technology	
BLED 6130	Literacy / Biliteracy Assessment and Evaluation	
EDUC 6210	Curricular Mediation for Democratic Communities	
ECED 5510	Advanced Teaching and Learning of Literacy	
READ 6130	Multiculturalism, Literature, and Inquiry	
	Credits	**9**

Second Year

Fall		
EDUC 6320	Social Justice Issues in Education	3
EDUC 6430	Advanced Statistics	3
Choose one of the following:		3
EDLT 6110	Foundations of Learning Design & Technology	
BLED 6120	Multiple Critical Literacies	
EDUC 6330	Critical Race Theory & Storytelling in Educational Spaces	

ECED 5520	Literacy Development in Early Childhood	
	Credits	**9**
Spring		
EDUC 6230	Research in Praxis: Qualitative Research II	3
EDUC 6410	Current Research in Educational Practice	3
Choose one of the following:		3
EDLT 6998	Advanced Fieldwork	
BLED 6310	Critical Theory and Pedagogy	
EDUC 6310	Critical Theory and Pedagogy	
ECED 6996	Selected Topics in Early Childhood Education	
READ 6210	Ethnography of Reading and Writing	
	Credits	**9**
Third Year		
Fall		
EDUC 6340	Theoretical Frameworks and Research Design Topics	3
EDUC 6910	Dissertation Seminar	3
EDUC 7000	Doctoral Dissertation	18
	Credits	**24**
	Total Credits	**60**

Economic Development - Doctor of Economic Development

The Doctor of Economic Development (DED) is a professional doctorate designed to provide advanced training for economic development professionals.

The Doctor of Economic Development (DED) is designed to prepare students to be professionals in the area of economic development. To receive a DED, students must successfully complete 39 ECDV credits. Successfully passing 2 comprehensive exams (offered twice each summer) is required to register for ECDV courses. The five courses covered by the two exams represent 15 credit hours of course work, which the student may complete at another program or at NMSU.

DED minimum admission requirements:

All students must meet the requirements specified in the general regulations and requirements for admission to the Graduate School and to candidacy, and in addition the following:

- Bachelor's degree or equivalent
- Minimum undergraduate GPA: 3.0/4.0
- GRE or GMAT score is recommended (not required)
- Completion of one undergraduate courses in intermediate microeconomic (ECON 311 Intermediate Macroeconomic Theory or equivalent) and intermediate macroeconomic (ECON 312 Intermediate Microeconomic Theory or equivalent) both with grades of B or better
- Completion of one course in college-level calculus (MATH 1430G Applications of Calculus I or equivalent) and one course in statistics including regression analysis (ECON 405 Introductory Econometrics or equivalent), with grades of B or better in both courses
- Additional coursework in matrix algebra is recommended
- One course in mathematical economics ECON 457 Mathematical Economics or equivalent), with a grade of B or better
- International students must meet graduate school admission requirements for English proficiency

In addition, all applicants must successfully pass Comprehensive Exams covering the "Microeconomic Core" and the "Macroeconomic and Econometric Core" before taking upper level ECDV courses. The Microeconomic Core exam covers advanced microeconomic theory (AEEC 5120 Microeconomic Theory and ECON 511 The Economics of Imperfect Markets). The Macroeconomic and Econometric Core covers advanced macroeconomic theory (AEEC 5130 Macroeconomic Theory), and econometrics (AEEC 5240 Econometrics and ECON 545 Econometrics II).
Students who have not passed all of these "core" courses with a grade of B or better, or feel the need to study the material further, may take the courses, along with ECON 457 Mathematical Economics during the fall and spring semesters of their first year in the program.

- Comprehensive Exam I covers the "Microeconomics Core": AEEC 5120 Microeconomic Theory, ECON 511 The Economics of Imperfect Markets
- Comprehensive Exam II covers the "Macroeconomics and Econometrics Core":AEEC 5130 Macroeconomic Theory, AEEC 5240 Econometrics and ECON 545 Econometrics II)
- Students who fail a comprehensive exam may apply to take the exam a second time. Only under special circumstances are students allowed to take a comprehensive exam a third time

Prefix	Title	Credits
All students in the DED program must successfully complete the following:		
ECDV 550	Introduction to Local and Regional Development	3
ECDV 661	Regional Economic Modeling	3
ECDV 664	Population Economics	3
ECDV 668	Economic Development Finance	3
ECDV 671	Sustainable Economic Development	3
ECDV 681	Urban Economic Development	3
ECDV 682	Rural Development	3
ECDV 683	Seminar in National Economic Development	3
ECDV 692	Seminar in Economic Development	3
ECDV 694	Internship	3
ECDV 699	Doctoral Project	9
Total Credits		**39**

Teaching and research assistantships are available to qualified applicants, however, admission to the program does not imply or guarantee funding.

Detailed and updated information is available at https://business.nmsu.edu/ded (https://business.nmsu.edu/ded/).

Suggested Plan of Study

This plan of study includes the "core" courses a student has not already completed these with a B or better.

First Year		
Fall		**Credits**
ECDV 550	Introduction to Local and Regional Development	3
AEEC 5120	Microeconomic Theory	3

AEEC 5240	Econometrics	3
	Credits	**9**
Spring		
AEEC 5130	Macroeconomic Theory	3
ECON 545	Econometrics II	3
ECON 511	The Economics of Imperfect Markets	3
	Credits	**9**
Second Year		
Fall		
ECDV 661	Regional Economic Modeling	3
ECDV 664	Population Economics	3
ECDV 671	Sustainable Economic Development	3
	Credits	**9**
Spring		
ECDV 668	Economic Development Finance	3
ECDV 692	Seminar in Economic Development	3
	Credits	**6**
Summer		
ECDV 694	Internship	3-9
	Credits	**3-9**
Third Year		
Fall		
ECDV 681	Urban Economic Development	3
ECDV 682	Rural Development	3
ECDV 683	Seminar in National Economic Development	3
	Credits	**9**
Spring		
ECDV 699	Doctoral Project	9
	Credits	**9**
	Total Credits	**54-60**

Educational Leadership & Administration (Higher Education Administration) - Doctor of Education

Educational Leadership Doctoral Program (ELDP)

The Doctor of Education is geared toward those students wishing to pursue a degree which will help them in their profession. Coursework, internships, and research are constructed to develop individuals for administrative position in Pk-12 schools in post secondary institutions.

For More Information

Please do not hesitate to contact the School of TPAL if you have any questions related to ELDP. Feel free to send an e-mail to eldpquestions@nmsu.edu

Educational Leadership Doctoral Program (ELDP)

Required Courses

Prefix	Title	Credits
ELAD 6110	Organizational Theory	3
ELAD 6120	Elements of Research	3
ELAD 6210	Quantitative Research I	3
ELAD 6220	Qualitative Research I	3
ELAD 6310	Concepts of Leadership in Education	3
ELAD 6320	Foundations of Educational Administration	3
ELAD 6410	Quantitative Research II	3
ELAD 6510	Qualitative Research II	3
ELAD 6525	Higher Education Law	3
ELAD 6610	Scholarly Writing and the Southwest Border	3
ELAD 6620	Evaluation Design in Education	3
ELAD 6635	Higher Education Finance and Funding	3
ELAD 6910	Dissertation Seminar	3
ELAD 6998	Advanced Internship	6
ELAD 7000	Doctoral Dissertation	18
Total Credits		**63**

A Suggested Plan of Study

First Year		
Fall		**Credits**
ELAD 6110	Organizational Theory	3
ELAD 6120	Elements of Research	3
	Credits	**6**
Spring		
ELAD 6210	Quantitative Research I	3
ELAD 6220	Qualitative Research I	3
	Credits	**6**
Summer		
ELAD 6310	Concepts of Leadership in Education	3
ELAD 6320	Foundations of Educational Administration	3
	Credits	**6**
Second Year		
Fall		
ELAD 6410	Quantitative Research II	3
ELAD 6998	Advanced Internship	3
	Credits	**6**
Spring		
ELAD 6510	Qualitative Research II	3
ELAD 6998	Advanced Internship	3
ELAD 6525	Higher Education Law	3
	Credits	**9**
Summer		
ELAD 6610	Scholarly Writing and the Southwest Border	3
ELAD 6620	Evaluation Design in Education	3
ELAD 6635	Higher Education Finance and Funding	3
	Credits	**9**
Third Year		
Fall		
ELAD 6910	Dissertation Seminar	3
	Credits	**3**
Spring		
ELAD 7000	Doctoral Dissertation	6
	Credits	**6**
Fourth Year		
Fall		
ELAD 7000	Doctoral Dissertation	6
	Credits	**6**

Spring		
ELAD 7000	Doctoral Dissertation	6
	Credits	**6**
	Total Credits	**63**

Educational Leadership & Administration (Higher Education) - Doctor of Philosophy

Educational Leadership Doctoral Program (ELDP)

The Doctor of Philosophy is a research-oriented degree. Coursework and internships are directed toward developing research proficiencies in educational leadership. The Ph.D. also requires additional hours of coursework in an approved cognate area.

For More Information

Please do not hesitate to contact the School of TPAL if you have any questions related to ELDP. Feel free to send an e-mail to eldpquestions@nmsu.edu

Educational Leadership Doctoral Program (ELDP)

Required Courses

Prefix	Title	Credits
ELAD 6110	Organizational Theory	3
ELAD 6120	Elements of Research	3
ELAD 6210	Quantitative Research I	3
ELAD 6220	Qualitative Research I	3
ELAD 6310	Concepts of Leadership in Education	3
ELAD 6320	Foundations of Educational Administration	3
ELAD 6410	Quantitative Research II	3
ELAD 6510	Qualitative Research II	3
ELAD 6525	Higher Education Law	3
ELAD 6610	Scholarly Writing and the Southwest Border	3
ELAD 6620	Evaluation Design in Education	3
ELAD 6635	Higher Education Finance and Funding	3
ELAD 6910	Dissertation Seminar	3
ELAD 6998	Advanced Internship	6
Graduate level cognate electives to bring total credit hours to 60 [1]		**15**
BEST 5510	Advanced Special Topics in Borderlands and Ethnic Studies	
EDUC 6210	Curricular Mediation for Democratic Communities	
EDUC 6320	Social Justice Issues in Education	
ELAD 6996	Selected Topics	
GNDR 533	Advanced Issues in Sex, Gender, and Culture	
GNDR 555	Advanced Feminist Research Methodologies	
GNDR 571	Advanced Seminar in Feminist and Queer Theories	
SOCI 570	Seminar in Sociology of Latinos/as in the United States	
SOCI 571	Advanced Race and Ethnic Relations	
SOCI 579	Seminar in Sociological Perspectives on the U.S.-Mexico Border	
SPED 5850	Current Research in Special Education	
Doctoral Dissertation		18
ELAD 7000	Doctoral Dissertation	
Total Credits		**78**

[1] All students can complete the 15 credits of cognate courses at their own pace but cannot start cognates until after their first semester in the program and must be complete the requirement before enrolling in ELAD 7000 Doctoral Dissertation. Students will need to coordinate with their advisor appropriately and may need to be prepared for extended time to degree if they hold off on cognates too long.

Example of possible Cognate courses but not limited to the following:

- Child and Family Development
- Communication
- Feminist/Gender Studies
- Latino/a Studies
- Native American Studies
- Program Evaluation/Data Analysis
- Research Methods
- Social Justice/Critical Theory
- Sociocultural Theory
- Critical Race Theory/LatCrit
- Sociology

A Suggested Plan of Study

There are also 15 credits of Cognate coursework that must be completed in order to fulfill the requirements of the Doctor of Philosophy in Educational Administration.

First Year		
Fall		**Credits**
ELAD 6110	Organizational Theory	3
ELAD 6120	Elements of Research	3
	Credits	**6**
Spring		
ELAD 6210	Quantitative Research I	3
ELAD 6220	Qualitative Research I	3
Possible Cognate Course [1]		3
	Credits	**9**
Summer		
ELAD 6310	Concepts of Leadership in Education	3
ELAD 6320	Foundations of Educational Administration	3
	Credits	**6**
Second Year		
Fall		
ELAD 6410	Quantitative Research II	3
ELAD 6998	Advanced Internship	3
Possible Cognate Course [1]		3
	Credits	**9**
Spring		
ELAD 6510	Qualitative Research II	3
ELAD 6998	Advanced Internship	3
ELAD 6525	Higher Education Law	3
Possible Cognate Course [1]		3
	Credits	**12**

Summer		
ELAD 6610	Scholarly Writing and the Southwest Border	3
ELAD 6620	Evaluation Design in Education	3
ELAD 6635	Higher Education Finance and Funding	3
	Credits	**9**
Third Year		
Fall		
ELAD 6910	Dissertation Seminar	3
Possible Cognate Course [1]		3
Possible Cognate Course [1]		3
	Credits	**9**
Spring		
ELAD 7000	Doctoral Dissertation	6
	Credits	**6**
Fourth Year		
Fall		
ELAD 7000	Doctoral Dissertation	6
	Credits	**6**
Spring		
ELAD 7000	Doctoral Dissertation	6
	Credits	**6**
	Total Credits	**78**

[1] All students can complete the 15 credits of cognate courses at their own pace but cannot start cognates until after their first semester in the program and must be complete the requirement before enrolling in ELAD 7000 Doctoral Dissertation. Students will need to coordinate with their advisor appropriately and may need to be prepared for extended time to degree if they hold off on cognates too long.
Note that the cognates listed in the Roadmap are an example of when to successfully add them to your schedule and stay on track for the four year program.
Example of possible Cognate courses but not limited to the following:

- Child and Family Development
- Communication
- Feminist/Gender Studies
- Latino/a Studies
- Native American Studies
- Program Evaluation/Data Analysis
- Research Methods
- Social Justice/Critical Theory
- Sociocultural Theory
- Critical Race Theory/LatCrit
- Sociology

Educational Leadership & Administration (Pk-12 Administration) - Doctor of Education

Educational Leadership Doctoral Program (ELDP)

The Doctor of Education is geared toward those students wishing to pursue a degree which will help them in their profession. Coursework, internships, and research are constructed to develop individuals for administrative position in Pk-12 schools in post secondary institutions.

For More Information

Please do not hesitate to contact the School of TPAL if you have any questions related to ELDP. Feel free to send an e-mail to eldpquestions@nmsu.edu

Educational Leadership Doctoral Program (ELDP)

Required Courses

Prefix	Title	Credits
ELAD 6110	Organizational Theory	3
ELAD 6120	Elements of Research	3
ELAD 6210	Quantitative Research I	3
ELAD 6220	Qualitative Research I	3
ELAD 6310	Concepts of Leadership in Education	3
ELAD 6320	Foundations of Educational Administration	3
ELAD 6410	Quantitative Research II	3
ELAD 6510	Qualitative Research II	3
ELAD 6520	Public School Law	3
ELAD 6610	Scholarly Writing and the Southwest Border	3
ELAD 6620	Evaluation Design in Education	3
ELAD 6630	Educational Financial Management	3
ELAD 6910	Dissertation Seminar	3
ELAD 6998	Advanced Internship	6
ELAD 7000	Doctoral Dissertation	18
Total Credits		**63**

A Suggested Plan of Study

First Year		
Fall		**Credits**
ELAD 6110	Organizational Theory	3
ELAD 6120	Elements of Research	3
	Credits	**6**
Spring		
ELAD 6210	Quantitative Research I	3
ELAD 6220	Qualitative Research I	3
	Credits	**6**
Summer		
ELAD 6310	Concepts of Leadership in Education	3
ELAD 6320	Foundations of Educational Administration	3
	Credits	**6**
Second Year		
Fall		
ELAD 6410	Quantitative Research II	3
ELAD 6998	Advanced Internship	3
	Credits	**6**
Spring		
ELAD 6510	Qualitative Research II	3
ELAD 6998	Advanced Internship	3
ELAD 6520	Public School Law	3
	Credits	**9**
Summer		
ELAD 6610	Scholarly Writing and the Southwest Border	3

ELAD 6620	Evaluation Design in Education	3
ELAD 6630	Educational Financial Management	3
	Credits	**9**
Third Year		
Fall		
ELAD 6910	Dissertation Seminar	3
	Credits	**3**
Spring		
ELAD 7000	Doctoral Dissertation	6
	Credits	**6**
Fourth Year		
Fall		
ELAD 7000	Doctoral Dissertation	6
	Credits	**6**
Spring		
ELAD 7000	Doctoral Dissertation	6
	Credits	**6**
	Total Credits	**63**

Educational Leadership & Administration (Pk-12 Education) - Doctor of Philosophy

Educational Leadership Doctoral Program (ELDP)

The Doctor of Philosophy is a research-oriented degree. Coursework and internships are directed toward developing research proficiencies in educational leadership. The Ph.D. also requires additional hours of coursework in an approved cognate area.

For More Information

Please do not hesitate to contact the School of TPAL if you have any questions related to ELDP. Feel free to send an e-mail to eldpquestions@nmsu.edu

Educational Leadership Doctoral Program (ELDP)

Required Courses

Prefix	Title	Credits
ELAD 6110	Organizational Theory	3
ELAD 6120	Elements of Research	3
ELAD 6210	Quantitative Research I	3
ELAD 6220	Qualitative Research I	3
ELAD 6410	Quantitative Research II	3
ELAD 6520	Public School Law	3
ELAD 6310	Concepts of Leadership in Education	3
ELAD 6320	Foundations of Educational Administration	3
ELAD 6510	Qualitative Research II	3
ELAD 6610	Scholarly Writing and the Southwest Border	3
ELAD 6620	Evaluation Design in Education	3
ELAD 6630	Educational Financial Management	3
ELAD 6910	Dissertation Seminar	3
ELAD 6998	Advanced Internship	6
Graduate level cognate electives to bring total credit hours to 60 [1]		**15**
BEST 5510	Advanced Special Topics in Borderlands and Ethnic Studies	
EDUC 6210	Curricular Mediation for Democratic Communities	
EDUC 6320	Social Justice Issues in Education	
ELAD 6996	Selected Topics	
GNDR 533	Advanced Issues in Sex, Gender, and Culture	
GNDR 555	Advanced Feminist Research Methodologies	
GNDR 571	Advanced Seminar in Feminist and Queer Theories	
SOCI 570	Seminar in Sociology of Latinos/as in the United States	
SOCI 579	Seminar in Sociological Perspectives on the U.S.-Mexico Border	
SPED 5850	Current Research in Special Education	
Doctoral Dissertation		18
ELAD 7000	Doctoral Dissertation	
Total Credits		**78**

[1] All students can complete the 15 credits of cognate courses at their own pace but cannot start cognates until after their first semester in the program and must be complete the requirement before enrolling in **ELAD 7000** Doctoral Dissertation. Students will need to coordinate with their advisor appropriately and may need to be prepared for extended time to degree if they hold off on cognates too long.

Example of possible Cognate courses but not limited to the following:

- Child and Family Development
- Communication
- Feminist/Gender Studies
- Latino/a Studies
- Native American Studies
- Program Evaluation/Data Analysis
- Research Methods
- Social Justice/Critical Theory

A Suggested Plan of Study

There are also 15 credits of Cognate coursework that must be completed in order to fulfill the requirements of the Doctor of Philosophy in Educational Administration.

First Year		
Fall		**Credits**
ELAD 6110	Organizational Theory	3
ELAD 6120	Elements of Research	3
	Credits	**6**
Spring		
ELAD 6210	Quantitative Research I	3
ELAD 6220	Qualitative Research I	3
Possible Cognate Course [1]		3
	Credits	**9**
Summer		
ELAD 6310	Concepts of Leadership in Education	3
ELAD 6320	Foundations of Educational Administration	3
	Credits	**6**

Second Year		
Fall		
ELAD 6410	Quantitative Research II	3
ELAD 6998	Advanced Internship	3
Possible Cognate Course [1]		3
	Credits	**9**
Spring		
ELAD 6510	Qualitative Research II	3
ELAD 6998	Advanced Internship	3
ELAD 6520	Public School Law	3
Possible Cognate Course [1]		3
	Credits	**12**
Summer		
ELAD 6610	Scholarly Writing and the Southwest Border	3
ELAD 6620	Evaluation Design in Education	3
ELAD 6630	Educational Financial Management	3
	Credits	**9**
Third Year		
Fall		
ELAD 6910	Dissertation Seminar	3
Possible Cognate Course [1]		3
Possible Cognate Course [1]		3
	Credits	**9**
Spring		
ELAD 7000	Doctoral Dissertation	6
	Credits	**6**
Fourth Year		
Fall		
ELAD 7000	Doctoral Dissertation	6
	Credits	**6**
Spring		
ELAD 7000	Doctoral Dissertation	6
	Credits	**6**
	Total Credits	**78**

[1] All students can complete the 15 credits of cognate courses at their own pace but cannot start cognates until after their first semester in the program and must be complete the requirement before enrolling in **ELAD 7000** Doctoral Dissertation. Students will need to coordinate with their advisor appropriately and may need to be prepared for extended time to degree if they hold off on cognates too long.
Note that the cognates listed in the Roadmap are an example of when to successfully add them to your schedule and stay on track for the four year program.
Example of possible Cognate courses but not limited to the following:

- Child and Family Development
- Communication
- Feminist/Gender Studies
- Latino/a Studies
- Native American Studies
- Program Evaluation/Data Analysis
- Research Methods
- Social Justice/Critical Theory
- Sociocultural Theory
- Critical Race Theory/LatCrit
- Sociology

Engineering (Chemical Engineering) - Doctor of Philosophy

The program of study leading to the Ph.D. is available to students who have either a BS or MS in chemical engineering. Students with a BS must complete 30 course credits and 24 dissertation credits, for a total of 54 credits, including:

- required core CHME courses (14 credits);
- graduate elective courses (12 credits);
- CHME elective courses (3 credits);
- independent research as CHME 698 Ph.D. Research prior to completion of the comprehensive exam (6 credits);
- dissertation as CHME 700 after completion of the comprehensive exam (18 credits); and
- graduate seminar as CHME 690 Graduate Seminar (1 credit).

Ph.D. students must pass:

1. a qualifying examination within 24 months of starting their Ph.D. studies;
2. a comprehensive examination completed a minimum of nine months prior to the dissertation defense; and
3. an oral defense of the written dissertation before the dissertation committee.
4. PhD candidates in the College of Engineering, who have successfully completed their PhD Qualifier Examination after January 1, 2018, must satisfy a publication requirement which requires two papers:

   Paper #1: An archival paper accepted or published in any journal listed in the source publication list for the Web of Science, or a refereed Journal or Conference Proceeding approved by the student's doctoral committee and the cognizant Department Head(s), before the Doctorate of Philosophy final examination. The candidate should be listed as the lead author in Paper #1.

   Paper #2: An additional archival paper submitted, accepted, or published in any journal listed in the source publication list for the Web of Science. Alternatively, one conference paper accepted or published in a national or international conference proceedings.

Prefix	Title	Credits
Required Core Courses		
CHME 501	Graduate Thermodynamics for Chemical Engineers	3
CHME 506	Graduate Transport Phenomena(s)	3
CHME 516	Graduate Numerical Methods in Chemical Engineering	3
CHME 542	Graduate Reactor Analysis and Design (s)	3
CHME 594	Professional Communication in Chemical Engineering	2
CHME electives (select from CHME 455-CHME 589)		3
Electives [1]		12
CHME 690	Graduate Seminar	1

CHME 698	Ph.D. Research	6
Dissertation (18 hours)		
CHME 700	Doctoral Dissertation	
Total Credits		**36**

[1] Elective courses are intended to supplement the research work of each graduate student. These courses must be numbered 450 or above and must be approved by the dissertation advisor.

First Year		
Fall		**Credits**
CHME 501	Graduate Thermodynamics for Chemical Engineers	3
CHME 516	Graduate Numerical Methods in Chemical Engineering	3
CHME Elective		3
	Credits	**9**
Spring		
CHME 506	Graduate Transport Phenomena(s)	3
CHME 542	Graduate Reactor Analysis and Design (s)	3
CHME 594	Professional Communication in Chemical Engineering	2
CHME 690	Graduate Seminar	1
	Credits	**9**
Summer		
Qualifying Exam		
	Credits	**0**
Second Year		
Fall		
Grad Electives		6
CHME 698	Ph.D. Research	3
	Credits	**9**
Spring		
Grad Elective		6
CHME 698	Ph.D. Research	3
	Credits	**9**
Third Year		
Fall		
CHME 698	Ph.D. Research	6
Comprehensive Exam		
	Credits	**6**
Spring		
CHME 700	Doctoral Dissertation	9
	Credits	**9**
Fourth Year		
Fall		
CHME 700	Doctoral Dissertation	3
	Credits	**3**
Spring		
Dissertation Defense		
	Credits	**0**
	Total Credits	**54**

During the Third Year - Fall semester students may need to take additional coursework that doesn't contribute to the 54 credit hour total in order to maintain full-time status

Engineering (Civil Engineering) - Doctor of Philosophy

In support of the mission and vision statements for the graduate program, the Civil Engineering Department adopts the following goals for the Doctor of Philosophy (Ph.D.) degree:

1. Prepare students to develop and conduct fundamental and applied research to generate innovative and original solutions for civil engineering problems.
2. Prepare students for research-based professional careers or academic careers in the civil engineering discipline.
3. Develop a culture of research/teaching scholarship among students.

Students may specialize in environmental, geotechnical, structural, transportation, or water resources engineering. Further information related to the Ph.D. degree may be found under the Academic Programs of Study (p. 31) section of the catalog.

Requirements

The Ph.D. program in Civil Engineering is open to students with a master's degree. Exceptionally well qualified students may petition for direct entry to the Ph.D. program without first obtaining a master's degree. The program of study requires a minimum of 36 graduate credits beyond the master's, including at least 18 credits of dissertation work.

Option 1 - Ph.D. with Completed Master's Degree

If the student has both bachelor's and master's degrees in fields that are not closely related to Civil Engineering, they must complete any undergraduate and graduate coursework deficiencies identified by the faculty in their area of specialization. Deficiencies may be identified upon admission, based on the student's performance on the qualifying exam, or both. Beyond completion of any deficiency coursework, the following requirements must be met:

Prefix	Title	Credits
Pass Qualifying Exam		
Graduate Electives (beyond master's degree, or equivalent thereof) these electives may include research (C E 600) or dissertation (C E 700) credits [1]		18
Pass Comprehensive Exam		
Doctoral Dissertation		18
C E 700	Doctoral Dissertation	
Complete and Defend Doctoral Dissertation		

[1] Graduate course work credits from the following prefixes are permitted for the Ph.D. degree. If a graduate course outside this list of prefixes logically fits into the Ph.D. program, see your graduate advisor about requesting an exception.
Prefixes: A EN, ENVE, ENVS, GENE, SOIL, BIOL, CS, CHEM, GEOG, GEOL, GPHY, MATH, MOLB, PHYS, STAT, A ST, A E, CE, CHME, EE, IE, ME

Option 2 - Direct Ph.D. with BSCE or Equivalent, but no Master's Degree

If the student has the equivalent of a BSCE degree, but no master's degree, they must fulfil the following requirements:

Prefix	Title	Credits
Area of Specialization (beyond the bachelor's degree, 450 or higher) [1]		18
Pass Qualifying Exam		

Graduate Electives (beyond master's degree, or equivalent thereof) these electives may include research (C E 600) or dissertation (C E 700) credits [2]		18
Pass Comprehensive Exam		
Doctoral Dissertation		18
C E 700	Doctoral Dissertation	
Complete and Defend Doctoral Dissertation		

[1] **Specialization Courses:**
Environmental: ENVE 456 Environmental Engineering Design, ENVE 550 Aquatic Chemistry, ENVE 551 Unit Processes/Operation of Water Treatment, ENVE 552 Unit Processes/Operation of Wastewater Treatment, ENVE 557 Surface Water Quality Modeling, ENVE 598 Special Research Programs
Geotechnical: C E 452 Geohydrology, C E 470 Design of Municipal and Hazardous Waste Landfills, C E 479 Pavement Analysis and Design, C E 485 Design of Earth Dams, C E 507 Design of Earth Retaining Structures, C E 508 Advanced Soil Behavior, C E 509 Deep Foundations, C E 579 Ground Improvement, C E 585 Slope Stability Analysis and Design
Structural: C E 454 Wood Design, C E 455 Masonry Design, C E 501 Advanced Mechanics of Materials, C E 510 Introduction to Nondestructive Testing, C E 515 Finite Element Methods, C E 544 Advanced Design of Steel Structures, C E 545 Advanced Concrete Design, C E 554 Wood Design, C E 555 Masonry Design, C E 571 Structural Dynamics
Transportation: C E 479 Pavement Analysis and Design C E 482 Hydraulic Structures, C E 501 Advanced Mechanics of Materials, C E 507 Design of Earth Retaining Structures, C E 509 Deep Foundations, C E 510 Introduction to Nondestructive Testing, C E 515 Finite Element Methods, C E 544 Advanced Design of Steel Structures, C E 545 Advanced Concrete Design, C E 547 Bridge Engineering
Water Resources: A EN 459 Groundwater, Wells & Pumps, A EN 478 Irrigation and Drainage Engineering, C E 452 Geohydrology, C E 482 Hydraulic Structures, C E 483 Surface Water Hydrology, C E 485 Design of Earth Dams, C E 682 Topics in Hydrodynamics II, ENVE 557 Surface Water Quality Modeling, ENVE 630 Fate and Transport of Environmental Contaminants, SOIL 652 Advanced Soil Physics

[2] **Included Prefixes:** Graduate course work credits from the following prefixes are permitted for the Ph.D. degree. If a graduate course outside this list of prefixes logically fits into the Ph.D. program, see your graduate advisor about requesting an exception. **Prefixes:** A EN, ENVE, ENVS, GENE, SOIL, BIOL, CSCI, CHEM, GEOG, GEOL, GPHY, MATH, MOLB, PHYS, STAT, A ST, A E, CE, CHME, EE, IE, ME

Additional Requirements

Ph.D. candidates in the College of Engineering, who have successfully completed their Ph.D. Qualifier Examination after January 1, 2018, must satisfy a publication requirement which requires two papers:

Paper #1: An archival paper accepted or published in any journal listed in the source publication list for the Web of Science, or a refereed Journal or Conference Proceeding approved by the student's doctoral committee and the cognizant Department Head(s), before the Doctorate of Philosophy final examination. The candidate should be listed as the lead author in Paper #1.

Paper #2: An additional archival paper submitted, accepted, or published in any journal listed in the source publication list for the Web of Science. Alternatively, one conference paper accepted or published in a national or international conference proceedings.

Engineering (Electrical Engineering) - Doctor of Philosophy

Requirements for Ph.D. Degree

The Program Educational Objectives for the Doctorate in Electrical Engineering are:

1. That graduates obtain relevant, productive employment performing research in academia, government or industry, and/or are teaching at institutions of higher education.
2. That graduates obtain relevant, productive employment with the private sector or in government and/or pursue additional advanced degrees.

The Ph.D. program is open to students with a master's degree. Exceptionally well qualified students may petition for direct entry to the Ph.D. program without first obtaining a master's degree.

At the discretion of the advisor, students may complete some or all degree requirements remotely, e.g., by registering in the online sections for courses. All Graduate Assistants must enroll as full-time students for 9 credits, excepting in their final two academic semesters where they may file a request for waiver permitting them to enroll in at least 6 credits in their second to last academic semester and at least 1 credit hour in their final academic semester.

Note–the following degree requirement tables outline the **minimum** requirements for a Ph.D. in Electrical Engineering. As many students must register for a minimum of 9 credits each semester to remain full time, a student will often take more than the minimum of 18 credits of E E 700 Doctoral Dissertation to complete their degree. Furthermore, as students are not eligible for enrollment in E E 700 until they have passed the Ph.D. Qualifying Exam, a student will often take more than the maximum of 6 or 9 hours of E E 600 Doctoral Research.

Option 1 - Ph.D. with Completed Master's Degree

If the student has both master's and bachelor's degrees in fields other than electrical engineering, they must complete undergraduate deficiency coursework, consisting of completion of the BSEE core courses. If the student has a master's degree in a field other than electrical engineering, they must complete graduate deficiency coursework, which consists of three graduate core courses from three different areas of emphasis (see MSEE program of study for more details).

Prefix	Title	Credits
Pass Qualifying Exam [1,2]		
Graduate Electives (credits beyond the master's degree) [3]		**18**
Pass Comprehensive Exam [4]		
Doctoral Dissertation		
E E 700	Doctoral Dissertation [2]	
Complete and defend doctoral dissertation [5]		
Total Credits		**36**

[1] It is expected that students will take the qualifying exam within one year of their master's or entering the Ph.D. program. The qualifying exam consists of two components: completing the graduate core (see MSEE program of study for details) with a grade of B or better and presenting a written and oral summary of a topical literature review.
For more details on the qualifying exam, see https://ece.nmsu.edu/grad-study/phd-qualifying.html.

[2] A student may not enroll in E E 700 Doctoral Dissertation until they have passed the qualifying exam.

[3] E E courses must be at the 500 level or higher. Non-E E courses must be at the 450 level or higher. At least 9 credits must be taken in E E. At most 6 credits may be E E 600 Doctoral Research. At most 6 credits may be E E 590 Selected Topics courses that are not subtitled. Exclude credits of E E 700 Doctoral Dissertation. Exclude credits for graduate deficiency coursework if master's degree is not E E. Exclude coursework used to satisfy the master's degree requirements. Courses excluded from the MSEE and MEEE degrees are also excluded from the Ph.D. degree.

[4] The candidate must pass a comprehensive examination after the completion of adequate coursework and demonstration of satisfactory progress toward the doctoral dissertation. The examination must be part written and part oral. The specific format of the exam is at the discretion of the examination committee. The written part must include a proposal for the dissertation research, and if the committee requires, it may also include a separate written exam. The written report on the proposal for the dissertation research must include the candidate's current research, planned research directions, and a reasonable timeline for completing the candidate's proposed research. The oral part may also include questions on completed coursework.

[5] The dissertation must be completed and orally defended. Additionally, evidence must be submitted for a minimum of two publications related to the dissertation research, including one of which is submitted to an internationally recognized journal, such as IEEE Transactions, and the second of which may be with a professional conference, such as an IEEE conference. Submissions must be completed prior to the final oral exam. For more details on the publication requirement, see https://ece.nmsu.edu/grad-study/phd-requirements.html.

Other limitations and requirements that apply to all Ph.D. degrees are described elsewhere in this catalog.

Option 2 - Direct Ph.D. with BSEE or Equivalent, but no Master's Degree

Prefix	Title	Credits
Graduate core courses (choose 3 from 3 different areas)		**9-10**
Microelectronics/VLSI		
E E 523	Analog VLSI Design	
Photonics/Optics		
E E 528	Fundamentals of Photonics	
Electric Energy Systems		
E E 543	Power System Faults and Stability	
Digital Signal Processing		
E E 545	Digital Signal Processing II	
or E E 596	Digital Image Processing	
Computer Engineering		
E E 562	Computer Systems Architecture	
Communications		
E E 571	Random Signal Analysis	
Controls & Robotics		
E E 551	Control Systems Synthesis	
Pass Qualifying Exam [1,2]		
Graduate Electives [3]		**33-32**
Pass Comprehensive Exam [4]		
Doctoral Dissertation		
E E 700	Doctoral Dissertation [2]	
Complete and defend doctoral dissertation [5]		
Total Credits		**60**

[1] It is expected that students will take the qualifying exam within one year of their MSEE or entering the Ph.D. program. The qualifying exam consists of two components: completing the graduate core (see MSEE program of study for details) with a grade of B or better and presenting a written and oral summary of a topical literature review. For more details on the qualifying exam, see https://ece.nmsu.edu/grad-study/phd-qualifying.html.

[2] A student may not enroll in E E 700 Doctoral Dissertation until they have passed the qualifying exam.

[3] E E courses must be at the 500 level or higher. Non-E E courses must be at the 450 level or higher. The total number of E E credits, including the graduate core and excluding credits of E E 700 Doctoral Dissertation must be at least 21. At most 9 credits may be E E 600 Doctoral Research. At most 9 credits may be E E 590 Selected Topics courses that are not subtitled. Courses excluded from the MSEE and MEEE degrees are also excluded from the Ph.D. degree.

[4] The candidate must pass a comprehensive examination after the completion of adequate coursework and demonstration of satisfactory progress toward the doctoral dissertation. The examination must be part written and part oral. The specific format of the exam is at the discretion of the examination committee. The written part must include a proposal for the dissertation research, and if the committee requires, it may also include a separate written exam. The written report on the proposal for the dissertation research must include the candidate's current research, planned research directions, and a reasonable timeline for completing the candidate's proposed research. The oral part may also include questions on completed coursework.

[5] The dissertation must be completed and orally defended. Additionally, evidence must be submitted for a minimum of two publications related to the dissertation research, including one of which is submitted to an internationally recognized journal, such as IEEE Transactions, and the second of which may be with a professional conference, such as an IEEE conference. Submissions must be completed prior to the final oral exam. For more details on the publication requirement, see https://gradschool.nmsu.edu/Current%20Students/College-of-Engineering-Ph.D.-Publication-Requirement-Form1.pdf.

Other limitations and requirements that apply to all Ph.D. degrees are described elsewhere in this catalog.

Included Prefixes

Graduate course work credits from the following prefixes are permitted for the Ph.D. degree. If a graduate course outside this list of prefixes logically fits into the Ph.D. program, see your graduate advisor about requesting an exception; note that exceptions must be approved before taking the class.

Prefix	Title	Credits
College of Agriculture/Consumer/Environmental Sciences		
AEEC		
ENVS		
GENE		
College of Arts and Sciences		
ASTR		
BCHE		
BIOL		
CSCI		

CHEM	
GEOL	
GPHY	
LING	
MATH	
MOLB	
PHYS	
STAT	
College of Business	
ECON	
MGMT	
College of Engineering	
A E	
A EN	
CHME	
E E	
ENVE	
I E	
M E	
SUR	

Engineering (Industrial Engineering) - Doctor of Philosophy

The Department of Industrial Engineering offers a Doctor of Philosophy (Ph.D.) in Engineering with a specialization in Industrial Engineering.

The program of study leading to the Ph.D. degree must include a minimum of 36 graduate course credits, plus 24 dissertation research credits (9 credits at the IE 600 level and 15 credits of IE 700). Among the 36 graduate course credits, 18 credits must be from IE 500-level courses relevant to your research. Typical areas include statistics, electrical engineering, mathematics, or mechanical engineering. You may not transfer credits from your master's degree to meet this requirement. Refer to http://ie.nmsu.edu for a program description and current research areas.

Time Line for a Ph.D. Program

Individual programs vary, however, you can expect to spend three to five years (mostly full-time) earning your degree. Below are the key milestones of every program:

Admittance to the program and begin coursework: In coordination with your academic advisor, select 500-level courses to help you prepare for the Qualifying Exam. This would include IE topics on the general part of the exam, as well as topics related to your intended research.

Pass the qualifying examination: It is expected that students will take the qualifying examination within one year of their entering the Ph.D. program. Details regarding the examination may be obtained from the department office. If you do not pass the examination on your first attempt, you may be allowed, based on the recommendation of the faculty, to take the exam again the next time it is offered. If you do not pass the examination on your second attempt, you will be dropped from the Ph.D. program.

Form your committee and prepare a research proposal: During this time, you are expected to be a full-time student. The Graduate School requires at least one academic year of residency as defined in the Graduate Catalog. You should take at least nine credits of IE 600-level courses. At this time, you should expect to file your *Program of Study* with the Graduate School.

Pass the comprehensive examination: The comprehensive examination consists of two parts: a written and oral presentation of your research proposal. You must pass the comprehensive examination within 24 months of passing the qualifying examination. You may not take 700-level courses until you have passed both parts of your comprehensive examination.

Conduct research, write the dissertation, and pass the final examination: Throughout your doctoral program, your advisor and committee will oversee your progress. During this time, you will be enrolled in IE 700 courses. Your program must include a minimum of 15 credits of IE 700 Doctoral Dissertation. There is a minimum time span of one year between the comprehensive and final oral examinations (e.g., the dissertation defense). If more than five years have passed since you passed the comprehensive examination, you may be required to pass another comprehensive examination.

Prefix	Title	Credits
Pass Qualifying Exam		
Graduate Electives (credits beyond the Bachelor's degree)		**36**
Pass Comprehensive Exam		
Doctoral Dissertation		**24**
I E 700	Doctoral Dissertation	
Defend doctoral dissertation		
Total Credits		**60**

Ph.D. Qualifying Exam

1. Format

- Exam offered in two parts:
  - Foundations of IE, all day Thursday
  - IE Specific area exam: all day Friday.

2. Content

- **IE Foundation Portion of the Exam** (all students will take an identical exam for the foundation portion). The Foundation portion consists of four areas:
  - Operations Research Deterministic and Stochastic
  - Probability and Statistics
  - Industrial Engineering Theory
  - Combination of questions from one or all of these four areas. Selection of Manufacturing, Engineering Economy, Process Improvement, Methods.
- **IE Research Topics Portion of the Exam** (Each student taking the qualifier must select two of the topics listed below for testing at least 6 weeks before the exam is offered. The student will work with his or her advisor on selecting the topics. The advisor must submit the two selected areas to the Chair of the Examining Committee at least one month before the exam is offered.)
  - Manufacturing
  - Computer/Simulation Modeling
  - Stochastic Operations Research
  - Queuing Theory
  - Design Optimization (product, facility, process, etc.)
  - Algorithmic Optimization (Dynamic cases)
  - Quality Control
  - Systems Integration and Control

- Facility Design and Layout
- Reliability

Additional Requirements

Ph.D. candidates in the College of Engineering, who have successfully completed their Ph.D. Qualifying Examination after January 1, 2018, must satisfy a publication requirement which requires two papers:

> Paper #1: An archival paper accepted or published in any journal listed in the source publication list for the Web of Science, or a refereed Journal or Conference Proceeding approved by the student's doctoral committee and the cognizant Department Head(s), before the Doctorate of Philosophy final examination. The candidate should be listed as the lead author in Paper #1.
>
> Paper #2: An additional archival paper submitted, accepted, or published in any journal listed in the source publication list for the Web of Science. Alternatively, one conference paper accepted or published in national or international conference proceedings.

Engineering (Mechanical Engineering) - Doctor of Philosophy

Requirements for Ph.D. Degree

The student's academic program is not judged satisfactory unless it prepares the student to contribute to the advancement of knowledge in the field of Mechanical Engineering. The Degree of Doctor of Philosophy is indicative of distinguished achievement in the areas of scholarship and original research. Therefore, a dissertation of high quality is required of all doctoral students in Mechanical Engineering.

The Ph.D. program is open to students with a master's degree. Exceptionally well qualified students may petition for direct entry to the Ph.D. program without first obtaining a master's degree.

A student is required to have one refereed journal paper accepted and a second one accepted or in review by graduation. The Ph.D. dissertation can be a compilation and reformatted version of these published or accepted journal papers. Exceptions may be made on case by case basis by the Department Head.

Prefix	Title	Credits
Pass Qualifying Exam [1]		
Graduate Coursework (Credits beyond the Bachelor's Degree) [2]		36
Pass Comprehensive Exam [3]		
Doctoral Dissertation [4]		24
M E 700	Doctoral Dissertation	
Complete and Defend Doctoral Dissertation		
Total Credits		**60**

1. It is expected that students will take the qualifying exam within one year of entering the Ph.D. program.
2. At least 18 of graduate coursework must support the student's research. The program of study may include up to 6 credits of M E 510 (special topics courses offered formally on a one-time basis) with the approval of the Graduate Coordinator.
3. The candidate must pass a comprehensive examination after the completion of adequate coursework and demonstration of satisfactory progress toward the doctoral dissertation. The specific format of the exam is at the discretion of the examination committee. The candidate may submit the proposal for the dissertation research that includes the candidate's current research, planned research directions, and a reasonable timeline for completing the candidate's proposed research if the committee requires.
4. This may include a maximum of 6 credit hours of M E 600 (https://catalogs.nmsu.edu/search/?P=M%20E%20600) Doctoral Research. M E 600 (https://catalogs.nmsu.edu/search/?P=M%20E%20600) Doctoral Research is intended for those students who have not completed the qualification examination, a prerequisite for M E 700 (https://catalogs.nmsu.edu/search/?P=M%20E%20700) Doctoral Dissertation.

Admission Requirements

For PhD Program, the Mechanical and Aerospace Engineering department asks for the following documents: Transcript, Three Recommendation Letters, Statement of Purpose, Resume, Writing Sample, and GRE. Also NMSU requires English Proficiency Tests such as TOEFL, IELTS, or Duolingo English Test for international students.

Ph.D. Program Transfer Credits

A student who has completed a Master of Science degree in M E, A E, or a closely related field may transfer up to 24 credits of graduate coursework, approved by the student's advisor, into a Ph.D. program of study.

Selection of Permanent Ph.D. Advisor

Newly admitted graduate students will be assigned a temporary advisor for the first semester. The student must select a permanent advisor before registering for the second semester. In selecting a permanent advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of enrollment to discuss specific objectives. The student should use these meetings to become familiar with faculty research interests and research projects currently in progress. The faculty member must consent (in writing) to serve as the student's advisor.

Policies governing the Ph.D. written Qualifying Examination, the Ph.D. written and oral comprehensive examination, the student's Ph.D. committee, and the Ph.D. dissertation are contained in the department's Graduate Program website.

Additional Requirements

Ph.D. candidates in the College of Engineering, who have successfully completed their Ph.D. Qualifying Examination after January 1, 2018, must satisfy a publication requirement which requires two papers:

> Paper #1: An archival paper accepted or published in any journal listed in the source publication list for the Web of Science, or a refereed Journal or Conference Proceeding approved by the student's doctoral committee and the cognizant Department Head(s), before the Doctorate of Philosophy final examination. The candidate should be listed as the lead author in Paper #1.
>
> Paper #2: An additional archival paper submitted, accepted, or published in any journal listed in the source publication list for the Web of Science. Alternatively, one conference paper accepted or published in a national or international conference proceedings.

Experimental Psychology - Doctor of Philosophy

The Ph.D. in psychology is offered in the major areas of cognitive, engineering and social psychology. Ph.D. candidates are required to complete the following coursework and tasks:

Prefix	Title	Credits
Core Course: (corresponding to the student's area of study)		**3**
PSYC 5310	Engineering Psychology	
PSYC 5320	Cognition	
PSYC 5330	Social Psychology	
Quantitative/Computer Methods Sequence:		**9**
PSYC 5110	Quantitative Methods in Psychology I	
PSYC 5120	Quantitative Methods in Psychology II	
PSYC 5210	Computer Methodology	
Content Courses:		**9**
PSYC 5340	Learning and Memory	
PSYC 5350	Sensation and Perception	
PSYC 540	History and Systems of Psychology	
Experimental Methods:		**6**
PSYC 5220	Methods in Cognitive Psychology	
PSYC 5230	Methods in Social Psychology	
PSYC 5410	Foundations of College Teaching	
Comprehensive Examination: [1]		
Work related training requirement: [2]		
Final Oral Examination: [3]		
Dissertation:		**18+**
PSYC 7000	Doctoral Dissertation	

1 Pass written and oral components of the comprehensive exam

2 Complete a work-related training requirement (i.e. complete an internship of at least 10 weeks duration, or teach at least one 3-credit undergraduate course independently: pre-teaching requirements listed here (https://psychology.nmsu.edu/pages/subpages/ph-d-degree-requirements.html))

3 Pass a final oral examination that consists primarily of an evaluation of the dissertation and the candidate's defense of it, but may extend over the entire field of the candidate's study

Students are encouraged to register for one credit of PSYC 590 Research Seminar in Psychology each semester.

Students should also enroll in at least one credit of the appropriate supervised research course each semester (i.e., PSYC 6991 Doctoral Research, PSYC 698 Special Research Programs, or PSYC 7000 Doctoral Dissertation.

When offered, PSYC 5996 Special Topics may be considered content, quantitative methods, or experimental methods, depending on the specific course content.

Food Science - Doctor of Philosophy

Coursework for students with a Master of Science degree should complete 42 credits:

Prefix	Title	Credits
Requirements		
Area of Research Emphasis		
Students will take at least 15 credits from the following: [4]		*15*
FSTE 6997	Special Research Program	
FSTE 6991	Doctoral Research	
FSTE 5110	Food Microbiology	
FSTE 5120	Food Chemistry	
FSTE 5230	Food Processing Technologies	
FSTE 5250	Sensory Evaluation of Foods	
FSTE 5140	Food Analysis	
FSTE 5130	Food Preservation	
FSTE 5997	Special Research Programs	
Students are required to take at least 6 statistic credits from the following: [1]		*6*
AXED 5510	Research Methods	
AXED 5515	Data Collection and Analysis	
AEEC 5110	Introduction to Quantitative Methods	
Required Courses		*21*
FSTE 6910	Doctoral Seminar	
FSTE 7000	Doctoral Dissertation	
Total Credits		**42**

Coursework for students with a Bachelor of Science degree should complete 72 credits:

Prefix	Title	Credits
Requirements		
Statistics, Research Methodology, and Master Thesis Courses		*12*
Statistics Course [1]		3
Research Methodology Course [2]		3
FCSC 5999	Master's Thesis (at least 6 credits must be taken)	
Take at least 18 credits from the following: [3]		18
FSTE 5110	Food Microbiology	
FSTE 5120	Food Chemistry	
FSTE 4997	Special Problems	
FSTE 4996	Special Topics	
FSTE 5250	Sensory Evaluation of Foods	
FSTE 5140	Food Analysis	
Area of Research Emphasis		
Students will take at least 15 credits from the following: [4]		15
FSTE 6997	Special Research Program	
FSTE 6991	Doctoral Research	
FSTE 5110	Food Microbiology	
FSTE 5120	Food Chemistry	
FSTE 5230	Food Processing Technologies	
FSTE 5250	Sensory Evaluation of Foods	
FSTE 5140	Food Analysis	

FSTE 5130	Food Preservation	
FSTE 5997	Special Research Programs	
Students are required to take at least 6 statistic credits from the following: [1]		*6*
AXED 5510	Research Methods	
AXED 5515	Data Collection and Analysis	
AEEC 5110	Introduction to Quantitative Methods	
Required Courses		*21*
FSTE 6910	Doctoral Seminar	
FSTE 7000	Doctoral Dissertation	
Total Credits		**78**

1 Students select a statistics course with the help of their committee chair (major advisor). Alternative statistic courses can be taken besides AXED 5510 Research Methods, AXED 5515 Data Collection and Analysis, and AEEC 5110 Introduction to Quantitative Methods.

2 Students select a research methodology course with the help of their committee chair (major advisor).

3 Students must take a total of 30 credits to continue to the Area of Research Emphasis coursework requirement for the Ph.D.

4 Other courses may be used to satisfy the required credits as approved by the student's committee chair (major advisor).

Students will select classes with the help of their committee chair (major advisor) based on background and interests. Students are expected to complete their degree in three to four years but may be allowed up to seven years to complete the requirements. Candidates are paired with a committee chair from their department and then they select two other committee members, at least one must be from another department.

Ph.D. candidates must meet the following requirements:

- Completion of a minimum of 6 semesters with at least two occurring after the comprehensive exam.
- Maintain a minimum grade point average of 3.0
- Completion of the degree within seven years of admission.
- Enrollment in at least 1 credit per semester, or 9 credits if on a GA.
- Enrollment in FSTE 6910 Doctoral Seminar, Doctoral Seminar, each year for three semesters.
- Gain experience as a teaching assistant for at least two semesters.
- Present a public seminar during FSTE 6910 Doctoral Seminar to be submitted as an oral or poster presentation at a regional/national or international conference.
- Have at least one refereed journal as the first author accepted for publication
- Yearly completion of Student Progress Review
- Successful completion of three exams:

1. Qualifying exam – completed by the end of the first year. Content to be determined by the Committee.

2. Comprehensive exam – The comprehensive examination consists of two parts: written and oral presentation of the research proposal. Students must pass the examination within 24 months of passing the qualifying examination and may not take 7000-level courses until both parts of the comprehensive examination have been passed.

3. Final oral exam – taken after completing all degree requirements, but not earlier than one month before completing six registration units. During this time, students are enrolled in 7000-level courses. The program of study must include a minimum of 18 credits of doctoral dissertation. There is a minimum period of one year between the comprehensive examination and the final oral examination ("dissertation defense").

Satisfactory completion of a dissertation under the supervision of the Committee.

Students should consult the Graduate School website for specific information regarding the completion of the degree and submission of the dissertation

Geography - Doctor of Philosophy

Overview

The New Mexico Doctoral Program in Geography (NMDPG) is a collaborative Ph.D. program jointly administered by the Department of Geography & Environmental Studies at New Mexico State University (NMSU) and the Department of Geography & Environmental Studies at the University of New Mexico (UNM). This unique partnership provides students with access to faculty expertise, research resources, and coursework across both institutions, offering a truly interdisciplinary and flexible approach to advanced geographic study and enabling students to pursue a wide range of career paths in higher education, government, private industry, and nonprofit organizations.

A Research-Driven, Interdisciplinary Approach

The Ph.D. in Geography is a rigorous, research-intensive program that cultivates expertise across a wide range of geographic subfields, including geographic information science and technology, landscape ecology, biogeography, political ecology, environmental policy and planning, geohumanities, historical geography, and health geography. The program builds on the existing strengths and resources of both universities, with a curriculum designed to evolve in response to emerging human-environment challenges and shifting career demands within professional geography.

The program's primary regional foci include New Mexico and the broader Southwest, the Mexico-U.S. borderlands, and Latin America, providing students with opportunities to engage in place-based research that informs both academic and applied geographic inquiry.

Students develop proficiency in quantitative, qualitative, critical, and creative research methods, learning to integrate these approaches into a mixed-methods framework that deepens their ability to analyze complex geographic issues. The program provides a strong theoretical foundation, methodological expertise, and hands-on experience, preparing students to tackle urgent global and regional challenges through innovative geographic research.

Each student works with faculty advisors to develop a personalized course of study, combining core geographic theory, research design, and specialized coursework aligned with their research interests and professional aspirations.

Ph.D. students collaborate closely with faculty advisors and dissertation committees from both NMSU and UNM, benefiting from interdisciplinary mentorship and cross-campus resources. The curriculum balances theoretical training, applied research, and technical proficiency, equipping students to conduct original, high-impact geographic research that

advances knowledge in the discipline while informing policy, practice, and community-based solutions beyond academia.

Collaborative Learning & Distinctive Opportunities

Students reside at either NMSU (Las Cruces) or UNM (Albuquerque), selecting a home institution based on faculty alignment with their research interests. However, students engage with faculty, resources, and coursework on both campuses, either in person or remotely.

The program also offers:

- State-of-the-art research facilities, including GIS and remote sensing labs with UAS technology, field spectroscopy, and survey-grade GPS units.
- Access to distinctive landscapes for field-based research, spanning the Chihuahuan Desert, Rocky Mountains, U.S.-Mexico borderlands, and urban centers.
- A collaborative, interdisciplinary environment, drawing from strengths in geography, anthropology, environmental science, public health, and more.
- Opportunities for teaching and research assistantships, providing funding and professional experience.

Program Structure & Coursework

The Ph.D. program requires a minimum of 66 credits beyond the bachelor's degree, including:

- Core courses in geographic theory, application, and research design
- Elective courses tailored to students' research interests
- Comprehensive exams to assess competency across geographic subfields and expertise within students' areas of specialization
- An original and significant dissertation

Students develop an individualized program of study in consultation with their faculty advisor and dissertation committee, ensuring alignment with career goals and disciplinary expertise.

Who Should Apply?

Applicants from diverse academic backgrounds are encouraged to apply. While a master's degree in geography or a related field is preferred, students without prior geography coursework may be required to take preparatory courses. Prospective students should consult with the Graduate Program Director at their chosen home institution to discuss application requirements and pathways into the program.

Career Pathways

Graduates of the Ph.D. in Geography program pursue careers in:

- Higher education (teaching and research in universities and colleges)
- Government agencies and NGOs (e.g., environmental management, conservation, and climate policy)
- Private industry (e.g., data science, geospatial analysis, and environmental consulting)
- Public health and emergency management (e.g., epidemiology, disaster response, and risk assessment)

The program equips students with theoretical expertise, technical skills, and research experience needed to lead innovative geographic inquiry and apply their knowledge to real-world challenges.

Program Learning Outcomes

Upon completion of the Ph.D. in Geography, students will be able to:

1. Apply advanced geographic knowledge and skills, demonstrating a critical understanding of how their expertise connects to broader geographic and interdisciplinary fields.
2. Conduct all stages of an independent, original, and significant research project, including conceptualization, planning, implementation, management, and communication.
3. Integrate communication, teaching, and professional knowledge to excel in academic, governmental, and industry careers.

More Information

For details on course and credit requirements, major program milestones, and additional academic guidelines, please refer to the NMDPG Handbook available under the Requirements tab.

Course and Credit Requirements

For details on course and credit requirements, major program milestones, and additional academic guidelines, please refer to this NMDPG Handbook (https://geography.nmsu.edu/phd-program/nmdpg_handbook_ay2425_2024-08-09.pdf).

Overall Requirements

All students in the NMDPG must successfully complete required credits and milestones, as shown below. Each of the milestone requirements is addressed in separate sections of the NMDPG handbook.

Specific Coursework Requirements

The New Mexico Doctoral Program in Geography (NMDPG) is designed to train students in both basic and applied geographic research, with a topical focus on human-environment interactions.

This program is unique because it is a consortium between two universities. This means that policies of UNM'S Office of Graduate Studies and NMSU's Graduate School together establish the general requirements for the NMDPG, which also has program-specific requirements for all students.

There are three formal course requirements for all NMDPG students. These core courses are Geog 601, GEOG 602 and GEOG 603.

All students must complete:

- at least 48 credit hours of graduate coursework.
- at least 18 credit hours of graduate coursework after completion of the Master's degree.
- at least 24 credit hours of graduate coursework at the home university.
- at least 18 credit hours of graduate coursework in UNM or NMSU courses numbered 500 or above.
- at least 18 hours of dissertation credits, which are in addition to other coursework requirements (GEOG/GESP 699 at UNM, or GEOG/GESP 700 at NMSU).
- at least three hours of graduate credit in the semester in which the comprehensive examination is taken.

- at least one hour of graduate credit in the semester in which they complete degree requirements.

Health Equity Sciences - Doctor of Philosophy

Program Description

The doctoral program in Health Equity Sciences (HES) focuses on health disparities and equity from public health, population health, and community health perspectives. Underserved and marginalized groups experience health disparities attributable to economic, social, cultural, and environmental disadvantages at higher rates than other groups. The HES program provides advanced training to prepare graduates to become health equity researchers and to assume leadership positions in governmental (local, state, federal) and non-governmental agencies, public health and social justice organizations, health care organizations, and institutions of higher learning. Graduates will have the ability to conduct original research that addresses complex health problems, develop culturally competent community-based programs, and design and conduct program evaluations. They will be able to apply their expertise in research methodology, statistical analysis, and health communication in many settings, including rural, tribal, border, and other underserved communities. The focus of the program will be on research to address existing and emerging health disparities and health equity. Through a cooperative agreement with the University of New Mexico, students are provided with advanced comprehensive training to prepare them for positions of leadership in state, federal, and global governmental and non-governmental agencies, public health and social justice organizations, health care provider organizations, and institutions of higher learning.

Program Curriculum

NOTE: Students will participate in a mix of program-specific courses using the HES (i.e., Health Equity Sciences) prefix and graduate-level courses from across the NMSU campus and from UNM by cooperative arrangement/MOU. All HES courses will be at the doctoral level (6000 or 7000), including content offerings and research/dissertation hours; courses from across the NMSU campus will be graduate-level (5000 or higher).

Prefix	Title	Credits
Core Courses (24 Credits)		
HESC 6110	Doctoral Seminar in Health Equity	3
HESC 6120	Quantitative Research Methods in Health Equity Sciences	3
HESC 6130	Seminar in Behavioral and Social Change for the Promotion of Health Equity	3
HESC 6250	Design and Evaluation of Programs to Promote Health Equity	3
HESC 6210	Advanced Multiple Regression for Health Equity Sciences	3
HESC 6220	Regression-Based Structural Equation Modeling for Health Equity Sciences	3
Qualitative Research Elective (3 credits) Choose one from the following:		**3**
CEPY 6410	Introduction to Qualitative Research	
ANTH 579	Qualitative Data Analysis and Interpretation	
SOCI 5157	Seminar in Qualitative Research Methods	
COMM 5140	Qualitative Research Methods in Communication	
POLS 503	Qualitative Research Methods	
Statistics or Research Methods Elective (3 credits) Choose one from the following:		**3**
SOCI 5160	Seminar in Data Visualization	
A ST 505	Statistical Inference I	
A ST 506	Statistical Inference II	
A ST 511	Statistical Methods for Data Analytics	
A ST 515	Statistical Analysis with R	
GEOG 578	Fundamentals of GIS	
GEOG 601	Geographic Theory and Application	
PSYC 5110	Quantitative Methods in Psychology I	
Track (12 credits) Select any four courses within one chosen track: [1]		**12**
Socio-Cultural & Behavioral Sciences		
SOCI 5415	Seminar in Social Stratification	
PHLS 5610	Health Disparities: Determinants and Interventions	
PHLS 5630	International Health Problems	
PHLS 5640	Rural Health Issues	
PHLS 5660	U.S.-Mexico Border Health Issues	
PHLS 5680	Hispanic Health Issues	
PHLS 5650	Coping with Loss and Grief: A Cross-Cultural Perspective	
PHLS 5670	American Indian Health	
ANTH 531	Issues in Nutritional Anthropology	
POLS 587	Seminar in Religion and Politics	
ENGL 560	Proposal and Grant Writing	
Health Across the Lifespan		
PHLS 5710	Introduction to Gerontology	
PHLS 5720	Health Promotion for the Older Adult	
PHLS 5730	Adulthood and Aging	
ENGL 560	Proposal and Grant Writing	
Health Administration and Policy		
PHLS 5160	Public Health Policy Analysis	
PHLS 5310	Principles of Health Program Management	
PHLS 5330	Public Health Finance and Budget Management	
PHLS 5350	Public Health Policy Analysis	
ENGL 560	Proposal and Grant Writing	
Applied Biostatistics		
A ST 505	Statistical Inference I	
A ST 506	Statistical Inference II	
A ST 507	Advanced Regression	
A ST 509	Statistical Models for Complex Data Structures	
A ST 511	Statistical Methods for Data Analytics	
A ST 515	Statistical Analysis with R	
A ST 555	Applied Multivariate Analysis	
A ST 565	Statistical Analysis I	
STAT 5330	Continuous Multivariate Analysis	
ENGL 560	Proposal and Grant Writing	
Completion of Preliminary Paper/Comprehensive Exam [2]		
Research and dissertation courses (18 hours)		**18**
HESC 6991	Doctoral Research	
HESC 6997	Independent Study	
HESC 7000	Doctoral Dissertation	
Completion of Written dissertation and oral defense [3]		
Total Credits		**54**

1 Track Elective courses will be determined with the consultation of the student's advisor.
2 Pass written and oral components of the preliminary paper/ comprehensive exam
3 Pass written and oral components of the dissertation

First Year		
Fall		**Credits**
HESC 6110	Doctoral Seminar in Health Equity	3
HESC 6130	Seminar in Behavioral and Social Change for the Promotion of Health Equity	3
HESC 6210	Advanced Multiple Regression for Health Equity Sciences	3
	Credits	**9**
Spring		
HESC 6120	Quantitative Research Methods in Health Equity Sciences	3
HESC 6220	Regression-Based Structural Equation Modeling for Health Equity Sciences	3
Concentration Elective		3
	Credits	**9**
Summer		
HESC 6991	Doctoral Research	3
	Credits	**3**
Second Year		
Fall		
Qualitative Methods Elective		3
Statistics/Research Methods Elective		3
Track Elective		3
	Credits	**9**
Spring		
HESC 6250	Design and Evaluation of Programs to Promote Health Equity	3
HESC 6991	Doctoral Research	3
Track Elective		3
	Credits	**9**
Summer		
HESC 6991	Doctoral Research	3
	Credits	**3**
Third Year		
Fall		
HESC 7000	Doctoral Dissertation	3
Track Elective		3
	Credits	**6**
Spring		
HESC 7000	Doctoral Dissertation	3
Track Elective		3
	Credits	**6**
	Total Credits	**54**

Kinesiology - Doctor of Philosophy

Coursework

The Ph.D. in Kinesiology requires a minimum of 36 credit hours of formal coursework (beyond a masters degree) and an expected 24 credit hours of research and dissertation work. Thus, the minimum expected credit hour accumulation is 60 credit hours.

At least 12 credit hours must come from graduate courses in the department of Kinesiology. NMSU's department of Kinesiology offers courses across a range of foundational knowledge areas including:

1. Relationships among physical activity, health, and quality of life
2. Scientific foundations for the study of physical activity and human movement
3. The social, cultural, and historical context of the study of physical activity
4. The practice of physical activity

A minimum of 12 credit hours must be taken in research methodologies, at least 3 credits of which must be in experimental statistics and at least 3 credits from a qualitative methods course(s). There are many options for these courses on the NMSU campus that will permit the student to meet this requirement.

The remaining 12 credit hours are taken at the direction of the student's advisor and committee and agreed upon at the time of the student's qualifying exam (see below).

Examinations

Students seeking the Doctor of Philosophy degree in Kinesiology must pass a (1) Qualifying Examination that must be completed before accumulating more than 24 credit hours towards their degree, a (2) Comprehensive Exam including written and oral elements that must be completed before beginning a final dissertation project, and a (3) Final Exam that includes the defense of their final dissertation study.

Dissertation

The candidate for the degree of Doctor in Philosophy in Kinesiology must complete a dissertation in a focused area of study. The student and their committee must agree upon the dissertation topic, and approval of the dissertation requires the consent of the plurality of the student's committee members. The student must complete a minimum of 18 dissertation credit hours.

Graduate courses currently offered in the department of Kinesiology

Prefix	Title	Credits
Kinesiology Course Requirements		**12**
SPMD 4540	Psychology of Coaching in Sport	
SPMD 4620	Nutrition and Metabolism of Sport	
SPMD 5350	Principles of Strength and Conditioning	
SPMD 5410	Biomechanics	
SPMD 5450	Exercise for Special Populations	
SPMD 5510	Psychology of Sport	
SPMD 5550	Skill Acquisition and Performance	
SPMD 5575	Advanced Motor Development	
SPMD 6310	The Social Construction of the Body	
SPMD 6350	Advanced Exercise Physiology	
SPMD 6410	Cardiovascular Physiology	
SPMD 6450	Skeletal Muscle: Structure and Function	
SPMD 6510	Designing Resistance Training Program	
SPMD 6996	Special Topics	
Research Methodologies		**12**
A ST 505	Statistical Inference I	

A ST 506	Statistical Inference II	
A ST 507	Advanced Regression	
A ST 555	Applied Multivariate Analysis	
EDUC 6440	Qualitative Research I	
PSYC 5220	Methods in Cognitive Psychology	
PSYC 5110	Quantitative Methods in Psychology I	
PSYC 5120	Quantitative Methods in Psychology II	
SOCI 5157	Seminar in Qualitative Research Methods	
SPMD 5310	Inferential Statistics in Sports and Exercise Science	
SPMD 5370	Research Methods in Kinesiology	
Research and Dissertation		**24**
SPMD 4997	Problems (May be repeated up to 9 credits)	
SPMD 6710	Project (May be repeated up to 12 credits)	
SPMD 6750	Kinesiology Research (May be repeated up to 15 credits)	
SPMD 7000	Doctoral Dissertation	
Electives	**Elective hours are taken at the direction of the student's advisor and committee**	**12**
Total Credits		**60**

Suggested Plan of Study

First Year		
Semester 1		**Credits**
SPMD 5450	Exercise for Special Populations	3
SPMD 6410	Cardiovascular Physiology	3
A ST 505	Statistical Inference I	4
	Credits	**10**
Semester 2		
SPMD 5410	Biomechanics	3
SPMD 5575	Advanced Motor Development	3
A ST 506	Statistical Inference II	3
	Credits	**9**
Second Year		
Semester 3		
SPMD 6750	Kinesiology Research	3
SPMD 6710	Project	3
SPMD 6996	Special Topics (Research Methodology)	3
SOCI 5157	Seminar in Qualitative Research Methods	3
	Credits	**12**
Semester 4		
SPMD 6310	The Social Construction of the Body	3
SPMD 6710	Project	8
	Credits	**11**
Third Year		
Semester 5		
SPMD 7000	Doctoral Dissertation	9
	Credits	**9**
Semester 6		
SPMD 7000	Doctoral Dissertation	9
	Credits	**9**
	Total Credits	**60**

Mathematics - Doctor of Philosophy

Candidates for the Ph.D. degree in the Department of Mathematical Sciences must pass

- a qualifying examination,
- a basic comprehensive written examination,
- an advanced comprehensive examination with written and oral components, and
- a final oral doctoral thesis examination.

These are briefly described below. For more information, see the Graduate School requirements in this catalog.

Course Requirements

Prefix	Title	Credits
Core Requirements		
MATH 5450	Abstract Algebra II: Fields, Rings and Modules	3
MATH 5460	Measure and Integration	3
MATH 5463	Real Analysis	3
MATH 5465	Introduction to Functional Analysis	3

In addition to the core requirements, each student must complete one of the following two options.

Prefix	Title	Credits
Option 1		
Choose three course sequences from Group A, as described below.		
Option 2		
Choose two course sequences from Group B and one from Group A, as described below.		

Course Sequences

Group A

Prefix	Title	Credits
Algebra: Choose two of the following.		
MATH 5453	Module Theory and Homological Algebra	
MATH 5455	Introduction to Commutative Algebra and Algebraic Geometry	
MATH 5458	Topics in Algebra	
Foundations: Choose two of the following.		
MATH 5430	Mathematical Structures in Logic	
MATH 5435	Universal Algebra and Model Theory	
MATH 5438	Topics in Foundations	
Topology: Choose two of the following.		
MATH 5420	Topology I	
MATH 5425	Topology II	
MATH 5428	Topics in Topology	

Group B

Prefix	Title	Credits
Differential Equations: Choose two of the following.		
MATH 5440	Partial Differential Equations I	
MATH 5440	Partial Differential Equations I	
MATH 5468	Topics in Analysis	
Probability: Choose two from the following.		
STAT 5310	Foundations of Probability	
STAT 5320	Advanced Topics in Stochastic Processes	
STAT 5348	Topics in Probability and Statistics	
Statistics: Choose two of the following.		

STAT 5330	Continuous Multivariate Analysis
STAT 5335	Linear Models
STAT 5340	Advanced Theory of Statistics I
STAT 5345	Advanced Theory of Statistics II
STAT 5348	Topics in Probability and Statistics

Additional Course Requirements

A full time graduate student is required to register each semester for at least two Math/Stat graduate courses. With the exception of the final semester, of these two, only one may be MATH 6991 Doctoral Research or MATH 7000 Doctoral Dissertation. Moreover, these two courses **must not** include:

Prefix	Title	Credits
MATH 5210	Complex Variables	3
MATH 5220	Fourier Series and Boundary Value Problems	3
MATH 5997	Directed Reading	1-6
MATH 5120	History and Theories of Mathematics Education	3
MATH 5130	Algebra with Connections	3
MATH 5140	From Number to Algebra	3
MATH 5150	Data Analysis with Applications	3
MATH 5160	From Measurement to Geometry	3
MATH 5170	Using Number Throughout the Curriculum	3
MATH 5180	Geometry with Connections	3
MATH 5999	Master's Thesis	1-15

Qualifying Examination

Every student admitted to the Ph.D. program must pass a written qualifying examination. Students who complete their mathematics Master's degree at NMSU may request that the Master's written examination also fulfill the Ph.D. qualifying examination requirement. In all other cases, the student takes a written Ph.D. qualifying exam. This exam is identical to the Master's written exam (based on the courses 5350/5360) and is administered and graded at the same time, but a higher passing score is required than for a Master's student. Ph.D. candidates need to pass the exam within their first year.

Basic Comprehensive Examinations

Every Ph.D. student must pass a Basic Comprehensive Exam, either in Algebra or in Analysis. The Algebra exam is based on the courses MATH 5340 Abstract Algebra I: Groups and Rings and MATH 5450 Abstract Algebra II: Fields, Rings and Modules and the Analysis exam is based on the courses MATH 5365 Introduction to Real Analysis II and MATH 5460 Measure and Integration.

These exams are offered every August and January. A student choosing to take the exam in Algebra must pass the exam within fourteen months of completing Math 581; similarly, a student taking the exam in Analysis must pass the exam within fourteen months of completing MATH 5460. Students failing to pass the exams within this period of time may be removed from the program. Students will normally not be given more than two attempts at any one exam.

Advanced Comprehensive Examinations

Candidates for the Ph.D. must pass an advanced comprehensive examination in their chosen research area. The examination has a written and an oral component. The written exam, which is written and administered by the student's committee, is based on two of the student's courses, normally among those listed in Options 1-2, chosen by the student in consultation with his/her committee and approved by the Graduate Studies Committee. Full-time students should complete the written component of the Advanced Comprehensive Exam after passing the Basic Comprehensive Exam and in the first two years. Those who have not made substantial progress towards completion of their written exams at the start of the fifth semester may be removed from the program. Students who have not completed the written exams by the start of the sixth semester will normally have any departmental funding revoked. The student must take the oral part of the exam at the end of the semester after completing the advanced written comprehensive exam. For the oral exam, the student should present a proposed direction for thesis work.

Final Oral Exam

This is an exam over the student's thesis. It is administered by the student's thesis committee.

Molecular Biology - Doctor of Philosophy

Prefix	Title	Credits
Phase I Core Courses		
MOLB 520	Molecular Cell Biology	3
MOLB 542	Biochemistry I	3
MOLB 545	Molecular and Biochemical Genetics	3
Molecular Biology Tier II Courses		
Select at least 9 credits from the following:		9
AGRO 516	Molecular Analysis of Complex Traits	
ANSC 602	Advanced Reproductive Physiology (fo)	
ANSC 621	Metabolic Functions and Dysfunctions (fe)	
GENE 486	Genes and Genomes	
BCHE 546	Biochemistry II	
BCHE 647	Physical Biochemistry	
BIOL 451	Physiology of Microorganisms	
BIOL 470	Developmental Biology	
BIOL 474	Immunology	
BIOL 475	Virology	
BIOL 477	Applied and Environmental Microbiology	
BIOL 478	Molecular Biology of Microorganisms	
BIOL 490	Neurobiology	
BIOL 541	Professional Development Seminar	
BIOL 550	Special Topics	
BIOL 577	Advanced Topics in Environmental Microbiology	
BIOL 590	Neuroscience	
BIOL 698	Selected Topics	
EPWS 486	Plant Virology	
MOLB 546	Biochemistry II	
MOLB 650	Advanced Topics in Molecular Biology	
TOX 461	Toxicology I	
Other Course Requirements		
A ST 505	Statistical Inference I (or equivalent course)	4
BIOL 540	Science and Ethics	1-3
BIOL 490	Neurobiology	3
MOLB 590	Discussions in Molecular Biology	1

MOLB 597	Laboratory Rotations/Research Discussions	1-3
Dissertation		18
MOLB 700	Doctoral Dissertation Research	
Total Credits		**46-50**

[1] PhD candidates must enroll for 18 credits MOLB 700 Doctoral Dissertation Research. May register for additional credits to maintain full-time status.

The Molecular Biology program also offers formal minors in molecular biology or bioinformatics.

Nursing Practice (Nurse Anesthesiology) - Doctor of Nursing Practice

The Doctor of Nursing Practice (DNP) degree concentration in Nurse Anesthesiology focuses on rural health and health disparities. Graduates will be qualified to take the national certification exam administered by the National Boards of Certification and Recertification of Nurse Anesthetists to become a certified registered nurse anesthetist (CRNA). In addition to the DNP core courses and nurse anesthesiology didactic course, Residents complete a minimum of 2400 supervised clinical contact hours completed in their clinical specialty and related areas. Courses for this degree are delivered through a combination of in-person didactic and laboratory experiences at the Las Cruces campus, and asynchronous and synchronous online learning. The majority of clinical training is completed at hospitals and surgical centers in the Las Cruces/El Paso and Albuquerque/Santa Fe regions. Residents complete a required rural New Mexico clinical rotation.

For application information, visit the **Nurse Anesthesiology webpage (https://schoolofnursing.nmsu.edu/graduate-program/doctor-of-nursing-practice-dnp.html)** or contact the Nursing Graduate Advisor for more information about application and admission requirements at (575) 646-3688.

Prefix	Title	Credits
NURS 5120	Nursing Informatics	3
NURS 6112	Population Health Leadership and Epidemiologic Decision-Making	3
NURS 6115	Advanced Nursing Knowledge and the DNP Role	3
NURS 6120	Quality Improvement in Healthcare	3
NURS 6125	Evidence-Based Practice in Healthcare	3
NURS 6135	Interdisciplinary Leadership and Role Development for Practice Excellence	3
NURS 6150	Advanced Anatomy	3
NURS 6155	Advanced Physiology	3
NURS 6160	Chemistry and Physics for Anesthesia	3
NURS 6215	Professional Aspects of Nurse Anesthesiology Practice	3
NURS 6230	Advanced Clinical Pharmacology	3
NURS 6235	Advanced Pathophysiology for Nurse Anesthesiology Practice	4
NURS 6240	Advanced Health Assessment for Nurse Anesthesiology Practice	4
NURS 6245	Advanced Pharmacology for Nurse Anesthesiology Practice	3
NURS 6250	Healthcare Policy and Ethics	3
NURS 6266	Strategic and Financial Decision-Making in Healthcare Systems	3
NURS 6270	Clinical Data Management and Analysis	2
NURS 6305	Introduction to the DNP Project	1
NURS 6610	Nurse Anesthesiology Principles I	2
NURS 6620	Nurse Anesthesiology Principles II	5
NURS 6630	Nurse Anesthesiology Principles III	3
NURS 6640	Nurse Anesthesiology Principles IV	3
NURS 6700	Introduction to the Clinical Residency	3
NURS 6710	Nurse Anesthesiology Clinical Residency I	3
NURS 6720	Nurse Anesthesiology Clinical Residency II	4
NURS 6730	Nurse Anesthesiology Clinical Residency III	4
NURS 6740	Nurse Anesthesiology Clinical Residency IV	4
NURS 6750	Nurse Anesthesiology Clinical Residency V	5
NURS 6770	Rural Health Anesthesiology Seminar	3
NURS 6771	Anesthesiology Integration/Clinical Correlation I	4
NURS 6991	DNP Project Development	2
NURS 6991	DNP Project Development	2
NURS 6991	DNP Project Development	1
Total Credits		**101**

New Mexico State University is a full member of the National Council of State Authorization Reciprocity Agreements consortium (SARA). Students will need to check the N (https://online.nmsu.edu/check-your-state/)MSU SARA website (https://online.nmsu.edu/state_authorization/Check%20Your%20State.html) before application to determine if NMSU has a reciprocity agreement with their home state before application is made.

The Doctor of Nursing Practice (DNP) degree concentration in Nurse Anesthesiology focuses on rural health and health disparities. Graduates will be qualified to take the national certification exam administered by the National Boards of Certification and Recertification of Nurse Anesthetists to become a certified registered nurse anesthetist (CRNA). In addition to the DNP core courses and nurse anesthesiology didactic course, CRNAs complete over 2000 hours of supervised clinical training.

For application information, visit the School of Nursing website (https://schoolofnursing.nmsu.edu/) or contact the Nursing Graduate Advisor for more information about application and admission requirements at (575) 646-3688.

First Year		
Spring		**Credits**
NURS 6115	Advanced Nursing Knowledge and the DNP Role	3
NURS 6135	Interdisciplinary Leadership and Role Development for Practice Excellence	3
NURS 6150	Advanced Anatomy	3
NURS 6155	Advanced Physiology	3
NURS 6160	Chemistry and Physics for Anesthesia	3
	Credits	**15**
Summer		
NURS 6120	Quality Improvement in Healthcare	3
NURS 6240	Advanced Health Assessment for Nurse Anesthesiology Practice	4
NURS 6305	Introduction to the DNP Project	1

NURS 6610	Nurse Anesthesiology Principles I	2
	Credits	**10**
Second Year		
Fall		
NURS 6125	Evidence-Based Practice in Healthcare	3
NURS 6230	Advanced Clinical Pharmacology	3
NURS 6620	Nurse Anesthesiology Principles II	5
NURS 6235	Advanced Pathophysiology for Nurse Anesthesiology Practice	4
	Credits	**15**
Spring		
NURS 6245	Advanced Pharmacology for Nurse Anesthesiology Practice	3
NURS 6630	Nurse Anesthesiology Principles III	3
NURS 6991	DNP Project Development	2
NURS 6700	Introduction to the Clinical Residency	3
NURS 6112	Population Health Leadership and Epidemiologic Decision-Making	3
	Credits	**14**
Summer		
NURS 6640	Nurse Anesthesiology Principles IV	3
NURS 6710	Nurse Anesthesiology Clinical Residency I	3
NURS 6991	DNP Project Development	2
	Credits	**8**
Third Year		
Fall		
NURS 6720	Nurse Anesthesiology Clinical Residency II	4
NURS 6270	Clinical Data Management and Analysis	2
NURS 6991	DNP Project Development	1
NURS 6266	Strategic and Financial Decision-Making in Healthcare Systems	3
	Credits	**10**
Spring		
NURS 5120	Nursing Informatics	3
NURS 6730	Nurse Anesthesiology Clinical Residency III	4
NURS 6770	Rural Health Anesthesiology Seminar	3
NURS 6250	Healthcare Policy and Ethics	3
	Credits	**13**
Summer		
NURS 6215	Professional Aspects of Nurse Anesthesiology Practice	3
NURS 6740	Nurse Anesthesiology Clinical Residency IV	4
	Credits	**7**
Fourth Year		
Fall		
NURS 6771	Anesthesiology Integration/Clinical Correlation I	4
NURS 6750	Nurse Anesthesiology Clinical Residency V	5
	Credits	**9**
	Total Credits	**101**

New Mexico State University is a full member of the National Council of State Authorization Reciprocity Agreements consortium (SARA). Students will need to check the NMSU SARA website (https://online.nmsu.edu/state_authorization/Check%20Your%20State.html) before application to determine if NMSU has a reciprocity agreement with their home state before application is made.

Physics - Doctor of Philosophy

For the Ph.D. degree, students must also pass the doctoral comprehensive examination, carry out original research, complete a dissertation, and pass a final oral examination. They must also pass or transfer at least 36 credits in formal courses numbered above 500 in physics, including 24 credits of core graduate courses, and complete at least 6 credits of formal courses numbered above 600. The total number of credits, including formal and informal course credits and a minimum of 18 dissertation credits, must be at least 72. Financial support is available to graduate students in physics through teaching and research assistantships and fellowships. Inquiries about these opportunities should be directed to the graduate program director.

Requirements

Prefix	Title	Credits
Core Courses		
PHYS 511	Mathematical Methods of Physics I	3
PHYS 551	Classical Mechanics	3
PHYS 554	Quantum Mechanics I	3
PHYS 555	Quantum Mechanics II	3
PHYS 561	Electromagnetic Theory I	3
PHYS 562	Electromagnetic Theory II	3
PHYS 576	Advanced Computational Physics I	3
PHYS 584	Statistical Mechanics	3
Select 3 credits from the following:		3
PHYS 571	Advanced Experimental Optics	
PHYS 575	Advanced Physics Laboratory	
PHYS 593	Advanced Experimental Nuclear Physics	
Total Credits		**27**

Plant and Environmental Science - Doctor of Philosophy

This degree is designed to provide students with a comprehensive knowledge of agronomy, horticulture, environmental science, or soil science, and training in methods of research affiliated with these disciplines. Emphases in agronomy and horticulture include sustainable crop production, plant breeding and genetics (alfalfa, chile, cotton, onion, peanut), forestry, turf grass management, plant-pest/disease/weed interactions, soil-water-plant relations, plant growth/development/physiology. Emphasis in environmental and soil science include environmental quality and ecosystem services, bioremediation, recycling of organic wastes and wastewater, water-use efficiency, soil-plant relations, soil-geomorphology and desert ecology, and fertility, chemistry, physics, and microbiology of soils. Students will be well-prepared to succeed as lead scientists in commercial companies, educational institutions, governmental agencies, and private production enterprises. Candidates for this degree must successfully conduct original publishable research in one of the above areas. They must also complete a minimum of 30 graduate credits beyond the Master's Degree, or 60 credits beyond the Bachelor of Science degree, based on a program of study approved by the student's graduate committee.

Candidates for a Ph.D. degree in Plant and Environmental Sciences are expected to demonstrate (via course work and independent study) a thorough understanding and proficiency in their chosen major, and if applicable, a minor area. Courses numbered 450-499 are designed for senior undergraduates and graduate students; 500-599 are for graduate

students working on a master's or doctoral degree; 6000-7000 are principally for students working on a doctoral degree. Qualifications for admission will be reviewed by the departmental graduate faculty.

Minimum Grade Point Average and Credit Hour Requirements: Your Doctorate degree requires a minimum of 30 completed degree hours beyond the Master's degree, or 60 degree hours beyond the Bachelor's degree, and a minimum GPA of 3.00 in all course work.

Degree residency requirement: 24 credits must be completed at NMSU.

Departmental Requirements: Selection of courses should be based on consultation with the student's graduate committee.

- Complete 2 credits of PLEN Seminar coursework: one credit each of AGRO 590 Graduate Seminar/HORT 590 Graduate Seminar/SOIL 590 Graduate Seminar and PLEN 6910 Doctoral Seminar.
- Complete 9 credits of course work numbered above 600: **exclusive** of PLEN 6991 Doctoral Research and PLEN 7000 Doctoral Dissertation credit.
- Complete at least 18 credits in PLEN 7000 Doctoral Dissertation after passing the comprehensive exam. A student may initially enroll in PLEN 7000 Doctoral Dissertation credits during the same semester that they take their comprehensive exam. However, this option is not recommended because if the student does not pass the exam, the 700-level credits will not count. Consequently, enrollment status, assistantship eligibility, and resident tuition rate eligibility could be jeopardized.
- Complete sufficient credits numbered 450 or above to bring total graduate credits to a minimum of 30 beyond the Master's degree, or a minimum of 60 credits beyond the Bachelor's degree.
- Complete a Qualifying Examination during the first (recommended) or second semester of study.
- Complete a written and oral Comprehensive Examination of the student's field of study.
- Complete a written Doctoral Dissertation.
- Complete a final oral defense of the Doctoral Dissertation.
- Complete one of the following requirements, as approved by the doctoral committee:
  - A thorough knowledge of a language other than English
  - A reading ability in two foreign languages
  - Reading ability in one foreign language and proficiency with a research tool
  - Reading ability in one foreign language and one semester of supervised teaching experience
  - Proficiency with a research tool and one semester of supervised teaching
  - Two semesters of supervised teaching

Range Science - Doctor of Philosophy

Admission Requirements

A GPA of 3.0 or higher is required for admission. Prerequisite for admission as a regular graduate student in the department is the completion of a curriculum substantially equivalent to that required of undergraduate students. Therefore, deficiency courses may be required after admission to the program, as determined by the admissions committee and the student's graduate committee and advisor.

Course Requirements

A minimum of 30 credits of graduate work plus 18 credits of dissertation (RGSC 700) are required to graduate. The Qualifying Exam will take place during the first semester of graduate work. Its purpose is to evaluate the student's strengths and weaknesses, determine deficiency courses, and discuss a possible program of study (coursework). The "Program of Study and Committee for Doctoral Students" form, listing the graduate committee and courses to be taken, should be filed with the Graduate School after completion of 12 credits and after the qualifying exam, and before registering for additional courses. The Comprehensive Exam is intended to test the knowledge of the major and minor fields of study. The student will be admitted to the exam after fulfilling the language/research tool requirement, after completion of adequate coursework (as determined by the department and the Graduate School), and when considered by the student's graduate committee to be adequately prepared. The exam is part written and part oral. The student is formally considered a candidate for the Ph.D. only after the successful completion of the comprehensive exam, the recommendation of the committee, and the approval of the graduate dean.

The research project must be approved by the student's graduate committee. The dissertation is expected to demonstrate the student's ability in independent investigation and to be a contribution to human knowledge. It shall display a mastery of the literature, present an organized, coherent development of ideas with a clear exposition of results, and provide a critical discussion of the student's conclusions. Every effort should be made to publish the dissertation as scientific journal articles. Final Exam is concerned primarily with the research work of the student as embodied in the dissertation, but it may also extend over the entire field of study. It is entirely oral. The final exam will be advertised to the public one week prior to the exam.

Rhetoric and Professional Communication - Doctor of Philosophy

An MA is required for admission to the PhD program. Students in the doctoral program will develop individualized plans of study in consultation with advisors. Students are required to take

- 60 hours of graduate-level coursework including the doctoral proseminar in the first semester;
- courses in research methods;
- core courses in composition, professional and technical communication, and rhetoric;
- additional coursework in an area of specialization determined in consultation with an advisor;
- an internship; and
- a dissertation.

The Ph.D. also requires a qualifying portfolio, a comprehensive examination and an oral examination. The dissertation must be completed and approved within 5 years after the comprehensive exam. Consult the department for additional instructions regarding the internship, qualifying comprehensive examinations, portfolio and dissertation.

Requirements

Prefix	Title	Credits
Program Requirements		**24-36**
ENGL 610	Proseminar in Rhetoric and Professional Communication	3
ENGL 597	Internship in Technical and Professional Communication	3
ENGL 600	Doctoral Research	3-15
ENGL 700	Doctoral Dissertation	15
Methods Courses		**3**
Select one from the following		
ENGL 548	Graduate Study in Empirical Research	
ENGL 601	Qualitative Research	
ENGL 604	Digital Research Methods	
Core Courses		**12**
Select four from the following core courses:		
Core Composition Courses (select one)		
ENGL 650	Graduate Study in Literacy	
ENGL 664	History and Theory of Composition Studies	
ENGL 683	Critical Writing Studies	
Core Professional and Technical Communication Courses (select one)		
ENGL 502	Critical Conversations in Technical and Professional Communication	
ENGL 572	Technical-Professional Communication Pedagogies	
ENGL 643	Multimedia Theory and Production	
Core Rhetoric Courses (select two)		
ENGL 518	History of Rhetoric	
ENGL 519	Graduate Study in Modern Rhetorical Theory	
ENGL 668	Rhetoric and Cultural Studies	
ENGL 690	Doctoral Seminar in Rhetoric	
Specialized Courses		**21**
Select 21 credits in specialized area determined in consultation with an advisor. [2]		
Transfer Credits (18 credits)		**0-18**
Total Credits		**84-126**

[1] Graduate assistants must take 3 hours of ENGL 571 Composition Pedagogy and Practicum, during their first semester of teaching.

[2] Students define their specialized area, a coherent set of related courses drawn from both inside and outside the Department of English, in consultation with their doctoral committee. Possible specializations include Border Rhetorics and Cultures; Writing Program Administration/Writing Center Administration; Assessment; Pedagogy; Literacy Studies; Identity and Political and Social Rhetoric; New Media Rhetoric and Design; Intercultural Rhetorics; Writing Across the Curriculum; Workplace Communication; and the Rhetoric of Science. Up to 6 hours may be taken outside of English.

Transfer Courses (18 credits)

In consultation with an advisor and the Doctoral Committee, courses taken at the Master's level can be used to waive specific area requirements in the PhD, but this will not reduce the minimum number of credits required.

Financial Support

Students are eligible for teaching assistantships and a variety of positions that involve writing around campus and the community. Because many students work full time, many courses are offered in the late afternoon and evening to accommodate various schedules.

Application Information

Please refer to the online application process described on the NMSU Admissions website for specific instructions for each program.

School Psychology - Doctor of Philosophy

The School Psychology Program at New Mexico State University is housed in and administered through the department of Counseling and Educational Psychology (CEP). Our program is guided by the standards of the American Psychological Association. The School Psychology PhD program at NMSU is Accredited, on Contingency by the American Psychological Association (APA) effective December 4, 2024. The expiration date of contingency status is December 4, 2029. We will apply for full accreditation at that time.

**Questions related to the program's accredited status should be directed to the Commission on Accreditation:*

Office of Program Consultation and Accreditation

American Psychological Association

750 1st Street, NE, Washington, DC 20002

Phone: (202) 336-5979 / E-mail: apaaccred@apa.org

Web: www.apa.org/ed/accreditation *(*http://www.apa.org/ed/accreditation/*)*

- Student Admissions, Outcomes, and Other Data (https://cep.nmsu.edu/academic-programs/2025_c-26d-template-final.pdf)

The School Psychology Program at New Mexico State University is fully accredited from the National Association of School Psychologists (NASP).

- Program Annual Report and Student Outcomes Data (https://apps.nasponline.org/standards-and-certification/graduate-education/school-psychology-program-information/?id=941429)

Mission

The mission of the school psychology doctoral program is to prepare school psychologists as scientists, practitioners and advocates for mental health and social justice in health service psychology settings, including public schools. The program addresses state and national shortages of personnel who are fully credentialed to serve the needs of children with disabilities. The primary goal of the school psychology program is to prepare scholars to become problem-solvers with the essential entry-level competencies to serve in the schools and agencies that serve school age populations. The program develops 3 major components: 1) *Knowledge of psychological and educational foundations, 2) skills in data-based decision-making, assessment, consultation, intervention and research, and 3) the capacity to apply knowledge and skills to promote*

mental health and development and prevent school failure and other disabling conditions. Specifically, the program accomplishes the following goals.

1. Prepare and graduate highly qualified school psychologists to meet the academic and psychological needs of infants, toddlers, children, youth and their families from diverse backgrounds (i.e., high need children with disabilities).
2. Increase the number of personnel who demonstrate the competencies needed to provide high-quality instruction, evidence-based interventions and services for children with disabilities.
3. Retain scholars in a high quality-preparation program to increase the numbers of school psychologists including scholars from bilingual and traditionally underrepresented backgrounds.
4. Provide the workforce needed to meet state licensure for Level 3 school psychologists

For more information on program application requirements and process, see School Psychology, Ph.D. program website: https://cep.nmsu.edu/academic-programs/school-psychology-phd.html

Curriculum

Preparation occurs from a developmental sequence of courses that follow scientifically based research and empirically validated strategies. The school psychology program at NMSU adheres to the scientist-practitioner model. This integrated approach to scholarship and practice promotes development of interlocking skills fostering a career-long process of psychological investigation, assessment, and intervention. Throughout the curriculum, the importance of knowledge and experience with a wide range of individual differences including, but not limited to ethnicity, gender, disability, age, culture, sexual orientation, religion, and race are emphasized. Ethical and legal issues, which guide service delivery, are also stressed throughout the curriculum. The American Psychological Association (APA) and National Association of School Psychologists (NASP) Standards and competencies provide the foundation for the program's conceptual framework. Candidates will complete 81 credits of coursework, at least 450 clock-hours of practicum (9 total credits) and an 1500 clock-hour doctoral internship. Of the 1500 clock-hour internship, 600 hours will be expected to be in a school setting.

Program of Study

Prefix	Title	Credits
CEPY 5235	Counseling Theory and Techniques for School Psychologists	3
CEPY 5260	Group Work Theory and Technique	3
CEPY 5310	Academic Assessment And Intervention	3
CEPY 6120	Human Development	3
CEPY 6130	Psychology of Multiculturalism	3
CEPY 6140	Cognitive & Affective Basis of Behavior	3
CEPY 6150	Social Psychology	3
CEPY 6160	History and Systems of Psychology	3
SPED 6170	School Intervention and Organization in a Diverse Society	3
CEPY 6180	Physiology of Behavior	3
CEPY 6185	Ethics, Law & Professional Issues in School Psychology	3
CEPY 6220	Spanish for Mental Health Professionals	3
CEPY 6240	Child and Adolescent Counseling Theory and Technique	3
CEPY 6260	Consultation	3
CEPY 6265	Diagnostic Class	3
CEPY 6330	Behavior Assessment and Intervention	3
CEPY 6340	Appraisal of Cognitive Functioning	3
CEPY 6350	Appraisal of Personality	3
CEPY 6360	School Safety and Crisis Response	3
CEPY 6410	Introduction to Qualitative Research	3
or EDUC 6440	Qualitative Research I	
CEPY 6420	Psychometrics	3
CEPY 6425	Counseling Psychology Research	3
CEPY 6430	Advanced Statistics	3
CEPY 6440	Multivariate Statistics	3
CEPY 6450	Educational Experimentation	3
CEPY 6510	Practicum in School Psychology: Psychoeducational	3
CEPY 6520	Field Experience in Educational Diagnostics (optional course)	
CEPY 6530	Practicum in School Psychology: Psychological	3
CEPY 6540	Advanced Multicultural School Psychology Field Experience	3
CEPY 6580	Supervision Theory and Practicum	3
CEPY 6640	Doctoral Internship in School Psychology	12
Dissertation		18
CEPY 7000	Doctoral Dissertation	
Total Credits		**117**

Transborder and Global Human Dynamics - Doctor of Philosophy

The Ph.D. program in Transborder and Global Human Dynamics is designed to provide doctoral students with a rigorous program of cultural, anthropological, political, historical, artistic, literary, and linguistic subject matter in the social sciences and humanities. At the heart of the endeavor is a program that fosters the study of the cultural pluralism and social, economic, political, linguistic, and creative interactions that emerge from and shape the diverse practices, interpretations, and reproduction of transnational borders. Such a program is ideally suited to forge new interpretations, solutions, and understandings of relevant issues for scholars and students living and studying in the US-Mexico transborder region, with implications not only for our border region, but also for other border communities around the world.

The program is based on the Cambridge-Oxford collaborative research and instruction model. The program curriculum closely follows the NMSU Graduate School's requirements and timelines for admission, doctoral committee formation, and comprehensive and qualifying examinations. The program has limited residency requirements, since doctoral students will perform research in the field, but come together to participate in colloquia at NMSU. The program centers on a set of common courses and colloquia exploring theory, methods, and mixed methods of quantitative and qualitative analysis, and six interdisciplinary research concentrations. Credits for fieldwork, archival work, and community engagement may involve transborder internships and experiences at universities, policy institutes, archives, and think tanks supervised by the student's committee.

Interdisciplinary Focus Areas:

- Cultural and linguistic translation, interpretation, literature, and heritage
- Refugees, asylum-seekers and migration

- Transnational public policy and human rights
- Environmental justice, landscape, archaeology, and heritage management
- Food security, water and energy security, human health, and sustainability
- Power, inequality, and racial justice

Sponsoring departments include Anthropology, Political Science, Public Law and Administration (formerly Government), and Languages and Linguistics. Related, affiliated, and sponsoring departments and programs also include English, Gender and Sexuality Studies, Geography and Environmental Studies, History, Borderlands and Ethnic Studies (BEST), Philosophy, Criminal Justice, Sociology, Latin American Programs, Center for Latin American and Border Studies, the American Indian Program, and NMSU Library and Archives.

Prefix	Title	Credits
Core Requirements		*6*
TBGD 5110	Introduction to Transborder and Global Human Dynamics (co-taught modules)	
TBGD 6991	Research Design in Transborder and Global Human Dynamics (Individualized study with committee)	
Methods: Select Two Courses [2]		*6*
ANTH 520	Ethnographic Field Methods	
ANTH 522	Archaeological Field School	
BEST 5110	Decolonial Research I: Overview [5]	
BEST 5125	Decolonial Research II: Methodologies [5]	
GEOG 602	Integrative Research Design	
GEOG 584	Qualitative, Critical, and Creative Methodologies	
GNDR 555	Advanced Feminist Research Methodologies	
HIST 590	Reading Seminar: Borders, Boundaries and Frontiers	
HIST 594	Public History Seminar	
HIST 598	Craft of History: Historical Theories, Methods, and Criticism (f)	
POLS 502	Research Methods in Government	
POLS 503	Qualitative Research Methods	
SOCI 5153	Seminar in Sociological Research	
SOCI 5157	Seminar in Qualitative Research Methods	
SPAN 500	Methods of Research and Literary Criticism	
SPAN 580	Research Methodology in Spanish Linguistics	
SPAN 595	Advanced Topics in Applied Spanish Linguistics	
Analysis: select two courses (with comittee)		*6*
ANTH 512	Quantitative Analytical Methods in Anthropology	
ANTH 579	Qualitative Data Analysis and Interpretation	
GEOG 578	Fundamentals of GIS	
GEOG 585	Spatial Analysis and Modeling	
POLS 544	Public Policy Analysis	
SOCI 5163	Issues in Advanced Quantitative Analysis	
SPAN 590	Advanced Special Topics (La Nueva Frontera: Critical Analysis of Border Theory & Cultural Identities)	
SPAN 597	Advanced Strategies for Teaching Spanish for Heritage/Native Speakers	
Field work and data collection: Select 6 credits in consultation with committee)		*6*
TBGD 6998	Fieldwork and Community Engagement in Transborder and Global Human Dynamics [3]	
Focus Areas: Select 12 credits each from at least two areas [4]		**24**
Cultural and linguistic translation, interpretation, literature and heritage		
ENGL 526	Special Topics in Critical Theory (with appropriate subtitle)	
ENGL 536	The Borderlands Writing Project	
ENGL 558	Latino/a Literature and Culture	
ENGL 589	Cultural Studies: Literature and Theory (Borderlands Representations)	
ENGL 649	Graduate Study in Writing (Subtitle: Transborder Rhetoric & Professional Communication)	
FREN 649	Readings in Transborder and Global Human Dynamics	
GNDR 508	Advanced Feminist Food Studies	
GNDR/ENGL 582	Gender and Popular Culture	
HIST 511	Making the American West	
SPAN 521	Advanced Culture and Literature of New Mexico	
SPAN 523	Colonial Legacy: Representations in Chican@ Literature & Culture	
SPAN 550	Advanced Chicana and Chicano Studies	
SPAN 551	Advanced Hispanic Cultures	
SPAN 558	Bilinguismo	
Refugess, asylum seekers, and migration		
CJUS 529	Advanced Immigration & Justice	
GNDR 511	Advanced Gender and Migration	
GNDR 554	Advanced Issues in Women Crossing Borders	
POLS 563	Issues in International Relations	
POLS 578	Seminar in the U.S.-Mexican Border	
POLS 596	International Law	
SOCI 5430	Seminar in International Migration	
SPAN 550	Advanced Chicana and Chicano Studies	
Transnational Public Policy and Human Rights		
GNDR 501	Advanced Women & Immigration	
GNDR 502	Advanced Transnational Feminisms	
GNDR 506	Advanced Women and Human Rights	
HIST 590	Reading Seminar: Borders, Boundaries and Frontiers	
PHIL 532	Advance Studies in Ethics and Global Poverty	
POLS 536	Public Policy and Indigenous Communities	
POLS 579	Seminar in Mexican Politics	
SOCI 5440	Seminar in Sociological Perspectives on the U.S.-Mexico Border	
SPAN 542	Adv. Formation of Hispanic National Identities	
Environmental justice, landscape, archaeology, and heritage management		
ANTH 516	Advanced Archaeology of Ancient Southwest	
ANTH 518	Advanced Historical Archaeology	
ANTH 540	Cultural Resource Management	
ANTH 545	Advanced Museology	
GEOG 555	Southwest Environments	
GEOG 598	Special Topics (Geohumanities)	
HIST 583	Advanced Historic Preservation	
HIST 586	Interpreting Historic Places for the Public	
Food security, water security, human health, and sustainability		
ANTH 586	Advanced Community Engagement and Service Learning	

ANTH 546	Advanced Contemporary Medical Anthropology	
ANTH 538	Plants, Culture, and Sustainable Development	
ANTH 535	Adv. Human Health and Biological Variation	
POLS 537	Issues in Public Policy (Subtitle: Environmental & Energy Policy)	
Power, inequality, and racial justice		
BEST 5105	Foundations in Borderlands & Ethnic Studies [5]	
BEST 5120	Theories in Borderlands and Ethnic Studies [5]	
BEST 5999	Capstone in Borderlands and Ethnic Studies [5]	
CJUS 514	Advanced Race, Crime, and Justice	
CJUS 528	Advanced Mexican-Americans and Issues of Social Justice	
GNDR 571	Advanced Seminar in Feminist and Queer Theories	
POLS 536	Public Policy and Indigenous Communities	
SOCI 5320	Seminar in Social Movements and Activism	
SOCI 5410	Seminar in Race and Ethnic Relations	
SOCI 5420	Seminar in Sociology of Latinos/as in the United States	
SOCI 5415	Seminar in Social Stratification	
SPAN 522	Adv. Cultural Production of Hispanic Revolutions and Wars	
Dissertation (18 credits)		*18*
TBGD 7000	Dissertation	
Total Credits		**66**

1. Student must satisfy all other requirements for the PhD as laid out in the Academic Regulations (https://catalogs.nmsu.edu/nmsu/regulations-policies/#academicprogramsofstudytext) section of the NMSU catalog
2. Two separate methods courses are recommended, if a student elects to take GEOG 578 Fundamentals of GIS for 6 credits they should consult with their advisor first.
3. TBGD 6998 Fieldwork and Community Engagement in Transborder and Global Human Dynamics may be substituted by field work, archival work, community consultation, or internship under an affiliated prefix, numbered 500 or above, approved by the student's committee
4. Courses listed are representative for each focus area. Other courses may be used to satisfy a focus area as approved by the student's committee.
5. This course supports the Borderlands and Ethnic Studies graduate certificate

This roadmap assumes prospective students have entered the PhD program with 12-30 credits from a completed Master's program (Years 1 and 2) that may be used to satisfy different requirements, and that graduate students pursue the degree full time, taking 9 credit hours per semester. Each student will work out a plan of study with their committee during the first semester in the program. In all cases, students will complete 54 credits, 9 per semester in each of Fall and Spring of Years 3, 4 and 5.

First Year		**Credits**
Master's degree credit transfer courses [1]		12-30
Between 12 and 30 credits that meet the goals and requirements of this Ph.D. Program, contingent on approval by the program committee		
	Credits	**12-30**
Second Year		
Master's degree credit transfer courses [1]		
	Credits	**0**
Third Year		
Fall		
TBGD 5110	Introduction to Transborder and Global Human Dynamics	3
Methods Course [2]		3
Choose one from the following:		3
Analysis Course [3]		
Focus Area Course [4]		
Required Benchmarks [5]		
	Credits	**9**
Spring		
TBGD 6991	Research Design in Transborder and Global Human Dynamics	3
Methods Course [2]		3
Choose one from the following:		3
Analysis Course [3]		
Focus Area Course [4]		
Required Benchmarks [6]		
	Credits	**9**
Fourth Year		
Fall		
TBGD 6998	Fieldwork and Community Engagement in Transborder and Global Human Dynamics	3
Focus Area Course [4]		3
Focus Area Course [4]		3
Spring		
TBGD 6998	Fieldwork and Community Engagement in Transborder and Global Human Dynamics	3
Focus Area Course [4]		3
Focus Area Course [4]		3
	Credits	**18**
Fifth Year		
Fall and Spring		
TBGD 7000	Dissertation (9 credit per semester)	18
Required Benchmarks		
	Credits	**18**
	Total Credits	**66-84**

1. The assumption for Year 1 and Year 2 of the road map is that students may transfer between 12 and 30 credits, depending on their fit with the goals and requirements of this program. It is not required that students transfer 30 credits (however, they must have completed a Masters degree to be eligible for admission), and if they do not have at least 12 relevant graduate credits to transfer, the first two years will be used to complete those credit to reach the required total of 66, taking account of the fact that they must take 54 credits in Years 3, 4 and 5. The eligibility of transfer credits will be determined by their committee.
2. **Methods Courses:** (students must take two different ones. Refer to list under course requirements)
3. **Analysis Courses:** students must take two different ones. Refer to list under course requirements.
4. **Focus Areas:** Select at least 12 credits (24 credits total) from at least two areas. Courses for each focus area are listed under course requirements.
5. **Required Benchmarks Year 3**
   - Form graduate committee, select two area concentrations, and curriculum plan in the first semester.

- Pass qualifying doctoral examination scheduled by the student's graduate committee chair and the Transborder and Global Human Dynamics Executive Committee by the end of Year 3.
  - For students who enter with a master's degree or equivalent from another university, or another department, the qualifying examination should be taken before the end of the second semester of Year 3 of graduate work.
  - For students who earn their master's degree at New Mexico State University and will continue in the Transborder and Global Human Dynamics doctoral program, the department may allow the master's final examination to serve as the doctoral qualifying examination or may require a separate examination.

[6] **Required Benchmarks Year 4:**

1. Comprehensive Examination
   - Completion of adequate course work, to the satisfaction of the graduate committee, the Transborder and Global Human Dynamics Executive Committee, and the Graduate School
   - The graduate committee determines the student is adequately prepared for the examination
   - Successful completion of language requirement.

2. Advancement to Candidacy: For advancement to candidacy the following criteria must be met
   - Successful completion of the comprehensive examination
   - Recommendation of the graduate committee
   - Approval of the Dean of the Graduate School Upon receiving advancement to candidacy, students must establish residency and follow the Dissertation Registration Requirements

[7] **Required Benchmarks Year 5:**

- Completion and Submission of Dissertation
- Final Oral Examination (Defense)

Water Science and Management - Doctor of Philosophy

This degree is designed to give students a thorough and comprehensive knowledge of water science and hydrology and training in methods of research. The Ph.D. degree can be earned in about 33-35 credits of formal course work beyond the Masters Degree, plus 18 additional dissertation research credits, for a minimum total of 75 credits beyond the BS degree, as detailed below. This degree has five available concentrations.

Prefix	Title	Credits
Core Courses		
AEEC 5350	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
C E 557	Water Resources Development	3
Select one from the following:		3-4
GEOG 578	Fundamentals of GIS	
GEOG 588	GIS and Water Resources	
Select one from the following: [1]		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modeling	
Seminar Credits OR Select one from the following: [2]		2
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Introduction to Geographic Theory and Application	
Electives/transfer credits chosen in consultation with the student's committee (enough to meet the required minimum of 75 credits)		**40**
Dissertation		**18**
WSAM 700	Doctoral Dissertation	
Total Credits		**75-77**

[1] With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modeling may be used as a substitute.

[2] Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Introduction to Geographic Theory and Application.

Students are expected to have a basic foundation in Geographic Information System (GIS) within a classroom, research experience, or professional experience. Students without this background are required to take an appropriate GIS class as advised by their advisor such as: GEOG 578 Fundamentals of GIS, or FWCE 535 Special Topics.

Water Science and Management (Agricultural Water Resources) - Doctor of Philosophy

This degree is designed to give students a thorough and comprehensive knowledge of water science and hydrology and training in methods of research. The Ph.D. degree can be earned in about 33-35 credits of formal course work beyond the Masters Degree, plus 18 additional dissertation research credits, for a minimum total of 75 credits beyond the BS degree, as detailed below. This degree has five available concentrations.

Prefix	Title	Credits
Core Courses		
AEEC 5350	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
C E 557	Water Resources Development	3
Select one from the following:		3-4
GEOG 578	Fundamentals of GIS	
GEOG 588	GIS and Water Resources	
Select one from the following: [1]		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modeling	
Seminar Credits OR Select one from the following: [2]		2-3
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Introduction to Geographic Theory and Application	
Concentration Electives		
Students must work with their committee to select 12 credits of elective courses that would meet the Agricultural Water Resources concentration		12

Electives chosen in consultation with the student's committee (enough to meet the required minimum of 75 credits)		**28**
Dissertation		**18**
WSAM 700	Doctoral Dissertation	
Total Credits		**75-78**

1 With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modeling may be used as a substitute.

2 Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Introduction to Geographic Theory and Application.

Students are expected to have a basic foundation in Geographic Information System (GIS) within a classroom, research experience, or professional experience. Students without this background are required to take an appropriate GIS class as advised by their advisor such as: GEOG 578 Fundamentals of GIS, or FWCE 535 Special Topics.

Water Science and Management (International Water Resilience) - Doctor of Philosophy

Prefix	Title	Credits
WSAM 590	System Dynamics	3
AEEC 5350	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
C E 557	Water Resources Development	3
A ST 505	Statistical Inference I	4
Seminar (8 Hours)		8
WSAM 595	Hands-On Transboundary Aquifer and Community System Convergence Seminar	
WSAM 598	Internship	3
GEOG 481	Fundamentals of GIS	4
WSAM 550	Special Topics	3
Choose one course from the following:		3
GEOG 602	Integrative Research Design	
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
Choose one course from the following:		3
GEOG 578	Fundamentals of GIS	
GEOG 588	GIS and Water Resources	
Choose one course from the following:		3
GEOG 585	Spatial Analysis and Modeling	
ANTH 579	Qualitative Data Analysis and Interpretation	
POLS 502	Research Methods in Government	
POLS 503	Qualitative Research Methods	
POLS 537	Issues in Public Policy	
SOCI 5157	Seminar in Qualitative Research Methods	
SOCI 5163	Issues in Advanced Quantitative Analysis	
SOCI 5153	Seminar in Sociological Research	
Dissertation		18
WSAM 700	Doctoral Dissertation	
Relevant committee-approved electives/transfer credits (enough to meet the required minimum of 75 credits)		14
Total Credits		**75**

Water Science and Management (Water Economics and Policy) - Doctor of Philosophy

This degree is designed to give students a thorough and comprehensive knowledge of water science and hydrology and training in methods of research. The Ph.D. degree can be earned in about 33-35 credits of formal course work beyond the Masters Degree, plus 18 additional dissertation research credits, for a minimum total of 75 credits beyond the BS degree, as detailed below. This degree has five available concentrations.

Prefix	Title	Credits
Core Courses		
AEEC 5350	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
C E 557	Water Resources Development	3
Select one from the following:		3-4
GEOG 578	Fundamentals of GIS	
GEOG 588	GIS and Water Resources	
Select one from the following: [1]		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modeling	
Seminar Credits OR Select one from the following: [2]		2
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Introduction to Geographic Theory and Application	
Concentration courses		
ECON 457	Mathematical Economics	3
AEEC 5240	Econometrics	3
or ECON 545	Econometrics II	
AEEC 5120	Microeconomic Theory	3
Students must work with their committee to select 3 credoits of elective course(s) that would meet the Water Economics and Policy concentration		3
Electives chosen in consultation with the student's committee (enough to meet the required minimum of 75 credits)		**28**
Dissertation		**18**
WSAM 700	Doctoral Dissertation	
Total Credits		**75-77**

1 With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modeling may be used as a substitute.

2 Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Introduction to Geographic Theory and Application.

Students are expected to have a basic foundation in Geographic Information System (GIS) within a classroom, research experience, or professional experience. Students without this background are required

to take an appropriate GIS class as advised by their advisor such as: GEOG 578 Fundamentals of GIS, or FWCE 535 Special Topics.

Ideas for Water Economics & Policy Electives

- AEEC 5350 Economics of Water Resource Management and Policy
- PHLS 4130 Environmental Health
- ECDV 661 Regional Economic Modeling
- ECDV 664 Population Economics
- ECDV 668 Economic Development Finance
- ECDV 671 Sustainable Economic Development
- PHLS 5150 Environmental Public Health Issues
- PHLS 5640 Rural Health Issues
- PHLS 5660 U.S.-Mexico Border Health Issues

Water Science and Management (Water Informatics) - Doctor of Philosophy

This degree is designed to give students a thorough and comprehensive knowledge of water science and hydrology and training in methods of research. The Ph.D. degree can be earned in about 33-35 credits of formal course work beyond the Masters Degree, plus 18 additional dissertation research credits, for a minimum total of 75 credits beyond the BS degree, as detailed below. This degree has five available concentrations.

Prefix	Title	Credits
Core Courses		
AEEC 5350	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
C E 557	Water Resources Development	3
Select one from the following:		3-4
GEOG 578	Fundamentals of GIS	
GEOG 588	GIS and Water Resources	
Select one from the following: [1]		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modeling	
Seminar Credits OR Select one from the following: [2]		2
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Introduction to Geographic Theory and Application	
Concentration Electives		
Students must work with their committee to select 12 credits of elective courses that would meet the Water Informatics concentration		12
Electives chosen in consultation with the student's committee (enough to meet the required minimum of 75 credits)		**28**
Dissertation		**18**
WSAM 700	Doctoral Dissertation	
Total Credits		**75-77**

1. With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modeling may be used as a substitute.
2. Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Introduction to Geographic Theory and Application.

Students are expected to have a basic foundation in Geographic Information System (GIS) within a classroom, research experience, or professional experience. Students without this background are required to take an appropriate GIS class as advised by their advisor such as: GEOG 578 Fundamentals of GIS, or FWCE 535 Special Topics.

Water Science and Management (Water Quality Treatments) - Doctor of Philosophy

This degree is designed to give students a thorough and comprehensive knowledge of water science and hydrology and training in methods of research. The Ph.D. degree can be earned in about 33-35 credits of formal course work beyond the Masters Degree, plus 18 additional dissertation research credits, for a minimum total of 75 credits beyond the BS degree, as detailed below.

Prefix	Title	Credits
Core Courses		
AEEC 5350	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
C E 557	Water Resources Development	3
Select one from the following:		3-4
GEOG 578	Fundamentals of GIS	
GEOG 588	GIS and Water Resources	
Select one from the following: [1]		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modeling	
Seminar Credits OR Select one from the following: [2]		2
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Introduction to Geographic Theory and Application	
Concentration Electives		
Students must work with their committee to select 12 credits of elective courses that would meet the Water Quality Treatment concentration		12
Electives chosen in consultation with the student's committee (enough to meet the required minimum of 75 credits)		**28**
Dissertation		**18**
WSAM 700	Doctoral Dissertation	
Total Credits		**75-77**

1. With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modeling may be used as a substitute.

[2] Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Introduction to Geographic Theory and Application.

Students are expected to have a basic foundation in Geographic Information System (GIS) within a classroom, research experience, or professional experience. Students without this background are required to take an appropriate GIS class as advised by their advisor such as: GEOG 578 Fundamentals of GIS, or FWCE 535 Special Topics.

Water Science and Management (Watershed and Aquatic/Riparian Wetlands) - Doctor of Philosophy

This degree is designed to give students a thorough and comprehensive knowledge of water science and hydrology and training in methods of research. The Ph.D. degree can be earned in about 33-35 credits of formal course work beyond the Masters Degree, plus 18 additional dissertation research credits, for a minimum total of 75 credits beyond the BS degree, as detailed below.

Prefix	Title	Credits
Core Courses		
AEEC 5350	Economics of Water Resource Management and Policy	3
RGSC 518	Watershed Methods and Management	3
or SOIL 456	Irrigation and Drainage	
C E 557	Water Resources Development	3
Select one from the following:		3-4
GEOG 578	Fundamentals of GIS	
GEOG 588	GIS and Water Resources	
Select one from the following: [1]		3-4
A ST 505	Statistical Inference I	
C E 582	Statistical Hydrology	
GEOG 585	Spatial Analysis and Modeling	
Seminar Credits OR Select one from the following: [2]		2
WSAM 605	Arid Land Water Resources	
WSAM 610	Water and Sustainable Economic Development	
GEOG 501	Introduction to Geographic Theory and Application	
Concentration Electives		
Students must work with their committee to select 12 credits of elective courses that would meet the Watersheds and Aquatic/Riparian Wetlands concentration		12
Electives chosen in consultation with the student's committee (enough to meet the required minimum of 75 credits)		**28**
Dissertation		**18**
WSAM 700	Doctoral Dissertation	
Total Credits		**75-77**

[1] With the consent of the instructor and the approval of the student's advisor, C E 582 Statistical Hydrology or GEOG 585 Spatial Analysis and Modeling may be used as a substitute.

[2] Seminar may be substituted by WSAM 605 Arid Land Water Resources, or WSAM 610 Water and Sustainable Economic Development, or GEOG 501 Introduction to Geographic Theory and Application.

Students are expected to have a basic foundation in Geographic Information System (GIS) within a classroom, research experience, or professional experience. Students without this background are required to take an appropriate GIS class as advised by their advisor such as: GEOG 578 Fundamentals of GIS, or FWCE 535 Special Topics.

Wildlife and Fisheries Ecology - Doctor of Philosophy

Candidates are accepted into the department to work with a specific faculty member that serves as their major advisor and committee chair. Students will develop their dissertation committee before the end of the second semester of study. Students will form the dissertation committee in consultation with their advisor and the committee must include a minimum of four members with at least two other members from the FWCE graduate faculty and a Dean's Representative that must come from outside the FWCE department. Students will select courses in consultation with their major advisor and committee members based on their background and interests.

A total of 66 credits will be required for students entering the Doctoral program in Wildlife and Fisheries Ecology, including 18 doctoral dissertation credits. Students who have already completed an Master of Science can transfer a maximum of 24 credits from their Master of Science program to the doctoral program. Additionally, students that enter the program having only completed a bachelor's degree must also complete the Master of Science degree requirements for Fish, Wildlife and Conservation Ecology as part of their coursework requirements. This includes 6 credits of quantitative foundations and three courses from Ecological Concepts, Organismal Biology, and Ecological Techniques (see graduate catalog for eligible courses). A maximum of 9 credits of course work below 500 but at or above 450 can count toward doctoral coursework.

Doctor of Philosophy students must:

- Complete a minimum of 6 semesters, with at least two occurring after the comprehensive exam.
- A maximum of 6 credits of FWCE 699 Doctoral Research doctoral research may apply toward graduation.
- Complete a minimum of 30 credits of graduate work excluding dissertation credits (FWCE 700 Doctoral Dissertation). This must include 2 credits of FWCE 690 Doctoral Seminar and BIOL 540 Science and Ethics (2 credits).
- Complete 18 credits of FWCE 700 Doctoral Dissertation after passing the comprehensive exams.
- At least 15 credits of the required elective courses must come from FWCE courses numbered 500 or above.
- Maintain a minimum grade point average of 3.0.
- Enroll in at least 1 credit/semester or 9 credits if full-time.
  - Full-time domestic students may file a request for waiver permitting them to enroll for only 6 credits in their second to last semester and to enroll for only 1 credit during their final semester if coursework and comprehensive exam requirements have been fulfilled.
- Successfully complete a qualifying exam (if a Ph.D. student without a master's degree), proposal defense, comprehensive exam, and dissertation defense. (see below)

Other recommendations for Ph.D. students:

- Ph.D. candidates are encouraged to do the following:
  - Consider including a committee member from outside NMSU, whether from a non-governmental organization, state/federal agency, or other university.
  - Gain experience as a teaching assistant for at least one semester and/or enroll in FWCE 510 Wildlife Ecology Teaching Practicum.
  - Present research at least once in a poster or oral format at a regional, national, or international conference.
  - Submit at least one manuscript as first author for publication in a peer-reviewed journal.

Exams

Qualifying exam – Students with an Master of Science degree do not need to take a qualifying exam. Students with a bachelor's degree must take a qualifying exam after completion of at least 18 credits. The qualifying exam will consist of an oral exam administered by the student's committee. If a student does not pass the qualifying exam, they can coordinate with their major advisor to potentially pursue a Master of Science degree.

Proposal defense – The student should defend their proposal to their committee no later than the end of the fourth semester of their studies. The students will prepare a short presentation summarizing the proposal chapters and will then answer questions related to their proposal from the committee.

Comprehensive exam – This exam covers all phases of the major and minor fields of study and is given after passing the proposal defense and before the end of the sixth semester, and when sufficient progress has been made toward fulfilling agreed upon research goals. The examination will have both written and oral portions. The written portion may be in the form of a research proposal (that does not overlap with their existing dissertation research) or may consist of questions presented by the students' committee. The student must pass their graduate committee's expectation on the written portion before taking the oral portion. Students will not be allowed to register for 700 level courses until both parts of the comprehensive exam have been passed. If a student does not pass the comprehensive exam, they will have the opportunity to retake their comprehensive exam no sooner than three months and no later than 12 months after their initial attempt.

Dissertation Defense – The dissertation defense shall be completed after all degree requirements are satisfied. However, dissertation credits can be taken during the same semester as the dissertation defense. A minimum of 2 semesters must elapse between the comprehensive exam and dissertation defense.

Failure to pass an exam does not necessarily mean removal from the Ph.D. program. Students may be given the option to continue the program or pursue a Master of Science degree after discussion with their major advisor and (or) academic dean. Note that for each of the exam stages (e.g., qualifying exam, comprehensive exam, and dissertation defense), when an Master of Science degree-holding student does not pass, they may not be allowed to continue in the program. Such a case will be dealt with on an individual basis with active participation from the graduate dean.

Students should consult the Graduate School website for specific information regarding the completion of the degree and submission of the dissertation.

Prefix	Title	Credits
Required Courses		
BIOL 540	Science and Ethics	2
Take 2 credits of Doctoral Seminar		2
FWCE 690	Doctoral Seminar	
Take 18 credits of Doctoral Dissertation after Comprehensive Exam		18
FWCE 700	Doctoral Dissertation	
Elective Courses - Courses from 450-600		44
Other courses that can count towards electives for degree requirements:		
A ST 505	Statistical Inference I	
A ST 506	Statistical Inference II	
A ST 507	Advanced Regression	
A ST 509	Statistical Models for Complex Data Structures	
A ST 511	Statistical Methods for Data Analytics	
A ST 515	Statistical Analysis with R	
A ST 540	Predictive Analytics	
A ST 550	Special Topics	
A ST 555	Applied Multivariate Analysis	
A ST 568	Applied Linear Models II	
FWCE 509	Population Ecology	
FWCE 523	Model Selection and Multimodel Inference in Ecology	
FWCE 526	Demographic Modeling and Bayesian Inference in Modern Wildlife Management	
FWCE 557	Ecological Biometry	
Ecological Concepts, Organismal Biology, Ecological Techniques		
BIOL 562	Advanced Genomics Technology	
BIOL 566	Advanced Bioinformatics and NCBI Database	
BIOL 568	Communities and Ecosystems	
BIOL 587	Behavioral and Evolutionary Ecology	
BIOL 581	Physiology of Animals	
FWCE 510	Wildlife Ecology Teaching Practicum	
FWCE 512	Scientific Writing	
FWCE 524	Structured Decision Making in Fish and Wildlife Management	
FWCE 525	Evidence-Based Conservation and Management	
FWCE 530	Large Mammal Ecology, Conservation and Management	
FWCE 531	Mammalogy	
FWCE 532	Environmental Biology of Fishes	
FWCE 537	Wildlife Damage Management	
FWCE 541	Conservation Genetics	
FWCE 542	Wildlife Disease Ecology and Management	
FWCE 546	Conservation Social Sciences	
FWCE 547	Wildlife Law and Policy	
FWCE 559	Aquatic Ecology	
FWCE 567	Herpetology	
FWCE 571	GIS for Natural Resource Scientists	
FWCE 582	Ichthyology	
GEOG 552	Landscape Ecology	
GEOG 557	Biogeography	
GEOG 573	Introduction to Remote Sensing	
GEOG 578	Fundamentals of GIS	
RGSC 513	Advanced Rangeland Ecology	
RGSC 516	Arid Land Management	
RGSC 518	Watershed Methods and Management	

RGSC 575	Climate Studies, Water and Society	
RGSC 585	Land Cover Analysis for Natural Resources	
Independent Study: Eligible courses		
FWCE 535	Special Topics	
FWCE 548	Graduate Problems	
FWCE 699	Doctoral Research	
Total Credits		**66**

Reading - Specialist in Education

The Reading Specialist in Education is for educators who are interested in becoming a reading specialist, literacy director, school district administrator in curriculum and instruction, or engage in leadership at the district and state levels. The program can be completed in two forms (1) solely as a Specialist in Education; (2) simultaneously with the Master of Arts in Education with a Concentration in Language, Literacy & Culture.

Reading Specialist in Education

For students wishing to only receive the Specialist in Education for Reading the following coursework will need to be completed.

Prefix	Title	Credits
Required Coursework		
Reading Specialist Coursework		
READ 5330	Content Area Literacy	3
READ 6110	Critical Issues in Literacy Education	3
READ 6120	Multiple Critical Literacies	3
READ 6130	Multiculturalism, Literature, and Inquiry	3
READ 6210	Ethnography of Reading and Writing	3
READ 6320	Praxis and Reflexivity	3
READ 5990	Practicum in Literacy Education	6
READ 6999	Research Project	9
Total Credits		**33**

Reading Specialist with the M.A. in Education (LLC)

For students who have already pursued a master's degree in reading/literacy (LLC) and are eligible to apply for the PED Reading Endorsement, the specialist can be added to their current curriculum the following coursework will need to be completed.

Prefix	Title	Credits
Required Coursework		
Language, Literacy and Culture Coursework		
EDUC 5120	Multicultural Education	3
EDUC 5140	Research in Curriculum and Pedagogy	3
EDUC 5160	Curriculum and Pedagogy	3
EDUC 5170	Action Research Projects	3
READ 5210	Language and Literacy Acquisition	3
READ 5220	Sociopsycholinguistics of Reading	3
READ 5340	Literacy Assessment and Evaluation	3
READ 5350	Adult and Family Literacy	3
READ 5360	Digital Literacies	3
READ 5410	Theory and Pedagogy of Literature for Children and Adolescents	3
READ 5420	Theory and Pedagogy of Writing	3
Reading Specialist Coursework		
READ 5330	Content Area Literacy	3
READ 6110	Critical Issues in Literacy Education	3
READ 6120	Multiple Critical Literacies	3
READ 6130	Multiculturalism, Literature, and Inquiry	3
READ 6210	Ethnography of Reading and Writing	3
READ 6320	Praxis and Reflexivity	3
READ 5990	Practicum in Literacy Education	6
READ 6999	Research Project	9
Total Credits		**66**

School Psychology - Specialist in Education

The CEP Department offers a School Psychology program that leads to a Specialist in Education (Ed. S.) degree. The National Association of School Psychologists accredits the program. The program provides additional education beyond the M.A. degree to prepare professionals for licensure as school psychologists in New Mexico and throughout the United States. The School Psychology program prepares its candidates to work with preschoolers, children, adolescents, and families. The various settings where School Psychologists are employed include public schools and other organizations that require advanced assessment, counseling, consultation, and other interventions. The program trains its candidates to serve students from various backgrounds with diverse educational, psychological, and emotional needs. Such training also includes working with all school personnel to help make education a positive and rewarding student experience.

For more information on program application requirements and process, see School Psychology, Ed.S., program website: https://cep.nmsu.edu/academic-programs/school-psychology.html

Program of Study

Prefix	Title	Credits
CEPY 5235	Counseling Theory and Techniques for School Psychologists	3
CEPY 5260	Group Work Theory and Technique	3
CEPY 5310	Academic Assessment And Intervention	3
CEPY 5997	Special Research Programs	3
CEPY 6120	Human Development	3
CEPY 6130	Psychology of Multiculturalism	3
CEPY 6140	Cognitive & Affective Basis of Behavior	3
CEPY 6175	School Intervention and Organization in a Diverse Society	3
CEPY 6185	Ethics, Law & Professional Issues in School Psychology	3
CEPY 6210	School Psychology Research and Program Evaluation	3
CEPY 6240	Child and Adolescent Counseling Theory and Technique	3
CEPY 6260	Consultation	3
CEPY 6265	Diagnostic Class	3
CEPY 6330	Behavior Assessment and Intervention	3
CEPY 6340	Appraisal of Cognitive Functioning	3
CEPY 6350	Appraisal of Personality	3
CEPY 6360	School Safety and Crisis Response	3
CEPY 6420	Psychometrics	3
CEPY 6510	Practicum in School Psychology: Psychoeducational	3

CEPY 6530	Practicum in School Psychology: Psychological	3
CEPY 6610	Internship in School Psychology	12
Total Credits		**72**

First Year

Semester 1		**Credits**
Summer		
CEPY 6120	Human Development	3
CEPY 6130	Psychology of Multiculturalism (10 weeks)	3
	Credits	**6**
Semester 2		
Fall		
CEPY 5235	Counseling Theory and Techniques for School Psychologists	3
CEPY 6265	Diagnostic Class	3
CEPY 6185	Ethics, Law & Professional Issues in School Psychology	3
CEPY 6340	Appraisal of Cognitive Functioning	3
	Credits	**12**
Semester 3		
CEPY 5310	Academic Assessment And Intervention	3
CEPY 5260	Group Work Theory and Technique	3
CEPY 6210	School Psychology Research and Program Evaluation	3
CEPY 6350	Appraisal of Personality	3
	Credits	**12**

Second Year

Semester 1		
Summer		
CEPY 6140	Cognitive & Affective Basis of Behavior	3
CEPY 6360	School Safety and Crisis Response	3
	Credits	**6**
Semester 2		
Fall		
CEPY 6420	Psychometrics	3
CEPY 6240	Child and Adolescent Counseling Theory and Technique	3
CEPY 6330	Behavior Assessment and Intervention	3
CEPY 6510	Practicum in School Psychology: Psychoeducational	1-6
	Credits	**10-15**
Semester 3		
Spring		
CEPY 5997	Special Research Programs	1-6
CEPY 6260	Consultation	3
CEPY 6530	Practicum in School Psychology: Psychological	3
CEPY 6520	Field Experience in Educational Diagnostics (MA degree only)	1-6
	Credits	**8-18**

Third Year

Semester 1		
Summer		
CEPY 6175	School Intervention and Organization in a Diverse Society	3
	Credits	**3**
Semester 2		
Fall		
CEPY 6610	Internship in School Psychology (600 clock hours)	6
	Credits	**6**
Semester 3		
Spring		
CEPY 6610	Internship in School Psychology (600 clock hours)	6
	Credits	**6**
	Total Credits	**69-84**

Please reach out to the Program Director for other advising plans, to include, if available, part-time enrollment.

Autism and Spectrum Disorders - Graduate Certificate

Prefix	Title	Credits
SPED 5310	Introduction to Autism	3
SPED 5320	Behavior and Autism	3
SPED 5330	Social Skills and Autism	3
SPED 5340	Communication and Autism	3
or SPHS 5360	Communication Disorders in Neurodiverse Populations	
Total Credits		**12**

Bilingual Education - Graduate Certificate

Requirements

Prefix	Title	Credits
BLED 5320	Second Language Acquisition	3
BLED 5420	Pedagogy of TESOL	3
BLED/READ 5210	Literacy-Language Instruction for Bilingual Students	3
BLED 5410/ READ 5220	Sociolinguistics in Education	3
Total Credits		**12**

Borderlands and Ethnic Studies - Graduate Certificate

Borderlands and Ethnic Studies (BEST) is a multidisciplinary program that critically explores the social, historical, cultural, and legal ways communities experience and navigate social constructs such as race, gender, and sexual orientation. These constructs permeate life, are entrenched in social structures and institutions, and shift and mutate over place and time in ways that reproduce existing power relations. The program outlines and analyzes the history, cultural production, politics and consequences of racialization and identity formation from an Indigenous, Diasporic and Transnational/Transborder, Decolonizing approach that remains rooted in a place-based, Borderlands imperative.

The graduate certificate advances an understanding of human relationships informed by unequal power and resource distribution to prepare students for service in various fields such as: education, government, law enforcement, health, environmental justice, sustainable agriculture, communications, social work, law and policy, public history, business and social entrepreneurship, and others. The certificate addresses a growing need for knowledge and skills in the areas

of cultural competency, equity and inclusion, critical thinking an conscientious problem solving, and effectively working with diverse populations.

Within the field of education, currently employed teachers and future teachers will be trained in historical and contemporary knowledge of Borderlands and ethnic Studies through a locally-relevant approach. nationally, Ethnic Studies is part of a burgeoning K-12 and higher education focus because of its potential for creating stronger and healthier communities. This certificate serves a growing cadre of educators as well as others pursuing careers in the public services sector. The certificate is comprised of 15 credits of graduate level work.

The certificate serves:

- Current NMSU degree seeking graduate students who wish to expand their primary area of study to include a specialization in Borderlands and Ethnic Studies.
- Non-degree seeking professionals who have completed an undergraduate degree in any major and who wish to invite, refresh, update and extend their knowledge and skill sets in Borderlands and Ethnic Studies.

Overview

The Graduate Certificate in Borderlands and Ethnic Studies is offered in the traditional classroom format as well as on-line. The program is designed to be completed in 4 semesters, with a requirement to successfully culminate in completion of BEST 5999 Capstone in Borderlands and Ethnic Studies - which will be tailored to the students' trajectory. Students must earn a minimum 3.0 in all 5 courses, including the Elective.

The certificate may be completed as a stand-alone certification or in conjunction with a graduate degree in another field.

If you wish to complete a graduate certificate, you must apply for admission to this program. Even if you already enrolled in a graduate program at NMSU, you will need to complete a separate application to be admitted to the certificate program. Once you have been admitted to the program and have completed all of the necessary coursework, you will need to file a Completion of Graduate Certificate form to be awarded the certificate.

Please contact the Borderlands and Ethnic Studies Advisor to further assist in completion of the application.

Prefix	Title	Credits
Requirements		
BEST 510	Foundations in Borderlands & Ethnic Studies	3
BEST 5110	Decolonial Research I: Methodologies	3
BEST 5120	Theories in Borderlands and Ethnic Studies	3
BEST 5999	Capstone in Borderlands and Ethnic Studies	3
Elective Course [1]		3
Total Credits		**15**

[1] Student and director selection

A Suggested Plan of Study

First Year		
Fall		**Credits**
BEST 510	Foundations in Borderlands & Ethnic Studies	3
	Credits	**3**
Spring		
BEST 5110	Decolonial Research I: Methodologies	3
	Credits	**3**
Second Year		
Fall		
BEST 5120	Theories in Borderlands and Ethnic Studies	3
Elective Course [1]		3
	Credits	**6**
Spring		
BEST 5999	Capstone in Borderlands and Ethnic Studies	3
	Credits	**3**
	Total Credits	**15**

[1] Student and Director selection

Collaborative Piano - Graduate Certificate

Prefix	Title	Credits
Requirements		
MUSC 533	Vocal Literature for Piano	2
or MUSC 534	Instrumental Sonatas and Duo Repertoire for Piano	
MUSC 582	Applied Music	4
MUSC 580	Ensemble Performance	1
MUSC 581	The Collaborative Pianist	2
MUSC 532	21st Century Piano Skills	1
Elective (Any graduate level MUSC course)		4
MUSC 540	Graduate Recital/Analytical Paper	4
Total Credits		**18**

[1] Students must make a B or better before taking additional music theory/music history courses.

Cultural Resource Management - Graduate Certificate

The Graduate Certificate in Cultural Resource Management provides specialized archaeological training that enables students to pursue careers cultural resource management, heritage, and historic preservation in the public or private sectors. The curriculum includes cultural resource management and historic preservation laws and regulations, area classes in prehistoric and historical archaeology, field classes, and laboratory methods courses in archaeology, history, and geography. Students take courses in traditional classroom and laboratory formats, as well as in the field. The core requirements (ANTH 540 Cultural Resource Management and ANTH 542 Cultural Resource Management II) are offered during the fall (ANTH 540) and spring (ANTH 542) semesters *every other year*. If you enroll in a year when these courses are not being offered, it will take you at least two years to complete your certificate.

The Certificate may be completed as a stand alone certification or in conjunction with the M.A. degree in Anthropology or any other related field.

If you wish to complete a graduate certificate, you must apply (https://gradschool.nmsu.edu/) for admission to this non-degree program. Even if you already enrolled in a graduate program at NMSU, you will need to complete a separate application to be admitted to the certificate program. Once you have been admitted to the program and have completed all of the necessary coursework, you will need to apply to be awarded the certificate through your myNMSU account.

Please contact the Anthropology Graduate Advisor, Dr. Kelly Jenks kljenks@nmsu.edu (istanfor@nmsu.edu) for information about how to complete the application.

The Graduate Certificate in Cultural Resource Management requires 18 credits of coursework and must be completed within 3 years. The certificate requires six credits from two required courses and 12 credits from a comprehensive list of electives in anthropology and related fields. Students are required to take at least one elective course in History or Geography. All these courses are designed to promote expertise in cultural resource management. The core requirements (ANTH 540 Cultural Resource Management and ANTH 542 Cultural Resource Management II) are offered in a sequence *every other year*. If you enroll in a year when these courses are not being offered, it will take you at least two years to complete your certificate.

Prefix	Title	Credits
Required Courses		
ANTH 540	Cultural Resource Management	3
ANTH 542	Cultural Resource Management II	3
Elective Courses		**12**
Select 12 credits from the following: [1,2]		
At least three credits must be in HIST or GEOG		
ANTH 507	Advanced Studies in Archaeology	
ANTH 512	Quantitative Analytical Methods in Anthropology	
ANTH 516	Advanced Archaeology of Ancient Southwest	
ANTH 514	Advanced Archaeology of Magic, Witchcraft, and Religion	
ANTH 518	Advanced Historical Archaeology	
ANTH 522	Archaeological Field School	
ANTH 523	Archaeological Mapping	
ANTH 564	Advanced Curation Crisis in Archaeology	
ANTH 574	Advanced Human Osteology	
ANTH 575	Advanced Pottery Analysis in Archaeology	
ANTH 576	Lithic Technology Organization	
ANTH 577	Advanced Zooarchaeology	
ANTH 578	Advanced Lab Methods in Archaeology	
GEOG 553	Geomorphology	
GEOG 573	Introduction to Remote Sensing	
GEOG 578	Fundamentals of GIS	
HIST 579	Oral History	
HIST 586	Interpreting Historic Places for the Public	
HIST 583	Advanced Historic Preservation	
HIST 594	Public History Seminar	
Total Credits		**18**

1. Some of these courses have prerequisites, consult the graduate catalog for details.
2. Other classes maybe included in the list of elective courses at the discretion of the Department and with approval of the Anthropology Department Head.

Elementary Education Alternative Licensure - Graduate Certificate

The NMSU Elementary Alternative Licensure Certificate aims to recruit highly qualified individuals who have earned at least a bachelor's degree in a related field and are eligible for a temporary two-year alternative license in the State of New Mexico. We seek individuals who will have positive impact on the social, cultural, emotional, and intellectual growth of youth with whom they will work throughout their career.

Eligible Participants must:

- Meet minimum state requirements of at least a bachelor's degree and course requirements of 30 undergraduate credit hours (6.60.3.7 NMAC) in the teaching field with a minimum 2.75 cumulative undergraduate GPA
- Be hired and submit a copy of a current teaching contract from a school district in New Mexico that indicates the candidate is the teacher of record in grades K to 8th
- Be admitted to the NMSU Graduate School
- Be admitted to the School of Teacher Preparation, Administration and Leadership

Prefix	Title	Credits
Required Courses		
EDUC 5120	Multicultural Education	3
EDUC 5310	Methods of Teaching Elementary School Science	3
EDUC 5320	Methods of Teaching Elementary School Mathematics	3
EDUC 5330	Methods of Teaching Elementary School Social Studies	3
READ 5310	Elementary School Literacy I	3
READ 5320	Elementary School Literacy II	3
SPED 5105	Introduction to Special Education in a Diverse Society	3
Total Credits		**21**

All licensure courses are eligible for transfer into a regular TPAL master's program.

Other Program Requirements to be completed by the end of the two-year program:

- Complete and maintain a 3.0 minimum GPA in all courses throughout the program
- Participate in two full semesters of observation (8 total observations) by a University Supervisor with a fee for each semester
- Teach with a provisional/intern license throughout the program and provide annual verification of continued elementary education employment at a New Mexico school district.
- Upon completion of the program students can apply for Level I Teaching License with NM PED by submitting their Elementary

Alternative Licensure Certificate and passing the following Praxis exams: Principles of Learning and Teaching: (https://praxis.ets.org/on/demandware.store/Sites-ETS-Praxis-Site/en_US/Product-Show/?pid=5622) K to 8th, **and Elementary Education: Curriculum, Instruction, and Assessment (https://praxis.ets.org/on/demandware.store/Sites-ETS-Praxis-Site/en_US/Product-Show/?pid=5017) 5017,** and Teaching Reading: Elementary (https://praxis.ets.org/on/demandware.store/Sites-ETS-Praxis-Site/en_US/Product-Show/?pid=5205) 5205.

Finance - Graduate Certificate

Admission requirements:

1. Completion of a Bachelors or other advanced degree with a minimum GPA of 3.0.
2. Earned a B or better in the following NMSU courses — or their equivalents — within seven years prior to acceptance into the program:

Prefix	Title	Credits
BFIN 341	Financial Analysis and Markets	3
MATH 1430G	Applications of Calculus I	3
MATH 1350G	Introduction to Statistics	3
or		
Undergraduate GPA of at least 3.25 with 2 or more years of experience [1]		

[1] Two or more years of relevant, full-time, post-degree, professional work experience in the finance industry. See Finance Graduate Certificate for more details.

3. Please visit gradschool@nmsu.edu and submit an application online.

Certificate Course Requirements

Courses are offered in a traditional classroom and/or online.

Prefix	Title	Credits
Choose four from the following:		**12**
BFIN 503	Financial Management	
BFIN 511	Financial Derivative Markets	
BFIN 521	Personal Financial Planning for Professionals	
BFIN 535	Investment Concepts	
BFIN 545	Fixed Income Markets, Instruments and Derivatives	
BFIN 555	Derivative Markets and Securities	
BFIN 566	Advanced Financial Management	
BFIN 575	International Managerial Finance	
BFIN 581	Management of Financial Institutions	
Total Credits		**12**

Museum Studies - Graduate Certificate

The Graduate Certificate in Museum Studies provides specialized interdisciplinary training that enables students to pursue careers in museums in the public or private sectors. The curriculum includes museology, methods, exhibit development, collections management, conservation, curation, and practice in Museum Studies. The core requirements for ANTH 545 Advanced Museology and HIST 594 Public History Seminarr alternate on rotation with controlled electives *every other year*. If you enroll in a year when these courses are not being offered, it will take you at least two years to complete your certificate.

The Certificate may be completed as a stand alone certification or in conjunction with the M.A. degree in Anthropology, History, Art, and related fields.

If you wish to complete a graduate certificate, you must apply (https://gradschool.nmsu.edu/) for admission to this non-degree program. Even if you already enrolled in a graduate program at NMSU, you will need to complete a separate application to be admitted to the certificate program. Once you have been admitted to the program and have completed all of the necessary coursework, you will need to apply to be awarded the certificate through your myNMSU account.

Please contact the Anthropology Graduate Advisor (kljenks@nmsu.edu) for information about how to complete the application.

The Museum Studies Graduate Certificate program is a program designed for individuals who want to enhance their understanding of museum work. It may be completed as a stand-alone certification or in conjunction with a Master's degree in Anthropology, Art History, History, Public History, Studio Art or other related disciplines.

Prefix	Title	Credits
Core Curriculum		
ANTH 545	Advanced Museology	3
ARTS 503	Preventive Conservation/Collections Care	3
HIST 594	Public History Seminar	3
Internship (credits from ANTH, ART, or HIST)		*3*
ANTH 597	Internship	
ARTS 490	Museum Conservation Internship	
ARTS 576	Museum/Gallery Research Internship	
HIST 585	Public History Internship	
Controlled Electives		
Select two from the following: [1]		6
ANTH 518	Advanced Historical Archaeology	
ANTH 540	Cultural Resource Management	
ANTH 549	Advanced Museum Anthropology	
ANTH 556	Advanced Native American Intersections in Museums	
ANTH 564	Advanced Curation Crisis in Archaeology	
ANTH 575	Advanced Pottery Analysis in Archaeology	
ANTH 576	Lithic Technology Organization	
ANTH 578	Advanced Lab Methods in Archaeology	
ARTS 501	Museum Conservation Techniques I	
ARTS 502	Museum Conservation Techniques II	
ARTH 546	Museum and Curatorial Studies	
ARTH 579	Methodologies and Historiography of Art History and Art Theory	
HIST 579	Oral History	
HIST 583	Advanced Historic Preservation	
HIST 586	Interpreting Historic Places for the Public	
Total Credits		**18**

[1] This list is regularly modified as new courses are added to the catalog, or old ones are phased out. Eligible courses are determined by a committee with at least one representative from Art, Anthropology and History. Substitutions may be approved with the advice of Museum

Studies Faculty in Art, History, and Anthropology by the Department Head of Anthropology.

Music Pedagogy and Performance - Graduate Certificate

Prefix	Title	Credits
Requirements		
MUSC 580	Ensemble Performance	1
MUSC 582	Applied Music	2-4
MUSC 486	Applied Music Pedagogy and Literature II	2
MUSC 586	Applied Music Pedagogy and Literature III	2
MUSC 581	The Collaborative Pianist	1
MUSC 532	21st Century Piano Skills	1
MUSC 441	Supervised Studio Teaching	1-2
MUSC 540	Graduate Recital/Analytical Paper	4
Total Credits		**14-17**

[1] Students must make a B or better before taking additional music theory/music history courses.

Music Performance - Graduate Certificate

Prefix	Title	Credits
Requirements		
MUSC 582	Applied Music	4
MUSC 580	Ensemble Performance	1
MUSC 581	The Collaborative Pianist	1
MUSC 532	21st Century Piano Skills	1
MUSC 540	Graduate Recital/Analytical Paper	4
Elective (Any graduate level MUSC course)		3
MUSC 486	Applied Music Pedagogy and Literature II	2
MUSC 586	Applied Music Pedagogy and Literature III	2
Total Credits		**18**

[1] Students must make a B or better before taking additional music theory/music history courses.

Principal Licensure - Graduate Certificate

Students seeking to complete the Principal Licensure Graduate Certificate program for the purpose of obtaining administrative licensure must already hold an MA or MS and New Mexico Level III teacher licensure. Students must complete the required 24 credit hours of coursework, which includes field-based experiences and six credit hours of a university-supervised administrative internship (over the course of two semesters). Students must earn a final grade of B- or better in all classes. Courses in which a student earns a "C" grade or below will need to be repeated and not count towards graduation. Important information about the Educational Leadership & Administration Programs can be found here (https://ela.nmsu.edu/).

Prefix	Title	Credits
Requirements		
All 24-credit hours must be completed to earn the Principal Licensure Graduate Certificate		
ELAD 5110	The Principalship	3
ELAD 5120	Leadership and Administration of Bilingual Education	3
ELAD 5140	Educational Financial Management	3
ELAD 5150	Public School Law	3
ELAD 5170	Special Education Administration	3
ELAD 5180	Internship Public Schools Part I	3
ELAD 5185	Internship: Public Schools Part II	3
ELAD 5320	Educational Leadership, Supervision, and Evaluation	3
Total Credits		**24**

Students must earn a final grade of "B-" or better in all classes. Courses in which a student earns a "C" grade or below will need to be repeated and not count towards graduation.

All 24-credit hours must be completed to earn the Principal Licensure Graduate Certificate and meet the administrative licensure requirements of the New Mexico Public Education Department. Course work requires field-based experiences.

Important information about the Educational Leadership & Administration Programs con be found here (https://tpal.nmsu.edu/degree-programs/concentrations/ela.html).

First Year		
Fall		**Credits**
ELAD 5110	The Principalship	3
	Credits	**3**
Spring		
ELAD 5120	Leadership and Administration of Bilingual Education	3
ELAD 5320	Educational Leadership, Supervision, and Evaluation	3
	Credits	**6**
Summer		
ELAD 5140	Educational Financial Management	3
ELAD 5170	Special Education Administration	3
	Credits	**6**
Second Year		
Fall		
ELAD 5150	Public School Law	3
ELAD 5180	Internship Public Schools Part I	3
	Credits	**6**
Spring		
ELAD 5185	Internship: Public Schools Part II	3
	Credits	**3**
	Total Credits	**24**

Public Health - Graduate Certificate

The graduate certificate program in public health is not an official graduate degree offered by NMSU but rather a focused collection of courses that enrolled students complete in public health. These courses are designed to provide and/or enhance students' knowledge of and skills in public health practice. Those students who successfully complete the

previously listed courses receive a certificate of completion statement on their official transcript and a formal certificate from the university.

Prefix	Title	Credits
Certificate Program Courses		
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5130	Epidemiological Approaches to Disease Control and Prevention	3
Choose one Health Policy Elective from the following:		3
PHLS 5140	Health Services System: Administration and Organization	
PHLS 5160	Public Health Policy Analysis	
PHLS 5150	Environmental Public Health Issues	3
Elective [1]		3
Total Credits		**15**

[1] For those who have not had any statistics courses it is strongly recommended that they complete PHLS 5120 Biostatistical Applications in Public Health as their elective.

Note that students who complete the Graduate Certificate are eligible to sit for the Certified Public Health (CPH) examination.

Apply online at http://gradschool.nmsu.edu (http://gradschool.nmsu.edu/)/. International students are required to contact the Center for International Programs at (575) 646-5480.

Graduate PH Certificate: 1 Year Plan

First Year		
Fall		**Credits**
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
PHLS 5140	Health Services System: Administration and Organization	3
	Credits	**6**
Spring		
PHLS 5130	Epidemiological Approaches to Disease Control and Prevention	3
PHLS 5150	Environmental Public Health Issues	3
	Credits	**6**
Summer		
Elective		3
	Credits	**3**
	Total Credits	**15**

Graduate PH Certificate: One course per semester plan

First Year		
Fall		**Credits**
PHLS 5110	Community and Psychosocial Aspects of Public Health	3
	Credits	**3**
Spring		
PHLS 5130	Epidemiological Approaches to Disease Control and Prevention	3
	Credits	**3**
Summer		
Elective		3
	Credits	**3**
Second Year		
Fall		
PHLS 5140	Health Services System: Administration and Organization	3
	Credits	**3**
Spring		
PHLS 5150	Environmental Public Health Issues	3
	Credits	**3**
	Total Credits	**15**

Public Utility Regulation and Economics - Graduate Certificate

The certificate in Public Utility Regulation and Economics (PURE) is a professional educational program designed for post-baccalaureate students pursuing a career in the utility sector, with an electric utility company, natural gas utility, water distribution utility, or with a government agency regulating these types of companies. PURE students must meet the general regulations and minimum requirements for admission to the graduate school and complete 12 credit hours including

Prefix	Title	Credits
ECON 571	Regulatory Policy and Industry Analysis: Electricity I	3
ECON 572	Regulatory Policy and Industrial Analysis: Water and Natural Gas	3
ECON 573	Regulatory Policy and Industry Analysis: Electricity II	3
ECON 574	Advanced Seminar Regulatory Policy and Industry Analysis	3
Total Credits		**12**

For details see https://business.nmsu.edu/minors-certificates (https://business.nmsu.edu/minors-certificates/)

School Social Work: Special Education Related Services - Graduate Certificate

Prefix	Title	Credits
SPED 5996	Topics in Special Education	3
or ECED 5110	Working with Young Children with Special Needs, Ages 3-8	
SOWK 5281	Advanced Generalist Practicum Seminar I	2
SOWK 5291	Advanced Generalist Practicum Seminar II	2
SOWK 5540	Introduction to School Social Work Practice in Diverse Communities	3
SOWK 5560	Advanced School Social Work Practice: Diverse Students and Families with Special Needs	3
Total Credits		**13**

First Year		
Semester 1		**Credits**
SPED 5996 or ECED 5110	Topics in Special Education (Bilingual and Multicultural Special Education) or Working with Young Children with Special Needs, Ages 3-8	3
	Credits	**3**
Second Year		
Semester 1		
SOWK 5281	Advanced Generalist Practicum Seminar I	2
SOWK 5540	Introduction to School Social Work Practice in Diverse Communities	3
	Credits	**5**
Semester 2		
SOWK 5291	Advanced Generalist Practicum Seminar II	2
SOWK 5560	Advanced School Social Work Practice: Diverse Students and Families with Special Needs	3
	Credits	**5**
	Total Credits	**13**

Secondary Education Alternative Licensure - Graduate Certificate

The NMSU Secondary Education Alternative Licensure program aims to recruit highly qualified individuals who have earned *at least* a bachelor's degree in a related field and are eligible for a temporary two-year alternative license in the State of New Mexico. We seek individuals who will have dramatic impact on the social. cultural, emotional, and intellectual growth of youth with whom they will work throughout their career.

Applicants must meet the following minimum requirements and submit the required documentation for consideration:

- Meet minimum state requirements of *at least* a bachelor's degree and course requirements of 30 undergraduate credit hours (6.60.3. 7 NMAC) in the teaching field (12 upper division) with a minimum 2.75 cumulative undergraduate GPA.
- Be hired as a teacher of record in a K-12 school, and submit a copy of a current teaching contract from a school district in New Mexico that indicates the candidate is the teacher of record in the teaching field for each year of employment.
- Admission to the NMSU Graduate School (https://gradschool.nmsu.edu/)
- Admission to the School of Teacher Preparation, Administration, and Leadership in the College of Education.

Prefix	Title	Credits
Required Courses		
EDUC 5120	Multicultural Education	3
EDUC 5130	Technology and Pedagogy	3
EDUC 5150 or EDUC 5110	Classroom Management Exploration in Education	3
Choose one from the following (based on content area):		3
EDUC 5410	Teaching Science at the Middle and High School Level	
EDUC 5420	Teaching Mathematics at the Middle and High School Level	
EDUC 5430	Teaching Social Studies at the Middle and High School Level	
EDUC 5440	Teaching Language Arts at the Middle and High School Level	
READ 5330	Content Area Literacy	3
SPED 5105	Introduction to Special Education in a Diverse Society	3
Total Credits		**18**

All licensure courses are eligible for transfer into a regular TPAL master's in education program.

Other Program Requirements to be completed by the end of the program:

- Complete and maintain a 3.0 minimum GPA in all courses throughout the program
- Complete two full consecutive semesters of observation by a University Supervisor with a fee for each semester (8 formal observations)
- To transition from an alternative license to a Level I license, NM PED requires additional requirements to be met. These requirements can be found on the NM PED website (https://web.ped.nm.gov/bureaus/licensure/licensure-requirements/secondary-6-12/). These requirements are not required for program completion.

First Year		
Semester 1		**Credits**
SPED 5105	Introduction to Special Education in a Diverse Society	3
Choose one from the following (based on content area)		3
EDUC 5410	Teaching Science at the Middle and High School Level	
EDUC 5420	Teaching Mathematics at the Middle and High School Level	
EDUC 5430	Teaching Social Studies at the Middle and High School Level	
EDUC 5440	Teaching Language Arts at the Middle and High School Level	
	Credits	**6**
Semester 2		
EDUC 5110	Exploration in Education	3
READ 5330	Content Area Literacy	3
	Credits	**6**
Semester 3		
EDUC 5120	Multicultural Education	3
EDUC 5130	Technology and Pedagogy	3
	Credits	**6**
	Total Credits	**18**

A total of 8 formal observations must be completed from an assigned university supervisor. These are typically complete during the last Fall and Spring semester.

Sustainability - Graduate Certificate

The Sustainability Graduate Certificate is open to students admitted to the Graduate School who have a GPA of 3.0 or higher. Completion of the certificate requires completion of each of the individual courses with a B or better.

A minimum of 12 credits are required for the certificate. At least 6 credits are from 500/5000-level and above.

Prefix	Title	Credits
The following courses are required and are expected to be taken in sequence:		
ENVS 451	Special Topics (Special Topics in Sustainability)	3
RGSC 575	Climate Studies, Water and Society	3
ENVS 605	Arid Land Water Resources	3
Electives (choose two from the following): [1]		**6**
AEEC 5350	Economics of Water Resource Management and Policy	
AGRO 483	Advanced Sustainable Crop Production	
ECON 571	Regulatory Policy and Industry Analysis: Electricity I	
ENVS 460	Introduction to Air Pollution	
ENVS 462	Sampling and Analysis of Environmental Contaminants	
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation	
GEOG 535	Planning a Sustainable World	
GEOG 555	Southwest Environments	
SOCI 4335V	Advanced Environmental Sociology	
SOCI 5310	Seminar in Community Development	
WSAM 590	System Dynamics	
Total Credits		**15**

[1] **Other potential courses** may be available in the catalog. Discuss with your Sustainability Advisor whether the course would be suitable. Substitutions and exceptions can be made with the approval of the Sustainability faculty advisor and Department Head of Plant & Environmental Sciences Department.

Systems Engineering - Graduate Certificate

Program Availability

This distance education program is available to working professionals who have undergraduate degrees in engineering, engineering technology, and related fields. It is also an option for persons with graduate degrees who seek career renewal. Systems engineering provides a unique opportunity for working professionals to integrate their work experience with advanced coursework.

Program Objectives

The objectives of this program are:

- To provide technical professionals an opportunity to advance their careers through advanced education in systems engineering.
- To develop and improve relationships with the College of Engineering's constituencies by offering a program that addresses a known need for professional graduate-level development.
- To provide an opportunity for non-traditional students to consider advancing their education in areas that will foster their career development.
- To enable program students to become aware of current faculty research in systems engineering areas.

Requirements

A 3.0 minimum cumulative GPA in four courses as described below will be required for award of the Systems Engineering Graduate Certificate Program.

Admission to the NMSU Graduate School

Students must apply and be admitted to NMSU as a non-degree student to take classes. For more information, contact:

NMSU Graduate School
Box 30001, MSC 3G
Las Cruces, NM 88003
(575) 646-2736
http://gradschool.nmsu.edu/ (http://gradschool.nmsu.edu)

To complete the Certificate Program, students must be admitted to the Graduate School as certificate students. If you are considering pursuing a degree in electrical or industrial engineering, you should contact that department for admissions
requirements and advising.

Academic Content

Prefix	Title	Credits
Required Courses		**6**
I E 537	Large Scale Systems Engineering	
I E 590	Selected Topics (Systems Engineering)	
Electives (six credits from the following):		**6**
Track 1- Modeling, Simulation & Decisions		
I E 490	Selected Topics	
I E 533	Linear Programming	
I E 535	Discrete Optimization	
I E 545	Characterizing Time-Dependent Engineering Data	
I E 567	Design and Implementation of Discrete-Event Simulation	
Track 2 - Applications		
E E 460	Space System Mission Design and Analysis	
I E 525	Systems Synthesis and Design	
E E 590	Selected Topics	
Track 3 - Systems Analysis		
I E 466	Reliability	
I E 515	Stochastic Processes Modeling	
I E 522	Queuing Systems	
I E 571	Advanced Quality Control	
Total Credits		**12**

Other courses may be substituted by the approval of your advisor and the program director.

Teaching English to Speakers of Other Languages - Graduate Certificate

Requirements

Prefix	Title	Credits
BLED 5320	Second Language Acquisition	3
BLED 5420	Pedagogy of TESOL	3

BLED 5330	Assessment in Culturally & Linguistically Responsive Teaching	3
BLED 5990	TESOL Practicum	3
Total Credits		**12**

Teaching Spanish for Heritage Language Learners - Graduate Certificate

The Department of Languages and Linguistics offers a graduate certificate program in Teaching Spanish for Heritage Language Learners. The certificate requires a student to complete 18 credit hours (a total of six courses) that could be completed in one year and to submit a portfolio. Four courses are mandatory core courses. The remaining two courses can be selected by the student from the list of approved courses. Upon completion of all six courses, students will be guided as they prepare and submit an online reflective portfolio. Students may choose to apply to our master's program online or on campus and upon completion, all six courses can be used towards final degree completion in our MA program. This certificate program is open to applicants not currently enrolled as well as to current NMSU graduate students and to students who already hold a master's degree who can benefit from the certificate as an additional credential.

***Program does NOT lead to licensure. However, students are encouraged to inquire with their local districts to see if this can be added as an endorsement to their CV. Students can work in conjunction with our master's degree to earn a graduate certificate at the same time.**

Prefix	Title	Credits
Core Courses		*12*
SPAN 594	Theory and Methodology of Spanish Pedagogy	
SPAN 597	Advanced Strategies for Teaching Spanish for Heritage/Native Speakers	
SPAN 510	Assessing the National Standards	
SPAN 503	Critical Language Awareness in Teaching SHL	
Approved Electives (must take two)		*6*
SPAN 502	Sentipensar Pedagogy: Anzaldúa and Other Theorists	
SPAN 507	Technology Enhanced Language Learning	
SPAN 508	Teaching Literature with Technology	
SPAN 509	Teaching Culture with Technology	
SPAN 545	Advanced Dialectos del Espanol	
SPAN 558	Bilinguismo	
SPAN 589	Spanish Sociolinguistics	
SPAN 591	Advanced Study in History of the Spanish Language	
SPAN 493	Espanol de los Estados Unidos	
SPAN 504	Culturally Sensitive Teaching in SHL: Teaching Spanish as a Heritage Language in the United States	

Online Portfolio Submission

Detailed instructions for the online portfolio submission guidelines will be provided during advising in the department, but will include deliverable items such as lesson plans, projects, and other pedagogical items that have been completed as part of the courses in the certificate that the student can use in their planned careers with heritage learners.

The program requirements can be completed in one year, including Summer, but can also be completed in multiple years. The following sample Plan of Study is based on one-year completion and lists sample elective courses. Some of the elective courses are offered in alternating (even or odd) years.

First Year		
Fall		**Credits**
Fall Core [1]		6
SPAN 594	Theory and Methodology of Spanish Pedagogy	
SPAN 503	Critical Language Awareness in Teaching SHL	
Fall electives (choose 1)		3
SPAN 545	Advanced Dialectos del Espanol	
	Credits	**9**
Spring		
Spring core		3
SPAN 510	Assessing the National Standards	
Spring electives (choose 1)		3
SPAN 502	Sentipensar Pedagogy: Anzaldúa and Other Theorists	
SPAN 507	Technology Enhanced Language Learning	
SPAN 509	Teaching Culture with Technology	
	Credits	**6**
Summer		
Summer core		3
SPAN 597	Advanced Strategies for Teaching Spanish for Heritage/Native Speakers	
Portfolio submission		
	Credits	**3**
	Total Credits	**18**

Advanced Manufacturing - Graduate Minor

The Advanced Manufacturing graduate minor is restricted to students currently enrolled in any of the Master of Engineering programs.

Prefix	Title	Credits
Required Courses		
C E 510	Introduction to Nondestructive Testing	3
CHME 491	Undergraduate Special Topics (Development of Agricultural Technologies)	3
I E 490	Selected Topics (Introduction to Advanced Manufacturing)	3
500 Level Approved Department Course List		3
Total Credits		**12**

First Year		
Fall		**Credits**
I E 590	Selected Topics	3
500 level Course (approved from the Department Course List)		3
	Credits	**6**
Spring		
C E 510	Introduction to Nondestructive Testing	3

CHME 491	Undergraduate Special Topics (Development of Agricultural Technologies)	3
	Credits	**6**
	Total Credits	**12**

Agribusiness - Graduate Minor

The graduate minor in Agribusiness requires at least 9 credit hours of graduate coursework within the AEEC prefix.
Students wishing to obtain a minor in Agricultural Economics and Agricultural Business (AEAB) while majoring in another academic program should:
1) Select an advisor from the Agricultural Economics and Agricultural Business (AEAB) Graduate Faculty.
2) Complete six hours of core courses, listed below.
3) Complete at least 3 additional credit hours of approved graduate-level AEEC courses.

Prefix	Title	Credits
AEEC 5330	Agribusiness Marketing	3
AEEC 5340	Agribusiness Management	3
Additional Graduate AEEC Course (5000 and above course)		3
Total Credits		**9**

Agricultural and Extension Education - Graduate Minor

A graduate student who wishes to minor in AXED, while majoring in another academic program, should select an advisor from the AXED Graduate Faculty. A student minoring in AXED must complete at least nine credit hours of approved courses in the AXED department. A copy of the minor program must be approved by the AXED department head. Contact an advisor in AXED.

Animal Science - Graduate Minor

A minimum of 9 credit hours in graduate level classes with the ANSC prefix are required to obtain a graduate minor in Animal Science. Approval by the Animal and Range Sciences Department Head is required.

Anthropology - Graduate Minor

Students who earn a graduate minor in Anthropology must complete at least 9 credits (3 courses) of graduate-level anthropology coursework at the level of 500 or above. Graduate students majoring in anthropology may **not** also earn a minor in the same field.

Applied Statistics - Graduate Minor

The minor in applied statistics is designed for graduate students majoring in other fields. It provides credentials that the student is capable of conducting statistical analyses in their area of specialization.

Master's level students wishing to minor in applied statistics at the master's level must have at least 10 credits of 500-level applied statistics courses. In accordance with Graduate School requirements, doctoral students must have at least 12 credits of 500-level applied statistics courses for a minor.

Students who wish to focus on experimental statistics typically complete A ST 503 SAS Basics, A ST 504 Statistical Software Applications, A ST 505 Statistical Inference I, A ST 506 Statistical Inference II. A typical course sequence for students interested in data analytics consists of A ST 505 Statistical Inference I, A ST 507 Advanced Regression, A ST 515 Statistical Analysis with R, and A ST 540 Predictive Analytics.

Students wishing to obtain the minor in applied statistics should contact an applied statistics faculty member to recommend appropriate applied statistics course work to be included in the plan of study and to serve as the graduate committee representative from the minor area.

Archaeology - Graduate Minor

The graduate minor in archaeology allows students in other programs to develop a specialization in archaeology. A minor in archaeology provides a useful concentration for students developing professional careers in cultural resource management, public lands management, environmental sciences, public history, geography, or teaching.

In order to complete the minor requirements, students are required to complete 9 credit hours (3 classes) of graduate level courses. The core courses for the minor are:

Prefix	Title	Credits
Course Requirements		
Select 9 credits from the following:		9
ANTH 514	Advanced Archaeology of Magic, Witchcraft, and Religion	
ANTH 516	Advanced Archaeology of Ancient Southwest	
ANTH 518	Advanced Historical Archaeology	
ANTH 522	Archaeological Field School	
ANTH 523	Archaeological Mapping	
ANTH 540	Cultural Resource Management	
ANTH 564	Advanced Curation Crisis in Archaeology	
ANTH 542	Cultural Resource Management II	
ANTH 575	Advanced Pottery Analysis in Archaeology	
ANTH 576	Lithic Technology Organization	
ANTH 577	Advanced Zooarchaeology	
ANTH 578	Advanced Lab Methods in Archaeology	
Total Credits		**9**

Students should choose among these core offerings with the advice of their MA thesis chair and minor area committee member. The minor in archaeology is not available to graduate anthropology majors. Substitutions for special topics courses available by permission of Anthropology Department Head.

Bioinformatics (with Computer Science) - Graduate Minor

The Bioinformatics minor is jointly offered with the Department of Computer Science and consists of 9 credit hours for Master's students and 12 credit hours for Ph.D. students, including BIOL 550 Special Topics/GENE 452 Applied Bioinformatics, and additional courses selected from those listed at http://research.nmsu.edu/molbio/ (https://molb.nmsu.edu/curriculum/under-graduate-minor-in-bioinformatics.html). The courses selected will depend on whether the student is majoring in a biological or non-biological science and include courses from the graduate Computer Science and Molecular Biology curricula. Please inquire with the Molecular Biology Program office for the most recent requirements for the bioinformatics minor.

Communication Studies - Graduate Minor

Students who wish to take a minor in Communication Studies will need to accumulate a minimum of 9 graduate credits in Communication Studies courses. Students are encouraged to contact the Communication Studies Department Head for direction in the selection of courses.

Computer Science - Graduate Minor

Students who wish to take a minor in Computer Science will need to accumulate a minimum of 9 graduate credits not including the CSCI 4540 Computer Science I Transition Computer Science course. Students are encouraged to contact the Computer Science Graduate Committee Chair for directions in the selection of courses.

Economics - Graduate Minor

The graduate minor in economics is appropriate for those who seek a better understanding of how micro- and macro- economic forces influence individuals, business and government decision making. Students interested in public utility regulation, banking and finance, government service, or law will find the minor especially interesting.

Graduate students wishing to earn a minor in economics must complete 12 semester credit hours, including:

Prefix	Title	Credits
Select at least two from the following:		6
AEEC 5120	Microeconomic Theory	
AEEC 5130	Macroeconomic Theory	
AEEC 5240	Econometrics	
ECON or AEEC 500 or higher courses (excluding ECON 503) [1]		6
Total Credits		**12**

[1] ECON 503 Managerial Economics cannot be counted toward the minor.

Students pursuing the economics minor must fulfill the course prerequisites before enrolling in the graduate courses.

Educational Administration (Doctoral) - Graduate Minor

Doctoral Graduate Minor

Doctoral students who wish to earn a minor in Educational Leadership and Administration should meet with an ELA faculty member to discuss program and/or courses. NOTE: Faculty will prescribe a plan of study for the minor that takes into consideration the career aspirations and goals of the student.

Students must earn a minimum of a "B" grade in all minor coursework. Students who receive a grade of "B-" or below will be required to retake the course.

Educational Administration (Higher Ed.) - Graduate Minor

Master's students may earn a minor in educational administration, with a focus in Higher Education Administration, by passing **three** of the listed classes below.

How to Apply

Students wishing to obtain the minor should contact ELA Doctoral Programs Coordinator at edmandev@nmsu.edu.

Minimum Grade Requirement

Students must earn a minimum "B-" grade in all required coursework. Students who receive a grade of "C+" or below will be required to retake the course.

Prefix	Title	Credits
ELAD 5215	Higher Education Administration	3
or ELAD 5210	Community College Administration	
ELAD 5250	Higher Education Law	3
ELAD 5230	Higher Education Finance and Funding	3
ELAD 5240	Management of Student Services in Higher Education	3
Total Credits		**12**

Educational Administration (Pk-12) - Graduate Minor

Master's level students wishing to earn a minor in educational administration, with a focus in Pk-12 Educational Administration, must pass **three** of the listed classes below.

How to Apply

Students wishing to obtain the minor should contact ELA Doctoral Programs Coordinator at edmandev@nmsu.edu.

Minimum Grade Requirement

Students must earn a minimum "B-" grade in all required coursework. Students who receive a grade of "C+" or below will be required to retake the course.

Prefix	Title	Credits
ELAD 5110	The Principalship	3
ELAD 5140	Educational Financial Management	3
ELAD 5150	Public School Law	3
ELAD 5320	Educational Leadership, Supervision, and Evaluation	3
Total Credits		**12**

Fish, Wildlife and Conservation Ecology - Graduate Minor

A minor in Fish, Wildlife, and Conservation Ecology requires 9 credits of graduate coursework that carries the FWCE prefix. Official minor documentation must be completed with the Department of Fish, Wildlife and Conservation Ecology. Students wishing to obtain to obtain a graduate minor in Fish, Wildlife and Conservation Ecology (FWCE) must: 1) obtain approval from the Department Head of the Department of Fish,

Wildlife and Conservation Ecology Department Head; 2) have a FWCE faculty member as part of their graduate advisory committee; FWCE faculty member needs to approve the proposed program of study for the minor; 3) complete a minimum of 9 credit hours in graduate level (500) classes with the FWCE prefix. FWCE 509 Population Ecology (s) (3 s.h.) is required, plus an additional 6 credit hours.

Prefix	Title	Credits
The graduate minor in FWCE would require nine credit hours in FWCE graduate-level courses and would include the following:		
Required course		*3*
FWCE 509	Population Ecology (s)	
Required elective (at least 3-4 credits from one of the following		*3-4*
FWCE 459	Aquatic Ecology	
FWCE 547	Wildlife Law and Policy	
Elective		
Three credits from any of the remaining graduate courses in Wildlife Science		3
Total Credits		**9-10**

Food Studies - Graduate Minor

The purpose of the Food Studies Graduate Minor is to:

1. Enable students to develop a specialization in food studies within their respective graduate program
2. Develop specialized knowledge of the complex and dynamic relationship between food and culture
3. Explore the role of culture in food production, distribution and consumption across different cultures
4. Apply ideas and knowledge from graduate seminars to fieldwork for MA thesis or internship in a food studies topic

Program Requirements

Prefix	Title	Credits
Core Curriculum		
Select three from the following: [1]		9
ANTH 520	Ethnographic Field Methods	
ANTH 531	Issues in Nutritional Anthropology	
ANTH 538	Plants, Culture, and Sustainable Development	
ANTH 539	Culture and Foodways	
ANTH 515	Applied Anthropology [2]	
ANTH 535	Adv. Human Health and Biological Variation [2]	
Total Credits		**9**

[1] Alternative classes may be substituted for one of the core classes with the approval of the Anthropology Department Head.

[2] In these cases, the student's class research project should focus on a food studies theme.

Students are expected to conduct a food studies thesis, applying anthropological theoretical frameworks and ethnographic methodologies to the study of a food-related topic. Non-thesis students may select a food studies internship. Possible topics include sustainable development, alternative food movements, community food security, community health, nutrition, food safety, globalization of food, indigenous knowledge systems, food self-sufficiency, among others.

Gender and Sexuality Studies - Graduate Minor

The graduate minor in Gender and Sexuality Studies specializes in the examination of gender; gender identity; queer and transgender studies; feminisms; and social justice from interdisciplinary perspectives. Students develop a strong understanding of how interconnected social formations such as race, class, age, nation, citizenship, ability, and other categories of difference are constructed and intersect with gender and sexuality. The graduate minor in Gender and Sexuality Studies offers students a documented emphasis in their academic training in the field of Gender and Sexuality Studies. The graduate minor allows students to acquire specialized knowledge through the interdisciplinary curriculum offered by Gender and Sexuality Studies and to integrate theoretical perspectives and methodologies from Gender and Sexuality Studies into diverse academic fields. Our courses equip students with analytical skills and knowledge to engage power structures critically and transform lives and communities.

We offer a plan of study that integrates humanities and social sciences methods and objects of study, including areas of concentration such as human rights and transnational migration; socially engaged literature, film, and other creative media; and transnational and decolonial methodologies. The graduate minor in Gender and Sexuality Studies complements many advanced degree programs at NMSU including Anthropology, Art, Biology, Business Administration, Chemistry, Clinical and Mental Health Counseling, Communication Studies, Creative Writing, Criminal Justice, Curriculum and Instruction, Economics, Education, English, Government, History, Psychology, Public Health Sciences, Social Work, Sociology, Spanish, and others.

Gender and Sexuality Studies students prepare for careers in such fields as advocacy and social organizing, community development, creative writing, criminal justice, education, filmmaking and video production, health care, human resources, journalism, law, music production, social services, and visual arts. Many students declare a graduate minor in Gender and Sexuality Studies to enhance career opportunities and learning.

Courses are offered both online and on campus. In addition to the graduate minor, Gender and Sexuality Studies offers a B.A. and undergraduate minor.

Master's and Doctoral minor candidates:

Prefix	Title	Credits
Required Core Course		
GNDR 571	Advanced Seminar in Feminist and Queer Theories	3

For a Master's Degree minor candidate:

6 additional credit hours from upper level Gender & Sexuality Studies courses or courses cross-listed with Women's Studies and other departments/programs are required. (9 credit hours total)

For a Doctoral Degree minor candidate:

9 additional credit hours from upper level Gender & Sexuality Studies courses or courses cross-listed with Women's Studies and other departments/programs are required. (12 credit hours total)

Geographic Information Science and Technology - Graduate Minor

Overview

The Department of Geography and Environmental Studies offers a Graduate Minor in Geographic Information Science and Technology (GIS&T). This minor is available to all graduate students and provides a valuable concentration for those seeking jobs that involve spatial data collection and analysis.

Graduates find career opportunities in diverse fields such as data and information management, urban and regional planning, water resource management, ecology, cultural resource management, emergency management, and public health.

Program Learning Outcomes

Upon completion of the Graduate Minor in Geographic Information Science & Technology, students will be able to:

1. Think spatially, geographically, and geospatially.
2. Explain basic and advanced concepts, methods, and applications in geographic information science and technology, including geographic information systems and remote sensing.
3. Solve real-world problems by acquiring, analyzing, interpreting, evaluating, and visualizing spatial data.

More Information

See the Requirements tab for details on course and credit expectations for earning the Graduate Minor in GIS&T.

Course and Credit Requirements

The Department of Geography and Environmental Studies offers a graduate minor in Geographic Information Science and Technology (GIS&T). This minor is available to all graduate students and provides a valuable concentration for those pursuing professional careers that involve spatial data collection and analysis. Career opportunities span diverse fields, including data and information management, urban and regional planning, water resource management, ecology, cultural resource management, emergency management, and public health.

To earn the minor in GIS&T, students must complete the following required courses, totaling 11-12 credits. All courses must be taken for a letter grade, with a minimum grade of B- required in each course. Students must also include a representative from the Department of Geography and Environmental Studies on their graduate committee.

Prefix	Title	Credits
Requirements		
GEOG 573	Introduction to Remote Sensing	4
GEOG 578	Fundamentals of GIS	4
Select 3-4 credits from the following:		3-4
GEOG 542	Programming for GIS	
GEOG 571	Cartography and GIS	
GEOG 582	Advanced Remote Sensing	
GEOG 585	Spatial Analysis and Modeling	
GEOG 588	GIS and Water Resources	
GEOG 544	GIS&T Professional Portfolio	
GEOG 545	Geospatial Professionalism	
Total Credits		**11-12**

Gerontology - Graduate Minor

A grade of B or higher is required in all coursework for the Graduate Minor in Gerontology.

Prefix	Title	Credits
Required Courses		
Select four courses from the list below (12 credits)		*12*
PHLS 4740	Aging and Public Policy	
PHLS 5650	Coping with Loss and Grief: A Cross-Cultural Perspective	
PHLS 5710	Introduction to Gerontology	
PHLS 5720	Health Promotion for the Older Adult	
PHLS 5730	Adulthood and Aging	
PHLS 5996	Special Topics (Aging in a Multicultural Society)	
Total Credits		**12**

History - Graduate Minor

Students may earn a graduate minor in History by passing the following courses:

Prefix	Title	Credits
Craft of History		3
Select one from the following:		3
HIST 590	Reading Seminar: Borders, Boundaries and Frontiers	
HIST 591	Reading Seminar: Modernity and its Discontents	
HIST 592	Reading Seminar: Nature and Society	
Select two additional 3-credit 500-level and above courses		6
Total Credits		**12**

Graduate students in History must maintain a 3.0 grade point average in their History courses. A graduate student earning a C or lower grade in one History course will receive a letter of warning. A graduate student earning two or more C or lower grades in History courses or whose History grade point average falls below 3.0 will be removed from the History graduate program. Students must earn at least one B or higher grade in a seminar during their first year in the graduate program, and must take at least one seminar during each year in which they are enrolled in the program. If a graduate student receives one U (Unsatisfactory) grade on his/her thesis or internship, the student will receive a written warning, and if a student received two or more U grades on his/her thesis or internship, the student will be removed from the program.

Information Systems - Graduate Minor

This minor is for master's-level students who are not in the Masters of Business Administration (MBA) program. Students in the MBA program may choose a concentration in Information Systems (see the Business Administration (p. 986) section).

To obtain a graduate minor in Information Systems (IS) students must satisfy the requirements as stated below for a minor at the master's level. For it to appear on the transcript, the student must list the minor on the Program of Study and Committee for Master's Student (Application for Admission to Candidacy) and have it signed by the head of the department offering the minor.

Requirements

The minor requires a minimum of 9 credits of graduate work.

Prefix	Title	Credits
Requirements		
BCIS 550	Information Systems Analysis and Design	3
BCIS 575	Database Management Systems	3
Select 3 credits from the following:		3
BCIS 561	Business Analytics I	
BCIS 566	Business Analytics II	
BCIS 580	Introduction to Cybersecurity: Exploring Computer, Network, and Data Security Principles	
BCIS 582	Management of Information Security	
BCIS 590	Special Topics	
Total Credits		**9**

Integrated Behavioral Health Care - Graduate Minor

The Minor in Integrated Behavioral Health Care, offered through the Counseling and Educational Psychology (CEP) department, is open to graduate students enrolled in CEP programs Clinical Mental Health Counseling, School Psychology, Counseling Psychology and to graduate students who are enrolled in Social Work, Public Health, Nursing and Marriage and Family Therapy programs.

It was established in the interest of meeting the needs of graduate students in the health professions who are receiving or seeking training in interdisciplinary or interprofessional collaborations with other healthcare disciplines. The provision of integrated behavioral health services fits within the university's broader goal of meeting the needs of the citizens of New Mexico and the department's commitment to graduating competent service providers who can be effective members of a healthcare team.

Students will complete 9 credits of coursework specific to this program of study in order to obtain a Minor in Integrated Behavioral Health Care. For application and coursework details, please get in touch with the CEP department office or visit the departmental website: https://cep.nmsu.edu

Through the courses in this minor students develop knowledge and skills in the following areas:

1. Apply the biopsychosocial model of health and illness with primary care patients,
2. Apply knowledge regarding the mind-body connection to address such issues as stress management, emotion regulation and sleep medicine,
3. Apply culturally responsive behavioral assessment/interventions,
4. Demonstrate behavioral health consultation skills with other health care providers, and
5. Develop interprofessional collaboration skills that include understanding the roles of all healthcare professionals and learning how to communicate effectively in order to engage in service delivery as a team.

Prerequisites

In order to begin the Minor courses, students **must currently be enrolled in a Behavioral Health program**. There are no other prerequisites.

How to Apply

If you are interested in pursuing a minor in Integrated Behavioral Healthcare, you are advised to meet with the CEP Program Coordinator, Yadira Ibanez (y1banez@nmsu.edu). It is best to meet with the program coordinator before enrolling in relevant coursework, but it is possible to obtain the minor after taking one of the courses in the program of study. This meeting will ensure that the minor is declared for graduation purposes. In addition, this meeting allows the CEP department to keep track of potential minors in order to determine what courses need to be offered at any given time. An IBH Minor faculty member is also required to sit on the committee for the student's final exam. For Doctoral students, this includes orals, dissertation proposal, and defense exams. Students should work with their advisor to ensure that an IBH faculty is in their committee requirements.

Program of Study

Students will successfully complete 9 credits of work from the courses listed below in order to obtain a Minor in Integrated Behavioral Health Care.

Prefix	Title	Credits
Core Courses		
Choose 9 credits from the following:		9
CEPY 5150	The Art & Science of Mindfulness for Helping Professionals	
CEPY 5280	Primary Care Psychology	
CEPY 5997	Special Research Programs	
or CEPY 6996	Selected Topics	
CEPY 6590	Behavioral Health Practicum	
Total Credits		**9**

CEPY 5150 The Art & Science of Mindfulness for Helping Professionals (1-3 s.h.)In this course, students learn about contemplative practices by learning about and participating in various mindfulness practices. This course engages students in a practice or experience that leads to reflection and, thus, acquired knowledge about themselves, others, and group functioning. The students learn how to increase well-being through mind-body integration, and they learn how to teach others mindfulness techniques. Students are required to explore the research on mindfulness for some medical condition or for its use with a specific population. This course has been taught in the spring semester, for five years, to CEP, MSW, MPH, and FCS students.

CEPY 5280 Primary Care Psychology (3 s.h.) Didactic and experiential learning in primary care psychology issues. Through this course students will learn about the cultural necessity of the integration of mental and physical health issues and multidisciplinary collaboration. Activities include 1) guest speakers on American Indian Health, the Mexican Healthcare System, and Integrated Care in primary care settings; 2) visits to 2 interdisciplinary, integrative, border community health centers; 3) shadowing residents at the Family Medicine Center and observing the

integration of psychological and medical aspects of the cases observed; and 4) exposure to the interventions of Motivational Interviewing and Mindfulness-Based Stress Reduction. CEP, MSW, and MPH trainees have enrolled in this course, taught during the fall semester, over the last 11 years.

CEPY 5997 Special Research Programs (1-6 s.h.)/CEPY 6996 Selected Topics (1-6 s.h.). This course will require students to spend a minimum of 6 hours per week at a primary care site, providing counseling, assessment, supervision, or psychoeducational services. The Minor coordinator must approve all placements. CEP students have enrolled in this course over the last 4 years. This course is available fall, spring and summer. During the summer, a special section of this course is subtitled, "Interprofessional Immersion" as CEP, DNP, and Family Medicine and PharmD residents learn interprofessional competencies related to providing geriatric care. This special section has been offered for two summers.

CEPY 6590 Behavioral Health Practicum (1-6 s.h.). An intensive supervised experience in providing behavioral health services at an on or off campus interdisciplinary health setting. This course will provide students the opportunity to participate in a supervised service-learning experience within community-based, interdisciplinary, primary care settings that serve medically underserved and high-risk groups. Students write and present a case study utilizing the biopsychosocial model of health. MSW and CEP students are placed in community-based organizations with Family Medicine residents or other medical personnel in order to provide integrated care. This course has been offered in the spring semester for the last 11 years.

Materials Engineering - Graduate Minor

The Materials Engineering minor at New Mexico State University is part of a materials education program that addresses the growing demand for engineers and scientists with understanding of the wide range of materials, their properties and means of characterization. A student must pass 18 credits of courses with a grade C or better. The minor includes one required course (CHME 361 Engineering Materials), and the balance elective courses chosen from menus available on the Chemical and Materials Engineering website (http://chme.nmsu.edu/academics/minors/materials-engineering/ (https://chme.nmsu.edu/academics/minors/materials-engineering/)). No courses may be taken S/U. All prerequisites for the classes must be met or consent of the instructor obtained before enrolling in class.

Prefix	Title	Credits
Required Courses		
CHME 361	Engineering Materials	3
Electives		15
Total Credits		**18**

Mathematics - Graduate Minor

Mathematics – Graduate Minor

Students pursuing a graduate minor in Mathematics must complete a minimum of 9 credit hours in graduate-level coursework with the MATH or STAT prefix at the 5200 level or above. Graduate students majoring in Mathematics may **not** also earn a minor in the same field. Students are encouraged to consult with the Department of Mathematical Sciences for guidance in selecting appropriate courses.

Prefix	Title	Credits
9 Credits of MATH or STAT Courses from the following list		9
MATH 5210	Complex Variables	
MATH 5220	Fourier Series and Boundary Value Problems	
MATH 5310	Introduction to Topology	
MATH 5320	Logic and Set Theory	
MATH 5330	Elementary Number Theory	
MATH 5340	Abstract Algebra I: Groups and Rings	
MATH 5350	Advanced Linear Algebra	
MATH 5360	Introduction to Real Analysis I	
MATH 5365	Introduction to Real Analysis II	
MATH 5410	Complex Analysis	
MATH 5420	Topology I	
MATH 5425	Topology II	
MATH 5428	Topics in Topology	
MATH 5430	Mathematical Structures in Logic	
MATH 5435	Universal Algebra and Model Theory	
MATH 5438	Topics in Foundations	
MATH 5440	Partial Differential Equations I	
MATH 5445	Partial Differential Equations II	
MATH 5450	Abstract Algebra II: Fields, Rings and Modules	
MATH 5453	Module Theory and Homological Algebra	
MATH 5455	Introduction to Commutative Algebra and Algebraic Geometry	
MATH 5458	Topics in Algebra	
MATH 5460	Measure and Integration	
MATH 5463	Real Analysis	
MATH 5465	Introduction to Functional Analysis	
MATH 5468	Topics in Analysis	
MATH 5996	Special Topics	
STAT 5210	Probability: Theory and Applications	
STAT 5220	Statistics: Theory and Applications	
STAT 5230	Elementary Stochastic Processes	
STAT 5310	Foundations of Probability	
STAT 5320	Advanced Topics in Stochastic Processes	
STAT 5330	Continuous Multivariate Analysis	
STAT 5335	Linear Models	
STAT 5340	Advanced Theory of Statistics I	
STAT 5345	Advanced Theory of Statistics II	
STAT 5348	Topics in Probability and Statistics	

Molecular Biology - Graduate Minor

The Molecular Biology Minor consists of 10 credit hours including MOLB 545; either MOLB 520 or MOLB 542; any of the tier II courses; and one MOLB 590 seminar.

Prefix	Title	Credits
Required Courses		
MOLB 545	Molecular and Biochemical Genetics	3
MOLB 520	Molecular Cell Biology	3
or MOLB 542	Biochemistry I	
MOLB 590	Discussions in Molecular Biology	1
Molecular Biology Tier II Courses		
Select one from the following:		3
AGRO 516	Molecular Analysis of Complex Traits	
ANSC 602	Advanced Reproductive Physiology (fo)	
ANSC 621	Metabolic Functions and Dysfunctions (fe)	

BCHE 546	Biochemistry II
BCHE 647	Physical Biochemistry
BIOL 451	Physiology of Microorganisms
BIOL 470	Developmental Biology
BIOL 474	Immunology
BIOL 475	Virology
BIOL 477	Applied and Environmental Microbiology
BIOL 478	Molecular Biology of Microorganisms
BIOL 490	Neurobiology
BIOL 541	Professional Development Seminar
BIOL 550	Special Topics
BIOL 577	Advanced Topics in Environmental Microbiology
BIOL 590	Neuroscience
BIOL 698	Selected Topics
EPWS 486	Plant Virology
MOLB 546	Biochemistry II
MOLB 650	Advanced Topics in Molecular Biology
TOX 461	Toxicology I
GENE 486	Genes and Genomes
Total Credits	**10**

Native American Studies - Graduate Minor

The purpose of the Native American Studies Graduate Minor are to:

- Provide an opportunity for all students to learn about Native American cultures and societies.
- Facilitate research and other creative activities that concern Native American peoples and that have potential benefit for them.
- Serve the University and State of New Mexico in ways that support and illuminate the rich heritage of Native American peoples.

The Graduate minor in Native American Studies focuses on Native American cultures and societies, deals with contemporary and historical experiences of American Indians, and examines the contributions of Indigenous peoples to life in the United States and other American nations. This specialization has developed in reaction to Western academic views of Native Americans and to the frequently restrictive, assimilationist approach within universities to issues concerning Native peoples. NAS contributes to a new understanding of Native American cultures and societies from contemporary and historical perspectives.

To qualify for a graduate minor in Native American Studies, students are required to complete 9 credit hours of graduate level courses. Two core requirements are NATV 5110 and NATV 4130. The third course is an elective from the remaining listed courses. To record a minor on a student's transcript, the minor must be listed on the Graduate School's Program of Study form, and the Native American Studies advisor in the Department of Borderlands and Ethnic Studies must sign this form.

Prefix	Title	Credits
Required Courses		
NATV 5110	Advanced Indigenizing Methodologies in Native American Studies	3
NATV 4130	Indigenous Ways of Knowing	3
Choose one course from the following:		*3*
NATV 4220	Federal Indian Policy (Choose one course from the following:)	
NATV 5210	Advanced Native American Education	
PHLS 5996	Special Topics (American Indian Health)	
NATV 5520	Advanced Native American Women	
Total Credits		**9**

[1] Alternative classes may be substituted with the approval of the student's MA chair and the Director for the Graduate Minor in Native American Studies, Dr. Georgina Badoni (gbadoni@nmsu.edu).

Physics - Graduate Minor

Eligibility

This minor is available to graduate students not majoring in Physics.

Requirements

A student must satisfy the following requirements to earn a graduate minor in Physics:

- Successfully complete 12 credit hours of courses in Physics numbered above 500. Of these, not more than 3 credit hours can be for research, independent study, or other informal courses.
- Pass one of the four sections of the Physics Department's Qualifying Exam at the Ph.D. level.
- A member of the Physics faculty must be a member of the student's graduate committee.

Psychology - Graduate Minor

Any master's or doctoral student can declare a minor in Psychology in addition to their major area of study.

Students may earn a minor in psychology at the M.A. or Ph.D. level by completing nine credits of any 500-level and above coursework in psychology EXCEPT the following courses (PSYC 5110 Quantitative Methods in Psychology I, PSYC 5120 Quantitative Methods in Psychology II, PSYC 5910 Research Seminar in Psychology, PSYC 5991 Special Research Programs, PSYC 5999 Master's Thesis, PSYC 6991 Doctoral Research, PSYC 7000 Doctoral Dissertation).

All minors must be approved by the minor department head and dean of the Graduate School. Students must declare the Psychology minor on a Program of Study and Committee Form for the Master's and doctoral level. Demonstration of competency in the minor area will be required at both comprehensive and final examinations. Students must also include a representative from the Psychology department on their thesis, comprehensive, and/or dissertation committees. The representative from the minor department can also serve as the Dean's Representative on the committee.

Range Science - Graduate Minor

A minimum of 9 credit hours in graduate level classes with the RGSC prefix are required to obtain a graduate minor in Range Science. Approval by the Animal and Range Sciences Department head is required.

Security Studies - Graduate Minor

Additional Courses

Other graduate courses may become available during the year which may be substituted for the above listed courses. Consideration may be made on a case-by-case basis.

Prefix	Title	Credits
Requirements		
Select three from the following:		9
POLS 549	Ethics in Government	
POLS 560	Seminar in International Relations Theory	
POLS 564	Advanced National Security Policy	
POLS 569	Advanced Issues in Globalization	
POLS 574	Contemporary Comparative Studies	
POLS 596	International Law	
Total Credits		**9**

Sociology - Graduate Minor

The Department of Sociology offers a Graduate Minor in Sociology to graduate students in other departments on campus at NMSU. For the minor in Sociology, students are required to complete 9 credits (3 courses) of graduate-level Sociology coursework. One course must be a core graduate Sociology course (SOCI 5153 Seminar in Sociological Research, SOCI 5157 Seminar in Qualitative Research Methods, SOCI 5163 Issues in Advanced Quantitative Analysis, and SOCI 5165 Foundations of Social Theory), and the remaining two courses must be elective Sociology courses. An elective Sociology course is any other non-core SOCI 5000+ course except for: SOCI 5110 Perspectives on Sociology, SOCI 5998 Internship and SOCI 5999 Master's Thesis.

Prefix	Title	Credits
Complete one course (3 credits) from the following:		3
SOCI 5153	Seminar in Sociological Research	
SOCI 5157	Seminar in Qualitative Research Methods	
SOCI 5163	Issues in Advanced Quantitative Analysis	
SOCI 5165	Foundations of Social Theory	
Complete two courses (6 credits) from any other SOCI 5000+ courses with the exception of SOCI 5110, 5998, 5999.		6
Total Credits		**9**

Spanish Counseling - Graduate Minor

The Minor in Spanish Counseling, offered through the Counseling and Educational Psychology department is open to graduate students who are enrolled in CEP's Counseling, School Psychology, and Counseling Psychology programs, and to graduate students who are enrolled in Social Work and Marriage and Family Therapy programs. It was established in the interest of meeting the needs of bilingual counseling students who seek training in the provision of Spanish language mental health services.

Prerequisites

In order to begin the Minor courses, students **must currently be enrolled in a Mental Health program** as described above. They must **demonstrate intermediate level Spanish language skills** as evidenced by the Spanish Placement Exam and an oral interview with the program coordinator. Advanced level in Spanish counseling skills is required for the completion of the Minor. If a student feels that he/she needs to improve his/her level of academic Spanish prior to completing the required course work, or if the program coordinator determines that it is necessary, the student has the option of taking additional Spanish courses through the Languages and Linguistics department. Students will be required to take Spanish language courses until they have satisfied this requirement. Please note that online courses will not fulfill this requirement.

How to Apply

If you are interested in pursuing a minor in Spanish Counseling, you are advised to meet with the CEP Program Coordinator, Yadira Ibanez (y1banez@nmsu.edu). It is best to meet with the program coordinator before enrolling in relevant coursework, but it is possible to obtain the minor after taking one of the courses in the program of study. This meeting will ensure that the minor is declared for graduation purposes. In addition, this meeting allows the CEP department to keep track of potential minors in order to determine what courses need to be offered at any given time. A Spanish Counseling Minor faculty member is also required to sit on the committee for the student's final exam. For Doctoral students, this includes orals, dissertation proposal and defense exams.

Program of Study

Students will successfully complete 9 credits of coursework specific to this program of study in order to obtain a Minor in Spanish Counseling. Courses will be taught by culturally competent faculty, adjunct professors, or community mental health professionals in the aforementioned disciplines. Students will choose one course from each of the following components: 1) Counseling language development, 2) Clinical experience, and 3) Sociocultural experiences.

Prefix	Title	Credits
Course Requirements		
Counseling Language Development (Component #1)		
Choose one from the following:		3
CEPY 6220	Spanish for Mental Health Professionals	
CEPY 5230	Counseling Theory and Technique	
Clinical Experience (Component #2)		
Choose one from the following:		3
CEPY 5997	Special Research Programs	
or CEPY 6996	Selected Topics	
CEPY 6590	Behavioral Health Practicum	
SOWK 5996	Special Topics	
FCST 5990	Supervised Clinical Practice	
Sociocultural Experiences (Comoonent #3)		
Choose one from the following:		3
SPAN 547	Advanced Hispanic Film	
or SPAN 548	Advanced U.S.-Hispanic Film	
SPAN 567	Advanced Study in Chicano Literature	
Total Credits		**9**

Component #1: Counseling Language Development

CEPY 6220 Spanish for Mental Health Professionals This course will help students acquire the necessary Spanish language skills needed to function as Spanish-speaking mental health professionals. The course will cover psychological terminology, concepts, and theories in Spanish. Examination of the professional roles of bilingual mental health professionals and their roles within Latina/o and underserved communities will also be addressed in this course.

CEPY 5230 Counseling Theory and Technique This course will assist students in learning and practicing basic, culturally-appropriate micro counseling skills in Spanish through individual, dyad, and small group participation.

Component #2: Clinical Experience

CEPY 5997 Special Research Programs/ CEPY 6996 Selected Topics This course will require students to spend a minimum of 6 hours per week at a bilingual site, providing counseling, assessment, or supervision services within a variety of clinical settings that serve Spanish-speaking populations. The Minor coordinator must approve all placements. This course will also integrate a Spanish-speaking student process group for bilingual counseling students. In this group, students will have the opportunity to develop bilingual multicultural counseling competencies. Students may also present clinical cases, theoretical perspectives, interventions or techniques in Spanish and receive feedback and support from other bilingual members. A summer semester immersion experience in providing counseling services in Spanish in a Latin American and/ or primarily Spanish-speaking country may be substituted for this experience.

Students have the option of completing their clinical hours for this course over **2 semesters** if so desired. The course requires an additional 6 clinical hours/week (if taken in one semester) or 3 clinical hours/week (if class is taken over the course of two semesters).

Note: *This course is not to replace required practicum or internship experiences necessary for degree completion. Students are allowed to count hours they are accruing for their internship and/or practicum as long as they are (1) enrolled in both courses [598/698 and either 578/675 or 580/684] (2) are meeting the requirements for the 598/698 course [i.e. attending class meetings, etc.] and (3) a separate log is kept documenting work with Spanish speaking clients; this log also has to be signed by both 598/698 instructor and site supervisor*

CEPY 6590 Behavioral Health Practicum This course will provide students the opportunity to participate in a supervised service-learning experience within community-based, interdisciplinary, primary care settings that serve medically underserved and high-risk groups. Students will each write and present a case study in Spanish regarding a Spanish-speaking client. Students will receive bilingual supervision regarding various topics such as training in Motivational Interviewing and discussion of Spanish-speaking clients from their practicum experience.

SOWK 5996 Special Topics This course will allow students to develop and practice skills in Spanish relevant to working with children and families in the child welfare system with a focus on the child protection process.

FCST 5990 Supervised Clinical Practice This course offers supervised clinical experience in Marriage and Family Therapy.

Component #3: Sociocultural Experiences

SPAN 547 Advanced Hispanic Film**/**SPAN 548 Advanced U.S.-Hispanic Film Advanced study of major films from Spain and Spanish-America and/or by Hispanics of the U.S.

SPAN 567 Advanced Study in Chicano Literature Study of all genres of Chicano literature.

*All courses outlined in the Program of Study have to be taken face-to-face. However, Spanish Counseling Minor Committee will review individual requests for any exceptions to this requirement.

Special Education - Graduate Minor

A minor in special education requires 9 credits of graduate coursework that carries the SPED prefix. Official minor documentation must be completed with the School of TPAL.

U.S.-Mexico Border Health Issues - Graduate Minor

A grade of B or higher is required for all requirements for this graduate minor.

Prefix	Title	Credits
Select four courses from the following:		12
PHLS 5610	Health Disparities: Determinants and Interventions	
PHLS 5620	Cross-Cultural Aspects of Health	
PHLS 5630	International Health Problems	
PHLS 5640	Rural Health Issues	
PHLS 5660	U.S.-Mexico Border Health Issues	
PHLS 5670	American Indian Health	
PHLS 5680	Hispanic Health Issues	
Total Credits		**12**

General Education & Viewing a Wider World Courses

Associates/Bachelor's General Education

The New Mexico General Education Requirements

General Education at NMSU provides all students with a broad foundation and common framework upon which to develop knowledge and skills, social consciousness and respect for self and others, thus enabling them to function responsibly and effectively now and in the future. General education courses at NMSU can be identified by the G suffix.

In accordance to state law (Post-Secondary Education Articulation Act) (https://www.srca.nm.gov/parts/title05/05.055.0006.html), the New Mexico Higher Education Department has established a state-wide model for General Education. Within the General Education model, is nine credits of electives that will be determined at an institutional level. The current approved NMSU General Education courses are listed below under each of the six general education areas.

Prefix	Title	Credits
Area I: Communications		**10**
Select one course from each sub group:		
English Composition-Level 1		
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I Multilingual	
English Composition-Level 2		
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2210M	Professional and Technical Communication for Multilingual Students	

ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		**3-4**
MATH 1130G	Survey of Mathematics	
MATH 1220G	College Algebra	
MATH 1250G	Trigonometry & Pre-Calculus	
MATH 1350G	Introduction to Statistics	
MATH 1430G	Applications of Calculus I	
MATH 1511G	Calculus and Analytic Geometry I	
MATH 1521G	Calculus and Analytic Geometry II	
MATH 1521H	Calculus and Analytic Geometry II Honors	
MATH 2134G	Fundamentals of Elementary Math II	
MATH 2350G	Statistical Methods	
MATH 2530G	Calculus III	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences [1]		**10-11**
Area III: Laboratory Sciences		
AGRO 1110G/ HORT 1115G	Introduction to Plant Science (Lecture & Lab)	
ANTH 1135G & ANTH 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab	
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
ASTR 1120G	The Planets Lecture & Laboratory	
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 1130G	Introductory Anatomy & Physiology (non-majors)	
BIOL 1190G	Contemporary Problems in Biology	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
CSCI 1115G	Modern Computing in Practice	
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
ENVS 1110G	Environmental Science I	
EPWS 1110G & EPWS 1110L	Applied Biology and Applied Biology Lab	
FSTE 2110G	Food Science I	
FWCE 1110G	Introduction to Natural Resources Management	
GEOG 1110G	Physical Geography	
GEOG 1115G	Maps and GIScience	
GEOL 1110G	Physical Geology	
HNRS 1135G & HNRS 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab	
HNRS 2116G	Earth, Time and Life	
HORT 1115G	Introductory Plant Science	
PHYS 1115G	Survey of Physics with Lab	
PHYS 1125G	Physics of Music	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
Area IV: Social/Behavioral Sciences		
AEEC 2130G	Survey of Food and Agricultural Issues	
ANTH 1115G	Introduction to Anthropology	
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1160G	World Archaeology	
ANTH 2140G	Indigenous Peoples of North America	
BEST 1110G	Introduction to Borderlands and Ethnic Studies	
BEST 2750G	Introduction to Palestine Studies: History, Land, Resistance, and Justice	
BUSA 2230G	Human Relations in Business	
CEPY 1120G	Human Growth and Behavior	
CJUS 1110G	Introduction to Criminal Justice	
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Microeconomics Principles	
ECON 2120H	Principles of Microeconomics Honors	
FSTE 2130G	Survey of Food and Agricultural Issues	
GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
GEOG 1150G	Introduction to Environmental Studies	
GNDR 2110G	Introduction to Women, Gender, and Sexuality Studies	
GNDR 2120G	Representing Women Across Cultures	
HNRS 2161G	Window of Humanity	
HNRS 2170G	The Human Mind	
HNRS 2172G	Archaeology: Search for the Past	
HNRS 2180G	Citizen and State Great Political Issues	
HRTM 1120G	Introduction to Tourism	
JOUR 105G	Media and Society	
LING 2110G	Introduction to the Study of Language and Linguistics	
PHLS 1110G	Personal Health & Wellness	
PHLS 1110H	Personal Health and Wellness Honors	
POLS 1110G	Introduction to Political Science	
POLS 1120G	American National Government	
POLS 1130G	Issues in American Politics	
POLS 2120G	International Relations	
PSYC 1110G	Introduction to Psychology	

SOCI 1110G	Introduction to Sociology	
SOCI 2310G	Contemporary Social Problems	
SOWK 2110G	Introduction to Human Services & Social Work	
Area V: Humanities		**3**
AFST 1110G	Introduction to Africana Studies	
AFST 2110G	African American History	
AFST 2140G	Black Women in the African Diaspora	
CCST 2110G	Introduction to Chicana and Chicano Studies	
ENGL 1410G	Introduction to Literature	
ENGL 2520G	Film as Literature	
ENGL 2610G	American Literature I	
ENGL 2620G	American Literature II	
ENGL 2630G	British Literature I	
ENGL 2640G	British Literature II	
ENGL 2650G	World Literature I	
FREN 2120G	French IV	
FREN 2135G	Frontiers and Border Crossings in the French-Speaking World	
HIST 1110G	United States History I	
HIST 1120G	United States History II	
HIST 1130G	World History I	
HIST 1140G	World History II	
HIST 1150G	Western Civilization I	
HIST 1160G	Western Civilization II	
HIST 1170G	Survey of Early Latin America	
HIST 1180G	Survey of Modern Latin America	
HIST 2245G	Islamic Civilizations to 1800	
HIST 2250G	East Asia to 1600	
HIST 2251G	East Asia since 1600	
HMRT 2110G	Introduction to Human Rights	
HMRT 2175G	Border Justice & Human Rights	
HNRS 2117G	The World of the Renaissance: Discovering the Modern	
HNRS 2140G	Plato and the Discovery of Philosophy	
HNRS 2141G	Bamboo and Silk: The Fabric of Chinese Literature	
HNRS 2145G	Celtic Literature	
HNRS 2160G	New Testament as Literature	
HNRS 2165G	Introduction to Humanities in the 21st Century	
HNRS 2190G	Claiming a Multiracial Past	
NATV 1150G	Introduction to Native American Studies	
PHIL 1115G	Introduction to Philosophy	
PHIL 1120G	Logic, Reasoning, & Critical Thinking	
PHIL 1140G	Philosophy and World Religions	
PHIL 1145G	Philosophy, Law, and Ethics	
PHIL 2110G	Introduction to Ethics	
PHIL 2230G	Philosophical Thought	
Area VI: Creative and Fine Arts		**3**
ARTH 1115G	Orientation in Art	
ARTH 2110G	History of Art I	
ARTH 2120G	History of Art II	
ARTS 1145G	Visual Concepts	
DANC 1110G	Dance Appreciation	
ENGL 2310G	Introduction to Creative Writing	
HNRS 2114G	Music in Time and Space	
HNRS 2115G	Encounters with Art	
HNRS 2130G	Shakespeare on Film	
HNRS 2178G	Theatre: Beginnings to Broadway	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
THEA 1210G	Acting for Non-Majors	
General Education Elective		**3-4**
This requirement can be met with any "G" course in any area, excluding Area I: Communications and any crosslisted courses, that exceeds the minimum requirement.		
or		
ENGR 100G	Introduction to Engineering	
or ENGR 100GH	Introduction to Engineering Honors	
Total Credits		**32-35**

[1] For Area III: Laboratory Sciences and Area IV: Social/Behavioral Sciences, students ***must*** take one course from each for a total of 7 credits.
Students will then take an additional course in either Area III or Area IV for 3-4 credits depending on the student's selection (i.e. Area III is 4 credits, Area IV is 3 credits).

Alternatives for Meeting General Education Requirements (9 credit hour rule)

Students taking nine or more credits in a specific subject area, even though the courses are not designated as General Education courses, will have met the general education requirements for that subject area. The courses can meet both major and general education requirements for the degree. For example, a student may complete ARTS 2610 Drawing II, ARTS 1240 Design I and ARTS 1250 Design II (9 hours) and thereby satisfy one course from the Area VI: Creative and Fine Arts category even though none of those courses carries a G suffix. Please check with the Center for Academic Advising and Student Support.

Applied Associates Degree

The New Mexico General Education Requirements

General Education at NMSU provides all students with a broad foundation and common framework upon which to develop knowledge and skills, social consciousness and respect for self and others, thus enabling them to function responsibly and effectively now and in the future. General education courses at NMSU can be identified by the G suffix.

In accordance to state law (Post-Secondary Education Articulation Act) (https://www.srca.nm.gov/parts/title05/05.055.0006.html), the New Mexico Higher Education Department has established a state-wide model for General Education. Within the General Education model, is nine credits of electives that will be determined at an institutional level. The current approved NMSU General Education courses are listed below under each of the six general education areas.

Prefix	Title	Credits
Select one course from four of the following six content areas for a total of 12-14 credits		**12-14**
Each course selected must be from a different area and students cannot take multiple courses in the same area.		
Area I: Communications		
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
ENGL 1110G	Composition I	

ENGL 1110H	Composition I Honors
ENGL 1110M	Composition I Multilingual
ENGL 2130G	Advanced Composition
ENGL 2210G	Professional and Technical Communication
ENGL 2210H	Professional and Technical Communication Honors
ENGL 2210M	Professional and Technical Communication for Multilingual Students
ENGL 2215G	Advanced Technical and Professional Communication
ENGL 2221G	Writing in the Humanities and Social Science
HNRS 2175G	Introduction to Communication Honors
Area II: Mathematics	
MATH 1130G	Survey of Mathematics
MATH 1220G	College Algebra
MATH 1250G	Trigonometry & Pre-Calculus
MATH 1350G	Introduction to Statistics
MATH 1430G	Applications of Calculus I
MATH 1511G	Calculus and Analytic Geometry I
MATH 1521G	Calculus and Analytic Geometry II
MATH 1521H	Calculus and Analytic Geometry II Honors
MATH 2134G	Fundamentals of Elementary Math II
MATH 2350G	Statistical Methods
MATH 2530G	Calculus III
Area III: Laboratory Sciences	
AGRO 1110G/ HORT 1115G	Introduction to Plant Science (Lecture & Lab)
ANTH 1135G & ANTH 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory
ASTR 1120G	The Planets Lecture & Laboratory
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory
BIOL 1130G	Introductory Anatomy & Physiology (non-majors)
BIOL 1190G	Contemporary Problems in Biology
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory
CSCI 1115G	Modern Computing in Practice
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors
EPWS 1110G & EPWS 1110L	Applied Biology and Applied Biology Lab
ENVS 1110G	Environmental Science I
FSTE 2110G	Food Science I
FWCE 1110G	Introduction to Natural Resources Management
GEOG 1110G	Physical Geography
GEOL 1110G	Physical Geology
HNRS 1135G & HNRS 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab
HNRS 2116G	Earth, Time and Life
HORT 1115G	Introductory Plant Science
PHYS 1115G	Survey of Physics with Lab
PHYS 1125G	Physics of Music
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II
Area IV: Social/Behavioral Sciences	
AEEC/FSTE 2130G	Survey of Food and Agricultural Issues
ANTH 1115G	Introduction to Anthropology
ANTH 1140G	Introduction to Cultural Anthropology
ANTH 1160G	World Archaeology
ANTH 2140G	Indigenous Peoples of North America
BEST 1110G	Introduction to Borderlands and Ethnic Studies
BUSA 2230G	Human Relations in Business
CEPY 1120G	Human Growth and Behavior
CJUS 1110G	Introduction to Criminal Justice
ECON 1110G	Survey of Economics
ECON 2110G	Macroeconomic Principles
ECON 2120G	Microeconomics Principles
ECON 2120H	Principles of Microeconomics Honors
FSTE 2130G	Survey of Food and Agricultural Issues
GEOG 1120G	World Regional Geography
GEOG 1130G	Human Geography
GNDR 2110G	Introduction to Women, Gender, and Sexuality Studies
GNDR 2120G	Representing Women Across Cultures
HNRS 2161G	Window of Humanity
HNRS 2170G	The Human Mind
HNRS 2172G	Archaeology: Search for the Past
HNRS 2180G	Citizen and State Great Political Issues
HRTM 1120G	Introduction to Tourism
JOUR 105G	Media and Society
LING 2110G	Introduction to the Study of Language and Linguistics
PHLS 1110G	Personal Health & Wellness
PHLS 1110H	Personal Health and Wellness Honors
POLS 1110G	Introduction to Political Science
POLS 1120G	American National Government
POLS 1130G	Issues in American Politics
POLS 2120G	International Relations
PSYC 1110G	Introduction to Psychology
SOCI 1110G	Introduction to Sociology
SOCI 2310G	Contemporary Social Problems

SOWK 2110G	Introduction to Human Services & Social Work
Area V: Humanities	
AFST 1110G	Introduction to Africana Studies
AFST 2110G	African American History
AFST 2140G	Black Women in the African Diaspora
CCST 2110G	Introduction to Chicana and Chicano Studies
ENGL 1410G	Introduction to Literature
ENGL 2520G	Film as Literature
ENGL 2610G	American Literature I
ENGL 2620G	American Literature II
ENGL 2630G	British Literature I
ENGL 2640G	British Literature II
ENGL 2650G	World Literature I
FREN 2120G	French IV
FREN 2135G	Frontiers and Border Crossings in the French-Speaking World
HIST 1110G	United States History I
HIST 1120G	United States History II
HIST 1130G	World History I
HIST 1140G	World History II
HIST 1150G	Western Civilization I
HIST 1160G	Western Civilization II
HIST 2245G	Islamic Civilizations to 1800
HIST 2250G	East Asia to 1600
HIST 2251G	East Asia since 1600
HNRS 2117G	The World of the Renaissance: Discovering the Modern
HNRS 2140G	Plato and the Discovery of Philosophy
HNRS 2141G	Bamboo and Silk: The Fabric of Chinese Literature
HNRS 2145G	Celtic Literature
HNRS 2160G	New Testament as Literature
HNRS 2165G	Introduction to Humanities in the 21st Century
HNRS 2190G	Claiming a Multiracial Past
NATV 1150G	Introduction to Native American Studies
PHIL 1115G	Introduction to Philosophy
PHIL 1120G	Logic, Reasoning, & Critical Thinking
PHIL 1140G	Philosophy and World Religions
PHIL 1145G	Philosophy, Law, and Ethics
PHIL 2110G	Introduction to Ethics
PHIL 2230G	Philosophical Thought
Area VI: Creative and Fine Arts	
ARTH 1115G	Orientation in Art
ARTH 2110G	History of Art I
ARTH 2120G	History of Art II
ARTS 1145G	Visual Concepts
DANC 1110G	Dance Appreciation
ENGL 2310G	Introduction to Creative Writing
HNRS 2114G	Music in Time and Space
HNRS 2115G	Encounters with Art
HNRS 2130G	Shakespeare on Film
HNRS 2178G	Theatre: Beginnings to Broadway
MUSC 1110G	Music Appreciation: Jazz
MUSC 1130G	Music Appreciation: Western Music
THEA 1110G	Introduction to Theatre
THEA 1210G	Acting for Non-Majors
General Education Elective	**3-4**
This requirement can be met with any "G" course in any area, excluding any crosslisted courses.	
or	
ENGR 100G	Introduction to Engineering
or ENGR 100GH	Introduction to Engineering Honors
Total Credits	**15-18**

Alternatives for Meeting General Education Requirements (9 credit hour Rule)

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NMSU Viewing a Wider World Requirements

The Viewing a Wider World (VWW) requirement fosters intelligent inquiry, abstract logical thinking, critical analysis, as well as the integration and synthesis of knowledge. The program strives for literacy in writing, reading, speaking and listening. It teaches mathematical structures, acquainting students with precise abstract thought about numbers and space. The program also encourages an understanding of science and scientific inquiry, as it provides a historical consciousness, including an understanding of one's own heritage as well as respect for other peoples and cultures. To achieve its goals, the program includes an examination of values and stresses the importance of a carefully considered values system as it fosters an appreciation of the arts and general education. It provides the breadth necessary to have a familiarity with the various branches of human understanding. All VWW courses can be identified by the "V" suffix.

Prior to graduating, NMSU students are required to take two courses from separate colleges from the Viewing a Wider World list in the Catalog. These courses are upper-division (300/300-400/4000 level) Viewing a Wider World courses and should be taken in a student's junior and/or senior year. One of the two courses must be in a college other than their own. The other course may be taken within their home college, but this course:

1. must be in a different department from their major department;
2. must not be cross-listed with a course in their home department;
3. cannot be counted as one of the requirements for the student's major.

These courses strongly emphasize the international character and multicultural influences in the fields of study and strengthen information retrieval skills. There are two options that NMSU allows for replacing 3 credits of VWW requirement with another form of educational experience, these are:

1. **Study Abroad Experience**- consisting of at least four weeks of a Study Abroad program or university coursework in a foreign country earning 3 credits.
2. **Military Experience**- for students who have served at least four weeks of military service in a foreign country.

The Military and Veterans Programs Office website (https://mvp.nmsu.edu/military-members/military-experience-waiver.html) provides the instructions on how to request the waiver for Military Experience replacing 3 credits of VWW.

NOTE: This list is under continuous revision. Please check with the office of the college associate dean or with college advisors for additional eligible courses. Honors courses have a specific college designation based on course content. These are listed near the end of this section.

College of Agricultural, Consumer and Environmental Sciences

Prefix	Title	Credits
ACOM 3160V	Communicating Agriculture & Science to the Public	3
AEEC 3110V	World Agriculture and Food Problems	3
AEEC 3120V	Natural Resource Economics	3
AEEC 3130V	Water Resource Economics	3
AEEC 3140V	Agricultural Policy	3
AGRO 303V	Genetics and Society	3
ANSC 312V	Companion Animals and the Human- Animal Interaction	3
ANSC 351V	Agricultural Animals of the World	3
AXED 3210V	John Muir: Lessons in Sustainability	3
CTFM 366V	Historic Fashion and Society	3
EPWS 325V	Insects, Humans, and the Environment	3
EPWS 380V	Science & Society	3
FCST 3110V	Introduction to Child Advocacy	3
FCST 3120V	Family Ethnicities and Subcultures	3
GENE 303V	Genetics and Society	3
HNRS 321V	Agriculture in an Interconnected World	3
HORT 302V	Forestry and Society	3
HORT 318V	Urban Water Issues and Society	3
HRTM 4240V	Sustainability in the Hospitality Industry	3
RGSC 302V	Forestry and Society	3

College of Arts and Sciences

Prefix	Title	Credits
ANTH 305V	Contemporary Native Americans	3
ANTH 306V	Peoples of Latin America	3
ANTH 313V	Ancient Mexico	3
ANTH 330V	Magic Witchcraft and Religion	3
ANTH 357V	Medical Anthropology	3
ANTH 360V	Food and Culture Around the World	3
ANTH 362V	Environmental Anthropology	3
ANTH 431V	Nutritional Anthropology	3
ANTH 433V	Sex, Gender and Culture	3
ASTR 301V	Revolutionary Ideas in Astronomy	3
ASTR 305V	The Search for Life in the Universe	3
ASTR 308V	Into the Final Frontier	3
ASTR 330V	Planetary Exploration	3
BEST 480V	Narratives and Representations of Palestinians: Media, Music, Film, and Art	3
CJUS 440V	Comparative Criminal Justice Systems	3
CJUS 4750V	International Criminal Law, War Crimes, Genocide, & Crimes Against Humanity	3
ENGL 327V	Shakespeare around the Globe	3
ENGL 328V	Literature of Science Fiction and Fantasy	3
ENGL 339V	Chicana/o Literature	3
ENGL 380V	Women Writers	3
ENGL 392V	Mythology	3
ENGL 394V	Southwestern Literature	3
FREN 365V	Perspectives in French Culture	3
GEOG 315V	World Agriculture and Food Problems	3
GEOG 325V	New Mexico and the American West	3
GEOG 328V	Environment and Society of Latin America	3
GEOG 331V	Environment and Society of Europe	3
GEOG 361V	Challenges and Opportunities of Globalization	3
GEOG 363V	Culture, Nature, and the Environment	3
GEOG 365V	The City	3
GEOL 305V	Fossils and the Evolution of Life	3
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	3
GNDR 380V	Women Writers	3
GNDR 381V	Women's Health Issues	3
GNDR 433V	Sex, Gender and Culture	3
GRMN 326V	Transnational German Film	3
HIST 302V	Science in Modern Society	3
HIST 308V	The History of Food	3
HIST 321V	History of Korea	3
HIST 366V	British Imperialism	3
HIST 379V	The History of Italy from the Etruscans to the Mafia	3
HIST 382V	Modern Russia	3
HIST 390V	The Holocaust	3
HMRT 4550V	Skills & Ethics for Human Rights Work	3
HMRT 4580V	International Environmental Law and Justice	3
HMRT 4720V	Space Law & Human Rights	3
JOUR 350V	Media History	3
JOUR 377V	Mass Media Ethics	3
JOUR 460V	Sports & Entertainment P.R.	3
LING 302V	Language and Society	3
MATH 4110V	Great Theorems in Mathematics	3
PHYS 303V	Energy and Society in the New Millennium	3
PHYS 305V	The Search for Water in the Solar System	3
POLS 351V	Conspiracy Theories in American Politics	3
POLS 380V	Political Ideologies	3
PORT 364V	Brazilian Culture Through Popular Music	3
SPAN 364V	Culture and Civilization of Mexico	3
SPAN 365V	Culture and Civilization of Spanish America	3
THEA 307V	Society in Style: Fashion, History and Culture	3

College of Business

Prefix	Title	Credits
BFIN 303V	Personal Financial Planning and Investing in a Global Economy	3
BLAW 385V	Employment and Consumer Law	3
ECON 324V	Developing Nations	3
ECON 325V	Economic Development of Latin America	3
ECON 335V	Business and Government	3
ECON 337V	Natural Resource Economics	3
ECON 384V	Water Resource Economics	3
MGMT 310V	Entrepreneurial Mindset	3
MGMT 335V	Business and Government	3

MGMT 345V	Quality and Competitiveness: An International Perspective	3
MGMT 388V	Leadership and Ethics	3
MKTG 311V	Consumer Behavior	3

College of Engineering

Prefix	Title	Credits
C E 355V	Technology and the Global Environment	3
CHME 370V	Discovery and Use of Radioactive Materials	3
CHME 395V	Brewing Science and Society	3
E T 309V	Manufacturing: History and Technology	3
E T 360V	Technology in Business and Society	3
ICT 350V	Introduction to Personal Computer Security and Privacy	3

College of Health, Education and Social Transformation

Prefix	Title	Credits
AFST 4110V	Race, Culture, and Education	3
BEST 4660V	Social Movements: Borderlands and Beyond	3
CCST 3120V	Chicana/o Genders and Sexualities	3
CEPY 3210V	Human Relations Training	3
CEPY 4110V	Introduction to Counseling	3
DANC 3510V	World Dance	3
EDUC 3110V	Multicultural Issues in Society	3
ELAD 3110V	Introduction to Educational Leadership in a Global Society	3
NATV 4120V	Native American Visual Culture	3
NATV 4210V	Native American Education	3
PHLS 3110V	Human Sexuality	3
PHLS 3120V	Women's Health Issues	3
PHLS 3130V	Global Environmental Health Issues	3
PHLS 4620V	Cross-Cultural Aspects of Health	3
SOCI 3110V	Sociology of Religion	3
SOCI 3120V	Introduction to Population Studies	3
SOCI 3245V	Comparative Family Systems	3
SOCI 3310V	Social Issues in the Rural Americas	3
SOCI 3340V	Social Change	3
SOCI 3610V	Sociology of Pop Culture	3
SOCI 3620V	Sports and Society: A Global Perspective	3
SOCI 3635V	Food and Society	3
SOCI 4240V	Comparative Global Family Systems	3
SOCI 4335V	Advanced Environmental Sociology	3
SOWK 3140V	Introduction to Social Policy: History	3
SPHS 3110V	Autism Spectrum Disorders - a Lifespan Perspective	3
SPMD 3650V	Motor Development	3

University Library

Prefix	Title	Credits
LIBR 311V	Information Literacy	3

Honors College - Viewing a Wider World

Prefix	Title	Credits
HNRS 3115V	Service Learning through Civic Engagement	3

College of Agricultural, Consumer and Environmental Sciences

Prefix	Title	Credits
HNRS 321V	Agriculture in an Interconnected World	3
HNRS 325V	Insects, Humans, and the Environment	3

College of Arts and Sciences

Prefix	Title	Credits
HNRS 304V	Dilemmas of War and Peace	3
HNRS 305V	Is Fake News Real: Journalism, Community, and Mass Communications	3
HNRS 306V	Science, Ethics and Society	3
HNRS 308V	Into the Final Frontier	3
HNRS 317V	Cultural Lessons on Nazism	3
HNRS 318V	The World of Cinema	3
HNRS 324V	Science and the Arts: Theatre and Story	3
HNRS 326V	Art and Mythology	3
HNRS 328V	Rock History: 20th Century Popular Music	3
HNRS 341V	The Old Testament as Literature	3
HNRS 348V	Comparative Mythology: Myth, Ritual, and the Life Cycle	3
HNRS 370V	Design: The Creative Act	3
HNRS 374V	The European City: History and Culture	3
HNRS 390V	Worlds of Buddhism	3
HNRS 394V	Southwestern and Border Literature	3
HNRS 411V	Great Theorems in Mathematics	3
HNRS 450V	The Sundt Honors Seminar	3

College of Business

Prefix	Title	Credits
HNRS 303 V	Personal Financial Planning and Investing in a Global Economy	3
HNRS 335V	Legal Issues in Modern Society	3
HNRS 381V	Economic Development of Latin America	3
HNRS 388V	Leadership and Society	3

College of Engineering

Prefix	Title	Credits
HNRS 378V	Technology and Policy	3

College of Health, Education and Social Transformation

Prefix	Title	Credits
HNRS 3110V	Human Sexuality	3
HNRS 336V	Testimonios from the Borderlands	3
HNRS 347V	World Dance	3
HNRS 353V	Justice without Prejudice	3
HNRS 387V	Comparative Perspectives on Women	3

Alternatives for Meeting Viewing a Wider World Requirements

Students taking nine or more credits in a specific subject area, even though the courses are not designated as Viewing a Wider World courses, will have met the VWW requirements for that subject area.

The 9 credit hours must be in 300 to 400 or 3000 to 4000 level courses in one prefix area. For example, 9 upper-division ECON credits would fulfill one VWW area for students majoring in programs other than Economics.

Common Course Numbering Crosswalk

The Post-secondary Education Articulation Act (https://hed.state.nm.us/resources-for-schools/public_schools/nm-course-numbering-system/) charges the New Mexico Higher Education Department with establishing and maintaining a common course numbering system, in consultation with faculty. To this end, the common course numbering system includes both equivalent (Common) and unique courses.

- **Common Course:** is any course that is offered at multiple institutions throughout the state, has the same prefix/number combination, the same title, the same description, and at least 80% of the learning outcomes for the course are the same.
- **Unique Course:** is any course that is unique to the institution (the NMSU system), has a prefix/number combination, title, description and learning outcomes that are unique to the institution (the NMSU System).

The table below shows the previous NMSU System-wide course prefix/number combination, the future Common Course Numbering prefix/number combination, and an indicator of whether the course is deemed Common or Unique throughout the state.

Current Course	Past Course	Course Type Indicator
ACCT-ACCOUNTING		
ACCT 1115	OATS 120	Common
ACCT 1120	OATS 121	Common
ACCT 1150	OATS 205	Common
ACCT 1410	OATS 244	Common
ACCT 2110	ACCT 221	Common
ACCT 2120	ACCT 222	Common
ACCT 2170	OATS 140	Common
ACCT 2220	OECS 200	Common
ACCT 2520	OATS 241	Common
ACES-AGRI,CONSUMER & ENV SCIE		
ACES 1120	ACES 111	Unique
ACES 1210	ACES 121	Unique
ACES 1220	ACES 199	Unique
ACOM-AG COMMUNICATION		
ACOM 1110	AXED 1120	Unique
ACOM 1130G	AXED 2120G	Unique
ACOM 3110	AXED 360	N/A
AEEC-AGRICULTURAL ECONOMICS		
AEEC 1110	AG E 100	Common
AEEC 1120	AG E 101	Unique
AEEC 2110	AG E 236	Unique
AEEC 2120	AG E 260	Unique
AEEC 2130G	AG E 210G	Unique
AEEC 2140	AG E 250	Unique
AEEC 2996	AG E 200	Unique
AEEC 315V	AEEC 3110V	N/A
AEEC 337V	AEEC 3120V	N/A
AEEC 384V	AEEC 3130V	N/A
AEEC 445V	AEEC 3140V	N/A
AEEC 305	AEEC 3210	N/A
AEEC 311	AEEC 3220	N/A
AEEC 313	AEEC 3230	N/A
AEEC 314	AEEC 3240	N/A
AEEC 340	AEEC 3250	N/A
AEEC 342	AEEC 3260	N/A
AEEC 350	AEEC 3270	N/A
AEEC 385	AEEC 3280	N/A
AEEC 300	AEEC 3998	N/A

AEEC 425	AEEC 4110	N/A
AEEC 400	AEEC 4410	N/A
AEEC 451	AEEC 4510	N/A
AEEC 452	AEEC 4520	N/A
AEEC 456	AEEC 4530	N/A
AEEC 458	AEEC 4540	N/A
AEEC 470	AEEC 4550	N/A
AEEC 420	AEEC 4997	N/A
AEEC 499	AEEC 4999	N/A
AEEC 503	AEEC 5110	N/A
AEEC 501	AEEC 5120	N/A
AEEC 502	AEEC 5130	N/A
AEEC 545	AEEC 5140	N/A
AEEC 506	AEEC 5150	N/A
AEEC 520	AEEC 5210	N/A
AEEC 511	AEEC 5220	N/A
AEEC 522	AEEC 5230	N/A
AEEC 540	AEEC 5240	N/A
AEEC 550	AEEC 5320	N/A
AEEC 551	AEEC 5330	N/A
AEEC 556	AEEC 5340	N/A
AEEC 575	AEEC 5350	N/A
AEEC 585	AEEC 5360	N/A
AEEC 597	AEEC 5991	N/A
AEEC 598	AEEC 5994	N/A
AEEC 590	AEEC 5996	N/A
AEEC 596	AEEC 5997	N/A
AEEC 593	AEEC 5998	N/A
AEEC 594	AEEC 5998	N/A
AEEC 595	AEEC 5998	N/A
AEEC 599	AEEC 5999	N/A
AGRO-AGRONOMY		
AGRO 1110G	AGRO 100G	Common
AGRO 2160	AGRO 250	Unique
AGRO 2996	AGRO 200	Unique
AIML-ARTIFICIAL INTELLIGENCE MACHINE LEARNING		
AIML 1310	CSEC 115	Common
AIML 1320	CSEC 190	Common
AIML 2310	CSEC 191	Common
ANSC-ANIMAL SCIENCE		
ANSC 1110	ANSC 220	Common
ANSC 1120	ANSC 100	Common
ANSC 1120H	ANSC 100 H	Unique
ANSC 1120L	ANSC 100 L	Unique
ANSC 1130	ANSC 190	Unique
ANSC 1140	ANSC 205	Unique
ANSC 1160	ANSC 103	Unique
ANSC 1170	ANSC 261	Unique
ANSC 1180	ANSC 112	Unique
ANSC 2120	ANSC 288	Common
ANSC 2130	ANSC 290	Common
ANSC 2140	ANSC 285	Unique

ANSC 2150	ANSC 289	Unique
ANSC 2310	ANSC 262	Common
ANSC 2330	ANSC 200	Common
ANSC 2340	ANSC 201	Common
ANSC 2996	ANSC 250	Unique
ANTH-ANTHROPOLOGY		
ANTH 1115G	ANTH 201G	Common
ANTH 1135G	ANTH 130G	Common
ANTH 1135L	ANTH 130GL	Common
ANTH 1136	ANTH 118	Unique
ANTH 1137G	ANTH 120G	Unique
ANTH 1140G	ANTH 125G	Common
ANTH 1160G	ANTH 202G	Common
ANTH 2140G	ANTH 115	Common
ANTH 2150	ANTH 116	Common
ANTH 2996	ANTH 297	Unique
ARCH-ARCHITECTURE		
ARCH 1105	ARCT 150	Unique
ARCH 1110	ARCT 104	Common
ARCH 1112	ARCT 124	Unique
ARCH 1114	ARCT 154	Unique
ARCH 1120	ARCT 101	Common
ARCH 1121	ARCT 170	Unique
ARCH 1122	ARCT 204	Unique
ARCH 1220	ARCT 111	Unique
ARCH 2111	ARCT 210	Unique
ARCH 2113	ARCT 224	Unique
ARCH 2114	ARCT 250	Unique
ARCH 2115	ARCT 254	Unique
ARCH 2116	ARCT 260	Unique
ARCH 2122	ARCT 274	Unique
ARCH 2124	ARCT 295	Unique
ARCH 2220	ARCT 211	Unique
ARCH 2994	ARCT 264	Unique
ARCH 2995	ARCT 291	Unique
ARCH 2996	ARCT 290	Unique
ARSC-ARTS & SCIENCES		
ARSC 1115	A S 101	Unique
ARSC 1120	A S 103	Unique
ARSC 2996	A S 200	Unique
ARSC 3110	A S 305	N/A
ARSC 3130	A S 350	N/A
ARSC 3996	A S 300	N/A
ARSC 4550	A S 480	N/A
ARSC 4555	A S 490	N/A
ARTH-ART HISTORY		
ARTH 1115G	ART 101G	Common
ARTH 2110G	ART 295G	Common
ARTH 2120G	ART 296G	Common
ARTH 2136	ARTS 2671	Unique
ARTH 300	ART 300	N/A
ARTH 305	ART 305	N/A

ARTH 310	ART 310	N/A
ARTH 311	ART 311	N/A
ARTH 312	ART 312	N/A
ARTH 321	ART 321	N/A
ARTH 323	ART 323	N/A
ARTH 325	ART 325	N/A
ARTH 330	ART 330	N/A
ARTH 336	ART 336	N/A
ARTH 338	ART 338	N/A
ARTH 339	ART 339	N/A
ARTH 342	ART 342	N/A
ARTH 343	ART 343	N/A
ARTH 390	ART 390	N/A
ARTH 444	ART 444	N/A
ARTH 477	ART 477	N/A
ARTH 478	ART 478	N/A
ARTH 479	ART 479	N/A
ARTH 500	ART 500	N/A
ARTH 510	ART 510	N/A
ARTH 511	ART 511	N/A
ARTH 521	ART 521	N/A
ARTH 525	ART 525	N/A
ARTH 536	ART 536	N/A
ARTH 538	ART 538	N/A
ARTH 539	ART 539	N/A
ARTH 542	ART 542	N/A
ARTH 543	ART 543	N/A
ARTH 578	ART 578	N/A
ARTH 579	ART 579	N/A
ARTH 597	ART 597	N/A
ARTH 599	ART 599	N/A
ARTS-ART STUDIO		
ARTS 1121	ART 125	Unique
ARTS 1145G	ART 110G	Unique
ARTS 1240	ART 155	Common
ARTS 1250	ART 156	Common
ARTS 1310	ART 275	Common
ARTS 1320	ART 276	Common
ARTS 1410	ART 270	Common
ARTS 1520	ART 161	Common
ARTS 1520	ART 272	Common
ARTS 1610	ART 150	Common
ARTS 1610	ART 250	Common
ARTS 1630	ART 260	Common
ARTS 1710	ART 280	Common
ARTS 1711	ART 160	Unique
ARTS 1712	ART 163	Unique
ARTS 1713	ART 165	Unique
ARTS 1810	ART 285	Common
ARTS 2010	ART 267	Common
ARTS 2355	ART 286	Unique
ARTS 2410	OEPT 100	Common

ARTS 2430	OEPT 155	Common
ARTS 2431	ART 255	Unique
ARTS 2440	OEPT 120	Unique
ARTS 2610	ART 151	Common
ARTS 2611	ART 269	Unique
ARTS 2616	ART 252	Unique
ARTS 2630	ART 261	Common
ARTS 2635	ART 262	Common
ARTS 2839	ART 265	Unique
ARTS 2993	ART 208	Unique
ARTS 2996	ART 294	Unique
ARTS 308	ART 308	N/A
ARTS 340	ART 340	N/A
ARTS 350	ART 350	N/A
ARTS 355	ART 355	N/A
ARTS 360	ART 360	N/A
ARTS 365	ART 365	N/A
ARTS 370	ART 370	N/A
ARTS 373	ART 373	N/A
ARTS 374	ART 374	N/A
ARTS 375	ART 375	N/A
ARTS 376	ART 376	N/A
ARTS 385	ART 385	N/A
ARTS 394	ART 394	N/A
ARTS 401	ART 401	N/A
ARTS 402	ART 402	N/A
ARTS 403	ART 403	N/A
ARTS 404	ART 404	N/A
ARTS 440	ART 440	N/A
ARTS 450	ART 450	N/A
ARTS 455	ART 455	N/A
ARTS 465	ART 465	N/A
ARTS 470	ART 470	N/A
ARTS 474	ART 474	N/A
ARTS 475	ART 475	N/A
ARTS 485	ART 485	N/A
ARTS 490	ART 490	N/A
ARTS 494	ART 494	N/A
ARTS 495	ART 495	N/A
ARTS 496	ART 496	N/A
ARTS 499	ART 499	N/A
ARTS 501	ART 501	N/A
ARTS 502	ART 502	N/A
ARTS 503	ART 503	N/A
ARTS 504	ART 504	N/A
ARTS 540	ART 540	N/A
ARTS 550	ART 550	N/A
ARTS 555	ART 555	N/A
ARTS 560	ART 560	N/A
ARTS 565	ART 565	N/A
ARTS 570	ART 570	N/A
ARTS 575	ART 575	N/A

ARTS 576	ART 576	N/A
ARTS 580	ART 580	N/A
ARTS 585	ART 585	N/A
ARTS 595	ART 595	N/A
ARTS 596	ART 596	N/A
ARTS 598	ART 598	N/A
ASTR-ASTRONOMY		
ASTR 1115G	ASTR 110G	Common
ASTR 1116	ASTR 199	Unique
ASTR 1120G	ASTR 105G	Unique
AXED-AGRICULTURAL EXTN EDUC		
AXED 1110	AXED 100	Unique
AXED 1130	AXED 105	Unique
AXED 2110	AXED 205	Common
AXED 2130	AXED 230	Unique
AXED 2140	AXED 232	Unique
AXED 2996	AXED 200	Unique
AXED 3115	AXED 303	N/A
AXED 3120	AXED 331	N/A
AXED 3130	AXED 348	N/A
AXED 3150	AXED 380	N/A
AXED 3210V	AXED 466V	N/A
AXED 3996	AXED 300	N/A
AXED 4110	AXED 400	N/A
AXED 4210	AXED 443	N/A
AXED 4215	AXED 445	N/A
AXED 4220	AXED 446	N/A
AXED 4230	AXED 447	N/A
AXED 4235	AXED 448	N/A
AXED 4510	AXED 456	N/A
AXED 4520	AXED 460	N/A
AXED 4610	AXED 475	N/A
AXED 4620	AXED 484	N/A
AXED 4710	AXED 488	N/A
AXED 4715	AXED 489	N/A
AXED 4991	AXED 499	N/A
AXED 4997	AXED 490	N/A
AXED 5110	AXED 500	N/A
AXED 5155	AXED 515	N/A
AXED 5160	AXED 530	N/A
AXED 5170	AXED 536	N/A
AXED 5210	AXED 543	N/A
AXED 5215	AXED 545	N/A
AXED 5220	AXED 546	N/A
AXED 5230	AXED 547	N/A
AXED 5235	AXED 548	N/A
AXED 5310	AXED 565	N/A
AXED 5510	AXED 556	N/A
AXED 5515	AXED 571	N/A
AXED 5610	AXED 575	N/A
AXED 5615	AXED 586	N/A
AXED 5993	AXED 594	N/A

AXED 5994	AXED 598	N/A
AXED 5996	AXED 590	N/A
AXED 5998	AXED 595	N/A
AXED 5999	AXED 599	N/A
BCIS-BUSINESS COMPUTER INFORMATION SYSTEMS		
BCIS 1110	BCIS 110	Common
BCIS 1110	C S 110	Common
BCIS 1160	CTEC 135	Common
BCIS 1215	OATS 215	Common
BCIS 1220	OATS 211	Common
BCIS 1230	OATS 217	Common
BCIS 1750	OATS 209	Common
BCIS 2120	OECS 280	Common
BCIS 2130	OECS 223	Common
BCIS 2221	OATS 213	Common
BCIS 2310	OECS 253	Common
BFIN-BUSINESS FINANCE		
BFIN 2110	FIN 206	Common
BFIN 2110	FIN 210	Common
BFIN 303V	FIN 303V	N/A
BFIN 311	FIN 311	N/A
BFIN 322	FIN 322	N/A
BFIN 323	FIN 323	N/A
BFIN 324	FIN 324	N/A
BFIN 325	FIN 325	N/A
BFIN 326	FIN 326	N/A
BFIN 341	FIN 341	N/A
BFIN 355	FIN 355	N/A
BFIN 360	FIN 360	N/A
BFIN 385	FIN 385	N/A
BFIN 391	FIN 391	N/A
BFIN 392	FIN 392	N/A
BFIN 393	FIN 393	N/A
BFIN 406	FIN 406	N/A
BFIN 421	FIN 421	N/A
BFIN 435	FIN 435	N/A
BFIN 445	FIN 445	N/A
BFIN 455	FIN 455	N/A
BFIN 470	FIN 470	N/A
BFIN 475	FIN 475	N/A
BFIN 480	FIN 480	N/A
BFIN 490	FIN 490	N/A
BFIN 498	FIN 498	N/A
BFIN 500	FIN 500	N/A
BFIN 503	FIN 503	N/A
BFIN 511	FIN 511	N/A
BFIN 521	FIN 521	N/A
BFIN 535	FIN 535	N/A
BFIN 545	FIN 545	N/A
BFIN 555	FIN 555	N/A
BFIN 575	FIN 575	N/A
BFIN 581	FIN 581	N/A

BFIN 590	FIN 590	N/A
BFIN 598	FIN 598	N/A
BIOL-BIOLOGY		
BIOL 1120G	BIOL 101G	Unique
BIOL 1120L	BIOL 101GL	Unique
BIOL 1130G	BIOL 154	Common
BIOL 1190G	BIOL 110G	Unique
BIOL 1996	BIOL 150	Unique
BIOL 2110G	BIOL 211G	Unique
BIOL 2110L	BIOL 211GL	Unique
BIOL 2210	BIOL 225	Common
BIOL 2221	BIOL 254	Unique
BIOL 2225	BIOL 226	Common
BIOL 2310	BIOL 221	Common
BIOL 2310L	BIOL 221 L	Common
BIOL 2320	BIOL 219	Unique
BIOL 2505	BIOL 227	Common
BIOL 2511	BIOL 262	Common
BIOL 2512	BIOL 263	Unique
BIOL 2610G	BIOL 111G	Common
BIOL 2610L	BIOL 111GL	Common
BIOL 2996	BIOL 250	Unique
BLAW-BUSINESS LAW		
BLAW 2110	BLAW 230	Common
BLAW 2110	BMGT 231	Common
BLED-BILINGUAL EDUCATION		
BLED 1110	EDUC 103	Common
BLED 2110	EDUC 204	Common
BLED 3110	BLED 303	N/A
BLED 3120	BLED 342	N/A
BLED 3130	BLED 343	N/A
BLED 3140	BLED 344	N/A
BLED 4110	BLED 483	N/A
BLED 4996	BLED 489	N/A
BLED 5110	BLED 504	N/A
BLED 5120	BLED 505	N/A
BLED 5130	BLED 520	N/A
BLED 5210	BLED 522	N/A
BLED 5220	BLED 542	N/A
BLED 5230	BLED 543	N/A
BLED 5310	BLED 545	N/A
BLED 5320	BLED 583	N/A
BLED 5330	BLED 584	N/A
BLED 5410	BLED 585	N/A
BLED 5420	BLED 587	N/A
BLED 5990	EDUC 590	N/A
BLED 5992	BLED 570	N/A
BLED 5996	BLED 560	N/A
BLED 5998	BLED 550	N/A
BLED 6110	BLED 616	N/A
BLED 6120	BLED 617	N/A
BLED 6130	BLED 621	N/A

BLED 6210	BLED 623	N/A
BLED 6220	BLED 633	N/A
BLED 6310	BLED 635	N/A
BLED 6320	BLED 637	N/A
BLED 6992	BLED 670	N/A
BLED 6998	BLED 640	N/A
BMET-BIOMEDICAL TECHNOLOGY		
BMET 1140	OEBM 140	Unique
BMET 1141	OEBM 141	Unique
BMET 2211	OEBM 211	Unique
BMET 2241	OEBM 241	Unique
BMET 2998	OEBM 200	Unique
BUSA-BUSINESS ADMINISTRATION		
BUSA 1110	BMGT 110	Common
BUSA 1110	BUSA 111	Common
BUSA 1115	OATS 105	Common
BUSA 1180	OATS 106	Common
BUSA 1210	OATS 110	Common
BUSA 2175	OATS 239	Common
CAST-CHILD ADVOCACY STUDIES		
CAST 1110	CAST 201	Unique
CAST 2110	CAST 202	Unique
CAST 2120	CAST 203	Unique
CEPY-COUNSELING & EDUC PSY		
CEPY 1120G	C EP 110G	Unique
CEPY 1150	C EP 199	Unique
CEPY 2110	C EP 210	Common
CEPY 2120	C EP 215	Unique
CEPY 2130	C EP 240	Unique
CEPY 2140	C EP 298	Unique
CEPY 2140H	C EP 298 H	Unique
CEPY 3110	CEPY 320	N/A
CEPY 3210V	CEPY 300V	N/A
CEPY 4110V	CEPY 451V	N/A
CEPY 4120	CEPY 420	N/A
CEPY 4130	CEPY 455	N/A
CEPY 4140	CEPY 461	N/A
CEPY 4150	CEPY 495	N/A
CEPY 4150H	CEPY 495 H	N/A
CEPY 4997	CEPY 499	N/A
CEPY 4998	CEPY 498	N/A
CEPY 5110	CEPY 503	N/A
CEPY 5120	CEPY 512	N/A
CEPY 5130	CEPY 517	N/A
CEPY 5140	CEPY 515	N/A
CEPY 5150	CEPY 520	N/A
CEPY 5160	CEPY 522	N/A
CEPY 5170	CEPY 524	N/A
CEPY 5180	CEPY 556	N/A
CEPY 5210	CEPY 532	N/A
CEPY 5220	CEPY 542	N/A
CEPY 5230	CEPY 550	N/A

CEPY 5235	CEPY 554	N/A
CEPY 5240	CEPY 558	N/A
CEPY 5250	CEPY 562	N/A
CEPY 5260	CEPY 566	N/A
CEPY 5270	CEPY 551	N/A
CEPY 5280	CEPY 563	N/A
CEPY 5310	CEPY 505	N/A
CEPY 5320	CEPY 552	N/A
CEPY 5985	CEPY 572	N/A
CEPY 5990	CEPY 578	N/A
CEPY 5997	CEPY 598	N/A
CEPY 5998	CEPY 580	N/A
CEPY 5999	CEPY 599	N/A
CEPY 6120	CEPY 612	N/A
CEPY 6130	CEPY 617	N/A
CEPY 6140	CEPY 615	N/A
CEPY 6150	C EP 619	N/A
CEPY 6160	CEPY 540	N/A
CEPY 6170	CEPY 618	N/A
CEPY 6180	CEPY 579	N/A
CEPY 6185	CEPY 624	N/A
CEPY 6190	CEPY 622	N/A
CEPY 6210	CEPY 630	N/A
CEPY 6220	CEPY 616	N/A
CEPY 6240	CEPY 658	N/A
CEPY 6250	CEPY 662	N/A
CEPY 6260	CEPY 671	N/A
CEPY 6265	CEPY 608	N/A
CEPY 6270	CEPY 651	N/A
CEPY 6320	CEPY 652	N/A
CEPY 6330	CEPY 646	N/A
CEPY 6340	CEPY 647	N/A
CEPY 6350	CEPY 648	N/A
CEPY 6410	CEPY 634	N/A
CEPY 6420	CEPY 642	N/A
CEPY 6425	CEPY 632	N/A
CEPY 6430	CEPY 636	N/A
CEPY 6440	CEPY 637	N/A
CEPY 6450	CEPY 693	N/A
CEPY 6510	CEPY 672	N/A
CEPY 6520	CEPY 676	N/A
CEPY 6530	CEPY 675	N/A
CEPY 6540	CEPY 681	N/A
CEPY 6550	CEPY 673	N/A
CEPY 6560	CEPY 677	N/A
CEPY 6570	CEPY 678	N/A
CEPY 6580	CEPY 679	N/A
CEPY 6590	CEPY 670	N/A
CEPY 6610	CEPY 684	N/A
CEPY 6620	CEPY 680	N/A
CEPY 6630	CEPY 682	N/A
CEPY 6640	CEPY 685	N/A

CEPY 6996	CEPY 698	N/A
CEPY 6999	CEPY 699	N/A
CEPY 7000	C EP 700	N/A
CHEM-CHEMISTRY		
CHEM 1111	CHEM 100	Unique
CHEM 1120G	CHEM 110G	Common
CHEM 1121	CHEM 101	Unique
CHEM 1122	CHEM 102	Unique
CHEM 1123	CHEM 103	Unique
CHEM 1215G	CHEM 111G	Common
CHEM 1216	CHEM 115	Unique
CHEM 1225G	CHEM 112G	Common
CHEM 1226	CHEM 116	Unique
CHEM 2111	CHEM 242	Unique
CHEM 2115	CHEM 211	Common
CHEM 2120	CHEM 210	Common
CHEM 2226	CHEM 217	Unique
CHEM 2991	CHEM 241	Unique
CHEM 2996	CHEM 251	Unique
CHIN-CHINESE		
CHIN 1110	CHIN 111	Common
CHIN 1120	CHIN 112	Common
CHIN 2110	CHIN 211	Common
CHIN 2120	CHIN 212	Common
CHSS-CONN HEALTH/SOC SRVCS		
CHSS 1110	CHSS 101	Unique
CHSS 2110	CHSS 216	Unique
CHSS 2510	CHSS 299	Common
CHSS 2511	CHSS 295	Unique
CIST-COMPUTER INFORMATION SYSTEMS TECHNOLOGY		
CIST 1110	OECS 125	Common
CIST 1111	OECS 101	Unique
CIST 1121	OECS 185	Common
CIST 1261	OECS 195	Common
CIST 1409	CTEC 120	Common
CIST 1412	CTEC 185	Common
CIST 1605	CSEC 127	Common
CIST 1611	OECS 207	Common
CIST 1996	CTEC 255	Common
CIST 2210	CTEC 145	Common
CIST 2211	OECS 231	Common
CIST 2237	CTEC 150	Common
CIST 2251	CTEC 156	Common
CIST 2275	CTEC 154	Common
CIST 2311	CTEC 140	Common
CIST 2321	CSEC 175	Common
CIST 2331	CSEC 180	Common
CIST 2411	CTEC 280	Common
CIST 2611	CTEC 235	Common
CIST 2636	CTEC 230	Common
CIST 2811	CSEC 285	Common
CIST 2812	CSEC 280	Common

CIST 2996	CTEC 299	Common
CIST 2998	CTEC 220	Common
CIST 2999	CTEC 295	Common
CJUS-CRIMINAL JUSTICE		
CJUS 1120	C J 205	Common
CJUS 1996	C J 199	Unique
CJUS 2120	C J 250	Common
CJUS 2140	C J 221	Common
CJUS 2150	C J 230	Common
CJUS 2160	C J 293	Common
CJUS 2220	C J 210	Common
CJUS 300	C J 300	N/A
CJUS 301	C J 301	N/A
CJUS 302	C J 302	N/A
CJUS 303	C J 303	N/A
CJUS 304	C J 304	N/A
CJUS 306	C J 306	N/A
CJUS 307	C J 307	N/A
CJUS 321	C J 321	N/A
CJUS 331	C J 331	N/A
CJUS 332	C J 332	N/A
CJUS 333	C J 333	N/A
CJUS 345	C J 345	N/A
CJUS 346	C J 346	N/A
CJUS 347	C J 347	N/A
CJUS 348	C J 348	N/A
CJUS 360	C J 360	N/A
CJUS 380	C J 380	N/A
CJUS 391	C J 391	N/A
CJUS 393	C J 393	N/A
CJUS 399	C J 399	N/A
CJUS 405	C J 405	N/A
CJUS 410	C J 410	N/A
CJUS 412	C J 412	N/A
CJUS 414	C J 414	N/A
CJUS 416	C J 416	N/A
CJUS 417	C J 417	N/A
CJUS 424	C J 424	N/A
CJUS 425	C J 425	N/A
CJUS 427	C J 427	N/A
CJUS 428	C J 428	N/A
CJUS 429	C J 429	N/A
CJUS 430	C J 430	N/A
CJUS 431	C J 431	N/A
CJUS 432	C J 432	N/A
CJUS 434	C J 434	N/A
CJUS 435	C J 435	N/A
CJUS 436	C J 436	N/A
CJUS 437	C J 437	N/A
CJUS 440V	C J 440V	N/A
CJUS 449	C J 449	N/A
CJUS 451	C J 451	N/A

CJUS 453	C J 453	N/A
CJUS 454	C J 454	N/A
CJUS 455	C J 455	N/A
CJUS 484	C J 484	N/A
CJUS 501	C J 501	N/A
CJUS 511	C J 511	N/A
CJUS 514	C J 514	N/A
CJUS 515	C J 515	N/A
CJUS 520	C J 520	N/A
CJUS 524	C J 524	N/A
CJUS 525	C J 525	N/A
CJUS 527	C J 527	N/A
CJUS 529	C J 529	N/A
CJUS 531	C J 531	N/A
CJUS 532	C J 532	N/A
CJUS 535	C J 535	N/A
CJUS 537	C J 537	N/A
CJUS 541	C J 541	N/A
CJUS 545	C J 545	N/A
CJUS 555	C J 555	N/A
CJUS 560	C J 560	N/A
CJUS 581	C J 581	N/A
CJUS 591	C J 591	N/A
CJUS 592	C J 592	N/A
CJUS 593	C J 593	N/A
CJUS 599	C J 599	N/A
CNST-CONSTRUCTION		
CNST 1110	BCT 100	Common
CNST 1121	BCT 101	Unique
CNST 1122	BCT 102	Unique
CNST 1133	BCT 103	Unique
CNST 1144	BCT 104	Unique
CNST 1155	BCT 105	Unique
CNST 1166	BCT 106	Unique
CNST 1160	BCT 109	Common
CNST 1120	BCT 110	Common
CNST 1311	BCT 111	Unique
CNST 1114	BCT 114	Unique
CNST 1115	BCT 115	Unique
CNST 1116	BCT 116	Unique
CNST 1118	BCT 118	Unique
CNST 1220	BCT 123	Common
CNST 1330	BCT 130	Unique
CNST 1710	BCT 150	Unique
CNST 1240	BCT 206	Common
CNST 2290	BCT 209	Unique
CNST 2217	BCT 217	Unique
CNST 1215	BCT 219	Common
CNST 2995	BCT 221	Common
CNST 1230	BCT 223	Common
CNST 2996	BCT 255	Common
CNST 2994	BCT 290	Unique

COMM-COMMUNICATION		
COMM 1115G	COMM 265G	Common
COMM 1130G	COMM 253G	Common
COMM 2110	COMM 285	Unique
COMM 2111	COMM 250	Unique
COMM 2996	COMM 291	Unique
COMM 2997	COMM 290	Unique
COMM 3110	COMM 310	N/A
COMM 3120	COMM 351	N/A
COMM 3510	COMM 370	N/A
COMM 3710	COMM 376	N/A
COMM 3530	COMM 377	N/A
COMM 3610	COMM 384	N/A
COMM 4210	COMM 440	N/A
COMM 4220	COMM 450	N/A
COMM 4230	COMM 457	N/A
COMM 4310	COMM 471	N/A
COMM 4520	COMM 425	N/A
COMM 4530	COMM 470	N/A
COMM 4550	COMM 478	N/A
COMM 4560	COMM 479	N/A
COMM 4620	COMM 460	N/A
COMM 4630	COMM 462	N/A
COMM 4640	COMM 465	N/A
COMM 4720	COMM 475	N/A
COMM 4730	COMM 477	N/A
COMM 4750	COMM 480	N/A
COMM 4997	COMM 490	N/A
COMM 4996	COMM 491	N/A
COMM 4998	COMM 495	N/A
COMM 5110	COMM 583	N/A
COMM 5120	COMM 551	N/A
COMM 5130	COMM 505	N/A
COMM 5140	COMM 506	N/A
COMM 5210	COMM 540	N/A
COMM 5220	COMM 550	N/A
COMM 5230	COMM 557	N/A
COMM 5310	COMM 571	N/A
COMM 5510	COMM 570	N/A
COMM 5710	COMM 576	N/A
COMM 5610	COMM 584	N/A
COMM 5550	COMM 578	N/A
COMM 5560	COMM 579	N/A
COMM 5630	COMM 562	N/A
COMM 5640	COMM 565	N/A
COMM 5994	COMM 598	N/A
COMM 5996	COMM 591	N/A
COMM 5997	COMM 590	N/A
COMM 5998	COMM 595	N/A
COMM 5999	COMM 599	N/A
CSCI-COMPUTER SCIENCE		
CSCI 1110	C S 111	Unique

CSCI 1115G	C S 171G	Unique
CSCI 1120	C S 117	Unique
CSCI 1240	C S 151	Common
CSCI 1210	C S 152	Common
CSCI 1220	C S 153	Common
CSCI 1225	C S 154	Unique
CSCI 1235	C S 158	Unique
CSCI 1720	C S 172	Unique
CSCI 2996	C S 209	Common
CSCI 2210	C S 271	Common
CSCI 2220	C S 272	Common
CSCI 2230	C S 273	Common
CSCI 2310	C S 278	Common
CSCI 2410	C S 281	Common
CSCI 3790	C S 343	N/A
CSCI 3730	C S 370	N/A
CSCI 3710	C S 371	N/A
CSCI 3720	C S 372	N/A
CSCI 4225	C S 380	N/A
CSCI 4270	C S 381	N/A
CSCI 4265	C S 382	N/A
CSCI 4425	C S 383	N/A
CSCI 4430	C S 384	N/A
CSCI 4240	C S385	N/A
CSCI 3410	C S 390	N/A
CSCI 4435	C S 391	N/A
CSCI 4235	C S 394	N/A
CSCI 4440	C S 395	N/A
CSCI 3997	C S 409	N/A
CSCI 4110	C S 419	N/A
CSCI 4980	C S 448	N/A
CSCI 4999	C S449	N/A
CSCI 4510	C S 451	N/A
CSCI 4505	C S452	N/A
CSCI 4520	C S 453	N/A
CSCI 4525	C S 454	N/A
CSCI 4530	C S 458	N/A
CSCI 4540	C S 460	N/A
CSCI 4545	C S 462	N/A
CSCI 4550	C S 463	N/A
CSCI 4560	C S 465	N/A
CSCI 4580	C S 466	N/A
CSCI 4575	C S 468	N/A
CSCI 5110	C S 469	N/A
CSCI 4105	C S 471	N/A
CSCI 4230	C S 473	N/A
CSCI 4120	C S 474	N/A
CSCI 4405	C S 475	N/A
CSCI 4410	C S 476	N/A
CSCI 4255	C S 477	N/A
CSCI 4205	C S 478	N/A
CSCI 4996	C S 479	N/A

CSCI 4130	C S 480	N/A
CSCI 4260	C S 481	N/A
CSCI 4140	C S 482	N/A
CSCI 4245	C S 484	N/A
CSCI 4250	C S 485	N/A
CSCI 4305	C S 486	N/A
CSCI 4420	C S 487	N/A
CSCI 4415	C S 488	N/A
CSCI 4310	C S 489	N/A
CSCI 4215	C S 491	N/A
CSCI 4565	C S 493	N/A
CSCI 4210	C S 494	N/A
CSCI 4220	C S 496	N/A
CSCI 5140	C S 502	N/A
CSCI 5245	C S 504	N/A
CSCI 5405	C S 505	N/A
CSCI 5410	C S 506	N/A
CSCI 5415	C S 508	N/A
CSCI 5310	C S 509	N/A
CSCI 5510	C S 510	N/A
CSCI 5205	C S 513	N/A
CSCI 5210	C S 514	N/A
CSCI 5250	C S 515	N/A
CSCI 5305	C S 516	N/A
CSCI 5255	C S 517	N/A
CSCI 5260	C S 518	N/A
CSCI 5420	C S 519	N/A
CSCI 5215	C S 521	N/A
CSCI 5220	C S 522	N/A
CSCI 5225	C S 525	N/A
CSCI 5265	C S 532	N/A
CSCI 5425	C S 533	N/A
CSCI 5430	C S 534	N/A
CSCI 5240	C S 535	N/A
CSCI 5435	C S 536	N/A
CSCI 5235	C S 544	N/A
CSCI 5440	C S 545	N/A
CSCI 5505	C S 570	N/A
CSCI 5605	C S 574	N/A
CSCI 5750	C S 575	N/A
CSCI 5996	C S 579	N/A
CSCI 5810	C S 581	N/A
CSCI 5820	C S 582	N/A
CSCI 5840	C S 584	N/A
CSCI 5860	C S 586	N/A
CSCI 5991	C S 589	N/A
CSCI 5994	C S 598	N/A
CSCI 5999	C S 599	N/A
CSCI 6991	C S 600	N/A
CSCI 7000	C S 700	N/A
CTFM-CLTHNG/TXTLS/FSHN MRCHDSG		
CTFM 1110	CTFM 178	Unique

CTFM 2120	CTFM 270	Unique
CTFM 2130	CTFM 273	Unique
CTFM 2990	CTFM 202	Unique
DANC-DANCE		
DANC 1110G	DANC 101G	Common
DANC 1130	DANC 123	Common
DANC 1131	DANC 125	Unique
DANC 1135	DANC 109	Unique
DANC 1140	DANC 129	Common
DANC 1150	DANC 126	Common
DANC 1155	DANC 102	Common
DANC 1185	DANC 121	Unique
DANC 1220	DANC 122	Unique
DANC 1235	DANC 118	Unique
DANC 2114	DANC 204	Unique
DANC 2130	DANC 223	Common
DANC 2130L	DANC 223 L	Unique
DANC 2140	DANC 229	Common
DANC 2140L	DANC 229 L	Unique
DANC 2142	DANC 210	Unique
DANC 2142L	DANC 210 L	Unique
DANC 2150	DANC 226	Common
DANC 2150L	DANC 226 L	Unique
DANC 2155	DANC 207	Unique
DANC 2157	DANC 212	Unique
DANC 2161	DANC 227	Unique
DANC 2250	DANC 205	Unique
DANC 2251	DANC 206	Unique
DANC 2265	DANC 289	Unique
DANC 2270	DANC 280	Unique
DANC 2310	DANC 222	Unique
DANC 2311	DANC 225	Unique
DANC 2320	DANC 232	Unique
DANC 2321	DANC 235	Unique
DANC 3110	DANC 345	N/A
DANC 3114	DANC 304	N/A
DANC 3130	DANC 323	N/A
DANC 3130L	DANC 323 L	N/A
DANC 3140	DANC 329	N/A
DANC 3140L	DANC 329 L	N/A
DANC 3142	DANC 310	N/A
DANC 3142L	DANC 310 L	N/A
DANC 3145	DANC 339	N/A
DANC 3150	DANC 326	N/A
DANC 3150L	DANC 326 L	N/A
DANC 3155	DANC 307	N/A
DANC 3157	DANC 312	N/A
DANC 3175	DANC 375	N/A
DANC 3250	DANC 305	N/A
DANC 3251	DANC 306	N/A
DANC 3265	DANC 389	N/A
DANC 3310	DANC 322	N/A

DANC 3311	DANC 325	N/A
DANC 3320	DANC 332	N/A
DANC 3321	DANC 335	N/A
DANC 3510V	DANC 451V	N/A
DANC 4250	DANC 466	N/A
DANC 4266	DANC 489	N/A
DANC 4310	DANC 422	N/A
DANC 4311	DANC 425	N/A
DANC 4320	DANC 432	N/A
DANC 4321	DANC 435	N/A
DANC 4610	DANC 447	N/A
DANC 4710	DANC 465	N/A
DANC 4990	DANC 411	N/A
DANC 4990	DANC 412	N/A
DANC 4990	DANC 413	N/A
DANC 4996	DANC 450	N/A
DANC 4997	DANC 499	N/A
DANC 5114	DANC 504	N/A
DANC 5130	DANC 523	N/A
DANC 5140	DANC 529	N/A
DANC 5142	DANC 510	N/A
DANC 5145	DANC 539	N/A
DANC 5150	DANC 526	N/A
DANC 5155	DANC 507	N/A
DANC 5157	DANC 512	N/A
DANC 5250	DANC 505	N/A
DANC 5251	DANC 506	N/A
DANC 5310	DANC 522	N/A
DANC 5311	DANC 525	N/A
DANC 5320	DANC 532	N/A
DANC 5321	DANC 535	N/A
DANC 5510	DANC 551	N/A
DANC 5550	DANC 566	N/A
DANC 5710	DANC 570	N/A
DANC 5900	DANC 599	N/A
DANC 5992	DANC 501	N/A
DANC 5996	DANC 550	N/A
DANC 5998	DANC 567	N/A
DANC 6998	DANC 670	N/A
DAST-DENTAL ASSISTING		
DAST 1111	DAS 117	Common
DAST 1123	DAS 115	Common
DAST 1515	DAS 111	Common
DAST 1519	DAS 113	Common
DAST 2222	DAS 129	Common
DAST 2990	DAS 123	Unique
DHYG-Dental Hygiene		
DHYG 2210	DHYG 110	Common
DHYG 2212	DHYG 112	Unique
DHYG 2213	DHYG 114	Common
DHYG 2214	DHYG 116	Common
DHYG 2215	DHYG 117	Common

DHYG 2216	DHYG 118	Common
DHYG 2220	DHYG 120	Common
DHYG 2222	DHYG 122	Unique
DHYG 2223	DHYG 124	Common
DHYG 2224	DHYG 126	Common
DHYG 2225	DHYG 134	Common
DHYG 2226	DHYG 215	Common
DHYG 2227	DHYG 132	Unique
DHYG 2228	DHYG 218	Common
DHYG 2228L	DHYG 219	Common
DHYG 2230	DHYG 210	Common
DHYG 2232	DHYG 212	Unique
DHYG 2233	DHYG 214	Common
DHYG 2234	DHYG 217	Unique
DHYG 2240	DHYG 220	Common
DHYG 2242	DHYG 222	Unique
DHYG 2243	DHYG 224	Common
DHYG 2244	DHYG 225	Common
DHYG 2996	DHYG 255	Common
DMSO-DIAGNOSTIC MEDICAL SONOGRAPHY		
DMSO 1110	DMS 100	Unique
DMSO 1111	DMS 101	Unique
DMSO 1114	DMS 105	Unique
DMSO 1116	DMS 116	Unique
DMSO 1116L	DMS 116L	Unique
DMSO 1131	DMS 130	Unique
DMSO 1131L	DMS 130L	Unique
DMSO 1140	DMS 140	Unique
DMSO 1140L	DMS 140L	Unique
DMSO 1150	DMS 150	Unique
DMSO 1170	DMS 170	Unique
DMSO 1180	DMS 180	Unique
DMSO 1526	DMS 160	Unique
DMSO 1527	DMS 165	Unique
DMSO 1528	DMS 260	Unique
DMSO 2020	DMS 248	Common
DMSO 2216	DMS 216	Unique
DMSO 2226	DMS 226	Unique
DMSO 2227	DMS 227	Unique
DMSO 2230	DMS 230	Unique
DMSO 2240	DMS 240	Unique
DMSO 2245	DMS 245	Unique
DMSO 2250	DMS 250	Unique
DMSO 2270	DMS 270	Unique
DMSO 2280	DMS 280	Unique
DMSO 2291	DMS 291	Unique
DMSO 2292	DMS 292	Unique
DMSO 2293	DMS 293	Unique
DMSO 2295	DMS 290	Unique
ECED-EARLY CHILDHOOD EDUCATION		
ECED 1110	ECED 115	Common
ECED 1115	ECED 125	Common

ECED 1120	ECED 265	Common
ECED 1125	ECED 255	Common
ECED 1130	ECED 135	Common
ECED 2110	ECED 245	Common
ECED 2115	ECED 235	Common
ECED 2120	ECED 215	Common
ECED 2121	ECED 220	Common
ECED 2130	ECED 225	Common
ECED 2131	ECED 230	Common
ECED 2140	ECED 275	Common
ECED 2141	ECED 276	Common
ECED 2215	ECED 270	Common
ECED 2280	ECED 280	Common
ECED 2281	ECED 281	Unique
ECED 3110	ECED 325	N/A
ECED 3120	ECED 345	N/A
ECED 3210	ECED 351	N/A
ECED 3996	ECED 395	N/A
ECED 4110	SPED 450	N/A
ECED 4120	SPED 451	N/A
ECED 4210	ECED 420	N/A
ECED 4211	ECED 425	N/A
ECED 4220	ECED 465	N/A
ECED 4250	ECED 440	N/A
ECED 4260	ECED 455	N/A
ECED 4310	ECED 329	N/A
ECED 4320	RDG 350	N/A
ECED 4810	ECED 470	N/A
ECED 4996	ECED 489	N/A
ECED 4998	ECED 458	N/A
ECED 5110	SPED 550	N/A
ECED 5120	SPED 551	N/A
ECED 5130	ECED 515	N/A
ECED 5210	ECED 530	N/A
ECED 5220	ECED 570	N/A
ECED 5230	ECED 479	N/A
ECED 5310	ECED 510	N/A
ECED 5410	ECED 520	N/A
ECED 5420	ECED 540	N/A
ECED 5510	RDG 550	N/A
ECED 5520	RDG 551	N/A
ECED 5810	ECED 550	N/A
ECED 6110	ECED 612	N/A
ECED 6996	ECED 698	N/A
ECON-ECONOMICS		
ECON 1110G	ECON 201G	Common
ECON 2110G	ECON 251G	Common
ECON 2110H	ECON 251GH	Common
ECON 2120G	ECON 252G	Common
ECON 2120H	ECON 252GH	Common
EDLT-EDUCATION		
EDLT 2110	EDLT 268	Unique

EDLT 3110	EDLT 368	N/A
EDLT 5110	EDLT 528	N/A
EDLT 5120	EDLT 520	N/A
EDLT 5130	EDLT 522	N/A
EDLT 5140	EDLT 560	N/A
EDLT 5210	EDLT 561	N/A
EDLT 5220	EDLT 573	N/A
EDLT 5230	EDLT 575	N/A
EDLT 5240	EDLT 577	N/A
EDLT 5250	EDLT 580	N/A
EDLT 5310	EDLT 578	N/A
EDLT 5320	EDLT 579	N/A
EDLT 5330	EDLT 581	N/A
EDLT 5992	EDLT 592	N/A
EDLT 5999	EDLT 590	N/A
EDLT 6110	EDLT 628	N/A
EDLT 6120	EDLT 672	N/A
EDLT 6210	EDLT 607	N/A
EDLT 6220	EDLT 620	N/A
EDLT 6230	EDLT 610	N/A
EDLT 6240	EDLT 677	N/A
EDLT 6998	EDLT 612	N/A
EDUC-EDUCATION		
EDUC 1110	EDUC 101	Unique
EDUC 1120	EDUC 250	Common
EDUC 1140	EDUC 150	Unique
EDUC 1150	EDUC 151	Unique
EDUC 1185	EDUC 281	Unique
EDUC 1995	EDUC 181	Unique
EDUC 1996	EDUC 195	Unique
EDUC 1998	EDUC 102	Unique
EDUC 2710	EDUC 219	Unique
EDUC 2998	EDUC 202	Unique
EDUC 3110V	EDUC 317	N/A
EDUC 3120	EDUC 315	N/A
EDUC 3220	EDUC 343	N/A
EDUC 3996	EDUC 395	N/A
EDUC 3997	EDUC 381	N/A
EDUC 4310	EDUC 451	N/A
EDUC 4320	EDUC 452	N/A
EDUC 4330	EDUC 454	N/A
EDUC 4410	EDUC 463	N/A
EDUC 4420	EDUC 462	N/A
EDUC 4430	EDUC 461	N/A
EDUC 4440	EDUC 460	N/A
EDUC 4510	EDUC 402	N/A
EDUC 4520	EDUC 475	N/A
EDUC 4530	EDUC 476	N/A
EDUC 4810	EDUC 470	N/A
EDUC 4811	EDUC 481	N/A
EDUC 4820	EDUC 471	N/A
EDUC 4821	EDUC 482	N/A

EDUC 4992	EDUC 495	N/A
EDUC 4996	EDUC 489	N/A
EDUC 5110	EDUC 530	N/A
EDUC 5120	EDUC 515	N/A
EDUC 5130	EDUC 518	N/A
EDUC 5140	EDUC 519	N/A
EDUC 5150	EDUC 505	N/A
EDUC 5160	EDUC 516	N/A
EDUC 5170	EDUC 520	N/A
EDUC 5210	EDUC 542	N/A
EDUC 5220	EDUC 543	N/A
EDUC 5310	EDUC 551	N/A
EDUC 5320	EDUC 552	N/A
EDUC 5330	EDUC 554	N/A
EDUC 5410	EDUC 563	N/A
EDUC 5420	EDUC 562	N/A
EDUC 5430	EDUC 561	N/A
EDUC 5440	EDUC 560	N/A
EDUC 5510	EDUC 573	N/A
EDUC 5520	EDUC 571	N/A
EDUC 5530	EDUC 572	N/A
EDUC 5540	EDUC 577	N/A
EDUC 5810	EDUC 510	N/A
EDUC 5811	EDUC 509	N/A
EDUC 5990	EDUC 5999	N/A
EDUC 5991	EDUC 598	N/A
EDUC 5992	EDUC 595	N/A
EDUC 5996	EDUC 501	N/A
EDUC 5997	EDUC 5999	N/A
EDUC 5998	EDUC 558	N/A
EDUC 6110	EDUC 603	N/A
EDUC 6120	EDUC 604	N/A
EDUC 6210	EDUC 623	N/A
EDUC 6220	EDUC 633	N/A
EDUC 6230	EDUC 634	N/A
EDUC 6310	EDUC 635	N/A
EDUC 6320	EDUC 637	N/A
EDUC 6330	EDUC 630	N/A
EDUC 6410	EDUC 607	N/A
EDUC 6420	EDUC 613	N/A
EDUC 6430	EDUC 636	N/A
EDUC 6440	EDUC 606	N/A
EDUC 6910	EDUC 694	N/A
EDUC 6990	EDUC 685	N/A
EDUC 6991	EDUC 600	N/A
EDUC 6996	EDUC 698	N/A
EDUC 6997	EDUC 605	N/A
EDUC 6998	EDUC 602	N/A
EDUC 6999	EDUC 699	N/A
EDUC 7000	EDUC 700	N/A
ELAD-EDUC LEADERSHIP & ADMIN		
ELAD 2210	ELA 255	Unique

ELAD 2340	ELA 215	Unique
ELAD 2996	ELA 298	Unique
ELAD 3110V	ELAD 350V	N/A
ELAD 3210	ELAD 342	N/A
ELAD 3996	ELAD 398	N/A
ELAD 4110	ELAD 440	N/A
ELAD 4120	ELAD 450	N/A
ELAD 4130	ELAD 455	N/A
ELAD 4410	ELAD 411	N/A
ELAD 4420	ELAD 412	N/A
ELAD 4510	ELAD 485	N/A
ELAD 4998	ELAD 499	N/A
ELAD 5110	ELAD 575	N/A
ELAD 5120	ELAD 578	N/A
ELAD 5130	ELAD 590	N/A
ELAD 5140	ELAD 576	N/A
ELAD 5150	ELAD 579	N/A
ELAD 5160	ELAD 530	N/A
ELAD 5170	ELAD 531	N/A
ELAD 5180	ELAD 564	N/A
ELAD 5185	ELAD 565	N/A
ELAD 5210	ELAD 582	N/A
ELAD 5215	ELAD 563	N/A
ELAD 5220	ELAD 520	N/A
ELAD 5230	ELAD 555	N/A
ELAD 5240	ELAD 540	N/A
ELAD 5250	ELAD 550	N/A
ELAD 5260	ELAD 580	N/A
ELAD 5270	ELAD 569	N/A
ELAD 5280	ELAD 566	N/A
ELAD 5285	ELAD 567	N/A
ELAD 5310	ELAD 586	N/A
ELAD 5320	ELAD 570	N/A
ELAD 5410	ELAD 511	N/A
ELAD 5510	ELAD 585	N/A
ELAD 5992	ELAD 502	N/A
ELAD 5996	ELAD 595	N/A
ELAD 5997	ELAD 598	N/A
ELAD 6110	ELAD 615	N/A
ELAD 6120	ELAD 685	N/A
ELAD 6210	ELAD 622	N/A
ELAD 6220	ELAD 623	N/A
ELAD 6310	ELAD 630	N/A
ELAD 6320	ELAD 671	N/A
ELAD 6410	ELAD 682	N/A
ELAD 6510	ELAD 683	N/A
ELAD 6520	ELAD 679	N/A
ELAD 6525	ELAD 650	N/A
ELAD 6610	ELAD 635	N/A
ELAD 6620	ELAD 689	N/A
ELAD 6630	ELAD 676	N/A
ELAD 6635	ELAD 655	N/A

ELAD 6710	ELAD 645	N/A
ELAD 6910	ELAD 693	N/A
ELAD 6991	ELAD 600	N/A
ELAD 6996	ELAD 698	N/A
ELAD 6998	ELAD 670	N/A
ELAD 7000	ELAD 700	N/A
ELTR-ELECTRICAL		
ELTR 1130	ELWK 130	Common
ELTR 1160	ELWK 131	Common
ELTR 1230	BCT 223	Common
ELTR 2120	ELWK 140	Common
ELTR 1165	ELWK 141	Common
ELTR 2995	ELWK 221	Common
ELTR 1120	OEET 110	Common
ELTR 1140	OEET 120	Common
ELTR 1115	OEET 205	Common
ELTR 2891	OEET 251	Common
ELTR 2892	OEET 252	Common
ELTR 2893	OEET 253	Common
ELTR 2894	OEET 254	Common
ELTR 1996	OEET 295	Common
EMSS-EMERGENCY MEDICAL SERVICES		
EMSS 1116	OEEM 101	Common
EMSS 1120	OEEM 120	Common
EMSS 1120L	OEEM 120L	Common
EMSS 1121	OEEM 121	Common
EMSS 1153	OEEM 153	Common
EMSS 2120	OEEM 150	Common
EMSS 2120L	OEEM 150L	Common
EMSS 2121	OEEM 151	Common
EMSS 2240	OEEM 206	Common
EMSS 2245	OEEM 201	Common
EMSS 2255	OEEM 207	Common
EMSS 2255L	OEEM 207L	Common
EMSS 2310	OEEM 202	Common
EMSS 2310L	OEEM 202L	Common
EMSS 2410	OEEM 210	Common
EMSS 2510	OEEM 204/OEEM 216	Common
EMSS 2610	OEEM 203	Common
EMSS 2610L	OEEM 203L	Common
EMSS 2650	OEEM 242	Common
EMSS 2710	OEEM 213	Common
EMSS 2890	OEEM 230	Common
EMSS 2895	OEEM 231	Common
EMSS 2998	OEEM 243	Common
ENGL-ENGLISH		
ENGL 1105M	SPCD 1110	Unique
ENGL 1110G	ENGL 111G	Common
ENGL 1110H	ENGL 111GH	Unique
ENGL 1110M	ENGL 111 M	Unique
ENGL 1120	ENGL 112	Common
ENGL 1410G	ENGL 115G	Common

ENGL 2130G	ENGL 311G	Common
ENGL 2210G	ENGL 203G	Common
ENGL 2210G	ENGL 218G	Common
ENGL 2215G	ENGL 318G	Unique
ENGL 2221G	ENGL 211G	Unique
ENGL 2280	ENGL 263	Unique
ENGL 2310G	ENGL 220G	Common
ENGL 2381	ENGL 232	Unique
ENGL 2382	ENGL 235	Unique
ENGL 2520G	ENGL 116G	Common
ENGL 2521	ENGL 243	Unique
ENGL 2610	ENGL 251	Common
ENGL 2620	ENGL 252	Common
ENGL 2630	ENGL 271	Common
ENGL 2640	ENGL 272	Common
ENGL 2650G	ENGL 244G	Common
ENGL 2996	ENGL 299	Unique
ENTR-ENTRPRENEURSHIP		
ENTR 1110	BMGT 275	Common
ENVS-ENVIRONMENTAL SCIENCE		
ENVS 1110G	E S 110G	Common
ENVS 2111	E S 256	Unique
ENVS 2111L	E S 256 L	Unique
ENVS 300	E S 300	N/A
ENVS 301	E S 301	N/A
ENVS 312	E S 312	N/A
ENVS 361	E S 361	N/A
ENVS 370	E S 370	N/A
ENVS 391	E S 391	N/A
ENVS 422	E S 422	N/A
ENVS 449	E S 449	N/A
ENVS 451	E S 451	N/A
ENVS 452	E S 452	N/A
ENVS 457	E S 457	N/A
ENVS 460	E S 460	N/A
ENVS 462	E S 462	N/A
ENVS 470	E S 470	N/A
ENVS 471	E S 471	N/A
ENVS 557	E S 557	N/A
ENVS 596	E S 596	N/A
ENVS 599	E S 599	N/A
ENVS 605	E S 605	N/A
ENVS 696	E S 696	N/A
ENVS 700	E S 700	N/A
EPWS-ENTMLGY/PLNT PTHLGY/WD SCI		
EPWS 1110	EPWS 100	Unique
EPWS 1110L	EPWS 100 L	Unique
EPWS 2996	EPWS 200	Unique
FCSC-FAMILY & CONSUMER SCI		
FCSC 2250	FCSE 245	Unique
FCSC 2330	FCSE 235	Unique
FCSC 345	FCSE 345	N/A

FCSC 348	FCSE 348	N/A
FCSC 445	FCSE 445	N/A
FCSC 446	FCSE 446	N/A
FCSC 447	FCSE 447	N/A
FCSC 448	FCSE 448	N/A
FCSC 492	FCSE 492	N/A
FCSC 545	FCSE 545	N/A
FCSC 546	FCSE 546	N/A
FCSC 547	FCSE 547	N/A
FCSC 548	FCSE 548	N/A
FCSC 590	FCSE 590	N/A
FCST-FAMILY AND CHILD STUDIES		
FCST 1130	FCS 181	Unique
FCST 2110	FCS 210	Unique
FCST 2135	FCS 212	Unique
FCST 2140	FCS 213	Unique
FCST 300	FCS 300	N/A
FCST 301	FCS 301	N/A
FCST 380	FCS 380	N/A
FCST 383	FCS 383	N/A
FCST 424	FCS 424	N/A
FCST 449V	FCS 449V	N/A
FCST 456	FCS 456	N/A
FCST 492	FCS 492	N/A
FCST 510	FCS 510	N/A
FCST 511	FCS 511	N/A
FCST 512	FCS 512	N/A
FCST 524	FCS 524	N/A
FCST 525	FCS 525	N/A
FCST 548	FCS 548	N/A
FCST 549	FCS 549	N/A
FCST 562	FCS 562	N/A
FCST 572	FCS 572	N/A
FCST 582	FCS 582	N/A
FCST 583	FCS 583	N/A
FCST 584	FCS 584	N/A
FCST 585	FCS 585	N/A
FCST 586	FCS 586	N/A
FCST 587	FCS 587	N/A
FCST 589	FCS 589	N/A
FCST 590	FCS 590	N/A
FCST 592	FCS 592	N/A
FCST 598	FCS 598	N/A
FCST 599	FCS 599	N/A
FDMA-FILM & DIGITAL MEDIA		
FDMA 1110	CMT 170	Common
FDMA 1120	CMT 140	Common
FDMA 1210	CMT 190	Common
FDMA 1220	CMI 216	Common
FDMA 1220	CMT 195	Common
FDMA 1260	CMT 108	Common
FDMA 1260	CMT 120	Common

FDMA 1360	CMT 130	Common
FDMA 1410	CMT 247	Common
FDMA 1415	CMT 206	Unique
FDMA 1510	CMI 260	Common
FDMA 1510	CMT 135	Common
FDMA 1515	CMT 145	Common
FDMA 1531	CMT 151	Unique
FDMA 1535	CMT 142	Common
FDMA 1536	CMT 242	Unique
FDMA 1545	CMT 115	Common
FDMA 1555	CMI 100	Unique
FDMA 1630	CMT 180	Common
FDMA 1710	CMT 150	Unique
FDMA 1715	CMI 245	Unique
FDMA 1720	CMT 175	Unique
FDMA 1996	CMT 155	Unique
FDMA 2111	CMT 220	Unique
FDMA 2120	CMT 126	Common
FDMA 2125	CMT 156	Common
FDMA 2150	CMT 240	Common
FDMA 2210	CMT 210	Unique
FDMA 2241	CMT 258	Unique
FDMA 2285	CMT 215	Common
FDMA 2287	CMT 223	Common
FDMA 2310	CMI 228	Unique
FDMA 2311	CMI 231	Unique
FDMA 2311	CMT 253	Unique
FDMA 2312	CMT 254	Unique
FDMA 2325	CMT 245	Common
FDMA 2326	CMT 216	Unique
FDMA 2360	CMT 230	Common
FDMA 2365	CMT 235	Unique
FDMA 2370	CMT 275	Unique
FDMA 2381	CMI 232	Unique
FDMA 2382	CMI 235	Unique
FDMA 2410	CMT 236	Common
FDMA 2510	CMI 200	Common
FDMA 2520	CMI 205	Common
FDMA 2520	CMT 205	Common
FDMA 2530	CMI 280	Common
FDMA 2530	CMT 160	Common
FDMA 2535	CMI 240	Unique
FDMA 2570	CMT 292	Unique
FDMA 2710	CMI 250	Unique
FDMA 2715	CMT 260	Unique
FDMA 2720	CMI 290	Unique
FDMA 2725	CMI 270	Unique
FDMA 2730	CMT 227	Unique
FDMA 2735	CMT 290	Unique
FDMA 2740	CMT 291	Unique
FDMA 2745	CMI 233	Unique
FDMA 2750	CMT 229	Unique

FDMA 2755	CMI 220	Unique
FDMA 2770	CMT 200	Unique
FDMA 2775	CMT 252	Unique
FDMA 2785	CMT 228	Unique
FDMA 2993	CMT 276	Unique
FDMA 2994	CMT 295	Unique
FDMA 2995	CMT 226	Unique
FDMA 2996	CMT 255	Unique
FDMA 2997	CMT 298	Unique
FDMA 2998	CMT 221	Unique
FDMA 300	CMI 300	N/A
FDMA 301	CMI 301	N/A
FDMA 303	CMI 303	N/A
FDMA 305	CMI 305	N/A
FDMA 308	CMI 308	N/A
FDMA 309	CMI 309	N/A
FDMA 310	CMI 310	N/A
FDMA 311	CMI 311	N/A
FDMA 312	CMI 312	N/A
FDMA 314	CMI 314	N/A
FDMA 315	CMI 315	N/A
FDMA 316	CMI 316	N/A
FDMA 318	CMI 318	N/A
FDMA 320	CMI 320	N/A
FDMA 325	CMI 325	N/A
FDMA 328	CMI 328	N/A
FDMA 332	CMI 332	N/A
FDMA 341	CMI 341	N/A
FDMA 348	CMI 348	N/A
FDMA 350	CMI 350	N/A
FDMA 360	CMI 360	N/A
FDMA 362	CMI 362	N/A
FDMA 365	CMI 365	N/A
FDMA 377	CMI 377	N/A
FDMA 395	CMI 395	N/A
FDMA 396	CMI 396	N/A
FDMA 397	CMI 397	N/A
FDMA 398	CMI 398	N/A
FDMA 400	CMI 400	N/A
FDMA 401	CMI 401	N/A
FDMA 410	CMI 410	N/A
FDMA 412	CMI 412	N/A
FDMA 420	CMI 420	N/A
FDMA 425	CMI 425	N/A
FDMA 433	CMI 433	N/A
FDMA 450	CMI 450	N/A
FDMA 470	CMI 470	N/A
FDMA 477	CMI 477	N/A
FDMA 480	CMI 480	N/A
FDMA 490	CMI 490	N/A
FDMA 491	CMI 491	N/A
FDMA 492	CMI 492	N/A

FDMA 493	CMI 493	N/A
FDMA 494	CMI 494	N/A
FDMA 495	CMI 495	N/A
FDMA 497	CMI 497	N/A
FREN-FRENCH		
FREN 1110	FREN 111	Common
FREN 1120	FREN 112	Common
FREN 2110	FREN 211	Common
FREN 2120	FREN 212	Common
FSTE-FOOD SCIENCE & TECHNOLOGY		
FSTE 1120	FSTE 175	Unique
FSTE 2110G	FSTE 263G	Unique
FSTE 2120	FSTE 275	Unique
FSTE 2130G	FSTE 210G	Unique
FSTE 2996	FSTE 200	Unique
FWCE-FISH,WILDLF,CONSERV ECOL		
FWCE 1110G	FWCE 110G	Unique
FWCE 1120	FWCE 109	Unique
FWCE 2110	FWCE 255	Unique
FYEX-FIRST YEAR EXPERIENCE		
FYEX 1110	COLL 101	Common
FYEX 1112	UNIV 150	Unique
FYEX 1116	COLL 103	Unique
FYEX 1117	UNIV 114	Unique
FYEX 1131	UNIV 110	Unique
FYEX 1132	UNIV 112	Unique
FYEX 1133	COLL 108	Unique
FYEX 1134	UNIV 113	Unique
FYEX 1140	COLL 120	Unique
FYEX 1160	UNIV 101	Unique
FYEX 1170	UNIV 161	Unique
FYEX 1995	UNIV 116	Unique
FYEX 1996	COLL 155	Unique
FYEX 2111	COLL 201	Unique
FYEX 2994	COLL 185	Unique
GENE-GENETICS		
GENE 1110	GENE 110	Unique
GEOG-GEOGRAPHY		
GEOG 1110G	GEOG 111G	Common
GEOG 1120G	GEOG 112G	Common
GEOG 1130G	GEOG 120G	Common
GEOG 2130	GEOG 281	Unique
GEOG 2996	GEOG 291	Unique
GEOL-GEOLOGY		
GEOL 1110G	GEOL 111G	Common
GEOL 2130	GEOG 257	Common
GEOL 2996	GEOL 220	Unique
GNDR-WOMEN'S STUDIES		
GNDR 2110G	W S 201G	Common
GNDR 2120G	HON 218	Unique
GNDR 2120G	W S 202G	Unique
GNDR 350	W S 350	N/A

GNDR 359	W S 359	N/A
GNDR 360	W S 360	N/A
GNDR 380V	W S 380V	N/A
GNDR 381V	W S 381V	N/A
GNDR 401	W S 401	N/A
GNDR 402	W S 402	N/A
GNDR 403	W S 403	N/A
GNDR 405	W S 405	N/A
GNDR 406	W S 406	N/A
GNDR 407	W S 407	N/A
GNDR 408	W S 408	N/A
GNDR 411	W S 411	N/A
GNDR 412	W S 412	N/A
GNDR 433V	W S 433V	N/A
GNDR 450	W S 450	N/A
GNDR 451	W S 451	N/A
GNDR 453	W S 453	N/A
GNDR 454	W S 454	N/A
GNDR 455	W S 455	N/A
GNDR 461	W S 461	N/A
GNDR 465	W S 465	N/A
GNDR 471	W S 471	N/A
GNDR 474	W S 474	N/A
GNDR 482	W S 482	N/A
GNDR 484	W S 484	N/A
GNDR 501	W S 501	N/A
GNDR 502	W S 502	N/A
GNDR 505	W S 505	N/A
GNDR 507	W S 507	N/A
GNDR 508	W S 508	N/A
GNDR 511	W S 511	N/A
GNDR 512	W S 512	N/A
GNDR 533	W S 533	N/A
GNDR 550	W S 550	N/A
GNDR 554	W S 554	N/A
GNDR 555	W S 555	N/A
GNDR 561	W S 561	N/A
GNDR 565	W S 565	N/A
GNDR 571	W S 571	N/A
GNDR 582	W S 582	N/A
GNDR 584	W S 584	N/A
GRMN-GERMAN		
GRMN 1110	GER 111	Common
GRMN 1120	GER 112	Common
GRMN 2110	GER 211	Common
GRMN 2120	GER 212	Common
GRMN 305	GER 305	N/A
GRMN 313	GER 313	N/A
GRMN 325	GER 325	N/A
GRMN 330	GER 330	N/A
GRMN 333V	GER 333V	N/A
GRMN 340	GER 340	N/A

GRMN 341	GER 341	N/A
GRMN 343	GER 343	N/A
GRMN 350	GER 350	N/A
GRMN 399	GER 399	N/A
GRMN 410	GER 410	N/A
GRMN 413	GER 413	N/A
GRMN 425	GER 425	N/A
GRMN 451	GER 451	N/A
GRMN 453	GER 453	N/A
GRMN 471	GER 471	N/A
HIST-HISTORY		
HIST 1105G	HIST 110G	Unique
HIST 1110G	HIST 201G	Common
HIST 1120G	HIST 202G	Common
HIST 1130G	HIST 111G	Common
HIST 1140G	HIST 112G	Common
HIST 1150G	HIST 101G	Common
HIST 1160G	HIST 102G	Common
HIST 2110	HIST 261	Common
HIST 2245G	HIST 221G	Unique
HIST 2246G	HIST 222G	Unique
HIST 2250G	HIST 211G	Unique
HIST 2251G	HIST 212G	Unique
HIST 2996	HIST 269	Unique
HITP - HEALTH INFORMATION TECHNOLOGY		
HITP 1110	HIT 110	Unique
HITP 1120	HIT 120	Common
HITP 1120	HIT 120/NURS 120	Common
HITP 1140	HIT 140	Common
HITP 2208	OATS 208	Common
HITP 2208	OATS 208	Common
HITP 2240	HIT 240	Common
HITP 2248	HIT 248	Common
HITP 2258	HIT 258	Common
HITP 2268	HIT 268	Common
HITP 2288	OATS 228	Common
HITP 2288	OATS 228	Common
HITP 2996	HIT 255	Common
HITP 2998	HIT 221	Common
HLED-HEALTH EDUCATION		
HLED 1110	OEEM 103	Common
HLED 1154	P E 134	Common
HLSC-HEALTH SCIENCE		
HLSC 1510	AHS 120	Common
HLSC 1510	AHS 120/OATS 150	Common
HLSC 1515	HIT 158	Common
HLSC 1520	AHS 140	Common
HLSC 1530	NURS 140	Common
HLSC 1540	AHS 202	Common
HMSV-HUMAN SERVICES		
HMSV 2110	S WK 253	Common
HNRS-HONORS		

HNRS 1110	HON 115	Unique
HNRS 2110G	HON 210	Unique
HNRS 2111	HON 214	Unique
HNRS 2114G	HON 208G	Unique
HNRS 2115G	HON 216G	Unique
HNRS 2116G	HON 219G	Unique
HNRS 2117G	HON 220G	Unique
HNRS 2120G	HON 222G	Unique
HNRS 2140G	HON 227G	Unique
HNRS 2141G	HON 230G	Unique
HNRS 2150G	HON 228G	Unique
HNRS 2160G	HON 229G	Unique
HNRS 2161G	HON 235G	Unique
HNRS 2170G	HON 232G	Unique
HNRS 2171G	HON 234G	Unique
HNRS 2172G	HON 237G	Unique
HNRS 2173G	HON 239G	Unique
HNRS 2174G	HON 249G	Unique
HNRS 2175G	HON 265G	Unique
HNRS 2178G	HON 270G	Unique
HNRS 2180G	HON 248G	Unique
HNRS 2185G	HON 211	Unique
HNRS 2190G	HON 242G	Unique
HNRS 2996	HON 221	Unique
HNRS 304V	HON 304V	N/A
HNRS 306V	HON 306V	N/A
HNRS 313	HON 313	N/A
HNRS 314	HON 314	N/A
HNRS 317V	HON 317V	N/A
HNRS 318V	HON 318V	N/A
HNRS 321V	HON 321V	N/A
HNRS 324V	HON 324V	N/A
HNRS 326V	HON 326V	N/A
HNRS 328V	HON 328V	N/A
HNRS 335V	HON 335V	N/A
HNRS 340V	HON 340V	N/A
HNRS 341V	HON 341V	N/A
HNRS 347V	HON 347V	N/A
HNRS 348V	HON 348V	N/A
HNRS 349V	HON 349V	N/A
HNRS 353V	HON 353V	N/A
HNRS 362V	HON 362V	N/A
HNRS 370V	HON 370V	N/A
HNRS 371V	HON 371V	N/A
HNRS 374V	HON 374V	N/A
HNRS 378V	HON 378V	N/A
HNRS 379V	HON 379V	N/A
HNRS 381V	HON 381V	N/A
HNRS 384V	HON 384V	N/A
HNRS 387V	HON 387V	N/A
HNRS 388V	HON 388V	N/A
HNRS 390V	HON 390V	N/A

HNRS 394V	HON 394V	N/A
HNRS 400	HON 400	N/A
HNRS 410	HON 410	N/A
HNRS 411V	HON 411V	N/A
HNRS 412	HON 412	N/A
HNRS 413	HON 413	N/A
HNRS 420	HON 420	N/A
HNRS 421	HON 421	N/A
HNRS 422	HON 422	N/A
HNRS 425V	HON 425V	N/A
HNRS 450V	HON 450V	N/A
HNRS 521	HON 521	N/A
HORT-HORTICULTURE		
HORT 1115G	HORT 100G	Unique
HORT 2110	HORT 210	Unique
HORT 2120	HORT 211	Unique
HORT 2130	HORT 240	Unique
HORT 2160	HORT 250	Unique
HORT 2990	HORT 241	Unique
HORT 2996	HORT 200	Unique
HRTM-HOTEL/RESTRNT/TOURISM MGT		
HRTM 1120G	HRTM 201	Unique
HRTM 1130	HRTM 221	Unique
HRTM 1310	HRTM 2110	Unique
HRTM 1320	HRTM 2120	Unique
HRTM 2130	HRTM 235	Unique
HRTM 2996	HRTM 200	Unique
HRTM 3210	HRTM 301	N/A
HRTM 3410	HRTM 302	N/A
HRTM 3220	HRTM 304	N/A
HRTM 3910	HRTM 307	N/A
HRTM 3230	HRTM 311	N/A
HRTM 3310	HRTM 363	N/A
HRTM 4998	HRTM 408	N/A
HRTM 4910	HRTM 409	N/A
HRTM 4410	HRTM 410	N/A
HRTM 4310	HRTM 412	N/A
HRTM 4320	HRTM 413	N/A
HRTM 4330	HRTM 414	N/A
HRTM 4230	HRTM 416	N/A
HRTM 4235	HRTM 420	N/A
HRTM 4135	HRTM 430	N/A
HRTM 4130	HRTM 431	N/A
HRTM 4140	HRTM 432	N/A
HRTM 4999	HRTM 434	N/A
HRTM 4145	HRTM 435	N/A
HRTM 4240V	HRTM 436V	N/A
HRTM 4110	HRTM 443	N/A
HRTM 4115	HRTM 444	N/A
HRTM 4120	HRTM 445	N/A
HRTM 4996	HRTM 450	N/A
HRTM 4991	HRTM 492	N/A

HRTM 5210	HRTM 501	N/A
HRTM 5120	HRTM 502	N/A
HRTM 5420	HRTM 505	N/A
HRTM 5220	HRTM 506	N/A
HRTM 5998	HRTM 507	N/A
HRTM 5410	HRTM 510	N/A
HRTM 5310	HRTM 512	N/A
HRTM 5992	HRTM 515	N/A
HRTM 5230	HRTM 516	N/A
HRTM 5130	HRTM 531	N/A
HRTM 5140	HRTM 532	N/A
HRTM 5145	HRTM 535	N/A
HRTM 5240	HRTM 536	N/A
HRTM 5510	HRTM 550	N/A
HRTM 5996	HRTM 590	N/A
HRTM 5991	HRTM 598	N/A
HRTM 5999	HRTM 599	N/A
HVAC-HEATING, VENTILATION AND AIR CONDITIONING		
HVAC 1111	HVAC 100	Common
HVAC 1105	HVAC 101	Common
HVAC 1110	HVAC 102	Common
HVAC 1125	HVAC 103	Common
HVAC 1233	HVAC 110	Common
HVAC 2098	HVAC 113	Unique
HVAC 1410	HVAC 205	Common
HVAC 1243	HVAC 207	Common
HVAC 1245	HVAC 209	Common
HVAC 2210	HVAC 210	Unique
HVAC 1250	HVAC 211	Common
HVAC 2990	HVAC 213	Common
HVAC 1238	HVAC 220	Common
HVAC 1338	HVAC 225	Common
HVAC 1996	HVAC 255	Common
HVAC 2996	HVAC 290	Common
JAPN-JAPANESE		
JAPN 1110	JPNS 111	Common
JAPN 1120	JPNS 112	Common
JAPN 2110	JPNS 211	Common
JAPN 2120	JPNS 212	Common
JAPN 320	JPNS 320	N/A
JAPN 453	JPNS 453	N/A
LIBR-LIBRARY SCIENCE		
LIBR 1110	LIB 101	Unique
LIBR 1111	LIB 111	Unique
LIBR 311V	LIB 311V	N/A
LING-LINGUISTICS		
LING 2110G	LING 200G	Common
MAST-MEDICAL ASSISTANT		
MAST 1112	NA 110	Common
MAST 1190	AHS 190	Common
MAST 1540	AHS 280	Common
MAST 2160	AHS 290	Unique

MAST 2990	NA 214	Common
MAST 2999	NA 212	Common
MATH-MATHEMATICS		
MATH 1130G	MATH 210G	Common
MATH 1134	MATH 111	Unique
MATH 1215	MATH 120	Common
MATH 1217	MATH 101	Unique
MATH 1220G	MATH 121G	Common
MATH 1221	MATH 102	Unique
MATH 1250G	MATH 190G	Common
MATH 1350G	A ST 251G	Common
MATH 1350G	STAT 251G	Common
MATH 1430G	MATH 142G	Common
MATH 1435	MATH 235	Common
MATH 1440	MATH 236	Common
MATH 1511G	MATH 191G	Unique
MATH 1521G	MATH 192G	Unique
MATH 1521H	MATH 192GH	Unique
MATH 1531	MATH 279	Unique
MATH 1996	MATH 107	Unique
MATH 2134G	MATH 112G	Unique
MATH 2234	MATH 215	Unique
MATH 2350G	STAT 271G	Common
MATH 2415	MATH 280	Unique
MATH 2530G	MATH 291G	Common
MATH 2992	MATH 200	Unique
MGMT-MANAGEMENT		
MGMT 2110	MGT 201	Common
MGMT 309	MGT 309	N/A
MGMT 310V	MGT 310V	N/A
MGMT 315V	MGT 315V	N/A
MGMT 332	MGT 332	N/A
MGMT 333	MGT 333	N/A
MGMT 335V	MGT 335V	N/A
MGMT 344	MGT 344	N/A
MGMT 347	MGT 347	N/A
MGMT 351	MGT 351	N/A
MGMT 361	MGT 361	N/A
MGMT 375V	MGT 375V	N/A
MGMT 388V	MGT 388V	N/A
MGMT 391	MGT 391	N/A
MGMT 448	MGT 448	N/A
MGMT 449	MGT 449	N/A
MGMT 451	MGT 451	N/A
MGMT 453	MGT 453	N/A
MGMT 454	MGT 454	N/A
MGMT 458	MGT 458	N/A
MGMT 460	MGT 460	N/A
MGMT 461	MGT 461	N/A
MGMT 465	MGT 465	N/A
MGMT 470	MGT 470	N/A
MGMT 490	MGT 490	N/A

MGMT 491	MGT 491	N/A
MGMT 498	MGT 498	N/A
MGMT 502	MGT 502	N/A
MGMT 503	MGT 503	N/A
MGMT 512	MGT 512	N/A
MGMT 527	MGT 527	N/A
MGMT 548	MGT 548	N/A
MGMT 590	MGT 590	N/A
MGMT 591	MGT 591	N/A
MGMT 598	MGT 598	N/A
MGMT 600	MGT 600	N/A
MGMT 601	MGT 601	N/A
MGMT 640	MGT 640	N/A
MGMT 645	MGT 645	N/A
MGMT 650	MGT 650	N/A
MGMT 655	MGT 655	N/A
MGMT 660	MGT 660	N/A
MGMT 661	MGT 661	N/A
MGMT 670	MGT 670	N/A
MGMT 675	MGT 675	N/A
MGMT 685	MGT 685	N/A
MGMT 690	MGT 690	N/A
MGMT 698	MGT 698	N/A
MGMT 700	MGT 700	N/A
MKTG-MARKETING		
MKTG 2110	BMGT 210	Common
MKTG 2110	MKTG 203	Common
MUSC-MUSIC		
MUSC 351	MUS 351	N/A
MUSC 1110G	MUS 201G	Common
MUSC 1130G	MUS 101G	Common
MUSC 1210	MUS 102	Common
MUSC 1310	MUS 121	Common
MUSC 1410	MUS 250	Common
MUSC 1440	MUS 141	Unique
MUSC 1450	MUS 103	Unique
MUSC 1451	MUS 104	Unique
MUSC 1460	MUS 105	Unique
MUSC 1461	MUS 106	Unique
MUSC 1470	MUS 145	Unique
MUSC 1471	MUS 146	Unique
MUSC 1472	MUS 147	Unique
MUSC 1992	MUS 130	Common
MUSC 2110	MUS 164	Common
MUSC 2110	MUS 171	Common
MUSC 2120	MUS 151	Common
MUSC 2120	MUS 160	Common
MUSC 2120	MUS 161	Common
MUSC 2120	MUS 162	Common
MUSC 2120	MUS 170	Common
MUSC 2120	MUS 172	Common
MUSC 2120	MUS 180	Common

MUSC 2120	MUS 181	Common
MUSC 2130	MUS 163	Common
MUSC 2132	MUS 174	Unique
MUSC 2151	MUS 202	Unique
MUSC 2210	MUS 262	Common
MUSC 2220	MUS 263	Common
MUSC 2240	MUS 207	Unique
MUSC 2310	MUS 273	Common
MUSC 2451	MUS 203	Unique
MUSC 2452	MUS 204	Unique
MUSC 2460	MUS 205	Unique
MUSC 2461	MUS 206	Unique
MUSC 2470	MUS 261	Unique
MUSC 2510	MUS 230	Unique
MUSC 2993	MUS 251	Unique
MUSC 2996	MUS 260	Unique
MUSC 301	MUS 301	N/A
MUSC 302	MUS 302	N/A
MUSC 303	MUS 303	N/A
MUSC 315	MUS 315	N/A
MUSC 316	MUS 316	N/A
MUSC 317	MUS 317	N/A
MUSC 318	MUS 318	N/A
MUSC 319	MUS 319	N/A
MUSC 320	MUS 320	N/A
MUSC 321	MUS 321	N/A
MUSC 322	MUS 322	N/A
MUSC 323	MUS 323	N/A
MUSC 324	MUS 324	N/A
MUSC 325	MUS 325	N/A
MUSC 326	MUS 326	N/A
MUSC 327	MUS 327	N/A
MUSC 330	MUS 330	N/A
MUSC 339	MUS 339	N/A
MUSC 340	MUS 340	N/A
MUSC 341	MUS 341	N/A
MUSC 346	MUS 346	N/A
MUSC 349	MUS 349	N/A
MUSC 350	MUS 350	N/A
MUSC 360	MUS 360	N/A
MUSC 361	MUS 361	N/A
MUSC 362	MUS 362	N/A
MUSC 363	MUS 363	N/A
MUSC 365	MUS 365	N/A
MUSC 368	MUS 368	N/A
MUSC 370	MUS 370	N/A
MUSC 372	MUS 372	N/A
MUSC 374	MUS 374	N/A
MUSC 380	MUS 380	N/A
MUSC 381	MUS 381	N/A
MUSC 386	MUS 386	N/A
MUSC 390	MUS 390	N/A

MUSC 391	MUS 391	N/A
MUSC 392	MUS 392	N/A
MUSC 413	MUS 413	N/A
MUSC 415	MUS 415	N/A
MUSC 417	MUS 417	N/A
MUSC 421	MUS 421	N/A
MUSC 422	MUS 422	N/A
MUSC 424	MUS 424	N/A
MUSC 429	MUS 429	N/A
MUSC 430	MUS 430	N/A
MUSC 440	MUS 440	N/A
MUSC 441	MUS 441	N/A
MUSC 450	MUS 450	N/A
MUSC 455	MUS 455	N/A
MUSC 470	MUS 470	N/A
MUSC 471	MUS 471	N/A
MUSC 475	MUS 475	N/A
MUSC 477	MUS 477	N/A
MUSC 486	MUS 486	N/A
MUSC 498	MUS 498	N/A
MUSC 511	MUS 511	N/A
MUSC 513	MUS 513	N/A
MUSC 518	MUS 518	N/A
MUSC 519	MUS 519	N/A
MUSC 521	MUS 521	N/A
MUSC 522	MUS 522	N/A
MUSC 523	MUS 523	N/A
MUSC 527	MUS 527	N/A
MUSC 529	MUS 529	N/A
MUSC 530	MUS 530	N/A
MUSC 531	MUS 531	N/A
MUSC 535	MUS 535	N/A
MUSC 540	MUS 540	N/A
MUSC 574	MUS 574	N/A
MUSC 575	MUS 575	N/A
MUSC 576	MUS 576	N/A
MUSC 577	MUS 577	N/A
MUSC 578	MUS 578	N/A
MUSC 579	MUS 579	N/A
MUSC 580	MUS 580	N/A
MUSC 582	MUS 582	N/A
MUSC 586	MUS 586	N/A
MUSC 598	MUS 598	N/A
MUSC 599	MUS 599	N/A
NATV-NATV-NATIVE AMERICAN STUDIES		
NATV 3110V	ANTH 305V	N/A
NATV 3120	ANTH 454	N/A
NATV 4110	ANTH 453	N/A
NATV 4120V	ANTH 444	N/A
NATV 4130	ANTH 443	N/A
NATV 4210	ANTH 407	N/A
NATV 4220	ANTH 455	N/A

NATV 4310	ANTH 441	N/A
NATV 5120	ANTH 551	N/A
NATV 5210	ANTH 528	N/A
NMNEC-NURSING EDUC CONSORTIUM		
NMNC 3110	NURS 293	Common
NMNC 3120	NURS 362	Common
NMNC 3135	NURS 294	Common
NMNC 3210	NURS 377	Common
NMNC 3220	NURS 378	Common
NMNC 3230	NURS 379	Common
NMNC 3235	NURS 380	Common
NMNC 4310	NURS 395	Common
NMNC 4320	NURS 396	Common
NMNC 4335	NURS 398	Common
NMNC 4410	NURS 466	Common
NMNC 4435	NURS 467	Common
NMNC 4445	NURS 468	Common
NMNC 4510	NURS 486	Common
NMNC 4520	NURS 487	Common
NMNC 4535	NURS 488	Common
NMNC 4545	NURS 489	Common
NUAS-NURSING ASSISTANT		
NUAS 1110	NA 101	Common
NUAS 1115	NA 105	Common
NUAS 2110	NA 201	Unique
NURS-NURSING		
NURS 1110	NURS 110	Unique
NURS 1120	NURS 156	Common
NURS 1121	NURS 136	Unique
NURS 1121L	NURS 136L	Unique
NURS 1125	NURS 147	Common
NURS 1125L	NURS 147L	Common
NURS 1131	NURS 130	Unique
NURS 1134	NURS 134	Unique
NURS 1134L	NURS 134L	Unique
NURS 1150	NURS 150/OATS 150	Common
NURS 1153	NURS 127	Common
NURS 1154	NURS 154	Common
NURS 1157	NURS 224	Common
NURS 1157L	NURS 224L	Common
NURS 2210	NURS 210	Common
NURS 2214	NURS 149	Common
NURS 2214L	NURS 149L	Common
NURS 2225	NURS 226	Common
NURS 2225L	NURS 226L	Common
NURS 2235	NURS 236	Common
NURS 2235L	NURS 236L	Common
NURS 2996	NURS 201	Unique
NURS 3110	NURS 328	N/A
NURS 3996	NURS 397	N/A
NURS 4110	NURS 460	N/A
NURS 4997	NURS 490	N/A

NURS 5110	NURS 507	N/A
NURS 5115	NURS 509	N/A
NURS 5120	NURS 567	N/A
NURS 5125	NURS 506	N/A
NURS 5130	NURS 530	N/A
NURS 5210	NURS 565	N/A
NURS 5220	NURS 549	N/A
NURS 5230	NURS 566	N/A
NURS 5240	NURS 595	N/A
NURS 5996	NURS 597	N/A
NURS 5997	NURS 590	N/A
NURS 6110	NURS 603	N/A
NURS 6120	NURS 651	N/A
NURS 6125	NURS 653	N/A
NURS 6130	NURS 685	N/A
NURS 6135	NURS 648	N/A
NURS 6210	NURS 697	N/A
NURS 6220	NURS 511	N/A
NURS 6230	NURS 512	N/A
NURS 6250	NURS 612	N/A
NURS 6255	NURS 649	N/A
NURS 6260	NURS 657	N/A
NURS 6265	NURS 642	N/A
NURS 6270	NURS 622	N/A
NURS 6305	NURS 679	N/A
NURS 6307	NURS 689	N/A
NURS 6310	NURS 686	N/A
NURS 6320	NURS 687	N/A
NURS 6330	NURS 688	N/A
NURS 6340	NURS 699	N/A
NURS 6350	NURS 678	N/A
NURS 6405	NURS 514	N/A
NURS 6410	NURS 660	N/A
NURS 6420	NURS 662	N/A
NURS 6430	NURS 664	N/A
NURS 6450	NURS 665	N/A
NURS 6505	NURS 676	N/A
NURS 6510	NURS 671	N/A
NURS 6520	NURS 672	N/A
NURS 6530	NURS 673	N/A
NURS 6990	NURS 698	N/A
NURS 6993	NURS 690	N/A
NURS 6997	NURS 691	N/A
NURS 7000	NURS 700	N/A
NUTR-NUTRITION		
NUTR 1120	AHS 115	Unique
NUTR 2110	HNDS 251	Common
NUTR 2120	HNDS 201	Unique
NUTR 3110	HNDS 350	N/A
NUTR 3120	HNDS 360	N/A
NUTR 3750	HNDS 440	N/A
NUTR 3996	HNDS 450	N/A

NUTR 4110	HNDS 448	N/A
NUTR 4210	HNDS 403	N/A
NUTR 4220	HNDS 430	N/A
NUTR 4230	HNDS 446	N/A
NUTR 4230L	HNDS 446 L	N/A
NUTR 4233	HNDS 420	N/A
NUTR 4235	HNDS 405	N/A
NUTR 4240	HNDS 449	N/A
NUTR 4240L	HNDS 449 L	N/A
NUTR 4550	HNDS 455	N/A
NUTR 4560	HNDS 401	N/A
NUTR 4565	HNDS 407	N/A
NUTR 4991	HNDS 492	N/A
NUTR 5110	HNDS 548	N/A
NUTR 5150	HNDS 500	N/A
NUTR 5210	HNDS 551	N/A
NUTR 5220	HNDS 530	N/A
NUTR 5230	HNDS 546	N/A
NUTR 5233	HNDS 520	N/A
NUTR 5240	HNDS 549	N/A
NUTR 5610	HNDS 560	N/A
NUTR 5620	HNDS 562	N/A
NUTR 5630	HNDS 563	N/A
NUTR 5640	HNDS 564	N/A
NUTR 5650	HNDS 565	N/A
NUTR 5660	HNDS 566	N/A
NUTR 5670	HNDS 567	N/A
NUTR 5680	HNDS 568	N/A
NUTR 5991	HNDS 598	N/A
NUTR 5996	HNDS 590	N/A
OTEC-OFFICE TECHNOLOGY		
OTEC 1101	OATS 101	Common
OTEC 1102	OATS 102	Common
OTEC 1103	OATS 202	Common
OTEC 1125	OATS 207	Common
OTEC 2260	OATS 203	Unique
OTEC 2270	OATS 223	Unique
OTEC 2998	OATS 221	Unique
OTEC 2999	OATS 270	Unique
PHED-PHYSICAL EDUCATION		
PHED 1110	P E 128	Common
PHED 1230	P E 147	Common
PHED 1230	P E 148	Common
PHED 1230	P E 150	Common
PHED 1290	P E 112	Common
PHED 1290	P E 113	Common
PHED 1290	P E 114	Common
PHED 1290	P E 115	Common
PHED 1290	P E 117	Common
PHED 1290	P E 166	Common
PHED 1310	P E 130	Common
PHED 1320	P E 131	Common

PHED 1410	P E 199	Common
PHED 1430	P E 109	Common
PHED 1510	P E 102	Common
PHED 1510	P E 103	Common
PHED 1510	P E 127	Common
PHED 1620	P E 205	Common
PHED 1630	P E 104	Common
PHED 1670	P E 129	Common
PHED 1710	P E 154	Common
PHED 1710	P E 159	Common
PHED 1830	P E 173	Common
PHED 1910	P E 263	Common
PHED 2996	P E 270	Common
PHIL-PHILOSOPHY		
PHIL 1115G	PHIL 101G	Common
PHIL 1120G	PHIL 211G	Common
PHIL 1140G	PHIL 136G	Unique
PHIL 1145G	PHIL 100G	Unique
PHIL 1155G	PHIL 124G	Unique
PHIL 2110G	PHIL 223G	Common
PHIL 2230G	PHIL 201G	Common
PHLB-PHLEBOTOMY		
PHLB 1110	NA 115	Common
PHLB 1190	NA 109	Unique
PHLS-PUBLIC HEALTH SCIENCES		
PHLS 1110G	PHLS 150G	Common
PHLS 2110	PHLS 275	Common
PHLS 2120	PHLS 295	Common
PHLS 3110V	PHLS 301V	N/A
PHLS 3120V	PHLS 380V	N/A
PHLS 3130V	PHLS 305V	N/A
PHLS 3210	PHLS 375	N/A
PHLS 3220	PHLS 395	N/A
PHLS 4130	PHLS 452	N/A
PHLS 4210	PHLS 475	N/A
PHLS 4310	PHLS 451	N/A
PHLS 4320	PHLS 450	N/A
PHLS 4410	PHLS 457	N/A
PHLS 4420	PHLS 473	N/A
PHLS 4430	PHLS 476	N/A
PHLS 4440	PHLS 478	N/A
PHLS 4510	PHLS 497	N/A
PHLS 4515	PHLS 499	N/A
PHLS 4610	PHLS 461	N/A
PHLS 4620V	PHLS 464V	N/A
PHLS 4630	PHLS 465	N/A
PHLS 4640	PHLS 467	N/A
PHLS 4650	PHLS 468	N/A
PHLS 4660	PHLS 469	N/A
PHLS 4710	GERO 415	N/A
PHLS 4720	GERO 450	N/A
PHLS 4730	GERO 493	N/A

PHLS 4740	GERO 451	N/A
PHLS 4810	PHLS 459	N/A
PHLS 4820	PHLS 471	N/A
PHLS 4996	PHLS 486	N/A
PHLS 4997	PHLS 490	N/A
PHLS 4998	PHLS 496	N/A
PHLS 5110	MPH 510	N/A
PHLS 5120	MPH 520	N/A
PHLS 5130	MPH 530	N/A
PHLS 5140	MPH 540	N/A
PHLS 5150	MPH 550	N/A
PHLS 5210	MPH 570	N/A
PHLS 5220	MPH 572	N/A
PHLS 5230	MPH 573	N/A
PHLS 5240	MPH 574	N/A
PHLS 5250	MPH 578	N/A
PHLS 5260	MPH 579	N/A
PHLS 5310	MPH 541	N/A
PHLS 5320	MPH 545	N/A
PHLS 5330	MPH 546	N/A
PHLS 5340	MPH 547	N/A
PHLS 5160	PHLS 5350	N/A
PHLS 5610	MPH 561	N/A
PHLS 5620	MPH 564	N/A
PHLS 5630	MPH 565	N/A
PHLS 5635	MPH 566	N/A
PHLS 5640	MPH 567	N/A
PHLS 5650	MPH 568	N/A
PHLS 5660	MPH 569	N/A
PHLS 5670	MPH 560	N/A
PHLS 5710	MPH 515	N/A
PHLS 5720	MPH 557	N/A
PHLS 5730	MPH 593	N/A
PHLS 5810	MPH 559	N/A
PHLS 5820	MPH 571	N/A
PHLS 5830	MPH 581	N/A
PHLS 5996	MPH 586	N/A
PHLS 5997	MPH 590	N/A
PHLS 5998	MPH 596	N/A
PHLS 5999	MPH 599	N/A
PHYS-PHYSICS		
PHYS 1111	PHYS 150	Unique
PHYS 1112	PHYS 210	Unique
PHYS 1115G	PHYS 110G	Common
PHYS 1125G	PHYS 120G	Common
PHYS 1230G	PHYS 211G	Common
PHYS 1230L	PHYS 211GL	Common
PHYS 1240G	PHYS 212G	Common
PHYS 1240L	PHYS 212GL	Common
PHYS 1310G	PHYS 215G	Common
PHYS 1310L	PHYS 215GL	Common
PHYS 1311	PHYS 205	Common

PHYS 1320G	PHYS 216G	Common
PHYS 1320L	PHYS 216GL	Common
PHYS 1321	PHYS 206	Common
PHYS 2110	PHYS 213	Unique
PHYS 2110L	PHYS 213 L	Unique
PHYS 2111	PHYS 203	Unique
PHYS 2120	PHYS 217	Unique
PHYS 2120L	PHYS 217 L	Unique
PHYS 2121	PHYS 218	Unique
PHYS 2140	PHYS 214	Unique
PHYS 2140L	PHYS 214 L	Unique
PHYS 2141	PHYS 204	Unique
PHYS 2230G	PHYS 221G	Unique
PHYS 2230L	PHYS 221GL	Unique
PHYS 2231	PHYS 223	Common
PHYS 2240G	PHYS 222G	Unique
PHYS 2240L	PHYS 222GL	Unique
PHYS 2241	PHYS 224	Common
PHYS 2996	PHYS 290	Unique
PHYS 2997	PHYS 280	Unique
PLEN-PLANT & ENVIRONMENTAL SCIENCES		
PLEN 6110	ENVS 605	N/A
PLEN 6120	AGRO 620	N/A
PLEN 6120	HORT 620	N/A
PLEN 6210	AGRO 625	N/A
PLEN 6210	HORT 625	N/A
PLEN 6210	SOIL 625	N/A
PLEN 6210	EPWS 625	N/A
PLEN 6320	SOIL 652	N/A
PLEN 6410	SOIL 655	N/A
PLEN 6415	AGRO 609	N/A
PLEN 6415	HORT 609	N/A
PLEN 6420	AGRO 610	N/A
PLEN 6420	HORT 610	N/A
PLEN 6425	AGRO 670	N/A
PLEN 6425	HORT 670	N/A
PLEN 6810	AGRO 697	N/A
PLEN 6810	HORT 697	N/A
PLEN 6810	SOIL 697	N/A
PLEN 6910	AGRO 694	N/A
PLEN 6910	SOIL 694	N/A
PLEN 6920	AGRO 696	N/A
PLEN 6920	SOIL 696	N/A
PLEN 6920	ENVS 696	N/A
PLEN 6991	AGRO 600	N/A
PLEN 6991	SOIL 600	N/A
PLEN 6996	AGRO 698	N/A
PLEN 6996	SOIL 698	N/A
PLEN 7000	AGRO 700	N/A
PLEN 7000	SOIL 700	N/A
POLS-POLITICAL SCIENCE		
POLS 1110G	GOVT 110G	Common

POLS 1111	GOVT 101	Unique
POLS 1120G	GOVT 100G	Common
POLS 1130G	GOVT 150G	Common
POLS 2120G	GOVT 160G	Common
POLS 2996	GOVT 201	Unique
POLS 300	GOVT 300	N/A
POLS 308	GOVT 308	N/A
POLS 313	GOVT 313	N/A
POLS 314	GOVT 314	N/A
POLS 315	GOVT 315	N/A
POLS 320	GOVT 320	N/A
POLS 321	GOVT 321	N/A
POLS 324	GOVT 324	N/A
POLS 330	GOVT 330	N/A
POLS 331	GOVT 331	N/A
POLS 335	GOVT 335	N/A
POLS 343	GOVT 343	N/A
POLS 344	GOVT 344	N/A
POLS 345	GOVT 345	N/A
POLS 348	GOVT 348	N/A
POLS 350	GOVT 350	N/A
POLS 353	GOVT 353	N/A
POLS 354	GOVT 354	N/A
POLS 360	GOVT 360	N/A
POLS 361	GOVT 361	N/A
POLS 362	GOVT 362	N/A
POLS 366	GOVT 366	N/A
POLS 367	GOVT 367	N/A
POLS 370	GOVT 370	N/A
POLS 371	GOVT 371	N/A
POLS 372	GOVT 372	N/A
POLS 373	GOVT 373	N/A
POLS 378	GOVT 378	N/A
POLS 379	GOVT 379	N/A
POLS 380V	GOVT 380V	N/A
POLS 382	GOVT 382	N/A
POLS 383	GOVT 383	N/A
POLS 385	GOVT 385	N/A
POLS 386	GOVT 386	N/A
POLS 387	GOVT 387	N/A
POLS 390	GOVT 390	N/A
POLS 391	GOVT 391	N/A
POLS 392	GOVT 392	N/A
POLS 394	GOVT 394	N/A
POLS 395	GOVT 395	N/A
POLS 396	GOVT 396	N/A
POLS 399	GOVT 399	N/A
POLS 405	GOVT 405	N/A
POLS 406	GOVT 406	N/A
POLS 407	GOVT 407	N/A
POLS 410	GOVT 410	N/A
POLS 411	GOVT 411	N/A

POLS 412	GOVT 412	N/A
POLS 415	GOVT 415	N/A
POLS 468	GOVT 468	N/A
POLS 469	GOVT 469	N/A
POLS 493	GOVT 493	N/A
POLS 502	GOVT 502	N/A
POLS 503	GOVT 503	N/A
POLS 505	GOVT 505	N/A
POLS 510	GOVT 510	N/A
POLS 517	GOVT 517	N/A
POLS 519	GOVT 519	N/A
POLS 522	GOVT 522	N/A
POLS 527	GOVT 527	N/A
POLS 530	GOVT 530	N/A
POLS 536	GOVT 536	N/A
POLS 537	GOVT 537	N/A
POLS 540	GOVT 540	N/A
POLS 541	GOVT 541	N/A
POLS 542	GOVT 542	N/A
POLS 543	GOVT 543	N/A
POLS 544	GOVT 544	N/A
POLS 547	GOVT 547	N/A
POLS 548	GOVT 548	N/A
POLS 549	GOVT 549	N/A
POLS 550	GOVT 550	N/A
POLS 560	GOVT 560	N/A
POLS 561	GOVT 561	N/A
POLS 563	GOVT 563	N/A
POLS 564	GOVT 564	N/A
POLS 569	GOVT 569	N/A
POLS 570	GOVT 570	N/A
POLS 574	GOVT 574	N/A
POLS 578	GOVT 578	N/A
POLS 579	GOVT 579	N/A
POLS 580	GOVT 580	N/A
POLS 587	GOVT 587	N/A
POLS 590	GOVT 590	N/A
POLS 591	GOVT 591	N/A
POLS 593	GOVT 593	N/A
POLS 596	GOVT 596	N/A
POLS 598	GOVT 598	N/A
POLS 599	GOVT 599	N/A
PORT-PORTUGUESE		
PORT 1110	PORT 213	Common
PORT 1120	PORT 214	Common
PSYC-PSYCHOLOGY		
PSYC 1110G	PSY 201G	Common
PSYC 2221	PSY 266	Unique
PSYC 2230	PSY 290	Common
PSYC 2311	PSY 274	Unique
PSYC 301	PSY 301	N/A
PSYC 302	PSY 302	N/A

PSYC 310	PSY 310	N/A
PSYC 311	PSY 311	N/A
PSYC 315	PSY 315	N/A
PSYC 317	PSY 317	N/A
PSYC 320	PSY 320	N/A
PSYC 321	PSY 321	N/A
PSYC 324	PSY 324	N/A
PSYC 325	PSY 325	N/A
PSYC 330	PSY 330	N/A
PSYC 340	PSY 340	N/A
PSYC 350	PSY 350	N/A
PSYC 351	PSY 351	N/A
PSYC 359	PSY 359	N/A
PSYC 370	PSY 370	N/A
PSYC 375	PSY 375	N/A
PSYC 376	PSY 376	N/A
PSYC 380	PSY 380	N/A
PSYC 383	PSY 383	N/A
PSYC 400	PSY 400	N/A
PSYC 401	PSY 401	N/A
PSYC 402	PSY 402	N/A
PSYC 430	PSY 430	N/A
PSYC 442	PSY 442	N/A
PSYC 450	PSY 450	N/A
PSYC 470	PSY 470	N/A
PSYC 507	PSY 507	N/A
PSYC 508	PSY 508	N/A
PSYC 509	PSY 509	N/A
PSYC 510	PSY 510	N/A
PSYC 520	PSY 520	N/A
PSYC 522	PSY 522	N/A
PSYC 523	PSY 523	N/A
PSYC 524	PSY 524	N/A
PSYC 527	PSY 527	N/A
PSYC 529	PSY 529	N/A
PSYC 540	PSY 540	N/A
PSYC 547	PSY 547	N/A
PSYC 550	PSY 550	N/A
PSYC 570	PSY 570	N/A
PSYC 590	PSY 590	N/A
PSYC 598	PSY 598	N/A
PSYC 599	PSY 599	N/A
PSYC 600	PSY 600	N/A
PSYC 698	PSY 698	N/A
PSYC 700	PSY 700	N/A
RADT-RADIOLOGIC TECHNOLOGY		
RADT 1115	RADT 103	Common
RADT 1130L	RADT 103L	Unique
RADT 1140	RADT 101	Common
RADT 1140L	RADT 101L	Common
RADT 1150	RADT 102	Common
RADT 1150L	RADT 102L	Common

RADT 1175	RADT 100	Common
RADT 1190	RADT 190	Unique
RADT 1191	RADT 191	Unique
RADT 1520	RADT 200	Common
RADT 1811	RADT 111	Unique
RADT 1812	RADT 112	Unique
RADT 1997	RADT 156	Unique
RADT 2250	RADT 205	Common
RADT 2404	RADT 104	Common
RADT 2408	RADT 110	Common
RADT 2410	RADT 105	Common
RADT 2811	RADT 201	Unique
RADT 2812	RADT 202	Unique
RADT 2813	RADT 203	Unique
RADT 2814	RADT 204	Unique
RADT 2817	RADT 207	Unique
RADT 2818	RADT 208	Unique
RADT 2819	RADT 209	Unique
RADT 2820	RADT 210	Unique
RADT 2999	RADT 206	Common
READ-READING		
READ 3110	RDG 371	N/A
READ 3996	RDG 395	N/A
READ 4310	RDG 360	N/A
READ 4320	RDG 361	N/A
READ 4330	RDG 414	N/A
READ 5210	RDG 522	N/A
READ 5220	RDG 530	N/A
READ 5310	RDG 560	N/A
READ 5320	RDG 561	N/A
READ 5330	RDG 514	N/A
READ 5340	RDG 511	N/A
READ 5350	RDG 510	N/A
READ 5360	RDG 518	N/A
READ 5410	RDG 525	N/A
READ 5420	RDG 590	N/A
READ 5990	RDG 585	N/A
READ 5992	RDG 536	N/A
READ 5996	RDG 598	N/A
READ 6110	RDG 608	N/A
READ 6120	RDG 617	N/A
READ 6130	RDG 639	N/A
READ 6210	RDG 630	N/A
READ 6320	RDG 633	N/A
READ 6991	RDG 600	N/A
READ 6992	RDG 636	N/A
READ 6996	RDG 698	N/A
READ 6997	RDG 605	N/A
READ 6999	RDG 699	N/A
RESP-RESPIRATORY THERAPY		
RESP 1140	RESP 115	Common
RESP 1150	RESP 110	Common

RESP 1150L	RESP 110L	Common
RESP 1250	RESP 120	Common
RESP 1250L	RESP 120L	Common
RESP 1330	RESP 124	Common
RESP 2110	RESP 233	Common
RESP 2120	RESP 210	Common
RESP 2120L	RESP 210L	Common
RESP 2150	RESP 240	Common
RESP 2150L	RESP 240L	Common
RESP 2230	RESP 230	Unique
RESP 2230L	RESP 230L	Unique
RESP 2242	RESP 242	Unique
RESP 2243	RESP 243	Unique
RESP 2330	RESP 224	Unique
RESP 2332	RESP 234	Unique
RESP 2334	RESP 244	Unique
RGSC-RANGE SCIENCE		
RGSC 1110	RGSC 150	Unique
RGSC 2110	RGSC 294	Common
RGSC 2996	RGSC 250	Unique
RXPP-PRESCIPTION PRIVATE PRACTICE PSYCHOLOGY		
RXPP 6110	RXPP 601	N/A
RXPP 6120	RXPP 602	N/A
RXPP 6210	RXPP 603	N/A
RXPP 6220	RXPP 604	N/A
RXPP 6230	RXPP 605	N/A
RXPP 6310	RXPP 606	N/A
RXPP 6320	RXPP 607	N/A
RXPP 6330	RXPP 608	N/A
RXPP 6410	RXPP 609	N/A
RXPP 6420	RXPP 610	N/A
RXPP 6510	RXPP 611	N/A
RXPP 6520	RXPP 612	N/A
RXPP 6996	RXPP 698	N/A
SIGN-SIGN LANGUAGE		
SIGN 1110	C D 374	Common
SIGN 1120	C D 375	Common
SIGN 2110	C D 476	Common
SIGN 574	C D 574	N/A
SOCI-SOCIOLOGY		
SOCI 1110G	SOC 101G	Common
SOCI 2230	SOC 263	Common
SOCI 2230	SOC 269	Common
SOCI 2240	SOC 258	Common
SOCI 2261	SOC 262	Unique
SOCI 2310G	SOC 201G	Common
SOCI 3110V	SOCI 330V	N/A
SOCI 3120V	SOCI 360V	N/A
SOCI 3150	SOCI 352	N/A
SOCI 3160	SOCI 353	N/A
SOCI 3165	SOCI 351	N/A
SOCI 3240	SOCI 359	N/A

SOCI 3245V	SOCI 374V	N/A
SOCI 3250	SOCI 390	N/A
SOCI 3255	SOCI 393	N/A
SOCI 3270	SOCI 357	N/A
SOCI 3310V	SOCI 361V	N/A
SOCI 3315	SOCI 362	N/A
SOCI 3330	SOCI 365	N/A
SOCI 3340V	SOCI 376V	N/A
SOCI 3410	SOCI 371	N/A
SOCI 3415	SOCI 375	N/A
SOCI 3510	SOCI 391	N/A
SOCI 3520	SOCI 392	N/A
SOCI 3610V	SOCI 336V	N/A
SOCI 3620V	SOCI 394V	N/A
SOCI 4150	SOCI 444	N/A
SOCI 4155	SOCI 445	N/A
SOCI 4160	SOCI 446	N/A
SOCI 4240V	SOCI 458V	N/A
SOCI 4310	SOCI 409	N/A
SOCI 4320	SOCI 430	N/A
SOCI 4335V	SOCI 465V	N/A
SOCI 4337	SOCI 464	N/A
SOCI 4410	SOCI 480	N/A
SOCI 4420	SOCI 470	N/A
SOCI 4430	SOCI 473	N/A
SOCI 4450	SOCI 486	N/A
SOCI 4460	SOCI 489	N/A
SOCI 4510	SOCI 481	N/A
SOCI 4555	SOCI 477	N/A
SOCI 4992	SOCI 449	N/A
SOCI 4996	SOCI 448	N/A
SOCI 4998	SOCI 496	N/A
SOCI 4999	SOCI 401	N/A
SOCI 5110	SOCI 501	N/A
SOCI 5150	SOCI 544	N/A
SOCI 5153	SOCI 553	N/A
SOCI 5155	SOCI 545	N/A
SOCI 5157	SOCI 561	N/A
SOCI 5160	SOCI 546	N/A
SOCI 5163	SOCI 551	N/A
SOCI 5165	SOCI 552	N/A
SOCI 5170	SOCI 582	N/A
SOCI 5175	SOCI 583	N/A
SOCI 5270	SOCI 559	N/A
SOCI 5310	SOCI 509	N/A
SOCI 5320	SOCI 530	N/A
SOCI 5335	SOCI 565	N/A
SOCI 5337	SOCI 564	N/A
SOCI 5410	SOCI 571	N/A
SOCI 5415	SOCI 575	N/A
SOCI 5420	SOCI 570	N/A
SOCI 5430	SOCI 587	N/A

SOCI 5440	SOCI 579	N/A
SOCI 5450	SOCI 586	N/A
SOCI 5460	SOCI 589	N/A
SOCI 5510	SOCI 581	N/A
SOCI 5515	SOCI 574	N/A
SOCI 5555	SOCI 577	N/A
SOCI 5991	SOCI 549	N/A
SOCI 5996	SOCI 548	N/A
SOCI 5998	SOCI 596	N/A
SOCI 5999	SOCI 599	N/A
SOIL-SOIL		
SOIL 2110	SOIL 252	Common
SOIL 2110L	SOIL 252 L	Common
SOIL 2996	SOIL 200	Unique
SOWK-SOCIAL WORK		
SOWK 2110G	S WK 221G	Common
SOWK 2111	S WK 251	Unique
SOWK 3110	SOWK 309	N/A
SOWK 3120	SOWK 311	N/A
SOWK 3130	SOWK 312	N/A
SOWK 3140V	SOWK 331V	N/A
SOWK 3150	SOWK 316	N/A
SOWK 3210	SOWK 300	N/A
SOWK 3220	SOWK 313	N/A
SOWK 3230	SOWK 315	N/A
SOWK 4110	SOWK 417	N/A
SOWK 4210	SOWK 415	N/A
SOWK 4220	SOWK 416	N/A
SOWK 4230	SOWK 443	N/A
SOWK 4240	SOWK 418	N/A
SOWK 4310	SOWK 401	N/A
SOWK 4311	SOWK 412	N/A
SOWK 4320	SOWK 403	N/A
SOWK 4321	SOWK 419	N/A
SOWK 4510	SOWK 490	N/A
SOWK 4996	SOWK 497	N/A
SOWK 4997	SOWK 449	N/A
SOWK 5110	MSW 509	N/A
SOWK 5120	MSW 560	N/A
SOWK 5130	MSW 510	N/A
SOWK 5140	MSW 514	N/A
SOWK 5150	MSW 500	N/A
SOWK 5160	MSW 520	N/A
SOWK 5170	MSW 521	N/A
SOWK 5180	MSW 551	N/A
SOWK 5190	MSW 552	N/A
SOWK 5220	MSW 562	N/A
SOWK 5250	MSW 503	N/A
SOWK 5280	MSW 554	N/A
SOWK 5290	MSW 555	N/A
SOWK 5310	MSW 547	N/A
SOWK 5320	MSW 524	N/A

SOWK 5330	MSW 525	N/A
SOWK 5340	MSW 526	N/A
SOWK 5350	MSW 527	N/A
SOWK 5510	MSW 590	N/A
SOWK 5996	MSW 597	N/A
SOWK 5997	MSW 595	N/A
SOWK 5999	MSW 599	N/A
SPAN-SPANISH		
SPAN 1110	SPAN 111	Common
SPAN 1120	SPAN 112	Common
SPAN 1210	SPAN 113	Common
SPAN 1220	SPAN 213	Common
SPAN 1410	OATS 171	Common
SPAN 1511	OATS 170	Unique
SPAN 2110	SPAN 211	Common
SPAN 2120	SPAN 212	Common
SPAN 2210	SPAN 214	Common
SPED-SPECIAL EDUCATION		
SPED 2996	SPED 201	Unique
SPED 3105	SPED 350	N/A
SPED 3110	SPED 355	N/A
SPED 3120	SPED 360	N/A
SPED 4110	SPED 407	N/A
SPED 4120	SPED 406	N/A
SPED 4130	SPED 409	N/A
SPED 4140	SPED 411	N/A
SPED 4150	SPED 480	N/A
SPED 4210	SPED 463	N/A
SPED 4220	SPED 459	N/A
SPED 4310	SPED 485	N/A
SPED 4320	SPED 486	N/A
SPED 4330	SPED 487	N/A
SPED 4340	SPED 488	N/A
SPED 4810	SPED 483	N/A
SPED 4811	SPED 481	N/A
SPED 4820	SPED 482	N/A
SPED 4840	SPED 492	N/A
SPED 4992	SPED 495	N/A
SPED 4996	SPED 489	N/A
SPED 5105	SPED 500	N/A
SPED 5110	SPED 507	N/A
SPED 5120	SPED 506	N/A
SPED 5130	SPED 509	N/A
SPED 5140	SPED 511	N/A
SPED 5150	SPED 580	N/A
SPED 5160	SPED 545	N/A
SPED 5210	SPED 504	N/A
SPED 5220	SPED 559	N/A
SPED 5230	SPED 523	N/A
SPED 5310	SPED 585	N/A
SPED 5320	SPED 586	N/A
SPED 5330	SPED 587	N/A

SPED 5340	SPED 588	N/A
SPED 5405	SPED 532	N/A
SPED 5410	SPED 533	N/A
SPED 5420	SPED 534	N/A
SPED 5430	SPED 536	N/A
SPED 5440	SPED 538	N/A
SPED 5450	SPED 539	N/A
SPED 5460	SPED 552	N/A
SPED 5470	SPED 553	N/A
SPED 5480	SPED 554	N/A
SPED 5490	SPED 555	N/A
SPED 5810	SPED 582	N/A
SPED 5811	SPED 548	N/A
SPED 5820	SPED 590	N/A
SPED 5850	SPED 513	N/A
SPED 5860	SPED 510	N/A
SPED 5870	SPED 583	N/A
SPED 5990	SPED 522	N/A
SPED 5991	SPED 598	N/A
SPED 5996	SPED 501	N/A
SPED 5999	SPED 599	N/A
SPED 6110	SPED 607	N/A
SPED 6120	SPED 606	N/A
SPED 6160	SPED 645	N/A
SPED 6170	SPED 619	N/A
SPED 6310	SPED 685	N/A
SPED 6330	SPED 687	N/A
SPED 6340	SPED 688	N/A
SPED 6810	SPED 690	N/A
SPED 6830	SPED 613	N/A
SPED 6840	SPED 610	N/A
SPED 6991	SPED 600	N/A
SPED 6996	SPED 698	N/A
SPED 6997	SPED 605	N/A
SPED 6998	SPED 640	N/A
SPED 7000	SPED 700	N/A
SPHS-SPEECH & HEARING SCIENCE		
SPHS 2110	C D 221	Common
SPHS 4510	SPHS 323	N/A
SPHS 4520	SPHS 422	N/A
SPHS 4610	SPHS 301	N/A
SPHS 4620	SPHS 324	N/A
SPHS 4710	SPHS 421	N/A
SPHS 4720	SPHS 322	N/A
SPHS 4810	SPHS 326	N/A
SPHS 4820	SPHS 423	N/A
SPHS 4830	SPHS 424	N/A
SPHS 5110	SPHS 505	N/A
SPHS 5120	SPHS 523	N/A
SPHS 5130	SPHS 525	N/A
SPHS 5140	SPHS 542	N/A
SPHS 5210	SPHS 530	N/A

SPHS 5220	SPHS 535	N/A
SPHS 5230	SPHS 584	N/A
SPHS 5310	SPHS 545	N/A
SPHS 5320	SPHS 547	N/A
SPHS 5330	SPHS 583	N/A
SPHS 5340	SPHS 585	N/A
SPHS 5350	SPHS 586	N/A
SPHS 5410	SPHS 521	N/A
SPHS 5510	SPHS 541	N/A
SPHS 5520	SPHS 548	N/A
SPHS 5988	SPHS 590	N/A
SPHS 5989	SPHS 640	N/A
SPHS 5990	SPHS 589	N/A
SPHS 5996	SPHS 591	N/A
SPHS 5999	SPHS 599	N/A
SPMD-SPORTS MEDICINE		
SPMD 1110	SP M 190	Unique
SPMD 1120	SP M 191	Unique
SPMD 1190	SP M 272	Unique
SPMD 1195	SP M 273	Unique
SPMD 1310	SP M 175	Unique
SPMD 1350	PE P 185	Unique
SPMD 2130	SP M 250	Unique
SPMD 2210	SP M 271	Unique
SPMD 2210L	SP M 271 L	Unique
SPMD 2250	PE P 208	Unique
SPMD 2310	SP M 200	Unique
SPMD 3010	SP M 310	N/A
SPMD 3050	SP M 375	N/A
SPMD 3090	SP M 372	N/A
SPMD 3093	SP M 373	N/A
SPMD 3110	PE P 323	N/A
SPMD 3120	PE P 363	N/A
SPMD 3130	PE P 392	N/A
SPMD 3140	PE P 394	N/A
SPMD 3150	PE P 393	N/A
SPMD 3160	PE P 315	N/A
SPMD 3210	SP M 371	N/A
SPMD 3210L	SP M 371 L	N/A
SPMD 3250	SP M 324	N/A
SPMD 3310	PE P 319	N/A
SPMD 3350	SP M 412	N/A
SPMD 3410	SP M 308	N/A
SPMD 3450	SP M 305	N/A
SPMD 3450L	SP M 305 L	N/A
SPMD 3550	SP M 304	N/A
SPMD 3610	SP M 303	N/A
SPMD 3650	SP M 341	N/A
SPMD 3710	SP M 342	N/A
SPMD 4010	SP M 410	N/A
SPMD 4015	SP M 415	N/A
SPMD 4020	SP M 420	N/A

SPMD 4025	SP M 411	N/A
SPMD 4030	SP M 425	N/A
SPMD 4090	SP M 422	N/A
SPMD 4093	SP M 423	N/A
SPMD 4095	SP M 424	N/A
SPMD 4098	SP M 498	N/A
SPMD 4110	PE P 455	N/A
SPMD 4130	PE P 466	N/A
SPMD 4210	SP M 451	N/A
SPMD 4250	SP M 460	N/A
SPMD 4250L	SP M 460 L	N/A
SPMD 4350	SP M 330	N/A
SPMD 4410	SP M 456	N/A
SPMD 4450	SP M 307	N/A
SPMD 4510	SP M 309	N/A
SPMD 4550	SP M 223	N/A
SPMD 4610	PE P 465	N/A
SPMD 4997	SP M 499	N/A
SPMD 4998	SP M 445	N/A
SPMD 5010	SP M 510	N/A
SPMD 5015	SP M 513	N/A
SPMD 5020	SP M 514	N/A
SPMD 5025	SP M 511	N/A
SPMD 5030	SP M 515	N/A
SPMD 5310	SP M 512	N/A
SPMD 5350	SP M 560	N/A
SPMD 5410	SP M 509	N/A
SPMD 5450	SP M 556	N/A
SPMD 5510	SP M 504	N/A
SPMD 5550	SP M 545	N/A
SPMD 6310	PE P 624	N/A
SPMD 6350	SP M 551	N/A
SPMD 6410	SP M 608	N/A
SPMD 6450	SP M 665	N/A
SPMD 6510	SP M 660	N/A
SPMD 6710	SP M 597	N/A
SPMD 6750	SP M 600	N/A
SPMD 6996	PE P 501	N/A
SPMD 7000	SP M 700	N/A
STAT-STATISTICS		
STAT 371	STAT 3110	N/A
STAT 470	STAT 4210	N/A
STAT 480	STAT 4220	N/A
STAT 515	STAT 5210	N/A
STAT 525	STAT 5220	N/A
STAT 535	STAT 5230	N/A
STAT 562	STAT 5310	N/A
STAT 563	STAT 5320	N/A
STAT 571	STAT 5330	N/A
STAT 572	STAT 5335	N/A
STAT 581	STAT 5340	N/A
STAT 582	STAT 5345	N/A

THEA-THEATRE		
THEA 1110G	THTR 101G	Common
THEA 1210G	THTR 105	Common
THEA 1221	THTR 110	Unique
THEA 1222	THTR 120	Unique
THEA 1223	THTR 130	Unique
THEA 1310	THTR 142	Common
THEA 1310L	THTR 142 L	Unique
THEA 1415	THTR 149	Unique
THEA 2221	THTR 210	Unique
THEA 2222	THTR 206	Unique
THEA 2310	THTR 141	Common
THEA 2310L	THTR 141 L	Unique
THEA 2340	THTR 250	Unique
THEA 2415	THTR 249	Unique
THEA 2421	THTR 220	Unique
THEA 2993	THTR 200	Unique
THEA 2996	THTR 222	Unique
THEA 300	THTR 300	N/A
THEA 303	THTR 303	N/A
THEA 304	THTR 304	N/A
THEA 305	THTR 305	N/A
THEA 307V	THTR 307V	N/A
THEA 308	THTR 308	N/A
THEA 310	THTR 310	N/A
THEA 311	THTR 311	N/A
THEA 312	THTR 312	N/A
THEA 313	THTR 313	N/A
THEA 317	THTR 317	N/A
THEA 321V	THTR 321V	N/A
THEA 322	THTR 322	N/A
THEA 323	THTR 323	N/A
THEA 329	THTR 329	N/A
THEA 330	THTR 330	N/A
THEA 334	THTR 334	N/A
THEA 337	THTR 337	N/A
THEA 341	THTR 341	N/A
THEA 343	THTR 343	N/A
THEA 345	THTR 345	N/A
THEA 346	THTR 346	N/A
THEA 347	THTR 347	N/A
THEA 348	THTR 348	N/A
THEA 349	THTR 349	N/A
THEA 352	THTR 352	N/A
THEA 353	THTR 353	N/A
THEA 354	THTR 354	N/A
THEA 355	THTR 355	N/A
THEA 356	THTR 356	N/A
THEA 357	THTR 357	N/A
THEA 360	THTR 360	N/A
THEA 366	THTR 366	N/A
THEA 384	THTR 384	N/A

THEA 395	THTR 395	N/A
THEA 396	THTR 396	N/A
THEA 408	THTR 408	N/A
THEA 409	THTR 409	N/A
THEA 410	THTR 410	N/A
THEA 414	THTR 414	N/A
THEA 417	THTR 417	N/A
THEA 430	THTR 430	N/A
THEA 435	THTR 435	N/A
THEA 439	THTR 439	N/A
THEA 440	THTR 440	N/A
THEA 450	THTR 450	N/A
THEA 535	THTR 535	N/A
WELD-WELDING		
WELD 100	WELD 1130	Common
WELD 102	WELD 1110	Common
WELD 110	WELD 1120	Common
WELD 115	WELD 2130	Common
WELD 120	WELD 1310	Common
WELD 125	WELD 1220	Common
WELD 130	WELD 1140	Common
WELD 140	WELD 1155	Common
WELD 150	WELD 2220	Common
WELD 160	WELD 1210	Common
WELD 170	WELD 1171	Common
WELD 180	WELD 2155	Common
WELD 190	WELD 1191	Common
WELD 211	WELD 2290	Common
WELD 221	WELD 2995	Unique
WELD 255	WELD 2996	Common
WELD 295	WELD 2997	Unique

College of Agricultural, Consumer, and Environmental Sciences

Dean and Chief Administrative Officer- ***Rolando A. Flores Galarza***

Associate Dean and Director of Academic Programs - ***Robert Torres***

Associate Dean and Director of the Cooperative Extension Service - ***Jon C. Boren***

Associate Dean and Director of the Agricultural Experiment Station - ***Jay Lillywhite***

Mission

The College of Agricultural, Consumer and Environmental Sciences (ACES) is an engine for economic and community development in New Mexico, improving the lives of New Mexicans through research, extension and teaching. ACES teaching programs help students discover new knowledge and become leaders in food and fiber production, environmental stewardship, water use and conservation and improving health in New Mexico and beyond.

The College's Academic Programs prepare students for a wide array of careers via its 20 plus bachelor degree programs, most of which are offered at no other institution in New Mexico. In addition to our undergraduate programs, ACES offers five doctoral and nine master's degree programs at the graduate level.

The College of Agricultural, Consumer and Environmental Sciences is comprised of eight departments:

- Agricultural and Extension Education (p. 329)
- Agricultural Economics and Agricultural Business (p. 343)
- Animal and Range Sciences (p. 357)
- Entomology, Plant Pathology and Weed Science (p. 380)
- Family and Consumer Sciences (p. 397)
- Fish, Wildlife and Conservation Ecology (p. 426)
- Plant and Environmental Sciences (p. 443)
- School of Hotel, Restaurant and Tourism Management (p. 477)

College Undergraduate Degree Requirements

1. Complete general education common core requirements.
2. Complete course requirements for the major.

3. Earn a minimum of 120 semester credits. Of this total at least 48 semester credits must be in upper-division courses (numbered 300 or above).
4. Earn a cumulative grade-point average of no less than 2.0.

Preprofessional Programs

NMSU offers a number of programs designed for transfer to professional schools through its undergraduate colleges. The program that is administered by the College of Agricultural, Consumer and Environmental Sciences is Preveterinary Medicine. Several majors are aligned for students to apply for the New Mexico State University Osteopathic Medicine Pathway Program to Burrell College of Osteopathic Medicine.

Veterinary Medicine (Preprofessional Training Only, Non-Degree)

The Doctor of Veterinary Medicine (D.V.M.) degree is a professional degree that is not offered by any college or university in New Mexico; however, you may complete the preparatory program required for admittance to the professional colleges of veterinary medicine at New Mexico State University.

The D.V.M. degree normally requires four years of training in a professional college subsequent to completion of a preveterinary program that requires at least three years of college-level instruction. In most instances a baccalaureate degree is a distinct advantage to the applicant.

Curriculum requirements are determined by the particular school or college of veterinary medicine. The Department of Animal and Range Sciences maintains current requirements for Colorado State University, Washington State, Oregon State, Texas Tech, and Texas A&M. You should check with an advisor for specific course requirements. As a student from New Mexico, you may be eligible for financial assistance under the program of the Western Interstate Commission for Higher Education (WICHE). See the section on WICHE in the General Information chapter under Resources for Students for more information.

Bachelor Degrees

A

- Agricultural and Extension Education (Agricultural Communications) - Bachelor of Science in Agriculture (p. 338)
- Agricultural and Extension Education (Agricultural Education Teaching) - Bachelor of Science in Agriculture (p. 339)
- Agricultural and Extension Education (Agricultural Extension/Development) - Bachelor of Science in Agriculture (p. 341)
- Agricultural Communications - Undergraduate Minor (p. 343)
- Agricultural Economics and Agricultural Business - Bachelor of Science in Agriculture (p. 352)
- Agronomy - Bachelor of Science in Agriculture (p. 458)
- Animal Science (Animal Industry) - Bachelor of Science in Agriculture (p. 372)
- Animal Science (Science) - Bachelor of Science in Agriculture (p. 374)
- Applied and Agricultural Biology (Applied Biology) - Bachelor of Science in Agriculture (p. 387)
- Applied and Agricultural Biology (Applied Microbiology) - Bachelor of Science in Agriculture (p. 389)
- Applied and Agricultural Biology (Entomology) - Bachelor of Science in Agriculture (p. 390)
- Applied and Agricultural Biology (Environmental Biology) - Bachelor of Science in Agriculture (p. 391)
- Applied and Agricultural Biology (Invasive Pest Biology and Management) - Bachelor of Science in Agriculture (p. 393)

C

- Conservation Ecology - Bachelor of Science in Conservation Ecology (p. 436)

E

- Environmental Science - Bachelor of Science in Environmental Science (p. 460)

F

- Family and Consumer Sciences Education - Bachelor of Science in Family and Consumer Sciences (p. 414)
- Fashion Merchandising and Design - Bachelor of Science in Family and Consumer Sciences (p. 415)
- Fisheries and Wildlife Science (Aquatic Ecology and Management) - Bachelor of Science in Fish, Wildlife and Conservation Ecology (p. 437)
- Fisheries and Wildlife Science (Wildlife Ecology and Management) - Bachelor of Science in Fish, Wildlife and Conservation Ecology (p. 440)
- Food Science and Technology (Science, Technology and Engineering) - Bachelor of Science in Food Science and Technology (p. 418)

G

- General Agriculture - Bachelor of Science in Agriculture (p. 395)
- Genetics and Biotechnology - Bachelor of Science in Genetics (p. 462)

H

- Horticulture (Turfgrass Science and Management) - Bachelor of Science in Agriculture (p. 467)
- Horticulture - Bachelor of Science in Agriculture (p. 464)
- Hotel, Restaurant and Tourism Management - Bachelor of Science (p. 489)
- Hotel, Restaurant and Tourism Management - Bachelor of Science (Online) (https://catalogs.nmsu.edu/global/nmsu-global/hotel-restaurant-tourism-mgt-bs-online/)
- Human Development and Family Science - Bachelor of Science (Online) (https://catalogs.nmsu.edu/global/nmsu-global/human-development-family-science-bs-online/)
- Human Nutrition and Dietetic Science (Nutrition Education) - Bachelor of Science in Family and Consumer Sciences (p. 419)
- Human Nutrition and Dietetic Science (Pre-Dietetics/Dietetics) - Bachelor of Science in Family and Consumer Sciences (p. 422)

N

- Natural Resource Economics and Policy - Bachelor of Science in Agriculture (p. 354)

R

- Range Science - Bachelor of Science in Agriculture (p. 377)

S

- Soil Science (Environment and Resource Management) - Bachelor of Science in Agriculture (p. 470)
- Soil Science (Soil and Water Science) - Bachelor of Science in Agriculture (p. 472)
- Soil Science (Soils) - Bachelor of Science in Agriculture (p. 474)

Masters Degrees

A

- Agricultural and Extension Education (Agricultural Strategic Communications) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/agricultural-extension-education-agricultural-strategic-comm-ma-online/)
- Agricultural and Extension Education - Master of Arts (p. 99)
- Agricultural and Extension Education - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/agricultural-extension-education-ma-online/)
- Agricultural Economics - Master of Science (p. 102)
- Agriculture (Agribusiness) - Master of Agriculture (p. 97)
- Agriculture (Agribusiness) - Master of Agriculture (Online) (https://catalogs.nmsu.edu/global/nmsu-global/agriculture-agribusiness-mag-online/)
- Agriculture (Domestic Animal Biology) - Master of Agriculture (p. 98)
- Agriculture (Domestic Animal Biology) - Master of Agriculture (Online) (https://catalogs.nmsu.edu/global/nmsu-global/agriculture-domestic-animal-biology-master-agriculture-online/)
- Animal Science - Master of Science (p. 104)
- Applied and Agricultural Biology - Master of Science (p. 101)

F

- Family and Consumer Sciences (Couples, Marriage and Family Therapy) - Master of Science (p. 159)
- Family and Consumer Sciences (Food Science and Technology) - Master of Science (p. 159)
- Family and Consumer Sciences (Food Science and Technology) - Master of Science (Online) (https://catalogs.nmsu.edu/global/nmsu-global/family-consumer-sciences-food-science-technology-ms-online/)
- Family and Consumer Sciences (Hotel, Restaurant and Tourism Management) - Master of Science (p. 160)
- Family and Consumer Sciences (Hotel, Restaurant and Tourism Management) - Master of Science (Online) (https://catalogs.nmsu.edu/global/nmsu-global/family-consumer-sciences-hrtm-ms-online/)
- Family and Consumer Sciences (Human Nutrition and Dietetic Sciences) - Master of Science (Online) (https://catalogs.nmsu.edu/global/nmsu-global/family-consumer-sciences-hnds-ms-online/)
- Fish, Wildlife and Conservation Ecology - Master of Science (p. 162)

H

- Horticulture - Master of Science (p. 168)

P

- Plant and Environmental Science - Master of Science (p. 180)

R

- Range Science - Master of Science (p. 185)

W

- Water Science and Management (Agricultural Water Resources) - Master of Science (p. 196)
- Water Science and Management (International Water Resilience) - Master of Science (p. 196)
- Water Science and Management (Water Economics and Policy) - Master of Science (p. 197)
- Water Science and Management (Water Informatics) - Master of Science (p. 197)
- Water Science and Management (Water Quality and Treatment) - Master of Science (p. 198)
- Water Science and Management (Watersheds and Aquatic/Riparian Wetlands) - Master of Science (p. 199)
- Water Science and Management - Master of Science (p. 195)

Doctoral Degrees

A

- Animal Science - Doctor of Philosophy (p. 200)
- Applied and Agricultural Biology - Doctor of Philosophy (p. 201)

P

- Plant and Environmental Science - Doctor of Philosophy (p. 233)

R

- Range Science - Doctor of Philosophy (p. 234)

W

- Water Science and Management (Agricultural Water Resources) - Doctor of Philosophy (p. 239)
- Water Science and Management (International Water Resilience) - Doctor of Philosophy (p. 240)
- Water Science and Management (Water Economics and Policy) - Doctor of Philosophy (p. 240)
- Water Science and Management (Water Informatics) - Doctor of Philosophy (p. 241)
- Water Science and Management (Water Quality Treatments) - Doctor of Philosophy (p. 241)
- Water Science and Management (Watershed and Aquatic/Riparian Wetlands) - Doctor of Philosophy (p. 242)
- Water Science and Management - Doctor of Philosophy (p. 239)
- Wildlife and Fisheries Ecology - Doctor of Philosophy (p. 242)

Undergraduate Minors

A

- Agricultural Business Management- Undergraduate Minor (p. 357)
- Agricultural Communications - Undergraduate Minor (p. 343)
- Agronomy - Undergraduate Minor (p. 476)

C

- Conservation Ecology - Undergraduate Minor (p. 443)
- Culinary Science - Undergraduate Minor (p. 424)

D

- Dairy Science - Undergraduate Minor (p. 379)

E

- Entomology - Undergraduate Minor (p. 397)
- Environmental Science - Undergraduate Minor (p. 476)

F

- Fashion Merchandising & Design - Undergraduate Minor (p. 425)
- Food Science - Undergraduate Minor (p. 425)

G

- Genetics and Biotechnology - Undergraduate Minor (p. 476)

H

- Horse Management - Undergraduate Minor (p. 379)
- Horticulture - Undergraduate Minor (p. 477)
- Hotel, Restaurant and Tourism Management - Undergraduate Minor (p. 491)
- Hotel, Restaurant and Tourism Management - Undergraduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/hotel-restaurant-tourism-management-undergraduate-minor-online/)
- Human Animal Interaction - Undergraduate Minor (p. 379)
- Human Development and Family Science - Undergraduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/human-development-family-science-undergraduate-minor-online/)

I

- Interior Spaces - Undergraduate Minor (p. 425)

L

- Leadership in Agricultural Communications - Undergraduate Minor (p. 343)
- Livestock Production - Undergraduate Minor (p. 379)

M

- Meat Science - Undergraduate Minor (p. 425)

N

- Natural Resource Economics - Undergraduate Minor (p. 357)
- Nutrition - Undergraduate Minor (p. 426)

P

- Pest Management - Undergraduate Minor (p. 397)
- Plant Pathology - Undergraduate Minor (p. 397)

R

- Ranch Management - Undergraduate Minor (p. 380)
- Range Science - Undergraduate Minor (p. 380)

S

- Soil Science - Undergraduate Minor (p. 477)

W

- Weed Science - Undergraduate Minor (p. 397)
- Wildlife Science - Undergraduate Minor (p. 443)

Graduate Minors

A

- Agribusiness - Graduate Minor (p. 254)
- Agricultural and Extension Education - Graduate Minor (p. 254)
- Animal Science - Graduate Minor (p. 254)

F

- Fish, Wildlife and Conservation Ecology - Graduate Minor (p. 255)
- Food Studies - Graduate Minor (p. 256)

R

- Range Science - Graduate Minor (p. 260)

Accreditation

The Agricultural Education Teaching program in the Department of Agricultural and Extension Education is accredited by the Council for the Accreditation of Educator Preparation (formerly NCATE) and the State Public Education Department of New Mexico. It is critical that students consult their academic advisor prior to selection of courses for the agriculture, secondary science and teaching endorsements.

The Family and Consumer Sciences Education major in the Department of Family and Consumer Sciences is accredited by the Council for the Accreditation of Educator Preparation (formerly NCATE) and the State Public Education Department of New Mexico, and meets the teacher licensure requirements for the State of New Mexico. Course selection is restricted to meet accreditation requirements, so students should consult their academic advisor prior to selection of courses for the Family and Consumer Sciences Education program.

The Human Nutrition & Dietetic Science (HNDS) major, Dietetics option, is a Didactic Program in Dietetics (DPD) accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND). The program meets national requirements to prepare students for a Dietetic Internship. Course selection is restricted to meet accreditation requirements. Students should consult their academic advisor prior to selection of courses for the HNDS Dietetics program.

Agricultural and Extension Education

Undergraduate Program Information

The department offers a broad curriculum with majors, options, and minors that prepare students for many careers as professional educators, communicators, and leaders in agricultural, natural resource, technology, and related disciplines. Some example occupations that the department prepares its students to enter are agricultural education teacher, media specialist, technology teacher, Extension agent, NMDA or USDA professional, industry educational specialist, and development specialist. Graduates work in domestic and/or international settings.

General Undergraduate Degree Requirements

You must meet the general education and departmental requirements for the degree and the major, option or minor chosen. You must establish a cumulative grade-point average of not less than 2.5 before you are admitted into the student teaching or other internship program. You need a minimum of 48 hours in technical agriculture for the secondary teaching certificate program in agriculture.

You may select technical courses required for completion of the majors and options from the following areas:

- Agricultural economics (p. 343)
- Agricultural mechanics
- Animal and range sciences (p. 357)
- Entomology, plant pathology and weed science (p. 380)
- Fish, wildlife and conservation ecology (p. 426)
- Plant and environmental sciences (p. 443)

Graduate Program Information

The Department of Agricultural and Extension Education requires the following items be sent directly to the department for admission:

- **Three letters of recommendation -** Applicants should request letters of recommendation from individuals who know them well enough to comment on their professional skills and abilities, and on their ability to complete graduate-level work.
- **Career statement -** The two-page letter of application should clearly identify applicant's professional and career goals as well as reasons for pursuing the degree.
- **Personal Interview -** Upon receipt of all application materials, a personal interview may be required at the discretion of the Departmental Graduate Committee.

***Do not send the above items to the Graduate School as this will cause a delay on your admission status. For questions regarding AXED Graduate Programs, please contact Dr. William Norris, Graduate Coordinator,* wnorris1@nmsu.edu.**

General Graduate Degree Requirements

The major requires courses in research methods, teaching methods and data collection and analysis; a graduate seminar; and a thesis or creative component. The department also have two 9 credit minors which are available to students completing major work in other departments.

Thesis plan: Requires a minimum of 30 semester credits which includes 4-6 credits of thesis. *(Both plans require a final oral examination).*

Non-Thesis plan: Requires 32 semester credits of course work which includes a focused creative component. *(Both plans require a final oral examination).*

Flexibility in each program allows students to pursue professional interests and develop specialized competencies in agricultural and extension education, technology education, and technical and scientific areas. The department delivers courses in evening, weekend, and distance formats (go to https://global.nmsu.edu/ and click on degree programs, then Agricultural and Extension Education) to accommodate student needs. Previous experience in teaching, extension, and/or other professional education positions is highly recommended to be considered for a graduate teaching assistantship.

The department offers major work for a Master of Arts in Agricultural and Extension Education. The degree can be obtained with an emphasis in

- Agricultural Teacher Education,
- Extension Education,
- Strategic Communications

Degrees for the Department

Bachelor's Degree(s)

- Agricultural and Extension Education (Agricultural Communications) - Bachelor of Science in Agriculture (p. 338)
- Agricultural and Extension Education (Agricultural Education Teaching) - Bachelor of Science in Agriculture (p. 339)
- Agricultural and Extension Education (Agricultural Extension/ Development) - Bachelor of Science in Agriculture (p. 341)

Master's Degrees

- Agricultural and Extension Education - Master of Arts (p. 99)

Minors for the Department

- Agricultural and Extension Education - Graduate Minor (p. 254)
- Agricultural Communications - Undergraduate Minor (p. 343)
- Leadership in Agricultural Communications - Undergraduate Minor (p. 343)

Dr. Richie Roberts, Department Head

Professors: *Richie Roberts*; ***Assistant Professors*** Norris, Spears, Rankin, Dyment

Richie Roberts, Ph.D. (Oklahoma State University)- agricultural education, agricultural extension, global education; Kristopher Rankin, Ph.D. (Oklahoma State University)– agricultural education, agricultural mechanization, methods of instruction, curriculum design; William Norris, Ph.D. (Mississippi State)– youth development, youth leadership, youth program development; Madison Dyment, Ph.D. (University of Florida) - visual and science communication, streaming science, and the scholarship of teaching and learning; L Spears, Ph.D. (Iowa State University) - agricultural education and studies, curriculum and instructional technology.

Agricultural Extension Education Courses

AXED 1110. Introduction to Agricultural, Extension, and Technology Education
3 Credits (3)
Orientation to programs, philosophies, competencies and leadership skills needed by professionals in agricultural and technology education,

extension education, agricultural communications, and related career opportunities in industry, governmental agencies, and international organizations.

Learning Outcomes

1. Orient student to the AXED Department and their role as students.
2. Explore career opportunities (and the related skill sets needed for success) in public schools, career and technical institutions, the cooperative extension service, community, and international development, agricultural communications, agricultural industry associations and public service (e.g., NMDA and USDA).
3. Develop an understanding of the self-leadership skills needed to be effective in a variety of professional and personal environments.
4. Familiarize students with the aspects included within a total program in agricultural or technology education.
5. Strengthen skills in oral and written communications.

AXED 1130. Techniques in Agricultural Mechanization
3 Credits (2+2P)

Development of competencies in agricultural mechanics including safety, tool identification, operation and maintenance of hand and power tools, cold metal, drafting, and plumbing procedures. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry.

Learning Outcomes

1. To understand basic drafting language used in orthographic and isometric drawings.
2. To develop an understanding of the proper use and safety of basic hand and power tools.
3. To develop skills needed to operate basic hand and power tools correctly.
4. To develop an understanding of surveying methods and building layout for construction.
5. To develop an adequate level of competence in workshop techniques.
6. To prepare students to properly teach and demonstrate these techniques to others who may use them as a means of earning a living.

AXED 2110. Metal Fabrication
3 Credits (2+4P)

Instruction and skill development in process and procedures of metal fusion, including gas and electric welding techniques, safety, and oxy-acetylene cutting and welding. Designed to improve mechanical skills needed in agriculturally related occupations in education and industry.

Learning Outcomes

1. To develop students understanding and appreciation for metal fabrication, design and teaching.
2. To develop in the student an adequate level of competence in shop work techniques, so that the student may be able to properly teach and demonstrate multiple metal fabrication techniques to others who may use them as a mean of earning a living.
3. To develop the student's fundamental techniques in shielded metal arc welding, oxy-acetylene welding and cutting operations, metal inert gas welding (MIG), and gas tungsten-arc welding as needed in repair and construction of agricultural equipment.
4. Student will understand appropriate shop management techniques and have an appreciation for mechanized agriculture.
5. To assist the student in developing an understanding and comprehension of the fundamental principles that apply to the area of basic shop work included in this course; such as proper selection of electrodes, oxy-acetylene filler rods, welding processes best suited for given welding conditions, the proper tool for the job, etc.
6. To develop in the student comprehension of safety practices that apply to the areas of basic shop work, tools, and equipment required in the course.

AXED 2130. Early Field-Based Experience
2 Credits (2)

First Hand view of the roles of professional educators through field experiences with Cooperative Extension or other government agencies. Includes 4 weeks of classroom instruction and 30 hours of observation in a work setting. Consent of Instructor required. Restricted to Las Cruces campus only.

Learning Outcomes

1. Identify successful characteristics, tips and strategies that an agricultural education professional may use as part of their program.
2. Identify key components of an agricultural education program
3. Actively observe a local agricultural education program.
4. Identify ways that your agency program networks and interacts with clientele and community

AXED 2996. Special Topics
1-4 Credits (1-4)

Specific subjects and credits to be announced in the Schedule of Classes. Student can only take up to 6 credits per semester, and will not be able to have more than 12 credits count towards their degree. May be repeated up to 12 credits.

Learning Outcomes

1. Varies

AXED 3105. Introduction to Special Education in Career and Technical Education
3 Credits (3)

Characteristics, identification, and educational needs of exceptional learners. Attention is given to the various types of programs serving exceptional learners. Designed for all professional personnel who work with exceptional learners. Specific strategies for working with students with special needs in a shop or laboratory setting within the Career and Technical Education environment will be included.

Learning Outcomes

1. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
3. Explain the major components of an IEP and its processes, as well as the roles of learners, families and professionals on the team.
4. Discuss the different service delivery models and discuss the principles, practices, and pragmatics of inclusion co-teaching.
5. Analyze the disability categories under IDEA, 2004; characteristics, etiology, and diagnostic criteria.
6. Examine educational considerations for exceptional learners (educational approaches [Universal design and differentiated instruction], assistive technology, accommodations, modifications, and related supports and services).
7. Employ culturally responsive evidence-based practices to create family/school/community partnerships to promote academic achievement and prepare students for their post-school transitions.

8. Evaluate and synthesize research literature on a selected topic from current special education research.
9. Develop hands-on laboratory activities and educational strategies that are appropriate for a wide variety of learners.

AXED 3115. Small Engine Technology
3 Credits (2+2P)
Development of competencies in small gasoline engines; theory, operation, design, maintenance and safety. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry. May be repeated up to 3 credits.

AXED 3120. Agricultural Structures
3 Credits (2+3P)
Selection and use of agricultural building materials. Design, construction, and maintenance of agricultural structures. Development of competencies in carpentry, concrete, electricity, masonry, and safety. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry. May be repeated up to 3 credits.

AXED 3130. Advanced Technology in the Agricultural Mechanization
3 Credits (2+3P)
Students will construct a project in the area of agricultural mechanization under the direction of instructor. Project must be completed within a semester and of sufficient complexity for 3 credits.
Prerequisite: AXED 1130 and AXED 2110 or consent of instructor.

AXED 3150. Philosophy and Methods of Contests
3 Credits (3)
Covers the roles that career development events (contests) play in agricultural and technology education and in extension programs. Topics include competition and cooperation, winning and losing, ethics, use of community resources, and academic and employability skills taught through contests. Coaching as a teaching method is introduced and expanded. Students will assist with the coordination of various career development events. May be repeated up to 3 credits.

AXED 3210V. John Muir: Lessons in Sustainability
3 Credits (3)
This course examines the life of John Muir in the context of sustainability. Muir was a farmer, inventor, explorer, botanist, glaciologist, conservationist, and noted nature author. He was influential in the National Parks movement and in starting the Sierra Club. Living in the natural world influenced his faith and philosophy. By examining his life and the themes that shaped it, students will develop an understanding of what it means to live sustainably and to contribute beyond their personal lives to a sustainable future. May be repeated up to 3 credits.

AXED 3996. Special Topics
1-4 Credits (1-4)
Course addresses specific subjects and issues as identified by department. Topics and credits to be announced in the Schedule of Classes. Students can only take up to 4 credits per semester and no more than 6 credits of the course may be applied to a degree. May be repeated up to 12 credits.
Learning Outcomes
1. Various

AXED 4110. Management of Change, Diffusion, and Adoption of Innovations
3 Credits (3)
Factors that influence the rates of diffusion and adoption of innovations. Consequences of adopting or rejecting innovations. Processes by which change agents influence introduction and adoption of innovations. Taught with AXED 5110. May be repeated up to 3 credits.
Learning Outcomes
1. Critically examine the adoption-diffusion model. Included are issues such as social class differentials in the dissemination of ideas and technology, non-adoption as a form of behavior, social and economic constraints on adoption behavior, and the consequences of adoption at both the individual and social levels.
2. Demonstrate understanding of how the rapid pace of change in technology and applied science may have good and bad outcomes.
3. Discuss the dissemination of new ideas and technology within various social units.
4. Discuss the applications of the adoption-diffusion model from the perspective of the change agent.
5. Enhance the development of leadership skills required to work with people in times of change.

AXED 4210. Curriculum Development and Assessment in Agricultural Education
3 Credits (3)
This course prepares students to develop curriculum, design lessons, and prepare appropriate assessments in an agricultural education setting. An emphasis will be placed on the developing curriculum using the currently established resources that are available to agriculture teachers.
Prerequisite: 2.5 GPA.

AXED 4215. Developing Excellent Programs in Career and Technical Education
3 Credits (3)
This course prepares students to effectively manage Supervised Agricultural Experiences (SAEs) as part of a comprehensive agricultural education program. Participants will learn strategies for guiding students in planning and conducting meaningful SAEs, utilizing the Agricultural Experience Tracker (AET) for recordkeeping and progress tracking, and developing high-quality award applications for proficiency awards, degrees, and other recognitions. Emphasis will be placed on integrating SAEs into classroom instruction and FFA activities to support the three-component model of agricultural education.
Learning Outcomes
1. Recognize the underlying philosophy of the SAE/FFA as an integral part of the total agricultural education program.
2. Describe ethical behavior as an FFA advisor and agricultural educator, including the proper management of finances.
3. Develop a personal philosophy for implementing SAE/FFA into the total agricultural education program.
4. Identify principles and practices for developing and conducting SAE programs.
5. Identify the importance of effectively supervising student SAEs, including safety considerations.
6. Apply record keeping skills in the use of the AET record book system.
7. Interpret the types of awards offered through the State and National FFA Organization.
8. Describe various opportunities, offered in the total agricultural education program at the local, state, and national level.

AXED 4220. Methods for Teaching Agricultural and Technology Education
3 Credits (3)
Methods of instruction and presentation, selection of teaching aids and support materials, classroom management, development of a complete educational program, and microteaching experiences. May be repeated up to 3 credits.

Prerequisite: GPA of 2.5 or above.

AXED 4230. Directed Teaching in Agricultural or Technology Education
15 Credits (15)
Semester-long off-campus professional experience in directed teaching and observation provided in selected centers under secondary agricultural or technology education supervising teachers. Consent of Instructor required.
Prerequisite: AXED 4215, AXED 4220 and consent of instructor.

AXED 4235. Directed Teaching in Extension Education
3-12 Credits (3-12)
Four-to-fourteen-week, professional experiences in directed teaching and observation provided in cooperative extension at the county, regional, or state level. Consent of instructor required. May be repeated up to 12 credits.

AXED 4330. Content Area Literacies
3 Credits (3)
Surveys integrated reading/writing/discursive practices in middle/secondary content areas.

Learning Outcomes

1. Analyze literacy processes, as they pertain to adolescent learners.
2. Discuss current trends and issues in content area literacy instruction with a specific focus on practices that promote achievement and equity.
3. Evaluate instructional practices that help students use reading, writing, speaking, listening, viewing and visually representing to learn the content areas.
4. Illustrate ethical reasoning and decision making in your approach to content area literacy education.
5. Integrate research, reflection, and best practices that positively impact students in a diverse society.

AXED 4510. Introduction to Research Methods
3 Credits (3)
Introduction to research design and methodology in education and behavioral sciences. Overview of common research designs and data collection strategies. Prepares students to critique published research and understand basic skills including hypothesis development and conducting a literature search. Students must be in junior standing to enroll. May be repeated up to 3 credits.

AXED 4520. Methods in Career and Technical Laboratory Instruction
2 Credits (2)
For students planning to teach agricultural or technology education at a secondary or postsecondary level. Focus on planning, delivering, and evaluating instruction in laboratories; and on CPR, first aid, and NCCER certifications. Laboratory safety and tool, equipment, and laboratory management systems are also emphasized. Restricted to AXED Majors. May be repeated up to 2 credits.

AXED 4610. Leadership On Agricultural and Natural Resource Issues
3 Credits (3)
Investigates leadership concepts and group dynamics as they relate to a changing world and complex agricultural and natural resource issues. Topics include emotional intelligence, leading change, political leadership, facilitating agreement, team building, and managing conflict in agricultural and natural resource settings. May be repeated up to 3 credits.

AXED 4620. Methods of Teaching Biological, Earth and Physical Sciences in Agriculture
3 Credits (3)
Students learn to set up and teach in a modular agriscience laboratory, utilizing a variety of technologies. Modules covered focus on incorporating biological, earth and physical sciences into agricultural instruction and may include: Tissue culture, animal anatomy, hydroponics microscopy, electrophoresis, microbiology, soils and plant nutrients, water quality, water systems, entomology, integrated pest management, and renewable energy applications. Students develop their own modules and/or experiments.

AXED 4710. 4-H Youth Development
1 Credit (1)
On-line course explores 4-H Youth Development as an integral part of the Cooperative Extension Service. Topics to be addressed include mission, philosophy, delivery modes, audiences and partnerships. Course is relevant for anyone interested in pursuing a career in Cooperative Extension. May be repeated up to 1 credit.

AXED 4715. The FFA Organization: An Overview
1 Credit (1)
Online course addressing the history, mission, philosophy and structure of the New Mexico and National FFA Organizations and their relationship to supervised agriculture experiences and the agricultural education curriculum. Course is relevant for anyone interested in pursuing a career in agricultural education. May be repeated up to 1 credit.

AXED 4991. Undergraduate Research
1-4 Credits (1-4)
Research experience in agricultural, extension, and technology education with applications to selected issues and problems. May be repeated up to 4 credits.

AXED 4997. Independent Study in Agricultural, Extension, or Technology Education
1-3 Credits (1-3)
Specific subjects are agreed upon by the student and instructor. Students must be juniors or seniors to enroll. May be repeated up to 6 credits.

AXED 5105. Introduction to Special Education in Career and Technical Education
3 Credits (3)
Characteristics, identification, and educational needs of exceptional learners. Attention is given to the various types of programs serving exceptional learners. Designed for all professional personnel who work with exceptional learners. Specific strategies for working with students with special needs in a shop or laboratory setting within the Career and Technical Education environment will be included.

Learning Outcomes

1. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
3. Explain the major components of an IEP and its processes, as well as the roles of learners, families and professionals on the team.
4. Discuss the different service delivery models and discuss the principles, practices, and pragmatics of inclusion co-teaching.
5. Analyze the disability categories under IDEA, 2004: characteristics, etiology, and diagnostic criteria.
6. Examine educational considerations for exceptional learners (educational approaches [Universal design and differentiated instruction], assistive technology, accommodations/modifications, and related supports and services).

7. Employ culturally responsive evidence-based practices to create family/school/community partnerships to promote academic achievement and prepare students for their post-school transitions.
8. Evaluate and synthesize research literature on a selected topic from current special education research.
9. Develop hands-on laboratory activities and educational strategies that are appropriate for a wide variety of learners.

AXED 5110. Management of Change, Diffusion, and Adoption of Innovations
3 Credits (3)
Factors that influence rates of diffusion and adoption of innovations. Consequences of adopting or rejecting innovations. Processes by which change agents influence introduction and adoption of innovations. Taught with AXED 4110 with differential assignments for graduate students. May be repeated up to 3 credits.
Learning Outcomes
1. Critically examine the adoption-diffusion model. Included are issues such as social class differentials in the dissemination of ideas and technology, non-adoption as a form of behavior, social and economic constraints on adoption behavior, and the consequences of adoption at both the individual and social levels.
2. Demonstrate understanding of how the rapid pace of change in technology and applied science may have good and bad outcomes.
3. Discuss the dissemination of new ideas and technology within various social units.
4. Discuss the applications of the adoption-diffusion model from the perspective of the change agent.
5. Enhance the development of leadership skills required to work with people in times of change.

AXED 5130. Advanced Agricultural Mechanization
3 Credits (3)
This course provides an overview of advanced agriculture mechanization techniques and concepts. Precision farming tools and applications will be introduced, and hands-on activities will be utilized. A discussion about applications and benefits will frame the course lectures.
Learning Outcomes
1. Describe and classify various precision agriculture software/hardware technologies
2. Demonstrate usage of various precision agriculture technologies
3. Understand decision making processes associated with implementation of precision agriculture technologies
4. Analyze the costs, time, and application of precision agriculture technologies

AXED 5150. Strategic Communications Campaigns and Evaluation
3 Credits (3)
Client-based marketing and communication needs for stakeholders in agricultural and life sciences. Students will learn brand awareness for agricultural stakeholders by developing a campaign of communications and marketing materials using multiple channels (e.g., written, visual, social). Students will also evaluate the materials for their audience reach, visibility, and effectiveness. Strategic communications involve planning, prioritizing, and evaluating. Students will gain experience implementing these needs with a real-world client to keep materials relevant to industry demands. May be repeated up to 3 credits.
Learning Outcomes
1. Identify communications-related needs with a client or stakeholder in the food, agricultural, natural resources, and human (FANH) sciences.
2. Define priority communications areas to address client or stakeholder needs.
3. Direct a communications plan with channels, tactics, steps, and timelines.
4. Develop a campaign of communications materials (e.g., written, visual, social) around a client's needs.
5. Evaluate the reach, visibility, and effectiveness of the communications materials.
6. Manage a client's brand with desired audiences through establishing, promoting, and reinforcing messages.
7. Publish portfolio materials showcasing the client's brand.

AXED 5155. Youth Program Development and Management
3 Credits (3)
Designed for professionals involved in youth group activities. Basic concepts in planning, conducting, and managing educational youth programs in a variety of organizations. Taught with AXED 415 with differentiated assignments for graduate students. May be repeated up to 3 credits.

AXED 5160. Teaching Adults in Nonformal Settings
3 Credits (3)
The adult and postsecondary learner; adult learning styles and principles; use of community resources and problem-solving techniques; and learning strategies for adults in formal and nonformal education. Taught with AXED 430 with differentiated assignments for graduate students. May be repeated up to 3 credits.

AXED 5165. History and Philosophy of Agricultural and Extension Education
3 Credits (3)
History and Philosophy of Agricultural and Extension Education serves as a foundational core of graduate studies in Agricultural and Extension Education. The design of the course is to acquaint the student with a broad perspective of cultural and historical conditions that have shaped both education and agricultural education as we know it today. The primary purpose of this course is to explore the nature of selected philosophical concepts and philosophers and to evaluate their influence upon education and agricultural/extension education in the United States. In addition to philosophical influences, students will examine the historical events and governmental laws and policies that have evolved and developed our educational system of today.
Learning Outcomes
1. Understand the principles of philosophy in education and agricultural and extension education.
2. Recognize the influence of philosophers and philosophical documents upon education and agricultural and extension education.
3. Analyze the historical foundations that have established our modern educational system.
4. Develop a personal philosophy regarding education and agricultural education.

AXED 5170. Keys for Agricultural and Rural Development
3 Credits (3)
Introduction to concepts of development, the process of change, key factors that contribute to agricultural and rural development in a community, and strategies employed to effect change with implications for international students or domestic students planning to work internationally. May be repeated up to 3 credits.

AXED 5210. Curriculum Development and Assessment in Agricultural Education
3 Credits (3)
This course prepares students to develop curriculum, design lessons, and prepare appropriate assessments in an agricultural education setting. An emphasis will be placed on the developing curriculum using the currently established resources that are available to agriculture teachers.
Prerequisite: 2.5 GPA.

AXED 5215. Developing Excellent Programs in Career and Technical Education
3 Credits (3)
Students learn to develop excellence in the three components of a successful secondary school program in career and technical education: classroom and laboratory instruction, career and technical student organizations, and career development activities. Community-based program planning, utilizing partners, program marketing, and professional development are addressed as strategies for achieving excellence. Methods of obtaining financing and maintaining accountability of the program are discussed. Taught with AXED 445 with differentiated assignments for graduate students. May be repeated up to 3 credits.

AXED 5220. Methods for Teaching Agricultural and Technology Education
3 Credits (3)
Methods of instruction and presentation, selection of teaching aids and support materials, classroom management, development of a complete educational program, and microteaching experiences. Taught with AXED 446. May be repeated up to 3 credits.
Prerequisite: GPA of 3.0 or above.

AXED 5230. Directed Teaching in Agricultural or Technology Education
4-9 Credits (4-9)
Semester-long off-campus professional experience in directed teaching and observation provided in selected centers under secondary agricultural and technology supervising teachers. Students need to have completed a teaching methods class prior to enrolling in this course. Consent of Instructor required.

AXED 5235. Directed Teaching in Extension Education
4-9 Credits (4-9)
Four- to fourteen-week professional experiences in directed teaching and observation provided in cooperative extension at the county, regional, or state level. Taught with AXED 448 with reduced credit hours for graduate students. Restricted to AXED majors. May be repeated up to 9 credits.

AXED 5310. New Mexico Water Issues
3 Credits (3)
Designed for agricultural and natural resource professionals who must educate others or provide leadership on complex water issues in New Mexico. Students will travel to four distinct geographic and cultural regions of the state and study water policies, issues, and delivery technologies in each region. Specific areas covered will be determined by resource professionals who will present past, current and future issues involved in the distribution of water. Urban impacts on water use will also be investigated. May be repeated up to 3 credits.

AXED 5320. Risk and Crisis Communications in Agricultural, Consumer, and Environmental Sciences
3 Credits (3)
The purpose of this course is to introduce risk and crisis as interdisciplinary concepts, reviewing theoretical frameworks from a variety of fields and perspectives, such as communication, social psychology and public relations. Students will develop a theoretical understanding of all aspects of strategic communication pertaining risks. Using readings and reflective writings, you will understand how individuals cognitively process risks and how to leverage trust and knowledge to facilitate public understanding. In addition, you will learn crisis communication and management from an organizational perspective. Using case studies and discussions, students will be able to recommend strategies for managing crises occurred to agricultural and natural resource industries.
Learning Outcomes
1. Develop a critical understanding of theoretical and conceptual frameworks related to risk and crisis communications
2. Use an integrated framework to analyze the communication strategies used by the agricultural and natural resource industries
3. Recommend effective and ethical strategies for managing actual and potential crises

AXED 5330. Content Area Literacies
3 Credits (3)
Surveys integrated reading/writing/discursive practices in middle/secondary content areas.
Learning Outcomes
1. Analyze literacy processes, as they pertain to adolescent learners.
2. Discuss current trends and issues in content area literacy instruction with a specific focus on practices that promote achievement and equity.
3. Evaluate instructional practices that help students use reading, writing, speaking, listening, viewing and visually representing to learn the content areas.
4. Illustrate ethical reasoning and decision making in your approach to content area literacy education.
5. Integrate research, reflection, and best practices that positively impact students in a diverse society.

AXED 5510. Research Methods
3 Credits (3)
Students learn the research process as it is applied to solving problems in the behavioral sciences. Prepares students to conduct and critique research and to diffuse research findings. Implications, applications, and ethics of research also stressed. Students develop a research proposal for a problem of their choice. May be repeated up to 3 credits.

AXED 5515. Data Collection and Analysis
3 Credits (3)
Introduction to basic concepts of data collection and analysis. Interpretations from observational studies and controlled experiments. Roles of descriptive and inferential statistics in a complete data analysis. Mean, median, standard deviation, and graphical summaries of data. Correlation and simple regression. One- and two-sample tests and confidence intervals. Chi-square tests and basic analysis of variance. Competency in arithmetic and algebra required. An undergraduate statistics course recommended. May be repeated up to 3 credits.

AXED 5610. Leadership on Agricultural and Natural Resource Issues
3 Credits (3)
Investigates leadership concepts and group dynamics as they relate to a changing world and complex agricultural and natural resource issues. Topics include emotional intelligence, leading change, political leadership, facilitating agreement, team building, and managing conflict in agricultural and natural resource settings. Taught with AXED 475 with differential assignments for graduate students. May be repeated up to 3 credits.

AXED 5615. Effective Management of Volunteer Programs
3 Credits (3)
For individuals currently involved in, or interested in being involved in, the management and supervision of volunteer programs. Emphasis on

practical application, utilizing a research and academic base. Explores the roles, functions, and tasks of volunteers and managers of volunteers including recruitment, orientation and training, supervision, evaluation, recognition and retention. May be repeated up to 3 credits.

AXED 5993. Workshops in Agricultural, Extension, and Technology Education
1-3 Credits (1-3)
Workshop procedures applied to current trends in agricultural, extension, and technology education. A maximum of seven credits will count towards a degree. May be repeated up to 7 credits.

AXED 5994. Creative Component
1-4 Credits (1-4)
For nonthesis program. Individual investigations or projects, either qualitative or quantitative studies. A maximum of six credits will count towards a degree. May be repeated up to 88 credits.

AXED 5996. Special Topics
1-4 Credits (1-4)
Specific subjects and credits to be announced in the Schedule of Classes. Students can take only a maximum of four credits per semester and no more than six credits will count towards a degree. May be repeated up to 6 credits.

AXED 5998. Internship/Cooperative Experience
1-6 Credits (1-6)
Supervised professional on-the-job learning experience. May be repeated up to 6 credits.

AXED 5999. Master's Thesis
1-6 Credits (1-6)
Thesis. May be repeated up to 88 credits.

AXED 7000. Doctoral Dissertation
1-9 Credits (1-9)
Independent research planned, conducted and reported in consultation with and the direction of a major professor. Open only to students pursuing graduate study beyond the master's degree level. Offered for variable credit, 1-18 credit hours, maximum of 18 credit hours. May be repeated up to 18 credits.
Prerequisite: Graduate Advisor Approval.
Learning Outcomes
1. Identify/define problems pertinent to the discipline.
2. Generate questions and/or a hypothesis to provide a solution to the problem.
3. Review and summarize the literature relative to the problem.
4. Apply appropriate research methods and collect data systematically.
5. Conduct research responsibly and ethically.
6. Evaluate, interpret, and analyze a body of empirical data and evidence.
7. Discuss findings in the broader context of the field.
8. Develop and sustain an evidence#based argument.
9. Write and speak critically and coherently. 1
10. Produce publishable results.

Agricultural Communication Courses

ACOM 1110. Introduction to Agricultural Communication
3 Credits (3)
Students will learn about the history and theories of agricultural communications, be introduced to the degree program, explore careers in the field, and examine the role of media in agricultural communications. May be repeated up to 3 credits.
Learning Outcomes
1. Identify classes needed in the degree program and relevant clubs.
2. Recall important times in history of agricultural communication and journalism.
3. Comprehend the communication process and identify its components.
4. Identify effective and efficient media for agricultural communication.
5. Analyze the various roles and uses of media in agriculture communication.
6. Apply theories of communication and journalism to class assignments.

ACOM 1120. Introduction to Graphic Design in Agriculture
3 Credits (3)
This course focuses on introducing students to creating and critiquing visual communication materials in agricultural communications by developing understanding of visual communications, graphic design and branding principles as well as basic skills in using Adobe Illustrator and Photoshop software.
Learning Outcomes
1. Understand and demonstrate the correct use of formats, modes, and resolutions when creating or using graphics for various mediums and audiences.
2. Critique and evaluate graphic and photographic design elements in agricultural communications pieces.
3. Demonstrate a working knowledge of the Adobe Illustrator and Photoshop software and their uses for implementing principles of graphic design and branding.

ACOM 1130G. Effective Leadership and Communication in Agriculture
3 Credits (2+2P)
Theory and practice in leadership and communication for professionals who must work effectively in leadership and supervisory roles with people in agricultural business, industry, government agencies, and education. Course focuses on contemporary leadership theories. Oral communication skills in informative and persuasive speaking, parliamentary procedure, and for small groups are developed. May be repeated up to 3 credits.
Learning Outcomes
1. Understanding Leadership: Definitions of Leadership; Agricultural Education, FFA , Leadership; Leadership Categories; Democratic, Authorization, and Situational Leadership; Personality and Leadership Relations; Developing Leaders; Personal Leadership Development; Ability, Experience, and the Opportunity to Lead; Leadership in the Workplace; Human Relations, Technical, and Conceptual Skills
2. Communication Skills: Communication and Leadership; The Purpose of Communication; Forms of Communication; Communication Barriers and Styles; Verbal and Nonverbal Communication; Feedback; Self Communication and Interpersonal Communication
3. Leading Individuals and Groups: Group Dynamics and Team Building; Democratic Group Leadership; Importance of Groups; Types of Groups; Organizing Groups; Group Dynamics, Development, and Discussion
4. Conducting Successful Meetings: Skills Developed by Bring an Officer; Basic Meeting Functions; Characteristics of a Good Meetings; Planning and Preparing for Meetings; The Meeting Room; Committees; Informative and Motivational Meetings; Group Member Involvement; Officer and Member Responsibilities; Developing a Program of Activities

ACOM 2120. Photography in Agriculture
3 Credits (1+2P)
This is a field-based course focused on how to students use the camera as a tool to make the rules of photography and design work for the student's style, creativity, and goals pertaining to application of photography in agricultural communications. Students develop and disseminate a photography portfolio through a variety of communications channels.
Learning Outcomes
1. Utilize a DSLR or mirrorless camera to analyze scenarios to effectively curate a body of work that compliments agricultural communications practice
2. Demonstrate working knowledge of camera equipment and photography principles to create visual stories
3. Evaluate and critique imagery for use of photography skills and principles

ACOM 2998. Early Field- Based Experience in Agricultural Communications
1-4 Credits (1-4)
This course is designed to help you understand people and how to communicate with people. The key to all journalism or communications-related courses is to understand the audience well enough to know how to speak like them, to them, and to your stakeholders. The most successful communicators exhibit greatness in themselves and in their peers. Communicators cannot do their job if they do not show up with their best attitude and work ethic. Don't let your audience down, and we will make sure you are equipped to do so. May be repeated up to 6 credits.
Learning Outcomes
1. Explain the role of communications in the agricultural or science industries.
2. Develop a communication campaign for an agriculturally related client.
3. Identify key principles of communication channels including newswriting, radio production, and communication plans.
4. Create effective internship application materials to meet needs in the industry.
5. Design a job portfolio that includes examples of communications experience.

ACOM 3110. Agricultural Communications
3 Credits (3)
Principles and practical experience in news writing, radio production, newsletter design, public meeting presentations, video productions, graphics, and public relations activities, especially as related to the fields of agriculture and family and consumer sciences.

ACOM 3115. Global Issues in Agricultural Communications and Marketing
3 Credits (3)
Global perspectives related to international agricultural communications and marketing. The course will provide real-world settings for students to advance their awareness of international issues influencing marketing and trade in the United States and abroad. The course will expose students to high-impact learning, research skill development, communication skill development with a global mindset, and international travel. May be repeated up to 6 credits.
Learning Outcomes
1. Explain the role of communications and marketing in international agriculture.
2. Develop an awareness of global agricultural issues and how they impact domestic and international trade.
3. Increase awareness of global perspectives in agriculture.
4. Discover cultural similarities and differences within the U.S. and the selected country.
5. Investigate agricultural communications and marketing issues using an applied perspective.
6. Communicate course experiences through reflective analyses, photojournalism blog entries, social media campaigns, and presentations.

ACOM 3125. Website User Experience Design in Agriculture
3 Credits (3)
The purpose of this course is for students acquire user experience development, coding and web design skills in order to create a live personal portfolio website that demonstrates their professional skills and experiences in agriculture.
Learning Outcomes
1. Evaluate websites based on user experience principles
2. Use the fundamentals of HTML and CSS to edit code
3. Implement user experience principles in website design
4. Develop a website using WordPress
5. Explain and justify web design decisions

ACOM 3150. Communications Campaigns in Agriculture
3 Credits (3)
Client-based marketing and communication needs for stakeholders in agricultural and life sciences. Students will learn brand awareness for agricultural stakeholders by developing a campaign of communications and marketing materials using multiple modes (e.g., written, visual, social). Students in this course will gain an overall understanding of the agricultural communications industry by developing portfolio materials, prepare for the job and internship search process, and identify the skills necessary to grow in and contribute to a communications profession.
Learning Outcomes
1. Students will be able to identify communications-related needs with a client or stakeholder in the food, fiber, and natural resources industries.
2. Direct a communications plan with channels, tactics, steps, and timelines for a client.
3. Develop a campaign of communications materials (e.g., written, visual, social) around a client's needs.
4. Manage a client's brand with desired audiences through establishing, promoting, and reinforcing messages.

ACOM 3160V. Communicating Agriculture & Science to the Public
3 Credits (3)
Principles and practical experience in general communications channels (i.e., news writing, radio production, newsletter design, public meeting presentations, video productions, graphics, and public relations activities) related to the fields of agricultural, consumer, or environmental sciences. Students in this course will gain an overall understanding of the agricultural communications industry and identify the skills necessary to grow in and contribute to a communications profession.
Learning Outcomes
1. Explain the role of communications in the agricultural, consumer, or environmental science industries.
2. Develop a communication campaign for an agricultural, consumer, or environmental science related client.

3. Identify key principles of communication channels including news writing, radio production, and communication plans.
4. Design a social media campaign including Instagram, Facebook, Twitter,and/or other emerging platforms.
5. Develop skills in media communications including public relations, conducting radio and television interviews, developing interview skills and identifying the needs of an audience.
6. Create effective internship application materials to meet needs in the industry.
7. Design a job portfolio that includes examples of communications experience.
8. Examine social, ethical, and legal issues related to communicating components related to the agricultural, consumer, and environmental science industries.
9. Conduct an audience analysis of key issue related to the agricultural, consumer, and environmental science industries by analyzing demographics, psychographics, sociographics, and geographics of affiliated audience personas.

ACOM 4115. Agricultural and Scientific Publications
3 Credits (3)
Learn and gain experience with the principles and concepts of designing, writing, editing, producing and distributing a student insert to the ACES Magazine, including practical applications of writing feature articles, magazine design, layout and graphics.
Learning Outcomes
1. Execute the steps necessary to be a freelance writer.
2. Identify feature story ideas, contact sources and develop publishable stories.
3. Compare and contrast the varying types of publication materials (connection/spotlights, feature stories, social media sprints, etc.).
4. Comprehend publication design principles and current practices used in print communication industries.
5. Create, produce, publish and publicize a print magazine.
6. Connect with an audience through soft news.

ACOM 4120. Advanced Graphic Design and Layout in Agriculture
3 Credits (3)
This class provides an in-depth examination of visual communication principles and theories, design applications, and design topics relevant to the agricultural industry. Students will learn how to more deeply evaluate designs and layouts, create effective design pieces for targeted agricultural audiences, and further utilize the Adobe Creative Cloud software.
Learning Outcomes
1. Analyze and apply the principles underlying effective graphic design and layout
2. Recognize and discuss communication and visual theories for developing effective designs and layouts for intended purposes and audiences
3. Demonstrate an extensive working knowledge of Adobe Illustrator, Photoshop, and InDesign to create effective designs for both print and digital platforms

ACOM 4130. Strategic Brand Identity & Design in Agriculture
3 Credits (3)
The purpose of this course is for students to develop extensive understanding of strategic and visual theory and principles specific to branding as a critical aspect of business development in all aspects of agriculture and natural resources. Students will utilize research and Adobe Creative Cloud to design targeted brand strategy, client brief, and design strategy to effectively build a client pitch.
Prerequisite: ACOM 1120.
Learning Outcomes
1. Articulate the significance of utilizing brand identity for differentiation
2. Apply extensive knowledge of visual and brand theory, principles, strategy and application to various contexts in agriculture and natural resources
3. Research, design and pitch a brand strategy, client brief and design strategy

ACOM 4998. Internship in Agricultural Communications
3-12 Credits (3-12)
The experiential learning experience selected by students and approved by their academic advisor will form the basis of this course. Students will apply problem-solving skills, communication skills, and disciplinary knowledge through an internship related to agricultural communications. During the internship, students will gain real-world experience in their specific field of interest within the discipline. May be repeated up to 12 credits.
Learning Outcomes
1. Synthesize discipline-specific knowledge and its application to real-world contexts
2. Design and implement solutions to meet project-related tasks
3. Produce professional-quality deliverables for the employer and for the course
4. Handle a high level of responsibility with professionalism and care in preparation and presentation

ACOM 5115. Global Issues in Agricultural Communications and Marketing
3 Credits (3)
Graduate-level course broadening global perspectives related to international agricultural communications and marketing. The course will provide real-world settings for students to advance their awareness of international issues influencing marketing and trade in the United States and abroad. The course will expose students to high-impact learning, research skill development, communication skill development with a global mindset, and international travel. May be repeated up to 6 credits.
Learning Outcomes
1. Explain the role of communications and marketing in international agriculture.
2. Develop an awareness of global agricultural issues and how they impact domestic and international trade.
3. Increase awareness of global perspectives in agriculture.
4. Discover cultural similarities and differences within the U.S. and the selected country.
5. Investigate communications and marketing issues using an applied perspective.
6. Communicate course experiences through reflective analyses, photojournalism blog entries, social media campaigns, and presentations.
7. Research and dissemination information regarding international issues in agriculture using critical thinking skills.

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Agricultural and Extension Education (Agricultural Communications) - Bachelor of Science in Agriculture

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. At least 19–22 hours must be in Agricultural, Consumer, and Environmental Sciences (ACES) (*in addition to the courses listed for the ACES minor*). At least 18 hours for the Journalism/Media Studies Minor. At least 18 hours for Agricultural, Consumer, and Environmental Sciences (ACES) Minor

Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

See your academic advisor for more information.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1 [1]		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2 [1]		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2130G	Advanced Composition	
or ENGL 2210H	Professional and Technical Communication	
Oral Communication [1]		
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
Area II: Mathematics [1]		
MATH 1220G	College Algebra	3
or MATH 1350G	Introduction to Statistics	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
HORT 1115G	Introductory Plant Science	4
JOUR 105G	Media and Society	3
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (3 or 4 credits) [1]		3-4
FWCE 1110G	Introduction to Natural Resources Management (Recommended)	
ECON 2120G	Principles of Microeconomics Honors (Recommended)	
AEEC 2130G	Survey of Food and Agricultural Issues (Recommended)	
Area V: Humanities [1]		
HIST 1110G	United States History I	3
Area VI: Creative and Fine Arts [1]		
ENGL 2310G	Introduction to Creative Writing	3
General Education Elective [1]		*3-4*
Viewing A Wider World [2]		
JOUR 377V	Mass Media Ethics	3
AEEC 3140V	Agricultural Policy	3
Departmental/College Requirements		
ACES 1120	Freshman Orientation	1
ACOM 1110	Introduction to Agricultural Communication	3
ACOM 1120	Introduction to Graphic Design in Agriculture	3
ACOM 2120	Photography in Agriculture	3
ACOM 3150	Communications Campaigns in Agriculture	3
ACOM 3160V	Communicating Agriculture & Science to the Public	3
ACOM 4115	Agricultural and Scientific Publications	3
ACOM 4998	Internship in Agricultural Communications	6
ANSC 1120	Introduction to Animal Science	3
ACOM Electives (6 credits)		**6**
ACES Electives: select 12 credits (see below)		**12**
Agricultural and Extension Education		
Agricultural Economics and Agriculutural Business		
Animal and Range Sciences		
Entomology, Plant Pathology and Weed Sciences		
Family and Consumer Sciences		
Fish, Wildlife, and Consevation Ecology		
Hotel, Restaurant, and Tourism Management		
Plant and Enviornmental Sciences		
Journalism and Media Studies Minor (required; choose one of the JOUR minors below) [3]		**18**
Journalism and Media Studies Minor		
Social Media Management		
Strategic Communications		
AEEC Minor 18 Credits (See below)		
AEEC 2110	Principles of Food and Agribusiness Management (AEEC Elective)	3
AEEC 2120	Introduction to Food and Agribusiness Accounting	3
AEEC 3210	Marketing and Food Agricultural Products	3
AEEC Agricultural Policy Elective		3
AEEC Ag Business/Ag Economics Elective		3
AEEC Ag Business/Ag Economics Elective		3
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**0**
Total Credits		**120-122**

1 See the General Education (p. 262) section of this catalog for a full list of courses

2 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

3 Courses for the Journalism Minors can be found:

- Journalism and Media Studies - Undergraduate Minor (https://catalogs.nmsu.edu/nmsu/arts-sciences/journalism-media-studies/journalism-media-studies-undergraduate-minor/)
- Social Media Management - Undergraduate Minor (https://catalogs.nmsu.edu/nmsu/arts-sciences/journalism-media-studies/social-media-management-undergraduate-minor/)
- Strategic Communications - Undergraduate Minor (https://catalogs.nmsu.edu/nmsu/arts-sciences/journalism-media-studies/strategic-communication-undergraduate-minor/)

4 Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

First Year		
Semester 1		**Credits**
ACES 1120	Freshman Orientation	1
ACOM 1110	Introduction to Agricultural Communication	3
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
HORT 1115G	Introductory Plant Science	4
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
	Credits	**15**
Semester 2		
ACOM 1120	Introduction to Graphic Design in Agriculture	3
ENGL 2210G or ENGL 2130G or ENGL 2210H	Professional and Technical Communication or Advanced Composition or Professional and Technical Communication	3
JOUR 105G	Media and Society	3
MATH 1220G	College Algebra	3
ANSC 1120	Introduction to Animal Science	3
	Credits	**15**
Second Year		
Semester 1		
ACOM 3150	Communications Campaigns in Agriculture	3
HIST 1110G	United States History I	3
Journalism Minor Course [1]		3
AEEC 2110	Principles of Food and Agribusiness Management	3
AEEC 2120	Introduction to Food and Agribusiness Accounting	3
	Credits	**15**
Semester 2		
ACOM 2120	Photography in Agriculture	3
AEEC 3210	Marketing and Food Agricultural Products	3
JOUR 377V	Mass Media Ethics	3
Either Area III/IV Lab Science or Social Behavioral Sci.		3
Journalism Minor Course [1]		3
	Credits	**15**
Third Year		
Semester 1		
ACOM 3160V	Communicating Agriculture & Science to the Public	3
ACOM 4998	Internship in Agricultural Communications	3
General Education Elective		3
Journalism Minor Course [1]		3
ACES Elective		3
	Credits	**15**
Semester 2		
ACOM 4998	Internship in Agricultural Communications	3
ENGL 2310G	Introduction to Creative Writing	3
ACES Elective Course [2]		3
AEEC Ag Business/Ag Economics Elective		3
Journalism Minor Course [1]		3
	Credits	**15**
Fourth Year		
Semester 1		
ACOM Elective Course		3
AEEC Ag Business/Ag Economics Elective [3]		3
AEEC Agricultural Policy Elective		3
Journalism Minor Course [1]		3
ACES Elective Course [2]		3
	Credits	**15**
Semester 2		
ACOM 4115	Agricultural and Scientific Publications	3
ACOM Elective Course		3
ACES Elective Course [2]		3
ACES Elective Course [2]		3
Journalism Minor Course [1]		3
	Credits	**15**
	Total Credits	**120**

[1] Journalism Minor Courses from one of the following Minors:

- Journalism and Media Studies - Undergraduate Minor (https://catalogs.nmsu.edu/nmsu/arts-sciences/journalism-media-studies/journalism-media-studies-undergraduate-minor/)
- Social Media Management - Undergraduate Minor (https://catalogs.nmsu.edu/nmsu/arts-sciences/journalism-media-studies/social-media-management-undergraduate-minor/)
- Strategic Communications - Undergraduate Minor (https://catalogs.nmsu.edu/nmsu/arts-sciences/journalism-media-studies/strategic-communication-undergraduate-minor/)

[2] ACES Electives- 15 credits from either of the following departments/areas:

- Agricultural and Extension Education
- Agricultural Economics and Agricultural Business
- Animal and Range Sciences
- Entomology, Plant Pathology and Weed Sciences
- Family and Consumer Sciences
- Fish, Wildlife and Conservation Ecology
- Hotel, Restaurant and Tourism Management
- Plant and Environmental Sciences

[3] AEEC Minor Courses listed on the Requirements (p. 338) tab

Agricultural and Extension Education (Agricultural Education Teaching) - Bachelor of Science in Agriculture

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications (10 credits)		
English Composition - Level 1 [1]		
ENGL 1110G or ENGL 1110H or ENGL 1110M	Composition I Composition I Honors Composition I	4

English Composition - Level 2 [1]		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
or ENGL 2210M	Professional and Technical Communication for Multilingual Students	
Oral Communication		
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
Area II: Mathematics (6 credits) [1]		
MATH 1220G	College Algebra	3
MATH 1130G	Survey of Mathematics	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
Area III: Laboratory Sciences Course (8 credits) [1]		
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
AGRO 1110G	Introduction to Plant Science (Lecture & Lab)	4
or HORT 1115G	Introductory Plant Science	
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
AEEC 2130G	Survey of Food and Agricultural Issues	3
Area V: Humanities (3 credits)		
Choose one from the following:		
HIST 1110G	United States History I	
or HIST 1120G	United States History II	
Area VI: Creative and Fine Arts (3 credits)		
Select one course from Area VI [1]		3
Viewing A Wider World (6 credits) [3]		
ANSC 351V	Agricultural Animals of the World	
or EPWS 325V	Insects, Humans, and the Environment	
Choose one additional VWW Course from a College outside of the College of ACES		
GEOG 315V	World Agriculture and Food Problems (recommended)	
Departmental/College Requirements (64 credits)		
ACES 1120	Freshman Orientation	1
ACES 1210	Financial Fitness for College Students	1
AXED 1110	Introduction to Agricultural, Extension, and Technology Education	3
AXED 1130	Techniques in Agricultural Mechanization	3
AXED 2110	Metal Fabrication	3
AXED 2130	Early Field-Based Experience	2
AXED 3130	Advanced Technology in the Agricultural Mechanization	3
AXED 3150	Philosophy and Methods of Contests	3
AXED 4210	Curriculum Development and Assessment in Agricultural Education	3
AXED 4215	Developing Excellent Programs in Career and Technical Education	3
AXED 4220	Methods for Teaching Agricultural and Technology Education	3
AXED 4230	Directed Teaching in Agricultural or Technology Education	15
AXED 4520	Methods in Career and Technical Laboratory Instruction	2
AXED 4620	Methods of Teaching Biological, Earth and Physical Sciences in Agriculture	3
READ 4330	Content Area Literacy (or AXED 4330 Content Area Literacies)	3
SPED 3105	Introduction to Special Education in a Diverse Society (or AXED)	3
ANSC 1120	Introduction to Animal Science	3
ANSC 1120L	Introduction to Animal Science Lab	1
SOIL 2110	Introduction to Soil Science	3
SOIL 2110L	Introduction to Soil Science Laboratory	1
ANSC 304	Feeds and Feeding	3
ANSC 310	Exhibiting Livestock	3
ACOM 3160V	Communicating Agriculture & Science to the Public	3
Agricultural Science Electives (7 - 13 credits) [2]		
Select from 7 to 13 credits from the following:		13
Agricultural Economics		
Plant, Pest and Soil Sciences		
Animal Science		
Horticulture		
Natural Resources		
Second Language: (not required)		
Electives, to bring the total credits to 120 (0-6 credits) [4]		**6**
Total Credits		**120**

1 See the General Education (p. 262) section of this catalog for a full list of courses

2 ACOM 1130G Effective Leadership and Communication in Agriculture will also count towards the Departmental/College requirements.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

4 Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ACES 1120	Freshman Orientation	1
ACES 1210	Financial Fitness for College Students	1
AXED 1110	Introduction to Agricultural, Extension, and Technology Education	3
AXED 1130	Techniques in Agricultural Mechanization	3
ENGL 1110G	Composition I [1]	4
MATH 1220G	College Algebra	3
	Credits	**15**
Semester 2		
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
AXED 2110	Metal Fabrication	3
AEEC 2130G	Survey of Food and Agricultural Issues	3
Choose HIST 1110G or HIST 1120G		3

MATH 1130G	Survey of Mathematics	3
HIST 1110G U.S. History I		
HIST 1120G U.S. History II		
	Credits	**15**
Second Year		
Semester 1		
ANSC 1120	Introduction to Animal Science	3
ANSC 1120L	Introduction to Animal Science Lab	1
HORT 1115G or AGRO 1110G	Introductory Plant Science or Introduction to Plant Science (Lecture & Lab)	4
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
ENGL 2210G	Professional and Technical Communication [1]	3
	Credits	**15**
Semester 2		
AXED 3150	Philosophy and Methods of Contests	3
AXED 3130	Advanced Technology in the Agricultural Mechanization	3
AXED 4215	Developing Excellent Programs in Career and Technical Education	3
ACOM 3160V	Communicating Agriculture & Science to the Public	3
Area VI Creative and Fine Arts Course		3
	Credits	**15**
Third Year		
Semester 1		
AXED 2130	Early Field-Based Experience	2
SOIL 2110	Introduction to Soil Science	3
SOIL 2110L	Introduction to Soil Science Laboratory	1
Agricultural Science Elective/Elective		3
GEOG 315V	World Agriculture and Food Problems	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
	Credits	**15**
Semester 2		
AXED 4210	Curriculum Development and Assessment in Agricultural Education	3
AXED 4620	Methods of Teaching Biological, Earth and Physical Sciences in Agriculture	3
ANSC 310	Exhibiting Livestock	3
ANSC 304	Feeds and Feeding	3
Agricultural Science Elective/Elective		3
	Credits	**15**
Fourth Year		
Semester 1		
AXED 4220	Methods for Teaching Agricultural and Technology Education	3
AXED 4520	Methods in Career and Technical Laboratory Instruction	2
ANSC 351V or EPWS 325V	Agricultural Animals of the World or Insects, Humans, and the Environment	3
Agricultural Science Elective		4
READ 4330	Content Area Literacy (or AXED 5330)	3
	Credits	**15**
Semester 2		
AXED 4230	Directed Teaching in Agricultural or Technology Education	15
	Credits	**15**
	Total Credits	**120**

[1] Students need to understand and complete any prerequisites prior to enrolling into this course.

[2] See the General Education (p. 262) section of this catalog for a full list of courses

Agricultural and Extension Education (Agricultural Extension/Development) - Bachelor of Science in Agriculture

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
ACOM 1130G	Effective Leadership and Communication in Agriculture (Departmental/College Requirement) [2]	3
Area II: Mathematics		
MATH 1220G	College Algebra	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
AGRO 1110G	Introduction to Plant Science (Lecture & Lab)	4
or HORT 1115G	Introductory Plant Science	
AEEC 2130G	Survey of Food and Agricultural Issues	3
Area V: Humanities		
Choose one from the following:		3
HIST 1110G	United States History I	
HIST 1120G	United States History II	
Area VI: Creative and Fine Arts		
MUSC 1130G	Music Appreciation: Western Music	3
General Education Elective [1]		
PSYC 1110G	Introduction to Psychology	3
Viewing A Wider World [3]		**6**
ANSC 351V	Agricultural Animals of the World	
or EPWS 325V	Insects, Humans, and the Environment	
Choose one additional VWW Course from a College outside of the College of ACES		

GEOG 315V	World Agriculture and Food Problems (recommended)	
Departmental/College Requirements		
ACES 1120	Freshman Orientation	1
AXED 1110	Introduction to Agricultural, Extension, and Technology Education	3
AXED 1130	Techniques in Agricultural Mechanization	3
AXED 2110	Metal Fabrication	3
AXED 2130	Early Field-Based Experience	2
AXED 3130	Advanced Technology in the Agricultural Mechanization	3
AXED 3150	Philosophy and Methods of Contests	3
AXED 4110	Management of Change, Diffusion, and Adoption of Innovations	3
AXED 4215	Developing Excellent Programs in Career and Technical Education	3
AXED 4220	Methods for Teaching Agricultural and Technology Education	3
AXED 4235	Directed Teaching in Extension Education	12
AXED 4620	Methods of Teaching Biological, Earth and Physical Sciences in Agriculture	3
AXED 4710	4-H Youth Development	1
ACOM 1110	Introduction to Agricultural Communication	3
ACOM 3150	Communications Campaigns in Agriculture	3
ACOM 3160V	Communicating Agriculture & Science to the Public	3
ANSC 1120	Introduction to Animal Science	3
ANSC 1120L	Introduction to Animal Science Lab	1
ANSC 304	Feeds and Feeding	3
ANSC 310	Exhibiting Livestock	3
SOIL 2110	Introduction to Soil Science	3
SOIL 2110L	Introduction to Soil Science Laboratory	1
Agricultural Elective Courses 12 credits from the following: [2]		12
Agricultural Communications		
Agricultural Economics		
Agricultural Mechanics		
Plant, Pest and Soil Sciences		
Animal Science		
Horticulture		
Second Language: (not required)		
Elective or other Ag Elective, to bring the total credits to 120 [4]		**3**
Total Credits		**120**

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ACES 1120	Freshman Orientation	1
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
AXED 1110	Introduction to Agricultural, Extension, and Technology Education	3
ACOM 1110	Introduction to Agricultural Communication	3
AGRO 1110G or HORT 1115G	Introduction to Plant Science (Lecture & Lab) or Introductory Plant Science	4
	Credits	**15**
Semester 2		
MATH 1220G	College Algebra [1]	3
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
AXED 1130	Techniques in Agricultural Mechanization	3
AXED 2110	Metal Fabrication	3
Choose from one of the following:		3
HIST 1110G	United States History I	
HIST 1120G	United States History II	
	Credits	**15**
Second Year		
Semester 1		
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	3
SOIL 2110	Introduction to Soil Science	3
SOIL 2110L	Introduction to Soil Science Laboratory	1
AXED 4710	4-H Youth Development	1
MUSC 1130G	Music Appreciation: Western Music	3
	Credits	**15**
Semester 2		
AXED 4215	Developing Excellent Programs in Career and Technical Education	3
PSYC 1110G	Introduction to Psychology	3
AEEC 2130G	Survey of Food and Agricultural Issues	3
AXED 2130	Early Field-Based Experience	2
ANSC 1120	Introduction to Animal Science	3
ANSC 1120L	Introduction to Animal Science Lab	1
	Credits	**15**
Third Year		
Semester 1		
GEOG 315V	World Agriculture and Food Problems	3
AXED 4220	Methods for Teaching Agricultural and Technology Education	3
ACOM 3160V	Communicating Agriculture & Science to the Public	3
Agricultural Elective		3
Agricultural Elective		3
	Credits	**15**
Semester 2		
ANSC 310	Exhibiting Livestock	3
AXED 3150	Philosophy and Methods of Contests	3
ACOM 3110	Agricultural Communications	3
AXED 4620	Methods of Teaching Biological, Earth and Physical Sciences in Agriculture	3
Agricultural Elective		3
	Credits	**15**
Fourth Year		
Semester 1		
Agricultural Elective		3
Elective		3
ANSC 304	Feeds and Feeding	3

AXED 3130	Advanced Technology in the Agricultural Mechanization	3
ANSC 351V or EPWS 325V	Agricultural Animals of the World or Insects, Humans, and the Environment	3
	Credits	**15**
Semester 2		
AXED 4235	Directed Teaching in Extension Education	12
AXED 4110	Management of Change, Diffusion, and Adoption of Innovations	3
	Credits	**15**
	Total Credits	**120**

Agricultural Communications - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
ACOM 1110	Introduction to Agricultural Communication	3
ACOM 1120	Introduction to Graphic Design in Agriculture	3
ACOM 3150	Communications Campaigns in Agriculture	3
Select 9 credits (3 courses) from the following courses, only one 2000-level course can be used:		9
ACOM 2120	Photography in Agriculture	
ACOM 2998	Early Field- Based Experience in Agricultural Communications	
ACOM 3115	Global Issues in Agricultural Communications and Marketing	
ACOM 3125	Website User Experience Design in Agriculture	
ACOM 3160V	Communicating Agriculture & Science to the Public	
ACOM 4115	Agricultural and Scientific Publications	
ACOM 4120	Advanced Graphic Design and Layout in Agriculture	
ACOM 4130	Strategic Brand Identity & Design in Agriculture	
Total Credits		**18**

Leadership in Agricultural Communications - Undergraduate Minor

The department offers a minor in Leadership in Agricultural Communications, which may be earned by completing the following coursework.

Prefix	Title	Credits
Required Courses		
Agricultural Leadership or Communication Courses in the Department of Agricultural and Extension Education [1]		12
Leadership Related Course from Outside the Department of Agricultural and Extension Education		3
Agricultural or Natural Resource Policy Course		3
Total Credits		**18**

[1] Student must get approval from Agricultural and Extension Education (AXED) Faculty

Minor must include 9 credits of upper division courses.

Agricultural Economics and Agricultural Business

Undergraduate Program Information

The Department of Agriculture Economics and Agricultural Business offers two Bachelor of Science in Agriculture degrees. A Bachelor of Science in Agriculture with a major in Agricultural Economics and Agricultural Business (AEAB) and a Bachelor of Science in Agriculture with a major in Natural Resource Economics and Policy (NREP).

Agricultural Economics and Agricultural Business - Bachelor of Science in Agriculture

The AEAB degree prepares students for leadership positions with companies that operate in the food and fiber supply chain. Positions may focus on areas of agribusiness management, agricultural production, financing, marketing, and economics. Recent AEAB graduates have accepted positions with national and international companies, non-profits, and government agencies. Many graduates are also successful entrepreneurs.

In this program, faculty, students, and industry stakeholders work together to provide students with real-world examples and opportunities to apply their skills and knowledge through departmental course offerings. The curriculum is designed to educate students as business professionals with the necessary skills to succeed in professional positions. Depending on their interest, students can customize their path of study to include additional courses in marketing, finance, or natural resource management.

Natural Resource Economics and Policy - Bachelor of Science in Agriculture

The Department of Agriculture Economics and Agricultural Business offers the Bachelor of Science in Natural Resource Economics and Policy (NREP); an undergraduate degree that trains students on the socio-economic and bio-physical aspects of environmental and natural resource management and policy. With increasing competition for limited land, water, and other natural resources in the U.S. and throughout the world, as well as growing concern about environmental degradation, there is a growing need for professionals who can assist in the process of balancing economic and environmental tradeoffs. The NREP major provides students with knowledge and skills to articulate and apply economic principles to a range of public and private sector issues such as land use, energy, wildlife, climate and air resources, and water. This major prepares students for private and public sector positions in resource assessment, management, or administration.

Graduate Program Information

The Department of Agricultural Economics and Agricultural Business supports six graduate programs. Several of these programs are offered with cooperation from other departments on campus. The six programs supported by AEAB include:

- Masters of Science in Agricultural Economics;
- Masters of Agriculture with a concentration in agribusiness;
- Masters of Business Administration with a concentration in agribusiness;
- Doctorate of Economic Development;
- MS & Ph.D. in Water Science Management; and
- Minor in Agribusiness.

Masters of Science in Agricultural Economics

Master of Science (MS) in Agricultural Economics program provides rigorous training in economic theory, applied economic analysis, and quantitative methods. The degree and curriculum are designed to prepare students for professional careers in business, government, research, and for continued education in pursuit of a Ph.D. The program requires students to complete a Master's thesis working closely with a faculty committee.

Masters of Agriculture with a concentration in Agribusiness

Master of Agriculture (MAG-AB) with a concentration in Agribusiness provides students with backgrounds or interests in agriculture with graduate-level training in agribusiness and applied economics. Students are able to develop knowledge and skills related to applied economics, finance, marketing, management, and quantitative methods and skills commonly used in managing businesses operating within the food and fiber value chain. The degree offers an alternative for individuals holding undergraduate degrees in various agricultural and food science fields to learn and develop skills needed to start or manage an agricultural business. The program requires students to complete a creative component or thesis working closely with a faculty committee. Courses are offered in a hybrid format allowing students not living in or near Las Cruces to participate in the program. This program is also offered online allowing working professionals to participate in it.

Masters of Business Administration with a concentration in Agribusiness

Master of Business Administration with a concentration in Agribusiness (MBA-AB) prepares students for business and public sector careers in agriculture and the food and fiber industry. Graduates from this program are knowledgeable about the U.S. and international food and fiber sectors and hold an AACSB International accredited MBA degree.

Doctor of Economic Development

Doctor of Economic Development (DED) is a professional doctorate designed to provide advanced training for economic development professionals. It is not designed to prepare graduates for academic careers.

Interdisciplinary Masters in Water Science and Management and Ph.D. in Water Science and Management

The Water Science program is an interdisciplinary program supported by AEAB faculty that provides graduate education for the next generation of water resources researchers, educators, and managers. The program provides knowledge and tools that can be used to address state, national, and international water challenges including water quality, quantity, timing/availability, and location of water resources.

Minor in Agribusiness

The graduate minor in Agribusiness provides graduate students training on business and economics methods to analyze agribusiness enterprises.

Degrees for the Department

Bachelor Degree(s)

- Agricultural Economics and Agricultural Business - Bachelor of Science in Agriculture (p. 352)
- Natural Resource Economics and Policy - Bachelor of Science in Agriculture (p. 354)

Master Degree(s)

- Agricultural Economics - Master of Science (p. 102)
- Agriculture (Agribusiness) - Master of Agriculture (p. 97)
- Agriculture (Agribusiness) - Master of Agriculture (Online) (https://catalogs.nmsu.edu/global/nmsu-global/agriculture-agribusiness-mag-online/)
- Business Administration (Agribusiness) - Master of Business Administration (p. 117)

Doctoral Degree(s)

- Economic Development - Doctor of Economic Development (p. 214)

Minors for the Department

Undergraduate Minors

- Agricultural Business Management- Undergraduate Minor (p. 357)
- Natural Resource Economics - Undergraduate Minor (p. 357)

Graduate Minors

- Agribusiness - Graduate Minor (p. 254)

Professor, Carlos E. Carpio Ochoa, Department Head

Professors Acharya, Hurd, Lillywhite, Patrick, Ward
Associate Professors Robinson
Assistant Professors Boufous, Dsouza, Miller, Regmi, Torell
College Professors Townsend

Department of Agricultural Economics and Agricultural Business:

C.E. Carpio Ochoa, Department Head, Ph.D. (North Carolina State University)– food and agricultural economics, applied econometrics/statistics; ***Professors*** *R.N. Acharya, Ph.D. (Auburn)– food safety, logistics management, technology adoption, and marketing; B. H. Hurd, Ph.D. (California-Davis)– water and natural resource economics; J. Lillywhite, Ph.D. (Purdue)– food and agribusiness management and marketing; M. Patrick, Ph.D. (Michigan State University)– Economic Development; F. A. Ward, Ph.D. (Colorado State)– resource economics, welfare economics;* ***Associate Professors*** *C. Robinson, Ph.D. (New Mexico State)- consumer behavior, agricultural production, marketing sales;* ***Assistant Professors*** *S. Boufous, Ph.D. (Texas Tech University)- sustainability, production economics, consumer demand analysis, and non-market valuation; A. Dsouza, Ph.D. (Arizona State University)- production economics, food supply chain management, and marketing; F. Miller, Ph.D. (University of Texas-Dallas)- agricultural economics, policy, dairy, range livestock; M. Regmi, Ph.D. (Kansas State University)- agricultural finance, risk management, production economics; G. Torell, Ph.D. (University of Wyoming)- agricultural economics, natural resources, environmental economics;* ***College Professors*** *J. Townsend, Ph.D. (Oklahoma State University) commodity risk management, agricultural marketing;* ***Affiliated Faculty*** *D. Blayney, Ph.D. (Washington State University) agricultural supply chain; dairy production;* ***Emeritus Faculty*** *V. Bullock M.S. (Emeritus) (New Mexico State University) real estate, real estate appraisal; P. Gutierrez, Ph.D. (Emeritus) (Oklahoma State)– extension, ranch economics, economic development; J. D. Libbin, Ph.D. (Emeritus) (Iowa State)– farm management, production economics; R. Skaggs, Ph.D. (Emeritus) (Utah State)– agriculture and natural resource policy*

Department of Economics, Applied Statistics and International Business:

Y. F. Lee, Ph.D. (Southern Illinois-Carbondale)-international finance and trade, international monetary system, economic development; ***Professors*** *L. Blank, Ph.D. (Tennessee, Knoxville)- microeconomic theory, managerial economics, and regulatory economics; C, Erickson, Ph.D. (Arizona State)-regional (Latin American) economic growth and development; money and banking; R. L. Steiner, Ph.D. (Oklahoma State)-likelihood methods, discrete distributions, and exact tests; B. Widner, Ph.D. (Colorado State)-urban/regional development, managerial economics, and public finance; D. M. VanLeeuwen, Ph.D. (Oregon State)-statistics;* ***Associate Professors*** *J. Caldwell Ph.D. (Illinois)-energy economics, utility rate design, climate policy; C. Gard, Ph.D. (Washington)-biostatistics, and breast cancer risk prediction; L. LaPlue (Tennessee)-international and environmental economics; M. Li, Ph.D.(Pennsylvania State)-labor, urban, and agricultural economics; J. Mamkhezri, Ph.D. (New Mexico)-energy, natural resources, environmental and health economics; C. Sroka (Ohio State)-count data models, and health economics;* ***Assistant Professors*** *J. Dawson Ph.D. (UW-Madison)–statistics, biostatistics; S. Jeon Ph.D. (North Carolina)-environmental statistics, extreme value analysis, and spatio-temporal modeling;* ***College Assistant, Associate, and Full Professors:*** *(College Associate Prof.) B. Bai, MS (New Mexico State)-applied statistics, behavioral science; (College Assistant Prof.) C. Blume, Master of Accountancy (New Mexico State); (College Full Prof.) M. Downes, Ph.D. (New Mexico)–environmental and natural resources economics, econometries and quantitative economics; (College Associate Prof.) F. Pallares, DED (New Mexico State)–economic development; (College Full Prof.) L. Vargas, DED (New Mexico State)-international development, institutional economics, and border economics;* ***Emeritus Faculty*** *R. V. Adkisson, Ph.D. (Nebraska)-international, public finance, economic development; K. Brook, Ph.D. (Texas-Austin)-macroeconomic theory, monetary policy; D.L. Clason, Ph.D. (Kansas State); D. L. Daniel, Ph.D. (Southern Methodist)-nonparametric, statistical computing, and environmental research; C. Enomoto, Ph.D. (Texas A&M)-econometrics, economic theory; M. Ellis, Ph.D. (California-Riverside)-economic development; D. A. Gegax, Ph.D. (Wyoming)-public utility economics, industrial organization; W. R. Gould, Ph.D. (North Carolina State)-biological sampling, wildlife and fisheries estimation. B. N. Matta, Ph.D. (Texas-Austin); J. T. McGuckin, Ph.D. (Wisconsin-Madison); J. T. Peach, Ph.D. (Texas-Austin)-quantitative economics, border studies, economic development; A.V. Popp, Ph.D., (Northern Illinois); D.B. Smith, Ph.D., E. S. Willman, Ph.D. (Indiana).*

Agricultural Economics Courses

AEEC 1110. Introduction to Agricultural Economics and Business
3 Credits (3)
This course is an orientation to agricultural economics and business through the discovery process for the consumer in the food, fiber, and natural resource sectors of the global economy. The course discusses the application of micro-and macro-economic principles as they relate to agricultural economics and business. May be repeated up to 3 credits.
Learning Outcomes
1. Gain a broad understanding of the role of the consumer in the market-place for agricultural commodities, producers, agencies and the global market structure.
2. Apply introductory economic principles to applied global situations.
3. Employ economic concepts in the application of production level decision making.
4. Employ economic principles to the basic and global agricultural community.
5. Understand relationships that exist between producers and consumers.

AEEC 1120. Careers in Food and Agribusiness
1 Credit (1)
This course provides an orientation to careers in agricultural economics and agricultural business. Students will learn about the agricultural supply chain in New Mexico, the United States, and the world. Students will be introduced to faculty and staff within the department, learn about career opportunities available to AEAB graduates, and develop a greater appreciation of current agricultural issues. Freshman status or consent of instructor required. May be repeated up to 1 credit.
Learning Outcomes
1. Become familiar with career opportunities in agricultural economics and agricultural business
2. Understand knowledge and skills desired by employers
3. Become acquainted with faculty and staff in the Department of Agricultural Economics and Agricultural Economics and resources available to students within the Department
4. Refine written and verbal communication skills

AEEC 2110. Principles of Food and Agribusiness Management
3 Credits (3)
This course introduces business management theory and application of theory related to businesses within the food and fiber supply chain. Topics include management and financial principles, market planning, and organization theory. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate, refine and expand written and oral communication skills
2. Develop an understanding of basic financial statements, their use and analysis
3. Understand the roles management and management styles play in modern agribusiness
4. Learn about the history of agribusiness domestically and internationally
5. Integrate the role of technology into modern agribusiness management

AEEC 2120. Introduction to Food and Agribusiness Accounting
3 Credits (3)
This course outlines the purpose and methods of keeping and analyzing farm and ranch records. Course topics include financial statements, efficiency measures, analysis of the business, and tax computations.
Learning Outcomes
1. Understand the terminology and principles used in modern farm and ranch financial management statements.
2. Evaluate capital investments, analyze farm business performance, and develop tools for financial planning and analysis
3. Evaluate farm and ranch cash flows

AEEC 2130G. Survey of Food and Agricultural Issues
3 Credits (3)
Survey of food and agricultural issues, including: geography of food production and consumption; human-agricultural-natural resource relations; agriculture in the United States and abroad; modern agribusiness; food safety; food, agriculture, and natural resources policy; ethical questions; role and impact of technology. Crosslisted with: FSTE 2130G.
Learning Outcomes
1. Understand of global agriculture including production techniques used in various geographical regions, consumption trends, and political and social constraints.
2. Synthesis information about agricultural issues and make informed arguments

3. Articulately discuss modern issues in agriculture
4. Write coherent arguments relative to personal beliefs regarding agricultural issues

AEEC 2140. Technology and Communication for Business Management
3 Credits (2+2P)
This course helps students improve their skills related to data analysis, information management, and communication. Drawing examples from a variety of management, business, technological and research situations, students discover the versatility and functionality of modern computer software. The course emphasizes a 'hands-on' approach. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate an understanding of the terminology used to describe common techniques and concepts in business information systems.
2. Demonstrate a mastery of spreadsheet design and use.

AEEC 2996. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. Consent of instructor required.
Learning Outcomes
1. Varies

AEEC 3110V. World Agriculture and Food Problems
3 Credits (3)
This course examines key concepts and issues relevant to the world's food production systems. Topical highlights include the causes and consequences of hunger, agriculture's economic and environmental significance, sustainable development, biotechnology, and globalization of agricultural markets. As students learn about these issues from both local and global perspectives they are engaged in the development of both their literacy of economic concepts and their core research and communication skills. We do this through a combination of relevant course readings, in-class discussion exercises, and focused writing assignments on current issues of relevance. Same as GEOG 315V. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate conceptual and systems thinking and design
2. Assess the nutrition and healthfulness of food choices
3. Describe the structure and function of food and agricultural systems
4. Analyze roles of and relationships between food producers, consumers, and policymakers
5. Apply basic economic concepts to describe and interpret food and agricultural issues
6. Explain the environmental context and role of agriculture
7. Articulate key arguments that favor and oppose food biotechnology
8. Recognize several of the benefits and barriers in international trade of food and agricultural products

AEEC 3120V. Natural Resource Economics
3 Credits (3)
This course helps students gain insight into important natural resource problems of our time. Apply economic principles to problems in the preservation, use, and development of agricultural, range, mineral, water, forestry, fishery, and environmental resources. Understand the use of cost-benefit analysis for government natural-resource projects, policies, and programs. Same as ECON 337V. May be repeated up to 3 credits.
Prerequisite: ECON 1110G or ECON 2120G or ECON 2120H.
Learning Outcomes
1. Demonstrate knowledge of economic principles to better understand natural resource issues
2. Document understanding of current and emerging natural resource issues
3. Apply economic principles to guide selected natural resource policy debates
4. Demonstrate the application of economic principles to inform policy debates addressing current water resources issues

AEEC 3130V. Water Resource Economics
3 Credits (3)
This course uses economic principles to evaluate current and emerging issues in water resources. Applications focus on the use of economic methods of analysis to current policy decisions surrounding agricultural, municipal, industrial, and environmental uses of water. Same as ECON 384V. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate knowledge of economic principles to better understand water resource issues
2. Show understanding of current and emerging water issues
3. Apply economic principles to guide selected water resource policy debates
4. Demonstrate the application of economic principles to inform policy debates addressing current water resources issues

AEEC 3140V. Agricultural Policy
3 Credits (3)
This course provides a historical and cultural background of food and agricultural policy in the United States. Analysis of food and agricultural problems, policy-making, and implementation. Economic evaluation of specific U.S. food and agricultural policy instruments, their domestic and international impacts.
Learning Outcomes
1. Apply economic concepts to deepen understanding of agricultural policy, particularly with regard to macroeconomic importance to agriculture
2. Describe inherent tradeoffs and opportunity costs in policy
3. Identify the global impacts of U.S. agricultural policy
4. Explain and describe important agricultural policy issues for a lay audience

AEEC 3210. Marketing and Food Agricultural Products
3 Credits (3)
This course provides a review of marketing principles and techniques used throughout the food and fiber supply chain. The course introduces a broad variety of marketing topics including marketing strategy, consumer behavior, market segmentation, market research, competitive analysis, and the marketing mix. The course serves as a foundation for advanced courses in agricultural marketing. Same as MKTG 305.
Prerequisite: ECON 1110G or ECON 2120G.
Learning Outcomes
1. Articulate how agricultural commodities move through the food and fiber supply chain.
2. Understand the importance of strategic marketing and how organizations within the food and fiber supply chain identify consumers and their preferences.

3. Understand key marketing concepts used by agribusiness marketers, including SWOT analysis, the marketing mix, advertising and public relations.
4. Know the basic outline and components of a marketing plan.

AEEC 3220. Financial Derivative Markets
3 Credits (3)
This course explores the role of financial derivatives in modern business, including income generation, risk management, and price discovery. Derivatives markets covered in the course include futures, options, and swaps. Course content focuses on the fundamentals of trading and hedging in a wide variety of markets, e.g., agriculture, interest rates, exchange rates. Students participate in simulated futures and options trading. Same as AEEC 5220/BFIN 511 with additional coursework required at the graduate level. Cannot receive credit for both AEEC 3220/BFIN 311 and AEEC 5220/BFIN 511. Same as BFIN 311.
Learning Outcomes
1. Understand and explain the concept of risk, list various sources of risks observed in businesses, and identify common methods used to manage risk
2. Demonstrate an understanding of the vocabulary associated with derivatives and derivative markets
3. Articulate the role that derivative markets play in reducing risk and illustrate how they can be used in practice to reduce risk
4. Illustrate how derivative markets can be used to generate income and manage risk through hedging

AEEC 3230. Food and Agricultural Sales
3 Credits (3)
This course reviews the techniques of salesmanship. Course topics include identification and classification of buyer type and different approaches to sales based on client base. Improving oral communication skills through individual and/or group sales presentations. Students must be in Junior or above standing to enroll. May be repeated up to 3 credits.
Learning Outcomes
1. Analyze sales situations and effectively identify pathways to closing the sale.
2. Demonstrate execution of the sales process – prepare, learn, communicate, evaluate.
3. Conduct product and customer analysis to build a sales strategy.
4. Exhibit enhanced relationship management and communication skills.

AEEC 3240. Agricultural and Natural Resource Law
3 Credits (3)
This course discusses the relationship of common-law principles, statutory law and regulatory law to problems involving agriculture with an emphasis on New Mexico issues. Legal problems relevant to agribusiness, torts, fencing laws, liability for agricultural pollution, irrigation water rights, corporations and partnerships, land tenure, farm and ranch tenancy, agricultural labor, farm and ranch management, and taxation. May be repeated up to 3 credits.
Learning Outcomes
1. Understand the complexity of law as it relates to agriculture and natural resources
2. Develop a basic understanding of the legal system in the U.S. including the role of federal and state agencies responsible for agricultural and natural resource regulation
3. Articulate at a layperson's level, the roles of the legislative, judicial, and executive branches of the government as they relate to agriculture and natural resources.

AEEC 3250. Economics of Food and Agricultural Markets
3 Credits (3)
This course focuses on the analysis of supply and demand characteristics of commodities with particular attention to agricultural products. Pays special attention to empirical analysis. Includes institutional aspects of pricing, temporal and spatial price relationships, price forecasting, and the economic consequences of pricing decisions. May be repeated up to 3 credits.
Prerequisite: ECON 2120G, MATH 1430G, and A ST 311 or MATH 1350G.
Learning Outcomes
1. Become familiar with commonly used data analysis methods and tools.
2. Develop an understanding of the factors that influence agricultural prices.
3. Use data to analyze and solve real-world problems related to agricultural prices.

AEEC 3260. Economic Analysis of Food and Agribusiness
3 Credits (3)
This course uses economic and business theory to analyze business decision making. The course includes a discussion of economic, managerial, and financial considerations relevant to modern agribusinesses. May be repeated up to 3 credits.
Prerequisite: ECON 2110G, ECON 2120G.
Learning Outcomes
1. Understand the role of managers within the food and fiber supply chain.
2. Develop an understanding of the applications of managerial economics as they related to businesses within the food and fiber supply chain.
3. Analyze market conditions and assess the position of a business within the market.
4. Identify and articulate optimal business decisions by analyzing economic and business information.

AEEC 3270. Spreadsheet Applications in Food and Agriculture
3 Credits (2+2P)
This course is an advanced course in electronic spreadsheets. Concepts and tools of data analysis and database management within a spreadsheet, emphasizing agricultural applications, are presented. Same as AEEC 5320 with additional work required at the graduate level. Cannot receive credit for both AEEC 3270 and AEEC 5320. May be repeated up to 3 credits.
Prerequisite: AEEC 2140 or consent of instructor.
Learning Outcomes
1. Ability to effectively utilize some of the advanced features in Microsoft Excel by course end.
2. Transforming agricultural and agribusiness problems into spreadsheet models for analysis.
3. Increase critical thinking capacity with respect to solving problems/tasks.
4. Develop creativity in solving problems/tasks.

AEEC 3280. Applied Production Economics
3 Credits (3)
This course introduces students to fundamental economic theories and analytical tools required for managing an agricultural operation. In

particular, the principles of microeconomics will be reviewed and applied to the problems faced by farms and ranches. The course focuses only on economic making at the farm or ranch level. May be repeated up to 3 credits.
Prerequisite: (ECON 2120G or ECON 2120H) and (MATH 1430G) and (A ST 311 or MATH 1350G).
Learning Outcomes
1. Analyze production function and calculate the total, average, and marginal products
2. Derive profit-maximizing input and output combinations
3. Evaluate the relationship between production, revenue, and profit functions
4. Analyze crop budgets and determine optimal acreage allocation
5. Measure the impact of risk and uncertainty on agricultural production

AEEC 3998. Internship
1-4 Credits (1-4)
Professional work experience under the supervision of a faculty member. May be repeated up to 6 credits.
Prerequisite: Consent of instructor.

AEEC 4110. Food and Agribusiness Financial Management
3 Credits (3)
This course provides a description and application of techniques and principles of financial management to problem situations faced by agricultural businesses, including financial statement development and analysis, capital budgeting, sources and costs of capital. May be repeated up to 3 credits.
Prerequisite: ECON 2120G or ECON 2120H and ACCT 2110.
Learning Outcomes
1. Understand the time value of money and perform capital investment analysis for agricultural firms
2. Interpret financial statements used by agricultural firms
3. Comprehend farm financial risks and returns
4. Discuss financing options for U.S. farm businesses

AEEC 4410. Senior Seminar
1 Credit (1)
This course focuses on current topics and cases in the agribusiness literature stressing rigorous qualitative analysis of current problems and policy issues. During the course, students provide feedback about their experience within the Department and help identify ways in which the Department can improve. Restricted to: AEAB; NREP majors. Must be Senior standing to enroll. May be repeated up to 1 credit.
Learning Outcomes
1. Illustrate an understanding of economic and business concepts as illustrated and applied in case analyses.
2. Articulate ways in which the Department can improve academically.
3. Prepare future steps in careers, e.g., resumes, cover letters, mock interviews.
4. Develop interpersonal communication skills.

AEEC 451. Food and Agribusiness Market Assessment
3 Credits (3)
This course is an application course in which self-managed teams develop and present marketing plans for agribusiness firms. Emphasis on integrating the marketing mix, particularly promotional elements. May be repeated up to 3 credits. Crosslisted with: AEEC 4510.
Prerequisite(s): AEEC 3210 or MKTG 305 or consent of instructor.
Learning Outcomes
1. Identify, organize ad conduct market research specific to the project
2. Develop an understanding of primary and secondary research collection and analysis
3. Exhibit enhanced relationship management, communication skills, and team building
4. Develop written communication with final deliverable for implementation into the business world

AEEC 4510. Food and Agribusiness Market Assessment
3 Credits (3)
This course is an application course in which self-managed teams develop and present marketing plans for agribusiness firms. Emphasis on integrating the marketing mix, particularly promotional elements. May be repeated up to 3 credits. Crosslisted with: MKTG 451.
Prerequisite(s): AEEC 3210 or MKTG 305 or consent of instructor.
Learning Outcomes
1. Identify, organize ad conduct market research specific to the project.
2. Develop an understanding of primary and secondary research collection and analysis.
3. Exhibit enhanced relationship management, communication skills, and team building.
4. Develop written communication with final deliverable for implementation into the business world.

AEEC 4520. Food and Agribusiness Marketing Plan Development
3 Credits (3)
This course focuses on learning marketing research methods applicable to developing new food and agricultural products and repositioning existing products for new markets. Students will be required to prepare precise written and oral marketing plans to industry standards and will have opportunities to present written and oral plans at national competitions. May be repeated up to 3 credits.
Learning Outcomes
1. Illustrate abilities to make decisions based on market research and analysis, including financial analysis, analysis of consumer trends, and the business environment.
2. Create professional marketing and business presentation.
3. Build effective teams to analyze and present real-world marketing opportunities.
4. Practice business decision making founded on evidence from market research.

AEEC 4530. Case Studies in Food and Agribusiness Management
3 Credits (3)
This course integrates production, marketing, accounting, finance, agricultural policy, human behavior, and business environment concepts in the management of agricultural businesses using a decision case approach. May be repeated up to 3 credits.
Learning Outcomes
1. Exhibit an ability to understand complex and varying business and resource issues, including financial analysis, natural resource issues, and business operations.
2. Provide reasoning and rationale for decision making, identifying the best options from many potential decisions.
3. Practice business writing and communication skills.

AEEC 4540. Economics of Making and Marketing Wine
3 Credits (3)

This course is designed to provide a basic knowledge of the principles of winemaking with emphases on wine production and economics for small wineries and home winemaking. The course also focuses on the investment costs of starting small wineries and the costs of making wine and successful market strategies for small wineries. The class includes a hands-on lab that includes selecting, crushing, fermenting grapes, and all the steps required through bottling the wine. Students must be 21 to enroll in the class. Consent of instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Identify and evaluate production costs, economics, and marketing strategies for small wineries.
2. Identify current technologies used in the production of wine for home and in a small winery.
3. Identify the processes required to make high-quality wine using hands-on winemaking techniques, sensory analysis, and testing.
4. Learn the basics of Viticulture (wine grape growing) practices.

AEEC 4550. Real Estate Appraisal
3 Credits (2+2P)

This course addresses issues influencing the value of real estate with some emphasis upon rural properties. Topics include courthouse records, property taxes, appraisal methodology, expert courtroom testimony, condemnation, and legal issues. Students will take field trips and write appraisals. Course material is relevant to students in Finance, Accounting, and Pre-Law, as well as Agriculture. Accredited for hours to apply to both pre-licensing and continuing education requirements of the New Mexico Real Estate Commission for both Appraisers and Real Estate Brokers. Crosslisted with BFIN 470.

Learning Outcomes

1. Distinguish between the Income Approach, Cost Approach, and Sales Comparison Approach.
2. Identify market abstracted influences on value.
3. Apply proper appraisal methodology.
4. Demonstrate appraisal knowledge by writing a residential appraisal and a farm appraisal.

AEEC 4997. Special Problems
1-3 Credits

Special problems in agricultural economics or agricultural business of particular interest to the individual student. Maximum of 3 credits per semester. No more than 6 credits toward degree. Consent of instructor required. May be repeated up to 6 credits.

AEEC 4999. Senior Thesis
3 Credits (3)

Develop a thesis project with a faculty advisor. The senior thesis requires students to work creatively to apply business and economic principles to address a problem of concern. May be repeated up to 3 credits. Restricted to AEAB majors.

Prerequisite: consent of department head and have senior standing.

AEEC 5110. Introduction to Quantitative Methods
3 Credits (3)

Introduce students to quantitative tools widely used in applied economic analysis such as regression analysis, statistical tests, and mathematical programming. Restricted to: Agricultural Economics and Business (Masters) majors.

Learning Outcomes

1. Course objectives for the statistics module include helping students master basic statistical tests/methods commonly used in research and business analysis. Specific methods / tests include: One-sample mean hypothesis tests, Two-sample mean hypothesis tests, Analysis of Variance (mean tests for three or more samples), and Nonparametric methods to test proportions.
2. Course objectives for the econometrics/regression module include introducing students to the field of econometrics and helping them master a basic understanding of econometrics and its use in agricultural economics and business. Specific topics that will be covered include: Correlation analysis, Simple least squares regression; and Multiple regression analysis.
3. Course objectives for the math programming module including helping students formulate, specify, build and interpret linear programming models using Microsoft Excel's Solver feature and the specialized software package, GAMS.

AEEC 5120. Microeconomic Theory
3 Credits (3)

A rigorous re-examination of the pricing mechanism in the goods and factor markets. Development of theoretical tools of general applicability. May be repeated up to 3 credits.

Prerequisite: ECON 371 and ECON 457, or consent of instructor.

Learning Outcomes

1. A rigorous re#examination of the structure and function of the price mechanism to guide resource allocation and policy analysis in the goods and factor markets.
2. Introduce the models that economists use to explain the behavior of consumers, firms, and markets.
3. Development of theoretical tools used for economic analysis.

AEEC 5130. Macroeconomic Theory
3 Credits (3)

This course provides contemporary aggregative theory regarding the interrelationships among national income, employment, the price level, money supply and interest rates, and implications of this theory for public policy in a mixed economy. May be repeated up to 3 credits.

Learning Outcomes

1. Develop an in-depth understanding of the IS/LM model.
2. Understand how fiscal and monetary policy affect output, employment, interest rates and prices.
3. Develop and use mathematical models of the economy.
4. Derive the effect of a change in tax rates, government spending, or a change in the money supply, on the nation's output through expenditure multipliers.
5. Understand how fiscal and monetary policy work in an Open economy.
6. Understand the basics of Exogenous and Endogenous Growth Theory.

AEEC 5140. Agricultural Policy
3 Credits (3)

Historical and cultural background of food and agricultural policy in the United States. Analysis of food and agricultural problems, policy-making and implementation. Economic evaluation of specific U.S. food and agricultural policy instruments, their domestic and international impacts. Same as AEEC 3140V with additional work required at the graduate level. Cannot receive credit for both AEEC 3140V and AEEC 5140.

Prerequisite: Consent of instructor.

Learning Outcomes

1. Apply economic concepts to deepen understanding of agricultural policy, particularly regarding the macroeconomic importance to agriculture.
2. Be able to describe inherent tradeoffs and opportunity costs in policy.

3. Acquire an international perspective with respect to food and agricultural policy.
4. Develop an appreciation for history and trajectory of agricultural policy.

AEEC 5150. Economic and Financial Analysis of Agribusiness
3 Credits (3)
This course focuses on common analytical tools used to evaluate the economic and financial performance of businesses operating in the food and fiber supply chain. The course uses a combination of course discussions, assignments, and case studies to present the material critical to the successful management of agribusinesses. Topics include financial statements and analysis, financial planning/modeling, financial risk and risk management, the time value of money, and capital budgeting methods used in agribusiness.
Learning Outcomes
1. Read, understand, and create financial statements used in agribusiness, including income statements, balance sheets, cash flow statements, and owner's equity statements.
2. Describe and conduct financial analysis including comparative analysis, change analysis, and common-size analysis, and ratio analysis.
3. Describe and understand credit in agricultural production and agribusiness.
4. Understand the importance of capital budgeting within agribusiness and be able to conduct capital budgeting.
5. Describe, calculate, and use standard measures of investment return including net present value, internal rate of return, discounted payback period, and simple payback period.

AEEC 5210. International Agricultural Trade Theory and Policy
3 Credits (3)
This course provides a review and analysis of international trade models. Analysis of the effects of trade instruments such as tariffs, quotas, and subsidies on welfare and income distribution. Analysis of bilateral, regional, and multilateral trade agreements and their effect on the agricultural sector from both country-specific and global perspectives. May be repeated up to 3 credits.
Learning Outcomes
1. Understand and be able to describe the importance of international trade to U.S. agriculture.
2. Familiar with commonly used trade models to describe impacts of trade barriers, for example tariffs, quotas, and subsidies.
3. Analyze trade agreements and their impact on economies of different trade partners.

AEEC 5220. Financial Derivative Markets
3 Credits (3)
This course examines advanced futures and options strategies for income generation and risk management. Coverage includes a variety of markets, e.g., interest rates, stock indexes, metals, currencies, livestock, and grains. Both technical and fundamental trading strategies are identified and discussed. Same as AEEC 3220/BFIN 311 with additional coursework required at the graduate level. Cannot receive credit for both AEEC 3220/BFIN 311 and AEEC 5220/BFIN 511. Taught with BFIN 511.
Learning Outcomes
1. Define risk and identify methods of managing risk.
2. Demonstrate understanding of vocabulary associated with derivatives and derivative markets.
3. Identify the role that derivative markets play in reducing risk.
4. Demonstrate a basic understanding of derivative markets including their use in risk management and income generation.

AEEC 5230. Public Sector Economics
3 Credits (3)
Introduction to the economic rationale for government intervention in the economy and the effects of that intervention on economic agents and the economy in general. Emphasis on the expenditure side of government policies. Same as POLS 522. May be repeated up to 3 credits.
Learning Outcomes
1. The focus of Public Sector Economics I, which draws on microeconomic theory, concentrates on the development of analytical tools and their application to key issues relating to the spending activities of government.
2. This course aims to provide students with a solid grounding in the analytical methods that are important for studying the role of government in society.
3. Moreover, it will provide students with an economics perspective of that role and when it is appropriate for governments to intervene in an economy.
4. Once established, students will have a practical way to examine a modern government's programs such as social Security and other welfare programs.

AEEC 5240. Econometrics
3 Credits (3)
An integration of quantitative and statistical techniques for research and management in economics and business. May be repeated up to 3 credits.
Prerequisite: ECON 457 and ECON 405 or A ST 505.
Learning Outcomes
1. This course will cover simple linear regression on cross-sectional data; multiple-regression, data with limited dependent variables (including binary, truncated/censored, and count data); and if time permits, time series econometrics.
2. After this course, you will understand the theories behind these methods, know when to use them, and be able to carry them out in Stata®, a popular commercial software for applied econometricians.

AEEC 5320. Microcomputer Applications in Agriculture
3 Credits (2+2P)
An advanced course in electronic spreadsheets and the concepts and tools of database management emphasizing agricultural applications. Same as AEEC 3270 with additional work required at the graduate level. Cannot receive credit for both AEEC 3270 and AEEC 5320. May be repeated up to 3 credits.
Prerequisite: AEEC 2140G or consent of instructor.
Learning Outcomes
1. Understand and apply descriptive, predictive, and prescriptive analysis to solve business problems.
2. Use Excel spreadsheet formula in modeling agribusiness problems/solutions.
3. Use basic spreadsheet skills to conduct simple business feasibility analyses.
4. Conceptualize and solve a research problem.

AEEC 5330. Agribusiness Marketing
3 Credits (3)
Applications course in which self-managed teams apply marketing theory in the development and presentation of marketing plans for food and agribusiness firms. Course includes analysis of marketing problems with

emphasis on strategic marketing issues changing trade policies, and global competiveness. May be repeated up to 3 credits.

Learning Outcomes

1. Estimate consumer demand and supply functions using regression analysis.
2. Measure consumer willingness to pay for food products using conjoint analysis.
3. Evaluate the value of new product attributes using contingent valuation.
4. Conduct market research and present results.

AEEC 5340. Agribusiness Management
3 Credits (3)

Integration of production, marketing, accounting, finance, agricultural policy, human behavior, and business environment concepts in management of agricultural businesses using a decision case approach. May be repeated up to 3 credits.

Learning Outcomes

1. To provide an integrated approach to marketing, financial, and strategic management problems of agribusiness and commercial farm and ranch businesses.
2. To develop a deeper understanding of the agribusiness system through the investigation of selected U.S. agribusinesses.

AEEC 5350. Economics of Water Resource Management and Policy
3 Credits (3)

Focuses on issues, approaches and methods used in the assessment of water resource management and policy problems. Extends and further develops student understanding and comprehension of specific economic concepts and methods that are useful in the assessment and management of water resources, including cost-benefit analysis, welfare economics, non-market valuation, watershed management, and consideration of equity and ethical concerns. Students will develop critical reasoning, communication and analytic skills through active class discussions and assignments that emphasize both quantitative and written products.

Learning Outcomes

1. Describe the major categories of water use and explain their role, function, and economic value of water within natural and human systems.
2. Apply basic economic concepts to the assessment of water quantity and quality issues.
3. Analyze impacts of water management and policy decisions on competing water resource users, public interests, and address their potential for conflict.
4. Demonstrate conceptual and systems thinking applied to water resource problems.
5. Apply quantitative and qualitative reasoning, modeling, and decision-support methods to water resource problems, including Integrated Water Resources Management (IWRM), Cost-Benefit Analysis (CBA), and Economic and Environmental Impact Assessment.
6. Compare analytic methods for watershed assessment, including statistical, optimization, and simulation methods applied to watershed assessment.

AEEC 5360. Production Economics
3 Credits (3)

Application of microeconomic theory to problems and decisions of food and agricultural firms. The theoretical foundation of production economics and the theory of the firm are developed. May be repeated up to 3 credits.

Prerequisite: MATH 1430G, ECON 312, and ECON 457.

Learning Outcomes

1. Students should be able demonstrate an understanding of the microeconomic underpinnings of production economics, as well as how theoretical assumptions are made regarding physical production of agricultural products.
2. Students should be able to examine production decisions by agricultural firms, and determine economically optimal decisions, including under cases of risk and uncertainty.

AEEC 5402. AI Applications in Fiber and Food Systems
3 Credits (3)

Focusing on food and fiber systems, the course includes applications of AI to food processing, food safety, nutrition, and sustainability. Students in the course will explore demand forecasting, labor management, consumer behavior, and other economic and sociocultural aspects of food and fiber systems. The course will incorporate concepts of equitable access, job quality, transparency, data privacy and security, and responsible and ethical use of AI in fiber and food systems.

Learning Outcomes

1. Identify application areas in food and fiber systems for AI opportunities.
2. Evaluate AI tools for nutrition, food processing, food safety, supply chain management, and sustainability in food and fiber systems.
3. Assess the impact of AI tools on demand forecasting, labor management and consumer behavior in food and fiber systems.
4. Apply machine learning and AI methods to enhance decision-making across food and fiber value chains.
5. Develop and evaluate predictive and classification models using real-world data from food and fiber systems.
6. Discuss and apply ethical and responsible AI frameworks to food and fiber systems.

AEEC 5404. Emerging Topics in AI for Food and Agriculture
3 Credits (3)

Analyze emerging applications and uses of AI in food systems, agriculture, and the environment. Project impacts of emerging AI topics to agriculture, the environment, and food and fiber industries. Evaluate new developments in AI for application to food, fiber, agriculture, and the environment. Explore ethical dimensions of AI in agriculture.

Learning Outcomes

1. Analyze emerging applications and uses of AI in food systems, agriculture, and the environment.
2. Describe and discuss how emerging developments in AI can impact food, fiber, and agriculture businesses.
3. Describe and discuss impacts of emerging AI technologies to agriculture, the environment, and food and fiber industries.
4. Evaluate new developments in AI for application to food, fiber, agriculture, and the environment.

AEEC 590. Special Topics
3 Credits (3)

Seminars in selected current topics in the various areas of agricultural economics and economics. Offerings will carry a subtitle.

Prerequisite: consent of instructor.

AEEC 593. Internship
1-6 Credits

Supervised professional on-the-job training experience in policy analysis.

AEEC 594. Internship
1-6 Credits

One semester to six months internship with a regulated firm or public utility commission. A faculty member will direct and evaluate the internship. For AEEC regulatory option students only.

AEEC 595. Internship
3 Credits (3)
Supervised professional on-the-job learning experience.
Prerequisite(s): Consent of instructor.

AEEC 596. Individual Study
1-3 Credits
Individual study programs. Each offering will carry a subtitle. Maximum of 3 credits in a semester and 6 credits in a program.
Prerequisite: consent of instructor.

AEEC 599. Master's Thesis
1-15 Credits
Thesis.

AEEC 5991. Non-Thesis Research Project
1-3 Credits (1-3)
Individual investigations, either analytical or experimental. Maximum of 3 credits per semester. No more than 3 credits toward a degree. May be repeated up to 3 credits.

AEEC 5994. Creative Component Project
3-6 Credits (3-6)
Individual investigations, either analytical or experimental. A minimum of 3 to 6 credits per semester. No more than 6 credits toward degree. Consent of instructor required. May be repeated up to 6 credits.
Prerequisite: Consent of Instructor.

AEEC 5996. Special Topics
3 Credits (3)
Seminars in selected current topics in the various areas of agricultural economics and economics. Offerings will carry a subtitle.
Prerequisite: consent of instructor.

AEEC 5997. Individual Study
1-3 Credits
Individual study programs. Each offering will carry a subtitle. Maximum of 3 credits in a semester and 6 credits in a program.
Prerequisite: consent of instructor.

AEEC 5998. Internship
1-6 Credits
Supervised professional on-the-job training experience in policy analysis.

AEEC 5999. Master's Thesis
1-15 Credits
Thesis.

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Agricultural Economics and Agricultural Business - Bachelor of Science in Agriculture

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Select one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1430G	Applications of Calculus I [2]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
ECON 2110G	Macroeconomic Principles (Economic Theory Coursework)	
ECON 2120G	Principles of Microeconomics Honors (Economic Theory Coursework)	
Area III: Laboratory Sciences (4 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing a Wider World [3]		**6**
Departmental/ College Requirements		
Quantitative		*12*
AEEC 2140	Technology and Communication for Business Management	
AEEC 3260	Economic Analysis of Food and Agribusiness	
AEEC 3270	Spreadsheet Applications in Food and Agriculture	
Choose one from the following:		
A ST 311	Statistical Applications	
MATH 1350G	Introduction to Statistics	
General Business		*15*
ACCT 2110	Principles of Accounting I	
ACCT 2120	Principles of Accounting II	
BLAW 316	Legal Environment of Business	
BFIN 341	Financial Analysis and Markets	
Select one from the following:		
MGMT 309	Human Behavior in Organizations	
MGMT 332	Human Resources Management	
MGMT 361	Small Business Management	
Economic Theory [4]		*6*

AEEC 3250	Economics of Food and Agricultural Markets	
or ECON 312	Intermediate Microeconomic Theory	
ECON 304	Money and Banking	
or ECON 311	Intermediate Macroeconomic Theory	
Applied Economics/Business		*25*
ACES 1120	Freshman Orientation	
ACES 1210	Financial Fitness for College Students	
AEEC 1110	Introduction to Agricultural Economics and Business	
AEEC 1120	Careers in Food and Agribusiness	
AEEC 2110	Principles of Food and Agribusiness Management	
AEEC 3210	Marketing and Food Agricultural Products	
or MKTG 305	Marketing and Food Agricultural Products	
AEEC 3280	Applied Production Economics	
AEEC 4410	Senior Seminar	
AEEC 4110	Food and Agribusiness Financial Management	
AEEC 3140V	Agricultural Policy	
AEEC 4530	Case Studies in Food and Agribusiness Management	
Required Specialty Area [5]		*6*
Select and Complete two courses (6 hrs) from one Specialty Area:		
Natural Resources		
AEEC 3240	Agricultural and Natural Resource Law	
AEEC 3130V	Water Resource Economics	
or ECON 384V	Water Resource Economics	
AEEC 3120V	Natural Resource Economics	
or ECON 337V	Natural Resource Economics	
Finance		
AEEC 3220	Financial Derivative Markets	
AEEC 4550	Real Estate Appraisal	
or BFIN 470	Real Estate Appraisal	
Marketing		
AEEC 3230	Food and Agricultural Sales	
AEEC 4510	Food and Agribusiness Market Assessment	
or MKTG 451	Food and Agribusiness Market Assessment	
AEEC 4520	Food and Agribusiness Marketing Plan Development	
Second Language: (not required)		
Electives, to bring the total credits to 120 [6]		**17-18**
Total Credits		**120**

1. See the General Education (p. 262) section the catalog for a full list of courses. It is strongly encouraged that students satisfy the Area II Laboratory Science category by enrolling in AGRO 1110G Introduction to Plant Science (Lecture & Lab).
2. MATH 1430G Applications of Calculus I is required for the degree but students may need to take any prerequisites needed to enroll in MATH 142G first.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. Students who are interested in graduate degrees should consult with their academic advisor or faculty mentor early in their undergraduate program as some courses may have specific grade requirements and/or prerequisites. Our department participates in NMSU's Graduate School MAP Program where students can take graduate courses during the last part of their undergraduate degree.
5. Specialty Areas are Natural Resources, Finance, and Marketing. Students must complete two courses from the selected Specialty Area.
6. Elective credits may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with the academic advisor.

A Suggested Plan of Study for Students

A roadmap for students coming into Department of Agricultural Economics and Agricultural Business without deficiencies and without advanced coursework, e.g., AP course credit or dual credits wishing to pursue a degree in Agricultural Economics and Agricultural Business (AEAB).

This roadmap assumes student placement in MATH 1215 and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
ACES 1120	Freshman Orientation	1
ACES 1210	Financial Fitness for College Students	1
AEEC 1120	Careers in Food and Agribusiness	1
AEEC 1110	Introduction to Agricultural Economics and Business	3
ENGL 1110G	Composition I	4
ECON 2110G	Macroeconomic Principles	3
AEEC 2140	Technology and Communication for Business Management	3
	Credits	**16**
Spring		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
AEEC 2110	Principles of Food and Agribusiness Management	3
ECON 2120G	Principles of Microeconomics Honors	3
Area III: Laboratory Science Course [1]		4
MATH 1215	Intermediate Algebra [2]	3
	Credits	**16**
Second Year		
Fall		
MATH 1220G	College Algebra [2]	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	

AEEC 3210 or MKTG 305	Marketing and Food Agricultural Products or Marketing and Food Agricultural Products	3
VWW - Viewing a Wider World Course [3]		3
Area V: Humanities [1]		3
	Credits	**15**
Spring		
MATH 1430G	Applications of Calculus I	3
Choose one from the following:		3
A ST 311	Statistical Applications	
MATH 1350G	Introduction to Statistics	
Choose one from the following:		3
MGMT 309	Human Behavior in Organizations	
MGMT 332	Human Resources Management	
MGMT 361	Small Business Management	
Area VI: Creative and Fine Arts [1]		3
Free Elective Course [4]		3
	Credits	**15**
Third Year		
Fall		
ACCT 2110	Principles of Accounting I	3
AEEC 3260	Economic Analysis of Food and Agribusiness	3
AEEC 3270	Spreadsheet Applications in Food and Agriculture	3
AEEC 3140V	Agricultural Policy ((doesn't count towards VWW))	3
Any General Education Elective - "G" Course [1]		3
	Credits	**15**
Spring		
ACCT 2120	Principles of Accounting II	3
AEEC 3250 or ECON 312	Economics of Food and Agricultural Markets or Intermediate Microeconomic Theory	3
BFIN 341	Financial Analysis and Markets	3
Required Specialty Area Course [5]		3
Free Elective Course [4,6]		3
	Credits	**15**
Fourth Year		
Fall		
ECON 304 or ECON 311	Money and Banking or Intermediate Macroeconomic Theory	3
AEEC 3280	Applied Production Economics	3
AEEC 4110	Food and Agribusiness Financial Management	3
Required Specialty Area Course [5]		3
Free Elective Course [4, 6]		3
	Credits	**15**
Spring		
AEEC 4410	Senior Seminar	1
AEEC 4530	Case Studies in Food and Agribusiness Management	3
VWW - Viewing a Wider World Course [3]		3
BLAW 316	Legal Environment of Business	3
Free Elective Course [4, 6]		3
	Credits	**13**
	Total Credits	**120**

1 See the General Education (p. 262) section the catalog for a full list of courses. It is strongly encouraged that students satisfy the Area II Laboratory Science category by enrolling in AGRO 1110G Introduction to Plant Science (Lecture & Lab).

2 MATH 1430G Applications of Calculus I is required for the degree but students may need to take any prerequisites needed to enroll in MATH 1430G Applications of Calculus I first.
**MATH 1215 and MATH 1220G are prerequisites, but if they are not needed use Free Elective Courses to replace the courses in the Roadmap*

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 Elective credits may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with the academic advisor.

5 Specialty Area courses can be found on the Requirements (p. 352) tab of this degree. The areas are Natural Resources, Finance and Marketing. Students must complete two courses from the selected Specialty Area

6 Students who are interested in graduate degrees should consult with their academic advisor or faculty mentor early in their undergraduate program as some courses may have specific grade requirements and/or prerequisites. Our department participates in NMSU's Graduate School MAP Program where students can take graduate courses during the last part of their undergraduate degree.
**The 4th Year Semester (Spring) shows 13 hours. Student's financial aid requirement may require them to enroll in 15 hours.*

Natural Resource Economics and Policy - Bachelor of Science in Agriculture

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level I [1]		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2 [1]		
Select one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication [1]		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	

COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1430G	Applications of Calculus I [2]	3
Area III/IV: Laboratory Science and Social/Behavioral Sciences		
ECON 2110G	Macroeconomic Principles	3
ECON 2120G	Principles of Microeconomics Honors	3
Area III: Laboratory Sciences (4 credits) [3]		4
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [4]		*4*
Viewing A Wider World [5]		**6**
Departmental/College Requirements		
Applied Economics Core		
ACES 1120	Freshman Orientation	1
ACES 1210	Financial Fitness for College Students	1
AEEC 3120V	Natural Resource Economics	3
or ECON 337V	Natural Resource Economics	
AEEC 3130V	Water Resource Economics	3
or ECON 384V	Water Resource Economics	
AEEC 4410	Senior Seminar	1
AEEC 3270	Spreadsheet Applications in Food and Agriculture	3
ECON 312	Intermediate Microeconomic Theory	3
AEEC/ECON Elective (300/3000- level or above)		3
AEEC Elective (300/3000- level or above)		3
Science, Policy and Ethics		
AEEC 3140V	Agricultural Policy	3
Select one from the following:		3
AEEC 3240	Agricultural and Natural Resource Law	3
BLAW 316	Legal Environment of Business	3
FWCE 447	Wildlife Law and Policy	3
FWCE 2110	Principles of Fish and Wildlife Management	3
GEOG 2130	Map Analysis & Interpretation	3
or FWCE 471	GIS for Natural Resource Scientists	
POLS 330	Introduction to Public Administration	3
or POLS 324	Environmental Policy & Administration	
RGSC 2110	Introduction to Rangeland Management	3
Science, Policy and Ethics Directed Electives (300/3000- level or above)		9
Quantitative Skills		
A ST 311	Statistical Applications	3
or MATH 1350G	Introduction to Statistics	
MATH 1215	Intermediate Algebra	3
MATH 1220G	College Algebra	3
AEEC 2140	Technology and Communication for Business Management	3
Second Language: (not required)		
Electives, to bring the total credits to 120 [6]		**12**
Total Credits		**120**

1 See the General Education (p. 262) section of the catalog for a full list of courses.

2 MATH 1430G Applications of Calculus I is required for the degree but students may first need to take any prerequisites needed before taking MATH 1430G. Students who place or transfer in a higher-level course are exempt from MATH 1430G.

3 See the **General Education** section of the catalog for a full list of courses. Students are strongly encouraged to satisfy the Area III Laboratory category by enrolling in courses related to their area of interest in environmental and natural resource sciences, which are prerequisites to upper-level courses. Recommended options include FWCE 1110G Introduction to Natural Resources Management, BIOL 2610G Principles of Biology: Biodiversity, Ecology, and Evolution, CHEM 1120G Introduction to Chemistry Lecture and Laboratory (non majors), CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors.

4 See the **General Education** section of the catalog for a full list of courses. Students are strongly encouraged to satisfy this General Education Elective with another Laboratory Science related to their area of interest in environmental and natural resource sciences (in addition to that required in Area III). These courses are prerequisites to upper-level courses in these fields. Recommended options include FWCE 1110G Introduction to Natural Resources Management, BIOL 2610G Principles of Biology: Biodiversity, Ecology, and Evolution, CHEM 1120G Introduction to Chemistry Lecture and Laboratory (non majors), CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors.

5 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

6 It is strongly suggested that students use their elective credits to earn a minor (or two) such as Sustainability, Conservation Ecology, Environmental Science, Range Science, Soil Science, Wildlife Science, Economics, Public Law, Public Administration, or Geographic Information Systems.

Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credit and may appear in variable form base on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their academic advisor.

A Suggested Plan of Study for Students

A roadmap for students coming into the Department of Agricultural Economics and Agricultural Business without deficiencies and without advanced coursework, e.g., AP course credit or dual credits wishing to pursue the degree in Natural Economics and Policy (NREP).

This roadmap assumes student placement in MATH 1215 and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
ACES 1120	Freshman Orientation	1
ACES 1210	Financial Fitness for College Students	1
ENGL 1110G	Composition I	4
Area V: Humanities [1]		3
AEEC 2140	Technology and Communication for Business Management	3
MATH 1215	Intermediate Algebra	3
	Credits	**15**
Spring		
Choose one from the following		3

ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
ECON 2110G	Macroeconomic Principles	3
MATH 1220G	College Algebra	3
RGSC 2110	Introduction to Rangeland Management	3
Free Elective Course [2]		3
	Credits	**15**

Second Year

Fall

Choose one from the following [1]		3
COMM 1130G	Public Speaking	
COMM 1115G	Introduction to Communication	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
HNRS 2175G	Introduction to Communication Honors	
MATH 1430G	Applications of Calculus I	3
ECON 2120G	Principles of Microeconomics Honors	3
Area III: Laboratory Science Course [3]		4
Free Elective Course [2]		3
	Credits	**16**

Spring

AEEC 3270	Spreadsheet Applications in Food and Agriculture	3
Choose one from the following:		3
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications	
ECON 312	Intermediate Microeconomic Theory	3
FWCE 2110	Principles of Fish and Wildlife Management	3
General Education Elective [4]		4
	Credits	**16**

Third Year

Fall

Area VI: Creative or Fine Arts Course [1]		3
AEEC 3120V or ECON 337V	Natural Resource Economics or Natural Resource Economics	3
AEEC/ECON Elective (300/3000-level or above)		3
Science, Policy and Ethics Directed Elective (300/3000-level or above)		3
GEOG 2130 or FWCE 471	Map Analysis & Interpretation or GIS for Natural Resource Scientists	3
	Credits	**15**

Spring

VWW - Viewing a Wider World Course [3]		3
AEEC 3130V or ECON 384V	Water Resource Economics or Water Resource Economics	3
Science, Policy and Ethics Directed Elective (300/3000-level or above)		3
Free Elective Course [2]		3
Free Elective Course [2]		3
	Credits	**15**

Fourth Year

Fall

Viewing a Wider World (VWW) [3]		3
AEEC 3140V	Agricultural Policy	3
POLS 330 or POLS 324	Introduction to Public Administration or Environmental Policy & Administration	3
Free Elective Course [2]		3
Free Elective Course [2]		3
	Credits	**15**

Spring

AEEC 3240 or BLAW 316 or FWCE 447	Agricultural and Natural Resource Law or Legal Environment of Business or Wildlife Law and Policy	3
AEEC 4410	Senior Seminar	1
Science, Policy and Ethics (300/3000-level or above)		3
AEEC Elective Course (300/3000-level or above)		3
Free Elective Course [2, 6]		3
	Credits	**13**
	Total Credits	**120**

1 See the General Education (p. 262) section of the catalog for a full list of courses.

2 It is strongly suggested that students use their elective credits to earn a minor (or two) such as Sustainability, Conservation Ecology, Environmental Science, Range Science, Soil Science, Wildlife Science, Economics, Public Law, Public Administration, or Geographic Information Systems.
Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

3 See the **General Education** section of the catalog for a full list of courses. Students are strongly encouraged to satisfy the Area III Laboratory category by enrolling in courses related to their area of interest in environmental and natural resource sciences, which are prerequisites to upper-level courses. Recommended options include FWCE 1110G Introduction to Natural Resources Management, BIOL 2610G Principles of Biology: Biodiversity, Ecology, and Evolution, CHEM 1120G Introduction to Chemistry Lecture and Laboratory (non majors), CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors.

4 See the **General Education** section of the catalog for a full list of courses. Students are strongly encouraged to satisfy this General Education Elective with another Laboratory Science related to their area of interest in environmental and natural resource sciences (in addition to that required in Area III). These courses are prerequisites to upper-level courses in these fields. Recommended options include FWCE 1110G Introduction to Natural Resources Management, BIOL 2610G Principles of Biology: Biodiversity, Ecology, and Evolution, CHEM 1120G Introduction to Chemistry Lecture and Laboratory (non majors), CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors.

5 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

6 The 4th year semester (Spring) shows 13 hours. Student's financial aid requirement may require them enroll in 15 hours.

Agricultural Business Management-Undergraduate Minor

The minor in Agricultural Business Management (ABM) consists of 18 or more credit hours of approved course work from the list below. All courses must be completed with grades of "C" or better. Once courses are completed or show "IP" status, students pursuing the ABM minor need to log in to their myNMSU and print out the STAR Audit for the minor and obtain departmental approval. The course requirements for the ABM minor are as follows:

Prefix	Title	Credits
Required Core		
AEEC 2110	Principles of Food and Agribusiness Management	3
AEEC 3210	Marketing and Food Agricultural Products	3
AEEC 2140	Technology and Communication for Business Management	3
Agricultural Policy		
Choose one from the following		*3*
AEEC 3110V	World Agriculture and Food Problems	
AEEC 3120V	Natural Resource Economics	
AEEC 3130V	Water Resource Economics (Agribusiness Electives)	
AEEC 3140V	Agricultural Policy (Technical Courses (6))	
Ag Business and Ag Economics		
Choose two from the following		*6*
AEEC 3220	Financial Derivative Markets	
AEEC 3230	Food and Agricultural Sales	
AEEC 3240	Agricultural and Natural Resource Law	
AEEC 3250	Economics of Food and Agricultural Markets	
AEEC 3270	Spreadsheet Applications in Food and Agriculture [0,3]	
AEEC 3280	Applied Production Economics	
AEEC 4110	Food and Agribusiness Financial Management	
AEEC 4510	Food and Agribusiness Market Assessment	
AEEC 4520	Food and Agribusiness Marketing Plan Development	
AEEC 4530	Case Studies in Food and Agribusiness Management	
AEEC 4540	Economics of Making and Marketing Wine	
AEEC 4550	Real Estate Appraisal	
Total Credits		**18**

Natural Resource Economics - Undergraduate Minor

The minor in Natural Resource Economics (NRE) consists of 18 or more credit hours of approved course work of which at least 9 hours must be numbered 300/3000 or above and completed with grades of "C" or better. Once courses are completed or show "IP" status in the audit, students pursuing the NRE minor need to log in to their MyNMSU and print out the STAR Audit and obtain departmental approval. The course requirements for the NRE minor are as follows:

Prefix	Title	Credits
Required Courses		
ECON 2120G	Principles of Microeconomics	3
Select one course from the following:		*3*
AEEC 3120V	Natural Resource Economics	
or ECON 337V	Natural Resource Economics	
AEEC 3130V	Water Resource Economics	
or ECON 384V	Water Resource Economics	
Select two courses from the following		*6*
FWCE 2110	Principles of Fish and Wildlife Management	
AEEC 3140V	Agricultural Policy	
POLS 330	Introduction to Public Administration	
Select two courses from the following		*6*
FWCE 1110G	Introduction to Natural Resources Management	
FWCE 301	Wildlife Ecology	
GEOG 2130	Map Use and Analysis	
RGSC 2110	Introduction to Rangeland Management	
PHIL 300/3000+		
Total Credits		**18**

Animal and Range Sciences

Undergraduate Program Information

The Department of Animal and Range Sciences provides opportunities for you to follow a variety of interests in modern scientific agriculture. The animal science curriculum provides a background for many phases of the food animal industry, from farm animal production on rangelands to management positions in the food processing industry to highly technical careers in research and companion animal management. The range science curriculum provides you with knowledge and skills necessary to sustainably manage rangelands for multiple uses. These curricula allow you to acquire the background necessary to adjust easily to variations in specific job opportunities. If you are majoring in either animal science or range science, you must meet general education requirements, have a minimum of 48 credits of upper-division courses (numbered 300 and above), and complete a minimum of 35 credits in courses in the College Agricultural, Consumer and Environmental Sciences.

Graduate Program Information

The Department of Animal and Range Sciences offers graduate work leading to the Master of Science and the Doctor of Philosophy degrees with majors in animal science and range science. The Doctor of Philosophy degree in animal science is only in the areas of reproductive physiology or ruminant nutrition.

Prerequisite for admission as a regular graduate student in the department is the completion of a curriculum, substantially equivalent to that required of undergraduate students in animal or range science at this institution, 3.0 GPA, and three letters of reference.

For the Master of Science degree, a minimum of 30 semester credits of graduate work in the major and related subjects will be required, together with a thesis for most majors. A non-thesis option is available for certain students.

For the Master of Agriculture with specialization in Domestic Animal Biology, students must complete 32 credit hours of graduate courses which include 2 credits of ANSC 598 Special Research Programs for the creative component.

The Doctor of Philosophy student must demonstrate proficiency in a foreign language or research tool, such as experimental statistics,

philosophy of science, computer science, or mathematics. Choice of the research tool will remain the option of the student subject to approval by the student's graduate committee. Demonstration of proficiency may be accomplished by satisfactory completion of courses or by other suitable evidence acceptable to the student's committee. In addition, doctoral students are required to complete advanced courses in a field of study closely related to animal science or range science. The number of courses to be completed in the related area will be determined by the student's committee. Related areas of study often are biology, chemistry, or experimental statistics.

The Department of Animal and Range Sciences is a sponsoring department in the recently approved interdisciplinary graduate degree program that offers both a MS and Ph.D. degree in Water Science Management. The degree program is being handled through the College of Agricultural, Consumer and Environmental Sciences (ACES), and the program description, including application guidelines, classes involved, and topic areas being supported can be found in the catalog under the section describing ACES Programs. Interested students are encouraged to contact the Department Head of Animal and Range Sciences, Shanna Ivey at (575) 646-2515 for more information.

Graduate work in the department is designed to prepare the student for work in the fields of research, extension, teaching, production, and conservation.

Facilities available to graduate students include herds and flocks of the major livestock species, animal nutrition laboratories, physiology laboratories, meats laboratory, small animal laboratory, 25,000-specimen herbarium, two ranches of approximately 92,000 acres, and a 1,000-head experimental feedlot. Active cooperation is maintained with federal research agencies located on and off the campus.

A number of graduate assistantships will be available each year. Inquiries should be addressed to the head of the department.

Degrees for the Department

Bachelor Degree(s)

- Animal Science (Animal Industry) - Bachelor of Science in Agriculture (p. 372)
- Animal Science (Science) - Bachelor of Science in Agriculture (p. 374)
- Range Science - Bachelor of Science in Agriculture (p. 377)

Master Degree(s)

- Agriculture (Domestic Animal Biology) - Master of Agriculture (p. 98)
- Agriculture (Domestic Animal Biology) - Master of Agriculture (Online) (https://catalogs.nmsu.edu/global/nmsu-global/agriculture-domestic-animal-biology-master-agriculture-online/)
- Animal Science - Master of Science (p. 104)
- Mathematics - Graduate Minor (p. 259)
- Music (Collaborative Piano) - Master of Music (p. 176)
- Range Science - Master of Science (p. 185)

Doctoral Degree(s)

- Animal Science - Doctor of Philosophy (p. 200)
- Mathematics - Graduate Minor (p. 259)
- Music (Collaborative Piano) - Master of Music (p. 176)
- Range Science - Doctor of Philosophy (p. 234)

Minors for the Department

- Animal Science - Graduate Minor (p. 254)
- Dairy Science - Undergraduate Minor (p. 379)
- Horse Management - Undergraduate Minor (p. 379)
- Human Animal Interaction - Undergraduate Minor (p. 379)
- Livestock Production - Undergraduate Minor (p. 379)
- Ranch Management - Undergraduate Minor (p. 380)
- Range Science - Graduate Minor (p. 260)
- Range Science - Undergraduate Minor (p. 380)

Department Head **Shanna L. Ivey**

Professors Ashley, Fasenko, Fernald, Hernandez Gifford, Ivey, Löest, Scholljegerdes, Soto

Associate Professors Fuentes-Soriano, Geli, Gifford, Utsumi

Assistant Professors Garbowksi, Mezzomo Giotto, Wendt

College Track Associate Professors Campbell

College Track Assistant Professor Smythe

Instructors Bilovesky; Painter; Priest, Rogers

Co-operators (USDA) Estell, Herrick, Peters

Emeritus Faculty Allred, Bailey, Cibils, Holechek, McDaniel, Ross, Thomas

S. L. Ivey, Department Head, Ph.D. (New Mexico State University)- ruminant nutrition/microbiology; K. W. Allred, Ph.D. (emeritus, Texas A&M University)– plant taxonomy; R.L. Ashley, Ph.D. (Colorado State University)– physiology of reproduction; D.W. Bailey, Ph.D. (emeritus, Colorado State University)– rangeland management; J.W. Campbell, Ph.D. (New Mexico State University)- reproductive physiology; A.F. Cibils, Ph.D. (emeritus, Colorado State University)– grazing management and ecology; G.C. Duff, Ph.D. (New Mexico State University)-animal nutrition; G.M. Fasenko, Ph.D. (North Carolina State University)– companion animal management; A. G. Fernald, Ph.D. (Colorado State University)– land use hydrology and water quality hydrology; S. Fuentes-Soriano, Ph.D. (University of Missouri-Saint Louis)- biology in plant systematics and evolution; M. Garbowksi, Ph.D. (Colorado State University) - restorative ecology; H. M. E. Geli, Ph.D. (Utah State University)-landscape hydrology; C. Gifford, Ph. D. (University of Idaho)- animal science; J. Hernandez-Gifford, Ph.D. (Washington State University)- reproductive physiology; J. L. Holechek, Ph.D. (emeritus, Oregon State)– range ecology; C. A. Löest, Ph.D. (Kansas State University)– ruminant nutrition; K. C. McDaniel, Ph.D. (emeritus, Texas A&M University)– brush management; F. Mezzomo Giotto, Ph. D. (University of Nevada, Reno) - meat science and food safety; L. Prihodko, Ph.D. (Colorado State University)- range ecology; T. T. Ross, Ph.D. (emeritus, North Carolina State University)– physiology of reproduction and sheep production; E.J. Scholljegerdes, Ph.D. (University of Wyoming)– ruminant nutrition; B.G. Smythe, Ph.D. (New Mexico State University)- veterinary entomology; S.A. Soto-Navarro, Ph.D. (New Mexico State University)– ruminant nutrition; J. D. Thomas, Ph.D. (emeritus, University of Missouri-Columbia)– meat science; S. Utsumi, Ph. D. (New Mexico State University) - range ecology; J .Wendt, Ph.D. (Montana State University) - Ecology and Environmental Sciences

Adjunct faculty: *C. D. Allison, Ph.D. (Texas A&M University)– range management; R.A. Cushman, Ph.D. (North Carolina State University)- physiology of reproduction; A. Faist, Ph. D. (University Colorado Boulder) - range ecology; K. M. Harvstad, Ph.D. (Utah State University)– range animal*

nutrition; J.E. Herrick, Ph.D. (Ohio State University)– soils; M.R. Levi, Ph. D. (University of Arizona)-soil morphology/classification; T.J. Nagaraja, Ph.D. (Kansas State University)-rumen microbiology; D.P. Peters, Ph.D. (Colorado State University)– landscape ecology; S. Spiegal, Ph.D. (University of California Berkeley)-range management; M. Steele, Ph.D. (University of Guelph)– ruminant nutrition; A.F. Summers, Ph.D. (University of Nebraska)-physiology of reproduction.

Cooperative Extension Service: *D. Cram, Ph.D. (New Mexico State University)-range science; R. Hagevoort, Ph. D. (*Texas A&M University) - dairy science; *R. Sallenave, Ph.D (*University of Guelph*)-aquatic ecology; S. Smallidge, Ph.D. (New Mexico State University) - wildlife; C. Spackman, Ph.D. (*Utah State University*)- range science; J. L. Turner, Ph.D. (Kansas State University)– equine immunology and physiology; M. Ward, Ph.D. (North Dakota State University)- ruminant nutrition;*

Animal Science Courses

ANSC 1110. Animal Science Careers
1 Credit (1)
Introduction to scientific disciplines and career options in animal-agriculture career skill development, including resume preparation, networking, importance of internships, and leadership experiences in animal agriculture.
Learning Outcomes
1. Increasing the understanding of career opportunities in animal agriculture.
2. Gain a broad experience in the development of creative thinking about the career choices available in animal agriculture.
3. Apply the increased knowledge of career development in the career path and internship directions for each student.
4. Gain leadership experience that will be impactful for the student in their pursuit of a career in animal agriculture.

ANSC 1120. Introduction to Animal Science
3 Credits (3)
Survey of the livestock industry throughout the world. Basic management practices will be covered, including livestock selection, nutrition, reproduction, anatomy and marketing to the consumer. This course will also discuss animal behavior and welfare.
Learning Outcomes
1. Understand the role of farm animals in a global setting.
2. Describe the role of nutrition, breeding, behavior, welfare, and physiology of livestock in the world.
3. Explain the structure and organization of livestock industries.
4. Discuss concepts and terminology of the livestock industries as they relate to the global perspective.
5. Classify the overall management, care, marketing of animals, represented in the various livestock industries.

ANSC 1120H. Introduction to Animal Science Honors
3 Credits (3)
This course is designed to provide an introduction to nutrients and their function in livestock animals. Basic feed identification, evaluation, and diet formulation will be discussed. The anatomy of the digestive tract of animals and their ability to utilize feedstuffs is presented. Classification, digestion, absorption, transport and metabolism of major nutrients required by animals are studied. Additional course work will be required. Restricted to Las Cruces campus only.
Prerequisite(s): Eligibility for membership in honors college.
Learning Outcomes
1. Identify conventional and non-conventional feedstuffs that are fed to livestock animals.
2. Describe various methods for feed processing and storage.
3. Assess the nutritional value of a ration or feed ingredients.
4. Interpret the NRC (Nutrient Requirement Council) guidelines for feeding livestock.
5. List the basic digestive anatomy for all classes of livestock.
6. Describe nutritional deficiencies and digestive disorders common to livestock animals

ANSC 1120L. Introduction to Animal Science Lab
1 Credit (2P)
Students will observe and participate in activities related to farm animal management and will include areas of livestock selection, nutrition, reproductive physiology, animal ID and animal health. This lab is required for animal science majors.
Prerequisite(s)/Corequisite(s): ANSC 1120.
Learning Outcomes
1. To provide the students with an understanding of the principles, concepts and terminology of today's livestock industry

ANSC 1125. Equestrian Team Competition
1 Credit (1)
Basic principles of equestrian team competition, including care and management of the riding horse, equitation equipment, and development of riding skills. Emphasis will be placed competition within the Intercollegiate Horse Show Association. Consent of Instructor required. May be repeated up to 8 credits.
Learning Outcomes
1. Have a general knowledge of horses and basic horsemanship/ equitation position.
2. Explain and demonstrate basic techniques of balance, control, and safety skills while being in contact and mounted on a horse.
3. Explain and demonstrate proper handling and safety around horses and the proper care of the stable and tack.
4. Be able to ride unassisted at the walk, jog, and lope in either English or Western tack.
5. Apply general knowledge of horsemanship and equitation to competitive equine events in a safe manner including equitation on the flat, equitation over fences, horsemanship, ranch riding and reining.

ANSC 1130. Western Equitation I
2 Credits (4P)
Basic principles of Western riding, including care and management of the riding horse, equitation equipment, and development of riding skills.
Learning Outcomes
1. Articulate basic horsemanship position and how it is used to communicate with the horse.
2. Implement proper handling and basic techniques of balance, control, and safety while working with or riding a horse.
3. Execute a basic horsemanship pattern at a walk, jog, and lope.
4. Integrate general knowledge of horsemanship to competitive equine events in a safe manner.

ANSC 1140. Introduction to Dairy Science
3 Credits (3)
Introduction to the basic aspects of dairy science and how to apply key concepts to the practical feeding and management of dairy cattle

and production of dairy products. Students should also obtain an appreciation for the size and diversity of the dairy industry.
Prerequisite(s)/Corequisite(s): ANSC 1120. Restricted to Las Cruces campus only.

Learning Outcomes

1. Learn key concepts in dairy production and management
2. Be familiar with terms used in production of milk and milk products

ANSC 1160. Introductory Horse Science
3 Credits (2+2P)
The light horse industry; breeds; introduction to feeding, breeding, marketing and management; handling and selecting horses for breeding and performance.

Learning Outcomes

1. Describe and identify breeds of horses, their characteristics and their uses.
2. Demonstrate knowledge of basic physiology of horses by recalling parts of the horse, including bones, muscle, tendons and ligaments. Also, by ageing horses via teeth, body condition scoring and taking vital signs.
3. Demonstrate safe and proper handling of horses.
4. Demonstrate comprehension of basic nutrition and feedstuffs by formulating/correcting diets in clinical and non-clinical situations.
5. Recall aspects of basic reproduction by calculating a stallion book and recalling appropriate procedures for breeding.
6. Create informative articles that seek to educate the lay horse person about a topic covered in class.

ANSC 1170. Introduction to Animal Metabolism
3 Credits (3)
Principles underlying the mechanisms of animal metabolism as they relate to production, maintenance, and health of animals.
Prerequisite: CHEM 1215G.

Learning Outcomes

1. This course provides an introduction to the study of the physiology of life.
2. The first part of the course covers acids and bases and the chemical nature of organic compounds.
3. The second part of the course relates to the chemistry of biomolecules (nutrients) and summarizes the chemical reactions of life (metabolism).

ANSC 1180. Companion Animal in Society
3 Credits (3)
Examination of the historical, current, and potential future roles of companion animals in human society. Topics include animal domestication, breeds, exotic companion animals, the companion animal industry, and competitions and sports involving companion animals. Emphasis is on canine and feline species. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

Learning Outcomes

1. Discuss the theories regarding why, how, and when companion animals became domesticated.
2. Describe how selective breeding has optimized certain physiological and behavioral traits of companion animals in order to fulfill the needs of individual people and society.
3. Explain the concept of human-companion animal interaction (HAI) and the influence this bond has on human behavior, health, society, and government policy/laws.
4. Understand the breadth and economic impact of the rapidly expanding companion animal industry and the recent expenditure trends of pet owners.
5. Discuss the past and present uses of companion animals and theorize regarding the future uses of companion animals in society
6. Be effective in searching for, and critically evaluating, scientific based resources.

ANSC 2120. Equine Management
3 Credits (3)
Introduction and application of the business skills necessary to effectively manage the equine operation. Students will learn how to use strategic thinking and sound business management practices to succeed in the demanding equine industry.
Prerequisite: ANSC 1160.

Learning Outcomes

1. Develop a working knowledge of the business principles needed to operate a successful entrepreneurial enterprise.
2. Increase the awareness of the need for business principles in the aggregate function of an equine operation.
3. Gain a greater perspective of accounting, economic and financial principles in an equine business operation.

ANSC 2130. Western Equitation II
2 Credits (4P)
Intermediate principles of Western riding, including reading horse behavior, limbering-up exercises, and developing riding skills. Introduction to rollbacks, turnarounds and stops.
Prerequisite: consent of instructor.

Learning Outcomes

1. Increasing the understanding of the student relative to equitation practices
2. Increase the students' ability to apply principles of Western Equitation to applied settings across a broad spectrum of outlets
3. Prepare the student to engage equine in a professional manner

ANSC 2140. Introduction to Companion Animal Science
3 Credits (3)
Introduction to the care of common companion animal species. Species specific housing and nutrition are covered in the context of maximizing animal health and well-being and reducing disease. May be repeated up to 3 credits.

Learning Outcomes

1. Accurately use scientific terminology common to the companion animal discipline.
2. Compare and contrast the physiological similarities and differences between the various companion animal species studied in class.
3. Create dietary plans based on the nutritional needs of different companion animal species to optimize animal health and lifespan.
4. Identify symptoms of disease/injury at the early stages of illness in order to obtain Veterinary care and treatment as quickly as possible.
5. Design and construct species specific cages/vivariums to maximize animal well- being and health.
6. Educate others regarding providing the best possible care for a variety of companion animal species.

ANSC 2150. Management of Equine Operations
3 Credits (3)
Introduction and application of business skills necessary to effectively manage the equine operation. Students will learn how to use strategic

thinking and sound business management practices to succeed in the demanding equine industry.
Prerequisite(s): ANSC 1160.
Learning Outcomes
1. Acquire a working knowledge of different sectors of the equine industry, including business practices, management and marketing skills.

ANSC 2310. Introduction to Meat Science
3 Credits (2+3P)
Fundamental aspects of the red meat industry. Lecture topics and laboratory exercises include the nutrient value of meat, meat preservation, meat safety, muscle structure and contraction, slaughter and processing of beef, lamb and pork, sausage manufacture, meat curing, meat cookery, and muscle and bone anatomy.
Learning Outcomes
1. Increasing the understanding of meat science applications across animal agriculture.
2. Increase the students' ability to apply principles of production to the industry perspective.
3. Apply the increased knowledge of meat science in a global situation.
4. Gain an understanding of the components involved in the development and processing of the red meat industry.

ANSC 2330. Animal Production
3 Credits (2+2P)
Production and utilization of beef cattle, sheep, and swine; emphasis on feeding, breeding, management problems and marketing; selection of animals for breeding and market
Learning Outcomes
1. Increasing the understanding of meat animal production.
2. Increase the students' ability to apply principles of production to the industry perspective.
3. Apply the increased knowledge of meat animal production to global situations.
4. Gain a broader understanding of the importance of meat animals in the global food system.

ANSC 2340. Genetics in Animal Science
3 Credits (3)
Introduction to genetics and inheritance relative to livestock production. Introduction to procedures for collection and use of performance information in livestock improvement programs.
Prerequisites: BIOL 2610G.
Learning Outcomes
1. Gain a broader understanding of the role genetic impacts in the livestock industry.
2. Employ an increased knowledge of impact of genetics in the food animal industry and the production and economic principles that apply.
3. Recognition of the global impacts of genetics in the food animal industry in a global setting.

ANSC 2996. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.
Learning Outcomes
1. Varies

ANSC 301. Animal and Carcass Evaluation
3 Credits (2+2P)
Determination of the market value of meat animals by relating live animal and carcass traits. Topics include the identification of economically important traits, grading, growth and development, wholesale and retail pricing, and futures and options markets. May be repeated up to 3 credits.
Learning Outcomes
1. Students should have a basic understanding of basic animal internal and external anatomy Yield and quality grades.
2. Students should have a basic understanding of live animal evaluation Carcass evaluation.
3. Students should have a basic understanding of economically important live and carcass traits.

ANSC 303. Livestock, Meat and Wool Evaluation
4 Credits (3+2P)
Selection, classification, grading, and judging of livestock, meat, and wool. May be repeated up to 4 credits.
Learning Outcomes
1. Judge all species of livestock to make decisions on class evaluation.
2. Assess classes of wool and make decisions on placing and be able to determine grade and quality of fleeces.
3. Evaluate and grade classes of meat and be able to make decisions on placing classes.
4. Defend decisions on class placing through written and oral defense.

ANSC 304. Feeds and Feeding
3 Credits (2+2P)
Digestibility of feeds, their nutritive values, grades, and classes, principles of ration formulation and computer ration formulations, and practical feeding of farm animals. May be repeated up to 3 credits.
Prerequisite: CHEM 1215G.
Learning Outcomes
1. Discuss how animals utilize nutrients.
2. Explain why feedstuffs differ in nutritional value.
3. Apply nutritional concepts to the practical feeding of farm animals.
4. Formulate diets that balance nutrient supply with the requirements of farm animals.

ANSC 305. Principles of Genetics
3 Credits (3)
Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.
Prerequisite: (BIOL 2610G and BIOL 2110G, or BIOL 2110G and BCHE 140, and either CHEM 1215G or CHEM 1216).
Learning Outcomes
1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

ANSC 308. Horse Evaluation
4 Credits (2+4P)
Students will acquire a working knowledge of selection and classification of horses, learn criteria for evaluation and selection of breeding and

show animals, gain a broad understanding of judging conformation and performance in the horse, and learn effective oral and written communication skills through defense of class placings. This course is considered an introduction to the NMSU Horse Judging Team. May be repeated up to 4 credits.

Learning Outcomes

1. Evaluate the conformation and performance of horses using established criteria and demonstrate proficiency in applying these skills.
2. Formulate decisions confidently and efficiently based on observed data and established selection principles.
3. Apply a working vocabulary of equine industry terminology to accurately describe and discuss horse evaluation and classification.
4. Identify conformational faults in horses and analyze how these faults relate to potential performance or soundness issues.
5. Defend class placings through effective oral and written communication, demonstrating clarity, reasoning, and industry appropriate language.

ANSC 310. Exhibiting Livestock
3 Credits (1+4P)

Fitting and showing beef cattle, dairy cattle, sheep and swine. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate proper grooming, fitting, and handling techniques for multiple species of livestock commonly exhibited at fairs and shows.
2. Apply principles of animal selection and evaluation to choose appropriate livestock for exhibition based on conformation, health, and market readiness.
3. Implement best practices in animal care and management to ensure ethical treatment, optimal health, and performance of livestock throughout the exhibition process.
4. Analyze the rules, ethics, and regulations governing youth livestock exhibitions at local, state, and national levels.

ANSC 312V. Companion Animals and the Human- Animal Interaction
3 Credits (3)

The science behind human-animal interactions (HAI). An examination of the interactions between humans and companion animals and the effects on human and animal health and wellness. Cultural differences in HAI will be explored. Topics will include Animal Assisted Activity (AAA), Animal Assisted Therapy (AAT), and service animals. Emerging and future uses of companion animals in HAI will be discussed.

Learning Outcomes

1. Provide an overall description of "Human-Animal Interaction" (HAI).
2. Understand and accurately use terminology common to the discipline of HAI.
3. Be able to demonstrate how HAI has influenced human behavior, health, society, and government policy/laws.
4. Provide examples of how HAI influences human and animal physical and psychological health and well-being.
5. Accurately compare and contrast the different categories of HAI animals (ESA, AAA, AAT, Facility and Service Animals) and the training and laws that apply to each animal's presence in public places with a handler.
6. Provide examples of how the field of HAI is interdisciplinary and applies to both social (sociology, psychology, child development, criminal justice) and physical (physiology, animal behavior) sciences.
7. Theorize the future roles of companion animals in HAI.
8. Be competent in applying the knowledge gained in this class to everyday situations, and educate family, friends and members of society, using factual information, about the roles and benefits of companion animals in HAI.

ANSC 320. Equine Behavior and Training
3 Credits (6P)

Basic principles, methods and philosophies of handling, breaking and training the two-year-old Western horse. May be repeated up to 6 credits.
Prerequisite: ANSC 2130 or consent of instructor.

Learning Outcomes

1. Demonstrate ability to acceptably catch, lead, tie, pick up all four feet, and groom an assigned horse.
2. Develop a means of communication to work a young horse in the round pen to develop confidence in both handler and young horse.
3. Evaluate horse natural abilities to determine its direction of training.
4. Integrate desensitizing techniques in order to saddle and unsaddle a horse safely.

ANSC 321. Advanced Equine Behavior and Training
3 Credits (6P)

Continuation of ANSC 320. Further development of skills required to advance the training of the two-year-old Western horse. Emphasis will be placed on lateral work, lead changes, turn-arounds, obstacles, and making the horse accustomed to ranch and trail riding situations.
Prerequisite: ANSC 320 or consent of instructor.

Learning Outcomes

1. Students will apply knowledge gained on natural behavior of the horse while working horses in the round pen, and all groundwork associated with starting a young horse under saddle.
2. Students will demonstrate the ability to use natural aids as a means of communication while putting the first rides on their assigned horse in a safe environment.
3. Students will demonstrate their understanding of the natural reactions and instincts of a young horse by completing a 5 minute demonstration of their assigned horse at the Horse Preview before the NMSU Horse Sale.

ANSC 350. Special Topics
1-4 Credits

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

ANSC 351V. Agricultural Animals of the World
3 Credits (3)

Global study of the development and use of animals for production of food and nonfood products. Climatic, cultural, and economic influences on systems of livestock production and species and breeds of livestock utilized will be evaluated.

Learning Outcomes

1. Define fundamental/basic terms related to animal science systems.
2. Reproduce the cycles of reproduction and nutrition related to farm animals.
3. Give examples of animal domestication.
4. Compare and contrast ruminate and non-ruminate farm animals.
5. Identify and list characteristics of common breeds of farm animals.
6. List farm animals used in other parts of the world.

ANSC 360. Meat and Muscle Biology
3 Credits (3)

Course will explore in depth the antemortem and postmortem factors that influence the properties of meat.
Prerequisite: BIOL 2610G.
Learning Outcomes
1. Identify anatomical parts of the animal's muscular system.
2. Employ principles of respiration within muscle contraction and relaxation.
3. Contrast the relationship between biochemistry and physiology in the context of muscle to meat conversion.
4. Explain the influence of stressors on meat quality.
5. Identify campus resources to successfully complement classroom materials.

ANSC 370. System Physiology of Farm Animals
4 Credits (3+2P)
Structure and function of the animal body. Includes studies of the horse, cow, sheep, pig, and comparisons with the human body. May be repeated up to 4 credits.
Prerequisite: CHEM 1215G and BIOL 2610G or BIOL 2110G.
Learning Outcomes
1. The objective of this course is to introduce the basic terminology and concepts of animal anatomy and physiology.
2. The course will stress the understanding of the functions of the entire body.
3. The interaction of different systems and the effect of environmental factors will be emphasized.

ANSC 383. Equine Reproductive Management
3 Credits (1+4P)
Anatomy, physiology, and endocrinology of reproduction of the mare and stallion; training in modern reproductive techniques employed in the horse industry. May be repeated up to 3 credits.
Prerequisite: ANSC 1160, ANSC 2150, and ANSC 370.
Learning Outcomes
1. Develop an equine management plan related to reproduction to improve the health and performance of horses.
2. Recognize behaviors and signs of the mare's estrous cycle and interpret reproductive records to make informed breeding decisions.
3. Identify and explain the anatomy and physiology of the mare's and stallion's reproductive tract.
4. Compare and contrast various breeding methods, including their advantages, challenges, and suitability for specific scenarios.
5. Assess a mare's pregnancy status and calculate expected foaling dates based on diagnostic and observational data.

ANSC 390. Internship
1-3 Credits
Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 3 credits toward a degree. Graded S/U.
Prerequisite: consent of instructor.

ANSC 391. Undergraduate Research Experience
1-3 Credits (1-3)
Formal laboratory, library, or field study of problems related to animal sciences, emphasizing hypothesis development, testing, and reporting results. Projects are preplanned, reviewed, and approved. Students submit periodic written reports and final written and oral reports. May be repeated for a maximum of three credits. Consent of Instructor required.

ANSC 392. Animal Sciences Teaching/Extension Experience
1-3 Credits (1-3)
: Formal teaching experience related to animal sciences supervised by a faculty member. May involve classroom instruction, educational material development, and/or student evaluation and assessment. Students may also be involved in development, implementation, or assessment of adult or youth educational programs related to animal sciences, supervised by a faculty member. Students submit periodic written reports and a final written and oral report. May be repeated for a maximum of three credits. Consent of Instructor required.

ANSC 402. Animal Science Seminar
1 Credit (1)
A seminar course designed to inform students of the career opportunities, develop their interviewing and other interpersonal skills may also include reading, discussions, written reports, and seminar presentations of current relevant literature.
Learning Outcomes
1. Design resume and cover letter.
2. Develop a 30 second elevator speech.
3. Create answers to common interview questions.
4. Outline personal skills for professional settings.

ANSC 402 H. Animal Science Seminar
1 Credit (1)
Taught with ANSC 402 with additional work. Before enrollment, student must meet Honors eligibility and/or Crimson Scholar status.
Learning Outcomes
1. Design resume and cover letter.
2. Develop a 30 second elevator speech.
3. Create answers to common interview questions.
4. Outline personal skills for professional settings.

ANSC 411. Canine and Feline Behavior and Training
3 Credits (3)
The influence of domestication, breeds, genetics, and physiology on the behavior of canine and feline species. Training methods and modification of problem behaviors are examined. The impact of the pet parent on their animal's behavior is addressed.
Prerequisite: Junior or Senior status or consent of the instructor.
Learning Outcomes
1. Provide evidence why the dominance theory and use of punishment are outdated methods of training.
2. Be able to fully describe and provide examples of classical and operant conditioning learning methods.
3. Justify the importance of socialization in puppies and kittens and the impact this has on adult animals.
4. Accurately interpret canine and feline visual and vocal communication.
5. Demonstrate how to use reward-based learning.
6. Assess the most common behavioral issues in dogs and cats and describe in detail the steps to take to redirect and/or modify undesirable behaviors.
7. Be able to demonstrate how a clicker is used including appropriate timing and reward.
8. Critically evaluate, summarize, and effectively articulate information on behavior and training using both verbal and written skills.
9. Be confident in applying the knowledge gained in this class to everyday situations, and educate family, friends and members of society about companion animal behavior and humane training.

ANSC 412. Canine and Feline Health and Diseases
3 Credits (3)
A review of common infectious and non-infectious diseases and the basics of the immune response. Pathophysiology and treatment of these diseases and the role the pet parent plays in pre-disposing their animals to disease.
Prerequisite: ANSC 2140 or consent of instructor.
Learning Outcomes
1. Accurately use scientific terminology common to the canine and feline health and diseases discipline.
2. Describe what a disease is and the difference between non-infectious and infectious disease.
3. Identify normal versus abnormal vital signs in canines and felines and how they differ between the species.
4. Explain how non-specific (innate) and specific (adaptive) immunity defend against disease.
5. Compare and contrast the etiology (cause) and pathophysiology (physical symptoms) of different canine and feline diseases and identify and understand appropriate preventative measures and treatments.
6. Be competent and confident in educating dog and cat owners regarding the important role they play in disease prevention of their animals.

ANSC 421. Physiology of Reproduction
4 Credits (3+2P)
Fertility and the role of hormones, nutrition, selection, management and environment in the maintenance of high reproductive rate. May be repeated up to 4 credits.
Prerequisite: ANSC 370.
Learning Outcomes
1. Debate past, present, and future ethical issues in the animal science industries.
2. Compare relationships between anatomy, physiology, nutrition, genetics, and reproduction among animal species.
3. Examine interrelationships between nutrition, genetics, reproduction, and their effects on animal health and the environment.

ANSC 422. Animal Nutrition
3 Credits (3)
Nutrient utilization and measurement and nutrient requirements for the various body functions. May be repeated up to 3 credits.
Prerequisite: CHEM 313 or ANSC 1170.
Learning Outcomes
1. Compare digestion, absorption and metabolism of nutrients between ruminants and non-ruminants.
2. Demonstrate how animal physiology drives nutrient usage in the body.
3. Integrate animal nutrition concepts to better understand efficient animal production and health.

ANSC 423. Animal Breeding
3 Credits (2+2P)
Mating systems, and selection procedures; calculation of inbreeding coefficients, genetic relationships, and gene frequency. May be repeated up to 3 credits.
Prerequisite: ANSC 2340 or 305.
Learning Outcomes
1. Explain the basic principles of Mendelian and quantitative genetics.
2. Interpret and apply population genetics and selection models to livestock breeding programs.
3. Calculate and analyze genetic parameters such as heritability, repeatability, and breeding values.
4. Evaluate breeding strategies including inbreeding, crossbreeding, and composite formation.
5. Apply molecular genetics tools and genomic concepts to animal breeding.
6. Design simple breeding plans incorporating selection, mating strategies, and reproductive technologies.

ANSC 424. Swine Production
3 Credits (2+2P)
Breeding, feeding, and care of swine. May be repeated up to 3 credits.
Prerequisite: ANSC 304.
Learning Outcomes
1. Identify major livestock production systems in the US.
2. Analyze basic animal physiological adaptations to environmental challenges.
3. Analyze production losses due to environmental challenges.
4. Explain physiological mechanisms resulting in production losses.
5. Research management intervention strategies to mitigate environmental challenges.
6. Solve a production loss scenario using an economically viable management strategy.
7. Generate research article based on thermography research.

ANSC 425. Horse Science and Management
3 Credits (2+2P)
Senior level course requiring students to apply basic knowledge acquired in the previous courses to solve typical problems encountered in the horse industry. Specific topics include genetics and animal breeding, business and legal issues, reproduction, health, nutrition and exercise physiology. May be repeated up to 3 credits.
Prerequisite: ANSC 304 and ANSC 370 or concurrent registration.
Learning Outcomes
1. Demonstrate advanced knowledge of equine genetics, breeding and reproduction.
2. Demonstrate advanced knowledge of equine management.
3. Demonstrate advanced knowledge of equine health, nutrition and exercise physiology.
4. Demonstrate advanced knowledge of equine business and legal issues.
5. Effectively problem solve issues pertaining to management of equine programs and facilities.
6. Develop a comprehensive business and management plan for an equine business such as a breeding farm, training center, boarding facility, etc.

ANSC 426. Beef Production: Cow-Calf Management
3 Credits (2+2P)
Senior level course examining management practices for the cow-calf producers. Specifically focusing on nutrition, reproduction, genetics, marketing, and health. May be repeated up to 3 credits.
Prerequisite: ANSC 304 and (ANSC 2340 or ANSC 305) or concurrent registration.

Learning Outcomes

1. Demonstrate knowledge of the different systems utilized to produce a unit of beef: topics considered will include discussion of breeding, reproduction, nutrition, health, management, and marketing strategies.

ANSC 427. Dairy Production
3 Credits (2+2P)
Breeding, nutrition, physiology and management of dairy cattle. May be repeated up to 3 credits.
Prerequisite: ANSC 304 and (ANSC 2340 or ANSC 305) or concurrent registration.
Learning Outcomes

1. Students will be able to evaluate appropriate housing for production practices.
2. Summarize ethical issues in the dairy industry along with regulations guiding production of the dairy industry.
3. Evaluate popular press and scientific literature related to dairy production practices.

ANSC 428. Sheep and Wool Production
3 Credits (2+2P)
Genetics, nutrition, physiology and management of sheep. Wool grading, shearing, and disease control. May be repeated up to 3 credits.
Prerequisite: ANSC 304, ANSC 370.
Learning Outcomes

1. Enhance knowledge and understanding of the different systems utilized to produce a sheep and wool: topics discussed will include breeding, nutrition, reproduction, management and marketing strategies.

ANSC 429. Beef Production: Feedlot Management
3 Credits (2P)
Senior level course in feedlot management of beef cattle. Topics of interest include cattle handling and processing, health and nutrition, intake management, and growth. Feed mill operation, marketing strategies, and regulatory concerns associated with finishing cattle production may also be discussed.
Prerequisite: ANSC 304 or Consent of Instructor.
Learning Outcomes

1. Examine requirements necessary to optimize animal health and welfare and growth performance. By the end of the semester, students will be able to plan appropriate management decisions to increase productivity in stocker/feedlot production.
2. Determine selective breeding decisions on productivity of stocker/feeder cattle.
3. Review appropriate scientific and popular press literature to improve management of stocker/feedlot cattle.

ANSC 448. Problems
1-4 Credits
Individual investigation in a specific area of animal science. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

ANSC 458. Livestock Behavior, Welfare and Handling
3 Credits (2+3P)
Principles of animal behavior and evaluation of management practices on animal welfare in confined and rangeland livestock operations. Low stress livestock handling techniques. Design of livestock handling facilities. Crosslisted with: RGSC 458
Prerequisite(s): RGSC 2110 or ANSC 1120.

ANSC 462. Parasitology
3 Credits (3)
Same as EPWS 462.

ANSC 468. Advanced Dairy Herd Management
3 Credits (3)
The course is offered through the Southern Great Plains Dairy Consortium in Clovis, NM, and will include breeding, nutrition, physiology, health and management of large herd dairies of the Southwest. Students must apply for the course through the Consortium, and can take it more than once, as topics vary. Consent of instructor required.
Prerequisite(s): ANSC 304.

ANSC 480. Environmental Physiology of Domestic Animals
3 Credits (3)
Influence of environmental factors on physiological processes of domestic animals.
Prerequisite: ANSC 370.
Learning Outcomes

1. Identify major livestock production systems in the US.
2. Analyze basic animal physiological adaptations to environmental challenges.
3. Analyze production losses due to environmental challenges.
4. Explain physiological mechanisms resulting in production losses.
5. Research management intervention strategies to mitigate environmental challenges.
6. Solve a production loss scenario using an economically viable management strategy.
7. Generate research article based on thermography research.

ANSC 484. Ruminant Nutrition
3 Credits (3)
Energy, nitrogen, and mineral nutrition of ruminants with special emphasis on digestive physiology and metabolism of nonprotein nitrogen compounds.
Prerequisite/Corequisite: ANSC 422.
Learning Outcomes

1. Examine the parts of the ruminant digestive tract and their function in digestion.
2. Integrate ruminal bacteria and their role into fermentation pathways.
3. Appraise fermentation/metabolic modifiers and their role in improving animal performance.
4. Calculate energy and protein requirements.
5. Integrate environmental and physiological impacts on intake and digestibility.
6. Combine animal requirements, feed nutrients, and knowledge of fermentation into feeding recommendations for various classes of ruminants.

ANSC 501. Advanced Animal Nutrition
3 Credits (3)
Emphasis on digestive physiology and metabolism. Basic mechanisms involved in the intake, digestion, and absorption of nutrients studied.
Learning Outcomes

1. Describe how animals utilize nutrients.
2. Explain why feedstuffs differ in nutritional value.
3. Apply nutritional concepts to practical feeding of domestic livestock ('critical thinking' skills).

4. Formulate diets for domestic livestock, with emphasis on mixing feedstuffs to balance nutrient supply with nutrient requirements ('quantitative reasoning' skills).

ANSC 507. Laboratory Techniques in Nutrition
4 Credits (2+6P)
Methodology and experimental procedures in measuring nutrient requirements and value of diets. May be repeated up to 4 credits.
Prerequisite: ANSC 422 or consent of instructor.
Learning Outcomes
1. Orient to the NMSU Animal Science Nutrition Laboratory.
2. Gain an understanding and familiarity with the basic techniques used in nutrition research.
3. Develop critical, scientific thinking.
4. Facilitate use of communication skills.

ANSC 509. Endocrinology of Domestic Animals
3 Credits (3)
The role of hormones in growth, development, metabolism, temperature regulation, lactation, and reproduction of domestic animals, including commercial applications.
Learning Outcomes
1. Explain the mechanisms in which physiological systems are influenced by hormonal regulation and chemical mediators.
2. Describe cellular and whole animal behavior related to endocrine function.
3. Interpret scientific literature related to molecular and endocrine physiology.
4. Articulate in comprehensive and succinct manner written communication specific functions of the endocrine system.

ANSC 510. Range Nutrition Techniques
3 Credits (3)
Animal and plant methods of determining quantity and quality of range forage. Taught with RGSC 510.
Prerequisite: ANSC 484 or consent of instructor.
Learning Outcomes
1. Students will organize a protocol with a description of research techniques needed to answer a research question related to grazing management.
2. Students will be able calculate diet digestibility of a diet using marker data.
3. Students will be able design a set of experiments that utilize a variety of techniques to answer hypothesis related to animal and range interactions.

ANSC 512. Research Methods in Animal Science
4 Credits (3+2P)
Procedures used in animal science research, including planning and conduct of investigations and interpretation of results. May be repeated up to 4 credits.
Learning Outcomes
1. Design rigorous animal science experiments.
2. Apply statistical methods to analyze experimental data.
3. Critically evaluate experimental designs and statistical methods of published research.
4. Communicate experimental statistical findings clearly and effectively.
5. Differentiate among core experimental designs.

ANSC 515. Graduate Seminar
1 Credit (1)
Exploration of current and emerging topics, with subject matter varying based on recent developments and trends. May be repeated up to 4 credits.
Learning Outcomes
1. Design a structured outline for a seminar presentation that reflects clear organization and purpose.
2. Analyze the key elements that contribute to an effective and professionally designed PowerPoint presentation.
3. Evaluate the relevance and appropriateness of content for inclusion in a professional presentation.
4. Create a PowerPoint presentation on a self-selected topic, demonstrating effective visual and informational design.
5. Analyze the content and structure of the presentation to predict potential audience questions.
6. Deliver a professional PowerPoint presentation tailored to a target audience.
7. Assess peer presentations using established criteria for content, design, and delivery.

ANSC 520. Advanced Nutritional Management I: Feedlot
3 Credits (3)
Emphasis on feeding systems for beef cattle from weaning to slaughter. Primary focus on feedlot nutrition and management.
Prerequisite: ANSC 484 or consent of instructor.
Learning Outcomes
1. Explain concepts and applications of nutritional management of feedlot cattle.
2. Critique scientific literature on nutritional management of feedlot cattle.
3. Solve feedlot case studies by analyzing, interpreting, and evaluating real-world cattle feeding scenarios.
4. Create a diet formulation using National Research Council equations to meet feedlot cattle nutrient requirements.

ANSC 521. Advanced Nutritional Management II: Cow Calf/Stocker
3 Credits (3)
Emphasis on nutritional management for cow-calf and stocker operations. Primary focus on applications to range animal nutrition and management.
Prerequisite: ANSC 484 or consent of instructor.
Learning Outcomes
1. Summarize basic nutrient metabolism in ruminants.
2. Identify physiological factors that influence maintenance requirements.
3. Characterize physiological factors that influence reproductive processes.
4. Outline nutrient requirements for calves, cows, steers, heifers, and bulls.
5. Formulate rations for calves, cows, steers, heifers, and bulls.
6. Justify nutritional recommendations that address a real-world scenario.

ANSC 522. Animal Nutrition
3 Credits (3)
Nutrient utilization and measurement; nutrient requirements for the various body functions. Taught with ANSC 422 with additional requirements for graduate students. Recommended for nonmajors.

Learning Outcomes

1. Compare digestion, absorption and metabolism of nutrients between ruminants and non-ruminants.
2. Demonstrate how animal physiology drives nutrient usage in the body.
3. Integrate animal nutrition concepts to better understand efficient animal production and health.

ANSC 560. Rumen Microbiology
3 Credits (3)
Issues in ruminal and gastrointestinal microbiology. Includes physiological and genetic mechanisms in carbohydrate and nitrogen utilization. Taught with FSTE 560.
Prerequisite: ANSC 501.
Learning Outcomes

1. Explain the mechanisms by which the rumen microbial population contributes to rumen function and structure.
2. Illustrate nutrient digestion and metabolism by rumen microbes.
3. Interpret scientific literature related to rumen microbiology.
4. Manage livestock in real world scenarios utilizing skills gained throughout the course.

ANSC 580. Environmental Physiology of Domestic Animals
3 Credits (3)
Influence of environmental factors on physiological processes of domestic animals. Specific focus on fetal and developmental programming, heat and cold stress.
Learning Outcomes

1. Identify major livestock production systems in the US.
2. Analyze basic animal physiological adaptations to environmental challenges.
3. Analyze production losses due to environmental challenges.
4. Explain physiological mechanisms resulting in production losses.
5. Research management intervention strategies to mitigate environmental challenges.
6. Solve a production loss scenario using an economically viable management strategy.
7. Generate research article based on thermography research.

ANSC 598. Special Research Programs
1-4 Credits (1-4)
Individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

ANSC 599. Master's Thesis
1-15 Credits (1-15)
Thesis. Consent of Instructor required. Thesis/Dissertation Grading. May be repeated up to 88 credits.
Learning Outcomes

1. Various

ANSC 600. Research
1-15 Credits
This course is for Ph.D. students before they have completed qualifiers. Consent of Instructor required. Thesis/Dissertation Grading.
Prerequisite(s): ANSC 421 or consent of instructor.

ANSC 602. Advanced Reproductive Physiology
3 Credits (3)
Mechanisms of reproductive function; research methodology.
Prerequisite: ANSC 421 or consent of instructor.
Learning Outcomes

1. Assess the biochemical properties and mechanisms of action for reproductive hormones, including receptor interactions and intracellular signaling.
2. Summarize endocrine regulation in reproduction, mapping the HPG axis and its role in puberty, cycles, and gametogenesis.
3. Compare ovarian and testicular functions including follicular development, ovulation, spermatogenesis, and steroidogenesis.
4. Integrate the physiological steps of fertilization, including gamete transport, capacitation, acrosome reaction, and sperm-egg interactions.
5. Evaluate hormonal and physiological mechanisms in pregnancy, including maternal recognition, implantation, and placental function.
6. Develop a proposal outlining the stages of parturition, including fetal signaling, maternal adaptations, and hormonal control.

ANSC 604. Hypothalamo-Hypophyseal-Pineal Endocrinology (fe)
1 Credit (1)
Hormones and other neurochemicals synthesized and secreted by the hypothalamus, pituitary, and pineal glands. Neuroendocrinology of the hypothalamo-hypophyseal axis.
Prerequisite: ANSC 509.

ANSC 605. Gonadal and Uterine Endocrinology
1 Credit (1)
Endocrinology of mammalian ovaries, testes, and uteri including developing trophoblasts.
Prerequisite: ANSC 509.
Learning Outcomes

1. Explain and evaluate advanced reproductive endocrine concepts of the uterus, ovaries, and testes in domestic animals.
2. Critically analyze and synthesize foundational and modern research literature on gonadal and uterine endocrinology.
3. Effectively communicate complex concepts in reproductive endocrinology through written discussion and abstract composition.
4. Integrate knowledge across modules to evaluate reproductive regulation and dysfunction in livestock.

ANSC 606. Endocrinology of Pregnancy, Parturition, and Lactation (fe)
1 Credit (1)
Hormones and other chemical messengers involved in maintenance of pregnancy, control of parturition, and initiation and maintenance of lactation in farm animals.
Prerequisite: ANSC 509.

ANSC 621. Metabolic Functions and Dysfunctions
3 Credits (3)
Physiological chemistry of ruminants and other domestic animals, with attention to metabolic dysfunctions and nutritional toxicology.
Prerequisite: CHEM 345 and ANSC 501.
Learning Outcomes

1. Explain the cellular and molecular mechanisms that control metabolic function and dysfunction in major organ systems.
2. Analyze the roles of organ systems in maintaining metabolic homeostasis.
3. Evaluate metabolic disorders in terms of pathophysiology, clinical symptoms, and treatments.
4. Integrate knowledge of proper metabolic functions to understand how metabolic dysfunction of one system affects the function of other systems.

5. Design evidence-based management strategies to mitigate common metabolic dysfunctions in livestock.

ANSC 625. Nutrient Metabolism I: Mineral, Vitamin, and Nitrogen Metabolism
4 Credits (4)
Cellular metabolism, physiological function(s), toxicities, and deficiencies of minerals, vitamins and nitrogen in ruminants and nonruminants.
Prerequisite: ANSC 501.
Learning Outcomes
1. To introduce the student to the absorption and disposition of vitamins and minerals in the animal.
2. To provide the student with a basic understanding of the importance of vitamins and minerals in animal metabolism.
3. To introduce the student to the concept of nitrogen metabolism and the partitioning of nitrogen in the animal.

ANSC 626. Nutrient Metabolism II: Carbohydrates, Lipids, and Energetics
4 Credits (4)
Basic principles of carbohydrate, lipid, and energy metabolism; integration of metabolism with emphasis on nutritional and biochemical processes related to efficiency of nutrient use.
Prerequisite: ANSC 501.
Learning Outcomes
1. Varies.

ANSC 698. Special Research Programs
1-4 Credits
Advanced individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

ANSC 700. Doctoral Dissertation
15 Credits
Dissertation. Consent of Instructor required. Thesis/Dissertation Grading.

Range Science Courses

RGSC 1110. The Range Science Profession
1 Credit (1)
Introduction to scientific disciplines and career opportunities in rangeland science and management.
Learning Outcomes
1. To introduce students to the Range Science program and to a variety of career opportunities in Range Science.
2. To develop an individualized course curriculum that prepares the student to achieve their career goals.
3. To examine opportunities to gain practical work experience through internships and cooperative employment.

RGSC 2110. Introduction to Rangeland Management
3 Credits (3)
This course covers the principles of managing and understanding pasture and rangelands. Plant physiology and ecology, plant communities and rangeland sustainability and how they relate to livestock production and wildlife management will be discussed. Restricted to: Main campus only.
Learning Outcomes
1. Understand rangeland management operations.
2. Identify rangeland plants.
3. Gain a perspective of watershed management.
4. Discuss the management of rangeland resources.
5. Understand the process of rangeland evaluation through a broad understanding of monitoring and production of these rangelands.
6. Gain a perspective of the correlation of rangelands and the economic principles guiding resource management.
7. Understand the process of rangeland condition.
8. Understand the concepts of stocking rates and usage of rangelands.
9. Gain a broad perspective of different classes of land ownership; Tribal, federal, private and state. 1
10. Recognize vegetative communities, ecological sites, plant physiology andapplication to rangeland management considerations.

RGSC 2996. Special Topics
1-4 Credits
Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.
Learning Outcomes
1. Varies

RGSC 302V. Forestry and Society
3 Credits (3)
Global study of the development and use of forest resources for production of wood, fuel, fiber, and food products. Climatic, edaphic, cultural, and economic influences on forests of the world evaluated. Same as HORT 302V.
Learning Outcomes
1. Demonstrate comprehension of basic plant physiology.
2. Analyze various inputs and environmental factors that affect trees and forests.
3. Identify forest biomes based on plant morphology and environmental characteristics.
4. Categorize different types of forest products and harvesting methods.
5. Compare and contrast various forest management practices in the US and worldwide.
6. Evaluate climate and ecological issues as they relate to society.
7. Develop an awareness of the interconnection of nature and society.

RGSC 316. Rangeland Plants
3 Credits (2+3P)
Identification, classification, cultural uses, and economic importance of native and introduced rangeland plants. May be repeated up to 3 credits.
Learning Outcomes
1. Describe the physical characteristics of plants within key Representative Rangeland Plant Groups.
2. Explain the scientific classification system and accurately place plants within the correct taxonomic hierarchy (kingdom to species).
3. Apply plant morphology and classification knowledge to identify rangeland plants using field guides, dichotomous keys, and other botanical tools.
4. Demonstrate proficiency in field methods through plant surveys and specimen collection, connecting practical skills with theoretical concepts.
5. Analyze selected rangeland plant species for their unique traits, ecological roles, and potential uses in land management or restoration.

RGSC 317. Rangeland Communities
3 Credits (3)
Rangeland associations and communities, their plant species composition, and ecological factors affecting management of communities.

Learning Outcomes

1. Identify and distinguish the major rangeland associations and plant communities found across different regions of the United States.
2. Explain the ecological and geographical characteristics (ecogeographic) of rangeland communities and evaluate the primary management challenges associated with each.
3. Recognize and describe key plant and wildlife species that characterize each rangeland community, highlighting their ecological roles and interactions.

RGSC 318. Watershed Management
3 Credits (2+2P)
Management of rangeland and forest watersheds with emphasis on hydrologic cycle and land use effects on runoff and water quality. May be repeated up to 3 credits.
Learning Outcomes

1. Understand impacts of land use on water quantity and quality.
2. Quantify components of the hydrologic cycle.
3. Learn watershed management techniques and practices.
4. Apply scientific principles to evaluate current issues in watershed management.

RGSC 325. Rangeland Restoration Ecology
3 Credits (3)
Principles and practices of vegetation management and ecological restoration. Course emphasizes problems associated with rangeland degradation, and implementation of rangeland restoration and improvements.
Prerequisite: Sophomore standing or consent of instructor.
Learning Outcomes

1. Use fundamental knowledge of plants, soils, and climate to explain how changes in the structure and function of ecological systems can cause ecological degradation, and how management actions can implement changes to facilitate ecological restoration.
2. Compare and contrast the four major plant control methods (mechanical, chemical, fire, and biological) in terms of their effects on vegetation and soils and demonstrate how this knowledge informs management decisions.
3. Describe the biotic and abiotic factors that must be considered to design and implement feasible revegetation and restoration plans and explain the importance of these factors in an ecological context.
4. Apply the concepts and principles learned in this course to predict the effect of vegetation management activities on common North American rangeland plant communities.
5. Effectively communicate understanding of land degradation and restoration practices via writing and oral presentations.

RGSC 350. Special Topics
1-4 Credits
Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

RGSC 357. Grass Taxonomy and Identification
3 Credits (1+4P)
Taxonomy of grasses; grass anatomy, variation in reproductive structures, and identification of grasses by sight and through the use of dichotomous keys. Students must be Junior standing to enroll in this course. May be repeated up to 3 credits.
Learning Outcomes

1. Use terminology to describe and identify grasses.
2. Apply dichotomous keys to unknown grass species so they can be identified.
3. Recognize numerous important rangeland grasses.
4. Understand the taxonomic classification of grasses.
5. Describe the important characteristics of grasses for disciplines related to range science, wildlife management, and natural history.

RGSC 390. Internship
1-3 Credits
Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 3 credits toward a degree. May be repeated up to 3 credits.
Learning Outcomes

1. Apply foundational knowledge of rangeland science to practical field and management settings.
2. Gain firsthand experience working with professionals in the rangeland ecology and management field and develop key workplace skills such as communication, collaboration, and time management.
3. Describe the goals, roles, and daily operations of the host agency or organization, and reflect on how the internship experience informs their career interests and personal development.
4. Through documentation and final reporting, students will demonstrate an ability to communicate the value of their internship work and articulate how it connects to broader concepts in rangeland ecology and management.

RGSC 402. Seminar
1 Credit (1)
A seminar course designed to inform students of the career opportunities, develop their interviewing and other interpersonal skills may also include reading, discussions, written reports, and seminar presentations of current relevant literature.
Prerequisite(s): Senior standing.

RGSC 402 H. Range Science Seminar
1 Credit (1)
Taught with RGSC 402 with additional work.
Prerequisite(s): Meets Honors eligibility and/or Crimson Scholar status and senior standing.

RGSC 440. Rangeland Resource Ecology
3 Credits (3)
Plant adaptations to arid environments. Life histories of arid land plants. Biotic interactions among rangeland organisms. Arid land plant communities: their physiognomy, diversity, productivity, and response to disturbance. Arid land ecosystem dynamics.
Learning Outcomes

1. Students who complete this course will have a better understanding of mechanisms that determine how rangeland plant communities and ecosystems respond to natural and human-induced disturbance regimes.

RGSC 440 L. Rangeland Resource Ecology Lab
1 Credit (2P)
Living and nonliving factors of the range environment, the life forms and role of range plants and animals on succession and interactions in range ecosystems. Corerequisite(s): RGSC 440. May be repeated up to 1 credit.

Learning Outcomes

1. Students who complete this course will gain a comprehensive understanding of the interplay between abiotic and biotic factors in shaping rangeland plant communities.
2. Learn how rangeland ecosystems adapt and respond to both natural and human-induced disturbances and change.
3. Students will apply field measurement techniques and remote sensing to develop and evaluate rangeland monitoring assessment plans.

RGSC 448. Problems
1-4 Credits (1-4)
Individual investigation in a specific area of range science. Maximum of 4 credits per semester and a grand total of 6 credits. Consent of Instructor required.

RGSC 452. Vegetation Measurements for Rangeland Assessment
4 Credits (2+4P)
Sampling principles, sampling design, and measurement methods used to quantify vegetation attributes and to assess the structure and function of rangeland ecosystems. Laboratory emphasizes practical field techniques, quantitative analysis, and interpretation of results. May be repeated up to 4 credits.
Prerequisite: RGSC 294 and A ST 311.
Learning Outcomes

1. Choose from many available tools and methods for measuring and quantifying vegetation.
2. Design appropriate sampling protocols to meet monitoring objectives in various types of vegetation.
3. Measure vegetation cover, density, frequency, species inventory and production on rangelands.
4. Estimate utilization of forage.
5. Explain advantages and disadvantages of different sampling and measurement methods.
6. Use standard approaches to land classification and evaluation to interpret results in the context of resource management decisions.
7. Clearly communicate results through graphics as well as writing.

RGSC 458. Livestock Behavior, Welfare and Handling
3 Credits (2+3P)
Principles of animal behavior and evaluation of management practices on animal welfare in confined and rangeland livestock operations. Low stress livestock handling techniques. Design of livestock handling facilities. Crosslisted with: ANSC 458
Prerequisite(s): RGSC 2110 or ANSC 1120.

RGSC 460. Rangeland and Natural Resource Planning and Management
4 Credits (3+3P)
Planning and problem solving in rangeland and natural resource management. Public land planning and policy. Application of land management principles to resolve rangeland, riparian and habitat issues. May be repeated up to 4 credits.
Prerequisite: Senior or graduate student standing.
Learning Outcomes

1. Apply previous course work and skills to evaluate approaches to rangeland management issues.
2. Prepare a proposal for a practitioner-scientist research and management project which will include a comprehensive literature review of a specific topic, a directed research and project objective, partnerships among stakeholders, a project budget and timeline, and a monitoring and evaluation plan.

RGSC 485. Land Cover Analysis for Natural Resources
3 Credits (3)
This course is designed to help students understand, manipulate and extract Earth Observation (EO) data and to conduct land cover analysis related to natural resources including water and vegetation. The course provides and highlights means to identify and access EO data in different formats, extract meaningful information, and to help students developing critical thinking skills. The course introduces tools such as python and ArcGIS Pro to handle different data formats (e.g. hdf) efficiently; develop and present creative maps. The course provides basic information about how to conduct land use, land cover change analysis, mapping vegetation, water related variables and plant and animal distribution analysis.
Learning Outcomes

1. Identify sources of and obtain land cover GIS data.
2. Handle GIS data in different formats.
3. Extract meaningful information.
4. Development of qualitative reasoning and analytical thinking skills to address research questions related to natural resources.

RGSC 509. Approaches to Rangeland Research
3 Credits (3)
Experimental design and statistical analysis of experimental results.
Prerequisite: A ST 505 or consent of instructor.
Learning Outcomes

1. Define and articulate problems related to rangeland resources with clarity and relevance.
2. Formulate researchable questions based on clearly defined problems.
3. Identify and justify key variables relevant to addressing specific research questions.
4. Develop testable hypotheses and clearly defined research objectives.
5. Evaluate and compare alternative sampling methods for rangeland data collection.
6. Assess the strengths and limitations of various experimental designs in rangeland research.
7. Use statistical software tools, including Excel and SAS, to organize, analyze, and interpret data.
8. Critically analyze research publications and ongoing projects, including those of peers and professionals, for methodological rigor and scientific validity.

RGSC 513. Advanced Rangeland Ecology
3 Credits (3)
Overview of the current state of knowledge in selected areas of rangeland ecology, with emphasis on currently developing ideas and issues relevant to rangeland management.
Prerequisite: RGSC 440 or equivalent.
Learning Outcomes

1. Define rangelands and describe their global distribution, ecological characteristics, and historical context within the field of natural resource management.
2. Explain key ecological principles and functional traits (morphology and physiology) that influence rangeland ecosystem structure, function, and response to disturbance.
3. Apply foundational methods for rangeland inventory, monitoring, and assessment, including techniques for evaluating vegetation, soil condition, and ecosystem health.

4. Evaluate strategies for sustainable rangeland management, including livestock grazing systems, vegetation management, restoration practices, and watershed/riparian area protection.

RGSC 515. Graduate Seminar
1 Credit (1)
Current topics. Graded S/U.

RGSC 516. Arid Land Management
3 Credits (3)
Survey of seminal and current literature dealing with management of arid and semiarid lands including soil-plant-animal interactions, plant community ecology, arid land assessment methods, and arid land hydrology.
Learning Outcomes
1. Gain a better understanding of the basic science underlying the management of semi-arid and arid range lands.
2. Have an increased appreciation of relevant topics, seminal papers, as well as key researchers in each of the areas of arid land management mentioned above.
3. Become familiarized with the history, academic traditions, and current issues in arid land management in the western United States.

RGSC 518. Watershed Methods and Management
3 Credits (3)
Management of rangeland and forest watersheds with emphasis on the hydrologic cycle and land use effects on runoff and water quality. Hydrologic monitoring methods problem sets required for graduate credit.
Learning Outcomes
1. Understand impacts of land use on water quantity and quality.
2. Quantify components of the hydrologic cycle.
3. Learn watershed management techniques and practices.
4. Apply scientific principles to evaluate current issues in watershed management.

RGSC 520. Arid Land Plant Herbivore Interactions
3 Credits (3)
Survey of seminal and current literature dealing with plant- and animal-related factors that influence herbivory patterns in arid landscapes. Although ungulate herbivory is a central focus of the course, the role of plant defenses in deterring both vertebrate and invertebrate herbivores is discussed in detail.
Learning Outcomes
1. To develop a holistic systems thinking and problem-solving approach to understanding plant and animal interrelationships, as well as addressing issues relevant to both managed and natural ecosystems.
2. Students who complete this course will develop a comprehensive understanding of these dynamics and be equipped with the skills to apply this knowledge in practical scenarios.
3. Students will deepen their understanding of how to read, review, and present scientific literature, and conduct scientific paper annotations.
4. Develop a first draft of a scientific paper reporting either experimental results, a meta-analysis of existing data, or an in-depth literature review on a topic related to the student's dissertation.

RGSC 525. Advanced Rangeland Restoration Ecology
3 Credits (3)
Theory and application of restoration ecology and the principles and practices of ecological restoration. Course emphasizes problems associated with rangeland degradation and highlights current restoration management actions.
Learning Outcomes
1. Use fundamental knowledge of plants, soils, and climate to explain how changes in the structure and function of ecological systems can cause ecological degradation, and how management actions can implement changes to facilitate ecological restoration.
2. Compare and contrast the four major plant control methods (mechanical, chemical, fire, and biological) in terms of their effects on vegetation and soils and demonstrate how this knowledge informs management decisions.
3. Describe the biotic and abiotic factors that must be considered to design and implement feasible revegetation and restoration plans and explain the importance of these factors in an ecological context.
4. Apply the concepts and principles learned in this course to predict the effect of vegetation management activities on common North American rangeland plant communities.
5. Effectively communicate understanding of land degradation and restoration practices via writing and oral presentations.

RGSC 550. Special Topics
1-4 Credits
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

RGSC 551. Earth Data Retrieval
3 Credits (3)
This course covers topics related to identifying sources, preprocessing, utilizing earth data that can be used to monitor some hydrological and water related variables, vegetation growth and related biophysical properties. The course focuses on developing students' skills on how to handle and analyze high-level large amounts of research data in different formats (i.e. .hdf). The course highlights the use of remote sensing and land surface models-based (NLDAS) earth observation datasets (e.g. NDVI, LST, Ta, and ET). The course uses some open-source tools including Python, API as well as MATLAB. Crosslisted with: WSAM 551.
Learning Outcomes
1. Identify, retrieve, and visualize earth observation datasets that are relevant to individual research activities.
2. Understand the nature and formats of earth observation data.
3. Handle, process, and conduct quantitative analysis of earth observation datasets using python, MATLAB, and cloud computing (GEE).
4. Development of qualitative reasoning and analytical thinking skills to address research questions related to earth observation datasets.

RGSC 557. Advanced Grass Taxonomy and Identification
3 Credits (1+4P)
Taxonomy of grasses; grass anatomy, variation in reproductive structures, and identification of grasses by sight and through the use of dichotomous keys. Additional writing and grass identification assignments are required for graduate credit. May be repeated up to 3 credits.
Learning Outcomes
1. Use terminology to describe and identify grasses.
2. Apply dichotomous keys to unknown grass species so they can be identified.
3. Recognize numerous important rangeland grasses.
4. Understand the taxonomic classification of grasses.
5. Describe the important characteristics of grasses for disciplines related to range science, wildlife management, and natural history.

RGSC 575. Climate Studies, Water and Society
3 Credits (3)
The course provides a brief description of the Earth's climate system, an in-depth review and methodologies used to investigate climate change and variability, evidence of climate change on natural systems (water availability) vulnerability of human systems (e.g. agriculture) to climate change, and mitigation and adaptation strategies.

Learning Outcomes

1. Know, identify, and interrogate Earth's climate observation datasets.
2. Evaluate and understand Earth's climate systems.
3. Conduct meaningful investigations, prediction, and inferencing.
4. Critical thinking about climate change impacts on human and natural resources.

RGSC 585. Land Cover Analysis for Natural Resources
3 Credits (3)
This course is designed to help students understand, manipulate and extract Earth Observation (EO) data and to conduct land cover analysis related to natural resources including water and vegetation. The course provides and highlights means to identify and access EO data in different formats, extract meaningful information, and to help students developing critical thinking skills. The course introduces tools such as python and ArcGIS Pro to handle different data formats (e.g. hdf) efficiently; develop and present creative maps. The course provides basic information about how to conduct land use, land cover change analysis, mapping vegetation, water related variables and plant and animal distribution analysis. Crosslisted with: WSAM 585.

Learning Outcomes

1. Identify sources of and obtain land cover GIS data.
2. Handle GIS data in different formats.
3. Extract meaningful information.
4. Development of qualitative reasoning and analytical thinking skills to address research questions related to natural resources.

RGSC 589. Landscape Hydrology Modeling
3 Credits (3)
The course "Landscape Hydrology Modeling" offers topics related to the physical hydrological processes that occur at different spatial and temporal scales in terms of understanding, quantitative evaluation, modeling, and visualization. It addresses precipitation, runoff, infiltration, and evaporation, as well as understanding impact of land use change on these processes. The course highlights and provide training on the use of hydrological modeling tools including WMS software, HydroVIS and ArcGIS software to help students understand, model, manipulate, and visualize hydrological data processes. The course offers hands-on learning experience on the use of these tools.

Learning Outcomes

1. Identify the different components of a landscape scale hydrologic system and quantitatively evaluate the associated physical processes including precipitation, runoff, streamflow, infiltration, evapotranspiration.
2. Retrieve and visualize a hydrologic system data along with the associated datasets.
3. Be able to model hydrological processes within a watershed and understand the streamflow generation process and the effect of vegetation and topography on streamflow generation.
4. Gain knowledge about, and be able to use, some of the available tools that can be used in spatial and temporal hydrological process modeling.

RGSC 598. Special Research Program
1-4 Credits
Individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

RGSC 599. Master's Thesis
15 Credits
Thesis. Consent of Instructor required. Thesis/Dissertation Grading.

RGSC 600. Doctoral Research
1-15 Credits
Research. Consent of Instructor required. Thesis/Dissertation Grading.

RGSC 616. Advanced Arid Land Management
3 Credits (3)
In depth discussion of seminal and current literature dealing with management of arid and semiarid lands including land tenure systems, soil-plant-animal interactions (emphasis on livestock grazing), plant community ecology and assessment methods, and arid land hydrology.

RGSC 620. Advanced Arid Land Plant-Herbivore Interactions
3 Credits (3)
In depth discussion of seminal work dealing with plant- and animal-related factors that influence herbivory patterns in arid landscapes. Although ungulate herbivory is a central focus of the course, the role of plant defenses in deterring both vertebrate and invertebrate herbivores is discussed in detail.

Learning Outcomes

1. To develop a holistic systems thinking and problem-solving approach to understanding plant and animal interrelationships, as well as addressing issues relevant to both managed and natural ecosystems.
2. Students will deepen their understanding of how to read, review, and present scientific literature, and conduct scientific paper annotations.
3. Develop a first draft of a scientific paper reporting either experimental results, a meta-analysis of existing data, or an in-depth literature review on a topic related to the student's dissertation.
4. Students who complete this course will develop a comprehensive understanding of these dynamics and be equipped with the skills to apply this knowledge in practical scenarios.

RGSC 698. Special Research Programs
1-4 Credits (1-4)
Advanced individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

RGSC 700. Doctoral Dissertation
15 Credits
Dissertation. Consent of Instructor required. Thesis/Dissertation Grading.

Office Location: Knox Hall 202

Phone: (575) 646-2514

Website: http://aces.nmsu.edu/academics/anrs/

Animal Science (Animal Industry) - Bachelor of Science in Agriculture

The animal industry concentration includes courses that prepare you for work in many phases of the livestock industry, such as livestock production on farms and ranches, the meat industry, the feed industry, livestock breed associations, and livestock publications.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1 [1]		*4*
English Composition - Level 2 [1]		*3*
Oral Communication		*3*
Area II: Mathematics		
MATH 1220G	College Algebra [2]	3-4
or MATH 1511G	Calculus and Analytic Geometry I	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
Choose one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [3]		**6**
Departmental/College Requirements [4]		
ANSC 1110	Animal Science Careers	1
ANSC 1120	Introduction to Animal Science	3
or ANSC 1120H	Introduction to Animal Science Honors	
ANSC 1120L	Introduction to Animal Science Lab	1
ANSC 303	Livestock, Meat and Wool Evaluation	4
or ANSC 308	Horse Evaluation	
ANSC 304	Feeds and Feeding	3
ANSC 370	System Physiology of Farm Animals	4
ANSC/RGSC 402	Animal Science Seminar (or)	1
or ANSC 402 H	Animal Science Seminar	
ANSC 421	Physiology of Reproduction	4
ANSC 422	Animal Nutrition	3
ANSC 423	Animal Breeding	3
Ag Electives: choose a total of 6 credit with no more than 3 credits in ANSC Experience		*6*
RGSC 2110	Introduction to Rangeland Management	
ANSC 1160	Introductory Horse Science	
ANSC 1180	Companion Animal in Society	
ANSC 1140	Introduction to Dairy Science	
ANSC 2310	Introduction to Meat Science	
ANSC 301	Animal and Carcass Evaluation	
ANSC Experience		
ANSC 390	Internship	
ANSC 391	Undergraduate Research Experience	
ANSC 392	Animal Sciences Teaching/Extension Experience	
Concentration		
ANSC 2330	Animal Production	3
ACCT 2110	Principles of Accounting I	3
ANSC 2340	Genetics in Animal Science	3
or ANSC 305	Principles of Genetics	
ANSC 1170	Introduction to Animal Metabolism	3
or CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Electives		
Production Electives		
Select 9 credits from production courses offered in the department		9
ANSC 424	Swine Production	
ANSC 425	Horse Science and Management	
ANSC 426	Beef Production: Cow-Calf Management	
ANSC 427	Dairy Production	
ANSC 428	Sheep and Wool Production	
ANSC 429	Beef Production: Feedlot Management	
ANSC 468	Advanced Dairy Herd Management	
Ranch Management Electives		
Select three courses from the following:		9
AEEC 2140	Technology and Communication for Business Management	
AEEC 3270	Spreadsheet Applications in Food and Agriculture	
ANSC 383	Equine Reproductive Management	
ANSC 480	Environmental Physiology of Domestic Animals	
RGSC 316	Rangeland Plants	
RGSC 318	Watershed Management	
RGSC 325	Rangeland Restoration Ecology	
Or any AEEC or RGSC numbered 300/3000 & above except AEEC 3210 and AEEC 4530		
Business Electives		
Select one from the following:		
AEEC 3210	Marketing and Food Agricultural Products	
AEEC 4530	Case Studies in Food and Agribusiness Management	
MGMT 361	Small Business Management	
MKTG 312	Personal Selling	
Or any BUSA, MGMT, MKTG numbered 300/3000 & above that are not VWW courses		
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
A ST 311	Statistical Applications	3
Second Language: (not required)		
Electives, to bring the total to 120 [5]		**13-15**
Total Credits		**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. MATH 1220G College Algebra or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G or MATH 1511G first.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4. Required of Industry and Science Options
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in

the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ANSC 1120	Introduction to Animal Science	3
ANSC 1120L	Introduction to Animal Science Lab	1
MATH 1220G	College Algebra	3
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
ACES 1120	Freshman Orientation	1
Ag Elective: choose one based on interest		3
ANSC 1160	Introductory Horse Science	
ANSC 1180	Companion Animal in Society	
RGSC 2110	Introduction to Rangeland Management	
ANSC 2310	Introduction to Meat Science	
	Credits	**15**
Semester 2		
ANSC 1110	Animal Science Careers	1
ANSC 2330	Animal Production	3
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	1
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
Choose an elective course. Consider a minor in horse management, human animal interaction, dairy science range science or ranch management.		3
	Credits	**14**
Second Year		
Semester 1		
ANSC 2340	Genetics in Animal Science	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ACCT 2110	Principles of Accounting I	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
ANSC 303 or ANSC 308	Livestock, Meat and Wool Evaluation or Horse Evaluation	4
	Credits	**17**
Semester 2		
ANSC 1170	Introduction to Animal Metabolism	3
ANSC 304	Feeds and Feeding	3
ECON 1110G	Survey of Economics	3
Area VI: Creative and Fine Arts -see catalog for complete list [1]		3
Ranch Management Elective: - see degree plan for complete list		3
	Credits	**15**
Third Year		
Semester 1		
ANSC 370	System Physiology of Farm Animals	4
A ST 311	Statistical Applications	3
Viewing a Wider World class - see catalog for complete list [2]		3
Ranch Management Elective: - see degree plan for complete list		3
Choose an elective course. Consider a minor in horse management, human animal interaction, dairy science range science or ranch management.		3
	Credits	**16**
Semester 2		
ANSC 421	Physiology of Reproduction	4
Viewing a Wider World - see catalog for complete list [2]		3
Ranch Management Elective - see degree plan for complete list		3
Area V: Humanities - see catalog for complete list [1]		3
	Credits	**13**
Fourth Year		
Semester 1		
ANSC 402	Animal Science Seminar	1
ANSC 422	Animal Nutrition	3
ANSC 423	Animal Breeding	3
Choose production course from degree plan		3
Choose Business Elective from degree plan		3
Choose an elective course. Consider a minor in horse management, human animal interaction, dairy science range science or ranch management.		3
	Credits	**16**
Semester 2		
Choose production course from degree plan		3
Choose production course from degree plan		3
Ranch Management Elective - see degree plan for complete list		3
Ag Elective - see degree plan for complete list. Recommend Internship		3
Choose an elective course. Consider a minor in horse management, human animal interaction, dairy science range science or ranch management.		3
	Credits	**15**
	Total Credits	**121**

[1] See the General Education (p. 262) section of the catalog for a full list of courses.

[2] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

Animal Science (Science) - Bachelor of Science in Agriculture

The science concentration provides you with a strong background in technical science and prepares you for advanced studies leading to graduate or professional degrees.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective

credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1 [1]		*4*
English Composition - Level 2 [1]		*3*
Oral Communication		*3*
Area II: Mathematics		
MATH 1220G	College Algebra [2]	3-4
or MATH 1511G	Calculus and Analytic Geometry I	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
Choose one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory (required for science option)	4
Viewing A Wider World [3]		**6**
Departmental/College Requirements [4]		
ANSC 1110	Animal Science Careers	1
ANSC 1120	Introduction to Animal Science	3
or ANSC 1120H	Introduction to Animal Science Honors	
ANSC 1120L	Introduction to Animal Science Lab	1
ANSC 303	Livestock, Meat and Wool Evaluation	4
or ANSC 308	Horse Evaluation	
ANSC 304	Feeds and Feeding	3
ANSC 370	System Physiology of Farm Animals	4
ANSC/RGSC 402	Animal Science Seminar (or)	1
or ANSC 402 H	Animal Science Seminar	
ANSC 421	Physiology of Reproduction	4
ANSC 422	Animal Nutrition	3
ANSC 423	Animal Breeding	3
Ag Electives: choose a total of 6 credit with no more than 3 credits in ANSC Experience		*6*
RGSC 2110	Introduction to Rangeland Management	
ANSC 1140	Introduction to Dairy Science	
ANSC 1160	Introductory Horse Science	
ANSC 1180	Companion Animal in Society	
ANSC 2310	Introduction to Meat Science	
ANSC 301	Animal and Carcass Evaluation	
ANSC Experience		
ANSC 390	Internship	
ANSC 391	Undergraduate Research Experience	
ANSC 392	Animal Sciences Teaching/Extension Experience	
Concentration		
ANSC 305	Principles of Genetics	3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
BCHE 395	Biochemistry I	3
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
Production Electives		
Select two from the following:		6
ANSC 424	Swine Production	
ANSC 425	Horse Science and Management	
ANSC 426	Beef Production: Cow-Calf Management	
ANSC 427	Dairy Production	
ANSC 428	Sheep and Wool Production	
ANSC 429	Beef Production: Feedlot Management	
ANSC 468	Advanced Dairy Herd Management	
Designated Electives		
Select one from the following:		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
MATH 1511G	Calculus and Analytic Geometry I	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
MATH 1521G	Calculus and Analytic Geometry II	
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Select one from the following:		3
ANSC 360	Meat and Muscle Biology	
ANSC 462	Parasitology	
ANSC 480	Environmental Physiology of Domestic Animals	
ANSC 484	Ruminant Nutrition	
BIOL 311	General Microbiology	
TOX 361	Basic Toxicology	
TOX 461	Toxicology I	
Or any 300 level or higher Biol not counting BIOL 305		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
A ST 311	Statistical Applications	3
Second Language: (not required)		
Electives, to bring the total credits to 120 [5]		**10**
Total Credits		**120-121**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. MATH 1220G College Algebra or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G or MATH 1511G first.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4. Required of Industry and Science Options
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-

case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1220G	College Algebra [1]	3
ANSC 1120 or ANSC 1120H	Introduction to Animal Science or Introduction to Animal Science Honors	3
ANSC 1120L	Introduction to Animal Science Lab	1
ACES 1120	Freshman Orientation	1
Choose from one of the following AG Elective Options:		3
RGSC 2110	Introduction to Rangeland Management	
ANSC 1160	Introductory Horse Science	
ANSC 1180	Companion Animal in Society	
ANSC 2310	Introduction to Meat Science	
	Credits	**15**
Semester 2		
ACOM 1130G or COMM 1115G or HNRS 2175G	Effective Leadership and Communication in Agriculture [1] or Introduction to Communication or Introduction to Communication Honors	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ANSC 1110	Animal Science Careers	1
Area V: Humanities Course [2]		3
Choose an elective course. Consider a minor in horse management, human animal interaction, dairy science range science or ranch management.		3
	Credits	**14**
Second Year		
Semester 1		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	3
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	1
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
ANSC 303 or ANSC 308	Livestock, Meat and Wool Evaluation or Horse Evaluation	4
	Credits	**15**
Semester 2		
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 2110L	Principles of Biology: Cellular and Molecular Biology Laboratory	1
ECON 1110G	Survey of Economics	3
ANSC 304	Feeds and Feeding	3
Area VI: Creative and Fine Arts - see catalog for complete list		3
VWW: Viewing a Wider World Course [3]		3
	Credits	**16**
Third Year		
Semester 1		
CHEM 313	Organic Chemistry I [1]	3
ANSC 370	System Physiology of Farm Animals	4
ANSC 305	Principles of Genetics [1]	3
Designated Elective II: see catalog for complete list		3-5
	Credits	**13-15**
Semester 2		
ANSC 421	Physiology of Reproduction (Spring Only) [1]	4
CHEM 314	Organic Chemistry II [1]	3
CHEM 315	Organic Chemistry Laboratory	2
Choose from one of the following:		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab [1]	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab [1]	
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [1] or Calculus and Analytic Geometry II Honors	
Choose an elective course. Consider a minor in horse management, human animal interaction, dairy science range science or ranch management.		3
	Credits	**16**
Fourth Year		
Semester 1		
ANSC 422	Animal Nutrition [1]	3
ANSC 423	Animal Breeding [1]	3
ANSC 402 or ANSC 402 H or RGSC 402	Animal Science Seminar or Animal Science Seminar or Seminar	1
A ST 311	Statistical Applications	3
BCHE 395	Biochemistry I	3
Choose an elective course. Consider a minor in horse management, human animal interaction, dairy science range science or ranch management.		3
	Credits	**16**
Semester 2		
VWW: Viewing a Wider World Course [3]		3
Choose an elective course. Consider a minor in horse management, human animal interaction, dairy science range science or ranch management.		3
AG Elective: see catalog for complete list		3
Choose any two production courses from the following:		6
ANSC 424	Swine Production	
ANSC 425	Horse Science and Management	
ANSC 426	Beef Production: Cow-Calf Management	
ANSC 427	Dairy Production	
ANSC 428	Sheep and Wool Production	
ANSC 429	Beef Production: Feedlot Management	
ANSC 468	Advanced Dairy Herd Management	
	Credits	**15**
	Total Credits	**120-122**

1 These courses have prerequisites and it is the students responsibility to check and fulfill all course prerequisites listed for these courses.
2 See the General Education (p. 262) section of the catalog for a full list of courses.
3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Range Science - Bachelor of Science in Agriculture

The following course work prepares you for study and management of rangelands through an integrated ecological approach with special emphasis on rangeland plants, livestock, wildlife, soils and watersheds. The course work is also well designed for those who want to continue study in graduate school. Any undergraduate student majoring in Range Science must earn a grade of C- or higher in Range Science (RGSC prefix) courses to satisfy degree requirements. Students earning a D or F in a Range Science (RGSC prefix) course will be expected to repeat that course until the student earns a grade of C- or higher.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
ACOM 1130G	Effective Leadership and Communication in Agriculture	
or COMM 1115G	Introduction to Communication	
or HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics [2]		
MATH 1220G	College Algebra	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
Select one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
Area V: Humanities		
PHIL 1145G	Philosophy, Law, and Ethics	3
or PHIL 2110G	Introduction to Ethics	
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
Range Science Core		
RGSC 1110	The Range Science Profession	1
RGSC 2110	Introduction to Rangeland Management	3
RGSC 316	Rangeland Plants	3
RGSC 317	Rangeland Communities	3
RGSC 318	Watershed Management	3
RGSC 325	Rangeland Restoration Ecology	3
RGSC 357	Grass Taxonomy and Identification	3
RGSC 402	Seminar	1
or RGSC 402 H	Range Science Seminar	
RGSC 440	Rangeland Resource Ecology	3
RGSC 440 L	Rangeland Resource Ecology Lab	1
RGSC 452	Vegetation Measurements for Rangeland Assessment	4
RGSC 460	Rangeland and Natural Resource Planning and Management	4
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Other Required Courses		
A ST 311	Statistical Applications	3
ANSC 1170	Introduction to Animal Metabolism	3-4
or CHEM 2115	Survey of Organic Chemistry and Laboratory	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
EPWS 314	Plant Physiology	3
FWCE 1110G	Introduction to Natural Resources Management	4
Select one from the following:		4
GEOG 381	Cartography and GIS	
or FWCE 471	GIS for Natural Resource Scientists	
A 300/400-level GIS Course		
SOIL 2110	Introduction to Soil Science	3
SOIL 2110L	Introduction to Soil Science Laboratory	1
SOIL 472	Soil Morphology and Classification	4
Natural Resource Management		
Choose two courses from the following:		6
AEEC 3120V	Natural Resource Economics	
AEEC 3130V	Water Resource Economics	
AEEC 3280	Applied Production Economics	
AEEC 4530	Case Studies in Food and Agribusiness Management	
FWCE 437	Wildlife Damage Management	
FWCE 2110	Principles of Fish and Wildlife Management	
RGSC 302V	Forestry and Society	
ANSC Elective		*3*
ANSC 1120	Introduction to Animal Science	
or ANSC 1120H	Introduction to Animal Science Honors	
ANSC 304	Feeds and Feeding	
ANSC 351V	Agricultural Animals of the World	
ANSC 422	Animal Nutrition	
ANSC 426	Beef Production: Cow-Calf Management	
ANSC 428	Sheep and Wool Production	
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**12-13**
Total Credits		**121**

[1] See the General Education (p. 262) section of the catalog for a full list of courses
[2] MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.
[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
[4] Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
MATH 1220G	College Algebra	3
RGSC 2110	Introduction to Rangeland Management	3
ACES 1120	Freshman Orientation	1
Area VI: Creative and Fine Arts [2]		3
Elective		3
ANSC 1120	Introduction to Animal Science	
FWCE 1110G	Introduction to Natural Resources Management	
	Credits	**17**
Semester 2		
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
PHIL 2110G or PHIL 1145G	Introduction to Ethics or Philosophy, Law, and Ethics	3
RGSC 1110	The Range Science Profession	1
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
Designated Elective: choose from the following		3
FWCE 1110G	Introduction to Natural Resources Management	
ANSC 1120	Introduction to Animal Science	
	Credits	**17**
Second Year		
Semester 1		
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
SOIL 2110	Introduction to Soil Science	3
SOIL 2110L	Introduction to Soil Science Laboratory	1
Choose from one of the following Area IV General Education Courses: [2]		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
	Credits	**14**
Semester 2		
RGSC 317	Rangeland Communities	3
RGSC 325	Rangeland Restoration Ecology	3
EPWS 314	Plant Physiology	3
A ST 311	Statistical Applications [1]	3
Choose from one of the following:		3-4
ANSC 1170	Introduction to Animal Metabolism (Spring Only) [1]	
CHEM 2115	Survey of Organic Chemistry and Laboratory [1]	
	Credits	**15-16**
Third Year		
Semester 1		
RGSC 452	Vegetation Measurements for Rangeland Assessment [1]	4
RGSC 316	Rangeland Plants	3
SOIL 472	Soil Morphology and Classification	4
Viewing a WIder World		3
	Credits	**14**
Semester 2		
RGSC 357	Grass Taxonomy and Identification	3
RGSC 318	Watershed Management	3
GEOG 381	Cartography and GIS	4
RGSC 325	Rangeland Restoration Ecology	3
Choose a course from the Natural Resource Management List:		3
AEEC 3120V	Natural Resource Economics	
AEEC 3130V	Water Resource Economics	
AEEC 3280	Applied Production Economics	
AEEC 4530	Case Studies in Food and Agribusiness Management	
FWCE 437	Wildlife Damage Management	
FWCE 2110	Principles of Fish and Wildlife Management	
RGSC 302V	Forestry and Society	
	Credits	**16**
Fourth Year		
Semester 1		
RGSC 402	Seminar	1
RGSC 440	Rangeland Resource Ecology	4
RGSC 440 L	Rangeland Resource Ecology Lab	1
Choose an elective course. Consider requirement for a minor		3
Choose from one of the following Natural Resource Management courses:		3-4
AEEC 3120V	Natural Resource Economics	
AEEC 3130V	Water Resource Economics (Spring Only)	
AEEC 3280	Applied Production Economics (Fall Only)	
AEEC 4530	Case Studies in Food and Agribusiness Management (Spring Only)	
FWCE 437	Wildlife Damage Management	
FWCE 2110	Principles of Fish and Wildlife Management	
RGSC 302V	Forestry and Society	
	Credits	**12-13**

Semester 2		
RGSC 460	Rangeland and Natural Resource Planning and Management	4
ENGL 2210G	Professional and Technical Communication	3
Viewing a Wider World		3
Choose 6 credits of electives. Consider courses that may count towards a minor.		6
	Credits	**16**
	Total Credits	**121-123**

1 These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Dairy Science - Undergraduate Minor

A minor in Dairy Science consists of at least 18 credits.

Prefix	Title	Credits
Core ANSC courses (all of the following are required)		**12**
ANSC 1120	Introduction to Animal Science	
or ANSC 1120H	Introduction to Animal Science Honors	
ANSC 1140	Introduction to Dairy Science	
ANSC 304	Feeds and Feeding	
ANSC Elective Course		
Dairy Science Electives:		**6**
ANSC 427	Dairy Production	
ANSC 468	Advanced Dairy Herd Management	
ANSC Science Experience (no more than 3 credits; must be in field of dairy science):		
ANSC 390	Internship	
ANSC 391	Undergraduate Research Experience	
ANSC 392	Animal Sciences Teaching/Extension Experience	
Total Credits		**18**

Horse Management - Undergraduate Minor

A minor in Horse Management consists of at least 18 credits.

Prefix	Title	Credits
Required Courses		
All of the following:		
ANSC 1160	Introductory Horse Science	3
ANSC 2120	Equine Management	3
ANSC 308	Horse Evaluation	4
ANSC 383	Equine Reproductive Management	3
ANSC 425	Horse Science and Management	3
Choose 2 or 3 credits of the following:		3
ANSC 1125	Equestrian Team Competition	
ANSC 1130	Western Equitation I	
ANSC 2130	Western Equitation II	
ANSC 320	Equine Behavior and Training	
ANSC 321	Advanced Equine Behavior and Training	
ANSC 390	Internship	
ANSC 391	Undergraduate Research Experience	
ANSC 392	Animal Sciences Teaching/Extension Experience	
Total Credits		**19**

Human Animal Interaction - Undergraduate Minor

A minor in Human Animal Interaction consists of at least 18 credits.

Prefix	Title	Credits
Required Courses		
ANSC 1180	Companion Animal in Society	3
ANSC 2140	Introduction to Companion Animal Science	3
ANSC 312V	Companion Animals and the Human- Animal Interaction	3
ANSC 390	Internship [1]	3
ANSC 411	Canine and Feline Behavior and Training	3
ANSC 412	Canine and Feline Health and Diseases	3
Total Credits		**18**

1 Must complete 3 credit hours of internship

Livestock Production - Undergraduate Minor

A minor in Livestock Production consists of at least 18 credits. Animal science majors may NOT minor in Livestock Production.

Prefix	Title	Credits
Core ANSC Courses		
All of the following		
ANSC 1120	Introduction to Animal Science	3
ANSC 304	Feeds and Feeding	3
Production Electives		
Choose 6 credits of the following:		6
ANSC 424	Swine Production	
ANSC 425	Horse Science and Management	
ANSC 426	Beef Production: Cow-Calf Management	
ANSC 427	Dairy Production	
ANSC 428	Sheep and Wool Production	
ANSC 429	Beef Production: Feedlot Management	
ANSC Electives		
Choose 6 credits of the following:		6
ANSC 301	Animal and Carcass Evaluation	
Or any ANSC course numbered 300 and above [1]		
Total Credits		**18**

1 Only one ANSC VWW is eligible towards minor

Ranch Management - Undergraduate Minor

The Ranch Management minor consists of at least 18 credits. Animal science majors may NOT minor in ranch management.

Prefix	Title	Credits
Core ANSC Courses		
ANSC 1120	Introduction to Animal Science	3
ANSC 304	Feeds and Feeding	3
Production Electives		
Choose 2 of the following		6
ANSC 425	Horse Science and Management	
ANSC 426	Beef Production: Cow-Calf Management	
ANSC 428	Sheep and Wool Production	
ANSC 429	Beef Production: Feedlot Management	
Range Electives		
RGSC 2110	Introduction to Rangeland Management	3
Choose 3 credits from the following		3
RGSC 302V	Forestry and Society	
RGSC 316	Rangeland Plants	
RGSC 317	Rangeland Communities	
RGSC 318	Watershed Management	
RGSC 440	Rangeland Resource Ecology	
Total Credits		**18**

Range Science - Undergraduate Minor

A minor in Range Science consists of at least 18 credits in courses with a RGSC prefix and achieve a C- or higher in all RGSC classes.

Prefix	Title	Credits
Choose 18 credits from the following courses		**18**
RGSC 2110	Introduction to Rangeland Management	
RGSC 302V	Forestry and Society	
RGSC 316	Rangeland Plants	
RGSC 317	Rangeland Communities	
RGSC 318	Watershed Management	
RGSC 325	Rangeland Restoration Ecology	
RGSC 357	Grass Taxonomy and Identification	
RGSC 440	Rangeland Resource Ecology	
RGSC 440 L	Rangeland Resource Ecology Lab	
RGSC 452	Vegetation Measurements for Rangeland Assessment [1]	
RGSC 460	Rangeland and Natural Resource Planning and Management	
Total Credits		**18**

[1] RGSC 2110 Introduction to Rangeland Management & A ST 311 Statistical Applications are pre-requisites for this course

Entomology, Plant Pathology and Weed Science

Undergraduate Program Information

Specific courses that meet these and the university general education requirements and additional courses in biology, chemistry, mathematics and seminar are included below in departmental requirements. A total of 120 credits are required for graduation. At least 48 credits must be 300-level courses and above. Schedules in specific semesters will be developed with the help of a student's academic advisor.

Graduate Program Information

The complexity of managing insects, plant diseases, and weeds is increasing environmental concerns, costs, and regulations requiring an integrated approach to management strategies. Future professionals in integrated pest management will be ecologically oriented, trained to manipulate biological and cultural technologies while minimizing chemical control options. The Master of Science degree program in agricultural biology is designed to produce graduates with the academic and research background needed to facilitate effective, innovative, and environmentally sound protection of plants and animals from a wide and varied spectrum of pests. Students will be prepared for careers in research, extension, teaching, private consulting, industry, and government or to continue in a broad range of Ph.D. programs. Specific opportunities will include positions as agricultural consultants, technical and sales representatives for industry, state departments of agriculture and USDA specialists, agricultural extension agents, and industry research and environmental technicians. There is currently a strong need for MS graduates trained in these areas, and the demand is expected to increase dramatically.

Students may wish to concentrate their graduate program in entomology, plant pathology, or weed science, or conversely may wish to be broadly trained in all three pest-management disciplines. Most students will be expected to complete a thesis. A non-thesis option is available, depending on prior training and experience and subject to approval by the department head. A nonthesis research option requires completion of a research paper, suitable as judged by the student's graduate committee, for journal publication. Completion of an undergraduate degree essentially equivalent to that offered by the department is required for admission to the MS graduate program. Qualifications for admission will be reviewed by the departmental Graduate Admissions committee. Prospective graduate students must have at least a 3.0 undergraduate GPA, complete the GRE, and submit an official transcript, a letter of intent and three letters of recommendation.

Degrees for the Department

Bachelor Degree(s)

- Applied and Agricultural Biology (Applied Biology) - Bachelor of Science in Agriculture (p. 387)
- Applied and Agricultural Biology (Applied Microbiology) - Bachelor of Science in Agriculture (p. 389)
- Applied and Agricultural Biology (Entomology) - Bachelor of Science in Agriculture (p. 390)
- Applied and Agricultural Biology (Environmental Biology) - Bachelor of Science in Agriculture (p. 391)

- Applied and Agricultural Biology (Invasive Pest Biology and Management) - Bachelor of Science in Agriculture (p. 393)
- General Agriculture - Bachelor of Science in Agriculture (p. 395)

Master Degree(s)

- Applied and Agricultural Biology - Master of Science (p. 101)

Doctoral Degree(s)

- Applied and Agricultural Biology - Doctor of Philosophy (p. 201)

Minors for the Department

- Entomology - Undergraduate Minor (p. 397)
- Pest Management - Undergraduate Minor (p. 397)
- Plant Pathology - Undergraduate Minor (p. 397)
- Weed Science - Undergraduate Minor (p. 397)

Professor, Ricardo Ramirez, Department Head

Professors Bundy, Creamer, Randall, Sanogo; ***Associate Professors*** Beck, Hanson, Lehnhoff, Mesbah, Pierce, Schutte; ***Assistant Professor*** Bloese, Bowers, Hubbard, King; Affiliated Faculty Bleiweiss, De Ley;

R. Ramirez, Department Head, Ph.D. (Washington State)– Entomology; L. Beck, Ph.D. (Texas Tech)- Weed Specialist; J. Bloese, Ph.D. (California-Davis) - Small Farms IPM Specialist; K. Bowers, Ph.D. (University of Florida)-Entomology; C. S. Bundy, Ph.D. (Georgia)– Entomology; R. Creamer, Ph.D. (California-Davis)– Plant Pathology; S. Hanson, Ph.D. (University of Wisconsin)– Molecular Plant Pathology; C. Hubbard, Ph.D. (California-Riverside) - Urban Entomology; E. Lehnhoff, Ph.D. (Montana State) Ecology and Environmental Science; J. Breen Pierce (Rutgers)– Entomology; J. Randall, Ph.D. (New Mexico State University)-Plant Pathology; S. Sanogo, Ph.D. (Pennsylvania State)– Plant Pathology; B. Schutte, Ph.D. (Ohio State)– Horticulture & Crop Science.

Entomology, Plant Pathology and Weed Science Courses

EPWS 1110G. Applied Biology
3 Credits (3)
Introduction to applied biology and ecology focusing on insects, plants and pathogens in natural areas, crops and urban settings. EPWS 1110L is strongly recommended to take in the same semester. May be repeated up to 3 credits.
Learning Outcomes
1. Students will learn about the Department of Entomology Plant Pathology and Weed Science and will have the opportunity to meet the Las Cruces-based faculty in the department.
2. By the end of this course students will have gained a broad understanding of the pests in a wide range of systems, their interactions with other organisms, and the methods available to minimize the influence of pests on target commodities.

EPWS 1110L. Applied Biology Lab
1 Credit (1)
Study of applied biology and ecology of insects, plants and pathogens in natural areas, crops, and urban settings. EPWS 1110 strongly recommended to take in the same semester. May be repeated up to 1 credits. Restricted to Las Cruces campus only.
Learning Outcomes
1. Students will learn about the Department of Entomology Plant Pathology and Weed Science and will have the opportunity to meet the Las Cruces-based faculty in the department.
2. By the end of this course students will have gained a broad understanding of the pests in a wide range of systems, their interactions with other organisms, and the methods available to minimize the influence of pests on target commodities.

EPWS 2996. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.
Learning Outcomes
1. Varies

EPWS 300. Special Topics
1-4 Credits
Specific topics and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

EPWS 301. Agricultural Biotechnology
3 Credits (2+2P)
The principles of molecular biology will be introduced and used to explore the past, present, and future applications of biotechnology in agriculture. Specific topics include methodologies for making transgenic plants with increased pest resistance, the use of biotechnology in pest detection, and improving nutritional value. The laboratory will provide students with hands-on experience with equipment used for biotechnology research.
Prerequisites: CHEM 1225G, BIOL 2610G, or BIOL 2110G.

EPWS 302. General Entomology
4 Credits (4)
An introduction to the biology and classification of insects. Lecture covers life histories, classification, ecology and behavior of insect orders and families. Laboratory focuses on identification of insect orders and families. May be repeated up to 4 credits.
Prerequisite: BIOL 2610G, or BIOL 2110G.
Learning Outcomes
1. Have a detailed understanding of the biology and taxonomy of insects.
2. Be able to identify all insect orders.
3. Be able to sight identify common families of North American Insects.
4. Be able to properly curate insect specimens.

EPWS 302 H. General Entomology Honors
4 Credits (4)
An introduction to the biology and classification of insects. Lecture covers life histories, classification, ecology and behavior of insects orders and families. Laboratory focuses on identification of insect orders and families. Students in the Honors section will be given the opportunity to enhance their understanding of entomology with a more detailed examination into the lives of these fascinating organisms.
Prerequisite: BIOL 2610G, or BIOL 2110G.
Learning Outcomes
1. Have a detailed understanding of the biology and taxonomy of insects.
2. Be able to identify all insect orders.
3. Be able to sight identify common families of North American Insects.
4. Be able to properly curate insect specimens.

EPWS 303. Economic Entomology
3 Credits (3+2P)
Identification and life cycles of insects of economic significance, their relationship to humans and agriculture including biological interactions and controls. May be repeated up to 3 credits.
Prerequisite: BIOL 2610G, or BIOL 2110G.
Learning Outcomes
1. Know the names and functions of insect arthropod organs and how these organisms sense the environment and maintain homeostasis within their environment.
2. Understand the importance of naming and classifying insects and be able to name the important orders and families of pest and beneficial insects.
3. Define what a pest arthropod and how to establish economic thresholds for pests.
4. Understand pest management theory and tactics and be able to describe including pest management with natural enemies, environmental manipulation, insecticides, biopesticides, sterile insect technique and others.

EPWS 310. Plant Pathology
4 Credits (3+2P)
Causes and methods of prevention and treatment of diseases in plants.
Prerequisite(s): BIOL 2610G, or BIOL 2110G.

EPWS 310 H. Plant Pathology Honors
4 Credits (4)
Cause and methods of prevention and treatment of diseases in plants. Students with an Honors designation will have additional project and report assignments.
Prerequisite(s): BIOL 2610G, or BIOL 2110G.

EPWS 311. Introduction to Weed Science
4 Credits (3+2P)
Principles of weed science, with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Identification of local weeds. Taught with AGRO 311. May be repeated up to 4 credits.
Prerequisite: CHEM 1215G, and BIOL 2110G.
Learning Outcomes
1. Describe the environmental conditions and inherent traits that promote the growth and persistence of weed populations in managed and natural ecosystems.
2. Predict causes and consequences of weed management failures in agricultural and natural ecosystems.
3. Apply knowledge of herbicidal, mechanical and cultural weed control to develop integrated strategies for weed problems.
4. Classify herbicides based on injury symptoms, mode of action, site of action, translocation, selectivity, potential uses and potential dangers.
5. Identify common weeds found in southern New Mexico by providing correctly spelled botanical and common names, as well as lifecycles.
6. Demonstrate the ability to safely apply herbicide solutions including: perform the activities and calculations to ensure that a sprayer delivers the appropriate amount of solution over the sprayed area, interpret herbicide labels to identify guidelines for safety, dosage and application procedures, and perform the calculations necessary for determining appropriate amounts of herbicide, carrier and adjuvant to add to a spray tank.

EPWS 314. Plant Physiology
3 Credits (3)
Overview of photosynthesis, respiration, water relations of plants, minerals and organic nutrition, growth and development. Same as BIOL 314.
Prerequisite: BIOL 2110G, CHEM 1225G.
Learning Outcomes
1. Summarize the chemical and physical bases for processes in plants involving water relations, metabolism, and growth.
2. Compare and contrast forms of photosynthesis that are adaptive, and not adaptive, to heat and drought.
3. Explain physiological mechanisms supporting plant tolerance to abiotic and biotic stresses.
4. Predict consequences of environmental change on physiological processes and growth of individual plants.
5. Apply course concepts to real-world scenarios that involve plant function and plant development.

EPWS 325V. Insects, Humans, and the Environment
3 Credits (3)
Overview of the interactions of the world's largest group of organisms with humans. Emphasizing the role of insects in the development of human cultures, including health, food and fiber production, art, music, and environmental issues; with discussions of historic, present day, and future impacts in underdeveloped, developing, and developed civilizations.
Learning Outcomes
1. Have an understanding and appreciation of the importance of insects and other arthropods to humans and the natural world.
2. Have a basic understanding of the biology of important insect groups.

EPWS 373. Fungal Biology
3 Credits (2+2P)
Introduction to the taxonomy, morphology, physiology, and ecology of fungi. Same as BIOL 373. May be repeated up to 3 credits.
Prerequisite: EPWS 310 or BIOL 311, or consent of instructor.
Learning Outcomes
1. To describe the importance of fungi in our environment.
2. To explore the morphology and physiology of major groups of fungi.
3. To describe the associations of fungi with humans, animals, and plants.

EPWS 380V. Science & Society
3 Credits (3)
Analysis and evaluation of how human activities affect the earth's environment or ecosystems. Several examples, from global issues to local issues will be studied in detail. Current science and the intersection of science and public policy will be discussed in relation to problems like world population, agricultural productivity, deforestation, medical advances, and future prospects for the environment.
Learning Outcomes
1. Become familiar with current science topics affecting society such as climate change, pandemics, vaccinations and the anti-vaccination movement, food production, and others to be discussed in class.
2. Improve critical thinking skills and become comfortable with evaluating claims using a data and evidence based approaches.
3. Gain an appreciation of how science affects society and how fake science can hurt society.

EPWS 390. Internship
1-3 Credits

Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. Maximum of 3 credits. May be repeated up to 3 credits.

Learning Outcomes

1. Varies.

EPWS 420. Environmental Behavior of Pesticides
3 Credits (3)

Behavior of pesticide compounds in the environment, their function toward target and non target pest organisms including humans, effect of environmental conditions on pesticide function, ecology of organisms involved in pesticides degradation,overview of environmental regulation. CHEM 2115 recommended prior to course. May be repeated up to 3 credits.

EPWS 440. Tropical Insect Ecology
3 Credits (3)

This course is designed to expose students to world of insects and other arthropods living in a variety of tropical environments. We will explore multiple habitats in search of these fascinating organisms. Students will gain valuable experience on the biology, identification, field sampling techniques, and ecology of tropical arthropods. We will examine the biodiversity of these important organisms and gain a better understanding of their diminishing habitats.

Learning Outcomes

1. Students will gain experience in the biology and identification of tropical insects and other arthropods.
2. Students will gain experience in insect biodiversity and proper field sampling techniques in a variety of habitats.
3. Students will gain experience on the issues affecting threatened habitats.

EPWS 447. Seminar
1 Credit (1)

Organization and techniques for the oral presentation of research information. Restricted to: Main campus only.

EPWS 447 H. Seminar Honors
1 Credit (1)

Organization and techniques for the oral presentation of research information. Students taking EPWS 447 H will have the additional assignment of making a poster on either scientific research or a scientific topic.

Prerequisite(s): Honors eligibility requirements.

EPWS 449. Special Problems
1-3 Credits

Individual investigation in specific areas of entomology, plant pathology or plant physiology. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits.

Learning Outcomes

1. Varies.

EPWS 451. Special Topics
1-4 Credits

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits.

Learning Outcomes

1. Varies.

EPWS 455. Advanced Integrated Pest Management
3 Credits (3)

Examination of factors affecting the biology and ecology, population evaluations, and control of insect, disease, and weed pests with an emphasis on integrating management practices. Credit cannot be given for both EPWS 455 and EPWS 505. Taught with: EPWS 505.

Prerequisite: Either EPWS 303 or EPWS 310 or EPWS 311, or consent of instructor.

Learning Outcomes

1. Understand the basic tenets of pest management.
2. Classify the different pest groups and their ecology.
3. Comprehend the variety of management strategies.
4. Understand how management effects the ecosystem.
5. Comprehend a systems approach to management.
6. Critically analyze, develop, present, and discuss pest management systems.

EPWS 456. Biological Control
3 Credits (3)

Principles of plant and animal suppression using living organisms. Interaction of biological control organisms with biotic and abiotic factors will be stressed. Credit cannot be given for both EPWS 456 and EPWS 506. Students should complete an introductory course in entomology prior to enrollment.

Learning Outcomes

1. Summarize the basic concepts of biological control of arthropods, weeds, and some pathogens.
2. Explain the benefits, challenges, and risks of biological control technologies.
3. Apply course concepts to real-world scenarios that involve biological control.

EPWS 462. Parasitology
3 Credits (3)

Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife.

Learning Outcomes

1. Students will learn about the major parasites of human, domestic animals, and wildlife.
2. Students will learn how to detect, identify, and manage parasites in the above mentioned mediums.

EPWS 471. Plant Mineral Nutrition
3 Credits (3)

Same as HORT 471 and AGRO 471.

EPWS 486. Plant Virology
3 Credits (3)

An overview of viral pathogens associated with infectious plant disease. Includes pathogens, replication, genetics, transmission, and movement of plant viruses.

Learning Outcomes

1. Understand the basic tenets of plant virology.
2. Determine different plant virus groups.
3. Comprehend the variety of genome strategies and organization.
4. Understand viral replication processes.
5. Comprehend transmission and viral ecology/epidemiology.
6. Critically analyze, present, and discuss current journal articles in plant virology.

EPWS 492. Diagnosing Plant Disorders
3 Credits (2+3P)

Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as AGRO 492 and HORT 492. May be repeated up to 3 credits.
Prerequisite: EPWS 303, EPWS 310.
Learning Outcomes

1. To describe the major types of plant disorders.
2. To identify the biotic and abiotic agents causing plant disorders.
3. To define the approaches used in diagnosing plant disorders.

EPWS 502. General Entomology
4 Credits (4)
An introduction to the biology and classification of insects. Lecture covers life histories, classification, ecology and behavior of insect orders and families. Laboratory focuses on identification of insect orders and families.
Prerequisite: BIOL 2610G or BIOL 2110G.
Learning Outcomes

1. Have a detailed understanding of the biology and taxonomy of insects.
2. Be able to identify all insect orders.
3. Be able to sight identify common families of North American Insects.
4. Be able to properly curate insect specimens.

EPWS 505. Advanced Integrated Pest Management
3 Credits (3)
Examination of the factors affecting the biology and ecology, population evaluations, and control of insect, disease, and weed pests, with an emphasis on integrating management practices. Crosslisted with: EPWS 455.
Prerequisite(s): EPWS 303 or EPWS 310 or EPWS 311 or consent of instructor.

EPWS 506. Biological Control
3 Credits (3)
Principles of plant and animal pest suppression using living organisms. Interaction of biological control organisms with biotic and abiotic factors will be stressed. Individual paper or project required. An introductory course in entomology should be completed before enrollment. Credit cannot be given for both EPWS 456 and EPWS 506.
Learning Outcomes

1. Summarize the basic concepts of biological control of arthropods, weeds, and some pathogens.
2. Explain the benefits, challenges, and risks of biological control technologies.
3. Apply course concepts to real-world scenarios that involve biological control.

EPWS 511. Introduction to Weed Science (f)
4 Credits (3+2P)
Covers the principles of weed science with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Includes identification of local weeds. Research paper required for graduate credit. Taught with AGRO 511. May be repeated up to 4 credits.
Prerequisite: CHEM 1215G and BIOL 2110G.
Learning Outcomes

1. Describe the environmental conditions and inherent traits that promote the growth and persistence of weed populations in managed and natural ecosystems.
2. Predict causes and consequences of weed management failures in agricultural and natural ecosystems.
3. Apply knowledge of herbicidal, mechanical and cultural weed control to develop integrated strategies for weed problems.
4. Classify herbicides based on injury symptoms, mode of action, site of action, translocation, selectivity, potential uses and potential dangers.
5. Identify common weeds found in southern New Mexico by providing correctly spelled botanical and common names, as well as lifecycles.
6. Demonstrate the ability to safely apply herbicide solutions includes: perform the activities and calculations to ensure that a sprayer delivers the appropriate amount of solution over the sprayed area, interpret herbicide labels to identify guidelines for safety, dosage and application procedures, and perform the calculations necessary for determining appropriate amounts of herbicide, carrier and adjuvant to add to a spray tank.

EPWS 513. Introduction to Scientific Writing
3 Credits (3)
Students will learn how to communicate, through written format, to both the scientific community and diverse audiences. Students will be introduced to new technologies and new genres of scientific writing. Students will also learn basic reviewing and writing skills that underlie efficient preparation of literature reviews, scientific manuscripts, project reports, blog-posts, opinion or perspective pieces for more popular venues, advocacy articles for legislators, and descriptive pieces for popular venues such as newspapers, magazines, and broadcast media. Emphasis will be on the communication of experimental findings in peer-reviewed scientific journals.
Learning Outcomes

1. Students will review the basics of rhetoric and the technology of language.
2. Students will learn how to overcome writing barriers and gain confidence in their writing skills.
3. Students will improve their writing skills so that manuscript preparation becomes more efficient and productive.
4. Students will learn professional standards for the conduct of ethical reporting of scientific results.
5. Students will learn to recognize structural and stylistic elements in scientific articles that help researchers achieve certain communication goals.
6. Students will learn the basics of table, figure, diagram, and image presentation in manuscripts.
7. Literature reviews, framed so that they answer an important question in the field, and lead to peer-reviewed publication, may also be prepared. (With permission of the instructor.)

EPWS 514. Plant Physiology
3 Credits (3)
Overview of photosynthesis, respiration, water relations of plants, minerals and organic nutrition, growth and development.
Prerequisite: BIOL 2110G, CHEM 1225G.
Learning Outcomes

1. Summarize the chemical and physical bases for processes in plants involving water relations, metabolism, and growth.
2. Compare and contrast forms of photosynthesis that are adaptive, and not adaptive, to heat and drought.
3. Explain physiological mechanisms supporting plant tolerance to abiotic and biotic stresses.
4. Predict consequences of environmental change on physiological processes and growth of individual plants.

5. Apply course concepts to real-world scenarios that involve plant function and plant development.

EPWS 520. Environmental Behavior of Pesticides (so)
3 Credits (3)
Behavior of these compounds in the environment, their function toward target and non target pest organisms including humans, effect of environmental conditions on pesticide function, ecology of organisms involved in pesticides degradation,overview of environmental regulation. CHEM 2115 recommended prior to course. May be repeated up to 3 credits.

EPWS 525. Scientific Writing- How to be a Productive and Effective Writing
1-3 Credits (1-3)
Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Crosslisted with: AGRO 525, HORT 525 and SOIL 525.

EPWS 549. Special Problems
1-4 Credits
Individual investigation in specific areas of entomology, plant pathology, and weed science. Maximum of 4 credits per semester and a total of 6 credits.

EPWS 551. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

EPWS 560. Ecology and Management of Invasive Plant Species
3 Credits (3)
An overview of the causes and consequences of plant invasions and invasive plant management, with a focus on critical examination of current literature and paradigms.
Learning Outcomes
1. Students will gain practical and theoretical knowledge to facilitate improved vegetation management by engaging in critical thinking and discussion on a wide variety of topics related to invasive plants.
2. Students will understand why plants invade and how to facilitate prevention of invasion in natural and rangeland areas
3. Further, students will gain knowledge of the tools and practices of invasive plant management.

EPWS 562. Parasitology
3 Credits (3)
Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife.
Learning Outcomes
1. Students will learn about the major parasites of human, domestic animals, and wildlife.
2. Students will learn how to detect, identify, and manage parasites in the above mentioned mediums.

EPWS 562 L. Parasitology Lab
1 Credit (1)
Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife.
Learning Outcomes
1. Students will learn how to conduct lab work to analyze, detect, and identify major parasites of human, domestic animals and wildlife.

EPWS 573. Fungal Biology
3 Credits (2+2P)
Introduction to the taxonomy, morphology, physiology, and ecology of fungi. Same as BIOL 573. May be repeated up to 3 credits.
Prerequisite: EPWS 310 or consent of instructor.
Learning Outcomes
1. To describe the importance of fungi in our environment.
2. To explore the morphology and physiology of major groups of fungi.
3. To describe the associations of fungi with humans, animals, and plants.

EPWS 590. Graduate Seminar
1 Credit (1)
Review of current scientific literature in entomology, plant pathology, and weed science, and verbal presentation of information. No more than 2 credits toward a degree. May be repeated up to 2 credits.
Learning Outcomes
1. To expose students to the fundamentals of speaking, including organization, listening, gestures, vocal variety, and language.
2. To understand components of abstracts for professional meetings and learn to write abstracts.
3. To understand and gain practice in preparation of PowerPoint presentations.
4. To present a professional PowerPoint talk on a scientific topic.
5. To become familiar with components of and preparation of posters for professional meetings.

EPWS 598. Graduate Internship
1-6 Credits
Supervised professional on-the-job learning experience. Limited to Master of Agriculture candidates. Not more than 6 credits toward the degree.

EPWS 599. Master's Thesis
15 Credits
Thesis.

EPWS 606. Biological Control
3 Credits (3)
An introduction to biological control that relies on ecological relationships among populations and the direct or indirect effects of these relationships to humans.
Learning Outcomes
1. Summarize the basic concepts of biological control of arthropods, weeds, and some pathogens.
2. Explain the benefits, challenges, and risks of biological control technologies.
3. Apply course concepts to real-world scenarios that involve biological control.

EPWS 613. Introduction to Scientific Writing
3 Credits (3)
Students will learn how to communicate, through written format, to both the scientific community and diverse audiences. Students will be introduced to new technologies and new genres of scientific writing. Students will also learn basic reviewing and writing skills that underlie efficient preparation of literature reviews, scientific manuscripts, project reports, blog-posts, opinion or perspective pieces for more popular venues, advocacy articles for legislators, and descriptive pieces for popular venues such as newspapers, magazines, and broadcast media. Emphasis will be on the communication of experimental findings in peer-reviewed scientific journals.

Learning Outcomes

1. Students will review the basics of rhetoric and the technology of language.
2. Students will learn how to overcome writing barriers and gain confidence in their writing skills.
3. Students will improve their writing skills so that manuscript preparation becomes more efficient and productive.
4. Students will learn professional standards for the conduct of ethical reporting of scientific results.
5. Students will learn to recognize structural and stylistic elements in scientific articles that help researchers achieve certain communication goals.
6. Students will learn the basics of table, figure, diagram, and image presentation in manuscripts.
7. Literature reviews, framed so that they answer an important question in the field, and lead to peer-reviewed publication, may also be prepared. (With permission of the instructor.)

EPWS 625. Advanced Scientific Writing
3 Credits (3)
The class is intended for graduate students who have obtained data from their graduate research program and are engaged in the analyses of their results (typically at or beyond the midway mark of their research program). At the end of the semester, it is anticipated that Ph.D. students enrolled in the 625 level offering shall have completed a manuscript that is essentially ready for submission to a journal. Master of Science students may also reach this level of completion, but it is dependent on each student's specific situation.
Learning Outcomes

1. Students will learn how to overcome writing barriers and develop a writing schedule.
2. Students will learn how to better organize the results of their experiments into effective tables and figures.
3. Students will improve their writing skills so that manuscript preparation becomes more efficient and productive.
4. Students will learn how to successfully navigate a manuscript through the entire manuscript preparation, revision, review and publishing process.
5. Students will learn professional standards for the conduct of ethical reporting of scientific results.
6. Students will learn professional standards for conducting objective, rigorous reviews of scientific manuscripts.
7. Students will successfully communicate their research findings to the scientific community through publication in peer-reviewed, scientific journals.

EPWS 640. Tropical Insect Ecology
3 Credits (3)
This course is designed to expose students to world of insects and other arthropods living in a variety of tropical environments. We will explore multiple habitats in search of these fascinating organisms. Students will gain valuable experience on the biology, identification, field sampling techniques, and ecology of tropical arthropods. We will examine the biodiversity of these important organisms and gain a better understanding of their diminishing habitats.
Learning Outcomes

1. Students will gain experience in the biology and identification of tropical insects and other arthropods.
2. Students will gain experience in insect biodiversity and proper field sampling techniques in a variety of habitats.
3. Students will gain experience on the issues affecting threatened habitats.

EPWS 660. Ecology and Management of Invasive Plant Species
3 Credits (3)
An overview of the causes and consequences of plant invasions and invasive plant management, with a focus on critical examination of current literature and paradigms.
Learning Outcomes

1. Students will gain practical and theoretical knowledge to facilitate improved vegetation management by engaging in critical thinking and discussion on a wide variety of topics related to invasive plants.
2. Students will understand why plants invade and how to facilitate prevention of invasion in natural and rangeland areas.
3. Further, students will gain knowledge of the tools and practices of invasive plant management.

EPWS 662. Parasitology
3 Credits (3)
Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife. May be repeated up to 3 credits.
Learning Outcomes

1. Students will learn about the major parasites of human, domestic animals, and wildlife.
2. Students will learn how to detect, identify, and manage parasites in the above mentioned mediums.

EPWS 662 L. Parasitology Lab
1 Credit (1)
Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife.
Learning Outcomes

1. Students will learn how to conduct lab work to analyze, detect, and identify major parasites of human, domestic animals and wildlife.

EPWS 675. Urban Entomology
3 Credits (3)
Study of insects and related arthropods in urban settings, about their impact on humans and damages to building. Principles of Integrate Pest Management (IPM) strategies with emphasis on current control techniques for detection, control and monitoring. May be repeated up to 3 credits.
Prerequisite: Either BIOL 2610G or BIOL 2110G.
Learning Outcomes

1. Students will learn about arthropods commonly located in urban environments.
2. Students will learn how to properly manage Pests and strategies implemented in modern pest management.
3. Students will gain sufficient knowledge in how to detect, monitor, control, and implement pest management strategies in the modern world.

EPWS 690. Doctoral Seminar
1 Credit (1)
Current research discussions presented by doctoral level graduate students. Not more than 2 credits toward the degree. May be repeated up to 2 credits.
Learning Outcomes

1. Students will learn how to gather, structure, and give oral presentations of research at the doctoral level.

EPWS 6991. Doctoral Research
1-15 Credits (1-15)
Research. May be repeated up to 88 credits.
Learning Outcomes
1. Varies based on research being conducted and type of outcome being sought.

EPWS 6996. Advanced Topics
1-6 Credits (1-6)
Topics of current interest, designated by title and credit. Maximum of 6 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits.
Learning Outcomes
1. Student learning outcomes will varied based on type of research, topic, or subject being taught.

EPWS 7000. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation. May be repeated up to 88 credits.
Learning Outcomes
1. Varies.

Name: Entomology, Plant Pathology & Weed Science Department

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Applied and Agricultural Biology (Applied Biology) - Bachelor of Science in Agriculture

The agricultural biology course work prepares you for a variety of careers in the biological sciences and agriculture. You will develop your curriculum with an academic advisor to attain your individual goals. Many will pursue advanced degrees in the sciences or prepare for admittance to professional schools (medical, dental, etc.). A diverse program is offered with five separate concentrations that allow you to tailor your program for careers in the commercial sector, such as agricultural consulting, and pest management or for careers with county, state, or federal agencies, such as research technicians, land managers, and extension agents. A minimum of 120 credit hours is required for graduation. Any undergraduate student majoring in Agricultural Biology must earn a grade of C- or higher in core (EPWS prefix) courses to satisfy degree requirements. Students earning a D or F in a core (EPWS prefix) course will be expected to repeat that course until the student earns a grade of C- or higher. The following courses are required for a major in Agricultural Biology.

The Applied Biology concentration prepares you for professional advancement including admittance to medical, dental, veterinary and graduate schools. Students interested in the health professions must register with the Health Professional Advisory Committee no later than the sophomore year. Students should check the specific entrance requirements for the professional or graduate school of their choice prior to selecting electives within this option.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
or HNRS 2175G	Introduction to Communication Honors	
COMM 1130G	Public Speaking	
Area II: Mathematics		
MATH 1220G	College Algebra [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social/Behavioral Sciences Course (3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
Viewing a Wider World [3]		**6**
One must be from outside of the College of ACES		
Departmental/College Requirements		
CHEM 1216G, CHEM 1226G and BIOL 2610G will count towards Departmental/College and General Education Requirements		
A ST 311	Statistical Applications	3
AGRO 305	Principles of Genetics	3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 311	General Microbiology	3
BIOL 313	Structure and Function of Plants	3
or BIOL 322	Zoology	
EPWS 1110	Applied Biology	3
EPWS 1110L	Applied Biology Lab	1
EPWS 301	Agricultural Biotechnology	3
EPWS 302	General Entomology	4
EPWS 310	Plant Pathology	4
EPWS 311	Introduction to Weed Science	4

EPWS 447	Seminar	1
Concentration Coursework		
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
MATH 1250G	Trigonometry & Pre-Calculus	4
MATH 1511G	Calculus and Analytic Geometry I	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
PHYS 1230G	Algebra-Based Physics I	3
or PHYS 2230G	General Physics for Life Science I	
PHYS 1230L	Algebra-Based Physics I Lab	1
or PHYS 2230L	Laboratory to General Physics for Life Science I	
Choose 6-8 credits from the following:		6-8
ANSC 370	System Physiology of Farm Animals	
BIOL 312	Plant Taxonomy	
BIOL 354	Physiology of Humans	
BIOL 377	Cell Biology	
EPWS 314	Plant Physiology	
EPWS 373	Fungal Biology	
EPWS 486	Plant Virology	
Non- Departmental Requirements (in addition to Gen.Ed/VWW)		
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**15-17**
Suggested Electives		
MATH 1521G	Calculus and Analytic Geometry II	
or MATH 1521H	Calculus and Analytic Geometry II Honors	
PHYS 1240G	Algebra-Based Physics II	
or PHYS 2240G	General Physics for Life Science II	
BCHE 395	Biochemistry I	3
Total Credits		**120**

1. MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G College Algebra first.
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1220G	College Algebra [1]	3
EPWS 1110 & 1110L	Applied Biology and Applied Biology Lab	4
ACES 1120	Freshman Orientation	1
Area IV: Social and Behavioral Science Course [2]		3
	Credits	**15**
Semester 2		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	3
MATH 1250G	Trigonometry & Pre-Calculus [1]	4
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution [1]	3
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
Area V: Humanities Course [2]		3
	Credits	**16**
Second Year		
Semester 1		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 313 or BIOL 322	Structure and Function of Plants or Zoology	3
VWW: Viewing a Wider World Course [3]		3
Area VI: Creative and Fine Arts Course [2]		4
	Credits	**17**
Semester 2		
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
BIOL 311	General Microbiology [1]	3
Elective Course		2
	Credits	**13**
Third Year		
Semester 1		
CHEM 313	Organic Chemistry I	3
A ST 311	Statistical Applications	3
EPWS 302	General Entomology	4
Choose from one of the following: [1]		3
ANSC 370	System Physiology of Farm Animals	
BIOL 312	Plant Taxonomy	
BIOL 354	Physiology of Humans	
BIOL 377	Cell Biology	
EPWS 314	Plant Physiology	
VWW: Viewing a Wider World Course [3]		3
	Credits	**16**
Semester 2		
CHEM 314 & CHEM 315	Organic Chemistry II and Organic Chemistry Laboratory [1]	5
EPWS 301	Agricultural Biotechnology [1]	3
Choose one from the following:		4

PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab [1]	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
Elective Course		3
	Credits	**15**
Fourth Year		
Semester 1		
EPWS 310	Plant Pathology (Fall Only) [1]	4
Elective course		4
EPWS 311	Introduction to Weed Science (Fall Only) [1]	4
AGRO 305	Principles of Genetics [1]	3
	Credits	**15**
Semester 2		
EPWS 447	Seminar	1
Choose from one of the following: [1]		3
ANSC 370	System Physiology of Farm Animals	
BIOL 312	Plant Taxonomy	
BIOL 354	Physiology of Humans	
BIOL 377	Cell Biology	
EPWS 314	Plant Physiology	
EPWS 373	Fungal Biology	
EPWS 486	Plant Virology	
Elective Course		3
Elective Course		3
Elective Course		3
	Credits	**13**
	Total Credits	**120**

1 These courses have prerequisites and it is the students responsibility to check and fulfill all course prerequisites listed for these courses.
2 See the General Education (p. 262) section of the catalog for a full list of courses.
3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Applied and Agricultural Biology (Applied Microbiology) - Bachelor of Science in Agriculture

The agricultural biology course work prepares you for a variety of careers in the biological sciences and agriculture. You will develop your curriculum with an academic advisor to attain your individual goals. Many will pursue advanced degrees in the sciences or prepare for admittance to professional schools (medical, dental, etc.). A diverse program is offered with five separate concentrations that allow you to tailor your program for careers in the commercial sector, such as agricultural consulting, and pest management or for careers with county, state, or federal agencies, such as research technicians, land managers, and extension agents. A minimum of 120 credit hours is required for graduation. Any undergraduate student majoring in Agricultural Biology must earn a grade of C- or higher in core (EPWS prefix) courses to satisfy degree requirements. Students earning a D or F in a core (EPWS prefix) course will be expected to repeat that course until the student earns a grade of C- or higher. The following courses are required for a major in Agricultural Biology.

The Applied Microbiology biotin prepare you for professional positions in algal biofuels, environmental monitoring and improvement, industrial applications of microbiology, food sanitation, research or graduate study.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Choose one from the following:		3
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
ENGL 2130G	Advanced Composition	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
or HNRS 2175G	Introduction to Communication Honors	
COMM 1130G	Public Speaking	
Area II: Mathematics		
MATH 1220G	College Algebra [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social/Behavioral Sciences Course (3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
Viewing a Wider World [3]		**6**
One must be from outside of the College of ACES		
Departmental/College Requirements		
CHEM 1216G, CHEM 1226G and BIOL 2610G will count towards Departmental/College and General Education Requirements		
A ST 311	Statistical Applications	3
AGRO 305	Principles of Genetics	3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 311	General Microbiology	3
BIOL 313	Structure and Function of Plants	3
or BIOL 322	Zoology	
EPWS 1110	Applied Biology	3
EPWS 1110L	Applied Biology Lab	1

EPWS 301	Agricultural Biotechnology	3
EPWS 302	General Entomology	4
EPWS 310	Plant Pathology	4
EPWS 311	Introduction to Weed Science	4
EPWS 447	Seminar	1
Concentration Coursework		
BIOL 311 L	General Microbiology Laboratory	2
BCHE 395	Biochemistry I	3
BIOL 451	Physiology of Microorganisms	3
BIOL 473	Ecology of Microorganisms	3
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
EPWS 373	Fungal Biology	3
EPWS 420	Environmental Behavior of Pesticides	3
EPWS 486	Plant Virology	3
MATH 1430G	Applications of Calculus I	3
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	4
Select 6-7 credits from the following:		6-7
AGRO 471	Plant Mineral Nutrition	
BIOL 477	Applied and Environmental Microbiology	
ENVS 301	Principles of Ecology	
ENVS 370	Environmental Soil Science	
EPWS 455	Advanced Integrated Pest Management	
EPWS 462	Parasitology	
EPWS 492	Diagnosing Plant Disorders	
FSTE 4110	Food Microbiology	
SOIL 2110	Introduction to Soil Science	
SOIL 312	Soil Management and Fertility	
SOIL 476	Soil Microbiology	
TOX 361	Basic Toxicology	
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**4-5**
Total Credits		**120**

1. MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G College Algebra first.
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor

Applied and Agricultural Biology (Entomology) - Bachelor of Science in Agriculture

The agricultural biology course work prepares you for a variety of careers in the biological sciences and agriculture. You will develop your curriculum with an academic advisor to attain your individual goals. Many will pursue advanced degrees in the sciences or prepare for admittance to professional schools (medical, dental, etc.). A diverse program is offered with five separate concentrations that allow you to tailor your program for careers in the commercial sector, such as agricultural consulting, and pest management or for careers with county, state, or federal agencies, such as research technicians, land managers, and extension agents. A minimum of 120 credit hours is required for graduation. Any undergraduate student majoring in Agricultural Biology must earn a grade of C- or higher in core (EPWS prefix) courses to satisfy degree requirements. Students earning a D or F in a core (EPWS prefix) course will be expected to repeat that course until the student earns a grade of C- or higher. The following courses are required for a major in Agricultural Biology.

The Entomology concentration prepares you for graduate degrees in entomology. Emphasis is placed on a broad background in field and laboratory aspects of insect biology and management.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
or HNRS 2175G	Introduction to Communication Honors	
COMM 1130G	Public Speaking	
Area II: Mathematics		
MATH 1220G	College Algebra	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social/Behavioral Sciences Course (3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3

Viewing a Wider World [3]		**6**
One must be from outside the College of ACES		
Departmental/College Requirements		
CHEM 1215G, CHEM 1225G and BIOL 2610G will count towards Departmental/College and General Education Requirements		
A ST 311	Statistical Applications	3
AGRO 305	Principles of Genetics	3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 311	General Microbiology	3
BIOL 313	Structure and Function of Plants	3
or BIOL 322	Zoology	
EPWS 1110	Applied Biology	3
EPWS 1110L	Applied Biology Lab	1
EPWS 301	Agricultural Biotechnology	3
EPWS 302	General Entomology	4
EPWS 310	Plant Pathology	4
EPWS 311	Introduction to Weed Science	4
EPWS 447	Seminar	1
Concentration Coursework		
MATH 1430G	Applications of Calculus I	3
EPWS 303	Economic Entomology	3
EPWS 325V	Insects, Humans, and the Environment	3
CHEM 2120	Integrated Organic Chemistry and Biochemistry (CHEM 2120 must be taken in association with 1-cr Lab))	3
EPWS 455	Advanced Integrated Pest Management	3
EPWS 462	Parasitology	3
EPWS 492	Diagnosing Plant Disorders	3
Select at least three courses from the following:		7-11
EPWS 314	Plant Physiology	
EPWS 451	Special Topics	
EPWS 486	Plant Virology	
BIOL 301	Principles of Ecology	
AGRO 365	Principles of Crop Production	
AGRO 471	Plant Mineral Nutrition	
SOIL 2110	Introduction to Soil Science	
ANSC 370	System Physiology of Farm Animals	
BIOL 436	Disease Vector Biology	
BIOL 462	Conservation Biology	
BIOL 469	Biology of Emerging Infectious Diseases	
BIOL 480	Animal Behavior	
GENE 452	Applied Bioinformatics	
ENVS 301	Principles of Ecology	
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**10-14**
Total Credits		**116**

1. MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G College Algebra first.
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor

Applied and Agricultural Biology (Environmental Biology) - Bachelor of Science in Agriculture

The agricultural biology course work prepares you for a variety of careers in the biological sciences and agriculture. You will develop your curriculum with an academic advisor to attain your individual goals. Many will pursue advanced degrees in the sciences or prepare for admittance to professional schools (medical, dental, etc.). A diverse program is offered with five separate concentrations that allow you to tailor your program for careers in the commercial sector, such as agricultural consulting, and pest management or for careers with county, state, or federal agencies, such as research technicians, land managers, and extension agents. A minimum of 120 credit hours is required for graduation. Any undergraduate student majoring in Agricultural Biology must earn a grade of C- or higher in core (EPWS prefix) courses to satisfy degree requirements. Students earning a D or F in a core (EPWS prefix) course will be expected to repeat that course until the student earns a grade of C- or higher. The following courses are required for a major in Agricultural Biology.

The Environmental Biology concentration prepares you for professional positions in environmental impact, regulation, compliance and improvement.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
or HNRS 2175G	Introduction to Communication Honors	
COMM 1130G	Public Speaking	
Area II: Mathematics		

MATH 1220G	College Algebra [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social/Behavioral Sciences Course (3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
Viewing a Wider World [3]		**6**
One must be from outside of the College of ACES		
Departmental/College Requirements		
A ST 311	Statistical Applications	3
AGRO 305	Principles of Genetics	3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 311	General Microbiology	3
BIOL 313	Structure and Function of Plants	3
or BIOL 322	Zoology	
EPWS 1110	Applied Biology	3
EPWS 1110L	Applied Biology Lab	1
EPWS 301	Agricultural Biotechnology	3
EPWS 302	General Entomology	4
EPWS 310	Plant Pathology	4
EPWS 311	Introduction to Weed Science	4
EPWS 447	Seminar	1
Concentration Coursework		
ENVS 301	Principles of Ecology	3
CHEM 2120	Integrated Organic Chemistry and Biochemistry (CHEM 2120 must be taken in association with 1-cr Lab))	3
EPWS 380V	Science & Society	3
EPWS 314	Plant Physiology	3
EPWS 455	Advanced Integrated Pest Management	3
EPWS 492	Diagnosing Plant Disorders	3
MATH 1430G	Applications of Calculus I	3
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	4
SOIL 2110	Introduction to Soil Science	3
TOX 361	Basic Toxicology	3
Select at least two courses from the following:		5-8
AGRO 365	Principles of Crop Production	
AGRO 471	Plant Mineral Nutrition	
ENVS 370	Environmental Soil Science	
BCHE 395	Biochemistry I	
EPWS 420	Environmental Behavior of Pesticides	
EPWS 451	Special Topics	
GEOG 381	Cartography and GIS	
SOIL 312	Soil Management and Fertility	
TOX 361	Basic Toxicology	
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**7-10**
EPWS 325V	Insects, Humans, and the Environment (recommended)	
Total Credits		**120**

1. MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G College Algebra first.
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1220G	College Algebra [1]	3
EPWS 1110 & 1110L	Applied Biology and Applied Biology Lab	4
ACES 1120	Freshman Orientation	1
Area IV: Social and Behavioral Science Course [2]		3
	Credits	**15**
Semester 2		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	3
MATH 1430G	Applications of Calculus I [1]	3
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution [1]	3
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
Area V: Humanities Course [2]		3
	Credits	**15**
Second Year		
Semester 1		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
EPWS 380V	Science & Society	3
Area VI: Creative and Fine Arts Course [2]		3
Elective Course		2
	Credits	**15**

Semester 2		
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
BIOL 311	General Microbiology [1]	3
BIOL 313 or BIOL 322	Structure and Function of Plants (Fall Only) [1] or Zoology	3
VWW: Viewing a Wider World Course [3]		4
	Credits	**14**
Third Year		
Semester 1		
CHEM 2115	Survey of Organic Chemistry and Laboratory	4
AGRO 305	Principles of Genetics	3
SOIL 2110	Introduction to Soil Science	3
EPWS 310	Plant Pathology (Fall Only) [1]	4
A ST 311	Statistical Applications [1]	3
	Credits	**17**
Semester 2		
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	4
EPWS 301	Agricultural Biotechnology (Spring Only) [1]	3
VWW: Viewing a Wider World Course [3]		3
Departmental Elective Course [4]		3
Elective Course		3
	Credits	**16**
Fourth Year		
Semester 1		
EPWS 311	Introduction to Weed Science	4
EPWS 302	General Entomology	4
EPWS 492	Diagnosing Plant Disorders	3
TOX 361	Basic Toxicology	3
Elective Course		1
	Credits	**15**
Semester 2		
EPWS 447	Seminar	1
EPWS 455	Advanced Integrated Pest Management (Odd Year Spring Only) [1]	3
ENVS 301	Principles of Ecology	3
EPWS 314	Plant Physiology [1]	3
Departmental Elective Course [4]		3
	Credits	**13**
	Total Credits	**120**

1 These courses have prerequisites and it is the students responsibility to check and fulfill all course prerequisites listed for these courses.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 Departmental Elective Course LIst (two required):

- AGRO 365 Principles of Crop Production (Odd Years Fall Only)
- AGRO 471 Plant Mineral Nutrition (Odd Years Spring Only)
- EPWS 325V Insects, Humans, and the Environment
- EPWS 420 Environmental Behavior of Pesticides
- EPWS 451 Special Topics (Spring Only)
- ENVS 370 Environmental Soil Science
- GEOG 381 Cartography and GIS

Applied and Agricultural Biology (Invasive Pest Biology and Management) - Bachelor of Science in Agriculture

The agricultural biology course work prepares you for a variety of careers in the biological sciences and agriculture. You will develop your curriculum with an academic advisor to attain your individual goals. Many will pursue advanced degrees in the sciences or prepare for admittance to professional schools (medical, dental, etc.). A diverse program is offered with five separate concentrations that allow you to tailor your program for careers in the commercial sector, such as agricultural consulting, and pest management or for careers with county, state, or federal agencies, such as research technicians, land managers, and extension agents. A minimum of 120 credit hours is required for graduation. Any undergraduate student majoring in Agricultural Biology must earn a grade of C- or higher in core (EPWS prefix) courses to satisfy degree requirements. Students earning a D or F in a core (EPWS prefix) course will be expected to repeat that course until the student earns a grade of C- or higher. The following courses are required for a major in Agricultural Biology.

The Pest Biology and Management concentration prepares you for careers such as insect, weed and disease management; in both field and urban environments, including IPM and Sustainable/Organic Techniques research technician; federal and state agencies; border security; agricultural consulting; and extension positions.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G or ENGL 1110H	Composition I Composition I Honors	4
English Composition - Level 2		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	

or HNRS 2175G	Introduction to Communication Honors	
COMM 1130G	Public Speaking	
Area II: Mathematics		
MATH 1220G	College Algebra [2]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social/Behavioral Sciences Course (3 Credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
Viewing a Wider World		**6**
One must be from outside the College of ACES		
Departmental/College Requirements		
CHEM 1215G, CHEM 1225G and BIOL 2610G will count towards Departmental/College and General Education Requirements		
A ST 311	Statistical Applications	3
AGRO 305	Principles of Genetics	3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 311	General Microbiology	3
BIOL 313	Structure and Function of Plants	3
or BIOL 322	Zoology	
EPWS 1110	Applied Biology	3
EPWS 1110L	Applied Biology Lab	1
EPWS 301	Agricultural Biotechnology	3
EPWS 302	General Entomology	4
EPWS 310	Plant Pathology	4
EPWS 311	Introduction to Weed Science	4
EPWS 447	Seminar	1
Concentration Coursework		
EPWS 314	Plant Physiology	3
EPWS 455	Advanced Integrated Pest Management	3
CHEM 2120	Integrated Organic Chemistry and Biochemistry (CHEM 2120 must be taken in association with 1-cr Lab))	3
EPWS 462	Parasitology	3
EPWS 492	Diagnosing Plant Disorders	3
MATH 1430G	Applications of Calculus I	3
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	4
SOIL 2110	Introduction to Soil Science	3
SOIL 312	Soil Management and Fertility	3
TOX 361	Basic Toxicology	3
Select one from the following:		3
BIOL 312	Plant Taxonomy	
RGSC 316	Rangeland Plants	
RGSC 325	Rangeland Restoration Ecology	
Select 3 credits from the following:		3
EPWS 451	Special Topics	
EPWS 486	Plant Virology	
AGRO 365	Principles of Crop Production	
AGRO 471	Plant Mineral Nutrition	
BIOL 301	Principles of Ecology	
RGSC 317	Rangeland Communities	
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**9**
Total Credits		**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G College Algebra first.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor

A Suggested Plan of Study

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
MATH 1220G	College Algebra	3
EPWS 1110 & 1110L	Applied Biology and Applied Biology Lab	4
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
ACES 1120	Freshman Orientation	1
General Education Course (Area V, VI, or VI) [1]		3
	Credits	**15**
Spring		
ACOM 1130G or COMM 1115G	Effective Leadership and Communication in Agriculture or Introduction to Communication	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
General Education Course (Area V, VI, or VI) [1]		3
General Education Course (Area V, VI, or VI) [1]		3
	Credits	**15**
Second Year		
Fall		
MATH 1430G	Applications of Calculus I	3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4

Elective Course		3
	Credits	**13**
Spring		
A ST 311	Statistical Applications	3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
BIOL 311	General Microbiology	3
BIOL 313	Structure and Function of Plants	3
Viewing A Wider World [2]		3
	Credits	**16**
Third Year		
Fall		
Concentration Coursework		4
EPWS 302	General Entomology	4
SOIL 2110	Introduction to Soil Science	3
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	4
	Credits	**15**
Spring		
EPWS 301	Agricultural Biotechnology	3
EPWS 314	Plant Physiology	3
EPWS 462	Parasitology	3
TOX 361	Basic Toxicology	3
Viewing a Wider World [2]		3
	Credits	**15**
Fourth Year		
Fall		
EPWS 310	Plant Pathology	4
EPWS 311	Introduction to Weed Science	4
Elective Course		1
BIOL 312	Plant Taxonomy	3
EPWS 492	Diagnosing Plant Disorders	3
	Credits	**15**
Spring		
AGRO 305	Principles of Genetics	3
AGRO 471	Plant Mineral Nutrition	3
EPWS 447	Seminar	1
EPWS 455	Advanced Integrated Pest Management	3
EPWS 420	Environmental Behavior of Pesticides	3
SOIL 312	Soil Management and Fertility	3
	Credits	**16**
	Total Credits	**120**

[1] See the General Education (p. 262) section of the catalog for a full list of courses.

[2] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

General Agriculture - Bachelor of Science in Agriculture

The general agriculture major is designed for students searching for a well-rounded education that builds on the diversity of the other degree programs in the College of Agricultural, Consumer and Environmental Sciences (ACES). The flexibility of the general agriculture degree allows students to tailor a program to fit their individual interests and career goals. Students completing the program earn a Bachelor of Science in General Agriculture. Students choose general agriculture for a variety of reasons. Some may enter the program with a specific career goal in mind. Others may choose general agriculture to obtain a broader education that will give them more flexibility. The curriculum in General Agriculture is administered by the Department of Entomology, Plant Pathology and Weed Science.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirements		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Select one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
or HNRS 2175G	Introduction to Communication Honors	
COMM 1130G	Public Speaking	
Area II: Mathematics		
Select 3-4 credits from the following: [1]		3-4
MATH 1130G	Survey of Mathematics	
MATH 1220G	College Algebra	
MATH 1430G	Applications of Calculus I	
MATH 1250G	Trigonometry & Pre-Calculus	
MATH 1511G	Calculus and Analytic Geometry I	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits) [2]		
Area IV: Social/Behavioral Sciences Course (3 credits) [2]		
Either an Area III: Laboratory Sciences Course (4 credits) or an Area IV:Social/Behavioral Sciences Course (3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective [2]		*3-4*
Viewing a Wider World [3]		
Departmental/College Requirements		
Additional College Requirements [4]		
Select three areas of concentration from the following ACES departments: [5]		52
Agricultural Economics and Agricultural Business		
Agricultural and Extension Education		

Animal and Range Science	
Entomology, Plant Pathology and Weed Science	
Family and Consumer Sciences	
Fish, Wildlife and Conservation Ecology	
Plant and Environmental Sciences	
Hotel, Restaurant and Tourism Management	
Second Language: (not required)	
Electives, to bring total credits to 120 [6]	**33-36**
Total Credits	**120**

1 See the General Education (p. 262) section of the catalog for a full list of courses

2 A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course first.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

4 Some ACES classes will meet general education requirements.

5 At least 18 credits must be taken from the primary department and at least 12 credits must be taken from two secondary departments. A minimum of 52 credits (20 of which need to be 300+) of the 120 required for the degree, must be completed in courses offered by the College of Agricultural, Consumer, and Environmental Sciences.

6 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ACES 1120	Freshman Orientation	1
ACES 1210	Financial Fitness for College Students	1
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1220G	College Algebra [1]	3
Area VI: Creative and Fine Arts Course [2]		3
Area V: Humanities Course [2]		3
	Credits	**15**
Semester 2		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	3
Area III: Laboratory Science Course (recommend one of the following): [2]		3-4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory [1]	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology [1]	
HORT 1115G	Introductory Plant Science [1]	
EPWS 1110	Applied Biology [1]	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
Area IV: Social and Behavioral Science Course (recommend one of the following): [2]		3
AEEC 2130G	Survey of Food and Agricultural Issues	
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
Elective Course		3
Primary Concentration Elective Course		3
	Credits	**15-16**
Second Year		
Semester 1		
ACOM 1130G	Effective Leadership and Communication in Agriculture [1]	3
Area III: Laboratory Science Course (recommend one of the following): [2]		3-4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory [1]	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology [1]	
HORT 1115G	Introductory Plant Science [1]	
EPWS 1110	Applied Biology [1]	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
General Education Elective Course [2]		3-4
Primary Concentration Elective Course		3
Secondary Concentration Elective Course		3
	Credits	**15-17**
Semester 2		
Primary Concentration Elective Course		3
Primary Concentration Elective Course		3
Secondary Concentration Elective Course		3
VWW: Viewing a Wider World Course [3]		3
Upper-Division Elective Course [3]		3
	Credits	**15**
Third Year		
Semester 1		
Primary Concentration Elective Course		3
Primary Concentration Elective Course		3
VWW: Viewing a Wider World Course [3]		3
Elective Course		3
Elective Course		3
	Credits	**15**
Semester 2		
Upper-Division ACES Elective Course		3
Upper-Division ACES Elective Course		3
Secondary Concentration Elective Course		3
Elective Course		3
Elective Course		3
	Credits	**15**

Fourth Year		
Semester 1		
Upper-Division ACES Elective Course		3
Upper-Division ACES Elective Course		3
Upper-Division ACES Elective Course		3
Secondary Concentration Elective Course		3
Elective Course		3
	Credits	**15**
Semester 2		
Upper-Division ACES Elective Course		3
Upper-Division ACES Elective Course		3
Elective Course		3
Elective Course		3
Elective Course		3
	Credits	**15**
	Total Credits	**120-123**

[1] These courses have prerequisites and it is the students responsibility to check and fulfill all course prerequisites listed for these courses.

[2] See the General Education (p. 262) section of the catalog for a full list of courses.

[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Entomology - Undergraduate Minor

Prefix	Title	Credits
Courses required for minor:		
EPWS 302	General Entomology	4
EPWS 325V	Insects, Humans, and the Environment	3
EPWS 303	Economic Entomology	3
Choose from the following courses:		**8**
EPWS 1110	Applied Biology	
EPWS 1110L	Applied Biology Lab	
EPWS 455	Advanced Integrated Pest Management	
EPWS 462	Parasitology	
Total Credits		**18**

Pest Management - Undergraduate Minor

Prefix	Title	Credits
Courses required for minor		
EPWS 302	General Entomology	4
EPWS 310	Plant Pathology	4
EPWS 311	Introduction to Weed Science	4
Choose from the following Courses:		**6**
EPWS 1110	Applied Biology	
EPWS 1110L	Applied Biology Lab	
EPWS 303	Economic Entomology	
EPWS 455	Advanced Integrated Pest Management	
Upper-division EPWS course(s): (3-6 credits)		
Total Credits		**18**

Plant Pathology - Undergraduate Minor

Prefix	Title	Credits
Courses required for minor:		
EPWS 310	Plant Pathology	4
EPWS 373	Fungal Biology	3
EPWS 486	Plant Virology	3
Choose from the following Courses:		**8**
BIOL 311	General Microbiology	
BIOL 311 L	General Microbiology Laboratory	
EPWS 1110	Applied Biology	
EPWS 1110L	Applied Biology Lab	
EPWS 314	Plant Physiology	
EPWS 455	Advanced Integrated Pest Management	
EPWS 492	Diagnosing Plant Disorders	
Total Credits		**18**

Weed Science - Undergraduate Minor

Prefix	Title	Credits
Courses required for minor:		
EPWS 311	Introduction to Weed Science	4
EPWS 314	Plant Physiology	3
EPWS 420	Environmental Behavior of Pesticides	3
Choose from the following Courses:		**8**
EPWS 1110	Applied Biology	
EPWS 1110L	Applied Biology Lab	
BIOL 312	Plant Taxonomy	
BIOL 301	Principles of Ecology	
BIOL 313	Structure and Function of Plants	
EPWS 455	Advanced Integrated Pest Management	
Total Credits		**18**

Family and Consumer Sciences

Undergraduate Program Information

Where Science Meets the Human Experience

The Department of Family and Consumer Sciences (FCS) at NMSU is dedicated to improving the quality of life for individuals, families, and communities in a rapidly changing global society. Our curriculum blends **scientific rigor with social impact**, equipping you with the research-backed tools needed to solve real-world problems.

Whether you are interested in the global fashion industry, the chemistry of food, or the complexities of human development, our programs provide a clear pathway from the classroom to a meaningful career.

Our Specialized Fields of Study

Explore our diverse program areas through our specialized course prefixes:

- **CTFM | Clothing, Textiles, and Fashion Merchandising:** The business, design, and sustainability of the global apparel industry.
- **FCST | Family and Child Science:** Understanding human development and strengthening the bonds of families and communities.

- **NUTR | Nutrition:** The science of health, wellness, and medical nutrition therapy.
- **FSTE | Food Science and Technology:** Innovation in food safety, processing, and the future of the food supply.
- **FCSC | Family and Consumer Sciences:** Core foundations and cross-disciplinary leadership in the field.

Graduate Program Information

Elevate your professional impact with a Master's degree from NMSU. Our graduate programs are designed for specialized research and leadership roles in the human sciences.

- **Who Should Apply:** Prospective students should hold an undergraduate degree in a field related to their intended area of specialization.
- **How to Apply:** In addition to Graduate School requirements, the department evaluates letters of reference, standardized test scores, and personal statements to ensure a holistic admission process.
- **Timelines:** To ensure a seamless start, we recommend submitting all materials at least **six weeks prior** to the start of your desired semester.

Note: For a full list of admission criteria and specialized prerequisites, please contact the department directly to connect with a faculty advisor.

Degrees for the Department

Bachelor Degree(s)

- Family and Consumer Sciences Education - Bachelor of Science in Family and Consumer Sciences (p. 414)
- Fashion Merchandising and Design - Bachelor of Science in Family and Consumer Sciences (p. 415)
- Food Science and Technology (Science, Technology and Engineering) - Bachelor of Science in Food Science and Technology (p. 418)
- Human Development and Family Science - Bachelor of Science (Online) (https://catalogs.nmsu.edu/global/nmsu-global/human-development-family-science-bs-online/)
- Human Nutrition and Dietetic Science (Nutrition Education) - Bachelor of Science in Family and Consumer Sciences (p. 419)
- Human Nutrition and Dietetic Science (Pre-Dietetics/Dietetics) - Bachelor of Science in Family and Consumer Sciences (p. 422)

Master Degree(s)

- Family and Consumer Sciences (Couples, Marriage and Family Therapy) - Master of Science (p. 159)
- Family and Consumer Sciences (Food Science and Technology) - Master of Science (p. 159)
- Family and Consumer Sciences (Hotel, Restaurant and Tourism Management) - Master of Science (p. 160)

Doctoral Degree(s)

- Food Science - Doctor of Philosophy (p. 225)

Minors for the Department

- Culinary Science - Undergraduate Minor (p. 424)
- Fashion Merchandising & Design - Undergraduate Minor (p. 425)
- Fashion Merchandising and Design - Bachelor of Science in Family and Consumer Sciences (p. 415)
- Food Science - Undergraduate Minor (p. 425)
- Interior Spaces - Undergraduate Minor (p. 425)
- Meat Science - Undergraduate Minor (p. 425)
- Nutrition - Undergraduate Minor (p. 426)

Efren Delgado, Department Head

Laura Bittner, Associate Department Head

Professors Delgado, Floros, Marin, Montañez

Associate Professors Martin, Martinez-Monteagudo

Assistant Professors Ahn, Mezzomo Giotto, Molina, Ruiz, Sabillon Galeas,

College Professor Vaillancourt

College Associate Professor Coffeen

College Assistant Professors

I. Ahn, Ph.D. (Chung-Ang University, Korea)- textile and clothing; K. Coffeen, Ph.D. (New Mexico State University)- educational leadership; E. Delgado, Ph.D. (Technical University of Berlin, Germany)–food science and technology; J. Floros, Ph. D. (University of Georgia) Food Science & Technology; S. Martin, Ph.D. (South Dakota State University)- nutrition and exercise science; M. Marin, Ph.D. (New Mexico State University)– counseling and educational psychology; F. Mezzomo Giotto, *Ph.D. (*University of Nevada); M. Molina, Ph.D. (Texas Tech University) - Family and Consumer Sciences Education; M. *Montanez, Ph.D. (Michigan State University)– psychology; S. Phillips, M.S. (New Mexico State University)- family and consumer sciences; Ruiz, S. Ph.D.* (University of Texas at El Paso)- Interdisciplinary Health Sciences ; *L. Sabillon Galeas, Ph.D. (University of Nebraska-Lincoln)- food science and technology; K. Vaillancourt, Ph.D. (Virginia Tech University)– family studies*

Cooperative Extension Service *L. Bittner, Ph.D. (New Mexico State University)-Educational Leadership and Administration; L. Banegas-Carreon, Ph.D. (New Mexico State University)- Educational Leadership and Administration; W. Fedio, Ph.D. (University of Alberta-Canada)– food microbiology; B. Jorgensen, Ph.D. (Virginia Tech University)– family studies; K. Martinez, Ph.D. (New Mexico State University)- educational leadership and administration; L. Olivas, M.Ed. (New Mexico State University)- education/ curriculum and instruction; L. Sabillon Galeas, Ph.D. (University of Nebraska-Lincoln)- food science and technology; C. Vanderpool, M.S. (University of New Mexico)- nutrition*

Clothing, Textiles & Fashion Merchandising

CTFM 1110. Fundamentals of Fashion
3 Credits (3)
Survey of the fashion business from fiber to end product.
Learning Outcomes

1. Describe the roles and functions of industry jobs and sectors involved in the designing, production, marketing, and distribution of fashion brands within the global context.

2. Describe the business strategies of industry sectors involved in the designing, production, marketing, and distribution of fashion brands within the global context.
3. Describe the interrelationships among line planning, line development, and line presentation at manufacturing and retail levels.
4. Provide examples of the fashion industry's environmental and social impact.
5. Learn about all career tracks involved in the fashion industry and the global fashion supply chain.
6. Synthesize industry-relevant information on current issues in the fashion industry.

CTFM 2120. Fashion Illustration
3 Credits (1+4P)
This course explores aspects of fashion illustration, from drawing basic fashion figures to producing finished professional illustrations in color. This course provides the opportunity for students to integrate their fashion design development with computer-aided systems. The emphasis is on fashion innovation and concept design exploration enhanced by computer applications. May be repeated up to 3 credits.. Prerequisites: ARTS 1145G and CTFM 1110
Learning Outcomes
1. To learn Adobe Illustrator and Adobe Photoshop as drawing and design tools for electronic design and rendering.
2. To understand and utilize the computer as a tool for fashion design.
3. To understand methods of design input, including scanning, digitizing and resizing.
4. To develop customer profiles
5. To Understand Concept Style

CTFM 2130. Concepts in Apparel Construction
3 Credits (1+4P)
Students are introduced to professional standard sewing techniques and apparel construction. The techniques learned are applied to produce finished garments. Restricted to: FCSE,CTFM majors. Restricted to Las Cruces campus only.
Learning Outcomes
1. Define sewing construction terminology, equipment and sewing machine parts.
2. Learn to select suitable patterns and fabrics for garments.
3. Learn to alter commercial patterns for different body types.
4. Identify fabric types, finishes, and labeling.
5. Perform standard operating procedures on sewing machines.
6. Perform clothing construction techniques for various garments.
7. Apply knowledge of industry sewing methods to recognition of garment workmanship.

CTFM 2990. Fashion Practicum
1-3 Credits (1-3)
Applied field experience in the related areas of apparel design, fashion merchandising, and textile science. May be repeated up to 3 credits. Restricted to: CTFM majors. Restricted to Las Cruces campus only.
Learning Outcomes
1. Gain hands-on knowledge of the fashion industry.
2. Demonstrate the ability to analyze the practices of management, as observed in the industry.
3. Demonstrate an attitude that is appropriate for a prospective manager in the industry.
4. Demonstrate the understanding of, and the ability to use research and problem solving methods to develop, analyze, and present a critical incident analysis.

CTFM 300. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. Restricted to Las Cruces campus only.
Prerequisite(s): CTFM 1110; CTFM 2120.

CTFM 365. Apparel Analysis
3 Credits (3)
An in-depth investigation of the development, production and comparison of wearing apparel. Focus on the structural, functional and decorative aspects of apparel. Emphasis on sourcing of companies and materials, costing of the product line, comparing design and manufacturing techniques that affect price, quality, and size of apparel. Restricted to: CTFM majors.
Prerequisite(s): CTFM 1110 and CTFM 2130.

CTFM 366V. Historic Fashion and Society
3 Credits (3)
This course will introduce you to the clothing history, sociocultural aspects of clothing, the use of historic clothing as inspiration for fashion design, clothing as an aspect of material culture, or adaptation of styles to amplify character or aesthetic expression in theater or dance. Additionally, we look at the history of clothing as a way to understand how this medium of expression in our lives has been used to elevate, suppress, unite and separate society.
Learning Outcomes
1. Compare and contrast the functions and uses of Euro American dress in historic periods.
2. Explain international issues in specific timelines in regards to dress and society.
3. Compare and contrast multicultural and economic issues.
4. Compare and Contrast specific political, cultural, economic, or technological developments in relationship to clothing through themes.
5. Illustrate and Summarize of the evolution of Western clothing in chronological time periods.
6. Define period and clothing terminology.
7. Identify themes in the study of clothing history.

CTFM 371. Textile Science
3 Credits (1+4P)
The study of fiber characteristics, fabric properties and the manufacturing processes that affect the selection, use, and care of textile goods. Restricted to: CTFM majors.
Prerequisite(s): CTFM 1110.

CTFM 372. Fashion Merchandising
3 Credits (3)
A study of the processes required to bring consumer goods to the marketplace.
Prerequisite(s): CTFM 1110 and CTFM 2130.

CTFM 373. Advanced Apparel Construction II
3 Credits (1+4P)
This course builds on Basics of Apparel Construction and explores the application of advanced sewing technology across a range of fashion products. Restricted to: CTFM majors.
Prerequisite(s): CTFM 2130.

CTFM 375. Fashion Buying
3 Credits (3)
The application of planning, purchasing and controlling inventories using industry data and analytics. Includes merchandising math with an emphasis on product selection and pricing.
Prerequisite(s): ACCT 2110, CTFM 1110, and CTFM 2130.

CTFM 377. Fashion Study Tour
1-3 Credits (1-3)
Study of international/domestic fashion, designers, manufacturers, merchandisers and/or retailers. May be repeated up to 6 credits. Consent of Instructor required.

CTFM 401. Professional Development
1 Credit (1)
Introduction to the field experience including resume writing, interviewing skills, understanding business ethics and etiquette. Also includes a discussion of career paths and advice from industry guest speakers. Restricted to: CTFM majors.
Prerequisite(s): CTFM 372 and CTFM 375.

CTFM 402. Field Experience
1-3 Credits (1-3)
Practical experience in fashion, clothing design, manufacturing, merchandising, or retailing. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: CTFM majors.
Prerequisite(s): CTFM 401.

CTFM 403. Post-Field Experience
1 Credit (1)
A case based approach to analyzing internship experiences. Students will share their experiences and prepare case studies about specific business issues they encountered during CTFM 402. Restricted to: CTFM majors.
Prerequisite(s): CTFM 402.

CTFM 460. Cultural Perspectives in Dress
3 Credits (3)
Explores the social, psychological and cultural aspects of dress and appearance. Consent of Instructor required.

CTFM 473. Flat Pattern for Apparel Design
3 Credits (1+4P)
Applied design principles to flat patterns techniques including bodies, skirts, sleeves, neckline, and bodies-sleeve combinations. Projects will require three-dimensional approaches in apparel design. Restricted to: CTFM majors.
Prerequisite(s): CTFM 2120 and CTFM 373.

CTFM 474. Fashion Promotion
3 Credits (3)
A comprehensive examination of promotion in the merchandising environment of fashion related goods. Restricted to: CTFM majors.
Prerequisite(s): CTFM 372.

CTFM 476. Draping for Apparel Design
3 Credits (1+4P)
Development of garment shapes using draping techniques. Emphasis placed on torso development, contouring principles and desgin development on the form. This course exposes the student to the design process, from initial concept and muslin sample development to final execution of the finished garments. Restricted to: CTFM majors.
Prerequisite(s): CTFM 2120 and CTFM 373.

CTFM 477. Capstone in Fashion Mechandising
3 Credits (3)
Synthesizes previous coursework. Students apply multi-disciplinary principles to the analysis of fashion merchandising case studies and industry related challenges.
Prerequisite(s): CTFM 372, CTFM 375 and CTFM 402.

CTFM 492. Special Problems
1-4 Credits
Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 6 credits toward a degree.

CTFM 571. Textile Science
3 Credits (1+4P)
The study of fiber characteristics, fabric properties and the manufacturing processes that affect the selection, use and care of textile goods. Students will be required to complete additional assignments beyond what is required for CTFM 371.

CTFM 598. Special Research Programs
1-4 Credits
Individual investigations, either analytical or experimental. May be repeated for a maximum of 4 credits per semester and no more than 6 credits toward a degree.

Family and Child Studies Courses

FCST 1130. Interpersonal Skills in Intimate Relationships
3 Credits (3)
Developing social skills within friendships, dating relationships, marriage, parenting, and families.
Learning Outcomes
1. To understand several theories that explain why some people have healthy interpersonal relationships while others do not.
2. To gain insight about one's self.
3. To learn and improve upon selected relationship skills that improve quality of life.
4. To learn skills that improve interpersonal relationships

FCST 2110. Infancy Through Middle Childhood in the Family
3 Credits (3)
This course discusses research and theory relevant to prenatal development and the physical, mental, and socio- emotional development of the child from birth through age 12. This developmental period will be examined across different cultures and in real world contexts. Attitudes, knowledge, and skills needed for working with young children and their families will be introduced. Restricted to Las Cruces campus only.
Learning Outcomes
1. Evaluate how genes and the environment interact to impact human development from prenatal stages through age twelve.
2. Assess the effects of environmental influences on the developing fetus.
3. Discuss the capacities of newborn development through age twelve.
4. Evaluate how individuals and couples change during the transition to parenthood.
5. Analyze the physical, cognitive, and social-emotional development of the child from birth through age twelve.

FCST 2135. Adolescent Development and the Family
3 Credits (3)
Research and theory relevant to the physical, mental, social, and emotional development of the children ages 12 to 18. Attitudes, knowledge, and skills related to working with adolescents in the family system. Observation in a variety of settings may be required.

Learning Outcomes

1. Compare adolescents of today with adolescents of the past.
2. Describe the physical, cognitive, and psychosocial development of the adolescent in the family system and evaluate individual differences in development.
3. Contrast ways in which culture impacts adolescent development.
4. Assess effective parenting strategies with adolescents.
5. Analyze the influence of family, peers, school, and work on adolescent development.

FCST 2140. Adult Development and Aging
3 Credits (3)
Research and theory related to the physical, mental, social, and emotional development of older adults. Attitudes, knowledge, and skills related to working with older adults in the family system, including normative, and nonnormative transitions.

Learning Outcomes

1. Contrast theories of adult development and aging and apply theories to adult behavior.
2. Hypothesize how physical, emotional, cognitive, and psychosocial aspects of adult development change over time.
3. Describe multicultural factors that impact attitudes toward aging and coping with aging family members.
4. Evaluate ways in which special issues (including but limited to Alzheimer's Disease, heart disease, end of life issues) impact aging.
5. Devise a conceptualization of one's own perspective in dealing with aging and aging family members.

FCST 3110V. Introduction to Child Advocacy
3 Credits (3)
Historical review and evolution of child welfare policies, initiatives and factors that influence child welfare service. Child welfare policies and services specific to the state of New Mexico are infused throughout the course. May be repeated up to 3 credits.

Learning Outcomes

1. To understand how to apply a model of critical thinking/analysis to child maltreatment issues using a systems framework.
2. Compare and contrast historical trends in child maltreatment an child advocacy.
3. Analyze individual, family and community risk factors for maltreatment.
4. Explain cultural issues related to assessing and working with diverse families.

FCST 3120V. Family Ethnicities and Subcultures
3 Credits (3)
Comparative study of American family subsystems with respect to selected social, economic, and cultural backgrounds. Interaction of these subsystems in American society. Differentiated assignments for graduate students. May be repeated up to 3 credits.

FCST 3210. Family Resource Management
3 Credits (3)
This course provides an understanding of the decision-making process of families concerning the utilization of financial, personal, environmental, and social resources. In particular, the class will focus on how families develop, exchange, and allocate resources throughout the lifespan with the expectation that the most effective resource management decisions are made from positions of knowledge and understanding. May be repeated up to 3 credits.

FCST 3220. Family Dynamics
3 Credits (3)
The dynamics of family relationships and changes influencing contemporary families. Interaction between the family and other social systems will be examined. Open to nonmajors.

Learning Outcomes

1. Apply theories to families throughout the family life cycle.
2. Appraise family development as an institution in society.
3. Identify the components of intra-familial dynamics.

FCST 3230. Parenting and Child Guidance
3 Credits (3)
Theories, principles, and skills essential for parents and professionals in guiding children within the family system. Problem prevention techniques are stressed. May be repeated up to 3 credits.

FCST 4310. Community Programs in Family Life
3 Credits (3)
The purpose of this course is for students to learn through class lectures, readings, and community based activities, about issues related to the formulation, delivery, and evaluation of family life education programs in the local community and through virtual delivery. Students will also learn about conducting needs assessments in the community, and evaluating programs after their implementation in preparation for jobs in the field of Family Science.

Learning Outcomes

1. Identify conceptual frameworks suitable in the development of family life programs.
2. Demonstrate knowledge and understanding of techniques and strategies useful in the delivery of family life education programs.
3. Conduct needs assessments and critiques of existing family life/parent education programs and methods of delivering information to parents and families.
4. Apply evaluation strategies for analyzing program effectiveness.
5. Demonstrate knowledge of the legal, moral, and ethical dimensions of family life education and certification standards.

FCST 4997. Special Problems
1-4 Credits
Individual research in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 6 credits. May be repeated up to 6 credits.

FCST 4998. Field Experience: Issues and Ethics
3 Credits (3)
Supervised work experience in community agencies providing services to family systems. Discussion of professional issues and ethical dilemmas. A total of 6 credits must be taken. Restricted to: FCS majors. Students must be in junior standing to enroll. May be repeated up to 6 credits.
Prerequisite: FCST 3220 or equivalent, and an overall GPA of at least 2.5.

Learning Outcomes

1. Complete 150 hours of professional experience.
2. Illustrate the interrelationship of theory, research, and intervention strategies through reflective writing.
3. Evaluate ethical issues in family life education and human services through class discussions and case studies.
4. Employs ethical decisions making using professional guidelines and rubrics.

FCST 5110. Infancy Through Middle Childhood in the Family
3 Credits (3)

Research and theory relevant to prenatal development and the physical, mental, and socio-emotional development of the child from birth to age 5. Attitudes, knowledge, and skills needed for working with young children and their families.

FCST 5120. Family Ethnicities and Subcultures
3 Credits (3)
Comparative study of American family subsystems with respect to selected social, economic and cultural backgrounds. Interaction of these subsystems in American society. Students responsible for all requirements for FCST 449V plus additional work. May be repeated up to 3 credits.

FCST 5135. Adolescent Development and the Family
3 Credits (3)
Advanced study in research and theory relevant to the physical, mental, social, and emotional development of the child, ages 12-18. Attitudes, knowledge, and skills related to working with adolescents in the family system.

Learning Outcomes

1. Compare adolescents of today with adolescents of the past.
2. Contrast ways in which culture impacts adolescent development.
3. Assess effective interventions with adolescents.
4. Analyze the influence of family, peers, school, and work on adolescent development.
5. Assess effective parenting strategies with adolescents.

FCST 5140. Adult Development and Aging
3 Credits (3)
Advanced study in research and theory related to the physical, mental, social, and emotional development of older adults. Attitudes, knowledge, and skills related to working with older adults in the family system, including normative and non-normative role transitions. May be repeated up to 3 credits.

FCST 5210. Family Law and Ethics
3 Credits (3)
Study of selected aspects of federal and state laws and ethical issues as they relate to the family system.

FCST 5220. The Business and Practice of Marriage and Family Therapy
1 Credit (1)
This seminar course will provide students with an overview of the business and practice of Marriage and Family Therapy to the end that they will understand how to develop and maintain a private practice in the field of MFT. Restricted to: FCS (MFT) majors. Graded: S/U Grading (S/U, Audit).

FCST 5230. Parenting and Child Guidance
3 Credits (3)
Theories, principles, and skills essential for parents and professionals in guiding children within the family system. Problem prevention techniques are stressed.

FCST 5310. Family Dysfunction and Diagnosis
3 Credits (3)
A study of the development of abnormal behavior patterns and characteristics to include the major mental and personality disorders and how these can influence and impact family systems. Emphasis is on the symptomology and/or life circumstances and events described in the various diagnostic categories.
Prerequisite(s): Students must be enrolled in a clinical program (i.e MFT, CEP, MSW).

FCST 5320. Theories of Marriage and Family Therapy
3 Credits (3)
A balanced study of major theories, research, applications and principles of marriage and family therapy. This course will examine major therapy models and the theories they are derived from as well as the effectiveness of specific therapy models for specific mental health disorders through research.

FCST 5330. Strategies in Family Therapy
3 Credits (3)
Effective intervention strategies in family therapy practice. Live and taped role plays of interventions for various family problems required. Constructive approaches for working with family systems and third-party payers.

FCST 5340. The Family System
3 Credits (3)
Contemporary family interaction: concepts, composition, resource and environment.

FCST 5410. Sexuality and Family Dynamics
3 Credits (3)
Psychosocial and physiological aspects of human sexuality from a life span and family systems perspective.

FCST 5420. Contemporary Marriage and Family Issues
3 Credits (3)
Investigation of one of the following topics each semester: dual career marriages, nontraditional relationships, aged in marriage.

FCST 5430. Family Crises and Rehabilitation
3 Credits (3)
Examination of the major crises experienced by families. Emphasis on family system functioning rather than individual functioning. Preventative measures, positive coping strategies, and therapeutic intervention approaches examined.

FCST 5990. Supervised Clinical Practice
1-9 Credits (2-18P)
Supervised clinical experience in Marriage and Family Therapy. Includes reviews of audio, video, and/or live sessions and case presentations. Maximum of 9 credits toward a degree. May be repeated up to 20 credits.

FCST 5991. Special Research Programs
1-4 Credits
Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

FCST 5996. Special Topics
1-4 Credits
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree.

FCST 5998. Supervised Practicum
1-9 Credits
Supervised experience in organizations providing services to families and children. Course subtitled in the Schedule of Classes. May be repeated for a maximum of 9 credits. Graded S/U.
Prerequisite: consent of instructor.

FCST 5999. Master's Thesis
15 Credits
Thesis

Family and Consumer Science Courses

FCSC 2250. Overview of Family and Consumer Sciences Teaching
3 Credits (3)
Overview of planning and teaching skills. Supervised experiences in observing and directing the learning of secondary family and consumer sciences students. Philosophy and history of the profession.

Learning Outcomes

1. Explain the foci of FCS—past, present and future.
2. Begin to develop a professional role in FCS.
3. Formulate a personal philosophy of FCS, and of teaching.
4. Explain the teaching process.
5. Give examples of roles, responsibilities and qualities of effective and ethical teachers.
6. Assess the characteristics, backgrounds, and needs of learner audiences.
7. Explain various learning theories/principles.
8. Illustrate how various input factors influence teaching decisions.
9. Plan a researched based student-centered lesson with a learning activity in a FCS content area. 1
10. Give examples of ways to evaluate learner growth.1
11. Present a FCS content-based lesson effectively to learners using PowerPoint presentation software and a selected teaching method. 1
12. Evaluate one's own teaching and the teaching of others. 1
13. Exhibit increased confidence in one's abilities as a teacher/educator.1
14. Exhibit excitement about assuming the teacher/educator role.

FCSC 2330. Housing and Interior Design
3 Credits (3)
Investigation of types of housing and factors impacting housing decisions for families. Selection, planning, and arrangement of interior components of homes to meet the needs of the family. Restricted to Las Cruces campus only.

Learning Outcomes

1. Differentiate between different architectural designs (i.e., Cape Cod, contemporary, craftsman, ranch, southern colonial, Spanish, Victorian, pueblo, New Mexican territorial, and territorial revival) and be able to identify historical, cultural, demographic, geographical, and environmental influences on style and aesthetics.
2. Analyze the fundamentals of housing for all families and cultures and understand the role housing plays in the ecological model of human ecology.
3. Define elements of design as related to housing and interiors (i.e., color, form, line, space texture).
4. Define principles of design as related to housing and interiors (i.e., balance emphasis, harmony, proportion, unity).
5. Compare and contrast the different periods of interior design from the 20th century to the present.
6. Analyze the influence of historical and cultural factors in the development of current interior trends.
7. Select and arrange interiors that are functional and aesthetically pleasing to designated interior design situations.
8. Identify, describe and make application of textiles as related to various furniture and interior design styles.
9. Design a three-dimensional tiny house or an interior space, using all concepts learned.

FCSC 3110. Management Concepts in Family and Consumer Sciences Teaching
3 Credits (3)
Incorporation and application of management concepts in family and consumer sciences subject matter. Practical experience teaching management and ways to use management skills to plan, implement, and evaluate the teaching-learning transaction. May be repeated up to 3 credits.

FCSC 4110. Teaching in Informal Family and Consumer Sciences Settings
3 Credits (3)
Learning principles and theories with application in informal family and consumer sciences education situations. Includes supervised experience in use of teaching strategies. May be repeated up to 3 credits.
Prerequisite: overall GPA of at least 2.5 or consent of instructor.

FCSC 4120. Career and Technical Education Programs
3 Credits (3)
History and development of career and technical programs. Ancillary functions of family and consumer sciences teachers, including student evaluation and leadership development for students. Experiences in extension programs and teaching. Ethical issues and concerns of educators are introduced. Lifelong leadership development and evaluation tools for educators are explored. May be repeated up to 3 credits.

FCSC 4510. Teaching Methods I for Family and Consumer Sciences
3 Credits (3)
Methods and strategies for teaching Family & Consumer Sciences content in middle and secondary schools. Organization and development of curriculum. May be repeated up to 3 credits.
Prerequisite: FCSC 2250 and FCSC 3110 and an overall GPA of 2.75, admitted to FCSE program; completion of NES Essential Basic Skills Tests I, II, & III; Human Nutrition Education Majors.
Corequisite: FCSC 4120.

Learning Outcomes

1. Methods and strategies for teaching Family Consumer Sciences content in middle and secondary schools.
2. Organization and development of curriculum.

FCSC 4520. Teaching Methods II for Family and Consumer Sciences
3 Credits (3)
Planning, preparation, and strategies for teaching family and consumer sciences in middle and secondary schools. Preparation for employment. Restricted to: FCSE majors and Human Nutrition Education Majors. May be repeated up to 3 credits.
Prerequisite: FCSC 4510; overall GPA of 2.75,admitted to program.

Learning Outcomes

1. Planning, preparation, and strategies for teaching family and consumer sciences in middle and secondary schools.
2. Preparation for employment.

FCSC 4810. Supervised Teaching in Family and Consumer Sciences
12 Credits (12)
Seventy (70) days of full-time supervised teaching in selected middle or secondary schools. May be repeated up to 12 credits. Restricted to: FCSE majors.
Prerequisite: FCSC 4510, an overall GPA of 2.75, and admitted to FCSE Program.
Corequisite: FCSC 4520.

FCSC 4815. Research Methods in Family and Consumer Sciences
3 Credits (3)
Introduction to research design and methodology in Family and Consumer Sciences. Overview of common research designs and data collection strategies. Prepares students to critique published research and perform basic skills including hypotheses development and conducting a literature search. May be repeated up to 3 credits.

FCSC 4997. Special Problems
1-4 Credits

Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and 6 credits toward degree.

FCSC 5815. Research Methods
3 Credits (3)
This course covers the critical evaluation of research literature, development of research proposals and principles of program evaluation. Students will be introduced to the application of qualitative or quantitative methods. Students will be expected to develop research questions and test hypotheses using statistical analysis and a variety of methodologies.

FCSC 5991. Special Research Programs
1-4 Credits
Individual investigations, either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree. May be repeated up to 4 credits.

FCSC 5996. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits toward a degree, 4 credits per semester.

FCSC 5999. Master's Thesis
1-15 Credits
May be repeated up to 88 credits.

Food Science and Technology Courses

FSTE 1120. ACES in the Hole Foods I
4 Credits (4)
Food production activities related to operation of ACES in the Hole Foods, a student-run food company that will give FSTE majors hands-on experience in all aspects of developing, producing and marketing food products Restricted to Las Cruces campus only. Students enrolled in this class must possess A Food Handler Card
Learning Outcomes
1. Apply basic scientific principles, procedures, techniques and standards in the production of food products.
2. Apply principles of sanitation and safety to the production of food products.
3. Assist in the development and evaluation of new and/or existing food products made for human consumption.
4. Prepare a resume and portfolio

FSTE 2110G. Food Science I
4 Credits (3+2P)
The scientific study of the principles involved in the preparation and evaluation of foods. May be repeated up to 4 credits.
Learning Outcomes
1. Explain basic scientific principles involved in the preparation of high quality food products.
2. Utilize scientific inquiry in the experimental investigation of factors influencing the chemical, physical and sensory properties of food products.
3. Apply basic scientific principles, procedures, techniques and standards in the preparation of all types of high quality food products.
4. Use basic methods of quantitative analysis to critically evaluate quality characteristics of food.
5. Use sensory science techniques and terminology to critically evaluate acceptability and quality characteristics of food.
6. Describe high quality characteristics of a variety of food products using appropriate terminology.
7. Apply principles of sanitation and safety to food preparation.

FSTE 2120. ACES in the Hole Foods II
4 Credits (8P)
Food production activities related to operation of ACES in the Hole Foods, a student-run food company that will give FSTE majors hands-on experience in all aspects of developing, producing and marketing food products. Student must also have a Food Handler Card to enroll in this course.
Prerequisite(s): FSTE 1120.
Learning Outcomes
1. Apply basic scientific principles, procedures, techniques and standards in the production of food products.
2. Apply principles of sanitation and safety to the production of food products.
3. Assist in the development and evaluation of new and/or existing food products made for human consumption.
4. Prepare a resume and portfolio

FSTE 2130G. Survey of Food and Agricultural Issues
3 Credits (3)
Survey of food and agricultural issues, including: geography of food production and consumption; human-agricultural-natural resource relations; agriculture in the United States and abroad; modern agribusiness; food safety; food, agriculture, and natural resources policy; ethical questions; role and impact of technology. Crosslisted with AEEC 2130G.
Learning Outcomes
1. Understand of global agriculture including production techniques used in various geographical regions, consumption trends, and political and social constraints.
2. Synthesis information about agricultural issues and make informed arguments
3. Articulately discuss modern issues in agriculture
4. Write coherent arguments relative to personal beliefs regarding agricultural issues

FSTE 2996. Special Topics
1-4 Credits
Specific topics and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.
Learning Outcomes
1. Varies

FSTE 3110. Professional Development in Food Science
1 Credit (1)
Covers essential elements of career management including preparation for a successful internship. Students must have a Food Handler Card. Restricted to: FSTE majors. Graded S/U.
Prerequisite: FSTE 2120.
Learning Outcomes
1. Describe their Jung Type.
2. Articulate their personal mission.
3. Identify their personal strengths and weaknesses.
4. Establish short and long term career goals.
5. Prepare an effective cover letter.
6. Develop a professional resume.
7. Understand the dos and dont's of interviewing.

8. Properly dress for interviewing.
9. Understand the factors to consider when deciding what job offer to accept. 1
10. Understand the objectives and requirements of the Food Science internship program.

FSTE 4110. Food Microbiology
4 Credits (3+2P)
Detrimental and beneficial microbiological aspects of food products. Methods of quantification and identification of microorganisms associated with food spoilage and preservation. May be repeated up to 4 credits. Prerequisite(s): (BIOL 2610G and BIOL 2610L), or (BIOL 2110G and BIOL 2110L)

FSTE 4120. Food Chemistry
3 Credits (3)
Comprehensive study of the chemical and physiochemical properties of food constituents. Chemical changes involved in the production, processing, and storage of food products and basic techniques used to evaluate chemical and physiochemical properties of foods.
Prerequisites: CHEM 1215G, CHEM 1225G, and CHEM 2115, or consent of instructor.

FSTE 4130. Food Preservation
3 Credits (2+2P)
Processes used in home and commercial food preservation, including canning, freezing, drying, and irradiation. May be repeated up to 3 credits.
Prerequisite(s): FSTE 2110G.

FSTE 4140. Food Analysis
3 Credits (2+2P)
Basic chemical and physical techniques used in establishing nutritional properties and overall acceptance of food products. May be repeated up to 3 credits.
Prerequisite(s): CHEM 1215G or consent of instructor.

FSTE 4150. Food Safety
3 Credits (3)
Provide students' knowledge on good manufacturing practices and prequisite programs, conduct hazard analysis and determine preventive controls, define process, food allergen, sanitation and supply-chain preventive controls and discuss verification validation, recall and recordkeeping requirements with training and educational opportunities related to current best practices and guidane, and future regulatory requirements by establishing the Produce Safety Alliance. Students participate in a Mock Audit. Participants will receive an official FSPCA Preventive Controls Qualified Individual certificate issues by AFDO after attending this training program.
Prerequisite(s): FSTE 4110 or BIOL 311, or consent of instructor.

FSTE 4210. Cereal Technology
3 Credits (2+2P)
This course provides students with an understanding of chemistry and technology of the cereal grains. The course is structured as a combination of theory, demonstrations, and practical laboratory exercises on the fundamentals of cereal processing. Students will learn about post-harvest processing and utilization of major cereal grains for food and feed, current industrial processes and practices, and the theoretical basis for these operations.
Learning Outcomes
1. Understand principles of cereal chemistry and processing.
2. Understand how cereal grains are produced, stored, marketed, and converted into food products.
3. Describe unit operations and procedures involved in the manufacture of cereal-based food and animal feed products.

FSTE 4220. Dairy Technology
3 Credits (2+2P)
This course provides general knowledge on dairy technology as well as on various processing technologies regarding the science behind a variety of dairy products. It is designed to give a thorough understanding of the composition and properties of milk, and of the physical and chemical changes occurring in milk during processing and storage. These products include fluid milk, fermented dairy products, concentrated and dried dairy products, butter, cream and various frozen dairy desserts. Principles and practices in assembling, receiving, processing, and packaging milk and dairy products, including beverage, frozen, cream, butter, concentrated and fractionated milks, dried milks, casein, and lactose.
Prerequisite: FSTE 2110G.
Learning Outcomes
1. To gain an understanding of dairy processing technologies, unit operation and production of dairy products and ingredients.
2. To understand the principles of processing of dairy products by integrating the concepts of chemistry, biochemistry, microbiology, nutrition, sensory properties, and engineering relevant to dairy processing operations.
3. To gain an ability to think critically on practical problems that occur in the dairy industry and to appreciate the many challenges in dairy research technology and dairy product development.
4. To engage in group discussion on current issues pertinent to culture dairy industry.

FSTE 4230. Food Processing Technologies
4 Credits (3+2P)
Common food processing unit operations such as raw material preparation, separation, concentration, fermentation, pasteurization, sterilization, extrusion, dehydration, baking, frying, chilling, freezing, controlled atmosphere storage, water, waste and energy management, packaging, materials handling and storage and process control. Application of principles to processing food in a laboratory setting.

FSTE 4240. Processed Meats
3 Credits (2+2P)
This course provides students with an understanding of physical, chemical and functional characteristics of meat raw materials. Modern meat processing industry and its use of science and technology. The fabrication, processing, preservation, sanitation, food safety, ethnic evolvement, and utilization of manufactured and processed meat. Regulatory compliance and quality assurance in commercial processed meat operations.
Learning Outcomes
1. The theory and chemistry of meat processing.
2. Processing techniques and basic formulations of different categories of processed meats.
3. The effect of type and composition of raw materials and added ingredients on processed meat quality and safety.
4. To evaluate products for consumer and analytical quality and composition.
5. To evaluate and assess defective products and propose processing/ingredient solutions.

FSTE 4250. Sensory Evaluation of Foods and Product Development
3 Credits (2+2P)

Application of affective sensory tests, chemical, physical, and experimental methods to the development and evaluation of a food product. Sensory test methods and procedures used to evaluate the flavor, color and texture of foods. Relationships between sensory and instrumental measurements quality parameters. The course will present the parametric and non-parametric tests that are used in sensory evaluation. May be repeated up to 3 credits.
Prerequisite: FSTE 2110G and (A ST 311 or MATH 1350G).
Learning Outcomes
1. Describe the chemical senses and the receptors that mediate the basic taste modalities.
2. Match sensory tests to research questions and to use the suitable statistical tests.
3. Design and develop a food product and conduct a basic research project.
4. Communicate research results using written, oral, and visual communication techniques.

FSTE 4996. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits towards a degree. Consent of instructor required.

FSTE 4997. Special Problems
1-4 Credits
Individual research study in a selected subject of Family and Consumer Sciences. Maximum of 4 credits per semester and a grand total of 8 credits towards a degree. Consent of instructor required.

FSTE 4998. ACES Foods at NMSU-Experiential Learning
1 Credit (2-8P)
Professional work experience for FSTE majors only.
Prerequisite: FSTE 3110.
Learning Outcomes
1. Students will collect a minimum of four hundred hours.

FSTE 5110. Food Microbiology
3 Credits (2+3P)
Detrimental and beneficial microbiological aspects of food products. Methods of quantification and identification of microorganisms associated with food spoilage and preservation. Additional work required at the graduate level.
Learning Outcomes
1. Understand the principles behind growth of microorganisms in foods.
2. Identify factors associated with growth, prevalence, and survival of microorganisms.
3. Use proper microbiological techniques for detection, isolation, and enumeration of microbial contaminants.
4. Understand the principles of food preservation.

FSTE 5120. Food Chemistry
3 Credits (3)
Comprehensive study of the chemical and physiochemical properties of food constituents. Chemical changes involved in the production, processing and storage of food products and basic techniques used to evaluate chemical and physiochemical properties of foods. Additional work required at the graduate level.
Learning Outcomes
1. Describe the major components, including water, carbohydrates, lipids, and proteins, of foods (edible plant products, milk, and eggs) in chemical and biochemical terms.
2. Relate the chemical nature of foods to the techniques used in and the changes occurring processing of foods.
3. Describe the chemical and biochemical basis of food quality problems.
4. Select ingredients and processes necessary to the composition of specific foods.
5. Select and apply techniques appropriate for producing specific food characteristics.
6. Evaluate food products to determine their quality and safety.
7. Apply chemical and biochemical principles in the design and creation of various food products.

FSTE 5130. Food Preservation
3 Credits (3)
Processes used in home and commercial food preservation, including canning, freezing, drying, and irradiation. Same as FSTE 4130 with additional work required at the graduate level.

FSTE 5140. Food Analysis
3 Credits (2+3P)
Covers basic chemical and physical techniques used in establishing nutritional properties and overall acceptance of food products. Additional work required at the graduate level.
Learning Outcomes
1. Explain the principles behind the analytical techniques used in the chemical and physical analyses of food.
2. Understand food constituents and functional properties important in quality control and research laboratories.
3. Acquire laboratory skills required for performing a range of chemical analyses of food.
4. Acquire writing skills related to food composition and analyses.

FSTE 5210. Cereal Technology
3 Credits (2+2P)
This course provides students with an understanding of chemistry and technology of the cereal grains. The course is structured as a combination of theory, demonstrations, and practical laboratory exercises on the fundamentals of cereal processing. Students will learn about post-harvest processing and utilization of major cereal grains for food and feed, current industrial processes and practices, and the theoretical basis for these operations.
Learning Outcomes
1. Understand principles of cereal chemistry and processing.
2. Understand how cereal grains are produced, stored, marketed, and converted into food products.
3. Describe unit operations and procedures involved in the manufacture of cereal-based food and animal feed products.

FSTE 5241. Processed Meats
3 Credits (2+2P)
This course provides students with an understanding of physical, chemical and functional characteristics of meat raw materials. Modern meat processing industry and its use of science and technology. The fabrication, processing, preservation, sanitation, food safety, ethnic involvement, and utilization of manufactured and processed meat. Regulatory compliance and quality assurance in commercial processed meat operations.
Learning Outcomes
1. Upon successful completion of this course, the student will learn the theory and chemistry of meat processing.

2. Upon successful completion of this course, the student will learn processing techniques and basic formulations of different categories of processed meats.
3. Upon successful completion of this course, the student will learn the effect of type and composition of raw materials and added ingredients on processed meat quality and safety.
4. Upon successful completion of this course, the student will learn to evaluate products for consumer and analytical quality and composition.

FSTE 5230. Food Processing Technologies
4 Credits (3+2P)
Common food processing unit operations such as raw material preparation, separation, concentration, fermentation, pasteurization, sterilization, extrusion, dehydration, baking, frying, chilling, freezing, controlled atmosphere storage, water, waste and energy management, packaging, materials handling and storage and process control. Application of principles to processing food in a laboratory setting. Additional work beyond that for FSTE 4230 required at the graduate level.
Learning Outcomes
1. Manage safety considerations and engineering controls for food processing operations.
2. Describe the effects of heat, cold, and pressure on microorganisms, particularly spoilage microorganisms.
3. Describe the effects of heat, cold, and pressure on foods, specifically on texture, flavor, and nutrition.
4. Choose heat, cold, and/or pressure treatment for foods based on desired characteristics of the product.
5. Evaluate and/or troubleshoot finished food products using sensory evaluation terminology and tools.
6. Create, and subsequently modify, a multi-step food processing regimen based desired outcomes, such as preservation, stylistic guidelines, production costs, and shelf-life.
7. Size and cost food processing operations, processes, ingredients, and utilities.
8. Create a food processing business plan for a food production facility, incorporating regulatory considerations.

FSTE 5250. Sensory Evaluation of Foods
3 Credits (2+3P)
Principles and procedures involved in the sensory evaluation of foods. Physiological, psychological and environmental factors affecting the evaluation of sensory properties. Analysis and interpretation of sensory data.
Learning Outcomes
1. Describe the chemical senses and the receptors that mediate the basic taste modalities.
2. Understand the capabilities and limitations of sensory tests.
3. Develop a food-based product.
4. Match sensory tests to research questions and use suitable statistical tests.
5. Design and conduct a basic research project.
6. Communicate research results using written, oral, and visual communication techniques.

FSTE 5310. Designing and Brewing Great Beers of the World
3 Credits (2+2P)
The science and technology of brewing unit operations and the ingredients used in beer brewing. That knowledge is then applied to designing and brewing classic world beer styles. Styles investigated change every semester but typically include India Pale Ale, Pale Ale, Stout, Porter, Hefeweisen, Scottish Ale, and Black IPA. Comprehensive evaluation of the product relative to style guidelines completes the design-brew-evaluate cycle. Students must be at least 21 years of age on the first day of class.

FSTE 5997. Special Research Programs
1-4 Credits
Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits towards a degree. Consent of instructor required.

FSTE 6910. Doctoral Seminar
1 Credit (1)
Current topics and research in Food Science and Human Nutrition. Course will include experts from the field as guest speakers. Students will have the opportunity to present their doctoral proposals and/or research findings.

FSTE 6991. Doctoral Research
1-6 Credits (1-6)
Research May be repeated up to 6 credits. Consent of Instructor required.

FSTE 6997. Special Research Program
1-6 Credits (1-6)
Special research for doctoral students May be repeated up to 6 credits. Consent of Instructor required.
Prerequisite(s): Consent of instructor.

FSTE 6998. Cooperative Extension Service Field Experience
1-3 Credits (1-3)
This course will provide students with knowledge and experience in community outreach through the cooperative extension service. This course is required for students pursuing a Ph.D. in FSHN. Students will work collaboratively with extension faculty on applied projects. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: FSHN majors.

FSTE 7000. Doctoral Dissertation
1-12 Credits (1-12)
Dissertation May be repeated up to 18 credits. Consent of Instructor required.
Prerequisite(s): Passed the qualifying exam and comprehensive exam.

Nutrition Courses

NUTR 1120. Dietary Guidelines
4 Credits (4)
A presentation and explanation in detail of the Dietary Guidelines for Americans developed by the U.S. Department of Agriculture (U.S.D.A.) and the U.S. Department of Health and Human Services.
Learning Outcomes
1. Recall, interpret and explain each of the Dietary Guidelines and U.S.D.A. nutrition education tools.
2. Translate the Dietary Guidelines into a diet and exercise program.
3. List and describe methods to select and prepare food which are consistent with the Dietary Guidelines for Americans.
4. Identify risk factors related to disease prevention.

NUTR 2110. Human Nutrition
3 Credits (3)
This course provides an overview of nutrients, including requirements, digestion, absorption, transport, function in the body and food sources. Dietary guidelines intended to promote long-term health are stressed.

Learning Outcomes

1. Evaluate sources of nutrition information for reliability
2. Identify elements of a nutritious diet
3. Describe the digestion, transport, and absorption of nutrients
4. Describe the importance of nutrition in weight control and health
5. Identify nutritional needs as they relate to the life cycle and performance
6. Describe behavior modification techniques that promote good health
7. Evaluate popular nutrition trends for scientific accuracy and effectiveness
8. Develop skills in the planning and assessing of healthy meal plans
9. Describe the role of food choices in the development of chronic disease 1
10. Describe the role of food in the promotion of a healthful lifestyle

NUTR 2120. Seminar I - Becoming a Nutrition Professional
1 Credit (1)
This course will introduce students to the field experience, careers, and professions in nutrition. This course is required for students pursuing a Didactic Program in Dietetics verification statement.
Learning Outcomes

1. Describe career options within the fields of Nutrition Dietetics.
2. Outline the HNDS field experience process.
3. Explain the educational pathways in HNDS.
4. List requirements for admission into the HNDS Dietetics pathway.
5. Begin an HNDS student portfolio.
6. Discuss the importance of personal responsibility accountability.

NUTR 3110. Nutrition Throughout the Lifecycle
3 Credits (3)
Relationship of the stages of the human life cycle to changes in nutrient need. Consent of Instructor required.
Prerequisite(s): NUTR 2110, BIOL 354 and BIOL 354L OR SPMD 2210 and SPMD 2210L.
Learning Outcomes

1. Understand the value of collaborative work in nutrition care of individuals.
2. Compare and contrast the physiological, behavioral, and psychosocial factors associated with each life stage that affect nutritional status.
3. For each life cycle stage, create a nutritionally adequate menu that meets key nutrient needs.
4. Culturally appropriate evidence-based interventions to address common nutrition-related conditions experienced in each lifecycle stage.
5. Utilize the Nutrition Care Process to complete a nutrition assessment.

NUTR 3710. Food Systems & Policy in Dietetics
3 Credits (3)
This course introduces students to food and nutrition policy issues, institutions, and stakeholders and their impacts on public health, sustainability, and the practice of dietetics in the US. The course will examine policy development and the roles of federal agencies, private firms, non-governmental organizations, and the media in food and nutrition policy. It will also examine international perspectives on food and nutrition policies and programs used to support global nutrition, health promotion, and wellness.
Prerequisite(s): Junior standing, NUTR 2120 (for HNDS majors), ENGL 2130G (or ENGL 2210G, 2215G, or 2221G).

Learning Outcomes

1. Discuss the economic, political, social, and cultural factors that influence US food and nutrition policies and impact national food systems and population health.
2. Identify the psychological, social, cultural, and environmental factors that influence food choices, eating behaviors, and nutrition-related practices.
3. Describe the processes and major players involved in US food and nutrition policy development, implementation, monitoring/evaluation, and regulation.
4. Recognize the influence of food and nutrition policy on the practice of dietetics.

NUTR 3750. Applied Nutrition Research
3 Credits (3)
This course will introduce students to various types of nutrition research and equip them to locate and critique nutrition and dietetics research articles. Research analysis skills will then be applied to a review of the current literature on a nutrition topic and applied to dietetics practice.
Prerequisite: MATH 1350G (OR A ST 311); NUTR 3110.
Learning Outcomes

1. Recall the various research methods, study designs, and statistical analyses used in nutrition research.
2. Compare and contrast research methods and analyses in nutrition research.
3. Analyze nutrition research for appropriateness of the methods and analyses.
4. Evaluate nutrition research to form sound, ethical conclusions and practice recommendations.

NUTR 3996. Special Topics
1-4 Credits (1-4)
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required.
Prerequisite(s): Junior or Senior standing, consent of instructor.
Learning Outcomes

1. Develop foundational knowledge in a specialized area of dietetics practice.

NUTR 4110. Advanced Nutrition
3 Credits (3)
Application of biochemistry and physiology to nutrition.
Prerequisite(s): SPMD 1120 or NURS 150; CHEM 2120; NUTR 3110.
Learning Outcomes

1. Describe the processes of digestion and absorption within the human body.
2. Compare and contrast the structure and function of key nutrients.
3. Describe the metabolism of key nutrients under various conditions.
4. Apply concepts of energy and nutrient metabolism to common medical conditions and other relevant situations such as exercising or fasting.

NUTR 4205. Nutrition Communication and Education
3 Credits (3)
In this course, HNDS students learn about the foundation, design, and delivery of nutrition communication and nutrition education. Students will learn ways to develop audience-focused communication and learning assessment. This course will cover the communication methods used in all facets of the nutrition and dietetics field including oral presentations, writing, video, food photography, and food demonstrations. Students will

utilize a large variety of channels to communicate and educate different target audiences.
Prerequisite: NUTR 3750 and NUTR 4210.
Learning Outcomes
1. Identify a minimum of four reliable sources of nutrition information.
2. Interpret and clearly communicate evidence-based nutrition information.
3. Evaluate the application of behavior change theories and models to nutrition communications.
4. Adapt nutrition communication and education to target specific cultural and age groups.
5. Develop a nutrition education lesson plan with SMART learning objectives, learning activities, and learning assessments.

NUTR 4207. Nutrition Services
3 Credits (3)
In this course, HNDS Dietetic students will learn about the promotion and payment of nutrition services along with aspects related to reimbursement and partnering with allied professionals. The HNDS Dietetics students will also engage in clinical and community nutrition field experiences. This course will provide HNDS Dietetic students with the opportunity to assess their knowledge of professional competencies within the field of dietetics. Restricted to students with senior standing within the Dietetics Option of the HNDS major. Must be in final spring semester.
Prerequisite(s): NUTR 4210 and NUTR 4230 and 4230L.
Corequisite(s): NUTR 4240 and 4240L.
Learning Outcomes
1. Compare best practice guidelines to actual practice in the provision of nutrition services within community settings.
2. Explain at least two processes in delivering quality food and nutrition services.
3. Identify private and public healthcare funding sources.
4. Explain Medicare, Medicaid, and private payer coverage for medical nutrition therapy.
5. Discuss referrals, primary care partnership and promoting nutrition services.
6. Describe best practices, resources and guidelines related to the reimbursement for nutrition services.
7. Compare best practice guidelines to actual practice in the provision of nutrition services within clinical nutrition settings.
8. Evaluate the content of the Commission on Dietetic Registration RDN credentialing exam.

NUTR 4210. Community Nutrition
3 Credits (3)
Overview of the practice of community nutrition. Includes program planning, needs assessment, program implementation and program evaluation. Role of public and private agencies in nutrition programs that impact on nutrition of individuals and groups in the community. Same as NUTR 5210.
Prerequisite: NUTR 3710 and NUTR 3750.
Learning Outcomes
1. Summarize the components of current national and local community nutrition programs.
2. Explain how national or state level policy influences a community nutrition issue.
3. Write a needs assessment for a community nutrition issue using reliable sources of community nutrition information and data and relevant research.
4. Develop goals and objectives of a nutrition program that address a community nutrition issue.
5. Develop a culturally appropriate nutrition education lesson plan that addresses a specific nutrition program objective.

NUTR 4220. Food Service Organization and Management
3 Credits (3)
Personnel, financial and general management in institutional and commercial food service operations.
Prerequisite: HRTM 3310 or 363.
Learning Outcomes
1. Evaluate food products and menu plans through the application of food service management theories and principles.
2. Describe the process of and ethical considerations surrounding purchasing, receiving, storing and controlling inventory of a given food item.
3. Evaluate food system, food safety practices, and scenarios.
4. Evaluate a nutrition and foodservice budget and interpret financial data.

NUTR 4230. Medical Nutrition Therapy I
3 Credits (3)
Special diets and physiological basis for their use. Laws and regulations concerning the practice of dietetics.
Prerequisite(s): NUTR 4110, BCHE 341.Corequisite(s): NUTR 4230, NUTR 4233.
Learning Outcomes
1. Examine the role of medical nutritional therapy in disease processes.
2. Apply nutritional assessment techniques utilizing the Nutrition Care Process.
3. Compose nutrition care plans and utilize various styles of medical charting.
4. Describe the interdisciplinary nature of working with a health care team in the delivery of medical nutritional therapy.

NUTR 4230L. Medical Nutrition Therapy I Lab
1 Credit (1P)
Supplements NUTR 4230. Students will perform nutrition assessments, nutrition focused physical exams, apply medical nutrition therapy-based interventions and practice patient discharge education for specific disease states. Elements of pathology and biochemistry of nutrition-related conditions are integrated into course topics. Restricted to: HNDS majors.
Corequisite: NUTR 4230.
Learning Outcomes
1. Examine the role of medical nutrition therapy in disease processes.
2. Conduct nutrition assessments.
3. Apply the Nutrition Care Process Model.
4. Apply medical terminology to nutrition interventions.
5. Apply therapeutic approaches to treating medical conditions and their associated symptoms via the use of specifically tailored diets.

NUTR 4233. Nutrition Counseling
3 Credits (3)
This course is designed to meet the needs of individuals entering the healthcare/dietetics field who have little counseling experience, but have a strong foundational knowledge in the field of dietetics. It includes counseling techniques and strategies, behavior change, interviewing, cultural competence, mass media, and nutrition education.
Prerequisite: NUTR 3750,NUTR 4110.

Learning Outcomes

1. Evaluate nutrition counseling strategies tools in promoting behavior change and self-management.
2. Apply behavior change theories and models to nutrition counseling sessions.
3. Develop nutrition care plans for nutrition counseling clients.
4. Analyze professionalism and ethics within nutrition counseling and education.

NUTR 4235. Entering the Field of Dietetics
1 Credit (1)
Students will develop professional materials that will be used in their future careers including a personal statement, resume, and interview dialogues. Students will become familiar with career options in the field of dietetics and learn to navigate the processes of becoming a registered dietitian or dietetic technician, registered. Restricted to: HNDS majors. Students must be a Senior to enroll. Final fall semester of dietetics program.
Learning Outcomes

1. Develop professional materials to use when applying to dietetic careers, including a personal statement, resume, and interview dialogue.
2. Become familiar with with career options in the field of dietetics by reviewing current job postings.
3. Navigate the process of becoming a registered dietitian or dietetic technician, registered.
4. Prepare a dietetic internship application using DICAS and DD Digital Matching Service.
5. Create both primary and alternative career plans within the field of dietetics.
6. Learn how to apply professional resources to aid in career development and continuing education.

NUTR 4240. Medical Nutrition Therapy II
3 Credits (3)
Continuation of NUTR 4230.
Prerequisite: NUTR 4230 and 4230L.
Corequisite: NUTR 4240L.
Learning Outcomes

1. Select appropriate medical nutrition therapy interventions for various disease processes.
2. Master nutrition assessment of patients/clients utilizing the Nutrition Care Process Model.
3. Interpret medical terminology in patient chart notes and medical history records.
4. Evaluate laws regulations concerning dietetics.

NUTR 4240L. Medical Nutrition Therapy II Laboratory
1 Credit (1P)
Supplements NUTR 4240. Students will apply medical nutrition therapy to specific disease states with special emphasis on writing nutrition support orders and learning to utilize nutrition support equipment. Students will learn and apply advanced nutritional therapies and patient management strategies. Restricted to: HNDS majors.
Prerequisite(s): NUTR 4230.
Corequisite(s): NUTR 4240.
Learning Outcomes

1. Calculate nutrition support recommendations and document orders in the patient's medical chart.
2. Demonstrate safe use of nutritional support equipment.
3. Master use of the Nutrition Care Process in case-based and simulated patient scenarios to conduct nutrition assessments and implement evidence-based interventions.
4. Critically evaluate lab values and client anthropometric data.
5. Select therapeutic diets for the treatment of medical conditions and their symptoms.

NUTR 4565. Field Experience Community Nutrition
1-8 Credits (1-8)
Experience working with nutritional problems of individual families of all socioeconomic and age levels and with agencies concerned with community nutrition. Practical experience with supervision by resident faculty as well as supervisor at the work site. Performance at work site graded in accordance with university standards. May be repeated up to 8 credits. Consent of Instructor required.
Prerequisite(s): Senior standing, NUTR 4210, consent of instructor.
Learning Outcomes

1. Apply dietetics knowledge to practice in various community settings.
2. Develop a field experience portfolio highlighting the development of community nutrition knowledge and skills.
3. Compare and contrast the responsibilities of Registered Dietitians in various community practice organizations.

NUTR 4991. Special Problems
1-4 Credits (1-4)
Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 8 credits. May be repeated up to 8 credits. Consent of Instructor required.
Prerequisite(s): Junior or Senior standing.
Learning Outcomes

1. Develop specialized knowledge and competencies in a selected nutrition and dietetics subject area.

NUTR 5110. Graduate Studies in Advanced Nutrition
3 Credits (3)
Covers biochemistry and physiology applied to nutrition. Students enrolled in the 5000-level class will be required to complete additional assignments beyond what is required for NUTR 4110. Crosslisted with: NUTR 4110.
Prerequisite(s)/Corequisite(s): NUTR 3110. Student must be classified as a Graduate student to enroll in this course, BIOL 2221, BCHE 341, and NUTR 2110, or consent of instructor.
Learning Outcomes

1. Describe the processes of digestion and absorption within the human body.
2. Compare and contrast the structure and function of key nutrients.
3. Describe the metabolism of key nutrients under various conditions.
4. Apply concepts of energy and nutrient metabolism to common medical conditions and other relevant situations such as exercise or fasting.

NUTR 5150. Orientation to Dietetic Internship
3 Credits (3)
Dietetic interns prepare for supervised practice rotations. Topics include professionalism, Code of Ethics, and dietetic internship portfolios. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: HNDS majors.
Prerequisite(s): Acceptance into Dietetic Internship.
Learning Outcomes

1. Assembly of dietetic intern portfolio that will be kept throughout dietetic internship.

2. Readiness to begin supervised practice rotations.
3. Understanding of steps and processes to successfully complete requirements of dietetic internship and Masters of Science in Family Consumer Sciences.
4. Upon completion of the course, students will be able to understand the importance of evidence-based information, research ethics, the Code of Ethics of the Profession of Dietetics, and the basic structure of an IRB proposal.

NUTR 5210. Graduate Study in Community Nutrition
3 Credits (3)
Overview on the practice of community nutrition to include program planning, needs assessment, program implementation and program evaluation. Role of public and private agencies in nutrition programs that impact on nutrition of individuals and groups in the community. Students enrolled in the 5000-level class will be required to complete additional assignments beyond what is required for NUTR 4110. May be repeated up to 3 credits. Crosslisted with: NUTR 4210.
Prerequisite(s): Graduate student, NUTR 3110, NUTR 3710, NUTR 3750, or consent of the instructor.
Learning Outcomes
1. Summarize the components of current national and local community nutrition programs.
2. Explain how national or state-level policy influences a community nutrition issue.
3. Write a needs assessment for a community nutrition issue using reliable sources of community nutrition information and data, and relevant research.
4. Develop goals and objectives of a nutrition program that address a community nutrition issue.
5. Develop a culturally appropriate nutrition education lesson plan that addresses a specific nutrition program objective.

NUTR 5220. Graduate Studies in Food Service Organization and Management
3 Credits (3)
Personnel, financial and general management in institutional and commercial food service operations. Students enrolled in the5000-level class will be required to complete additional assignments beyond what is required for NUTR 4220. May be repeated up to 3 credits.
Prerequisite(s): Graduate Students; HRTM 2120, NUTR 3120, or consent of instructor.
Learning Outcomes
1. Evaluate food products and menu plans through the application of food service management theories and principles.
2. Describe the process of and ethical considerations surrounding purchasing, receiving, storing, and controlling inventory of a given food item.
3. Evaluate food system, food safety practices, and management practices of a specific food service establishment.
4. Apply management theories and principles to quality assurance and human resource case scenarios.
5. Evaluate a nutrition and food service budget and interpret financial data.

NUTR 5230. Graduate Studies in Medical Nutrition I
3 Credits (3)
Special diets and physiological basis for their use. Laws and regulations concerning the practice of dietetics. Additional assignments beyond NUTR 4230 required. May be repeated up to 3 credits. Crosslisted with: NUTR 4230.
Prerequisite(s): Graduate student, NUTR 3110, NUTR 4110, BIOL 2225 or BIOL 2221, or consent of instructor.
Learning Outcomes
1. Examine the role of medical nutritional therapy in disease processes.
2. Apply nutritional assessment techniques utilizing the Nutrition Care Process.
3. Compose nutrition care plans and utilize various styles of medical charting.
4. Describe the interdisciplinary nature of working with a health care team in the delivery of medical nutritional therapy.

NUTR 5233. Graduate Studies in Nutrition Counseling & Education
3 Credits (3)
This course is designed to meet the needs of individuals entering the healthcare/dietetics field who have little counseling experience, but have a strong foundational knowledge in the field of dietetics. It includes counseling techniques and strategies, behavior change, interviewing, cultural competence, mass media, and nutrition education. Additional assignments beyond NUTR 4233 required. May be repeated up to 3 credits. Crosslisted with: HNDS 4233.
Prerequisite(s)/Corequisite(s): NUTR 5230. Students must be classified as a Graduate student to enroll in this course, NUTR 2110, NUTR 3110, FCSC 348.
Learning Outcomes
1. Evaluate nutrition counseling strategies and tools in promoting behavior change and self-management.
2. Apply behavior change theories and models to nutrition counseling sessions.
3. Develop nutrition care plans for nutrition counseling clients.
4. Analyze professionalism and ethics within nutrition counseling and education.
5. Develop and present a nutrition education lesson based on current nutrition research.

NUTR 5240. Graduate Studies in Medical Nutrition Therapy II
3 Credits (3)
Continuation of HNDS 546. May be repeated up to 3 credits. Crosslisted with: NUTR 4240.
Prerequisite(s): Graduate student, NUTR 5230 and NUTR 4230L or consent of instructor.
Learning Outcomes
1. Select appropriate medical nutrition therapy interventions for various disease processes.
2. Master nutrition assessment of patients/clients utilizing the Nutrition Care Process model.
3. Interpret medical terminology in patient chart notes and medical history records.
4. Evaluate laws regulations concerning dietetics.

NUTR 5610. Dietetic Intern Seminar
1 Credit (1)
Portfolio development for dietetic interns during supervised practice rotations. May be repeated up to 3 credits. Consent of Instructor required.
Prerequisite(s): Acceptance into Dietetic Internship.
Learning Outcomes
1. CRDN
2. 2: Apply evidence-based guidelines, systematic reviews and scientific literature.

3. CRDN
4. 3: Justify programs, products, services and care using appropriate evidence or data.
5. CRDN
6. 4: Evaluate emerging research for application in nutrition and dietetics practice.
7. CRDN
8. 6: Incorporate critical-thinking skills in overall practice.
9. CRDN
10. 1: Practice in compliance with current federal regulations and state statutes and rules, as applicable and in accordance with accreditation standards and the Scope of Nutrition and Dietetics Practice and Code of Ethics for the Profession of Nutrition and Dietetics.
11. CRDN
12. 2: Demonstrate professional writing skills in preparing professional communications.

NUTR 5620. Dietetic Internship: Supervised Practice in Community Nutrition
1-8 Credits (2-6P)
Provides dietetic interns with a minimum of 500 clock hours of supervised practice in community nutrition to include an emphasis in Cooperative Extension Service. Dietetic interns work under the the guidance of faculty and community nutrition professionals. May be repeated up to 8 credits. Consent of Instructor required. Restricted to: HNDS majors.
Prerequisite(s): Acceptance into Dietetic Internship.
Learning Outcomes
1. CRDN
2. 1 Select indicators of program quality and/or customer service and measure achievement of objectives.
3. CRDN
4. 2 Apply evidence-based guidelines, systematic reviews and scientific literature.
5. CRDN
6. 4 Evaluate emerging research for application in nutrition and dietetics practice.
7. CRDN
8. 5 Conduct projects using appropriate research methods, ethical procedures and data analysis.
9. CRDN
10. 14 Demonstrate advocacy on local, state or national legislative and regulatory issues or policies impacting the nutrition and dietetics profession.
11. CRDN
12. 1 Perform the Nutrition Care Process and use standardized nutrition language for individuals, groups and populations of differing ages and health status, in a variety of settings.
13. CRDN
14. 5 Develop nutrition education materials that are culturally and age appropriate and designed for the literacy level of the audience.
15. CES
16. Consult with organizations regarding food access for target populations.
17. CES
18. Evaluate the operation of Cooperative Extension Service nutrition programs in the areas of policies and procedures. 1
19. CES
20. Develop and deliver nutrition presentations to client/consumer audiences on various topics related to client/consumer needs. 1
21. CES
22. Ensure cultural relevancy and appropriateness of nutrition education. 1
23. CES
24. Assess educational needs and provide nutrition counseling based on individual needs, knowledge, medical needs, and socioeconomic status.

NUTR 5630. Community Nutrition for Dietetic Interns
3 Credits (3)
Advanced topics in community nutrition to include conducting community nutrition needs assessments, program planning and grant writing. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: HNDS majors.
Prerequisite(s): Acceptance into Dietetic Internship.
Learning Outcomes
1. CRDN
2. 1 Select indicators of program quality and/or customer service and measure achievement of objectives.
3. CRDN
4. 2 Apply evidence-based guidelines, systematic reviews and scientific literature.
5. CRDN
6. 4 Evaluate emerging research for application in nutrition and dietetics practice.
7. CRDN
8. 5 Conduct projects using appropriate research methods, ethical procedures and data analysis.
9. CRDN
10. 14 Demonstrate advocacy on local, state or national legislative and regulatory issues or policies impacting the nutrition and dietetics profession.
11. CRDN
12. 1 Perform the Nutrition Care Process and use standardized nutrition language for individuals, groups and populations of differing ages and health status, in a variety of settings.
13. CRDN
14. 5 Develop nutrition education materials that are culturally and age appropriate and designed for the literacy level of the audience.
15. CES
16. Consult with organizations regarding food access for target populations.
17. CES
18. Ensure cultural relevancy and appropriateness of nutrition education.

NUTR 5640. DI SUP PRACT FS MGT
1-5 Credits (2-10P)
Provides dietetic interns with a minimum of 300 clock hours of supervised practice in foodservice management. Dietetic interns work under the guidance of faculty and foodservice management professionals. Students must complete a total of 4 credit hours of NUTR 5640. May be repeated up to 5 credits. Consent of Instructor required. Restricted to: HNDS majors.
Prerequisite(s): Acceptance into Dietetic Internship.

NUTR 5650. Foodservice Management for Dietetic Interns
3 Credits (3)
Advanced topics in foodservice systems management to include business planning and marketing. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: HNDS majors.
Prerequisite(s): Acceptance into Dietetic Internship.
Learning Outcomes
1. CRDN
2. 2: Demonstrate professional writing skills in preparing professional communications.
3. CRDN
4. 15: Practice and/or role play mentoring and precepting others.
5. CRDN
6. 4: Design, implement and evaluate presentations to target audiences.
7. CRDN
8. 3: Demonstrate active participation, teamwork and contributions in group setting.
9. CRDN
10. 7: Apply leadership skills to achieve desired outcomes.
11. CRDN
12. 8: Demonstrate negotiation skills.
13. CRDN
14. 4: Apply current informatics technology to develop, store, retrieve and disseminate information and data.
15. CRDN
16. 6: Analyze quality, financial and productivity data for use in planning.
17. CRDN
18. 7: Conduct feasibility studies for products, programs, or services with consideration of costs and benefits.1
19. CRDN
20. 8: Develop a plan to provide or develop a product, program, or service that includes a budget, staffing needs, equipment and supplies.

NUTR 5660. Dietetic Internship: Supervised Practice in Clinical Dietetics
1-8 Credits (2-16P)
Provides dietetic interns with a minimum of 500 clock hours of supervised practice in clinical dietetics. Dietetic interns work under the guidance of faculty and dietetics professionals. May be repeated up to 8 credits. Consent of Instructor required. Restricted to: HNDS majors.
Prerequisite(s): Acceptance into Dietetic Internship.
Learning Outcomes
1. CRDN
2. 1 Select indicators of program quality and/or customer service and measure achievement of objectives.
3. CRDN
4. 4 Function as a member of interprofessional teams.
5. CRDN
6. 11 Show cultural competence/sensitivity in interactions with clients, colleagues and staff.
7. CRDN
8. 1 Perform the Nutrition Care Process and use standardized nutrition language for individuals, groups and populations of differing ages and health status, in a variety of settings.
9. CRDN
10. 2 Conduct nutrition focused physical exams.
11. CRDN
12. 3 Demonstrate effective communication skills for clinical and customer services in a variety of formats

NUTR 5670. Nutrition Care Process for Dietetic Interns
3 Credits (3)
Advanced topics in nutrition care process and model to include medical nutrition therapy and evidence-based research and outcomes assessment in clinical dietetics. Consent of Instructor required.
Prerequisite(s): Acceptance into Dietetic Internship.Restricted to: HNDS majors.
Learning Outcomes
1. CRDN
2. 2: Apply evidence-based guidelines, systematic reviews and scientific literature.
3. CRDN
4. 3: Justify programs, products, services and care using appropriate evidence or data.
5. CRDN
6. 4: Evaluate emerging research for application in nutrition and diet.
7. CRDN
8. 4 Evaluate emerging research for application in dietetics practice.
9. CRDN
10. 2 Demonstrate professional writing skills in preparing professional communication. Perform the nutrition care process and use standardized nutrition language for individuals, groups, and populations of differing ages and health status, in a variety of settings.
11. CRND
12. 2 Conduct nutrition focused physical exams.

NUTR 5680. Review Course for National RD Exam
3 Credits (3)
Completion of dietetic internship portfolio and preparation for the national registration examination for dietitians. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: exclude HNDS majors.
Prerequisite(s): Acceptance into Dietetic Internship.
Learning Outcomes
1. Demonstrate readiness to take the National Registration Examination for Dietitians.
2. Completion of all requirements of the NMSU Dietetic Internship.
3. Completion of all requirements to receive a Master of Science in Family Consumer Sciences from New Mexico State University

NUTR 5991. Special Research Programs
1-4 Credits (1-4)
Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree. May be repeated up to 6 credits.
Prerequisite(s): Graduate Student.
Learning Outcomes
1. Develop analytical or experimental research skills in the areas of human nutrition and dietetics.

NUTR 5996. Special Topics
1-4 Credits (1-4)
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.
Prerequisite(s): Graduate student.

Learning Outcomes

1. Evaluate issues surrounding advanced nutrition and dietetics topics.

Gerald Thomas Hall, Room 308

Phone: (575) 646-3936

Website: https://fcs.nmsu.edu/

Family and Consumer Sciences Education - Bachelor of Science in Family and Consumer Sciences

This major prepares you to teach in middle or high school or in other settings such as the Cooperative Extension Service or community agencies. The major is an accredited education program which meets the teacher licensure requirements for the State of New Mexico. In the spring semester of the senior year, you will apply all the principles of teaching that you have learned in a semester of student teaching in a selected school. Requirements for admission to the student teaching component of the Family and Consumer Sciences Education are

1. an overall grade-point average of 2.75 or higher, and a grade-point average of 2.75 or higher in family and consumer sciences courses;
2. evidence of passing NES Essential Academic Tests I, II, III;
3. a C or better in all departmental courses; and
4. recommendation of the advisor.

You must have passed the NES Essential Academic Tests I, II, III and you must have a GPA of 2.75 or higher before enrolling in the following FCSE courses:

Prefix	Title	Credits
FCSC 4510	Teaching Methods I for Family and Consumer Sciences	3
FCSC 4520	Teaching Methods II for Family and Consumer Sciences	3
FCSC 4810	Supervised Teaching in Family and Consumer Sciences	12

Requirements

A list of specific requirements is available in the department. Please check with your advisor.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2221G	Writing in the Humanities and Social Science	3
or ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
Oral Communication:		
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
Area II: Mathematics		
MATH 1130G	Survey of Mathematics [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	4
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
Choose one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
Area V: Humanities		
HIST 1110G	United States History I	3
or HIST 1120G	United States History II	
Area VI: Creative and Fine Arts		
ARTH 1115G	Orientation in Art	3
or ARTS 1145G	Visual Concepts	
General Education Elective		
PSYC 1110G	Introduction to Psychology	3
Viewing a Wider World		
PHLS 3110V	Human Sexuality	3
One approved VWW course (see advisor) [2]		3
Departmental Requirements		
CTFM 1110	Fundamentals of Fashion	3
CTFM 2130	Concepts in Apparel Construction	3
CTFM 371	Textile Science	3
FCST 2135	Adolescent Development and the Family	3
FCST 3210	Family Resource Management	3
FCST 3220	Family Dynamics	3
FCST 3230	Parenting and Child Guidance	3
FCSC 2330	Housing and Interior Design	3
FCSC 2250	Overview of Family and Consumer Sciences Teaching	3
FCSC 3110	Management Concepts in Family and Consumer Sciences Teaching	3
FCSC 4120	Career and Technical Education Programs	3
FCSC 4510	Teaching Methods I for Family and Consumer Sciences	3
FCSC 4520	Teaching Methods II for Family and Consumer Sciences	3
FSTE 2110G	Food Science I	4
NUTR 2110	Human Nutrition	3
FSTE food science 3000+ elective (see advisor for selections)		3
NUTR nutrition 3000+ elective (see advisor for selections)		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
HRTM 1130	Introduction to Hospitality Management	3
HRTM 1310	Safety, Sanitation and Health in the Hospitality Industry	1
HRTM 1320	Food Production and Service Fundamentals	3
HRTM 3310	Quantity Food Production and Service	4
Specific Teaching Requirements		
FCSC 4810	Supervised Teaching in Family and Consumer Sciences	12

SPED 3105	Introduction to Special Education in a Diverse Society	3
READ 4330	Content Area Literacy	3
Second Lanuage: (not required)		
Electives, to bring the total credits to 120		**0**
Total Credits		**120**

1 MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.

2 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
ARTH 1115G or ARTS 1145G	Orientation in Art or Visual Concepts	3
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
MATH 1130G	Survey of Mathematics	3
PSYC 1110G	Introduction to Psychology	3
CTFM 1110	Fundamentals of Fashion (C or better)	3
	Credits	**16**
Spring		
ENGL 2221G or ENGL 2210G or ENGL 2210H	Writing in the Humanities and Social Science or Professional and Technical Communication or Professional and Technical Communication	3
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	4
FCST 2135	Adolescent Development and the Family (C or better)	3
Choose one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
	Credits	**13**
Second Year		
Fall		
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
HRTM 1130	Introduction to Hospitality Management	3
FCSC 2250	Overview of Family and Consumer Sciences Teaching (C or better)	3
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
NUTR 2110	Human Nutrition (C or better)	3
	Credits	**16**
Spring		
FCSC 2330	Housing and Interior Design (C or better)	3
HRTM 1310	Safety, Sanitation and Health in the Hospitality Industry	1
CTFM 2130	Concepts in Apparel Construction (C or better)	3
FCST 3230	Parenting and Child Guidance (C or better)	3
FSTE 2110G	Food Science I (C or better)	4
	Credits	**14**
Third Year		
Fall		
VWW - Viewing A Wider Course [1]		3
CTFM 371	Textile Science (C or better)	3
NUTR Upper Division Elective Course (C or better)		3
FCST 3210	Family Resource Management (C or better)	3
HIST 1110G or HIST 1120G	United States History I or United States History II	3
	Credits	**15**
Spring		
FCSC 3110	Management Concepts in Family and Consumer Sciences Teaching (C or better)	3
HRTM 3310	Quantity Food Production and Service	4
SPED 3105	Introduction to Special Education in a Diverse Society	3
FSTE Upper Divison Elective Course (C or better)		3
HRTM 1320	Food Production and Service Fundamentals	3
	Credits	**16**
Fourth Year		
Fall		
FCST 3220	Family Dynamics (C or better)	3
FCSC 4120	Career and Technical Education Programs (C or better) [2]	3
FCSC 4510	Teaching Methods I for Family and Consumer Sciences (C or better) [2,3]	3
READ 4330	Content Area Literacy [2]	3
VWW - Viewing a Wider World Course [1]		3
	Credits	**15**
Spring		
FCSC 4520	Teaching Methods II for Family and Consumer Sciences (C or better) [2, 3]	3
FCSC 4810	Supervised Teaching in Family and Consumer Sciences (C or better) [2, 3]	12
	Credits	**15**
	Total Credits	**120**

1 Approved VWW courses are: PHLS 3110V Human Sexuality,BLAW 385V Employment and Consumer Law and MKTG 311V Consumer Behavior

2 Before being admitted to the program and enrolling in 4000-level classes, students must pass the National Evaluation Series for Certification: Essential Academic Skills, Subtests I, II, and III.

3 Students must have a 2.75 GPA or higher in order to register for these courses.

Fashion Merchandising and Design - Bachelor of Science in Family and Consumer Sciences

The Fashion Merchandising and Design major prepares students to achieve career goals in the diverse areas of the fashion industry. Students

are prepared with well-rounded coursework related to the creative, technical and business aspects of the industry. The program develops the business knowledge, design fundamentals and industry experience needed to compete in today's fashion industry. The required coursework includes completion of a minor in Marketing as well as gaining valuable hands-on field-experience. A GPA of 2.5 or better is required to enroll in CTFM 402 Field Experience to complete the degree requirements.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
English Composition - Level 2		
Choose one from the following:		3
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		*3*
MATH 1350G	Introduction to Statistics [2]	
Area III/IV: Laboratory Sciences and Social/ Behavioral Sciences		*10*
Area III: Laboratory Science Course (4 credits) [1]		
Area IV: Social/Behavioral Science Course (3 credits) [1]		
Choose one from the following (3 credits):		
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts		*3*
ARTS 1145G	Visual Concepts	
General Education Elective [1]		*3-4*
Any "G" course, excluding Area I and crosslisted courses		
Viewing A Wider World [3]		
MKTG 311V	Consumer Behavior	3
VWW "THEA 307V -Society in Style" may be used to fullfill this degree requirement		3
Departmental Requirements		
CTFM 1110	Fundamentals of Fashion	3
CTFM 2120	Fashion Illustration	3
CTFM 2130	Concepts in Apparel Construction	3
CTFM 365	Apparel Analysis	3
CTFM 366	Historic Fashion and Society [4]	3
or THEA 307V	Society in Style: Fashion, History and Culture	
CTFM 371	Textile Science	3
CTFM 372	Fashion Merchandising	3
CTFM 373	Advanced Apparel Construction II	3
CTFM 375	Fashion Buying	3
CTFM 401	Professional Development	1
CTFM 402	Field Experience [5]	1-3
CTFM 403	Post-Field Experience	1
CTFM 460	Cultural Perspectives in Dress	3
CTFM 473	Flat Pattern for Apparel Design	3
CTFM 474	Fashion Promotion	3
CTFM 476	Draping for Apparel Design	3
CTFM 477	Capstone in Fashion Mechandising [6]	3
Departmental Electives		
Choose two courses from the following:		*6*
CTFM 377	Fashion Study Tour	
Any FCST Course [7]		
Any FCSC Course [7]		
Non-Departmental Requirements		
ACCT 2110	Principles of Accounting I	3
MGMT 388V	Leadership and Ethics	3
MKTG 313	Retail Management	3
MKTG 317	International Marketing	3
One MKTG 300 or above		*3*
Choose one course from the following:		*3*
AEEC 2140	Technology and Communication for Business Management	
BCIS 1110	Introduction to Information Systems	
Choose one course from the following:		*3*
MGMT 309	Human Behavior in Organizations	
MGMT 332	Human Resources Management	
Second Language: (not required)		
Electives, to bring the total credits to 120 [8,9]		**10**
Total Credits		**120-123**

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. MATH 1350G Introduction to Statistics is required for the degree but students may need to take MATH 1215 as a prerequisite. If this course is used to fulfill the Math Basic Skills requirement, a C- or better is required.
3. See the Viewing a Wider World (p. 266) Section of the catalog for a full list of courses.
4. Offered summers only.
5. A GPA of 2.5 or higher is required before enrolling in CTFM 402 Field Experience.
6. Should be completed last semester.
7. Please review prerequisites prior to enrolling.
8. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
9. ACES 1120 Freshman Orientation/ACES 1210 Financial Fitness for College Students are strongly recommended for freshmen.

NOTE: This degree includes the requirements necessary to complete a minor in Marketing. The student is responsible for completing the necessary paperwork in order for the minor to be awarded.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1350G Introduction to Statistics . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
English Composition - Level 1 Course [1]		4
ARTS 1145G	Visual Concepts	3
CTFM 1110	Fundamentals of Fashion	3
CTFM 2130	Concepts in Apparel Construction	3
Elective Course(s)		2
ACES 1120	Freshman Orientation (Strongly Recommended)	
ACES 1210	Financial Fitness for College Students (Strongly Recommended)	
	Credits	**15**
Spring		
English Composition - Level 2 Course [1]		3
MATH 1350G	Introduction to Statistics [3]	3
Either an Area IV/V:Social/Behavioral Sciences Course or Humanities Course [1, 4]		3
CTFM 2120	Fashion Illustration	3
Choose one from the following:		3
AEEC 2140	Technology and Communication for Business Management	
BCIS 1110	Introduction to Information Systems	
	Credits	**15**
Second Year		
Fall		
Oral Communication Course [1]		3
ACCT 2110	Principles of Accounting I	3
Any General Education Elective Course [1]		3-4
CTFM 365	Apparel Analysis	3
CTFM 371	Textile Science	3
	Credits	**15-16**
Spring		
Either an Area IV/V: Social/Behavioral Sciences Course or Humanities [1,4]		3
Free Elective Course [2]		3
CTFM 372	Fashion Merchandising	3
CTFM 375	Fashion Buying	3
Choose one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
	Credits	**15**
Third Year		
Fall		
MKTG 311V	Consumer Behavior	3
Area III: Laboratory Sciences Course [1]		4
CTFM 373	Advanced Apparel Construction II	3
CTFM 460	Cultural Perspectives in Dress	3
Choose one from the following:		3
MGMT 309	Human Behavior in Organizations	
MGMT 332	Human Resources Management	
	Credits	**16**
Spring		
MKTG 313	Retail Management	3
CTFM 366 or THEA 307V	Historic Fashion and Society [5] or Society in Style: Fashion, History and Culture	3
CTFM 473	Flat Pattern for Apparel Design	3
CTFM 401	Professional Development	1
Free Elective Courses [2]		5
	Credits	**15**
Fourth Year		
Fall		
MKTG 317	International Marketing	3
MGMT 388V	Leadership and Ethics	3
FCST or FCSC Elective Courses [6]		3
CTFM 474	Fashion Promotion	3
CTFM 402	Field Experience	1-3
CTFM 403	Post-Field Experience	1
	Credits	**14-16**
Spring		
MKTG Elective Course (Upper-Division)		3
FCST or FCSC Elective Courses [6]		3
Free Elective Course [2]		3
CTFM 476	Draping for Apparel Design	3
CTFM 477	Capstone in Fashion Mechandising	3
	Credits	**15**
	Total Credits	**120-123**

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
3. MATH 1350G Introduction to Statistics is required for the degree but students may need to take MATH 1215 as a prerequisite. If this course is used to fulfill the Math Basic Skills requirement, a C- or better is required.
4. One Area IV: Social/Behavioral Sciences course and one Area V: Humanities course must be taken in order to fulfill the General Education requirements
5. If THTR 307V is taken than students will not need to take an additional Viewing a Wider World course.
6. Departmental Electives can be completed by taking either CTFM 377 Fashion Study Tour, any FCS course or any FCSE course, but make sure to check any prerequisites on courses before enrolling.

Please Note: Many scholarships require enrollment in a minimum of 15 credits per semester, so additional elective coursework may be required to remain eligible for scholarships.

Food Science and Technology (Science, Technology and Engineering) - Bachelor of Science in Food Science and Technology

Food science is the science of food. Food scientists study the physical microbiological, and chemical makeup of food. Food technology is the application of food science to the selection, preservation, processing, packaging, distribution, and use of safe food. The food industry is the largest manufacturing industry in the United States. This multidisciplinary field applies scientific disciplines including chemistry, microbiology, nutrition and engineering to develop new food products as well as the processes designed to improve food safety and the quality of foods. Food scientists develop new foods, add value to raw food commodities and improve the quality and safety of foods.

Consider exploring food science through our introductory course: FSTE 2110G Food Science I which fulfills the general education Area III Laboratory Science requirement. Food scientists typically work in the food and beverage industry in the areas of quality assurance, product development, product procurement, research, sensory evaluation, sales, and food safety regulations. Graduates of the program will also be prepared for postgraduate studies leading to research, production and management careers in the food and feed industries, goverment and academia.

A minimum grade of C- is required in all classes with CHEM, BCHE, BIOL, FSTE, or NUTR prefix.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1 [1]		*4*
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication [1]		*3*
Area II: Mathematics		
MATH 1430G	Applications of Calculus I [2]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
FSTE 2130G	Survey of Food and Agricultural Issues	3
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
Viewing A Wider World [3]		**6**
Departmental Requirements		
FSTE 2110G	Food Science I	4
FSTE 4110	Food Microbiology	4
FSTE 4120	Food Chemistry	3
FSTE 4130	Food Preservation	3
FSTE 4140	Food Analysis	3
FSTE 4150	Food Safety	3
FSTE 4230	Food Processing Technologies	4
FSTE 4250	Sensory Evaluation of Foods and Product Development	3
NUTR 2110	Human Nutrition	3
Science, Technology and Engineering Concentration		
FSTE 1120	ACES in the Hole Foods I	4
FSTE 2120	ACES in the Hole Foods II	4
FSTE 3110	Professional Development in Food Science	1
FSTE 4998	ACES Foods at NMSU-Experiential Learning	1
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	4
Non-Departmental Requirements		
ANSC 2310	Introduction to Meat Science	3
BCHE 395	Biochemistry I	3
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory	5
CHEM 314	Organic Chemistry II (Students in Food Science need the following chemistry courses: CHEM 1215G, CHEM 1225G, CHEM 313, CHEM 314 and BCHE 395 and these are all non departmental requirements)	3
Choose one course from the following:		*3*
CHEM 313	Organic Chemistry I (Need to replace CHEM 2120 with CHEM 313)	3
AEEC 2140	Technology and Communication for Business Management	
BCIS 1110	Introduction to Information Systems	
Choose one course from the following:		*3*
A ST 311	Statistical Applications	
MATH 1350G	Introduction to Statistics	
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**17**
Total Credits		**124**

1. See the General Education (p. 262) Section of the catalog for a full list of courses
2. MATH 1430G Applications of Calculus I is required for the degree but students may need to take any prerequisites needed to enter MATH 1430G first.
3. See the Viewing a Wider World (p. 266) Section of the catalog for a full list of courses
4. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-

case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1430G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
English Composition - Level 1 Course [1]		4
Area V/VI: Humanities or Creative/ Fine Arts Course [1,2]		3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
FSTE 2110G	Food Science I	4
	Credits	**15**
Spring		
Oral Communication Course [1]		3
Area V/VI: Humanities or Creative/ Fine Arts Course [1,2]		3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
FSTE 1120	ACES in the Hole Foods I	4
Elective Course [3]		1
	Credits	**15**
Second Year		
Fall		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
Choose one from the following:		3
AEEC 2140	Technology and Communication for Business Management	
BCIS 1110	Introduction to Information Systems	
CHEM 2120	Integrated Organic Chemistry and Biochemistry	3
MATH 1430G	Applications of Calculus I [4]	3
Elective Course [3]		2
	Credits	**14**
Spring		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
NUTR 2110	Human Nutrition	3
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	4
FSTE 2120	ACES in the Hole Foods II	4
	Credits	**15**
Third Year		
Fall		
Choose one from the following:		3
A ST 311	Statistical Applications	
MATH 1350G	Introduction to Statistics	
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory	5
FSTE 4110	Food Microbiology	4
FSTE 4150	Food Safety	3
Elective Course [4]		3
	Credits	**18**
Spring		
FSTE 3110	Professional Development in Food Science	1
FSTE 4120	Food Chemistry	3
FSTE 4140	Food Analysis	3
FSTE 4230	Food Processing Technologies	4
Elective Course [3]		4
	Credits	**15**
Fourth Year		
Fall		
Viewing the Wider World [5]		3
FSTE 2130G	Survey of Food and Agricultural Issues	3
BCHE 395	Biochemistry I	3
FSTE 4250	Sensory Evaluation of Foods and Product Development	3
ANSC 2310	Introduction to Meat Science	3
	Credits	**15**
Spring		
FSTE 4130	Food Preservation	3
Viewing a Wider World [5]		3
FSTE 4998	ACES Foods at NMSU-Experiential Learning	1
Elective Course [3]		7
	Credits	**14**
	Total Credits	**121**

1. See the General Education (p. 262) Section of the catalog for a full list of courses
2. Students must take one Area V: Humanities and one Area VI: Creative and Fine Arts course in order to complete the General Education requirements
3. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
4. MATH 1430G Applications of Calculus I is required for the degree but students may need to take any prerequisites needed to enter MATH 1430G first.
5. See the Viewing a Wider World (p. 266) Section of the catalog for a full list of courses

Human Nutrition and Dietetic Science (Nutrition Education) - Bachelor of Science in Family and Consumer Sciences

This concentration prepares students to become nutrition educators that work within the community and public health settings. This concentration focuses on health and wellness, the association between nutrition

and health, and teaching healthy living. Graduates from the Nutrition Education concentration will have learned the skills to communicate evidence-based nutrition information, provide nutrition education, and blend nutrition with other health science subjects. The job opportunities for those graduating from this program include working as a nutrition educator or nutrition assistant in county agencies, Extension Services, community nutrition programs, schools and with health organizations.

Unlike the Dietetics concentration, this concentration does **not** prepare students to pursue the credential of a Registered Dietitian.

Concentration: Nutrition Education (General)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Due to the large number of PHLS course in the Nutrition Education option, students are encouraged to pursue a Public Health minor. Please see an advisor for more information and to view a Nutrition Education & Public Health minor roadmap.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
Choose one ENGL Course from the following:		
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
English Composition - Level 2 [1,4]		
Choose one ENGL Course from the following:		
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication [1]		
Choose one from the following:		
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1350G	Introduction to Statistics	3
or A ST 311	Statistical Applications	
Choose one MATH Course from the following:		
MATH 1220G	College Algebra [2]	
MATH 1430G	Applications of Calculus I	
MATH 1511G	Calculus and Analytic Geometry I	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
MATH 2530G	Calculus III	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
or BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
PHLS 1110G	Personal Health & Wellness	3
Area V: Humanities		
PHIL 1145G	Philosophy, Law, and Ethics	3
or PHIL 2110G	Introduction to Ethics	
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
FSTE 2110G	Food Science I	4
Viewing A Wider World		
PHLS 3120V	Women's Health Issues	3
One other Viewing a Wider World course [3]		3
Departmental/College Requirements		
FCSC 2250	Overview of Family and Consumer Sciences Teaching	3
FCSC 3110	Management Concepts in Family and Consumer Sciences Teaching	3
FCSC 4120	Career and Technical Education Programs	3
FCSC 4510	Teaching Methods I for Family and Consumer Sciences	3
FCSC 4520	Teaching Methods II for Family and Consumer Sciences	3
NUTR 2110	Human Nutrition	3
NUTR 2120	Seminar I - Becoming a Nutrition Professional	1
NUTR 3110	Nutrition Throughout the Lifecycle	3
NUTR 3710	Food Systems & Policy in Dietetics	3
NUTR 3750	Applied Nutrition Research	3
NUTR 4205	Nutrition Communication and Education	3
NUTR 4210	Community Nutrition	3
NUTR 4220	Food Service Organization and Management	3
NUTR 4565	Field Experience Community Nutrition	1-8
HRTM 2110	Safety, Sanitation and Health in the Hospitality Industry	1
HRTM 2120	Food Production and Service Fundamentals	3
HRTM 3310	Quantity Food Production and Service	4
Choose one from the following:		4-5
FSTE 4110	Food Microbiology	
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory	
BIOL 2320 & BIOL 311 L	Public Health Microbiology and General Microbiology Laboratory	
Non-Departmental Requirements		
ELAD 3110V	Introduction to Educational Leadership in a Global Society	3
PHLS 2110	Foundations of Health Education	3
PHLS 3220	Foundations of Public Health	3
PHLS 4810	Infectious and Noninfectious Disease Prevention	3
PHLS 4610	Health Disparities: Determinants and Interventions	3
PHLS 4620V	Cross-Cultural Aspects of Health	3

SPMD 2210 & 2210L	Anatomy and Physiology I and Anatomy and Physiology Laboratory	4
SPMD 2225 & 2225L	Anatomy and Physiology II and Anatomy and Physiology II Lab	4
ACES 1120	Freshman Orientation (Highly recommended if new to NMSU)	
or ACES 1210	Financial Fitness for College Students	
Electives, to bring the total credits to 120		**4**
Total Credits		**120-128**

1 See the General Education (p. 262) section of the catalog for a full list of courses.Please refer to the HNDS Undergraduate Student Handbook for a list of recommended courses to choose from in order to fulfill these requirements.

2 MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
**Refer to the "List of Recommended GE courses" for HNDS students in the HNDS Undergraduate Student Handbook for a list of field-related course options that can be selected from the GE Core Curriculum and Viewing a Wider World course requirements*.

4 Students who have taken a second level English course may be required to take another to fulfill the program's technical/scientific writing requirement.

Concentration: Nutrition Education

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Please meet with an advisor to determine course progression.

First Year		
Fall		**Credits**
ENGL 1110G or ENGL 1110H	Composition I (C or better) or Composition I Honors	4
MATH 1220G	College Algebra (C or better) [1]	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G or HNRS 2175G	Introduction to Communication (C- or better) or Introduction to Communication Honors	
COMM 1130G	Public Speaking (C- or better)	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
Recommended courses for 2 credits (not required) [2]		
ACES 1120 or ACES 1210	Freshman Orientation or Financial Fitness for College Students	
	Credits	**14**
Spring		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication (C or better)	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science (C or better)	
NUTR 2110	Human Nutrition (C or better)	3
NUTR 2120	Seminar I - Becoming a Nutrition Professional (C or better and only available in Spring semesters)	1
PHLS 1110G	Personal Health & Wellness	3
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
Electives		2
	Credits	**15**
Second Year		
Fall		
Area VI- Creative & Fine Arts Course [5]		3
FCSC 2250	Overview of Family and Consumer Sciences Teaching (C or better and only available in Fall semesters)	3
FSTE 2110G	Food Science I (C or better)	4
SPMD 2210 & 2210L	Anatomy and Physiology I and Anatomy and Physiology Laboratory (C or better)	4
	Credits	**14**
Spring		
HRTM 2110	Safety, Sanitation and Health in the Hospitality Industry	1
HRTM 2120	Food Production and Service Fundamentals	3
PHLS 2110	Foundations of Health Education (C- or better and at DACC only)	3
PHIL 1145G or PHIL 2110G	Philosophy, Law, and Ethics or Introduction to Ethics	3
SPMD 2225 & 2225L	Anatomy and Physiology II and Anatomy and Physiology II Lab (C or better in both)	4
	Credits	**14**
Third Year		
Fall		
Choose one from the following:		4-5
FSTE 4110	Food Microbiology (C or better)	
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory (C or better for both)	
BIOL 2320 & BIOL 311 L	Public Health Microbiology and General Microbiology Laboratory (C or better for both)	
PHLS 3120V	Women's Health Issues	3
PHLS 3220	Foundations of Public Health (C- or better)	3
NUTR 3110	Nutrition Throughout the Lifecycle (C or better)	3
Viewing A Wider World [3]		3
	Credits	**16-17**
Spring		
NUTR 3710	Food Systems & Policy in Dietetics	3
NUTR 3750	Applied Nutrition Research	3
FCSC 3110	Management Concepts in Family and Consumer Sciences Teaching (C or better and only available in Spring semesters)	3
PHLS 4620V	Cross-Cultural Aspects of Health (C- or better)	3
HRTM 3310	Quantity Food Production and Service	4
	Credits	**16**

Fourth Year		
Fall		
NUTR 4210	Community Nutrition	3
PHLS 4610	Health Disparities: Determinants and Interventions	3
NUTR 4220	Food Service Organization and Management (C or better, Fall only)	3
FCSC 4120	Career and Technical Education Programs	3
FCSC 4510	Teaching Methods I for Family and Consumer Sciences (C or better and only available in Fall semesters)	3
	Credits	**15**
Spring		
PHLS 4810	Infectious and Noninfectious Disease Prevention (C or better and only available in Spring semesters)	3
NUTR 4565	Field Experience Community Nutrition	2
NUTR 4205	Nutrition Communication and Education	3
FCSC 4520	Teaching Methods II for Family and Consumer Sciences (C or better, Spring only)	3
ELAD 3110V	Introduction to Educational Leadership in a Global Society	3
Electives		2
	Credits	**16**
	Total Credits	**120-121**

1 MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G College Algebra first.

2 Not required for the degree. Highly recommended if new to NMSU

3 AXED 4510 Introduction to Research Methods is only taught in the Fall semesters, this will require changes to year three- spring and year four- fall semesters, speak with your advisor if you'd like to take this course.

4 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses, cannot be offered through the College of Health and Social Services.

5 See the General Education (p. 262) section of the catalog for a full list of courses

Human Nutrition and Dietetic Science (Pre-Dietetics/Dietetics) - Bachelor of Science in Family and Consumer Sciences

The Dietetics option prepares students to become registered dietitians (RD) and dietetic technicians, registered (DTR). This option encompasses nutritional science, clinical dietetics, community nutrition, food science and food service management.

All students enrolled in this option begin as Pre-Dietetics students. **All Pre-Dietetics students are required to apply for admission into the Dietetics option in the fall semester of their junior year as indicated on the Pre-Dietetics/Dietetics road map.** Please refer to the HNDS Undergraduate Student Handbook for information on the admissions criteria, application instructions, and the application process. Pre-Dietetic students are termed Dietetic students upon formal notification of admission into the Dietetics program.

The Dietetics option is a Didactic Program in Dietetics (DPD) that is accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND). This option enables graduates to continue pursuing the credentials of a registered dietitian (RD). Becoming an RD is currently a three-step process:

1. Successfully complete an ACEND-accredited DPD program (e.g. the NMSU Dietetics Option), earn a degree and a verification statement
   a. The verification statement ensures eligibility to apply to the next step.
2. Successfully complete an ACEND-accredited Dietetic Internship (DI) program, earn another verification statement.
   a. This 2nd verification statement ensures eligibility to begin the next step.
3. Pass the Commission on Dietetic Registration (CDR) registration exam.

To earn a Verification Statement from the NMSU DPD, students must:

1. Complete all classes outlined in the Dietetics option roadmap.
2. Attain a C or higher (on campus or transfer) in classes with CHEM, BCHE, BIOL, SPMD, AHS/CHSS/NURS, FSTE and NUTR prefixes (C- does not count toward degree).

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 121 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1,4]		
Choose one ENGL course from the following:		
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Choose one from the following:		
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra [2]	3
or MATH 1430G	Applications of Calculus I	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
PHLS 1110G	Personal Health & Wellness (Recommended) [1]	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
Choose one sequence from the following (4 credits):		

BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
Area V: Humanitites		*3*
PHIL 1145G or PHIL 2110G	Philosophy, Law, and Ethics (recommended) Introduction to Ethics	
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
FSTE 2110G	Food Science I	4
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
FSTE Upper Division Course - any 300 or 400 level FSTE, except FTSE 4310		3
NUTR 2110	Human Nutrition (FSTE Upper Division Course - any 3000 or 4000 level FSTE, except FSTE 4310)	3
NUTR 2120	Seminar I - Becoming a Nutrition Professional	1
NUTR 3110	Nutrition Throughout the Lifecycle	3
NUTR 3710	Food Systems & Policy in Dietetics	3
NUTR 3750	Applied Nutrition Research	3
NUTR 4110	Advanced Nutrition	3
NUTR 4205	Nutrition Communication and Education	3
NUTR 4207	Nutrition Services	3
NUTR 4210	Community Nutrition	3
NUTR 4220	Food Service Organization and Management	3
NUTR 4230	Graduate Studies in Medical Nutrition I	3
NUTR 4230L	Medical Nutrition Therapy I Lab	1
NUTR 4233	Nutrition Counseling	3
NUTR 4235	Entering the Field of Dietetics	1
NUTR 4240	Medical Nutrition Therapy II	3
NUTR 4240L	Medical Nutrition Therapy II Laboratory	1
Choose one from the following:		*3-4*
FSTE 4110	Food Microbiology	
BIOL 311	General Microbiology	
BIOL 2320	Public Health Microbiology	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
A ST 311 or MATH 1350G	Statistical Applications Introduction to Statistics	3
ACCT 2110	Principles of Accounting I	3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
CHEM 2120	Integrated Organic Chemistry and Biochemistry	3
HRTM 2110	Safety, Sanitation and Health in the Hospitality Industry	1
HRTM 2120	Food Production and Service Fundamentals	3
HRTM 363	Quantity Food Production and Service	4
SPMD 2210 & 2210L	Anatomy and Physiology I and Anatomy and Physiology Laboratory	4
SPMD 2225 & 2225L	Anatomy and Physiology II and Anatomy and Physiology II Lab	4
Choose one from the following:		
SPMD 1120	Medical Terminology	
NURS 1150	Medical Terminology	
Second Language: (not required)		
Electives, to bring the total credits to 121		**0**
Total Credits		**122-123**

1 See the General Education (p. 262) section of the catalog for a full list.

Please refer to the HNDS Undergraduate Student Handbook for a list of recommended courses to choose from in order to fulfill these requirements.

2 MATH 1220G College Algebra or MATH 1430G Applications of Calculus I is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G or MATH 1430G first.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
Refer to the "List of Recommended GE courses" for HNDS students in the HNDS Undergraduate Student Handbook for a list of field-related course options that can be selected from the GE Core Curriculum and Viewing a Wider World course requirements.

4 Students who have taken a second level English course may be required to take another to fulfill the program's technical/ scientific writing requirement.

A Suggested Plan of Study for Students

During the following semesters, a student may need to submit for an overload to enroll in over 18 credits of course work (see the NMSU Regulations section-Course Load for Undergraduate Students (p. 40) for more information):

- Third Year- Fall Semester

This roadmap assumes student placement in MATH 1220G and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1220G	College Algebra [1, 2]	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors (C or better) [1,3]	4
PHLS 1110G	Personal Health & Wellness (Recommended)	3
Recommended courses (not required)		1
ACES 1120	Freshman Orientation	
ACES 1210	Financial Fitness for College Students	
	Credits	**15**
Spring		
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors (C or better) [1, 3]	4
Choose one from the following:		4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory (C or better) [1, 3]	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory (C or better) [1,3]	

Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
NUTR 2110	Human Nutrition (C or better) [1, 3]	3
NUTR 2120	Seminar I - Becoming a Nutrition Professional (C or better and only available in Spring Semesters) [1, 3]	1
	Credits	**15**
Second Year		
Fall		
FSTE 2110G	Food Science I (C or better) [1,3]	4
HRTM 2110	Safety, Sanitation and Health in the Hospitality Industry [1,3]	1
CHEM 2120	Integrated Organic Chemistry and Biochemistry (C or Better) [1,3]	3
ACCT 2110	Principles of Accounting I [1, 3]	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture [1]	
COMM 1115G	Introduction to Communication [1]	
COMM 1130G	Public Speaking [1]	
HNRS 2175G	Introduction to Communication Honors [1]	
	Credits	**14**
Spring		
HRTM 2120	Food Production and Service Fundamentals [1,3]	3
PHIL 1145G or PHIL 2110G	Philosophy, Law, and Ethics (either recommended) or Introduction to Ethics	3
SPMD 2210 & 2210L	Anatomy and Physiology I and Anatomy and Physiology Laboratory (C or Better) [1]	4
A ST 311 or MATH 1350G	Statistical Applications [1, 3] or Introduction to Statistics	3
NURS 1150 or SPMD 1120	Medical Terminology [3, 6] or Medical Terminology	3
	Credits	**16**
Third Year		
Fall		
SPMD 2225 & 2225L	Anatomy and Physiology II and Anatomy and Physiology II Lab (C or better) [1,3]	4
FSTE 4110	Food Microbiology (C or better and only available Fall semesters) [1, 3]	4
NUTR 3110	Nutrition Throughout the Lifecycle (C or better, and only available in Fall semesters) [1, 3]	3
HRTM 363	Quantity Food Production and Service (C or Better) [1, 3]	4
Apply to the HNDS- Didactic Program in Dietetics		
	Credits	**15**
Spring		
FSTE Upper Division Course (C or better) Any 3000 or 4000 level FSTE except FSTE 4310 [3,6]		4
FSTE 4250	Sensory Evaluation of Foods and Product Development	
NUTR 3750	Applied Nutrition Research (C or better, and only available in Spring semesters) [3,7]	3
NUTR 4110	Advanced Nutrition (C or better, Spring only) [3, 7]	3
NUTR 3710	Food Systems & Policy in Dietetics (C or better, Spring only) [3,7]	3
Area VI- Creative & Fine Arts Course		3
	Credits	**16**
Fourth Year		
Fall		
VWW- Viewing a Wider World Course [6,8]		3
NUTR 4210	Community Nutrition (C or better, Fall only) [3,7]	3
NUTR 4235	Entering the Field of Dietetics (C or better, Fall only) [3,7]	1
NUTR 4230 & 4230L	Graduate Studies in Medical Nutrition I and Medical Nutrition Therapy I Lab (C or better, Fall only) [3,7]	4
NUTR 4233	Nutrition Counseling (C or better, Fall only) [3,7]	3
NUTR 4220	Food Service Organization and Management (C or better, Fall only) [3,7]	3
	Credits	**17**
Spring		
VWW - Viewing a Wider World Course [6, 8]		3
NUTR 4240 & 4240L	Medical Nutrition Therapy II and Medical Nutrition Therapy II Laboratory (C or better, Spring Only) [3,7]	4
NUTR 4207	Nutrition Services (C or Better Spring Only) [3,7]	3
NUTR 4205	Nutrition Communication and Education (C or Better Spring Only) [3,7]	3
	Credits	**13**
	Total Credits	**121**

1 Pre-Dietetics courses must be completed and/or enrolled in prior to applying to the Dietetics program.

2 MATH 1220G College Algebra or MATH 1430G Applications of Calculus I is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G College AlgebraMATH 1220G College Algebra or MATH 1430G Applications of Calculus IMATH 1430G Applications of Calculus I first.

3 **Courses are required for application to a dietetic internship, GPAs in the application will be calculated using these classes.**

4 See the General Education (p. 262) section of the catalog for a full list.

5 CHEM 313 Organic Chemistry I, CHEM 314 Organic Chemistry II, and CHEM 315 Organic Chemistry Laboratory combination for the Organic Chemistry requirement is a total of 8 credits,

6 Required courses are upper-division courses that can be completed in the junior year prior to admission to the Dietetics program.

7 Dietetics courses can only be completed by Dietetic students who have been admitted into the Dietetics program.

8 See the Viewing a Wider World (p. 266) section of the catalog for a full list.

Culinary Science - Undergraduate Minor

A minor in Culinary Science is available. The minor requires a minimum of 20 credits of which a minimum of 9 hours must be at the 300 or higher level. A grade of "C-" or better is required in all classes to be counted towards the minor. Prerequisites for a given course must be completed

before taking the course or consent of instructor must be obtained before enrolling in the course.

Prefix	Title	Credits
FSTE 2110G	Food Science I	4
FSTE 4110	Food Microbiology	4
HRTM 1310	Safety, Sanitation and Health in the Hospitality Industry	1
HRTM 1320	Food Production and Service Fundamentals	3
HRTM 3310	Quantity Food Production and Service	4
HRTM 4320	Restaurant Operations Management	4
Total Credits		**20**

Fashion Merchandising & Design - Undergraduate Minor

A minor in Fashion Merchandising and Design is available. The minor requires a minimum of 18 hours of which a minimum of 9 hours must be at the 300 or higher level. A grade of "C" or better is required in all classes to be counted towards the minor. Prerequisites for a given course must be completed before taking the course or consent of instructor must be obtained before enrolling in the course.

Prefix	Title	Credits
Course Requirements		
CTFM 1110	Fundamentals of Fashion	3
CTFM 2130	Concepts in Apparel Construction	3
CTFM 371	Textile Science	3
Choose three Upper-Division courses from the following:		9
CTFM 365	Apparel Analysis	
CTFM 366	Historic Fashion and Society	
CTFM 372	Fashion Merchandising	
CTFM 373	Advanced Apparel Construction II	
CTFM 375	Fashion Buying	
CTFM 377	Fashion Study Tour	
CTFM 460	Cultural Perspectives in Dress	
CTFM 473	Flat Pattern for Apparel Design	
CTFM 474	Fashion Promotion	
CTFM 476	Draping for Apparel Design	
Total Credits		**18**

Food Science - Undergraduate Minor

A minimum of 18 credits of courses with the FSTE prefix are required for a minor in Food Science and Technology. A grade of "C-" or better is required in all classes to be counted toward the minor. Prerequisites for a given course must be completed before taking the course, or consent of instructor must be obtained before enrolling in the course.

Prefix	Title	Credits
Required Courses		
FSTE 4110	Food Microbiology	4
FSTE 4250	Sensory Evaluation of Foods and Product Development	3
FSTE 4998	ACES Foods at NMSU-Experiential Learning	1
Electives (select at least three courses from the following):		*10*
FSTE 4140	Food Analysis	
FSTE 4120	Food Chemistry	
FSTE 4230	Food Processing Technologies	
FSTE 4310		
Total Credits		**18**

Interior Spaces - Undergraduate Minor

Requirements for a Minor in Interior Spaces

A minimum of eighteen (18) credits is required for a minor in Interior Spaces, of which a minimum of nine (9) credits must be at the 300/3000 or higher level. A grade of "C" or better is required in all classes to be counted towards the minor. Prerequisites for a given course must be completed before taking the course, or consent of the instructor must be obtained before enrolling in the course.

Prefix	Title	Credits
Required Courses (9 Credits)		
FCSC 2330	Housing and Interior Design	3
CTFM 371	Textile Science	3
ARTH 1115G	Orientation in Art	3
Choose 3 Courses (9 credits) from the following:		*9*
ARCH 1120	Introduction to Architecture	
MKTG 311V	Consumer Behavior	
PSYC 315	Emotion	
FCST 3120V	Family Ethnicities and Subcultures	
FCSC 4110	Teaching in Informal Family and Consumer Sciences Settings	
FCSC 4120	Career and Technical Education Programs	
Total Credits		**18**

Meat Science - Undergraduate Minor

Requirements for a Minor in Meat Science

A minimum of eighteen (18) credits is required for a minor in Meat Science.

A grade of "C" or better is required in all classes to be counted towards the minor.

Prerequisites for a given course must be completed before taking the course, or consent of the instructor must be obtained before enrolling in the course.

Prefix	Title	Credits
Complete 16 credits from the following required courses:		*16*
ANSC 2310	Introduction to Meat Science	
ANSC 301	Animal and Carcass Evaluation	
ANSC 360	Meat and Muscle Biology	
FSTE 4110	Food Microbiology	
FSTE 4240	Processed Meats	
Choose one course from the list below:		*2*
FSTE 4140	Food Analysis	
FSTE 4250	Sensory Evaluation of Foods and Product Development	
Total Credits		**18**

Nutrition - Undergraduate Minor

A minor in Human Nutrition is available. The minor requires a minimum of 19 hours. Specific coursework requirements may apply, including prerequisites. See an advisor for course requirements and scheduling. Students should take the following courses:

Prefix	Title	Credits
Required Courses		
NUTR 2120	Seminar I - Becoming a Nutrition Professional (only offered in Spring semesters)	1
NUTR 2110	Human Nutrition	3
NUTR 3110	Nutrition Throughout the Lifecycle (only offered in Fall semesters)	3
Choose a minimum of 12 credits from the following		12
HRTM 3310	Quantity Food Production and Service	
NUTR 3710	Food Systems & Policy in Dietetics (only offered in Spring semesters)	
NUTR 3750	Applied Nutrition Research (only offered in Spring semesters)	
NUTR 4220	Food Service Organization and Management (only offered in Fall semesters)	
NUTR 4233	Nutrition Counseling and Education (only offered in Fall semesters)	
Total Credits		**19**

Fish, Wildlife and Conservation Ecology

Undergraduate Program Information

Through lecture courses, labs, hands-on field experience and internships, the Department of Fish, Wildlife and Conservation Ecology will prepare you for a career in a variety of natural resource fields related to the conservation and management of wild animal populations and the natural systems they perpetuate. Award-winning professors will guide students in the study of how to manage fish and wildlife populations, their habitats, how their populations grow and contract, how different species influence the biotic community in which they live and how natural systems are affected by human activities.

Bachelor of Science in Fish, Wildlife and Conservation Ecology.

With the continuous growth of human populations and the ever dwindling of natural resources, natural resource professionals are needed now more than ever. Learn how to sustainably manage fish and wildlife populations and the habitats they utilize to ensure their long-term successful conservation. We offer two options within this degree. The Wildlife Ecology and Management option focuses on the ecology, conservation and management of wildlife (including mammals, birds, amphibians, and reptiles) in their natural habitats. The Aquatic Ecology and Management option focuses on the ecology, conservation and management of aquatic resources and the animals and plants found in them.

The department offers a minor in Wildlife Science for students majoring in other disciplines. The minor includes a minimum of 18 credit hours.

Bachelor of Science in Conservation Ecology

New Mexico State University offers an interdisciplinary, undergraduate program in Conservation Ecology. The goal of this program is to train biologists for the current and future challenges that we face in the conservation and wise use of natural resources. An overriding principle of the program is to provide a solid foundation in basic science coupled with a practical approach towards sustainability and stewardship. The curriculum encompasses several disciplines and includes a wide variety of courses from Fish, Wildlife and Conservation Ecology, Biology, and Geography.

This educational experience will provide students with an overview of global biodiversity and an understanding of the ecological and evolutionary processes that have created and sustained it. Courses in population and community ecology coupled with population viability analysis and risk assessment will give students the necessary background to understand the theory and development of these fields as well as the tools to tackle real-world problems. Courses in basic genetics, evolution, and conservation genetics will expose students to the importance of conserving genetic variation in order to maintain adaptive potential within populations, thereby sustaining the evolutionary process. Students will also receive background on wildlife law and environmental policy, information vital for assisting governing bodies in making decisions regarding the protection and wise use of our natural resources. Skills obtained in the application of geographic information systems, molecular genetics, and professional communication can also be acquired through various electives. If biochemistry is taken as an elective, this curriculum provides the necessary educational background for pre-vet requirements, thus preparing students for veterinary school and future jobs such as wildlife or zoo veterinarian, or conservation medicine practioner. In sum, we seek to provide undergraduate students with an education that will allow them the opportunity to contribute to the conservation of all life on Earth.

The department offers a minor in Conservation Ecology for students majoring in other disciplines. The minor includes 20 credits.

To graduate from the Department of Fish, Wildlife and Conservation Ecology, an overall grade point average of 2.0 is required in courses taken in the major field and in all courses taken at NMSU.

Graduate Program Information

Master of Science in Fish, Wildlife and Conservation Ecology.

The Department of Fish, Wildlife and Conservation Ecology (FWCE) offers graduate work leading to the Master of Science degree with a major in Fish, Wildlife and Conservation Ecology. Faculty members in the department also may advise Ph.D. candidates through the graduate program in the Department of Biology, Department of Animal and Range Sciences, Department of Plant and Environmental Sciences, as well as other Ph.D. granting departments. For additional information please see the graduate catalog entries for the respective departments.

Minimum qualifications for admission to the graduate program include the following:

- 3.0 grade-point average in the last two years of undergraduate work
- Students who are most competitive for admission are those with a combined average GRE score greater than 70th percentile on the verbal and quantitative parts of the GRE.
- Course work in zoology, botany and animal ecology and a basic appreciation of sustainable use of natural resources, with supporting courses in mathematics, chemistry, physics and written and oral communication.

Applicants should submit a written composition of approximately 350 words that indicates the applicant's reasons for pursuing advanced study, explains personal and educational goals, and any additional experiences (e.g., military or career) or skills that might provide a foundation for graduate study. Applicants should submit three letters of recommendation (it is preferred that at least two letters come from university instructors) along with official GRE scores (use NMSU code 4531). Applicants should also contact a faculty member in the department that they would like to work with as an advisor, and that faculty member needs to agree to serve as the student's advisor. Application forms, application fee and transcripts, GRE scores, letters of recommendation and letter of application should be submitted online to the Graduate School. Successful applicants will be selected from those who meet the criteria of grade-point average, GRE scores, and educational background described above and who appear to have professional promise as indicated by personal history and written references.

For the Master of Science degree, a minimum of 30 semester credits of graduate work in the major and related subjects is required, together with a thesis for most students. Of these credits, at least 15 must be in courses numbered 500 or above, and at least 15 must be for courses with the FWCE prefix. Those programs involving a thesis or research project include 4 to 6 credits of research (FWCE 598 Special Research Programs or FWCE 599 Master's Thesis). Students electing a minor in FWCE are required to take at least 9 credits in the minor field. A nonthesis option is available to some students, depending on prior training and experience, and subject to approval by the advisor and department head.

All students in the program must complete the following requirements:

- A ST 505 Statistical Inference I or equivalent
- One semester of Graduate Seminar (FWCE 515 Graduate Seminar - may be repeated for credit)
- A minimum of 3 additional credits from the Quantitative Methods category in addition to A ST 505 Statistical Inference I (eligible courses listed below)
- One course each from the Ecological Concepts, Organismal Biology and Ecological Techniques categories (eligible courses listed below)
- 4 to 9 credits from the Independent Study category (eligible courses listed below)

In addition, a student may petition to have up to 3 credits of special topics courses (FWCE 548 Graduate Problems) to apply to one of the three areas. Courses other than those listed may be acceptable, given permission by the student's supervisory committee

Degrees for the Department

Bachelor Degree(s)

- Conservation Ecology - Bachelor of Science in Conservation Ecology (p. 436)
- Fisheries and Wildlife Science (Aquatic Ecology and Management) - Bachelor of Science in Fish, Wildlife and Conservation Ecology (p. 437)
- Fisheries and Wildlife Science (Wildlife Ecology and Management) - Bachelor of Science in Fish, Wildlife and Conservation Ecology (p. 440)

Master Degree(s)

- Fish, Wildlife and Conservation Ecology - Master of Science (p. 162)

Doctoral Degree(s)

- Wildlife and Fisheries Ecology - Doctor of Philosophy (p. 242)

Minors for the Department

- Conservation Ecology - Undergraduate Minor (p. 443)
- Fish, Wildlife and Conservation Ecology - Graduate Minor (p. 255)
- Wildlife Science - Undergraduate Minor (p. 443)

Regents Professor, Martha Desmond, Department Head

Professors Boeing, Desmond, Frey, Jones; ***Associate Professor*** Gebreselassie; ***Assistant Professors*** Hernandez-Gomez, Klein, Lawson, Laverty, Pregler, Young

M.J. Desmond, Ph.D. (University of Nebraska)– avian ecology and conservation; W.J. Boeing, Ph.D. (Louisiana State University)– aquatic ecology; J.K. Frey, Ph.D. (University of New Mexico)– ecology and conservation of mammals; F.A. Gebreselassie, Ph.D. (University of Bern Switzerland)- Capture-recapture models, Integrated population models; O. Hernandez-Gomez, Ph.D. (Purdue University)- disease ecology, herpetology, conservation genetics; K. Jones, Ph.D. (University of Wisconsin-Madison)- human dimensions of conservation, environmental economics, evidence-based conservation; Z. Klein, Ph.D. (University of Idaho)-fish ecology, fisheries management, fish conservation, population ecology; A. Lawson, Ph.D. (Clemson University)- vertebrate population ecology, analytical tool development; T. Laverty, Ph.D. (Colorado State University)- applied population, community and conservation ecology; K.C. Pregler, Ph.D. (Colorado State University)- population and evolutionary ecology, conservation biology; A. Young, Ph.D. (University of Idaho) - Wildlife Conservation and Management, Avian Ecology, Quantitative Ecology

Fish, Wildlife and Conservation Ecology Courses

FWCE 1110G. Introduction to Natural Resources Management
4 Credits (3+2P)
This class covers historical and current issues affecting the management of renewable natural resources with an emphasis on water, soil, rangeland, forest, fish, and wildlife resources. An emphasis is placed on the scientific method and critical thinking. In the laboratory students collect and analyze field data on topics covered above and write up each unit as a laboratory report.
Learning Outcomes

1. Students should be able to recall, describe and explain the laws, treaties and acts that have led to our current management of natural resources in the United States.
2. Students should recognize or explain what ecological processes are, the importance of ecological processes in maintaining ecosystem function and how human activities change ecological processes and the ecosystems dependent on those processes.
3. In each of the six course and lab modules (water quality, soils, forestry, rangelands, wildlife and fisheries) students should be able to recall, describe and explain basic terminology, fundamental ecological principles and management techniques and challenges.
4. Students should be able to interpret data presented graphically and in tables from class exercises and lectures.
5. Students should be able to solve problems scientifically through field data collection, laboratory analyses and the use of quantitative methods (basic statistics, tables and graphs).

6. Students should be able to communicate results from laboratory exercises (6 lab modules) orally and in writing.
7. Students will learn to apply scientific thinking to real world problems through in class discussion and short essays based on material from case studies presented in class and guest speakers.

FWCE 1120. Contemporary Issues in Wildlife and Natural Resources Management
3 Credits (3)
Ecological, socioeconomic, and political issues surrounding the management of our natural resources with an emphasis on fish and wildlife resources.

FWCE 2110. Principles of Fish and Wildlife Management
3 Credits (3)
Basic principles of fish and wildlife management including history, ecology, economics, and policy. Emphasis on wildlife and fisheries. Uses an ecosystem approach integrating living and nonliving resources.
Prerequisite(s): FWCE 1110G.
Learning Outcomes
1. The goal of this course is to provide a firm foundation in the principles of wildlife and fisheries management.
2. Material will include a background in biological principles geared towards animal populations, characteristics and management of the habitats utilized by fish and wildlife, techniques used to study and manage animals and their habitats, and aspects of the human dimension involved in wildlife and fisheries issues.
3. This course serves as a core requirement for degrees offered in the Department of Fish, Wildlife and Conservation Ecology and as a required course for degrees in other departments such as Rangeland Resources.

FWCE 301. Wildlife Ecology
3 Credits (3)
General ecological theory with emphasis on concepts including how organisms interact with their abiotic environment and with each other, population dynamics, community and ecosystem ecology, and biogeography. Emphasis on how these concepts relate to the management and conservation of vertebrates.
Prerequisite: BIOL 2610G.
Learning Outcomes
1. Students can describe major concepts and theories in ecology that relate to Fish and Wildlife conservation and management (niche, succession).
2. Students will understand population dynamics.
3. Students will learn concepts related to density dependence, population growth, and carrying capacity.
4. Students will learn concepts related to species interactions (predator prey-dynamics, intra- and inter-specific competition, mutualism, and disease dynamics).
5. Students will understand concepts related to the abiotic component of the ecosystem.
6. Students can articulate principles of fishery and wildlife management and apply ecological principles to conservation.

FWCE 325. Human Dimensions of Fish and Wildlife
3 Credits (3)
This course provides a foundational understanding of multiple perspectives in human dimensions of fish and wildlife. The course provides the information needed to identify stakeholders, engage them, understand their concerns, and communicate management plans effectively. Specific topics include the social, psychological, and economic underpinnings of human interactions with wildlife; qualitative and quantitative methods to gather information from people; and ethical considerations. Students will be challenged to approach human dimensions of wildlife issues from multiple perspectives. While this course is focused on fish and wildlife, the concepts covered about human dimensions will be relevant to a broader audience interested in environmental and natural resource conservation, management, or stewardship.
Learning Outcomes
1. Students will learn about human-wildlife conflicts and strategies to mitigate those conflicts.
2. Students will understand how human values, attitudes, and behaviors influence fish and wildlife management.
3. Students will become familiar with stakeholder engagement and communication techniques able to communicate with non-scientist stakeholders.
4. Students will learn to use logic and reasoning to arrive to reasonable conclusions.

FWCE 330. Natural History of the Vertebrates
4 Credits (3+1P)
This course provides students with a foundation in vertebrate natural history, including the evolution, ecology, behavior, anatomy, and physiology of extant and extinct vertebrates. Field trips may be required.
Prerequisite: BIOL 2610G and BIOL 2610L.
Learning Outcomes
1. Students can identify common vertebrate taxa, arrange them into phylogenetic order, and describe their anatomy and physiology.
2. Students understand the major precepts of evolutionary biology.
3. Students are proficient in the use and application of peer-review literature (access, proper use).
4. Students can communicate effectively via technical writing.
5. Students can disseminate information via oral communication.
6. Students will understand concepts related to the abiotic component of the ecosystem.

FWCE 355. Wildlife Management and Analysis
4 Credits (3+1P)
This course is intended to provide a broad overview of basic skills and statistical interpretation that are commonly used by biologists in performing management, research, and reporting functions in natural resource fields with an emphasis on terrestrial wildlife techniques, study design, and data processing/analysis. Field trips may be required.
Prerequisite: FWCE 301 and A ST 311 or consent of instructor.
Learning Outcomes
1. Students can describe major concepts and theories in ecology that relate to Fish and Wildlife conservation and management (niche, succession).
2. Students will understand population dynamics.
3. Students are familiar with techniques used to study fish and wildlife (common capture marking methods).
4. Students can visualize and summarize ecological data using graphs and descriptive statistics.
5. Students can perform basic data analysis and interpret results to draw meaningful conclusions.
6. Students are familiar with common statistical software (R).
7. Students will develop professional (field skills) and interpersonal skills (working in groups).

FWCE 357. Fisheries Management and Analysis
4 Credits (3+1P)
Lectures and laboratory exercises provide a broad overview of basic skills and techniques used for assessing and managing fish populations.
Prerequisite: FWCE 301 and A ST 311.
Learning Outcomes
1. Students can describe major concepts and theories in ecology that relate to animal conservation and management, especially niche, habitat, succession, etc.
2. Students will understand concepts related to population ecology, especially density dependence, population growth and dynamics, metapopulation dynamics, and carrying capacity.
3. Students have hands-on experience with techniques used to study fish and wildlife (common capture marking methods).
4. Students can understand and apply the methods used to measure abiotic and biotic variables.
5. Students can visualize and summarize ecological data using graphs and descriptive statistics.
6. Students can perform basic data analysis and interpret results to draw meaningful conclusions.
7. Students understand the law and policy underlying fish and wildlife management and conservation (North American Model, Public Trust Doctrine).

FWCE 391. Internship
1-3 Credits (1-3)
Professional work experience under the joint supervision of the employer and a faculty member. No more than 3 credits toward a degree.
Learning Outcomes
1. Students are familiar with techniques used to study fish and wildlife (common capture marking methods).
2. Students are familiar with methods used to measure environmental variables.
3. Student can design basic scientific experiments.
4. Students are familiar with the scientific method and its application.
5. Students will develop professional (field skills) and interpersonal skills (working in groups).
6. Students will become familiar with stakeholder engagement and communication techniques able to communicate with non-scientist stakeholders.

FWCE 393. Professional Experience and Communication
3 Credits (3)
Professional work experience under the supervision of employer and/or a faculty member. Written report and presentation is required. Students will learn oral and written communication, interviewing, and networking skills.
Prerequisite/Corequisite: FWCE 2110.
Learning Outcomes
1. Communicate effectively via technical writing.
2. Disseminate information via oral communication.
3. Learn to use logic and reasoning to arrive to reasonable conclusions.
4. Develop professional (field skills) and interpersonal skills (working in groups).

FWCE 402. Seminar in Natural Resource Management
1 Credit (1)
Review and discussion of current topics in natural resource management.
Prerequisite: Senior standing or above.
Learning Outcomes
1. Students can describe major concepts and theories in ecology that relate to FW conservation and management.
2. Students can articulate principles of fishery and wildlife management and apply ecological principles to conservation.
3. Students can understand concepts related to interconnectedness of habitat, abiotic factors, and Fish and Wildlife species common to the Southwest.
4. Students can disseminate information via oral communication.
5. Students will learn to use logic and reasoning to arrive to reasonable conclusions.
6. Students will understand population dynamics.
7. Students will understand concepts related to the abiotic component of the ecosystem.
8. Students will understand genetic concepts as they relate to FW management and conservation.
9. Students will understand how human values, attitudes, and behaviors influence fish and wildlife management. 1
10. Students will become familiar with stakeholder engagement and communication techniques able to communicate with non-scientist stakeholders. 1
11. Students are familiar with the law and policy underlining fish and wildlife management and conservation.

FWCE 409. Introduction to Population Ecology
3 Credits (3)
This course introduces students to the fundamental concepts and principles of population ecology. It covers topics such as population growth and regulation, life history, species interactions, age-structured population models, and metapopulation dynamics. Students will develop skills in applying basic models and interpreting data, with introductory exposure to relevant software tools such as R and Program MARK. The course also emphasizes the role of population ecology in the management and conservation of animal populations.
Prerequisite: MATH 1430G and FWCE 2110.
Learning Outcomes
1. Describe and compare exponential and logistic models of population growth.
2. Construct and interpret simple life tables and basic matrix population models.
3. Explain factors influencing population regulation and viability.
4. Describe and analyze key species interactions (competition, predation) using graphical models.
5. Apply basic models to analyze population dynamics, including metapopulation dynamics.
6. Communicate core concepts and findings effectively through written assignments.

FWCE 425. Evidence-Based Conservation and Management
3 Credits (3)
This course will explore theories and concepts that are fundamental to applied conservation management and evaluation. There is increasing need to justify and evaluate conservation and management actions, and this course will provide students with the insight and knowledge on how to consult the best evidence in conservation planning and how to set up and evaluate a conservation action plan. This course also provides insight into systems thinking, which is needed to address the complex problems faced by conservation managers. Finally, this course teaches students a specific adaptive management framework that has been

adopted by several leading conservation organizations and agencies. While this course is focused on biodiversity conservation, the concepts covered about systems thinking and applied conservation planning and management will be relevant to a broader audience interested in environmental and natural resources management or stewardship.

Learning Outcomes

1. Students will understand how human values, attitudes, and behaviors influence fish and wildlife management.
2. Students will learn to use logic and reasoning to arrive to reasonable conclusions.
3. Students can disseminate information via oral communication.
4. Students are proficient in the use and application of peer-review literature (access, proper use).

FWCE 430. Avian Field Ecology
4 Credits (3+1P)

Principles of avian ecology and management with an emphasis on taxonomy, physiology, behavior and field studies. Includes weekly field trips focusing on identification and behavior of Southwest birds.

Prerequisite: FWCE 2110.

Prerequisite/Corequisite: FWCE 330 or Consent of Instructor.

Learning Outcomes

1. Students can understand concepts related to interconnectedness of habitat, abiotic factors, and Fish and Wildlife species common to the Southwest.
2. Students are proficient in the use and application of peer-review literature (access, proper use).
3. Students are familiar with the scientific method and its application.
4. Students can identify common vertebrate taxa, arrange them into phylogenetic order, and describe their anatomy and physiology.
5. Students can communicate effectively via technical writing.
6. Students will learn to use logic and reasoning to arrive to reasonable conclusions.
7. Students will develop professional (field skills) and interpersonal skills (working in groups).
8. Students can perform basic data analysis and interpret results to draw meaningful conclusions.
9. Students will learn concepts related to species interactions (predator prey-dynamics, intra- and inter-specific competition, mutualism, and disease dynamics). 1
10. Students will understand genetic concepts as they relate to Fish and Wildlife management and conservation (population size, connectivity, inbreeding depression).

FWCE 431. Mammalogy
4 Credits (3+1P)

This course provides an overview of the biology of Class Mammalia, the mammals. We will cover the classification, distribution, anatomy, physiology, life history, and ecology of mammals in lecture and learn to identify mammal orders, families, and species in lab with an emphasis on those found in the Southwest. Field trips may be required.

Prerequisite: FWCE 2110 and FWCE 330 or consent of instructor.

Learning Outcomes

1. Students can understand concepts related to interconnectedness of habitat, abiotic factors, and Fish and Wildlife species common to the Southwest.
2. Students can identify common vertebrate taxa, arrange them into phylogenetic order, and describe their anatomy and physiology.
3. Students are proficient in the use and application of peer-review literature (access, proper use).
4. Students will learn concepts related to species interactions (predator prey-dynamics, intra- and inter-specific competition, mutualism, and disease dynamics).
5. Students can communicate effectively via technical writing.
6. Students can disseminate information via oral communication.

FWCE 432. Environmental Biology of Fishes
4 Credits (3+3P)

What makes a fish, a fish? Mechanisms of circulation, gas exchange, osmotic and ionic regulation, swimming, migration, reproduction, and chemoreception will be covered in this class. Taught with FWCE 532.

Prerequisite(s): CHEM 1215G and senior standing.

FWCE 434. Aquatic Contaminants and Toxicology
4 Credits (3+3P)

Basic principles and methodologies of aquatic toxicity testing; routes of exposure and modes of action; environmental legislation and ecological risk assessment. Taught with FWCE 534. Crosslisted with: ENVS 434.

Prerequisite(s): CHEM 1215G and senior standing.

FWCE 437. Wildlife Damage Management
3 Credits (3)

Introduction to basic need and appropriate methods for resolving human-wildlife conflicts and management of animal damage. Socioeconomic, ecological, and political factors. Field trips required. Taught with FWCE 537.

Prerequisite: BIOL 2610G, FWCE 2110, FWCE 301, FWCE 409.

Learning Outcomes

1. Students can articulate principles of fishery and wildlife management and apply ecological principles to conservation.
2. Students are familiar with the scientific method and its application.
3. Students can disseminate information via oral communication.
4. Students will learn to use logic and reasoning to arrive to reasonable conclusions.
5. Students will learn concepts related to density dependence, population growth, and carrying capacity.
6. Students will learn concepts related to species interactions (predator prey-dynamics, intra- and inter-specific competition, mutualism, and disease dynamics).
7. Students will learn about human-wildlife conflicts and strategies to mitigate those conflicts.
8. Students are proficient in the use and application of peer-review literature (access, proper use).

FWCE 442. Wildlife Disease Ecology and Management
4 Credits (3+1P)

This course will provide students with an understanding of the ecological and evolutionary complexity inherent to host-pathogen interactions in wildlife systems. FWCE 442/542 introduces students to parasite and pathogen diversity, core concepts in disease ecology (e.g., pathogen population dynamics, transmission, disease models, virulence), host-pathogen coevolution, community ecology of host-pathogen interactions, and the importance of pathogens in conservation and management. In the laboratory, students will learn basic techniques to isolate pathogens from living organisms, detect pathogens using molecular tools, and model disease outbreaks using bioinformatics. Field trips are required.

Prerequisite: FWCE 2110, FWCE 330.

Learning Outcomes

1. Students can describe major concepts and theories in ecology that relate to Fish and Wildlife conservation and management (niche, succession).
2. Students can articulate principles of fishery and wildlife management and apply ecological principles to conservation.
3. Students understand the major precepts of evolutionary biology.
4. Students are familiar with techniques used to study fish and wildlife (common capture marking methods).
5. Student can design basic scientific experiments.
6. Students are proficient in the use and application of peer-review literature (access, proper use).
7. Students are familiar with the scientific method and its application.
8. Students can identify common vertebrate taxa, arrange them into phylogenetic order, and describe their anatomy and physiology.
9. Students can communicate effectively via technical writing. 1
10. Students can disseminate information via oral communication. 1
11. Students will develop professional (field skills) and interpersonal skills (working in groups). 1
12. Students can visualize and summarize ecological data using graphs and descriptive statistics. 1
13. Students can perform basic data analysis and interpret results to draw meaningful conclusions. 1
14. Students are familiar with common statistical software (R). 1
15. Students will understand population dynamics. 1
16. Students will learn concepts related to density dependence, population growth, and carrying capacity. 1
17. Students will learn concepts related to species interactions (predator prey-dynamics, intra- and inter-specific competition, mutualism, and disease dynamics).

FWCE 447. Wildlife Law and Policy
3 Credits (3)
Introduction to state and federal laws and policies for wildlife and the historical context for their development. Taught with FWCE 547.
Prerequisite: Junior or Senior level standing.
Learning Outcomes

1. Students will learn about human-wildlife conflicts and strategies to mitigate those conflicts.
2. Students will understand how human values, attitudes, and behaviors influence fish and wildlife management.
3. Students will become familiar with stakeholder engagement and communication techniques able to communicate with non-scientist stakeholders.
4. Students are familiar with the law and policy underlining fish and wildlife management and conservation (NAM, PTD).

FWCE 448. Problems
1-3 Credits (1-3)
Individual investigations in fishery or wildlife science. Maximum 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.
Prerequisite(s): 18 credits in WLSC.

FWCE 450. Special Topics
1-4 Credits (1-4)
Specific subjects and credits as announced in the Schedule of Classes. Maximum of 4 credits per semester. May be repeated up to 9 credits. Consent of Instructor required.

FWCE 457. Ecological Biometry
3 Credits (3)
This course introduces students to basic statistical methods used in ecology. Topics include data visualization, basic probability and probability distributions, estimation, hypothesis testing, and simple and multiple linear regression. Students will develop essential skills in summarizing and analyzing ecological data using R, a widely used open-source statistical software. Emphasis will be placed on practical application in ecological studies.
Prerequisite: MATH 1430G or MATH 1511G, A ST 311, FWCE 301.
Learning Outcomes

1. Demonstrate a solid understanding of basic statistical concepts and their application in ecology.
2. Summarize ecological data and create graphs and charts to effectively visualize it.
3. Apply common statistical methods to address real-world ecological questions.
4. Interpret results from statistical tests and draw inference from ecological data.
5. Develop skills in using R for ecological data analysis and visualization.
6. Communicate core statistical concepts and findings effectively through written assignments.

FWCE 459. Aquatic Ecology
4 Credits (4)
Ecological functions of plant and animal communities in aquatic ecosystems with emphasis on chemical and physical properties, productivity, species interactions, population dynamics, and concepts for diagnosing problems and restoring aquatic ecosystems. Taught with FWCE 559.
Prerequisite(s): FWCE 301 or BIOL 301, CHEM 1225G, MATH 1430G.

FWCE 464. Fish and Wildlife Management, Law, and Policy
3 Credits (3)
The course will focus on the policy and governance surrounding fish and wildlife management with the goal of preparing students for careers in fish and wildlife management.
Learning Outcomes

1. Students can apply the scientific method.
2. Students are proficient the finding, using and applying peer-review literature (access, proper use).
3. Students can communicate effectively via technical writing.
4. Students can disseminate information via oral communication.
5. Students understand the law and policy underlying fish and wildlife management and conservation (North American Model, Public Trust Doctrine).

FWCE 467. Herpetology
4 Credits (4)
Systematics, taxonomy, ecology, behavior, and conservation of amphibians and reptiles. Field trips required. Taught with FWCE 567.
Prerequisite(s): FWCE 330.

FWCE 471. GIS for Natural Resource Scientists
4 Credits (4)
Practical GIS class for students with little or no GIS experience. Class focuses on learning to use industry-standard software and applications in natural resource management. Taught with FWCE 571.
Learning Outcomes

1. Students can articulate principles of fishery and wildlife management and apply ecological principles to conservation.

2. Students can understand concepts related to interconnectedness of habitat, abiotic factors, and FW species common to the Southwest.
3. Students are familiar with methods used to measure environmental variables.
4. Students are familiar with the scientific method and its application.
5. Students will learn to use logic and reasoning to arrive to reasonable conclusions.
6. Students can perform basic data analysis and interpret results to draw meaningful conclusions.

FWCE 472. Wildlife Museum Internship
1-4 Credits (1-4)
Substantial directed work experience in various functions of the wildlife natural history museum developed by the student in consultation with the faculty curator. Internships may involve aspects of collection development and management, public education programs, or other related museum activities. Internship must be approved by the faculty curator. May be repeated up to 9 credits. Consent of Instructor required.
Prerequisite(s): BIOL 2610G and BIOL 2610L.

FWCE 482. Ichthyology
4 Credits (3+1P)
Fishes are an incredibly diverse group and have evolved numerous anatomical, physiological, behavioral, and ecological adaptations. In an effort to better understand how fish function within a broader ecosystem, we will take a holistic view of the group. We will first focus on the phylogeny, physiology, and anatomy of fishes such that we can better understand fishes within an ecological context in the later part of the course. Collectively, our treatment of fish should provide a broad overview that will improve your understanding of the form, function, and ecology of fishes.
Prerequisite: FWCE 330 or consent of instructor.
Learning Outcomes
1. Students will understand concepts related to conservation biology, especially the drivers of biodiversity patterns, biodiversity crisis and its causes, extinction vortex, etc.
2. Students will understand concepts related to the abiotic component of the ecosystem (biomes, lentic zones, nutrient cycling), with an emphasis on global change.
3. Students can identify common vertebrate taxa, arrange them into phylogenetic order, and describe their anatomy, physiology, and natural history.
4. Students can interpret and understand analytical results.

FWCE 509. Population Ecology
3 Credits (3)
This course introduces students to the fundamental theories and quantitative methods of population ecology. It covers topics such as population growth and regulation, demographic analysis, species interactions, and spatial population dynamics. Students will gain hands-on experience in applying these concepts by implementing relevant models and analytical techniques using the open-source statistical software R and Program MARK.
Learning Outcomes
1. Develop and apply deterministic and stochastic population growth models.
2. Construct and interpret life tables and matrix population models.
3. Assess population viability and metapopulation dynamics.
4. Examine species interactions using competition and predation models.
5. Apply quantitative methods to estimate population abundance and survival rates.

FWCE 510. Wildlife Ecology Teaching Practicum
3 Credits (3)
This doctoral-level practicum provides hands-on experience in teaching undergraduate courses in wildlife and fisheries ecology. Students will engage in course planning, instructional delivery, and assessment under faculty supervision. Emphasis is placed on applying evidence-based teaching practices, communicating ecological concepts effectively, and fostering inclusive learning environments. Participants will also reflect on their teaching, receive feedback, and develop a professional teaching portfolio. Designed for future educators and academic professionals, this course prepares students for teaching roles in higher education and science communication. May be repeated once for credit with departmental approval.
Prerequisite: Doctoral standing in the Department of Fish, Wildlife and Conservation Ecology.
Learning Outcomes
1. The students will effectively communicate scientific information verbally and in written format.
2. The students will understand how to conduct scholarly and professional activities in an ethical manner.
3. The students will demonstrate thorough knowledge of their chosen disciplines within fish, wildlife and conservation ecology.

FWCE 512. Scientific Writing
3 Credits (3)
This graduate-level course will guide students through the development of a scientific manuscript suitable for submission to a peer-reviewed journal. We will cover the structure of a scientific paper, how to approach drafting each section, as well as give guidance on the submission and peer-review process, and other ethical considerations such as coauthorship. By the end of this course each student will have produced a manuscript based on their research focus.
Learning Outcomes
1. The students will effectively communicate the importance of their research, research hypotheses, data collection and analytical methods, and study conclusions.
2. The students will effectively communicate their research in writing.

FWCE 515. Graduate Seminar
1 Credit (1)
Current topics.

FWCE 523. Model Selection and Multimodel Inference in Ecology
2 Credits (2)
This course will introduce students to the theory and practice of model selection and multimodel inference in ecology. Both techniques are widely used in ecology, natural resources, and related disciplines and have become essential tools in gaining reliable inference from data. A substantial number of novel model selection techniques have emerged in recent years, and are accompanied by their unique drawbacks and potential pitfalls. The objective of this class if to provide students with background knowledge to select the appropriate model selection and inferential tools and interpret the results with confidence and accuracy. The course will comprise a mixture of short lectures, lab exercises, and discussions of the primary literature. There are no course prerequisites, though students are encouraged to have successfully completed at least one semester of graduate-level statistics.

Learning Outcomes

1. Students will demonstrate theoretical and practical understanding of data analysis methods employed.
2. Students will correctly interpret the results of their data analyses.
3. The students will select and use the most appropriate research methodologies and technologies to address the research questions in their thesis/proposal.

FWCE 524. Structured Decision Making in Fish and Wildlife Management
3 Credits (3)

This course will introduce students to the theory and application of structured decision making (SDM). SDM incorporates human-centered values into the decision making process, identifies a set of actions to achieve those values, and creates models that connect actions to outcomes. Though SDM has long been used in business contexts, SDM has recently been applied to diverse problems in wildlife and fisheries management at local, state, and federal levels. Unlike other decision processes that strive to separate management and scientific endeavors, SDM is a collaborative process that unites managers and scientists, and adds transparency to decision making to promote buy-in and trust. The course will comprise a mixture of lectures, discussions of the primary literature, lab exercises, and mock workshop sessions.

Learning Outcomes

1. Students will demonstrate theoretical and practical understanding of the data analysis methods employed.
2. Students will correctly interpret the results of their analyses.
3. Students will select and use the most appropriate research methodologies and technologies to address the research hypothesis in their thesis/proposal.

FWCE 525. Evidence-Based Conservation and Management
3 Credits (3)

This course will explore theories and concepts that are fundamental to applied conservation management and evaluation. There is increasing need to justify and evaluate conservation and management actions, and this course will provide students with the insight and knowledge on how to consult the best evidence in conservation planning and how to set up and evaluate a conservation action plan. This course also provides insight into systems thinking, which is needed to address the complex problems faced by conservation managers. Finally, this course teaches students a specific adaptive management framework that has been adopted by several leading conservation organizations and agencies. While this course is focused on biodiversity conservation, the concepts covered about systems thinking and applied conservation planning and management will be relevant to a broader audience interested in environmental and natural resources management or stewardship.

Learning Outcomes

1. The students will effectively communicate the importance of their research, research hypotheses, data collection and analytical methods, and study conclusions.
2. The students will effectively communicate their research orally.
3. The students will develop professional working relationships with colleagues and agency personnel.

FWCE 526. Demographic Modeling and Bayesian Inference in Modern Wildlife Management
3 Credits (3)

This course introduces students to the practical application of demographic models in wildlife management. It explores how wildlife laws and regulations are created in the United States, how science is being formally incorporated into the regulatory process, and how advanced quantitative methods are used to connect wildlife ecology with wildlife law. Students will gain hands-on experience using popular software such as R and JAGS to implement these methods within a Bayesian framework.

Learning Outcomes

1. Explain how wildlife laws and regulations are developed and informed by science.
2. Apply advanced demographic models to analyze real-world wildlife datasets.
3. Demonstrate proficiency in statistical software for Bayesian analysis.
4. Interpret and effectively present quantitative findings for management decisions.

FWCE 530. Large Mammal Ecology, Conservation and Management
3 Credits (3)

This course will cover aspects of large mammal ecology, management and conservation. Will include aspects of foraging ecology, resource and habitat selection, competition and resource partitioning, predation and population dynamics. Taught with FWCE 436.

Learning Outcomes

1. Students possesses the ability to develop and articulate appropriate research hypotheses consistent with the overall goals of the thesis research project.
2. The students will effectively communicate their research in writing.

FWCE 531. Mammalogy
4 Credits (3+1P)

Classification, identification, anatomy, physiology, life history, and ecology of mammals. Field trips required.

Learning Outcomes

1. Students will demonstrate theoretical and practical understanding of the data analysis methods employed.
2. Students will effectively communicate their research in writing.
3. Students will effectively communicate their research orally.

FWCE 532. Environmental Biology of Fishes
4 Credits (3+3P)

What makes a fish, a fish? Mechanisms of circulation, gas exchange, osmotic and ionic regulation, swimming, migration, reproduction, and chemoreception will be covered in this class. Taught with FWCE 432; however, students are responsible for all requirements in FWCE 432, plus additional assignments.

FWCE 535. Special Topics
1-4 Credits (1-4)

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

FWCE 537. Wildlife Damage Management
3 Credits (3)

Introduction to basic need and appropriate methods for resolving human-wildlife conflicts and management of animal damage. Socioeconomic, ecological, and political factors. Field trips required. Taught with FWCE 437. Students are responsible for all requirements for FWCE 437 plus additional work. Prerequisite(s): BIOL 2610G, FWCE 2110, FWCE 301 and FWCE 409

FWCE 540. Wildlife Habitat Relationships
4 Credits (4)

The study of wildlife-habitat relationships primarily seeks to describe how the distribution and abundance of resources used for food, cover and security, and constraints on the use of these resources influence the distribution of animals. This course will cover aspects of animal

behavior related to how animals select habitat, theoretical models of habitat selection, the influence of inter- and intra-specific interactions on habitat selection, habitat quality, study designs for wildlife-habitat studies, modeling habitat selection and data analyses.

Learning Outcomes

1. Students can select and use the most appropriate data analysis methodologies given the research design and hypothesis being tested.
2. Students will demonstrate theoretical and practical understanding of the data analysis methods employed.
3. Students will correctly interpret the results of their data analyses.
4. Students will effectively communicate their research in writing.

FWCE 541. Conservation Genetics
3 Credits (3)

This course will provide a broad introduction to the use of molecular markers to address questions in ecology, evolution, behavior, and especially conservation. We will begin by learning about genetic variation and basic population genetic principles, then we will explore the applications of genetic markers for understanding relatedness, population structure, and conservation of biodiversity. Finally, we will discuss how to apply and interpret molecular approaches in conservation.

Learning Outcomes

1. Students will demonstrate theoretical and practical understanding of the data analysis methods employed.
2. Students will correctly interpret the results of their data analyses.
3. The students will effectively communicate the importance of their research, research hypotheses, data collection and analytical methods, and study conclusions.
4. The students will effectively communicate their research in writing.
5. The students will effectively communicate their research orally.

FWCE 542. Wildlife Disease Ecology and Management
4 Credits (3+1P)

This course will provide students with an understanding of the ecological and evolutionary complexity inherent to host-pathogen interactions in wildlife systems. FWCE 442/542 introduces students to parasite and pathogen diversity, core concepts in disease ecology (e.g., pathogen population dynamics, transmission, disease models, virulence), host-pathogen coevolution, community ecology of host-pathogen interactions, and the importance of pathogens in conservation and management. In the laboratory, students will learn basic techniques to isolate pathogens from living organisms, detect pathogens using molecular tools, and model disease outbreaks using bioinformatics. Field trips are required.
Prerequisite: FWCE 2110, FWCE 330.

Learning Outcomes

1. The students can formulate a scientifically sound study/research design linking the overall goals of the thesis research project with the research hypothesis.
2. Students can select and use the most appropriate data analysis methodologies given the research design and hypothesis tested.
3. The students will select and use the most appropriate research methodologies and technologies to address the research hypothesis in their thesis/proposal.
4. The students will effectively communicate the importance of their research hypothesis, data collection and analytical methods, and study conclusions.
5. The students will effectively communicate their research in writing.
6. The students will effectively communicate their research orally.
7. The students will develop professional working relationships with colleagues and agency personnel.

FWCE 546. Conservation Social Sciences
3 Credits (3)

This course provides an overview of social science concepts and research important to the conservation and management of wildlife and natural resources. The course will introduce students to the social, psychological, and economic underpinnings of human dimensions research, and specific approaches used to change human behaviors to improve conservation outcomes. Some of the approaches covered in the course include economic incentives, behavioral nudges, and community-based conservation. Additionally, the course will provide an overview of the methods used by conservation social scientists including participatory, qualitative, and quantitative methods. Students will be challenged to approach human dimensions issues from multiple perspectives. The concepts covered about human dimensions will be relevant to a broad audience interested in environmental and natural resource conservation, management, and stewardship.

Learning Outcomes

1. The students will select and use the most appropriate research methodologies and technologies to address the research hypotheses in their thesis/proposal.
2. The students will effectively communicate the importance of their research, research hypotheses, data collection and analytical methods, and study conclusions.
3. The students will effectively communicate their research in writing.

FWCE 547. Wildlife Law and Policy
3 Credits (3)

Introduction to state and federal laws and policies for wildlife and the historical context for their development. Taught with FWCE 447.

FWCE 548. Graduate Problems
1-3 Credits (1-3)

Individual studies in fishery and wildlife sciences. Maximum of 3 credits per semester. No more than 6 credits of this course and FWCE 598, combined, toward a degree. May be repeated up to 6 credits.

FWCE 557. Ecological Biometry
3 Credits (3)

This course introduces students to fundamental descriptive and inferential statistical methods commonly used in ecological research. Topics include data visualization, estimation, hypothesis testing, and statistical modeling. Students will develop essential skills in summarizing and analyzing ecological data using R, a powerful open-source statistical software. Emphasis will be placed on practical applications of statistics to real-world problems in ecology.

Learning Outcomes

1. Demonstrate a critical understanding of fundamental statistical concepts in ecological contexts.
2. Summarize and visualize ecological data.
3. Apply a range of statistical methods to address real-world ecological problems.
4. Interpret statistical findings and draw inference from ecological data.
5. Demonstrate proficiency in using R for ecological data analysis and visualization.

FWCE 558. Nonthesis Project
1-6 Credits (1-6)

Independent study to satisfy nonthesis project requirement. Maximum of 6 credits toward degree. Available only to nonthesis students. May be repeated up to 6 credits.

FWCE 559. Aquatic Ecology
4 Credits (3+1P)
Ecological functions of plant and animal communities in aquatic ecosystems with emphasis on chemical and physical properties, productivity, species interactions, population dynamics, and concepts for diagnosing problems and restoring aquatic ecosystems. Taught with FWCE 459.
Prerequisite: FWCE 301 or BIOL 301, CHEM 1225G, MATH 1430G.
Learning Outcomes
1. Students can possesses the ability to develop and articulate appropriate research hypotheses consistent with the overall goals of the thesis research project.
2. Students can select and use the most appropriate data analysis methodologies given the research design and hypothesis being tested.
3. The students will effectively communicate the importance of their research, research hypotheses, data collection and analytical methods, and study conclusions.
4. The students will effectively communicate their research in writing.
5. The students will effectively communicate their research orally.
6. The students will select and use the most appropriate research methodologies and technologies to address the research hypotheses in their thesis/proposal.
7. Students will correctly interpret the results of their data analyses.
8. Students can formulate a scientifically sound study/research design linking the overall goals of the thesis research project with the research hypothesis.

FWCE 567. Herpetology
4 Credits (3+1P)
Systematics, taxonomy, ecology, behavior and conservation of amphibians and reptiles. Field trips required. Taught with FWCE 467.
Learning Outcomes
1. The students can formulate a scientifically sound study/research design linking the overall goals of the thesis research project with the research hypothesis.
2. Students will demonstrate theoretical and practical understanding of the data analysis methods employed.
3. The students will select and use the most appropriate research methodologies and technologies to address the research hypothesis in their thesis/proposal.
4. The students will effectively communicate the importance of their research hypothesis, data collection and analytical methods, and study conclusions.
5. The students will develop professional working relationships with colleagues and agency personnel.

FWCE 571. GIS for Natural Resource Scientists
4 Credits (4)
Practical GIS class for students with little or no GIS experience. Class focuses on learning to use industry-standard software and applications in natural resource management. Taught with FWCE 471.
Learning Outcomes
1. Students can select and use the most appropriate data analysis methodologies given the research design and hypothesis being tested.
2. Students will demonstrate theoretical and practical understanding of the data analysis methods employed.
3. Students will correctly interpret the results of their data analyses.
4. Students will select and use the most appropriate research methodologies and technologies to address the research hypotheses in their proposal.

FWCE 582. Ichthyology
4 Credits (4)
Fishes are an incredibly diverse group and have evolved numerous anatomical, physiological, behavioral, and ecological adaptations. In an effort to better understand how fish function within a broader ecosystem, we will take a holistic view of the group. We will first focus on the phylogeny, physiology, and anatomy of fishes such that we can better understand fishes within an ecological context in the later part of the course. Collectively, our treatment of fish should provide a broad overview that will improve your understanding of the form, function, and ecology of fishes. Taught with FWCE 482.
Learning Outcomes
1. Students understand the major precepts of evolutionary biology.
2. Students can understand concepts related to interconnectedness of habitat, abiotic factors, and FW species common to the Southwest.
3. Students can identify common vertebrate taxa, arrange them into phylogenetic order, and describe their anatomy and physiology.
4. Students can communicate effectively via technical writing.
5. Students will develop professional (field skills) and interpersonal skills (working in groups).

FWCE 598. Special Research Programs
1-3 Credits (1-3)
Individual investigations, either analytical or experimental. Maximum of 3 credits per semester. No more than 6 credits of this course and FWCE 548, combined, toward a degree. Not available to students in the nonthesis program. May be repeated up to 6 credits.

FWCE 599. Master's Thesis
1-9 Credits (1-9)
Thesis. May be repeated up to 30 credits. Thesis/Dissertation Grading.

FWCE 690. Doctoral Seminar
1 Credit (1)
This doctoral-level seminar provides an interdisciplinary forum for engaging with a distinguished seminar series featuring guest speakers from academia, government agencies, national laboratories, non-governmental organizations (NGOs), and industry. Through weekly presentations and discussions, students gain exposure to cutting-edge research, policy-relevant insights, and real-world applications across a range of fields. The course emphasizes critical analysis, cross-sector dialogue, and professional development. Students will prepare for and respond to each seminar through guided readings, written reflections, and facilitated discussions. Designed to foster intellectual breadth and career-relevant perspectives, this seminar supports doctoral students in connecting their research to broader societal challenges and opportunities. May be repeated up to 2 credits.
Learning Outcomes
1. Students will demonstrate theoretical and practical understanding of the data analysis methods employed.
2. Students will correctly interpret the results of their data analyses.
3. The students will select and use the most appropriate research methodologies and technologies to address the research hypotheses in their thesis/proposal.

4. The students will effectively communicate the importance of their research, research hypotheses, data collection and analytical methods, and study conclusions.
5. The students will develop professional working relationships with colleagues and agency personnel.

FWCE 699. Doctoral Research
1-18 Credits (1-18)
Research units that are preformed prior to the students comprehensive exam. May be repeated up to 88 credits.
Learning Outcomes
1. Students will be able to formulate hypotheses and conduct research.
2. Students will demonstrate thorough knowledge of their chosen discipline in Fish, Wildlife and Conservation Ecology.

Office Location: Knox Hall 132

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Website: http://aces.nmsu.edu/academics/fws/

Conservation Ecology - Bachelor of Science in Conservation Ecology

Co-directors of the Program:

Professor, Charles Shuster, Department Head, Biology
Professor, Matthew Gompper, Department Head, Fish, Wildlife and Conservation Ecology

Professors Bailey, Boecklen, Boeing, Caldwell, Cowley, Desmond, Gompper, Hanley, Houde, James, Milligan, Roemer, Smith, Wright; ***Associate Professors*** Cain, Mabry; ***Assistant Professors*** Orr

New Mexico State University offers an interdisciplinary, undergraduate program in Conservation Ecology. The goal of this program is to train biologists for the current and future challenges that we face in the conservation and wise use of our Earth's natural resources. An overriding principle of the program is to provide a solid foundation in basic science coupled with a practical approach towards sustainability and stewardship. The curriculum encompasses several disciplines and includes a wide variety of courses from the Biology; Fish, Wildlife and Conservation Ecology; Geography; and Range Science departments.

The educational experience will provide students with an overview of global biodiversity and an understanding of the ecological and evolutionary processes that have created and sustained it. Courses in population and community ecology coupled with population viability analysis and risk assessment will give students the necessary background to understand the theory and development of these fields as well as the tools to tackle real-world problems. Courses in basic genetics, evolution, and conservation genetics will expose students to the importance of conserving genetic variation in order to maintain adaptive potential within populations, thereby sustaining the evolutionary process. Students will also receive background on wildlife law and environmental policy, information vital for assisting governing bodies in making decisions regarding the protection and wise use of our natural resources. Skills obtained in the application of geographic information systems, molecular genetics, and professional communication can also be acquired through various electives. In sum, we seek to provide undergraduate students with an education that will allow them the opportunity to contribute to the conservation of all life on Earth.

The requirements are listed below. In addition, each required course must be passed with a grade of C- or better.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1 [1]		*4*
English Composition - Level 2		*3*
ENGL 2210G	Professional and Technical Communication (preferred)	
Oral Communication [1]		*3*
Area II: Mathematics		*3-4*
MATH 1430G	Applications of Calculus I [2]	
or MATH 1521G	Calculus and Analytic Geometry II	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Choose one from the following (3 credits):		
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
FWCE 1110G	Introduction to Natural Resources Management	4
Viewing a Wider World		**3**
One VWW course will be met with the 9-credit rule [3]		
Major Requirements		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 301	Principles of Ecology	3
or FWCE 301	Wildlife Ecology	
BIOL 305	Principles of Genetics	3
or AGRO 305	Principles of Genetics	
BIOL 312	Plant Taxonomy	3
or RGSC 316	Rangeland Plants	
BIOL 313	Structure and Function of Plants	3
BIOL 322	Zoology	3
BIOL 455	Biometry	3
or FWCE 457	Ecological Biometry	
BIOL 462	Conservation Biology	3
BIOL 467	Evolution	3
BIOL 488	Principles of Conservation Genetics	3

FWCE 2110	Principles of Fish and Wildlife Management	3
FWCE 330	Natural History of the Vertebrates	4
FWCE 402	Seminar in Natural Resource Management	1
FWCE 409	Introduction to Population Ecology	3
FWCE 447	Wildlife Law and Policy	3
FWCE 464	Fish and Wildlife Management, Law, and Policy	3
Physiology Requirement		*3-4*
BIOL 314	Plant Physiology	
BIOL 354 & 354 L	Physiology of Humans and Laboratory of Human Physiology	
BIOL 381	Animal Physiology	
ANSC 370	System Physiology of Farm Animals	
FWCE 432	Environmental Biology of Fishes	
Diversity of Life Requirement		*6-8*
BIOL 480	Animal Behavior	
EPWS 303	Economic Entomology	
EPWS 462	Parasitology	
FWCE 430	Avian Field Ecology	
FWCE 431	Mammalogy	
FWCE 467	Herpetology	
FWCE 482	Ichthyology	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
CHEM 2120 & 2120L	Integrated Organic Chemistry and Biochemistry and Integrated Organic Chemistry and Biochemistry Lab	4
Choose one from the following:		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
Choose one from the following:		4
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**6-10**
Select additional electives to bring total to 120 credits including 48 upper division credits. [5]		
Total Credits		**120**

1. See the General Education (p. 262) Section of the catalog for a full list of courses.
2. Either MATH 1430G Applications of Calculus I or MATH 1521G Calculus and Analytic Geometry II is required for the degree but students may need to take any prerequisites needed to enter these courses.
3. One Viewing a Wider World (p. 266) course will be satisfied using the 9-hour rule: students with Biology as home department use FWCE courses and students with Fish, Wildlife and Conservation Ecology as home department use BIOL courses.
4. Other related courses may include BIOL 436 Disease Vector Biology, BIOL 442 Genomics Technology, BIOL 446 Bioinformatics and NCBI Database, BIOL 469 Biology of Emerging Infectious Diseases, ECON 337V Natural Resource Economics, GEOG 381 Cartography and GIS, GEOG 481 Fundamentals of GIS, GEOL 1110G Physical Geology, GEOL 424 Soil Chemistry, POLS 378 U.S.-Mexico Border Politics, RGSC 318 Watershed Management, RGSC 325 Rangeland Restoration Ecology, RGSC 452 Vegetation Measurements for Rangeland Assessment.
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credits in the requirements list is the amount needed to bring the total to 120 credits and may vary based on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Science in Conservation Ecology there is no second language requirement for the degree.

Fisheries and Wildlife Science (Aquatic Ecology and Management) - Bachelor of Science in Fish, Wildlife and Conservation Ecology

The Department of Fish, Wildlife and Conservation Ecology prepares you for careers in a variety of natural resource fields related to the management of wild animal populations and the natural systems they share.

To graduate, an overall grade point average of 2.0 is required in courses taken in the major field and in all courses taken at NMSU. In addition, each required course must be passed with a grade of C- or better. The department offers a minor in Fish, Wildlife and Conservation Ecology for students majoring in other disciplines. The minor includes a minimum of 18 credit hours.

The Aquatic Ecology and Management Concentration is for students who want to focus on fish and aquatic systems.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
or HNRS 2175G	Introduction to Communication Honors	
COMM 1130G	Public Speaking	

Area II: Mathematics		
MATH 1430G	Applications of Calculus I [1]	3-4
or MATH 1511G	Calculus and Analytic Geometry I	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
ECON 2110G	Macroeconomic Principles	
or ECON 2120G	Principles of Microeconomics Honors	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
Select one from the following:		
PHYS 1115G	Survey of Physics with Lab	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
Viewing a Wider World [3]		**3**
The second VWW requirment (3 credits) may be filled with the 9-credit hour rule. Please see your advisor for more information.		
Departmental/College Requirements		
Departmental Core Courses (29 credits)		
FWCE 1110G	Introduction to Natural Resources Management [4]	4
or FWCE 1120	Contemporary Issues in Wildlife and Natural Resources Management	
FWCE 2110	Principles of Fish and Wildlife Management	3
FWCE 301	Wildlife Ecology	3
FWCE 330	Natural History of the Vertebrates	4
FWCE 391	Internship	1
FWCE 393	Professional Experience and Communication	3
FWCE 402	Seminar in Natural Resource Management	1
FWCE 409	Introduction to Population Ecology	3
FWCE 457	Ecological Biometry	3
FWCE 464	Fish and Wildlife Management, Law, and Policy	
or FWCE 325	Human Dimensions of Fish and Wildlife	
Departmental Botany Requirements (9 credits)		
BIOL 312	Plant Taxonomy	3
or RGSC 316	Rangeland Plants	
BIOL 313	Structure and Function of Plants	3
Select one from the following:		3
BIOL 314	Plant Physiology	
RGSC 325	Rangeland Restoration Ecology	
RGSC 357	Grass Taxonomy and Identification	
RGSC 440	Rangeland Resource Ecology	
Departmental Physiology Requirements (3-4 credits)		
Select 3-4 credits from the following:		3-4
ANSC 370	System Physiology of Farm Animals	
BIOL 314	Plant Physiology	
BIOL 381	Animal Physiology	
FWCE 432	Environmental Biology of Fishes	
Concentration Coursework		
Techniques		
FWCE 357	Fisheries Management and Analysis	4
Management		
Choose one from the following:		3-4
FWCE 434	Aquatic Contaminants and Toxicology	
FWCE 459	Aquatic Ecology	
RGSC 318	Watershed Management	
Organismal Biology		
Choose one from the following: [5]		3-4
EPWS 462	Parasitology	
FWCE 467	Herpetology	
FWCE 482	Ichthyology	
Wildlife Ecology and Management Electives [6]		*3-4*
Non-Departmental Requirements (in addition to Gen.Ed/VWW) [7]		
AGRO 305	Principles of Genetics	3
or BIOL 305	Principles of Genetics	
A ST 311	Statistical Applications	3
BIOL 322	Zoology	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
Select one from the following:		4
GEOL 1110G	Physical Geology	
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	
Second Language: (not required)		
Electives, to bring the total credits to 120 [8]		**4-9**
Total Credits		**117**

1. MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1430G or MATH 1511G first.
2. See General Education (p. 262) section of the catalog for a full list of courses.
3. See Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
   Three credits can be taken inside the College of ACES, but three credits must also be taken outside the College of ACES or 9 credits can be taken within a single department (e.g. Biology) that is outside the College of Aces.
4. Off campus students can take FWCE 1120 Contemporary Issues in Wildlife and Natural Resources Management Distance Education.
5. At least one course chosen must be a vertebrate taxonomy course with FWCE prefix, i.e., one of FWCE 467 Herpetology or FWCE 482 Ichthyology.
6. Wildlife Concentration Electives (any course for 3-4 credits from the Techniques, Management or Organismal Biology areas):

   Techniques
   - FWCE 355 Wildlife Management and Analysis

   Management
   - FWCE 437 Wildlife Damage Management
   - FWCE 447 Wildlife Law and Policy
   - RGSC 325 Rangeland Restoration Ecology

   Organismal Biology
   - BIOL 484 Animal Communication
   - EPWS 303 Economic Entomology

- EPWS 462 Parasitology
- FWCE 430 Avian Field Ecology
- FWCE 431 Mammalogy
- FWCE 467 Herpetology

[7] Students intending to pursue graduate studies should also take CHEM 2115 Survey of Organic Chemistry and Laboratory.

[8] Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Additional Electives

Take additional credits so the total adds up to at least 120 credits including 55 credits 300- and 400-level classes.

Students are encouraged to pursue a minor course of study with a department of their choosing.

Compatible minors include, but are not limited to:

- animal science,
- biology,
- chemistry,
- environmental science,
- forensic sciences,
- geography,
- journalism,
- management,
- and range science.

Notes:

1. No more than 6 credits of Physical Education classes will count towards your degree.
2. Maximum of two grades of 'D' in FWCE classes will count towards a student's degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1430G Applications of Calculus I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
MATH 1430G	Applications of Calculus I [1]	3
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
FWCE 1110G	Introduction to Natural Resources Management	4
ACES 1120	Freshman Orientation	1
Area V: Humanities Course [2]		3
	Credits	**15**
Semester 2		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory [1]	4
FWCE 2110	Principles of Fish and Wildlife Management	3
Choose from one of the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	
Area VI: Creative and Fine Arts [2]		3
Choose from one of the following:		3
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
	Credits	**16**
Second Year		
Semester 1		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [1]	4
FWCE 301	Wildlife Ecology	3
PHYS 1115G	Survey of Physics with Lab	4
Elective Course		4
	Credits	**15**
Semester 2		
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [1]	4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 313	Structure and Function of Plants	3
Choose from one of the following:		4
FWCE 434	Aquatic Contaminants and Toxicology	
FWCE 459	Aquatic Ecology	
RGSC 318	Watershed Management	
	Credits	**15**
Third Year		
Semester 1		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
BIOL 322	Zoology (Fall Only) [1]	3
A ST 311	Statistical Applications [1]	3
VWW: Viewing a Wider World Course [3]		3
Choose from one of the following:		4
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory [1]	
GEOL 1110G	Physical Geology [1]	
	Credits	**16**
Semester 2		
FWCE 330	Natural History of the Vertebrates (Spring Only) [1]	4
FWCE 357	Fisheries Management and Analysis (Spring Only in Even Years) [1]	4
Choose from one of the following:		4
EPWS 462	Parasitology	
FWCE 467	Herpetology [1]	
FWCE 482	Ichthyology [1]	

Elective Course		2
	Credits	**14**
Fourth Year		
Semester 1		
FWCE 391	Internship (Fall Only must be taken with FWCE 393) [1]	1
FWCE 393	Professional Experience and Communication (Fall Only Must be taken with FWCE 391) [1]	3
BIOL 312	Plant Taxonomy (Fall Only) [1]	3
FWCE 457	Ecological Biometry (Fall Only) [1]	3
FWCE 402	Seminar in Natural Resource Management	1
Choose from one of the following:		3
BIOL 305	Principles of Genetics [1]	
AGRO 305	Principles of Genetics [1]	
Elective Course		1
	Credits	**15**
Semester 2		
FWCE 409	Introduction to Population Ecology (Spring Only)	3
FWCE 464 or FWCE 325	Fish and Wildlife Management, Law, and Policy (Spring Only) [1] or Human Dimensions of Fish and Wildlife	3
BIOL 314	Plant Physiology (Spring Only) [1]	3
Choose from one of the following:		4
ANSC 370	System Physiology of Farm Animals [1]	
BIOL 314	Plant Physiology [1]	
BIOL 381	Animal Physiology [1]	
Elective Course		1
	Credits	**14**
	Total Credits	**120**

1. These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
   Three credits can be taken inside the College of ACES, but three credits must also be taken outside the College of ACES or 9 credits can be taken within a single department (e.g. Biology) that is outside the College of Aces.

Fisheries and Wildlife Science (Wildlife Ecology and Management) - Bachelor of Science in Fish, Wildlife and Conservation Ecology

The Department of Fish, Wildlife and Conservation Ecology prepares you for careers in a variety of natural resource fields related to the management of wild animal populations and the natural systems they share.

To graduate, an overall grade point average of 2.0 is required in courses taken in the major field and in all courses taken at NMSU. In addition, each required course must be passed with a grade of C- or better. The department offers a minor in Fish, Wildlife and Conservation Ecology for students majoring in other disciplines. The minor includes a minimum of 18 credit hours.

The Wildlife Ecology and Management Concentration is for students who plan to focus on terrestrial organisms.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
or HNRS 2175G	Introduction to Communication Honors	
COMM 1130G	Public Speaking	
Area II: Mathematics		
MATH 1430G	Applications of Calculus I [1]	3-4
or MATH 1511G	Calculus and Analytic Geometry I	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
ECON 2110G	Macroeconomic Principles	
or ECON 2120G	Principles of Microeconomics Honors	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
Select one from the following:		
PHYS 1115G	Survey of Physics with Lab	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
Viewing a Wider World [3]		**3**
The second VWW requirment (3 credits) may be filled with the 9-credit hour rule. Please see your advisor for more information.		
Departmental/College Requirements		
Departmental Core Courses (29 credits)		
FWCE 1110G	Introduction to Natural Resources Management [4]	4
FWCE 2110	Principles of Fish and Wildlife Management	3

FWCE 301	Wildlife Ecology	3
FWCE 330	Natural History of the Vertebrates	4
FWCE 391	Internship	1
FWCE 393	Professional Experience and Communication	3
FWCE 402	Seminar in Natural Resource Management	1
FWCE 409	Introduction to Population Ecology	3
FWCE 457	Ecological Biometry	3
FWCE 464	Fish and Wildlife Management, Law, and Policy	3
or FWCE 325	Human Dimensions of Fish and Wildlife	
Departmental Botany Requirements (9 credits)		
BIOL 312	Plant Taxonomy	3
or RGSC 316	Rangeland Plants	
BIOL 313	Structure and Function of Plants	3
Select one from the following:		3
BIOL 314	Plant Physiology	
RGSC 325	Rangeland Restoration Ecology	
RGSC 357	Grass Taxonomy and Identification	
RGSC 440	Rangeland Resource Ecology	
Departmental Physiology Requirements (3-4 credits)		
Select 3-4 credits from the following:		3-4
ANSC 370	System Physiology of Farm Animals	
BIOL 314	Plant Physiology	
BIOL 381	Animal Physiology	
FWCE 432	Environmental Biology of Fishes	
Concentration Coursework		
Techniques		
FWCE 355	Wildlife Management and Analysis	4
Management		
Choose one from the following:		3-4
FWCE 437	Wildlife Damage Management	
FWCE 447	Wildlife Law and Policy	
RGSC 325	Rangeland Restoration Ecology	
Organismal Biology		
Choose one from the following: [5]		3-4
BIOL 484	Animal Communication	
EPWS 303	Economic Entomology	
EPWS 462	Parasitology	
FWCE 430	Avian Field Ecology	
FWCE 431	Mammalogy	
FWCE 467	Herpetology	
Aquatic Ecology and Management Electives [6]		*3-4*
Non-Departmental Requirements (in addition to Gen.Ed/VWW) [7]		
AGRO 305	Principles of Genetics	3
or BIOL 305	Principles of Genetics	
A ST 311	Statistical Applications	3
BIOL 322	Zoology	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
Select one from the following:		4
GEOL 1110G	Physical Geology	
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	
Second Language: (not required)		
Electives, to bring the total credits to 120 [8]		**4-9**
Total Credits		**120**

1. MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1430G or MATH 1511G first.
2. See General Education (p. 262) section of the catalog for a full list of courses.
3. See Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
   Three credits can be taken inside the College of ACES, but three credits must also be taken outside the College of ACES or 9 credits can be taken within a single department (e.g. Biology) that is outside the College of Aces.
4. Off campus students can take FWCE 1120 Contemporary Issues in Wildlife and Natural Resources Management Distance Education.
5. At least one course chosen must be a vertebrate taxonomy course with FWCE prefix, i.e., one of FWCE 467 Herpetology or FWCE 482 Ichthyology.
6. Aquatic Concentration Electives, at least one course chosen must be a vertebrate taxonomy course with FWCE prefix
   (i.e., one of FWCE 430 Avian Field Ecology, FWCE 431 Mammalogy, or FWCE 467 Herpetology)
7. Students intending to pursue graduate studies should also take CHEM 2115 Survey of Organic Chemistry and Laboratory.
8. Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Additional Electives

Take additional credits so the total adds up to at least 120 credits including 55 credits 300- and 400-level classes.

Students are encouraged to pursue a minor course of study with a department of their choosing.

Compatible minors include, but are not limited to:

- animal science,
- biology,
- chemistry,
- environmental science,
- forensic sciences,
- geography,
- journalism,
- management,
- and range science.

Notes:

1. No more than 6 credits of Physical Education classes will count towards your degree.
2. Maximum of two grades of 'D' in FWCE classes will count towards a student's degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1430G Applications of Calculus I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
MATH 1430G	Applications of Calculus I [1]	3
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
FWCE 1110G	Introduction to Natural Resources Management	4
Area V: Humanities Course [2]		3
ACES 1120	Freshman Orientation	1
	Credits	**15**
Semester 2		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory [1]	4
FWCE 2110	Principles of Fish and Wildlife Management	3
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
Area VI: Creative and Fine Arts Course [2]		3
Elective Course		3
	Credits	**16**
Second Year		
Semester 1		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [1]	4
Choose from one of the following:		3
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
PHYS 1115G	Survey of Physics with Lab	4
FWCE 301	Wildlife Ecology [1]	3
	Credits	**14**
Semester 2		
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [1]	4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 313	Structure and Function of Plants (Spring Only)	3
Choose from one of the following:		3
FWCE 437	Wildlife Damage Management	
FWCE 447	Wildlife Law and Policy	
RGSC 325	Rangeland Restoration Ecology	
	Credits	**14**
Third Year		
Semester 1		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
BIOL 322	Zoology (Fall Only) [1]	3
A ST 311	Statistical Applications [1]	3
VWW: Viewing a Wider World Course [3]		3
Choose from one of the following:		4
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory [1]	
GEOL 1110G	Physical Geology [1]	
	Credits	**16**
Semester 2		
FWCE 330	Natural History of the Vertebrates (Spring Only) [1]	4
FWCE 355	Wildlife Management and Analysis (Spring Only in Odd Years) [1]	4
Choose from one of the following:		3-4
BIOL 484	Animal Communication	
EPWS 303	Economic Entomology	
EPWS 462	Parasitology	
FWCE 430	Avian Field Ecology [1]	
FWCE 431	Mammalogy [1]	
FWCE 467	Herpetology [1]	
Elective Course [3]		4
	Credits	**15-16**
Fourth Year		
Semester 1		
FWCE 391	Internship (Fall Only Must be taken with FWCE 393) [1]	1
FWCE 393	Professional Experience and Communication (Fall Only Must be taken with FWCE 391) [1]	3
BIOL 312	Plant Taxonomy (Fall Only) [1]	3
FWCE 402	Seminar in Natural Resource Management	1
FWCE 457	Ecological Biometry (Fall Only) [1]	3
Choose from one of the following:		3
AGRO 305	Principles of Genetics [1]	
BIOL 305	Principles of Genetics [1]	
Elective Course		3
	Credits	**17**
Semester 2		
FWCE 409	Introduction to Population Ecology (Spring Only) [1]	3
FWCE 464 or FWCE 325	Fish and Wildlife Management, Law, and Policy [1] or Human Dimensions of Fish and Wildlife	3
Elective Course		1
Choose from one of the following:		3
BIOL 314	Plant Physiology [1]	
RGSC 357	Grass Taxonomy and Identification [1]	
RGSC 440	Rangeland Resource Ecology [1]	
Choose one from the following:		3
BIOL 314	Plant Physiology	
RGSC 325	Rangeland Restoration Ecology	
RGSC 357	Grass Taxonomy and Identification	
RGSC 440	Rangeland Resource Ecology	
	Credits	**13**
	Total Credits	**120-121**

[1] These courses have prerequisites or co-requisites, and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses.

[2] See the General Education (p. 262) section of the catalog for a full list of courses.
[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Conservation Ecology - Undergraduate Minor

A minor in Conservation Ecology is available for students who choose to major in other areas, but wish to include Conservation Ecology in their academic training. A minor in Conservation Ecology must include a minimum of 20 credits in the discipline with 9 of these coming from upper-division courses.

Requirements

Prefix	Title	Credits
Core Curriculum		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
BIOL 301	Principles of Ecology	3
or FWCE 301	Wildlife Ecology	
BIOL 462	Conservation Biology	3
FWCE 2110	Principles of Fish and Wildlife Management	3
FWCE 402	Seminar in Natural Resource Management	1
Select 6 credits from the following:		6
BIOL 312	Plant Taxonomy	
or RGSC 316	Rangeland Plants	
BIOL 313	Structure and Function of Plants	
BIOL 322	Zoology	
BIOL 467	Evolution	
BIOL 480	Animal Behavior	
BIOL 488	Principles of Conservation Genetics	
ECON 384V	Water Resource Economics	
ECON 337V	Natural Resource Economics	
EPWS 303	Economic Entomology	
EPWS 462	Parasitology	
FWCE 330	Natural History of the Vertebrates	
FWCE 409	Introduction to Population Ecology	
FWCE 430	Avian Field Ecology	
FWCE 431	Mammalogy	
FWCE 447	Wildlife Law and Policy	
FWCE 464	Management of Aquatic and Terrestrial Ecosystems	
FWCE 467	Herpetology	
FWCE 482	Ichthyology	
Total Credits		**20**

Wildlife Science - Undergraduate Minor

The Department offers a minor in Wildlife Science for students majoring in other disciplines. The minor consists of a minimum of 18 credit hours.

Prefix	Title	Credits
Required Courses		
FWCE 1110G	Introduction to Natural Resources Management	4
FWCE 2110	Principles of Fish and Wildlife Management	3
FWCE 301	Wildlife Ecology	3
FWCE 330	Natural History of the Vertebrates	4
FWCE 402	Seminar in Natural Resource Management	1
FWCE 464	Management of Aquatic and Terrestrial Ecosystems	3
Total Credits		**18**

Plant and Environmental Sciences

Undergraduate Program Information

The undergraduate program in Plant and Environmental Science prepares you for a variety of careers in agriculture and related fields. Accordingly, a flexible curriculum has been designed that will allow specific programs to be developed in consultation with your academic advisor. Programs may also be developed if you wish to prepare for advanced studies in graduate school. In addition to the courses listed for each major, 35 credits must be taken in the College of Agricultural, Consumer and Environmental Sciences, and the university general education requirements must be met.

The minors require a minimum of 18 credits of which at least 9 hours must be at the 300 or higher level. Specific coursework requirements apply. See advisor for course requirements and scheduling.

Graduate Program Information

More than ever, we are linked in an interconnected world: both in agriculture and sustainability of environmental systems. The department has programs in

- plant sciences,
- environmental science,
- soil science,
- water management,
- natural resources management and
- turf management.

Students trained in these areas are in demand for U.S. and international positions. This demand is at all levels of training–BS, MS, and Ph.D. Therefore, the course work and original research in Plant and Environmental Sciences leading to the Master of Science and Doctor of Philosophy are designed for and have proven to be successful in preparing students for commercial companies, educational institutions, governmental agencies and private production enterprises.

The student may emphasize study in several discipline areas described in the following pages.

- The agronomy section emphasizes sustainable crop production, plant-pest/disease/weed interactions, soil-water-plant relations, crop physiology, and breeding and genetics of cotton, alfalfa, maize and peanuts.
- The genetics section places special emphasis on genetic basis of agronomic or horticultural traits, applied bioinformatics, gene regulation and genomics.

- The environmental and soil science sections emphasize environmental quality and ecosystem services, bioremediation, recycling of organic wastes and wastewater, water use efficiency, soil-plant relations, soil-geomorphology and desert ecology, and the fertility, chemistry, physics, and microbiology of soils, including forest soils.
- The horticulture section emphasizes the creative use of plants by humans, and studies on the technical advancements in the husbandry of most economic commodity groups of fruits, vegetables, or ornamentals as well as managed turf. Emphasis may be in breeding and genetics of chile or onions, plant growth and development, nutrition, dormancy and cold hardiness, plant stress (water and/or salinity) response, fruit and vegetable physiology, forestry, and turfgrass.

Most students will be expected to complete a thesis. The research detailed in a thesis should be of a scope and quality to merit publication in a refereed journal. Depending on prior training and experience, a non-thesis option is available subject to approval by a departmental committee. The non-thesis option requires completion of a research project and paper of limited scope. In both the thesis and non-thesis options, suitability of the research project and resulting thesis or paper will be judged by the student's graduate committee. A minor is recommended and may be taken in chemistry, biology, molecular biology, environmental management, applied statistics, toxicology or other areas.

Prerequisite to major graduate work is completion of a curriculum essentially equivalent to that required by the department for the BS degree at New Mexico State University.

Degrees for the Department

Bachelor Degree(s)

- Agronomy - Bachelor of Science in Agriculture (p. 458)
- Environmental Science - Bachelor of Science in Environmental Science (p. 460)
- Genetics and Biotechnology - Bachelor of Science in Genetics (p. 462)
- Horticulture (Turfgrass Science and Management) - Bachelor of Science in Agriculture (p. 467)
- Horticulture - Bachelor of Science in Agriculture (p. 464)
- Soil Science (Environment and Resource Management) - Bachelor of Science in Agriculture (p. 470)
- Soil Science (Soil and Water Science) - Bachelor of Science in Agriculture (p. 472)
- Soil Science (Soils) - Bachelor of Science in Agriculture (p. 474)

Master Degree(s)

- Horticulture - Master of Science (p. 168)
- Plant and Environmental Science - Master of Science (p. 180)

Doctoral Degree(s)

- Plant and Environmental Science - Doctor of Philosophy (p. 233)

Certificate(s)

- Sustainability - Graduate Certificate (p. 251)

Minors for the Department

- Agronomy - Undergraduate Minor (p. 476)
- Environmental Science - Undergraduate Minor (p. 476)
- Genetics and Biotechnology - Undergraduate Minor (p. 476)
- Horticulture - Undergraduate Minor (p. 477)
- Soil Science - Undergraduate Minor (p. 477)

Anowar Islam, Department Head

Professors Angadi, Burney, Carroll, Cramer, Goss, Hanan, Heerema, Idowu, Islam, Leinauer, Lombard, Marsalis, Pratt, Ulery, Walker, Yao; ***Associate Professors*** Brungard, Darapuneni, Djaman, Ghimire, Grover, Guzman, Holguin, Salmasi; ***Assistant Professors*** Chavez, Li, Lozada, Thompson; ***College Professors*** Lauriault, Puppala, Stringam; ***College Associate Professors*** DuBois, Gioannini, Steele; ***Research Assistant Professors*** Anchang, Edwards, Kahiu, Rodriguez-Uribe; ***Emeriti*** Bosland, Guldan, Mexal, Monger, O'Connell, O'Neill, Picchioni, Ray, Sengupta-Gopalan, St. Hillaire; ***Affiliate faculty*** Kahn, Pietrasiak, Rucker, Schooley, Webb

A. Islam Department Head, Ph.D. (University of Sydney, Australia)–forage agroecology; J. Anchang, Ph.D. (University of South Florida)-remote sensing and dryland ecology; S. Angadi, Ph.D. (University of Manitoba, Canada)–crop physiology; C. Brungard, Ph.D. (Utah State University, Logan)–pedology; O. Burney, Ph.D. (Purdue University, West Lafayette)–silviculture and forest biology; K.C. Carroll, Ph.D. (University of Arizona)–hydrology and water resources; M.Y. Chavez, Ph.D. (Colorado State University)-agroecology and agrovoltaics; C.S. Cramer, Ph.D. (North Carolina State University)–onion breeding and horticulture; M. Darapuneni, Ph.D. (Texas A&M, College Station)–Agronomy and semi-arid crop rotations; K. Djaman, Ph.D. (University of Nebraska-Lincoln)-soil & water resources and irrigation engineering; D. DuBois, Ph.D. (University of Nevada)–atmospheric science; B. Edwards, Ph.D. (Louisiana State University)-geomorphology, aeolian processes; R. Ghimire, Ph.D. (University of Wyoming, Laramie)–soil & crop management; R. Gioannini, M.S. (New Mexico State University)-ornamental horticulture, landscape design; R.M. Goss, Ph.D. (University of Nebraska, Lincoln)–turf science; K. Grover, Ph.D. (Pennsylvania State University)–agronomy; I. Guzman, Ph.D. (New Mexico State University)–horticulture; N.P. Hanan, Assistant Department Head, Ph.D. (Queen Mary College, UK)–dryland ecology; R.J. Heerema, Ph.D. (University of California, Davis)–pecans; F.O. Holguin, Ph.D. (New Mexico State University)–biochemical analysis; J. Idowu, Ph.D. (Cranfield University, United Kingdom)–agronomy and land management; M.N. Kahiu, Ph.D. (South Dakota State University)-savannah ecology and remote sensing; M. Kahn, PhD. (CA Institute of Technology)-molecular biology; B. Leinauer, Ph.D. (Hohenheim University, Germany)–turfgrass; X. Li, Ph.D. (Oklahoma State University)-soil microbiology, fertility, and soil health; K. Lombard, Ph.D. (New Mexico State University)–horticulture; D. Lozada Ph.D. (University of Arkansas, Fayetteville)-cell and molecular biology; M. Marsalis, Ph.D. (Texas Tech University)–forages; N. Pietrasiak, Ph.D. (University of California, Riverside)–soil and water sciences; R. Pratt, Ph.D. (Purdue University)–plant breeding and genetics; N. Puppala, Ph.D. (New Mexico State University)–plant breeding and genetics; L. Rodriguez-Uribe. Ph.D. (New Mexico State University)-molecular genetics; D. Rucker, Ph.D. (University of Arizona)–hydrogeophysics; S.Z. Salmasi, Ph.D. (University of Tabriz, Iran)-sustainable crop management; R. Schooley, PhD. (Colorado State University)-wildlife ecology and management; B. Stringam, Ph.D. (Utah State University)–biological and agricultural engineering; C. Steele, Ph.D. (King's College, University of London, United Kingdom)–range soils; M. Thompson, Ph.D. (New Mexico State University)–horticulture; A.L. Ulery, Ph.D. (University of California, Riverside)–environmental soil chemistry; S. J. Walker, Ph.D. (New Mexico State University)–horticulture; N. Webb Ph.D.

(University of Queensland, Australia)-aeolian process, land degradation processes and rangeland management; S. Yao, Ph.D. (Cornell University)–pomology/horticulture.

Emeriti

P.W. Bosland, Ph.D. (University of Wisconsin, Madison)–chile breeding and genetics; S.J. Guldan, Ph.D. (University of Minnesota)–sustainable agriculture; J.G. Mexal, Ph.D. (Colorado State University)-plant physiology; C.H. Monger, Ph.D. (New Mexico State University)-soil genesis and classification; M.A. O'Connell, Ph.D. (Cornell University)–plant biochemistry and molecular genetics; M. O'Neill, Ph.D. (University of Arizona, Tucson)-agronomy and crop physiology; G.A. Picchioni, Ph.D. (Texas A&M University)-plant-mineral relations; I.M. Ray, Ph.D. (University of Wisconsin-Madison)–alfalfa breeding and genetics; C. Sengupta-Gopalan, Ph.D. (Ohio State University)–biochemical genetics; R. St. Hilaire, Ph.D. (Iowa State University)-plant stress physiology and landscape horticulture.

Agronomy Courses

AGRO 1110G. Introduction to Plant Science (Lecture & Lab)
4 Credits (3+2P)
This is an introductory course for understanding plant science. Basic biological, chemical, and physical principles of various plants are covered. The focus of this course is on plants/crops used in agriculture production of food and fiber as well as pasture and range plants. Plant taxonomy and soil properties will also be discussed. Same as HORT 1115G.
Learning Outcomes
1. Describe the basic structure of plants including growth and function.
2. Define photosynthesis, respiration, and translocation
3. Utilize plant taxonomy techniques to identify various plants.
4. Classify soils based on their chemical and physical properties.
5. Explain how different soil properties affect plant growth and sustainability.

AGRO 2160. Plant Propagation
3 Credits (2+2P)
Practical methods of propagating horticultural plants by seed, cuttings, layering, grafting, division and tissue culture. Examination of relevant physiological processes involved with successful plant propagation techniques. Crosslisted with HORT 2160.
Learning Outcomes
1. Practical methods of propagating plants by seed, cuttings, layering, grafting, division, and tissue culture through experiential, "hands-on" laboratories.
2. Relevant physiological principles involved in propagating horticultural plants through lecture discussions and readings.

AGRO 2996. Special Topics
1-4 Credits (1-4)
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.
Learning Outcomes
1. Varies

AGRO 300. Special Topics
1-4 Credits (1-4)
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

AGRO 303V. Genetics and Society
3 Credits (3)
Relates the science of genetics with social ramifications. Ways in which genetics and evolution interact with social, political, and economic issues. Includes genetic engineering, gene therapy, DNA finger-printing, ancient DNA, plant and animal improvement, and future prospects. Students required to formulate value judgments on contemporary biological issues that will impact society. Crosslisted with: GENE 303V.
Learning Outcomes
1. Explain foundational genetic concepts and modern biotechnological techniques, including whole genome sequencing and genetic variation.
2. Analyze the implications of genetic technologies, such as cloning, gene therapy, genetic testing, and DNA forensics, to society.
3. Evaluate ethical issues surrounding genetic applications, including genetic discrimination, eugenics, and ownership of genetic information.
4. Develop and defend informed arguments about controversial topics in genetics (cloning and stem cells), using scientific evidence and ethical reasoning.
5. Collaborate on a group project (a term paper) to research and present real-world genetics-related issues and their impact on society.

AGRO 305. Principles of Genetics
3 Credits (3)
Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.
Prerequisite: (BIOL 2610G and BIOL 2110G, or BIOL 2110G and BCHE 140, and either CHEM 1215G or CHEM 1216).
Learning Outcomes
1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

AGRO 311. Introduction to Weed Science
4 Credits (3+2P)
Principles of weed science, with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Identification of local weeds. Taught with AGRO 311. May be repeated up to 4 credits.
Prerequisite: CHEM 1215G, and BIOL 2110G.
Learning Outcomes
1. Describe the environmental conditions and inherent traits that promote the growth and persistence of weed populations in managed and natural ecosystems.
2. Predict causes and consequences of weed management failures in agricultural and natural ecosystems.
3. Apply knowledge of herbicidal, mechanical and cultural weed control to develop integrated strategies for weed problems.
4. Classify herbicides based on injury symptoms, mode of action, site of action, translocation, selectivity, potential uses and potential dangers.

5. Identify common weeds found in southern New Mexico by providing correctly spelled botanical and common names, as well as lifecycles.
6. Demonstrate the ability to safely apply herbicide solutions including: perform the activities and calculations to ensure that a sprayer delivers the appropriate amount of solution over the sprayed area, interpret herbicide labels to identify guidelines for safety, dosage and application procedures, and perform the calculations necessary for determining appropriate amounts of herbicide, carrier and adjuvant to add to a spray tank.

AGRO 365. Principles of Crop Production
4 Credits (3+3P)
Basic principles of crop production including environmental and physiological factors limiting production, plant nutrition and soil science, soil-water management, cropping systems and management, pest management, and economic factors influencing crop production. Taught with HORT 365. May be repeated up to 4 credits.
Prerequisite: AGRO 1110G/HORT 1115G, CHEM 1215G or equivalent and MATH 1215 or equivalent.
Learning Outcomes
1. Analyze and apply core principles of crop production, including environmental, physiological, and climatic factors, to optimize plant growth, yield, and overall production efficiency.
2. Demonstrate understanding of plant biology by identifying structures, growth stages, and functions across the plant life cycle.
3. Evaluate plant propagation and reproduction methods by distinguishing between sexual and asexual techniques, explaining pollination and fertilization processes, and discussing their impact on genetic improvement and crop uniformity.
4. Demonstrate proficiency in seed and equipment technologies, including identification and calibration of farm implements, calculation of seed rates, and evaluation of certified seed quality and planting operations.
5. Apply experiential learning methods to design, manage, and assess crop production systems using real-world data and reflection-based decision-making models (Kolb's learning cycle).

AGRO 377. Introduction to Turfgrass Management
4 Credits (3+3P)
Establishment and maintenance of turfgrass with emphasis on seeding methods, soil and water management, mowing, disease, insects and turfgrass varieties. Consent of instructor required. Crosslisted with: HORT 377
Learning Outcomes
1. Identify the general morphology of grass plants and the characteristics of cool- and warm-season grasses.
2. Explain various turf establishment techniques and procedures.
3. Demonstrate understanding of basic soil science, soil testing, amendments, and fertilization regarding cultural and maintenance procedures as well as seasonal projects to maintain healthy turf.
4. Recognize and identify common turf disturbances including weed, pest, and disease identification.
5. Communicate turf conditions and the rationale for different maintenance processes on the course or field.

AGRO 391. Internship
1-6 Credits
Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of Instructor required. Graded: S/U Grading (S/U, Audit).
Prerequisite(s): Consent of instructor.

AGRO 447. Seminar
1 Credit (1)
Organization, preparation, and presentation of current topics in agronomy, environmental sciences, horticulture, and soil science. Crosslisted with: SOIL 447, HORT 447 and ENVS 447.
Learning Outcomes
1. Develop professional communication skills through teamwork, case study preparation and presentation, data interpretation, and role-playing in mock interviews.
2. Prepare a professional resume, personal statement of goals for graduate school or permanent employment and make a Case Study presentation to faculty and peers.

AGRO 449. Special Problems
1-3 Credits (1-3)
Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

AGRO 450. Special Topics
1-4 Credits (1-4)
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

AGRO 462. Plant Breeding
3 Credits (3)
Principles and practices involved with the genetic improvement of plants.
Prerequisite: ANSC/AGRO/BIOL/HORT/GENE 305, or GENE 320.
Learning Outcomes
1. Determine important plant traits and develop means to obtain trait variation for any plant species.
2. Create a plan for obtaining plant germplasm for any plant species.
3. Synthesize 3-5 breeding objectives that are obtainable for the breeding of any plant species.
4. Propose different breeding methods for use to develop cultivars for any plant species.
5. Work as a team with other students to produce a comprehensive breeding plan to develop cultivars for any plant species.

AGRO 471. Plant Mineral Nutrition
3 Credits (3)
Basic and applied aspects of plant requirements for soil-derived minerals and the processes whereby minerals are acquired, absorbed, translocated, and utilized throughout the plant. Same as HORT 471 and EPWS 471.
Prerequisite/Corequisite: EPWS 314/BIOL 314, or concurrent enrollment, or consent of instructor.
Learning Outcomes
1. Describe essential plant minerals, how each plant mineral is acquired, the function of each plant mineral, and how plants regulate internal mineral content.
2. Diagnose plant mineral disorders and stress.
3. Demonstrate ability to understand plant nutrient analyses, this includes: 1) perform the activities and conversions to understand the analyses and 2) make recommendations based on analyses.
4. Develop and present a fifteen-minute presentation describing aspects of a specific crop including information on 1) fertilizer needs and rates, leaf nutrient values, and nutrient disorders 2) roles and function of a minimum of one specific mineral used by selected plant, and

3) environmental and sustainability issues with managing the fertilization chosen crop.

AGRO 483. Advanced Sustainable Crop Production
4 Credits (3+3P)
Characteristics and objectives of sustainable agricultural systems with application to the production, utilization, and improvement of agronomic and vegetable crops.
Prerequisite: AGRO 365 or HORT 365.
Learning Outcomes
1. Design and evaluate sustainable cropping systems by integrating principles of crop diversification, crop rotation, no-till, and organic practices, and assessing their advantages, challenges, and impact on long-term agricultural sustainability.
2. Analyze and apply crop and soil management strategies using holistic and integrated approaches, including mycorrhizal fungi use in arid environments, IPM (Integrated Pest Management), and the "many little hammers" approach to weed control.
3. Select and recommend crop cultivars and management practices for specific agronomic and horticultural crops using tools such as growing degree days, variety test reports, and region-specific criteria (for New Mexico).
4. Critically review and communicate sustainable agricultural research and practices by analyzing case studies, scientific literature, and peer presentations to evaluate the effectiveness of sustainability-focused strategies.
5. Identify and engage with agricultural support systems and sustainability networks, including agencies like Western SARE, to explore resources for funding, research, and application of sustainable agriculture practices.

AGRO 492. Diagnosing Plant Disorders
3 Credits (2+3P)
Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as EPWS 492 and HORT 492.
Prerequisites: EPWS 303 and EPWS 310.

AGRO 500. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

AGRO 505. Research Orientation
4 Credits (3+2P)
Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: HORT 505, SOIL 505 and ENVS 505.
Learning Outcomes
1. Gain insight into the nature of scientific research and skills vital for graduate research and future careers in science.
2. Navigate graduate school processes and protocols.
3. Demonstrate critical thinking.
4. Generate a scientific hypothesis.
5. Communicate science effectively in written and oral formats, including drafting a proposal for thesis or dissertation research.

AGRO 511. Introduction to Weed Science (f)
4 Credits (3+2P)
Covers the principles of weed science with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Includes identification of local weeds. Research paper required for graduate credit. Taught with AGRO 511. May be repeated up to 4 credits.
Prerequisite: CHEM 1215G and BIOL 2110G.
Learning Outcomes
1. Describe the environmental conditions and inherent traits that promote the growth and persistence of weed populations in managed and natural ecosystems.
2. Predict causes and consequences of weed management failures in agricultural and natural ecosystems.
3. Apply knowledge of herbicidal, mechanical and cultural weed control to develop integrated strategies for weed problems.
4. Classify herbicides based on injury symptoms, mode of action, site of action, translocation, selectivity, potential uses and potential dangers.
5. Identify common weeds found in southern New Mexico by providing correctly spelled botanical and common names, as well as lifecycles.
6. Demonstrate the ability to safely apply herbicide solutions includes: perform the activities and calculations to ensure that a sprayer delivers the appropriate amount of solution over the sprayed area, interpret herbicide labels to identify guidelines for safety, dosage and application procedures, and perform the calculations necessary for determining appropriate amounts of herbicide, carrier and adjuvant to add to a spray tank.

AGRO 513. Introduction to Scientific Writing
3 Credits (3)
Students will learn how to communicate, through written format, to both the scientific community and diverse audiences. Students will be introduced to new technologies and new genres of scientific writing. Students will also learn basic reviewing and writing skills that underlie efficient preparation of literature reviews, scientific manuscripts, project reports, blog-posts, opinion or perspective pieces for more popular venues, advocacy articles for legislators, and descriptive pieces for popular venues such as newspapers, magazines, and broadcast media. Emphasis will be on the communication of experimental findings in peer-reviewed scientific journals.
Learning Outcomes
1. Students will review the basics of rhetoric and the technology of language.
2. Students will learn how to overcome writing barriers and gain confidence in their writing skills.
3. Students will improve their writing skills so that manuscript preparation becomes more efficient and productive.
4. Students will learn professional standards for the conduct of ethical reporting of scientific results.
5. Students will learn to recognize structural and stylistic elements in scientific articles that help researchers achieve certain communication goals.
6. Students will learn the basics of table, figure, diagram, and image presentation in manuscripts.
7. Literature reviews, framed so that they answer an important question in the field, and lead to peer-reviewed publication, may also be prepared. (With permission of the instructor.)

AGRO 516. Molecular Analysis of Complex Traits
3 Credits (3)
Provide a comprehensive overview of molecular genetic analysis of complex phenotypes, including case histories/experiments in plants, animals and humans. Emphasize technological developments in DNA marker technologies and their application to molecular quantitative

genetics. Explore the efficient application of these technologies in the future to complex genetic systems, breeding, and other areas of life sciences. Same as HORT 516.
Prerequisite: AGRO 305 or consent of instructor.

AGRO 525. Scientific Writing- How to be a Productive and Effective Writer
1-3 Credits (1-3)
Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Crosslisted with: HORT 525, EPWS 525, SOIL 525, AGRO 625, HORT 625 and SOIL 625.

AGRO 590. Graduate Seminar
1 Credit (1)
Current research discussions presented by masters level graduate students. Not more than one credit toward the degree. Same as HORT/SOIL 590. Crosslisted with: HORT 590 and SOIL 590.

AGRO 595. Internship
1-6 Credits
Supervised professional on-the-job learning experience. Limited to Master of Agriculture candidates. Not more than 6 credits toward the degree.

AGRO 596. Masters Proposal
1 Credit (1)
Current research proposal written by maters level graduate students. Consent of Instructor required. Crosslisted with: ENVS 596, GENE 596, HORT 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.
Prerequisite(s): Master level graduate students.

AGRO 597. University Teaching Experience
1-3 Credits (1-3)
Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ENVS course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures.

AGRO 598. Special Research Programs
1-6 Credits
Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits towards degree. Same as SOIL 598.

AGRO 599. Master's Thesis
15 Credits
Thesis.

Environmental Science Courses

ENVS 1110G. Environmental Science I
4 Credits (3+2P)
Introduction to environmental science as related to the protection, remediation, and sustainability of land, air, water, and food resources. Emphasis on the use of the scientific method and critical thinking skills in understanding environmental issues.
Learning Outcomes
1. Students will learn to critically analyze cause-and-effect relationships in the environment
2. Students will integrate and synthesize knowledge and draw appropriate conclusions based on the scientific method

ENVS 2111. Environmental Engineering and Science
3 Credits (3)
Principles in environmental engineering and science: physical chemical systems and biological processes as applied to pollution control. Crosslisted with: C E 256.
Prerequisite: (C- or better grade in CHEM 1215G) and (C- or better grade in MATH 1511G or ENGR 190).
Learning Outcomes
1. To understand the nature of water quality parameters in the context of Civil Engineering and Environmental Science (Water Treatment/Wastewater Treatment/Environmental Science).
2. To learn to apply engineering and scientific solutions to water quality problems.
3. To understand environmental regulations and their consequences on the design of pollution control systems.

ENVS 2111L. Environmental Science Laboratory
1 Credit (1)
Laboratory experiments associated with the material presented in ENVS 2111. Same as C E 256 L.
Corequisite(s): ENVS 2111.
Learning Outcomes
1. List typical analyses commonly performed to evaluate physical, chemical, and microbiological parameters used to describe water quality.
2. Follow experimental procedures listed in the class laboratory manual, or other publications such as Standards Methods, to perform common water quality analyses.
3. Evaluate, analyze, and discuss experimental results and present the conclusions in the form of a professional report

ENVS 300. Special Topics
1-4 Credits
Special subjects and credits to be announced in the Schedule of Classes. Consent of instructor required. Maximum of 4 credits per semester. Restricted to majors.

ENVS 301. Principles of Ecology
3 Credits (3)
A survey of ecology including general theory, the adaptations of organisms, population dynamics, species interactions, and the structure and function of natural communities and ecosystems. Crosslisted with: BIOL 301
Prerequisite(s): BIOL 2610G, A ST 311, and grade of C or better in MATH 1511G or Math Placement Exam score adequate to enroll in mathematics courses beyond MATH 1511G.

ENVS 312. Emergency Response to Hazardous Material Incidents
2 Credits (2)
EPA approved Environmental Response Training Program Course 165.15. In compliance with OSHA 29 CFR 1910.120. Normally taken during last year of study.
Prerequisite: Same as E T 312 and WERC 312.
Learning Outcomes
1. Satisfy OSHA training requirements for members of hazardous materials response teams and for environmental personnel requiring access to superfund sites.
2. Recognize, evaluate, and safely control an incident involving the release or potential release of hazardous materials.
3. Participate in mock scenarios using self-contained breathing apparatus, fully encapsulated suits, and a variety of equipment to test hazardous levels.

ENVS 361. Basic Toxicology
3 Credits (3)
Introduction to the principles of toxicology, discussion of toxic agents, environmental problems, testing procedures, and regulations. Prior course work in biology and chemistry recommended.
Prerequisite: CHEM 2120 or CHEM 313 or ANSC 1170 and BIOL 2610G or BIOL 2110G.
Learning Outcomes
1. Learn how toxins are absorbed, distributed, metabolized, and excreted from living systems.
2. Demonstrate how metabolism can appreciably alter the toxicity of compounds as well as dictate the resultant toxicity with an emphasis on target organ(s).
3. Explain the specific mechanism(s) of actions of toxins targeting the liver, lung, kidney, and nervous systems.
4. Delineate how certain toxins induce cancer and/or promote the development of cancer.
5. Understand how and why certain plants and animals are poisonous and venomous, specifically linking discreet chemicals or complex mixtures to the resultant toxic manifestation.

ENVS 370. Environmental Soil Science
3 Credits (3)
Continuation of SOIL 2110 that emphasizes soil properties and processes that directly relate to environmental pollution problems. Same as SOIL 370.
Prerequisite: SOIL 2110.
Learning Outcomes
1. Connect soil science to the environment.
2. Describe several contaminants and their methods of remediation.
3. Design a remediation plan based on environmental transport mechanisms.
4. Demonstrate a clear understanding of the direct and indirect costs (consequences) associated with poor soil and water management.

ENVS 391. Internship
3 Credits (3)
Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. Maximum of 3 credits toward a degree. Consent of Instructor required. Graded: S/U Grading (S/U, Audit).

ENVS 422. Environmental Chemistry
3 Credits (3)
Chemistry of organic and metal ion pollutants in the environment and principles important to their remediation including bioremediation. Restricted to: Main campus only. Crosslisted with: CHEM 422
Prerequisite(s): CHEM 1225G and either CHEM 2120 or CHEM 313.
Learning Outcomes
1. Describe and explain the solid, liquid, and gas phases of the environment and how they interact.
2. Understand the chemical reactions and processes that occur between various phases of the environment.
3. Learn how the chemical processes can be managed to promote environmental remediation, including the techniques and calculations used.

ENVS 447. Seminar
1 Credit (1)
Organization, preparation, and presentation of current topics in agronomy, environmental sciences, horticulture, and soil science. Crosslisted with: AGRO 447, HORT 447 and SOIL 447.
Learning Outcomes
1. Develop professional communication skills through teamwork, case study preparation and presentation, data interpretation, and role-playing in mock interviews.
2. Prepare a professional resume, personal statement of goals for graduate school or permanent employment and make a Case Study presentation to faculty and peers.

ENVS 449. Special Problems
1-3 Credits
Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and 6 credits toward a degree. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: E S majors.

ENVS 451. Special Topics
1-4 Credits (1-4)
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

ENVS 452. Geohydrology
3-4 Credits (3+1P)
Origin, occurrence, and movement of fluids in porous media and assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. Crosslisted with: C E 452 and GEOL 452.
Learning Outcomes
1. An understanding of the movement of water in porous media and its effects on aquifers.
2. An understanding of the development and conservation of ground water resources.

ENVS 457. Water Measurement
3 Credits (3)
The fundamentals of measuring water will be covered. Participants will learn about measurement techniques that are used to estimate evapotranspiration as well as commonly used water measurement structures to estimate water use. The benefits and problems that are associated with using each measurement will be discussed. Students will also learn about the principles of how to use water measurement as a management tool.
Prerequisite(s): MATH 1215 or higher, or consent of Instructor.

ENVS 460. Introduction to Air Pollution
3 Credits (3)
An introduction to the physics and chemistry of tropospheric air pollution including sources of air pollution, local and long-range transport, instrumentation, regulatory requirements, control technology.
Prerequisite: PHYS 1310G, CHEM 1225G, MATH 1511G.
Learning Outcomes
1. Gain experience in critical thinking and assessment and presenting the results in a clear and concise manner.
2. Describe and communicate air pollution issues.
3. Develop skills for approaching air quality problems and calculating air quality data analysis.
4. Gain practical experience in operating air pollution instrumentation and sample collection.
5. Communicate science using social media.

ENVS 462. Sampling and Analysis of Environmental Contaminants
3 Credits (1+6P)
Theory, application, methodology, and instrumentation used in the sampling and analysis of environmental contaminants. May be repeated up to 3 credits. Same as ENVE 462.
Prerequisite: ENVS 2111 or C E 256.
Learning Outcomes
1. Plan and execute the collection of relevant and useful data for environmental projects based on procedures outlined by the EPA, DOD, and DOE.
2. Understand the importance of careful planning, implementation, and assessment of environmental chemical data collection.
3. Work in teams to master the scientific method, including originating a question, collecting and analyzing samples, and presenting the findings orally and in professionally written reports.

ENVS 470. Environmental Impacts of Land Use and Contaminant Remediation
3 Credits (3)
The course will cover the integrated assessment of soil erosion, contaminant transport in soil and water, and contaminant remediation from site scale to watershed scales. Understanding of the controlling factors for each type land use impact will be gained through the use of risk assessment, case studies, and computer modeling. Case studies will illustrate the processes under various environmental applications. This course will also cover the application of solute transport principles and methods for the remediation of contaminated soil and groundwater. It will also discuss the contaminated site characterization, monitoring, and remediation design. Discussions of innovative methodologies will be supported with case studies.
Learning Outcomes
1. Apply knowledge of mathematics, science, and engineering to identify, formulate, and solve environmental problems.
2. Function on multidisciplinary teams and exhibit professional and ethical responsibility and communicate findings effectively.
3. Recognize the need for, and an ability to engage in, life-long learning.
4. Describe contemporary land-use impact and cleanup issues.
5. Use the techniques, skills, and modern environmental science and engineering tools necessary for current industry practice.

ENVS 505. Research Orientation
4 Credits (3+2P)
Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: HORT 505, SOIL 505 and AGRO 505.
Learning Outcomes
1. Gain insight into the nature of scientific research and skills vital for graduate research and future careers in science.
2. Navigate graduate school processes and protocols.
3. Demonstrate critical thinking.
4. Generate a scientific hypothesis.
5. Communicate science effectively in written and oral formats, including drafting a proposal for thesis or dissertation research.

ENVS 596. Master's Proposal
1 Credit (1)
Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, HORT 596, GENE 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.
Prerequisite: Master level graduate students.
Learning Outcomes
1. Student will review academic literature and draft a research proposal.

ENVS 599. Master's Thesis
1-15 Credits
Thesis Graded: Thesis/Disertation.

Genetics Courses

GENE 1110. Experimental Systems in Genetics
1 Credit (1)
Survey of molecular, biochemical, organismal, and computer science based approaches to investigate how genes determine important traits. Historical development and topics of current interest will be discussed.
Learning Outcomes
1. To give the students a historical perspective on the field of genetics.
2. To familiarize the students to introductory concepts and vocabulary to the field of genetics.
3. Introduce experimental systems within the field of genetics and to give perspective to current genetic research.
4. As this course is designed for beginning students as an overview of faculty and research labs on campus. The students majoring in genetics are encouraged to meet with faculty and to explore opportunities available to them on campus

GENE 303V. Genetics and Society
3 Credits (3)
Relates the science of genetics with social ramifications. Ways in which genetics and evolution interact with social, political, and economic issues. Includes genetic engineering, gene therapy, DNA finger-printing, ancient DNA, plant and animal improvement, and future prospects. Students required to formulate value judgments on contemporary biological issues that will impact society. Crosslisted with: AGRO 303V.
Learning Outcomes
1. Explain foundational genetic concepts and modern biotechnological techniques, including whole genome sequencing and genetic variation.
2. Analyze the implications of genetic technologies, such as cloning, gene therapy, genetic testing, and DNA forensics, to society.
3. Evaluate ethical issues surrounding genetic applications, including genetic discrimination, eugenics, and ownership of genetic information.
4. Develop and defend informed arguments about controversial topics in genetics (cloning and stem cells), using scientific evidence and ethical reasoning.
5. Collaborate on a group project (a term paper) to research and present real-world genetics-related issues and their impact on society.

GENE 305. Principles of Genetics
3 Credits (3)
Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.
Prerequisite: (BIOL 2610G and BIOL 2110G, or BIOL 2110G and BCHE 140, and either CHEM 1215G or CHEM 1216).
Learning Outcomes
1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity

3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

GENE 305 L. Genetic Techniques
1 Credit (3P)
Experimental procedures used in genetic research including: sexual transmission genetics, eukaryotic DNA isolation, DNA marker development and genotyping, polymerase chain reaction, and cytogenetics.
Prerequisite(s)/Corequisite(s): GENE 315, or AGRO/ANSC/BIOL/HORT 305.

GENE 315. Molecular Genetics
3 Credits (3)
Covers fundamental principles of DNA structure and replication, transcription, translation, gene regulation, recombinant DNA technology, and a survey of genomics and bioinformatics. Recommend CHEM 313.
Prerequisite(s): CHEM 1225G and BIOL 2110G.

GENE 320. Hereditary and Population Genetics
3 Credits (3)
Covers fundamental principles of reproduction, variation, and heredity in plants and animals including: Mendelian inheritance, mitosis, meiosis, genetic linkage, random mating, genetic drift, natural selection, inbreeding, migration, mutation, interrelationships between individuals, populations and communities and the environment.
Prerequisite: CHEM 1215G & BIOL 2110G.
Learning Outcomes
1. Deduce correctly how a trait is being inherited from one generation to another in any species.
2. Explain correctly concepts associated with Mendelian, quantitative, and population genetics.
3. Solve numerical problems correctly associated with Mendelian inheritance of traits, gene linkage and recombination, quantitative inheritance of traits, and population genetics.

GENE 391. Genetics Internship
1-6 Credits (1-6)
Professional work experience in genetics under the joint supervision of an employer and a faculty member. Documentation of proposed internship activities must be submitted prior to the start of the internship. A written report is required after the internship is completed. No more than 6 credits toward a degree. May be repeated up to 6 credits. Graded: S/U Grading (S/U, Audit).

GENE 440. Genetics Seminar
1 Credit (1)
Organization, preparation, and presentation of genetic studies in model microorganism, plant, or animal systems that have been used to solve problems in molecular, cellular, and developmental biology.
Prerequisite: Seniors only; GENE 315 & GENE 320.
Learning Outcomes
1. Evaluate and discuss scientific literature associated with the use of a genetic model (microorganism, plant, or animal).
2. Identify several types of peer-reviewed journal articles.
3. Lead a discussion of a peer-reviewed journal article in genetics.
4. Develop and present a three-minute “lightning talk”.
5. Organize, develop, and deliver a presentation on a topic in genetics.

GENE 449. Special Problems
1-3 Credits (1-3)
Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 3 credits toward a degree. Consent of instructor required.

GENE 450. Special Topics
1-3 Credits (1-3)
Specific subjects to be announced in the schedule of classes. Maximum of 3 credits per semester and a total of 3 credits toward a degree. Consent of instructor required.

GENE 452. Applied Bioinformatics
3 Credits (3)
Survey and application of publicly available bioinformatic tools that treat genomic DNA, cDNA, and protein sequences, RNA abundance, as well as tools that allow inference based on phylogenetic relationships.
Prerequisite: AGRO/ANSC/BIOL/HORT 305 or GENE 315 and GENE 320, and BCHE 341, or BCHE 395.
Learning Outcomes
1. Define bioinformatics and its relevance in different fields or disciplines.
2. Interpret gene sequence and expression information derived from genomic and transcriptomic databases.
3. Identify the importance of sequencing the genomes of organisms and determine the relationships of sequence to the structure, function, and diversity of DNA, RNA, and proteins.
4. Implement information derived from bioinformatics to solve specific biological problems (disease resistance in animals and plants).
5. Organize a round-table discussion of a peer-reviewed journal demonstrating the application of bioinformatics software/program(s) or databases to study (a) gene expression, (b) multiple sequence alignments, or (c) genomics and develop a presentation and research project proposal related to bioinformatics.

GENE 486. Genes and Genomes
3 Credits (3)
Extensive coverage of nuclear and organelle genome structure in plants and animals, genome restructuring including duplication, anueploidy, chromosome translocations and inversions, comparative genomics, and molecular systematics.
Prerequisites: AGRO/ANSC/BIOL/HORT 305 or GENE 315, and GENE 320.

Horticulture Courses

HORT 1115G. Introductory Plant Science
4 Credits (3+2P)
Introduction to the physical, biological, and chemical principles underlying plant growth and development in managed ecosystems. In the laboratory portion of the class, students perform experiments demonstrating the principles covered in lecture. The course uses economic plants and agriculturally relevant ecosystems to demonstrate basic principles. Appropriate for nonscience majors. Same as AGRO 1110G.
Learning Outcomes
1. Describe the role plants play in everyday lives
2. Introduce career opportunities in plant and soil sciences, and related fields
3. Define plants through the concepts of plant structure and anatomy
4. Introduce the wide variety of plants cultivated throughout the world
5. Describe how plants work (growth, reproduction, physiology, and soil)

6. Describe how plants are manipulated to feed, clothe and entertain the world

HORT 2110. Ornamental Plants I
4 Credits (2+3P)
Covers identification, botanical characteristics, culture, and landscape uses of woody plants. Emphasis on deciduous trees, native shrubs, and evergreens.
Learning Outcomes
1. Identify landscape plants by scientific names, including family, genus and specific epithet.
2. Use scientific terminology to accurately describe landscape plant morphology.
3. Illustrate plant family relationships at the family and genus level.
4. Apply landscape design principles and knowledge of plant requirements to arrange plants in a landscape.

HORT 2120. Ornamental Plants II
4 Credits (2+3P)
Identification, botanical characteristics, culture, and landscape uses of woody plants. Emphasis on flowering trees, cacti, and members of the pea and rose families.
Learning Outcomes
1. Identify landscape plants by scientific names, including family, genus and specific epithet.
2. Use scientific terminology to accurately describe landscape plant morphology.
3. Illustrate plant family relationships at the family and genus level.
4. Apply landscape design principles and knowledge of plant requirements to arrange plants in a landscape.

HORT 2130. Floral Quality Evaluation and Design
2 Credits (1+2P)
Critical hands-on evaluation of the quality of cut and potted floral and tropical foliage crops, their specific merits and faults, and fundamentals of floral design.
Learning Outcomes
1. Identify common floriculture crops, or know resourcing to help identify the crop.
2. Evaluate quality (merit and fault) of common floriculture crops, based on industry standards and merit. Pi Alpha Xi and American Floral Endowment standards will be used for the purpose of this class.
3. Have a basic understanding of the floriculture industry, and identify career pathways within the industry.
4. Know, understand, creatively interpret, and execute basic principles of design in regards to floral design.
5. Use interpersonal communication, problem solving, basic math, and marketing during cash and carry "lab" time (flower sales) in developing job ready skills in floristry.
6. Layer principles of design, marketing, sales, and time management to create floral art in real-world scenarios.

HORT 2160. Plant Propagation
3 Credits (2+2P)
Practical methods of propagating horticultural plants by seed, cuttings, layering, grafting, division and tissue culture. Examination of relevant physiological processes involved with successful plant propagation techniques. Same as AGRO 2160.
Learning Outcomes
1. Practical methods of propagating plants by seed, cuttings, layering, grafting, division, and tissue culture through experiential, “hands-on” laboratories.
2. Relevant physiological principles involved in propagating horticultural plants through lecture discussions and readings.

HORT 2990. Floriculture Field Practicum
1 Credit (1)
Participation as team member in the National Intercollegiate Floral Quality Evaluation and Design Competition. Intensive week-long travel for competition, networking with industry, academia, and floriculture tours. May be repeated for a maximum of 3 credits.
Prerequisite(s): HORT 2130 or consent of instructor.
Learning Outcomes
1. Varies

HORT 2996. Special Topics
1-4 Credits
Specific subjects and credits as announced. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required.
Learning Outcomes
1. Varies

HORT 300. Special Topics
1-4 Credits
Specific subjects as announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

HORT 302V. Forestry and Society
3 Credits (3)
Global study of the development and use of forest resources for production of wood, fuel, fiber, and food products. Climatic, edaphic, cultural, and economic influences on forests of the world evaluated. Same as RGSC 302V.
Learning Outcomes
1. Demonstrate comprehension of basic plant physiology.
2. Analyze various inputs and environmental factors that affect trees and forests.
3. Identify forest biomes based on plant morphology and environmental characteristics.
4. Categorize different types of forest products and harvesting methods.
5. Compare and contrast various forest management practices in the US and worldwide.
6. Evaluate climate and ecological issues as they relate to society.
7. Develop an awareness of the interconnection of nature and society.

HORT 304. Hydroponics
4 Credits (4)
This course will introduce students to the basics of the different soil-less growing systems: hydroponics, aeroponics and aquaponics. Topics will include growing systems and environments, crop management, business aspects of hydroponic growing, integrated pest management, commercial and restaurant systems, and plant nutrition. Labs will reinforce lecture topics and give students practical experience growing different types of crops in different types of systems.
Prerequisite: AGRO 1110G or HORT 1115G.

Learning Outcomes

1. Discuss the benefits and constraints of different hydroponic systems.
2. Evaluate different crops for each type of system.
3. Identify the components and calculate costs of different systems.
4. Demonstrate how to build and maintain each type of system.
5. Discuss how soilless growing relates to sustainability and local food production.

HORT 305. Principles of Genetics
3 Credits (3)
Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.
Prerequisite: (BIOL 2610G and BIOL 2110G, or BIOL 2110G and BCHE 140, and either CHEM 1215G or CHEM 1216).
Learning Outcomes

1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

HORT 307. Landscape Design
4 Credits (3+3P)
Design elements, the design process, and contemporary planting design used in the design of residential and small commercial landscapes. Basic drafting, drawing, and landscape plan presentation techniques.
Prerequisite: HORT 2110 or HORT 2120 or consent of instructor.
Learning Outcomes

1. Access a residential site for landscape design.
2. Create a landscape plan that addresses and solves a client's needs and wishes.
3. Incorporate ideas into the landscape plan that reflects the region.
4. Incorporate sustainable ideas into a landscape plan.
5. Analyze a landscape plan for aesthetics and functionality.
6. Verbally and visually present a landscape plan in a professional manner.

HORT 310. Medicinal Herbs
3 Credits (3)
Introduction to ethnobotany, including plant cultivation, extraction methods, and analysis of active chemistries.
Learning Outcomes

1. Describe relationships between people and plants.
2. Identify cultural uses of plants by peoples across the world.
3. Discuss the westernized use of plants and regulations associated with medicinal plant products.
4. Discuss the scientific methods employed to study medicinal plant compounds.
5. Identify medicinal plant chemical structures.
6. List medicinal plant tincture preparation methods.
7. Discuss analytical chemistry instrumentation used to identify plant compounds.

HORT 318V. Urban Water Issues and Society
3 Credits (3)
Global study of water science, development, law, and use for agriculture, manufacturing, landscaping, home use, and other urban uses. This course allows students to become familiar with important issues concerning the interaction between water use and humans. Topics include the water cycle, water chemistry, human-water relations, plant-water relations, water users, water-dependent population placement and growth, water regulation, and the future of water.
Learning Outcomes

1. Define and describe Earth's water sources and the water cycle.
2. Describe the chemical processes associated with water and analyze the composition of several water sources.
3. Summarize the interactions of water with the human body.
4. Explain the use of water in agricultural and other plants on both a regional scale and cellular level.
5. Identify, explain, and compare all water users and categorize their demand and availability for water.
6. Analyze the interconnection of the human societies and water while discussing locations of civilizations and communities.
7. Analyze, from a historical perspective, the interrelationships of all water users and all water decision makers. Describe the history of US and world water regulation and analyze its success rate.
8. Predict and recommend how water will be used and distributed in the future.

HORT 340. Greenhouse Retailing
2 Credits (1+1P)
A hands-on experience in weekly organizing, management, propagation and sale of greenhouse crops. This course is to learn how to propagate crops to achieve the fastest finished products, maintain the stock plant, and create opportunities for sales. Students will work 2 hours a week in the greenhouse with instructor, and choose one day a week to maintain and check on the greenhouse throughout the semester. May be repeated up to 4 credits.
Learning Outcomes

1. Identification and propagation of common greenhouse plants.
2. Create care sheets and propagation manuals for potential buyers of greenhouse crops.
3. Propagate, maintain, water, schedule and sell greenhouse products.
4. Practice team communication and support to create an equitable division of labor during the semester.
5. Learn to maintain labor and sales records.

HORT 365. Principles of Crop Production
4 Credits (3+3P)
Basic principles of crop production including environmental and physiological factors limiting production, plant nutrition and soil science, soil-water management, cropping systems and management, pest management, and economic factors influencing crop production. Taught with AGRO 365. May be repeated up to 4 credits.
Prerequisite: AGRO 1110G/HORT 1115G, CHEM 1215G or equivalent and MATH 1215 or equivalent.
Learning Outcomes

1. Analyze and apply core principles of crop production, including environmental, physiological, and climatic factors, to optimize plant growth, yield, and overall production efficiency.
2. Demonstrate understanding of plant biology by identifying structures, growth stages, and functions across the plant life cycle.
3. Evaluate plant propagation and reproduction methods by distinguishing between sexual and asexual techniques, explaining

pollination and fertilization processes, and discussing their impact on genetic improvement and crop uniformity.
4. Demonstrate proficiency in seed and equipment technologies, including identification and calibration of farm implements, calculation of seed rates, and evaluation of certified seed quality and planting operations.
5. Apply experiential learning methods to design, manage, and assess crop production systems using real-world data and reflection-based decision-making models (Kolb's learning cycle).

HORT 377. Introduction to Turfgrass Management
4 Credits (3+3P)
Establishment and maintenance of turfgrass with emphasis on seeding methods, soil and water management, mowing, disease, insects and turfgrass varieties. Consent of instructor required. Crosslisted with: AGRO 377
Learning Outcomes
1. Identify the general morphology of grass plants and the characteristics of cool- and warm-season grasses.
2. Explain various turf establishment techniques and procedures.
3. Demonstrate understanding of basic soil science, soil testing, amendments, and fertilization regarding cultural and maintenance procedures as well as seasonal projects to maintain healthy turf.
4. Recognize and identify common turf disturbances including weed, pest, and disease identification.
5. Communicate turf conditions and the rationale for different maintenance processes on the course or field.

HORT 378. Turfgrass Science
4 Credits (3+3P)
Introduction to the scientific fundamentals for turfgrass management cultural practices, pest management, rootzone construction and ecology. May be repeated up to 4 credits.
Prerequisite: HORT 377 or consent of instructor.
Learning Outcomes
1. Explain the benefits and history of turfgrass.
2. Apply basic plant physiological knowledge to turfgrass adaptation, growth and function.
3. Demonstrate ability to identify known and unknown turfgrasses and appraise how, when and why specific turfgrasses are used in certain environments.
4. Examine the basic principles of turfgrass soils, turfgrass establishment and major turfgrass management practices (mowing, fertility, irrigation, cultivation, secondary cultural practices).
5. Examine basic turfgrass pest management principles and practices in order to be able to identify, analyze and implement solutions.
6. Calculate common turfgrass math calculations and perform equipment calibrations.
7. Analyze how the environment influences turfgrass growth and management.
8. Prepare a consulting appraisal and specific turfgrass management plan using learned turfgrass knowledge.

HORT 391. Internship
1-6 Credits
Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of instructor required. Graded: S/U. Crosslisted with: AGRO 391 and SOIL 391

HORT 447. Seminar
1 Credit (1)
Organization, preparation, and presentation of current topics in agronomy, environmental sciences, horticulture, and soil science. Crosslisted with: AGRO 447, SOIL 447 and ENVS 447.
Learning Outcomes
1. Develop professional communication skills through teamwork, case study preparation and presentation, data interpretation, and role-playing in mock interviews.
2. Prepare a professional resume, personal statement of goals for graduate school or permanent employment and make a Case Study presentation to faculty and peers.

HORT 449. Special Problems
1-3 Credits
Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

HORT 450. Special Topics
1-4 Credits
Specific subjects as announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required.

HORT 462. Plant Breeding
3 Credits (3)
Principles and practices involved with the genetic improvement of plants.
Prerequisite: ANSC/AGRO/BIOL/HORT/GENE 305 or GENE 320.
Learning Outcomes
1. Learn the principles and practices involved in plant genetic improvement.
2. Be able to apply principles and practices in real life scenarios.

HORT 471. Plant Mineral Nutrition
3 Credits (3)
Basic and applied aspects of plant requirements for soil-derived minerals and the processes whereby minerals are acquired, absorbed, translocated, and utilized throughout the plant. Same as AGRO/EPWS 471.
Prerequisite/Corequisite: EPWS/BIOL 314, or concurrent enrollment, or consent of instructor.
Learning Outcomes
1. Describe how minerals function in plants, including uptake, transport and heritability factors.
2. Explain how plants regulate internal mineral content.
3. Compare different crop nutrient management practices.
4. Identify plant mineral disorders and stressors.
5. Prepare and present information on crop mineral nutrition.

HORT 479. Advanced Turfgrass Science
3 Credits (3)
Extensive reviews of turfgrass sciences including ecology, physiology, entomology, pathology, weed science, and soil science.
Prerequisite: HORT 378 or consent of instructor.
Learning Outcomes
1. Discuss the fundamentals of turfgrass management practices including mowing, fertilization, irrigation, cultural practices and pest management, and use these practices to plan an integrated turfgrass management plan.
2. Identify common and unique turfgrass problems and situations and formulate a solution based on prior knowledge learned.

3. Analyze how stresses, construction and turfgrass management practices affect growth, development, and physiology of turfgrasses.
4. Ascertain how environmentally sound management practices can be modified to promote optimal turfgrass health under stress conditions.
5. Critically evaluate scientifically based literature on turfgrass management.

HORT 483. Advanced Sustainable Crop Production
4 Credits (3+3P)
Characteristics and objectives of sustainable agricultural systems with application to the production, utilization, and improvement of agronomic and vegetable crops.
Prerequisite: AGRO 365 or HORT 365.
Learning Outcomes
1. Design and evaluate sustainable cropping systems by integrating principles of crop diversification, crop rotation, no-till, and organic practices, and assessing their advantages, challenges, and impact on long-term agricultural sustainability.
2. Analyze and apply crop and soil management strategies using holistic and integrated approaches, including mycorrhizal fungi use in arid environments, IPM (Integrated Pest Management), and the "many little hammers" approach to weed control.
3. Select and recommend crop cultivars and management practices for specific agronomic and horticultural crops using tools such as growing degree days, variety test reports, and region-specific criteria (for New Mexico).
4. Critically review and communicate sustainable agricultural research and practices by analyzing case studies, scientific literature, and peer presentations to evaluate the effectiveness of sustainability-focused strategies.
5. Identify and engage with agricultural support systems and sustainability networks, including agencies like Western SARE, to explore resources for funding, research, and application of sustainable agriculture practices.

HORT 488. Greenhouse Management
4 Credits (3+3P)
Principles and practices involved in greenhouse structures and construction, site considerations, heating and cooling systems, greenhouse crop production techniques, sustainability practices. May be repeated up to 4 credits.
Prerequisite: HORT/AGRO 365 or consent of instructor.
Learning Outcomes
1. Establish, operate, and maintain a greenhouse.
2. Demonstrate greenhouse business and marketing skills, horticulture techniques.
3. Practice “hands-on” greenhouse production.
4. Describe greenhouse sustainability issues.
5. Identify emerging trends in the greenhouse industry.

HORT 492. Diagnosing Plant Disorders
3 Credits (2+3P)
Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as EPWS 492 and AGRO 492.
Prerequisites: EPWS 303 and EPWS 310.

HORT 500. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes . Maximum of 4 credits per semester. No more than 9 credits toward a degree.

HORT 505. Research Orientation
4 Credits (3+2P)
Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: AGRO 505, SOIL 505 and ENVS 505.
Learning Outcomes
1. Gain insight into the nature of scientific research and skills vital for graduate research and future careers in science.
2. Navigate graduate school processes and protocols.
3. Demonstrate critical thinking.
4. Generate a scientific hypothesis.
5. Communicate science effectively in written and oral formats, including drafting a proposal for thesis or dissertation research.

HORT 513. Introduction to Scientific Writing
3 Credits (3)
Students will learn how to communicate, through written format, to both the scientific community and diverse audiences. Students will be introduced to new technologies and new genres of scientific writing. Students will also learn basic reviewing and writing skills that underlie efficient preparation of literature reviews, scientific manuscripts, project reports, blog-posts, opinion or perspective pieces for more popular venues, advocacy articles for legislators, and descriptive pieces for popular venues such as newspapers, magazines, and broadcast media. Emphasis will be on the communication of experimental findings in peer-reviewed scientific journals.
Learning Outcomes
1. Students will review the basics of rhetoric and the technology of language.
2. Students will learn how to overcome writing barriers and gain confidence in their writing skills.
3. Students will improve their writing skills so that manuscript preparation becomes more efficient and productive.
4. Students will learn professional standards for the conduct of ethical reporting of scientific results.
5. Students will learn to recognize structural and stylistic elements in scientific articles that help researchers achieve certain communication goals.
6. Students will learn the basics of table, figure, diagram, and image presentation in manuscripts.
7. Literature reviews, framed so that they answer an important question in the field, and lead to peer-reviewed publication, may also be prepared. (With permission of the instructor.)

HORT 525. Scientific Writing How to be a Productive and Effective Writer
1-3 Credits (1-3)
Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review Crosslisted with: AGRO 525, AGRO 625, EPWS 525, SOIL 625 and SOIL 525.

HORT 590. Graduate Seminar
1 Credit (1)
Current research discussions presented by masters level graduate students. Not more than one credit toward the degree. Same as AGRO/SOIL 590. Crosslisted with: AGRO 590 and SOIL 590.

HORT 595. Internship
1-6 Credits
Supervised professional on-the-job learning experience. Limited to Master of Horticulture or Plant & Environmental Science candidates. Not more than 6 credits toward the degree.

HORT 596. Master's Proposal
1 Credit (1)
Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, ENVS 596, GENE 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.
Prerequisite: Master level graduate students.
Learning Outcomes
1. Student will review academic literature and draft a research proposal.

HORT 598. Special Research Programs
1-6 Credits
Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits toward a degree.
Prerequisite: consent of instructor.

HORT 599. Master's Thesis
15 Credits
Thesis.

Soil Courses

SOIL 2110. Introduction to Soil Science
3 Credits (3)
An overview of fundamental concepts in soil science and soils as a natural resource. Students will be introduced to the physical, chemical, and biological properties as it relates to soil management in environmental science, conservation, and agronomy. May be repeated up to 3 credits.
Prerequisite: (CHEM 1120G and MATH 1215 or higher) or CHEM 1215G.
Learning Outcomes
1. Understand and use the technical terminology associated with the use and management of soils.
2. Understand the classification of soils and the processes leading to their formation.
3. Identify key physical, chemical, and biological properties of soils.
4. Explain the impact of land use and management decisions as it relates to soil degradation and environmental problems.

SOIL 2110L. Introduction to Soil Science Laboratory
1 Credit (1)
Morphological, chemical, physical and biological properties of soil in the laboratory and field.
Corequisite(s): SOIL 2110.
Learning Outcomes
1. Learn techniques for sampling and characterizing soils in the region.
2. Understand how soils are formed and the processes that occur within the soil profile.
3. Gain fundamental knowledge on soil physical, chemical, and biological properties and how each can influence the overall function of a particular soil.
4. Develop critical thinking and analytical skills within laboratory and field settings.
5. Encourage collaboration, inclusiveness and critical thinking.

SOIL 2996. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.
Learning Outcomes
1. Varies

SOIL 300. Special Topics
1-4 Credits
Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

SOIL 312. Soil Management and Fertility
3 Credits (3)
Management, conservation, and fertility of soils; physical conditions affecting growth, nutrition, and plant production.
Prerequisite: SOIL 2110.
Corequisite: SOIL 312L.
Learning Outcomes
1. Explain the elements affecting soil productivity.
2. Determine what factors influence fertilizer use and needs.
3. Identify factors affecting soil pH and summarize materials used for pH modification.
4. Recognize typical nutrient deficiency symptoms and their general location on the plant.
5. Calculate soil amendment amounts needed for field applications.

SOIL 312 L. Soil Management and Fertility Lab
1 Credit (1)
Hands-on experience. Includes field trips, videos, calculations, visiting lecturers and other lab activities as possible.
Prerequisite: SOIL 2110.
Corequisite: SOIL 312.
Learning Outcomes
1. Use proper procedures to collect soil samples and prepare them for analyses including documentation, pretreatment, and storage.
2. Extract various nutrients from soil and interpret/convey the results in written reports.
3. Explain the difference between total and plant-available nutrients.
4. Observe lab analytical procedures and field practices common in soil fertility and management.
5. Calculate the amounts of nutrients in soil samples and convert to field scale.

SOIL 370. Environmental Soil Science
3 Credits (3)
Continuation of SOIL 2110 that emphasizes soil properties and processes that directly relate to environmental pollution problems. Same as ENVS 370.
Prerequisite: SOIL 2110.

SOIL 391. Internship
1-6 Credits (1-6)
Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of Instructor required. Graded: S/U Grading (S/U, Audit).

SOIL 424. Soil Chemistry
3 Credits (3)

Basic elements of soil chemistry including clay mineralogy, cation and anion exchange and the chemistry of problem (acid, saline and flooded) soils. Credit not given for both SOIL 424 and SOIL 479.
Prerequisite: SOIL 2110L or CHEM 1215G and CHEM 1225G.
Learning Outcomes
1. Explain the solid and liquid phases of soil.
2. Describe the chemical reactions and processes that occur between various soil phases.
3. Describe the techniques used to promote plant productivity and land remediation.
4. Calculate nutrient and contaminant concentrations in soil samples and convert to field scale.
5. Calculate soil chemical properties including CEC, pH, EC, SAR, nitrate, and convert them between old and new units.

SOIL 447. Seminar
1 Credit (1)
Organization, preparation, and presentation of current topics in agronomy, environmental sciences, horticulture, and soil science. Crosslisted with: AGRO 447, HORT 447 and ENVS 447.
Learning Outcomes
1. Develop professional communication skills through teamwork, case study preparation and presentation, data interpretation, and role-playing in mock interviews.
2. Prepare a professional resume, personal statement of goals for graduate school or permanent employment and make a Case Study presentation to faculty and peers.

SOIL 449. Special Problems
1-3 Credits
Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

SOIL 450. Special Topics
1-4 Credits
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits towards a degree. May be repeated up to 9 credits. Consent of Instructor required.

SOIL 456. Irrigation and Drainage
3 Credits (3)
Principles and practices required for irrigation to exist as a permanent economy. Equipment and methods for measurement and control of water.

SOIL 472. Soil Morphology and Classification
4 Credits (2+2P)
Same as SOIL 472. Crosslisted with: SOIL 472.
Learning Outcomes
1. Describe soil profile morphology at a competitive level.
2. Understand the processes that drive soil formation and use this knowledge to identify common landforms.
3. Classify soils using Soil Taxonomy.
4. Interpret available soil mapping products to infer soil use and management conditions.

SOIL 476. Soil Microbiology
3 Credits (3)
Nature and physiology of soil microorganisms, how they affect plant growth and recycle nutrients. Land farming, bioremediation and other environmental problems as influenced by soil microorganisms. SOIL 2110 and BIOL 311 recommended. Same as BIOL 476.
Learning Outcomes
1. Explain foundational concepts of the soil environment and soil microbiology, including the soil habitat, the rhizosphere, microbial taxonomy, and microbial cell structure and function.
2. Analyze the diversity, physiology, and ecological functions of soil microorganisms—such as bacteria, archaea, fungi, micro-algae, and micro-fauna—and evaluate their interactions with plants and the soil environment.
3. Apply core soil microbiological techniques—including culturing, inoculation, microscopy, and DNA sequencing—to isolate, identify, and characterize soil microorganisms.
4. Evaluate real-world applications of soil microbiology in areas such as organic matter decomposition, nutrient cycling, integrated disease management, bioremediation, and wastewater treatment.
5. Effectively Communicate evidence-based strategies for enhancing soil microbial diversity and soil health through practices like soil amendments, cover cropping, crop rotation, and conservation tillage.

SOIL 476 L. Soil Microbiology Laboratory
1 Credit (3P)
Enumeration of soil microorganisms, their activities, and transformations they mediate. May be repeated up to 1 credit.
Corequisite: SOIL 476.
Learning Outcomes
1. Collect, store, and characterize soil samples using appropriate and sterile techniques of soil microbiology.
2. Observe, describe, and recognize major groups of microbial organisms
3. Develop skills in basic microscopy, isolation and culturing of soil microbes
4. Acquire basic DNA-based molecular skills in soil microbiology.
5. Compare and evaluate soil samples from different microhabitats regarding their soil microbiota.
6. Apply the scientific method including the following steps: developing a research question, constructing a testable hypothesis, design a research study to test the hypothesis, perform the experiment and collect data, analyze the results, evaluate the results and support/reject the hypothesis, and report the results.

SOIL 477. Environmental Soil Physics
3 Credits (3)
A description of the physical characteristics of porous media including soil. Examination of processes describing the transport of water, chemicals, heat and gases through porous media with application to environmental quality, waste management, and crop production.

SOIL 477 L. Environmental Soil Physics Laboratory
1 Credit (1)
Concurrent enrollment with SOIL 477 recommended. Hands on experience with techniques for characterizing soil physical properties such as particle size distribution, bulk density, water retention, hydraulic conductivity and solute transport. Demonstrations of field and laboratory techniques for measuring moisture content, soil water potential, gas/air flow and thermal conductivity.
Prerequisite(s): SOIL 2110.

SOIL 479. Environmental Soil Chemistry
3 Credits (3)
Basic elements of soil chemistry including discussion of clay mineralogy, cation and anion exchange and the chemistry of problem (acid, saline and flooded) soils. Credit not given for both SOIL 424 and SOIL 479.
Prerequisite: SOIL 2110L or CHEM 1215G and CHEM 1225G.

Learning Outcomes

1. Describe and explain the solid and liquid phases of soil.
2. Explain the chemical reactions and processes that occur between soil phases.
3. Use soil chemistry processes and properties to promote plant productivity and land remediation.
4. Calculate nutrient and contaminant concentrations in soil samples and convert to field scale.
5. Calculate soil chemical properties including CEC, pH, EC, SAR, nitrate, and convert them between old and new units.

SOIL 500. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

SOIL 505. Research Orientation
4 Credits (3+2P)
Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: HORT 505, AGRO 505 and ENVS 505.

Learning Outcomes

1. Gain insight into the nature of scientific research and skills vital for graduate research and future careers in science.
2. Navigate graduate school processes and protocols.
3. Demonstrate critical thinking.
4. Generate a scientific hypothesis.
5. Communicate science effectively in written and oral formats, including drafting a proposal for thesis or dissertation research.

SOIL 513. Introduction to Scientific Writing
3 Credits (3)
Students will learn how to communicate, through written format, to both the scientific community and diverse audiences. Students will be introduced to new technologies and new genres of scientific writing. Students will also learn basic reviewing and writing skills that underlie efficient preparation of literature reviews, scientific manuscripts, project reports, blog-posts, opinion or perspective pieces for more popular venues, advocacy articles for legislators, and descriptive pieces for popular venues such as newspapers, magazines, and broadcast media. Emphasis will be on the communication of experimental findings in peer-reviewed scientific journals.

Learning Outcomes

1. Students will review the basics of rhetoric and the technology of language.
2. Students will learn how to overcome writing barriers and gain confidence in their writing skills.
3. Students will improve their writing skills so that manuscript preparation becomes more efficient and productive.
4. Students will learn professional standards for the conduct of ethical reporting of scientific results.
5. Students will learn to recognize structural and stylistic elements in scientific articles that help researchers achieve certain communication goals.
6. Students will learn the basics of table, figure, diagram, and image presentation in manuscripts.
7. Literature reviews, framed so that they answer an important question in the field, and lead to peer-reviewed publication, may also be prepared. (With permission of the instructor.)

SOIL 525. Scientific Writing- How to be a Productive and Effective Writer
1-3 Credits (1-3)
Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review Crosslisted with: AGRO 525, AGRO 625, HORT 525, HORT 625, SOIL 625 and EPWS 525.

SOIL 590. Graduate Seminar
1 Credit (1)
Current research discussions presented by master level graduate students. Not more than one credit toward the degree. Same as AGRO/HORT 590. Crosslisted with: AGRO 590 and HORT 590.

SOIL 596. Masters Proposal
1 Credit (1)
Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, ENVS 596, GENE 596 and HORT 596. Students must be a Master level graduate student to enroll in this course. Restricted to: Masters HORT; Masters PLEN majors.

SOIL 597. University Teaching Experience
1-3 Credits (1-3)
Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ENVS course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures.

SOIL 598. Special Research Programs
1-6 Credits
Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits toward a degree.

Office Location: Skeen Hall room N127

Phone: (575) 646-3405

Website: https://pes.nmsu.edu/

Agronomy - Bachelor of Science in Agriculture

Agronomy is an understanding of the principles of plant and soil science and an application of these principles in the production of crops. Commercial sector careers include positions in agricultural consulting companies, agricultural seed or chemical companies, research and development with commercial companies, as well as farm and/or ranch management. Careers in county, state or federal agencies are in the areas of USDA, Cooperative Extension Service, Natural Resources Conservation Service, Forest Service and Bureau of Land Management.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2		
Choose from one of the following:		
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Oral Communication [1]		
Area II: Mathematics		
Choose from one of the following:		3
MATH 1220G	College Algebra	
MATH 1430G	Applications of Calculus I	
Area III/IV: Laboratory Science and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social & Behavioral Sciences Course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
AGRO 1110G	Introduction to Plant Science (Lecture & Lab)	4
or HORT 1115G	Introductory Plant Science	
Viewing A Wider World [2]		**6**
Departmental/College Requirements		
AEEC 2140	Technology and Communication for Business Management	3
AGRO 305	Principles of Genetics (or GENE 320 AND EPWS 301)	3
AGRO 311	Introduction to Weed Science	4
AGRO 365	Principles of Crop Production	4
AGRO 447	Seminar	1
AGRO 449	Special Problems	1-3
AGRO 462	Plant Breeding	3
AGRO 471	Plant Mineral Nutrition	3
AGRO 483	Advanced Sustainable Crop Production	4
AGRO 492	Diagnosing Plant Disorders	3
EPWS 303	Economic Entomology	3
EPWS 310	Plant Pathology	4
EPWS 314	Plant Physiology	3
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	4
SOIL 312	Soil Management and Fertility	3
SOIL 312 L	Soil Management and Fertility Lab	1
Other Required Courses		
Choose 10 credits from the following:		10
AEEC 2110	Principles of Food and Agribusiness Management	
AEEC 3210	Marketing and Food Agricultural Products	
AEEC 3110V	World Agriculture and Food Problems	
AGRO 2160	Plant Propagation	
AGRO 391	Internship	
BIOL 312	Plant Taxonomy	
EPWS 303	Economic Entomology	
BLAW 316	Legal Environment of Business	
EPWS 301	Agricultural Biotechnology	
EPWS 373	Fungal Biology	
EPWS 455	Advanced Integrated Pest Management	
RGSC 2110	Introduction to Rangeland Management	
SOIL 456	Irrigation and Drainage	
SPAN 1110	Spanish I	
SPAN 1120	Spanish II	
SPAN 2110	Spanish III	
Non- Departmental Requirements (other than Gen.Ed/VWW)		
A ST 311	Statistical Applications	3
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 313	Structure and Function of Plants	3
CHEM 2120	Integrated Organic Chemistry and Biochemistry (CHEM 2120 must be taken with associated 1-cr CHEM lab)	3
or ANSC 1170	Introduction to Animal Metabolism	
Electives, to bring the total credits to 120 [3]		**6-8**
Total Credits		**120**

1 See the General Education (p. 262) Section of the catalog for a full list of courses

2 See the Viewing a Wider World (p. 266) Section of the catalog for a full list of courses

3 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1220G or MATH 1430G	College Algebra [1] or Applications of Calculus I	3
AGRO 1110G or HORT 1115G	Introduction to Plant Science (Lecture & Lab) or Introductory Plant Science	4
Area IV: Social and Behavioral Science Course [2]		3
Students who must be enrolled in 15 credits a semester for Financial Aid purposes will need to enroll in additional elective credits		
	Credits	**14**
Semester 2		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	3

CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [1]	4
Area V: Humanities Course [2]		3
AEEC 2140	Technology and Communication for Business Management	3
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution [1]	3
	Credits	**16**
Second Year		
Semester 1		
ACOM 1130G	Effective Leadership and Communication in Agriculture [1]	3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [1]	4
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory [1]	4
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**17**
Semester 2		
AGRO 305	Principles of Genetics [1]	3
BIOL 313	Structure and Function of Plants [1]	3
A ST 311	Statistical Applications [1]	3
CHEM 2120	Integrated Organic Chemistry and Biochemistry (CHEM 2120 must be taken with associated 1-cr CHEM lab)	4
EPWS 303	Economic Entomology (Spring Only) [1]	3
	Credits	**16**
Third Year		
Semester 1		
AGRO 365	Principles of Crop Production (Odd year Fall Only) [1]	4
EPWS 310	Plant Pathology (Fall Only) [1]	4
AGRO 311	Introduction to Weed Science (Fall Only) [1]	4
AGRO Option Course [4]		3
VWW: Viewing a Wider World Course [3]		3
	Credits	**18**
Semester 2		
SOIL 312	Soil Management and Fertility (Spring Only) [1]	3
SOIL 312 L	Soil Management and Fertility Lab	1
EPWS 314	Plant Physiology (Spring Only) [1]	3
AGRO Option Course [4]		3
AGRO Option Course [4]		3
VWW: Viewing a Wider World Course [3]		3
	Credits	**16**
Fourth Year		
Semester 1		
AGRO 492	Diagnosing Plant Disorders (Fall Only) [1]	3
AGRO 449	Special Problems	1-3
AGRO 462	Plant Breeding (Fall Only) [1]	3
AGRO 483	Advanced Sustainable Crop Production (Even Fall Only) [1]	4
AGRO Option Course [4]		3
	Credits	**14-16**
Semester 2		
AGRO 447	Seminar (Spring Only)	1
AGRO 471	Plant Mineral Nutrition (Odd Year Spring Only) [1]	3
Elective Course		3
Elective Course		2
	Credits	**9**
	Total Credits	**120-122**

1. These courses have prerequisites and it is the students responsibility to check and fulfill all course prerequisites listed for these courses.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. Consult with your departmental advisor.

Environmental Science - Bachelor of Science in Environmental Science

The environmental science major is a multidisciplinary program based on a strong general science curriculum and an environmental curriculum that focuses on environmental problems and solutions. Although administered by the Department of Plant and Environmental Sciences, a multidisciplinary advisory committee recommends curriculum and other changes to the program. Graduates are very competitive for careers in industry and government and have excellent preparation for graduate programs in a variety of fields. A grade of C- or better must be earned in the Basic Background and Core Requirements.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [2]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social & Behavioral Sciences Course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [3]		
GEOL 1110G	Physical Geology	4
Viewing A Wider World [4]		**6**
Departmental/College Requirements		
Basic Science and Math Requirements (42-43 credits including Area III and General Education Elective above)		
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3

BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution (note: BIOL 2610L is NOT required for ES major)	3
BIOL 311	General Microbiology	3
A ST 311	Statistical Applications	3
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1430G	Applications of Calculus I	
PHYS 1310G	Calculus -Based Physics I (note: the lab is NOT required for ES major)	3
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	4
Select one of the following:		3-4
ANSC 1170	Introduction to Animal Metabolism	
CHEM 2120	Integrated Organic Chemistry and Biochemistry (CHEM 2120 must be taken with associated 1-cr CHEM lab)	
CHEM 313	Organic Chemistry I	
Environmental Science Core Requirements		
ENVS 1110G	Environmental Science I	4
ENVS 2111 & 2111L	Environmental Engineering and Science and Environmental Science Laboratory	4
ENVS 301	Principles of Ecology	3
ENVS 312	Emergency Response to Hazardous Material Incidents	2
ENVS 361	Basic Toxicology	3
ENVS 370	Environmental Soil Science	3
ENVS 391	Internship	3
ENVS 447	Seminar	1
ENVS 452	Geohydrology	4
ENVS 460	Introduction to Air Pollution	3
ENVS 462	Sampling and Analysis of Environmental Contaminants	3
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation	3
Select from one of the following:		3-4
ENVS 457	Water Measurement	
FWCE 434	Aquatic Contaminants and Toxicology	
FWCE 459	Aquatic Ecology	
Select one of the following:		3
ENVS 422	Environmental Chemistry	
GEOL 360	General Geochemistry	
SOIL 424	Soil Chemistry	
Select one of the following:		3-4
GEOG 381	Cartography and GIS	
GEOG 481	Fundamentals of GIS (any GIS course)	
GEOG 488	GIS for Water Resources	
GEOL 444	GIS for Geology	
Second Language: (not required)		
Electives, to bring the total credits to 120 [5]		**8**
Total Credits		**120-123**

1 See the General Education (p. 262) Section of the catalog for a full list of courses

2 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take prerequisites first.

3 MATH 1511G, ENVS 1110G, and GEOL 1110G are all required for this major and will satisfy this category depending on which course is completed first.

4 See the Viewing a Wider World (p. 266) Section of the catalog for a full list of courses; one course may be in the College of ACES but cannot be taught or cross-listed with AGRO, HORT, ENVS, SOIL, or GENE.

5 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Students should meet with their advisor every semester.

First Year

Semester 1		**Credits**
ENVS 1110G	Environmental Science I	4
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
Choose from one of the following: [2]		3
Area IV: Social and Behavioral Science Course [2]		
Area V: Humanities Course [2]		
Area VI: Creative and Fine Arts Course [2]		
Elective Course [3]		3
Students who must be enrolled in 15 credits a semester for Financial Aid purposes will need to enroll in additional elective credits [3]		
	Credits	**14**
Semester 2		
Elective Course [3]		3
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution (Lab not required)	3
Choose from one of the following:		3
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
GEOL 1110G	Physical Geology	4
Choose from one of the following:		3
Area IV: Social Behavioral Course [2]		
Area V: Humanities Course [2]		
Area V: Creative and Fine Arts Course [2]		
	Credits	**16**

Second Year

Semester 1		
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology (Lab not required)	3
Choose from one of the following:		3

ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Choose one from the following:		4
ENVS 457	Water Measurement	
FWCE 434	Aquatic Contaminants and Toxicology	
FWCE 459	Aquatic Ecology	
Students who must be enrolled in 15 credits a semester for Financial Aid purposes will need to enroll in additional elective credits [3]		
	Credits	**18**
Semester 2		
MATH 1521G or MATH 1430G or MATH 1521H	Calculus and Analytic Geometry II [1] or Applications of Calculus I or Calculus and Analytic Geometry II Honors	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [1]	4
Choose from one of the following:		3
Area IV: Social and Behavioral Science Course [2]		
Area V: Humanities Course [2]		
Area VI: Creative and Fine Arts [2]		
Students who must be enrolled in 15 credits a semester for Financial Aid purposes will need to enroll in additional elective credits [3]		
	Credits	**11**
Third Year		
Semester 1		
A ST 311	Statistical Applications [1]	3
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	4
CHEM 2120 or CHEM 313	Integrated Organic Chemistry and Biochemistry (CHEM 2120 must be taken with associated 1-cr CHEM lab) or Organic Chemistry I	3-4
GEOG 481	Fundamentals of GIS	4
VWW: Viewing a Wider World Course [4]		3
	Credits	**17-18**
Semester 2		
ENVS 312	Emergency Response to Hazardous Material Incidents (Spring Only)	2
ENVS 2111 & 2111L	Environmental Engineering and Science and Environmental Science Laboratory	4
ENVS 370	Environmental Soil Science (Spring Only)	3
PHYS 1310G	Calculus -Based Physics I (lab not required)	3
	Credits	**12**
Fourth Year		
Semester 1		
ENVS 462	Sampling and Analysis of Environmental Contaminants (Fall Only)	3
ENVS 452	Geohydrology (Fall Only)	4
ENVS 460	Introduction to Air Pollution (Fall Only)	3
ENVS 361	Basic Toxicology (Fall Only)	3
ENVS 422	Environmental Chemistry	3
	Credits	**16**
Semester 2		
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation (Spring Only)	3
ENVS 301	Principles of Ecology	3
ENVS 391	Internship	3
VWW: Viewing a Wider World Course [4]		3
BIOL 311	General Microbiology	3
ENVS 447	Seminar	1
	Credits	**16**
	Total Credits	**120-121**

1 These courses have prerequisites and it is the students responsibility to check and fulfill all course prerequisites listed for these courses.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 The department recommends utilizing the following courses to fulfill the additional elective credits needed for Financial Aid requirements.

First Year - Semester 1:

- MATH 1220G College Algebra
- ACES 1120 Freshman Orientation

First Year - Semester 2:

- MATH 1250G Trigonometry & Pre-Calculus

4 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Genetics and Biotechnology - Bachelor of Science in Genetics

Codirectors of the Program:

Professor, Charles Shuster, Department Head, Biology
Professor, Anowar Islam, Department Head, Plant and Environmental Sciences

Professors Bailey, Cramer, Hanley, Houde, Milligan, Randall, Serrano, C. Shuster, M. Shuster, Smith, Unguez, Zhang; ***Associate Professors*** Curtiss, James, Xu ***Assistant Professors*** Lozada

Have you ever wondered why your hair or eye color, facial features, or the build of your body resembles that of your parents, grandparents, or other close relatives? What factors are responsible for generating all the variety of colors and shapes of flowers, trees, and different types of animals? If these questions have crossed your mind, then you have been thinking about Genetics; the science of heredity. Genetics is studied at the DNA/gene/genome level (molecular genetics, biotechnology, genomics and bioinformatics), the level of organisms (classical or Mendelian genetics), and within/among populations of individuals (population and quantitative genetics).

One of the most significant scientific accomplishments in history has been the use of genomic technologies to recently identify most human genes, as well as, most genes for a number of other animals, plants, fungi, and bacteria. Geneticists now have tremendous opportunities to use molecular, biochemical, mathematical, and computer science-based (bioinformatics) approaches to investigate how these genes determine observable traits. This information can be used to significantly advance human health and well being, and to meet the food and fiber needs of the world.

A degree in Genetics can provide excellent preparation for careers in academic research and technical support, teaching, agriculture, the biotechnology industry, medicine and health sciences, forensic science, technical writing, and sales or marketing. It is also an excellent

background for students wishing to enter a graduate program, medical school, and veterinary school.

Undergraduates in the Genetics program must earn a grade of C- or better to receive credit for Departmental and Non-Departmental required courses. Within the Departmental Required courses, Tier I courses must be taken by all majors, for a total of 31 credit hours*. To accommodate differing interests among students, a series of Tier II courses comprising 9-11 credits are provided. Ethical considerations of genetic based technologies will be infused throughout the curriculum, with a focused course on Science and Ethics in the Tier III portion of the core curriculum.

**Note: This includes BIOL 2610G which also counts as a General Education elective.*

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, other Non-Departmental requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirements		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics		
MATH 1521G	Calculus and Analytic Geometry II [2]	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social/Behavioral Sciences (3 credits) [1]		*3*
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution (Tier I Requirement also)	3
Viewing a Wider World [3]		**6**
Departmental/College Requirements		
Tier I Requirements		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 377	Cell Biology	3
BIOL 446	Bioinformatics and NCBI Database	3
or GENE 452	Applied Bioinformatics	
BIOL 455	Biometry	3
or A ST 311	Statistical Applications	
BIOL 467	Evolution	3
GENE 1110	Experimental Systems in Genetics	1
GENE 305 L	Genetic Techniques	1
GENE 315	Molecular Genetics	3
GENE 320	Hereditary and Population Genetics	3
GENE 440	Genetics Seminar	1
Choose 3 Credits from Following:		3
GENE 391	Genetics Internship	
GENE 449	Special Problems	
BIOL 302	Molecular Biology Techniques Laboratory	
BIOL 309	Guided Biological Research Lab	
BIOL 351	Biology Internship	
Tier II Requirements		*9-11*
Select one course from each of the three following categories.		
1. Molecular and Applied Genetics: AGRO 462, ANSC 423, BIOL 442, BIOL 475, BIOL 478, BIOL 488, GENE 486		
2. Physiology: ANSC 421, BIOL 354, BIOL 381, BIOL 385, BIOL 451, BIOL 474, EPWS 314, HORT 471		
3. Organism Structure: ANSC 370, BIOL 311, BIOL 313, BIOL 322, BIOL 382, BIOL 470, BIOL 490, EPWS 302, EPWS 373		
Tier III Courses		*3*
Select one from the following:		
AGRO 303V	Genetics and Society	
HNRS 306V	Science, Ethics and Society	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
BCHE 395	Biochemistry I	3
BCHE 396	Biochemistry II, Lecture and Laboratory	4
PHYS 2230G	General Physics for Life Science I	3
or PHYS 1230G	Algebra-Based Physics I	
PHYS 2240G	General Physics for Life Science II	3
or PHYS 1240G	Algebra-Based Physics II	
Electives, to bring the total credits to 120 [4]		**16**
Select electives to bring total to 120 credits including 48 upper division credits.		
Recommended Electives		
HNRS courses [5]		
Total Credits		**120-122**

1. See the General Education Section (p. 262) of the catalog for a full list of courses.
2. MATH 1521G Calculus and Analytic Geometry II is required for the degree but students may need to take prerequisite courses before entering MATH 1521G Calculus and Analytic Geometry II.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credits in the requirements list is the amount needed to bring the total to 120 credits and may vary based on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss elective requirements with their advisor.
5. Students interested in graduating with University Honors should consult with an advisor to select 18 credits of relevant Honors (HNRS) courses.

Second Language Requirement

For the Bachelor of Science in Genetics with a major in Genetics and Biotechnology there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
GENE 1110	Experimental Systems in Genetics	1
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
Area IV: Social/Behavioral Science Course [1]		3
	Credits	**15**
Spring		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
MATH 1220G	College Algebra	3
Area V: Humanities Course [1]		3
Elective		1
	Credits	**15**
Second Year		
Fall		
CHEM 313	Organic Chemistry I	3
MATH 1250G	Trigonometry & Pre-Calculus	4
GENE 315	Molecular Genetics	3
Choose one from the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Area I: Oral Communication [1]		3
	Credits	**16**
Spring		
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I or Calculus and Analytic Geometry I Honors	4
GENE 320	Hereditary and Population Genetics	3
Elective Course		3
	Credits	**15**
Third Year		
Fall		
BCHE 395	Biochemistry I	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
PHYS 2230G	General Physics for Life Science I	3
Area IV: Creative and Fine Arts		3
Elective		2
	Credits	**15**
Spring		
BIOL 377	Cell Biology	3
BCHE 396	Biochemistry II, Lecture and Laboratory	4
GENE 305 L	Genetic Techniques	1
PHYS 2240G	General Physics for Life Science II	3
Choose from one of the following:		3
A ST 311	Statistical Applications	
BIOL 455	Biometry	
Elective		1
	Credits	**15**
Fourth Year		
Fall		
BIOL 467	Evolution	3
Choose 3 Credits from Following:		3
GENE 391	Genetics Internship	
GENE 449	Special Problems	
BIOL 302	Molecular Biology Techniques Laboratory	
BIOL 309	Guided Biological Research Lab	
BIOL 351	Biology Internship	
Tier II: Organism Structure Course		3-4
Choose from one of the following:		3
BIOL 446	Bioinformatics and NCBI Database	
GENE 452	Applied Bioinformatics	
VWW: Viewing a Wider World Course [2]		3
	Credits	**15-16**
Spring		
GENE 440	Genetics Seminar	1
AGRO 303V	Genetics and Society	3
Tier II: Molecular and Applied Genetics Course		3
Tier II: Physiology Course		3-4
VWW: Viewing a Wider World Course		3
Elective		1
	Credits	**14-15**
	Total Credits	**120-122**

[1] See the General Education (p. 262) section of the catalog for a full list of courses.

[2] See the Viewing a Wider World (p. 266) section for a full list of courses.

Horticulture - Bachelor of Science in Agriculture

Horticulture includes a wide variety of topics that relate to fruit, vegetable and ornamental crops. Careers range from production management to processing and marketing, retail and wholesale management, greenhouse and nursery production, floriculture, landscaping, turf management, research and development, various service activities and positions with local, state and federal agencies.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or

elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
Oral Communication [1]		
Area II: Mathematics		
MATH 1220G	College Algebra [2, 3]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social & Behavioral Sciences Course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
AGRO 1110G/ HORT 1115G	Introduction to Plant Science (Lecture & Lab)	4
Viewing A Wider World [3, 4]		**6**
Departmental/College Requirements		
EPWS 303	Economic Entomology	3
EPWS 310	Plant Pathology	4
EPWS 314	Plant Physiology	3
HORT 2160	Plant Propagation	3
HORT 365	Principles of Crop Production	4
HORT 447	Seminar	1
SOIL 2110	Introduction to Soil Science	3
Choose 21 credits from the following: [3]		*21*
HORT 2110	Ornamental Plants I	
HORT 2120	Ornamental Plants II	
HORT 2130	Floral Quality Evaluation and Design	
HORT 2990	Floriculture Field Practicum	
HORT 2996	Special Topics	
HORT 300	Special Topics	
HORT 302V	Forestry and Society	
HORT 304	Hydroponics	
HORT 305	Principles of Genetics	
HORT 307	Landscape Design	
HORT 310	Medicinal Herbs	
HORT 318V	Urban Water Issues and Society	
HORT 377	Introduction to Turfgrass Management	
HORT 378	Turfgrass Science	
HORT 391	Internship	
HORT 449	Special Problems	
HORT 450	Special Topics	
HORT 462	Plant Breeding	
HORT 471	Plant Mineral Nutrition	
HORT 479	Advanced Turfgrass Science	
HORT 483	Advanced Sustainable Crop Production	
HORT 488	Greenhouse Management	
HORT 492	Diagnosing Plant Disorders	
Choose 28 credits from the following:		*28*
A ST 311	Statistical Applications	
ACCT 2110	Principles of Accounting I	
ACCT 2120	Principles of Accounting II	
AEEC 2110	Principles of Food and Agribusiness Management	
AEEC 2140	Technology and Communication for Business Management	
AEEC 3210	Marketing and Food Agricultural Products	
AEEC 3110V	World Agriculture and Food Problems	
AEEC 4110	Food and Agribusiness Financial Management	
AGRO 303V	Genetics and Society	
AGRO 311	Introduction to Weed Science	
AGRO 483	Advanced Sustainable Crop Production	
ARTS 1610	Drawing I	
ARTS 2610	Drawing II	
AXED 3115	Small Engine Technology	
AXED 3120	Agricultural Structures	
BIOL 301	Principles of Ecology	
BIOL 313	Structure and Function of Plants	
BLAW 316	Legal Environment of Business	
BLAW 385V	Employment and Consumer Law	
BUSA 1110	Intro to Business	
CHEM 2120	Integrated Organic Chemistry and Biochemistry (CHEM 2120 must be taken with associated 1-cr CHEM lab)	
or ANSC 1170	Introduction to Animal Metabolism	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
EPWS 301	Agricultural Biotechnology	
EPWS 373	Fungal Biology	
FSTE 4110	Food Microbiology	
FSTE 4120	Food Chemistry	
GENE 305 L	Genetic Techniques	
GENE 315	Molecular Genetics	
GENE 320	Hereditary and Population Genetics	
MGMT 309	Human Behavior in Organizations	
MGMT 332	Human Resources Management	
MKTG 303	Principles of Marketing	
MKTG 313	Retail Management	
SOIL 2110L	Introduction to Soil Science Laboratory	
SOIL 312	Soil Management and Fertility	
SOIL 312 L	Soil Management and Fertility Lab	
SOIL 456	Irrigation and Drainage	
SOIL 476	Soil Microbiology	
SPAN 1110	Spanish I	
SPAN 1120	Spanish II	
SPAN 2110	Spanish III	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
Electives to bring the total credit to 120 [5]		**7**
Total Credits		**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.
3. Requires a grade of C- or above in horticulture courses.

[4] See the Viewing a Wider World (p. 266) Section of the catalog for a full list of courses.

[5] Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1220G	College Algebra [1]	3
HORT 1115G	Introductory Plant Science	4
Area IV: Social and Behavioral Science Course [2]		3
ACES 1120	Freshman Orientation	1
	Credits	**15**
Semester 2		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [1]	4
Area V: Humanities Course [2]		3
HORT Elective Course		3
HORT Elective Course		3
	Credits	**16**
Second Year		
Semester 1		
ACOM 1130G or COMM 1115G or HNRS 2175G	Effective Leadership and Communication in Agriculture or Introduction to Communication or Introduction to Communication Honors	3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [1]	4
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
Area VI: Creative and Fine Arts Course [2]		3
HORT Elective Course		3
	Credits	**16**
Semester 2		
SOIL 2110	Introduction to Soil Science [1]	3
EPWS 303	Economic Entomology (Spring Only) [1]	3
HORT 2160	Plant Propagation	3
VWW: Viewing a Wider World Course [3]		3
HORT Elective Course		3
	Credits	**15**
Third Year		
Semester 1		
EPWS 310	Plant Pathology (Fall Only) [1]	4
HORT Prefix Course		3
HORT Prefix Course		3
HORT Prefix Course		3
VWW: Viewing a Wider World Course [3]		3
	Credits	**16**
Semester 2		
EPWS 314	Plant Physiology	3
HORT Upper-Division Prefix Course		3
HORT Upper-Division Prefix Course		3
HORT Upper-Division Elective Course		3
HORT Upper-Division Elective Course		3
	Credits	**15**
Fourth Year		
Semester 1		
HORT 365	Principles of Crop Production	4
HORT Elective Course		3
HORT Upper-Division Prefix Course		3
HORT Upper-Division Prefix Course		3
Upper-Division Elective Course		3
	Credits	**16**
Semester 2		
HORT 447	Seminar	1
HORT Upper-Division Elective Course		4
Elective Course		3
Elective Course		3
	Credits	**11**
	Total Credits	**120**

[1] These courses have prerequisites and it is the students responsibility to check and fulfill all course prerequisites listed for these courses.

[2] See the General Education (p. 262) section of the catalog for a full list of courses.

[3] **HORT Elective Courses:**

- HORT 2110 Ornamental Plants I
- HORT 2120 Ornamental Plants II
- HORT 2130 Floral Quality Evaluation and Design
- HORT 2990 Floriculture Field Practicum
- HORT 300 Special Topics
- HORT 302V Forestry and Society
- HORT 304 Hydroponics
- HORT 305 Principles of Genetics
- HORT 307 Landscape Design
- HORT 310 Medicinal Herbs
- HORT 318V Urban Water Issues and Society
- HORT 377 Introduction to Turfgrass Management
- HORT 378 Turfgrass Science
- HORT 391 Internship
- HORT 449 Special Problems
- HORT 450 Special Topics
- HORT 462 Plant Breeding
- HORT 471 Plant Mineral Nutrition
- HORT 479 Advanced Turfgrass Science

- HORT 483 Advanced Sustainable Crop Production
- HORT 488 Greenhouse Management
- HORT 492 Diagnosing Plant Disorders

[4]
- **Horticulture Core Courses:**
- A ST 311 Statistical Applications
- ACCT 2110 Principles of Accounting I
- ACCT 2120 Principles of Accounting II
- AEEC 2110 Principles of Food and Agribusiness Management
- AEEC 2140 Technology and Communication for Business Management
- AEEC 3210 Marketing and Food Agricultural Products
- AEEC 3110V World Agriculture and Food Problems
- AEEC 4110 Food and Agribusiness Financial Management
- AGRO 303V Genetics and Society
- AGRO 311 Introduction to Weed Science
- AGRO 483 Advanced Sustainable Crop Production
- ARTS 1610 Drawing I
- ARTS 2610 Drawing II
- AXED 3115 Small Engine Technology
- AXED 3120 Agricultural Structures
- BIOL 301 Principles of Ecology
- BIOL 313 Structure and Function of Plants
- BLAW 316 Legal Environment of Business
- BLAW 385V Employment and Consumer Law
- BUSA 1110 Intro to Business
- ECON 2110G Macroeconomic Principles
- ECON 2120G Principles of Microeconomics Honors
- EPWS 301 Agricultural Biotechnology
- EPWS 373 Fungal Biology
- FSTE 4110 Food Microbiology
- FSTE 4120 Food Chemistry
- GENE 305 L Genetic Techniques
- GENE 315 Molecular Genetics
- GENE 320 Hereditary and Population Genetics
- MGMT 309 Human Behavior in Organizations
- MGMT 332 Human Resources Management
- MKTG 303 Principles of Marketing
- MKTG 313 Retail Management
- SOIL 2110L Introduction to Soil Science Laboratory
- SOIL 312 Soil Management and Fertility/SOIL 312 L Soil Management and Fertility Lab
- SOIL 456 Irrigation and Drainage
- SOIL 476 Soil Microbiology
- SPAN 1110 Spanish I
- SPAN 1120 Spanish II
- SPAN 2110 Spanish III

[5] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Horticulture (Turfgrass Science and Management) - Bachelor of Science in Agriculture

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
Oral Communication [1]		
Area II: Mathematics		
MATH 1220G	College Algebra [2, 3]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social & Behavioral Sciences Course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
AGRO 1110G/ HORT 1115G	Introduction to Plant Science (Lecture & Lab)	4
Viewing A Wider World [3, 4]		**6**
Departmental/College Requirements		
EPWS 303	Economic Entomology	3
EPWS 310	Plant Pathology	4
EPWS 314	Plant Physiology	3
HORT 2160	Plant Propagation	3
HORT 365	Principles of Crop Production	0,4
HORT 447	Seminar	1
HORT 377	Introduction to Turfgrass Management	4
HORT 378	Turfgrass Science	4
HORT 391	Internship (taken twice for a total of 6 credits)	6
HORT 479	Advanced Turfgrass Science	3
SOIL 2110	Introduction to Soil Science	3
Choose 4 credits from the following: [3]		*3*
HORT 2110	Ornamental Plants I	
HORT 2120	Ornamental Plants II	
HORT 2130	Floral Quality Evaluation and Design	
HORT 2990	Floriculture Field Practicum	
HORT 2996	Special Topics	
HORT 300	Special Topics	
HORT 302V	Forestry and Society	
HORT 305	Principles of Genetics	
HORT 307	Landscape Design	
HORT 310	Medicinal Herbs	

HORT 449	Special Problems	
HORT 450	Special Topics	
HORT 462	Plant Breeding	
HORT 471	Plant Mineral Nutrition	
HORT 479	Advanced Turfgrass Science (required)	
HORT 488	Greenhouse Management	
HORT 492	Diagnosing Plant Disorders	
Concentration Courses		
AGRO 311	Introduction to Weed Science	4
Choose 28 credits from the following:		28
A ST 311	Statistical Applications	
ACCT 2110	Principles of Accounting I	
ACCT 2120	Principles of Accounting II	
AEEC 2110	Principles of Food and Agribusiness Management	
AEEC 2140	Technology and Communication for Business Management	
AEEC 3210	Marketing and Food Agricultural Products	
AEEC 3110V	World Agriculture and Food Problems	
AEEC 4110	Food and Agribusiness Financial Management	
AGRO 303V	Genetics and Society	
AGRO 483	Advanced Sustainable Crop Production	
ARTS 1610	Drawing I	
ARTS 2610	Drawing II	
BFIN 2110	Introduction to Finance	
BFIN 341	Financial Analysis and Markets	
BIOL 301	Principles of Ecology	
BIOL 313	Structure and Function of Plants	
BLAW 313	Sports and the Law	
BLAW 316	Legal Environment of Business	
BLAW 385V	Employment and Consumer Law	
BUSA 1110	Intro to Business	
CHEM 2115	Survey of Organic Chemistry and Laboratory	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
ECON 337V	Natural Resource Economics	
ECON 384V	Water Resource Economics	
EPWS 301	Agricultural Biotechnology	
EPWS 373	Fungal Biology	
EPWS 420	Environmental Behavior of Pesticides	
FSTE 4110	Food Microbiology	
FSTE 4120	Food Chemistry	
GENE 305 L	Genetic Techniques	
GENE 315	Molecular Genetics	
GENE 320	Hereditary and Population Genetics	
MGMT 309	Human Behavior in Organizations	
MGMT 333	Training and Development	
MGMT 351	Supply Chain Management	
MKTG 303	Principles of Marketing	
MKTG 313	Retail Management	
PHED 1230	Individual Sport: (Golf (Beginning and/or Intermediate))	
SOIL 2110L	Introduction to Soil Science Laboratory	
SOIL 312	Soil Management and Fertility	
SOIL 312 L	Soil Management and Fertility Lab	
SOIL 456	Irrigation and Drainage	
SOIL 476	Soil Microbiology	
SPAN 1110	Spanish I	
SPAN 2110	Spanish III	
SPAN 2120	Spanish IV	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
Electives to bring the total credit to 120 [5]		**4**
Total Credits		**116-120**

1 See the General Education (p. 262) section of the catalog for a full list of courses

2 MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.

3 Requires a grade of C- or above in horticulture courses.

4 See the Viewing a Wider World (p. 266) Section of the catalog for a full list of courses.

5 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1220G	College Algebra [1]	3
HORT 1115G	Introductory Plant Science	4
Area IV: Social and Behavioral Science Course [2]		3
	Credits	**14**
Semester 2		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
Area V: Humanities Course [2]		3
HORT Elective Course		3
HORT Elective Course		3
	Credits	**16**
Second Year		
Semester 1		
ACOM 1130G or COMM 1115G or HNRS 2175G	Effective Leadership and Communication in Agriculture or Introduction to Communication or Introduction to Communication Honors	3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [1]	4

BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
Area VI: Creative and Fine Arts Course [2]		3
HORT Elective Course		3
	Credits	**16**
Semester 2		
SOIL 2110	Introduction to Soil Science [1]	3
EPWS 303	Economic Entomology (Spring Only) [1]	3
HORT 2160	Plant Propagation	3
VWW: Viewing a Wider World Course [3]		3
HORT 377	Introduction to Turfgrass Management	4
	Credits	**16**
Third Year		
Semester 1		
EPWS 310	Plant Pathology (Fall Only) [1]	4
HORT 378	Turfgrass Science	4
AGRO 311	Introduction to Weed Science	4
VWW: Viewing a Wider World Course [3]		3
	Credits	**15**
Semester 2		
EPWS 314	Plant Physiology	3
HORT 479	Advanced Turfgrass Science	3
HORT Upper-Division Prefix Course		3
HORT Upper-Division Prefix Course		3
HORT Upper-Division Elective Course		3
	Credits	**15**
Fourth Year		
Semester 1		
HORT 365	Principles of Crop Production	4
HORT 391	Internship	3
HORT Upper-Division Prefix Course		3
HORT Upper-Division Prefix Course		3
Upper-Division Elective Course		3
	Credits	**16**
Semester 2		
HORT 447	Seminar	1
HORT 391	Internship	3
HORT Upper-Division Elective Course		4
Elective Course		3
Elective Course		1
	Credits	**12**
	Total Credits	**120**

1 These courses have prerequisites and it is the students responsibility to check and fulfill all course prerequisites listed for these courses.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 **HORT Elective Courses:**

- HORT 2110 Ornamental Plants I
- HORT 2120 Ornamental Plants II
- HORT 2130 Floral Quality Evaluation and Design
- HORT 2990 Floriculture Field Practicum
- HORT 300 Special Topics
- HORT 302V Forestry and Society
- HORT 305 Principles of Genetics
- HORT 307 Landscape Design
- HORT 310 Medicinal Herbs
- HORT 377 Introduction to Turfgrass Management
- HORT 378 Turfgrass Science
- HORT 391 Internship
- HORT 449 Special Problems
- HORT 450 Special Topics
- HORT 462 Plant Breeding
- HORT 471 Plant Mineral Nutrition
- HORT 479 Advanced Turfgrass Science
- HORT 488 Greenhouse Management
- HORT 492 Diagnosing Plant Disorders

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- **Horticulture Core Courses:**
- A ST 311 Statistical Applications
- ACCT 2110 Principles of Accounting I
- ACCT 2120 Principles of Accounting II
- AEEC 2110 Principles of Food and Agribusiness Management
- AEEC 2140 Technology and Communication for Business Management
- AEEC 3210 Marketing and Food Agricultural Products
- AEEC 3110V World Agriculture and Food Problems
- AEEC 4110 Food and Agribusiness Financial Management
- AGRO 303V Genetics and Society
- AGRO 311 Introduction to Weed Science
- AGRO 483 Advanced Sustainable Crop Production
- ARTS 1610 Drawing I
- ARTS 2610 Drawing II
- AXED 3115 Small Engine Technology
- AXED 3130 Advanced Technology in the Agricultural Mechanization
- BIOL 301 Principles of Ecology
- BIOL 313 Structure and Function of Plants
- BLAW 316 Legal Environment of Business
- BLAW 385V Employment and Consumer Law
- BUSA 1110 Intro to Business
- CHEM 2115 Survey of Organic Chemistry and Laboratory
- ECON 2110G Macroeconomic Principles
- ECON 2120G Principles of Microeconomics Honors
- EPWS 301 Agricultural Biotechnology
- EPWS 373 Fungal Biology
- FSTE 4110 Food Microbiology
- FSTE 4120 Food Chemistry
- GENE 305 L Genetic Techniques
- GENE 315 Molecular Genetics
- GENE 320 Hereditary and Population Genetics
- MGMT 309 Human Behavior in Organizations
- MGMT 332 Human Resources Management
- MKTG 303 Principles of Marketing
- MKTG 313 Retail Management
- SOIL 2110L Introduction to Soil Science Laboratory
- SOIL 312 Soil Management and Fertility/SOIL 312 L Soil Management and Fertility Lab
- SOIL 456 Irrigation and Drainage
- SOIL 476 Soil Microbiology

- SPAN 1110 Spanish I
- SPAN 2110 Spanish III

[5] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Soil Science (Environment and Resource Management) - Bachelor of Science in Agriculture

Soil scientists investigate the physical, chemical and biological characteristics and behavior of soils, their description and classification, and their management for both agricultural and non-agricultural uses. Career opportunities include: industry jobs; environmental consulting firms; and federal, state and local government careers working on various environmental, agricultural and ecological projects.

Soil science is integrated into the management of the environment and natural resources. Students interested in careers of conservation,. environmental management, urban planning, waste disposal and related fields in government and industry may choose from a variety of course offerings. The economic and social implications as well as the technological aspects of resource management are included in the concentration courses.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. In addition to the courses listed for each major, you must take 35 credits in the College of Agricultural, Consumer and Environmental Sciences and at least 24 credits of soil science related courses with a grade of C- or above including:

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1 [1]		*4*
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication [1]		*3*
Area II: Mathematics		
Choose from one of the following:		3-4
MATH 1430G	Applications of Calculus I [2]	
MATH 1511G	Calculus and Analytic Geometry I [2]	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Science and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social & Behavioral Sciences Course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
GEOL 1110G	Physical Geology	4
or HNRS 2116G	Earth, Time and Life	
Viewing A Wider World [3]		**6**
Departmental/College Requirements		**24**
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	
SOIL 312 & 312 L	Soil Management and Fertility and Soil Management and Fertility Lab	
SOIL 447	Seminar	
Choose 15 credit hours of SOIL Courses (300-level or above)		
SOIL 370	Environmental Soil Science	
SOIL 424	Soil Chemistry	
or SOIL 479	Environmental Soil Chemistry	
SOIL 456	Irrigation and Drainage	
SOIL 472	Soil Morphology and Classification	
SOIL 476	Soil Microbiology	
SOIL 476 L	Soil Microbiology Laboratory	
SOIL 477	Environmental Soil Physics	
SOIL 477 L	Environmental Soil Physics Laboratory	
Concentration Coursework [4]		
Select at least one course from each of the following four categories to bring total concentration coursework to 30 credits		30
All course selections must be in addition to the courses required under the Departmental/College and Non-Departmental Requirements sections listed above		
Category 1: Soil, Water, Wildlife, or Range Conservation		
Course category areas are as follows:		
Range Science		
Soil		
Environmental Science		
Wildlife Science		
Category 2: Ecology, Plant Biology, or Crop Production		
Course category areas are as follows:		
Agronomy		
Biology		
Entomology		
Plant Pathology		
Weed Science		
Horticulture		
Toxicology		
Category 3: Earth, Mineral, or Climatic Resources & Economics		
Course category areas are as follows:		
Agricultural Economics		
Geography		
Geology		
Planning		
Survey		
Category 4: Advanced Science, Computing & Statistics		
Course category areas are as follows:		
Math		
Chemistry		
Physics		
Computer-Oriented		
Statistics or Applied Statistics		
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
PHYS 1230G	Algebra-Based Physics I ((Lab not required))	3
CHEM 2120	Integrated Organic Chemistry and Biochemistry (CHEM 2120 must be taken with associated 1-cr CHEM lab)	3-4

or ANSC 1170	Introduction to Animal Metabolism	
Choose two from the following (lab is NOT required)		6
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	
BIOL 311	General Microbiology	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
Second Language: (not required)		
Electives, to bring the total credits to 120 [5]		**12-14**
Total Credits		**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites to enter either course first.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4. Please see your academic advisor for a list of appropriate courses to satisfy the concentration coursework requirements.
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

Additional classes may be needed based on placement test results and course prerequisites. Visit with an advisor for help with creating a customized plan. This roadmap assumes student placement in MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
ACES 1120 & ACES 1210	Freshman Orientation and Financial Fitness for College Students (recommended)	2
BIOL 2110G or BIOL 2610G	Principles of Biology: Cellular and Molecular Biology ((Lab not required)) or Principles of Biology: Biodiversity, Ecology, and Evolution	3
MATH course as per MPE		3-4
Area V: Humanities Course [3]		3
	Credits	**15-16**
Spring		
GEOL 1110G or HNRS 2116G	Physical Geology or Earth, Time and Life	4
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
Area VI: Creative and Fine Arts Course [3]		3
Concentration Category Course: Category 1, 2, 3, or 4 [4]		4
Elective Course [1]		1-3
	Credits	**15-17**
Second Year		
Fall		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
Viewing a Wider World [5]		3
Concentration Category Course: Categories 1, 2, or 3 [4]		4
Choose one from the following: [6]		3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	
BIOL 311	General Microbiology	
	Credits	**14**
Spring		
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	4
ENGL 2210G or ENGL 2215G or ENGL 2210H	Professional and Technical Communication or Advanced Technical and Professional Communication or Professional and Technical Communication	3
Elective Course [1]		4
	Credits	**15**
Third Year		
Fall		
SOIL 472	Soil Morphology and Classification	4
Viewing a Wider World Course [5]		3
Concentration Category Course: Category 1, 2 ,3 ,or 4 [4]		3
PHYS 1230G	Algebra-Based Physics I	3
Choose from one of the following:		3-4
MATH 1430G	Applications of Calculus I	
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I or Calculus and Analytic Geometry I Honors	
	Credits	**16-17**
Spring		
SOIL 456	Irrigation and Drainage	3
SOIL 476	Soil Microbiology	3
SOIL 479 or SOIL 424	Environmental Soil Chemistry or Soil Chemistry	3
Choose from one of the following:		3-4
CHEM 2120	Integrated Organic Chemistry and Biochemistry (CHEM 2120 must be taken with associated 1-cr CHEM lab)	
ANSC 1170	Introduction to Animal Metabolism	
CHEM 313	Organic Chemistry I	
Concentration Category Course: Categories 1, 2, 3, or 4 [4]		3
	Credits	**15-16**
Fourth Year		
Fall		
SOIL 477	Environmental Soil Physics	3
Concentration Category Course: Categories 1, 2, 3, or 4 [4]		3
Concentration Category Course: Categories 1, 2, 3, or 4 [4]		3
Concentration Category Course: Categories 1, 2, 3, or 4 [4]		3

Elective Course [1]		4
	Credits	**16**
Spring		
SOIL 312 & 312 L	Soil Management and Fertility and Soil Management and Fertility Lab	4
SOIL 447	Seminar	1
Concentration Category Course: Cateogries 1, 2, 3, or 4 [4]		3
Concentration Category Course: Cateogries 1, 2, 3, or 4 [4]		3
Elective Course [1]		3
	Credits	**14**
	Total Credits	**120-125**

1. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
2. The degree requires either MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I, students who do not test into these courses will have additional MATH courses to complete in this semester and where "Elective Courses" are listed in the Roadmap.
3. See the General Education (p. 262) section of the catalog for a full list of courses
4. Please see your academic advisor for a list of appropriate courses to satisfy the concentration coursework requirements.
5. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
6. Students must take two courses from the following, to fulfill degree requirements (lab is not required)
   - BIOL 2110G Principles of Biology: Cellular and Molecular Biology
   - BIOL 2610G Principles of Biology: Biodiversity, Ecology, and Evolution
   - BIOL 311 General Microbiology

Soil Science (Soil and Water Science) - Bachelor of Science in Agriculture

Soil scientists investigate the physical, chemical and biological characteristics and behavior of soils, their description and classification, and their management for both agricultural and non-agricultural uses. Career opportunities include: industry jobs; environmental consulting firms; and federal, state and local government careers working on various environmental, agricultural and ecological projects.

The soil and water science concentration is for students interested in careers in water management and water quality. Employment opportunities exist with irrigation districts, consulting firms, and government agencies dealing with water management and quality. The optimum use of water in semi-arid areas is emphasized through selection of courses in the technical and social sciences.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. In addition to the courses listed for each major, you must take 35 credits in the College of Agricultural, Consumer and Environmental Sciences and at least 24 credits of soil science related courses with a grade of C- or above including:

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1 [1]		*4*
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication [1]		*3*
Area II: Mathematics		
Choose from one of the following:		3-4
MATH 1430G	Applications of Calculus I [2]	
MATH 1511G	Calculus and Analytic Geometry I [2]	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Science and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social & Behavioral Sciences Course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
GEOL 1110G	Physical Geology	4
or HNRS 2116G	Earth, Time and Life	
Viewing A Wider World [3]		**6**
Departmental/College Requirements		**24**
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	
SOIL 312 & 312 L	Soil Management and Fertility and Soil Management and Fertility Lab	
SOIL 447	Seminar	
Choose 15 credits of SOIL Courses (300-level or above)		
SOIL 370	Environmental Soil Science	
SOIL 424	Soil Chemistry	
or SOIL 479	Environmental Soil Chemistry	
SOIL 456	Irrigation and Drainage	
SOIL 472	Soil Morphology and Classification	
SOIL 476	Soil Microbiology	
SOIL 476 L	Soil Microbiology Laboratory	
SOIL 477	Environmental Soil Physics	
SOIL 477 L	Environmental Soil Physics Laboratory	
Concentration Coursework [4]		
Select at least one course from each of the following four categories to bring total concentration coursework to 30 credits		30
All course selections must in addition to the courses required under the Departmental/College and Non-Departmental Requirements sections listed above		
Category 1: Crop Production & Protection		
Course category areas are as follows:		
Agronomy		
Entomology		
Plant Pathology		

Weed Science	
Horticulture	
Category 2: Soil & Water Engineering Management	
Course category areas are as follows:	
Agricultural Engineering	
Agricultural Economics	
Civil Engineering	
Environmental Sciences	
Horticulture	
Soil	
Category 3: Ecology	
Course category areas are as follows:	
Biology	
Geography	
Geology	
Range Science	
Soil	
Waste-Management	
Wildlife Science	
Category 4: Advanced Science, Computing & Statistics	
Course category areas are as follows:	
Math	
Chemistry	
Physics	
Computer-Oriented	
Statistics or Applied Statistics	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)	
PHYS 1230G Algebra-Based Physics I	3
CHEM 2120 Integrated Organic Chemistry and Biochemistry (CHEM 2120 must be taken with associated 1-cr CHEM lab)	3
or ANSC 1170 Introduction to Animal Metabolism	
Choose two from the following (lab is NOT required for this major):	6
BIOL 2610G Principles of Biology: Biodiversity, Ecology, and Evolution	
BIOL 2110G Principles of Biology: Cellular and Molecular Biology	
BIOL 311 General Microbiology	
Second Language: (not required)	
Electives, to bring the total credits to 120 [5]	**12-14**
Total Credits	**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites to enter either course first.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4. Please see your academic advisor for a list of appropriate courses to satisfy the concentration coursework requirements.
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1430G Applications of Calculus I and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
ACES 1120	Freshman Orientation (recommended)	1
ACES 1210	Financial Fitness for College Students (recommended)	1
Area V: Humanities Course [5]		3
Choose one from the following: [2]		3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology (Lab not required)	
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution (Lab not required)	
Area VI: Creative and Fine Arts Course [5]		3
	Credits	**15**
Spring		
GEOL 1110G or HNRS 2116G	Physical Geology or Earth, Time and Life	4
Concentration Category Course: Category 1, 2, 3, or 4 [4]		4
Oral Communication course		3
Choose one of the following [2]		3-4
MATH 1430G	Applications of Calculus I	
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I or Calculus and Analytic Geometry I Honors	
	Credits	**14-15**
Second Year		
Fall		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
Viewing a Wider World [6]		3
Concentration Category Course: Categories 1, 2, 3, or 4 [4]		3
Choose one from the following: [2]		3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology (Lab not required)	
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution (Lab not required)	
BIOL 311	General Microbiology (Lab not required)	
Elective Course [1]		3
	Credits	**16**
Spring		
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	4

ENGL 2210G or ENGL 2215G or ENGL 2210H	Professional and Technical Communication or Advanced Technical and Professional Communication or Professional and Technical Communication	3
Elective Course [1]		4
	Credits	**15**
Third Year		
Fall		
SOIL 472	Soil Morphology and Classification	4
Viewing a Wider World Course [6]		3
Area IV: Social/Behavioral Sciences Course [5]		3
Concentration Category Course: Catagory 1, 2, 3, or4 [4]		3
PHYS 1230G	Algebra-Based Physics I (Lab not required)	3
	Credits	**16**
Spring		
SOIL 456	Irrigation and Drainage	3
SOIL 424	Soil Chemistry	3
Concentration Category Course: Cateogries 1, 2, 3, or 4 [4]		3
CHEM 2120 or ANSC 1170	Integrated Organic Chemistry and Biochemistry (CHEM 2120 must be taken with associated 1-cr CHEM lab) or Introduction to Animal Metabolism	3-4
Concentration Category Course: Categories 1, 2, 3, or 4 [4]		3
	Credits	**15-16**
Fourth Year		
Fall		
SOIL 477	Environmental Soil Physics	3
Concentration Category Course: Cateogries 1, 2, 3, or 4 [4]		3
Concentration Category Course: Cateogries 1, 2, 3, or 4 [4]		3
Concentration Category Course: Cateogries 1, 2, 3, or 4 [4]		3
Elective		3
	Credits	**15**
Spring		
SOIL 447	Seminar	1
SOIL 312 & 312 L	Soil Management and Fertility and Soil Management and Fertility Lab	4
Concentration Category Course: Cateogries 1, 2, 3, or 4 [4]		3
Concentration Category Course: Cateogries 1, 2, 3, or 4 [4]		3
SOIL 476	Soil Microbiology	3
	Credits	**14**
	Total Credits	**120-122**

1. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
2. Students must take two courses from the following, to fulfill degree requirements:
   - BIOL 2110G Principles of Biology: Cellular and Molecular Biology
   - BIOL 2610G Principles of Biology: Biodiversity, Ecology, and Evolution
   - BIOL 311 General Microbiology
3. The degree requires either MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I, students who do not test into these courses will have additional MATH courses to complete in this semester and where "Elective Courses" are listed in the Roadmap.
4. Please see your academic advisor for a list of appropriate courses to satisfy the concentration coursework requirements.
5. See the General Education (p. 262) section of the catalog for a full list of courses
6. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

Soil Science (Soils) - Bachelor of Science in Agriculture

Soil scientists investigate the physical, chemical and biological characteristics and behavior of soils, their description and classification, and their management for both agricultural and non-agricultural uses. Career opportunities include: industry jobs; environmental consulting firms; and federal, state and local government careers working on various environmental, agricultural and ecological projects.

Crop production and plant growth are emphasized in the soils concentration. Soil management, soil conservation, and soil reclamation are related to plant growth for those students interested in both private industry and government employment opportunities as well as farm management.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. In addition to the courses listed for each major, you must take 35 credits in the College of Agricultural, Consumer and Environmental Sciences and at least 24 credits of soil science related courses with a grade of C- or above including:

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1 [1]		*4*
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication [1]		*3*
Area II: Mathematics		
Choose from one of the following:		3-4
MATH 1430G	Applications of Calculus I [2]	
MATH 1511G	Calculus and Analytic Geometry I [2]	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Science and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social & Behavioral Sciences Course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		

GEOL 1110G	Physical Geology	4
Viewing A Wider World [3]		**6**
Departmental/College Requirements		**24**
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	
SOIL 312 & 312 L	Soil Management and Fertility and Soil Management and Fertility Lab	
SOIL 447	Seminar	
Choose 15 credits of SOIL Courses (300-level or above)		
SOIL 424	Soil Chemistry	
or SOIL 479	Environmental Soil Chemistry	
SOIL 456	Irrigation and Drainage	
SOIL 472	Soil Morphology and Classification	
SOIL 476	Soil Microbiology	
SOIL 476 L	Soil Microbiology Laboratory	
SOIL 477	Environmental Soil Physics	
SOIL 477 L	Environmental Soil Physics Laboratory	
Concentration Coursework [4]		
Select at least one course from each of the following four categories to bring total concentration coursework to 30 credits		30
All course selections must in addition to the courses required under the Departmental/College and Non-Departmental Requirements sections listed above		
Category 1: Crop Production & Protection		
Course category areas are as follows:		
Agronomy		
Entomology		
Plant Pathology		
Weed Science		
Horticulture		
Category 2: Plant Biology & Ecology		
Course category areas are as follows:		
Biology		
Rangeland Resources		
Category 3: Soil, Water & Agricultural Business Management		
Course category areas are as follows:		
Agricultural Economics		
Geography		
Economic Geology		
Range Science		
Soil		
Category 4: Advanced Science, Computing & Statistics		
Course category areas are as follows:		
Math		
Chemistry		
Physics		
Computer-Oriented		
Statistics or Applied Statistics		
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
CHEM 2120	Integrated Organic Chemistry and Biochemistry (CHEM 2120 must be taken with associated 1-cr CHEM lab)	3
or ANSC 1170	Introduction to Animal Metabolism	
PHYS 1230G	Algebra-Based Physics I	3
Choose two from the following (lab is NOT required for this major):		6
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	
BIOL 311	General Microbiology	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
Second Language: (not required)		
Electives, to bring the total credits to 120 [5]		**12-14**
Total Credits		**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites to enter either course first.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4. Please see your academic advisor for a list of appropriate courses to satisfy the concentration coursework requirements.
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
MATH 1220G	College Algebra [1]	3
ACOM 1130G	Effective Leadership and Communication in Agriculture	3
GEOL 1110G	Physical Geology	4
ACES 1120	Freshman Orientation	1
ACES 1210	Financial Fitness for College Students	1
Area IV: Social and Behavioral Science Course [2]		3
	Credits	**15**
Semester 2		
MATH 1430G	Applications of Calculus I [1]	3
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [1]	4
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution (Lab not required)	3
	Credits	**14**
Second Year		
Semester 1		
PHYS 1230G	Algebra-Based Physics I	3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology (Lab not required)	3
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory [1]	4

CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [1]	4
	Credits	**14**
Semester 2		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	3
Area V: Humanities Course [2]		3
Area VI: Creative and Fine Arts Course [2]		3
Soils Option Course		3
Soils Option Course		3
	Credits	**15**
Third Year		
Semester 1		
SOIL 472	Soil Morphology and Classification [1]	4
Soils Option Courses		6
CHEM 2120 or ANSC 1170	Integrated Organic Chemistry and Biochemistry (CHEM 2120 must be taken with associated 1-cr CHEM lab) or Introduction to Animal Metabolism	3
Electives		2-3
	Credits	**15-17**
Semester 2		
SOIL 312	Soil Management and Fertility	3
SOIL 424	Soil Chemistry	3
Soils Option Course		3
Soils Option Course		3
Elective		3
	Credits	**15**
Fourth Year		
Semester 1		
SOIL 477 & 477 L	Environmental Soil Physics and Environmental Soil Physics Laboratory	4
VWW: Viewing a Wider World Course [3]		3
Soils Option Course		3
Soils Option Course		3
Soils Option Course		3
	Credits	**16**
Semester 2		
SOIL 456	Irrigation and Drainage	3
SOIL 447	Seminar	1
SOIL 476	Soil Microbiology	3
SOIL 391	Internship	3
Soils Option Course		3
Soils Option Course		3
	Credits	**16**
	Total Credits	**120-122**

1 These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Agronomy - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
AGRO 1110G	Introduction to Plant Science (Lecture & Lab)	4
AGRO 365	Principles of Crop Production	4
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	4
SOIL 312	Soil Management and Fertility	3
SOIL 312 L	Soil Management and Fertility Lab	1
Select 3-4 credits from the following to bring the total AGRO and SOIL credits to a minimum of 18 credits:		3-4
AGRO 2160	Plant Propagation	
AGRO 305	Principles of Genetics	
AGRO 311	Introduction to Weed Science	
AGRO 462	Plant Breeding	
AGRO 471	Plant Mineral Nutrition	
AGRO 483	Advanced Sustainable Crop Production	
SOIL 456	Irrigation and Drainage	
Total Credits		**19-20**

Environmental Science - Undergraduate Minor

A minor in Environmental Sciences requires the following minimum coursework. Note that the prerequisites for most of these courses include chemistry, biology, and/or calculus requirements. Grades of C or better are required in all courses applied to the minor.

Prefix	Title	Credits
ENVS 1110G	Environmental Science I	4
ENVS 2111	Environmental Engineering and Science	3
ENVS 301	Principles of Ecology	3
ENVS 422	Environmental Chemistry	3
ENVS 462	Sampling and Analysis of Environmental Contaminants	3
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation	3
Total Credits		**19**

Genetics and Biotechnology - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
GENE 1110	Experimental Systems in Genetics	1
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
GENE 305 L	Genetic Techniques	1
GENE 452	Applied Bioinformatics	3
Select two from the following:		6
BIOL 305	Principles of Genetics	
GENE 315	Molecular Genetics	

GENE 320	Hereditary and Population Genetics	
Total Credits		**18**

Horticulture - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
HORT 1115G	Introductory Plant Science	4
HORT 2160	Plant Propagation	3
SOIL 2110	Introduction to Soil Science	3
Select 9 credits from the following: [1]		9
HORT 304	Hydroponics	
HORT 305	Principles of Genetics	
HORT 307	Landscape Design	
HORT 310	Medicinal Herbs	
HORT 365	Principles of Crop Production	
HORT 377	Introduction to Turfgrass Management	
HORT 378	Turfgrass Science	
HORT 391	Internship	
HORT 462	Plant Breeding	
HORT 471	Plant Mineral Nutrition	
HORT 483	Advanced Sustainable Crop Production	
HORT 488	Greenhouse Management	
HORT 492	Diagnosing Plant Disorders	
Total Credits		**19**

[1] or other upper division HORT courses deemed appropriate by student's advisor

Soil Science - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	4
SOIL 312	Soil Management and Fertility	3
SOIL 312 L	Soil Management and Fertility Lab	1
SOIL 472	Soil Morphology and Classification	4
Select any SOIL course to bring the total SOIL credit hours to 18.		6
Total Credits		**18**

School of Hotel, Restaurant and Tourism Management

Undergraduate Program Information

The School of Hotel, Restaurant & Tourism Management is committed to the broad land-grant mission of New Mexico State University. The school's mission is to serve the needs of our constituents through innovative teaching, research, service, professional applications and partnerships in a multi-cultural and international environment.

The **Bachelor of Science - Hotel, Restaurant and Tourism Management** degree program prepares students for supervisory and management positions in all areas of the diverse and growing hospitality and tourism industry. It is available through NMSU main campus as well as completely online through NMSU Global. The program also provides a foundation for continuing development to advance to more senior management or to pursue entrepreneurial opportunities. In this guest service and experience-oriented, professional program, faculty, students and industry partners bring together theory and practice to forge hospitality management excellence. The curriculum is designed to educate students as individuals and professionals in a changing society. Students take a core curriculum featuring courses in a broad spectrum of skills and knowledge needed for industry and personal success. They develop an individual plan with a faculty mentor for selecting professional elective courses based on their interests. A grade of C- or better must be earned in each upper-division HRTM class to satisfy the requirements of the major.

Students are required to participate in an internship program after completion of 400 hours of hospitality or related guest service work experience. The internship sequence consists of three, one-credit courses: Professional Development, Hospitality Internship, and Internship Seminar and includes another 400 hours in the field, normally the summer between the student's junior and senior year. The Hospitality Internship course is a prerequisite for several of the student's final 400-level courses. Thus, at the end of both the work experience practicum and the internship, students will have completed a minimum of 800 hours professional work experience in the field.

Students in other majors can earn a **Hotel, Restaurant, and Tourism Management Minor.** The requirements include HRTM 1130 - Introduction to Hospitality Management, HRTM 3410 Hospitality Management Accounting, and four elective classes - three of which must be at the upper-division level.

Special Features of the School of Hotel, Restaurant, and Tourism Management

The School of Hotel, Restaurant and Tourism Management provides excellent opportunities for experiential learning. Main campus students take hands-on food and beverage and meetings and events courses in the 100 West Café and Bobby Lee Lawrence Academy of Wine. The Hospitality Technology Lab seats 33 for courses using hospitality simulation and general software programs.

The School of HRTM has a special relationship with the NMSU Courtyard by Marriott Las Cruces hotel and Total Management Systems, Inc. to provide educational opportunities for our students. Corporate executives and property managers are frequent guest speakers in classes. HRTM students and alumni have preferential consideration for part-time jobs, internships, its senior management-in-training program and management opportunities at the property as well as the company's other locations throughout the state. Other industry partners that are actively involved in the program and provide scholarships and other opportunities for students include the New Mexico Beef Council, New Mexico Restaurant Association, the American, Greater Albuquerque and El Paso Hotel & Lodging Associations, New Mexico Hospitality Association, New Mexico Wine Association, Latino Hotel Association and many more.

The School houses the Marriott Hospitality Futures Center. Its office suite allows the campus and surrounding community to discover the many opportunities available when exploring a career in hospitality. It hosts facilitated workshops, and has a strong dedication to outreach throughout New Mexico, El Paso, and the surrounding areas to student groups, public schools, and our industry partners. HRTM's Annual Hospitality and ACES Career Fair brings 25 - 30 companies to campus each spring semester to interview students for jobs, internships, management training programs, and other career opportunities. Many

recruiters and industry guest speakers come to campus at other times of the year as well.

Trips to major industry trade shows throughout the country and field trips to hospitality properties are only a few of the professional activities available to our students. HRTM's Faculty Led International Program (FLIP) takes students to Florence, Italy each summer. The School's Unity in Hospitality student club is very active and represents HRTM at many college, university, and national activities. Other student organizations include Eta Sigma Delta Honors Society, Delta Sigma Pi, and ACES College Ambassadors and Peer Mentors.

Undergraduate Program Learning Objectives

The School of Hotel, Restaurant and Tourism Management is committed to ensuring that our graduates are prepared to be leaders of the hospitality and tourism industries. By the end of their studies are students will be able to:

1. Evaluate the current and key concepts and principles related to sustainable practices, global market trends, teamwork and ethical management and decision-making strategies in the operation of global hospitality and tourism organizations.
2. Analyze the principles of ethical leadership and effective teamwork within diverse hospitality and tourism management contexts, demonstrating the ability to apply these principles in real-world scenarios.
3. Apply current and emerging professional hospitality product and service management and techniques and service quality measurement systems creating favorable guest experiences in hospitality and tourism settings.
4. Assess current and emerging operational methods and relevant technologies—such as data analytics, artificial intelligence, and industry-specific tools—that enhance organizational performance in both the current and future competitive hospitality and tourism landscape.
5. Demonstrate effective written, oral, visual, and interpersonal communication skills.

Graduate Program Information

Students can earn a **Master of Science degree in Family and Consumer Sciences with a Concentration in Hotel, Restaurant and Tourism Management (HRTM)**. Students can complete the program on campus or completely online through NMSU Global. The emphasis in HRTM combines both coursework and research to expand the student's knowledge, abilities, and problem-solving skills.

Students begin the program by learning about the current trends in a wide range of hotel, restaurant and tourism academic research areas. Students also take graduate classes that apply to their chosen area of specialization. Some students focus on general hospitality management. However, most choose an area of interest such as tourism, foodservice, hotel operations, destination management, revenue management, sales and marketing, hospitality or culinary education, beverage management, vacation ownership, hospitality information systems, or human resource management/training. Some of our students are hospitality educators who may desire to take specialized courses in online teaching or educational technology.

Students with undergraduate degrees in closely related fields (including Business, Information Technology, Nutrition, Food Science, Culinary Arts, and Education) are strongly encouraged to apply as are students from under-represented groups and international students. We also welcome applications from non-traditional applicants who have work experience in the hotel, restaurant and tourism business. These students bring unique views to our program and strengthen our breadth and diversity.

In addition to the Graduate School requirements, the admissions criteria for the Master of Family and Consumer Sciences, HRTM concentration include a statement of interest essay and resume. Suggested departmental deadlines for review of admission materials are six weeks prior to the first day of the semester of desired start. However, international students must apply by March 1 for Fall semester admissions and October 1 for spring semester admissions.

A minimum of 30 credits (including 4-6 credits of thesis) is required under the thesis plan. A non-thesis plan is available that requires also requires a minimum of 30 credits of course work with a 3 credit written comprehensive applied management project. Both plans require a final oral examination. Students will take 3 credits of statistics and 3 credits of research methodology at the graduate level. Students with limited work experience in HRTM should complete a paid internship in their area of specialization. Prior to the completion of 12 credits, the student will form a program advisory committee and determine the appropriate courses for the degree work.

There are a limited number of graduate teaching assistant positions available for HRTM concentration students.

Starting in Fall 2026, we will also offer a **12 credit Graduate Certificate in Hotel, Restaurant and Tourism Management.** This option is perfect for the hospitality manager, executive, or educator seeking professional development to upgrade their hospitality knowledge and stay up-to-date with current trends without committing to the full master degree program. It is especially useful for those whose undergraduate degrees are not in hospitality related or who need graduate courses to be eligible for promotion and salary increases. All courses earned through the certificate program can be applied to the requirements if the student decides to pursue and apply for admission to the full master's degree program. Admission requirements are the same as for the degree program.

Graduate Program Learning Objectives

1. Analyze and apply strategic decision making processes to create sustainable competitive advantages for hospitality and service industries
2. Design and manage service delivery systems to create appropriate and authentic hospitality and tourism experiences.
3. Evaluate new developments in hotel and restaurant management and discuss contemporary issues confronting the global hospitality industry
4. Execute a professional paper or thesis about a relevant hospitality or tourism topic using appropriate research methodologies and analytical skills.

Please see the HRTM website at https://hrtm.nmsu.edu/ for information about all of the School of Hotel, Restaurant and Tourism Management's programs.

Degree(s) for the Department

Bachelor Degree(s)

- Hotel, Restaurant and Tourism Management - Bachelor of Science (p. 489)

- Hotel, Restaurant and Tourism Management - Bachelor of Science (Online) (https://catalogs.nmsu.edu/global/nmsu-global/hotel-restaurant-tourism-mgt-bs-online/)

Graduate Certificate

- Hotel, Restaurant and Tourism Management - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/hotel-restaurant-tourism-management-graduate-certificate-online/)

Minor(s) for the Department

- Hotel, Restaurant and Tourism Management - Undergraduate Minor (p. 491)
- Hotel, Restaurant and Tourism Management - Undergraduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/hotel-restaurant-tourism-management-undergraduate-minor-online/)

Director - Jean Hertzman

Professors - Jean Hertzman; Keith Mandabach; Betsy Stringam

Assistant Professor - Christina K. Dimitriou

College Assistant Professors - Daren Bloomquist; Peter Mitchell; Danielle Young

Remote College Assistant Professors - Adam Carmer; Tanya Ruetzler

Professor Emeritus - Priscilla Bloomquist

Hotel, Restaurant and Tourism Management Courses

HRTM 1120G. Introduction to Tourism
3 Credits (3)
Survey of travel and tourism development and operating characteristics.
Learning Outcomes

1. Define tourism and related terms.
2. Identify and explain the role of the elements of the destination mix.
3. Identify the potential socio-cultural, economic and environmental impacts of tourism.
4. Identify and describe the role of key governmental and nongovernmental organizations in tourism.
5. Describe basic tourism planning and development principles.
6. Discuss the unique challenges of tourism marketing and standard marketing methods.
7. Describe the components of the tourism distribution system.
8. Demonstrate a basic understanding of traveler behavior including motivations and barriers to travel.
9. Identify major factors that influence traveler flows. 1
10. Describe the role of major modes of transportation in the tourism system. 1
11. Identify and describe the three pillars of sustainable tourism development. 1
12. Explain personal and social responsibility as it relates to sustainable tourism development. 1
13. Demonstrate effective communication and critical thinking skills.

HRTM 1130. Introduction to Hospitality Management
3 Credits (3)
Overview of the major segments of the hospitality industry, with a focus on basic management principles.
Learning Outcomes

1. Understand the concept of management contracts and franchising.
2. Recognize and understand needed leadership qualities to achieve organizational objectives.
3. Understand the hospitality industry within the global environment.
4. Identify company and industry trends.
5. Understand the functions of all departments in a hospitality organization (restaurant, hotel, club, etc.).
6. Apply the concepts of convention management, meeting and event planning, and casino management.
7. Understand the concepts of quick and institutional/contract foodservice management.
8. Understand the principles of bar management and compare and contrast wines, beers and distilled spirits.
9. Manage the process of service delivery. 1
10. Identify and solve managerial problems 1
11. Manage a diverse workforce and develop positive employee relations to reduce turnover.

HRTM 1310. Safety, Sanitation and Health in the Hospitality Industry
1 Credit (1)
Addresses public health, HACCP, and food safety responsibilities in the hospitality industry. Sanitation certification test allows students to receive national ServSafe Food Protection Manager Certification.
Learning Outcomes

1. Identify the hazards to safe food and the foods at risk in a foodservice operation.
2. Identify and discuss the Hazard Analysis Critical Control Point (HACCP) system and be able to design a HACCP flowchart.
3. Demonstrate knowledge of how to protect food during purchasing, receiving, storing, preparing, holding, and serving.
4. Discuss the procedures for ensuring sanitary equipment, facilities, and food-handling practices.
5. Explain how to set-up cleaning, safety, pest control, crisis management, and training programs.
6. Also meets KRDNs for the Accreditation Council for Education in Nutrition and Dietetics (ACEND).

HRTM 1320. Food Production and Service Fundamentals
3 Credits (1+4P)
Basic overview of food service systems including menu management, purchasing and production. The course includes basic principles of food fabrication and production. Topics include knife skills, culinary terminology, product identification, quality standards, nutritional cooking theory and application of food preparation techniques. The course includes laboratory aspects and demonstration of basic food production techniques, service styles, practices and procedures in food service operations including culinary math. This course provides students with an understanding of food service sanitation and culinary nutrition. Completion of a national certification examination is required. Students who have not completed HRTM 1310 before enrolling in the course must have proof of valid ServSafe Food Protection Manager certificate. May be repeated up to 3 credits.
Prerequisite: HRTM 1130 or FSTE 2110G.
Prerequisite/Corequisite: HRTM 1310.

Learning Outcomes

1. Demonstrate use of standard recipes and how to reduce and increase their yields
2. Demonstrate basic culinary knife cuts, basic fabrication and mise en place
3. Demonstrate basic cookery techniques of dry, moist and a combination of heat
4. Demonstrate the proper plating and garnishing of foods
5. Describe proper personal behaviors required for the safe handling of food
6. Identify and properly operate kitchen equipment.
7. Pass the ServSafe Exam
8. Describe the three forms of food contaminants and preventative measures.
9. Demonstrate how to properly "set" a table for service 1
10. Demonstrate how to provide dining room service with proper etiquette 1
11. Demonstrate safe work habits, identify safety hazards, and employ preventative safety measures. 1
12. Maintain positive relations with fellow students and faculty through teamwork. 1
13. Exhibit appropriate work habits and attitudes; demonstrate a willingness to compromise. 1
14. Demonstrate a positive attitude, conversation skills, personal hygiene and work attire.

HRTM 2130. Hotel Operations I
3 Credits (3)
Analysis of hotel operations to include: guest services, reservations, reception, guest/city ledger and the night audit. May be repeated up to 3 credits. Restricted to Las Cruces campus only.
Prerequisite(s): HRTM 1130.
Learning Outcomes

1. Outline the history, magnitude and culture of the hotel industry
2. Define and identify hotel ownership and operational structures
3. Outline the organization and structure of a hotel and resort.
4. Describe and calculate the components and processes of room reservation forecasting, pricing and revenue management.
5. Outline and explain the flow of the guest from pre-arrival through arrival, room occupancy and departure.
6. Demonstrate the procedures and processes for Guest Accounting, the City Ledger, Guest Credit and the Night Audit.
7. Discuss problem solving and guest service associated with the front office and other departments of the hotel and resort.
8. Forecast impacts of technology to the guest services and hotel operations
9. Describe the day to day activities and responsibilities of a Hotel Front Office Manager or a Hotel Assistant General Manager (AGM).

HRTM 2996. Special Topics
1-4 Credits
Specific subjects and credits to be assigned on a semester basis for both lecture and laboratory assignments. May be repeated for a maximum of 4 credits.
Prerequisite: consent of instructor.
Learning Outcomes

1. Varies

HRTM 3210. Hotel, Restaurant, and Tourism Marketing
3 Credits (3)
The development of effective marketing programs for hospitality service organizations.
Prerequisite: HRTM 1130.
Learning Outcomes

1. Understand the unique challenges involved in marketing and managing services.
2. Describe the hospitality marketing concepts.
3. Define the characteristics of hospitality marketing.
4. Understand management strategies for service businesses.
5. Discuss the role of marketing in strategic planning.
6. Explain how customer behavior influences individual customer buying decisions.
7. Discuss market segmentation, targeting, and positioning.
8. Use the elements of the marketing mix to create a marketing action plan targeting a specific market.

HRTM 3220. Hospitality and Travel Law
3 Credits (3)
Specialized applications of the law to the hospitality and tourism industry.
Prerequisite: HRTM 1130.
Learning Outcomes

1. Describe the history and origins of hospitality law.
2. Identify the differences between the types of laws governing the hospitality industry.
3. Explain how civil and disability rights laws impact hospitality operations and their duties to guests.
4. Determine how contract law applies to the hospitality industry.
5. Describe the concepts of negligence and due diligence and the actions that can be used to minimize potential legal liability.
6. Interpret laws associated to hotel guests' right to privacy, personal safety and safekeeping of personal property.
7. Assess hospitality operators' legal obligations in safely serving food and alcoholic beverages.
8. Analyze hospitality related legal case studies.

HRTM 3230. Hospitality Leadership Management
3 Credits (3)
Examines modern leadership theory in the context of the hospitality industry. Connects contemporary leadership topics to their historical antecedents through focused reading, discussion and assignments.
Prerequisite: HRTM 1130 and HRTM 1120G.
Learning Outcomes

1. Analyze leadership theories and the current research on effective leadership behavior.
2. Apply leadership theories to management practice.
3. Identify relevant characteristics, skills, and situations that contribute to leadership effectiveness.
4. Explain the importance of ethical leadership and how promoting diversity, inclusion, and equity benefits organizations.
5. Discuss what hospitality organizations must do to empower their managers and staff.
6. Explain why conflict occurs in organizations and describe positive and negative aspects of organizational conflict.

HRTM 3310. Quantity Food Production and Service
4 Credits (1+6P)

Covers quantity food production and service including cooking concepts, sanitation and safety, teamwork, dining room service, and management responsibilities. Students will apply this knowledge developing product for sale in a student run restaurant. Proof of current ServSafe Food Protection Manager or NM Food Handler certification required. May be repeated up to 4 credits.
Prerequisite(s): HRTM 1320.
Learning Outcomes
1. Describe and apply the process of planning and producing foods in quantity.
2. Follow, extend, and reduce a recipe.
3. Prepare and plate foods for service to guests.
4. Demonstrate dining room set up skills.
5. Demonstrate food serving skills.
6. Operate a foodservice establishment using proper food safety practices.
7. Work as a team to operate a foodservice establishment.
8. Evaluate the quality and profitability of menu items.
9. Evaluate a budget and interpret financial data. 1
10. Evaluate guests perceptions of food and service.

HRTM 3410. Hospitality Management Accounting
3 Credits (3)
Specialized accounting for hotel revenue and expenses; accounting for inventory, property, and equipment; hospitality payroll accounting; hotel departmental financial statements; income statement, balance sheet, and statement of cash flows; the analysis of financial statements; interim and annual reports; budgeting expenses; forecasting sales; budgetary reporting and analysis; and financial decision making.
Prerequisite: ACCT 2110.
Learning Outcomes
1. Present the terminology and principles required to develop modern Hospitality Management financial statements.
2. Present the primary principles of managerial accounting and applications to modern Hospitality Management cost and profit analysis.
3. Demonstrate the concepts of financial analysis required to evaluate capital investments, analyze business performance, and to develop tools for financial planning and analysis.
4. Develop the analytical concepts required to understand and evaluate money flows over time and apply these concepts to the use of capital and credit.

HRTM 3910. Professional Development
1 Credit (1)
Covers essential elements of career management including preparation for a successful internship. Restricted to majors.
Learning Outcomes
1. Classify your personality type and its relationship to career goals and strategies.
2. Write an effective resume in the appropriate style.
3. Recognize the importance of appropriate and effective communications with potential employers using a various professional behavior methods.
4. Demonstrate effective interview preparation and engagement.
5. Determine appropriate professional dress and etiquette for various business and dining experiences.
6. Select an appropriate internship experience.
7. Transform the base tools of resume writing, interview preparation, and professional development into future adaptations of career progress and network growth and determine what criteria are important when hiring.

HRTM 4110. Meetings, Conventions and Special Events
3 Credits (3)
Examination of the role of the meeting/event planner, including setting objectives, site selection, negotiations, design, budgeting, marketing, registration, on-site logistics, and evaluation.
Learning Outcomes
1. Identify and differentiate between different types of meetings, conventions, and events.
2. Analyze the scope and complexity of meetings, conventions, and special events.
3. Develop realistic goals, strategic plans, action plans, production schedules, budgets, and facilities designs for meetings and special events.
4. Apply group dynamics, management, and leadership skills to accomplish organizational tasks.
5. Implement an effective communication network among different parties involved in meetings and special events.
6. Organize and facilitate contacts with hospitality industry leaders, vendors, and media personnel.
7. Evaluate the outcomes of meetings and events.

HRTM 4115. Entertainment Business and Venue Management
3 Credits (3)
This course will review and examine the principles and practices associated with managing a public assembly venue and the nature of the venue and entertainment business. This is a comprehensive course designed to cover all aspects of incorporated event practices such as marketing, production, contracts, ticketing, and security.
Learning Outcomes
1. Analyze the origin and history of public assembly venues and the role they play within the community.
2. Analyze different ownership and management structures and how governance relationships impact operational management.
3. Analyze the business and financial operations of a public assembly venue.
4. Describe the booking process, the entities involved, and the importance of relationships.
5. Analyze and create marketing and sales strategies for both a public assembly venue and an event that is booked in the venue.
6. Identify and analyze the ticket system options available to venue managers, as well as their importance in access management, financial accountability, and data collection.
7. Analyze the role and importance of ancillary revenue sources, as well as the need for creativity and entrepreneurship.
8. Describe the operational systems and processes required to maintain a venue and produce events.
9. Analyze the event planning process and how it is used to produce an event experience for guests and clients. 1
10. Analyze management's role in developing and maintaining a safe and secure public assembly venue.

HRTM 4120. An Overview of Italian Tourism focused on Food, Wine, Art and Culture
3 Credits (3)

The course content provides a global perspective and understanding of Italian food, wine, art and culture and their integration into tourism. The content is designed to provide students an appreciation of Italian cultural values and an overview of food, wine and art in the tourism regions of Italy.

Learning Outcomes

1. Describe and explain the basic history of the tourism regions of Italy.
2. Recognize and describe the Italian food and wine industry and its impact on tourism.
3. Detail how the Italian's integrate sustainability into tourism.
4. Recognize the impact of culture and art on tourism.
5. Explain strategies for responsible travel abroad in Italy and the European Union focused on personal and group safety.
6. Analyze and evaluate multicultural differences between Italian and American societies focused on effective personal communication practices.
7. Produce a 20 slide narrated online presentation with pictures that focused on at least two course learning objectives

HRTM 4130. Advanced Hotel Operations
3 Credits (3)

The duties and administration of a hotel front office, including housekeeping. Additional focus on the procedures of reservations and night audit. Students also gain exposure to property management systems.

Prerequisite: HRTM 2130.

Learning Outcomes

1. Describe day-to-day responsibilities for a hotel General Manager.
2. Explain departmental competencies for a hotel (Human Resources, Accounting, Revenue Management, Sales and Marketing, Front Office, Housekeeping, Food and Beverage, and Property Operation and Maintenance).
3. Compare and contrast management roles and responsibilities between limited service and full service hotels.
4. Describe hotel organizational, ownership, and franchising structures and their effect on hotel operations.
5. Explain the role of service throughout hotel operation departments.

HRTM 4135. Hospitality Facilities Management
3 Credits (3)

Exploration of the engineering and maintenance requirements specific to the hospitality industry. Emphasis on environmental issues, renovation and management of the physical plant.

Prerequisite: HRTM 2130, HRTM 4998.

Learning Outcomes

1. Manage property assets using planning and budgeting strategies and the appropriate type of maintenance.
2. Explain how technology is used to make maintenance and operations more efficient and effective.
3. Devise strategies to sustainably manage operational areas and systems in a hospitality business.
4. Manage water, HVAC, electrical, lighting, laundry safety and security, and waste management systems safely and efficiently.
5. Interpret construction drawings and schematics in a basic manner.
6. Describe various kitchen hood systems and individual pieces of kitchen equipment from a mechanical, maintenance and operational perspective.
7. Explain how risk management strategies for a hospitality business relate to facilities management.
8. Describe the importance of building design and engineering to guest experiences, safety, government compliance, and brand identity.
9. Describe real-world facility management activities for hotels and restaurants as described by industry professionals active within their career. 1
10. Apply effective communication and critical thinking skills.

HRTM 4140. Hotel Revenue and Sales Management
3 Credits (3)

Examines methods used for profitably managing capacity, including dynamic pricing and allocation of the rooms inventory across market segments to maximize revenues. Focuses on the integration of revenue management principles with information technology, management, marketing and sales concerns at the property and market level.

Prerequisite: HRTM 2130.

Learning Outcomes

1. Describe and discuss the role and function of revenue management in a hotel organization.
2. Evaluate pricing techniques and effects on demand.
3. Determine market segmentation for a hotel.
4. Demonstrate inventory management strategies.
5. Discuss legal and ethical aspects of revenue management.
6. Perform various analysis for a hotel as a function of revenue management.
7. Evaluate distribution channels for hotels.
8. Evaluate and recommend revenue management techniques.

HRTM 4145. Resort Management
3 Credits (3)

This course introduces students to the operation and management of full service resort properties, including the management of resort recreational amenities.

Prerequisite: HRTM 2130 or consent of instructor.

Learning Outcomes

1. Explain the history and structure of the resort industry, and its various products.
2. Describe the operations and management between resorts and hotels.
3. Identify and explain concepts and terminology for various resort amenities and activities.
4. Evaluate resort amenities and activities for various market segments.
5. Discuss trends in the resort industry.
6. Describe best practices in resort management.

HRTM 4230. Hotel, Restaurant and Tourism Industry Purchasing, Selection, and Procurement
3 Credits (3)

Purchasing methods for the hotel, restaurant and tourism industries based on standards of quality, grade, care, and storage for food and nonfood supplies. Purchasing, installation, operation, and care of large foodservice equipment.

Learning Outcomes

1. Differentiate purchasing functions in different types of hotel, restaurant and tourism operations and determine how internal and external forces impact purchasing decisions.
2. Outline and describe the duties and responsibilities of hotel, restaurant and tourism purchasing managers.

3. Develop product recommendations for hotel, restaurant and tourism food and equipment through the use of various product evaluation methods.
4. Identify examples of unethical purchasing practices throughout history, research present a code of purchasing ethics for a hotel, restaurant or tourism company.
5. Analyze hotel, restaurant and tourism industry supplier selection criteria and recommend a supplier based on those criteria.
6. Apply mathematical models to calculate recipe costs as well as order quantities and times. Determine how to reduce AP prices.
7. Outline and describe each step of the flow of inventory and determine which controls are needed for security of inventory.
8. Explain product grades and explain grading procedures and procurement criteria for meats, poultry, eggs, dairy, produce, marine products, groceries, and nonfood items.

HRTM 4235. Club Management and Marketing
3 Credits (3)
Provides an understanding of the general operational and administrative procedures practiced in private clubs from a marketing perspective with a special emphasis on managing and marketing club food and beverage operations and service. It will provide the professional golf management and hospitality students with the unique sensitivities required in managing and operating in the increasingly lucrative club management market.
Learning Outcomes
1. Describe the different types of private clubs and their specific operations.
2. Describe the different types of membership categories offered by private clubs.
3. Describe the responsibilities of the board of directors of private clubs.
4. Identify the typical organizational structure in private clubs.
5. Distinguish the functions and responsibilities of a club's board of directors from those of the club's general manager and staff.
6. Identify tips for long-term success to become an effective leader and communicator.
7. Explain the importance of a club strategic plan and strategic implementation.
8. Explain the role of marketing in a private club setting.
9. Summarize the importance of training and lifelong learning to the success of private clubs. 1
10. Describe the different types of food and beverage operations found in private clubs. 1
11. Identify the different financial statements used by clubs. 1
12. Describe the functions and ethical interdependencies among the major departments within a club. 1
13. Describe a manager's operational inspection and critique of one of the major departments within a club from an overall department manager's leadership perspective. 1
14. Explain the importance of facility management in clubs, particularly as it relates to members, employees and costs. 1
15. Summarize the duties and responsibilities of golf professionals, greens and grounds departments, and other golf staff members. 1
16. Describe a club fitness operation, and common programs of a club fitness center.

HRTM 4240V. Sustainability in the Hospitality Industry
3 Credits (3)
This course provides a summary and definition of the concept and roots of sustainability and climate change as well as their impact and effect on the hospitality industry while providing the rationale for sustainable development for the industry. A review of environmentally sound management strategies for all operational management areas ranging from eco-design, energy, waste and water management, food security, sourcing of agricultural products leads to a detailed strategy for planning and evaluating the sustainability of a hospitality operation in terms of corporate responsibility and social entrepreneurship. The content is focused on a global perspective of sustainability in the industry.
Learning Outcomes
1. Recognize, interpret and summarize the global challenges facing the hospitality industry caused by climate change driving the need for sustainability in the industry.
2. Explain implementation strategies for responsible environmentally sound hospitality management practices for hotel, food and beverage and tourism businesses.
3. Evaluate sustainable development practices and the importance of personal and corporate social development.
4. Analyze, evaluate and communicate the sustainability practices of a hospitality operation.

HRTM 4310. Beverage Management
3 Credits (3)
Survey of all aspects of beverage management, including wine/beer/distilled spirits origins and trends, cost control, bar management, beverage purchasing, and wine appreciation.
Prerequisite: HRTM 3310.
Learning Outcomes
1. Identify beverage industry career opportunities and trends that impact hospitality beverage operations.
2. Discuss responsible alcohol service principles in compliance with legal and ethical standards.
3. Explain the basic components of bar and beverage operations', design, layout and equipment.
4. Differentiate between the various beverage production processes and service standards.
5. Classify types of alcoholic and non-alcoholic beverages.
6. Develop beverage menus that align with food offerings, customer preferences, and business goals.
7. Describe the key principles of beverage inventory management and control.
8. Illustrate the role of beverage sales in operational profitability including pricing strategies and marketing techniques.

HRTM 4320. Restaurant Operations Management
4 Credits (1+6P)
Provides a detailed understanding of the processes of restaurant operations management. Students are expected to increase kitchen and service technical skills, develop and cook from recipes, develop a personal leadership style, understand food and wine pairing, and supervise front and back of the house operations. Provides the opportunity to perform a detailed analysis of a food and beverage operation. Proof of valid ServSafe Food Protection Manager or NM Food Handler certification and current NM Alcohol Server certification required.
Prerequisite: HRTM 3310.
Learning Outcomes
1. Demonstrate the skill of planning, designing, pricing and evaluating menus.
2. Demonstrate servant leadership skills during fine dining meals.

3. Demonstrate cost control through budget, income and expense reports.
4. Demonstrate how to construct, portion and cost standard recipes.
5. Demonstrate how to inventory, purchase, receive and store foods for production.
6. Demonstrate back of house production, service, and management.
7. Demonstrate how to manage alcoholic beverages with emphasis on wines.
8. Demonstrate front of house service and management.
9. Demonstrate how labor costs effect menu, food production, and desired service. 1
10. Demonstrate application of revenue control in the food service facility. 1
11. Demonstrate ability to implement change within the restaurant setting.

HRTM 4330. Wine Appreciation
3 Credits (3)
An experiential examination of wine through lectures, guest speakers and focused tasting of wine and food. Topics include viticulture, wine making varietals, terroir, wine service, tasting and evaluation techniques, and food pairings. Student must be at least 21 years old. Consent of instructor required.
Learning Outcomes
1. Discuss the historical and cultural significance of wine.
2. Compare and contrast the production processes for wines.
3. Describe and analyze the characteristics of popular wine varietals.
4. Describe how viticultural practices and geography/climate factors relate to the quality and variation in wines.
5. Perform evaluation and appraisal of wines based on quality, value, and intended use.
6. Apply knowledge of terminology related to labeling laws, practices, and geography of the major wine-growing regions of the world to the effective selection of both domestic and imported wines.
7. Pair wine with foods.
8. Examine the distribution and service systems for wine, including current issues affecting them.

HRTM 4410. Hospitality Cost Control
3 Credits (3)
Familiarizes students with all aspects of cost control including financial data entry and hospitality accounting practices, financial report production, analysis and problem solving. Students will learn to understand the roles of the various stakeholders (owners, managers, employees and customers.) Provides tools needed to communicate effectively about global financial issues affecting the hospitality business.
Prerequisite: HRTM 3310, HRTM 3410.
Learning Outcomes
1. Analyze relationships between hospitality business traffic, revenue, expense, and contribution margin as key variables associated with demand and profitability.
2. Explain professional purchasing, storage, and receiving techniques managers use to minimize spoilage and prevent product shortages.
3. Apply standardized recipes and effective menu planning techniques to efficiently manage food and beverage production systems.
4. Outline the steps managers take to control costs and achieve operational profit goals.
5. Categorize types of expenses accurately.
6. Calculate expenses by the cost per guest served and by the percentage of sales revenue.
7. Evaluate operational cost effectiveness through income (PL) statement analysis, including sales volume and all expense categories.
8. Prepare cost-volume-profit analysis(s) to evaluate the contribution of menu items to operational profits, including calculating break-even points.
9. Propose systems to prevent potential internal and external revenue theft threats. 1
10. Solve detailed virtual restaurant simulation exercises, including start-up and turnaround scenarios.

HRTM 4910. HRTM Internship Seminar
1 Credit (1)
A case based approach to analyzing internship experiences. Students will write case studies about specific business issues they encountered during HRTM 4998 and analyze them. Restricted to HRTM majors. May be repeated up to 1 credit.
Prerequisite: HRTM 4998.
Learning Outcomes
1. Explain the strengths and weaknesses of departments and work units from the hospitality operation in which they interned.
2. Compare and contrast management styles, leadership skill, and effectiveness of supervisors and managers.
3. Offer solutions to problems and challenges encountered in the workplace.
4. Write a comprehensive case study about their internship experiences.

HRTM 4991. Special Problems
1-4 Credits (1-4)
Individual research in a selected subject area of hospitality management. Consent of instructor required. Maximum of 4 credits per semester and a total of 6 credits toward a degree. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

HRTM 4996. Special Topics
1-4 Credits (1-4)
Specific subjects to be announced in the Schedule of Classes. Consent of instructor required. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits.
Learning Outcomes
1. Varies.

HRTM 4998. Hospitality Internship
1 Credit (1)
Hospitality and tourism professional work experience for HRTM majors only. Consent of instructor required. May be repeated up to 1 credit.
Prerequisite: HRTM 3910.
Learning Outcomes
1. Secure and maintain an internship opportunity that includes leadership/cross training industry-related experience and work.
2. Recognize current and key concepts and principles related to market trends, teamwork and ethical management and decision-making strategies in the operation of hospitality and tourism organizations.
3. Demonstrate principles of ethical leadership and effective teamwork within diverse hospitality and tourism management contexts, and the ability to apply these principles in real-world scenarios.

4. Apply current and emerging professional operational systems, service management techniques and service quality measurement systems.
5. Create favorable guest experiences in hospitality and tourism settings.
6. Use current and emerging operational methods and relevant technologies.
7. Exercise effective written, oral, visual, and interpersonal communication skills.

HRTM 4999. Senior Capstone Experience
3 Credits (3)
Synthesizes all previous work. Students apply multi-disciplinary principles to the analysis of hospitality business cases and tourism problems.
Prerequisite: HRTM 4998.
Learning Outcomes
1. Apply the ethical lens framework to business decisions.
2. Evaluate the importance of the effects of the Covid-19 pandemic, diversity, equity, and inclusion, the guest service experience, including service failure, and recovery, innovation, technology, corporate social responsibility, business models, and other trends to the hospitality and tourism industry.
3. Use research and the case study method to analyze hospitality business issues and trends.
4. Present case and research findings in a professional manner
5. Write professional reports.

HRTM 5115. Graduate Entertainment Business and Venue Management
3 Credits (3)
This course will review and examine the principles and practices associated with managing a public assembly venue and the nature of the venue and entertainment business. This is a comprehensive course designed to cover all aspects of incorporated event practices such as marketing, production, contracts, ticketing, and security.
Learning Outcomes
1. Analyze the origin and history of public assembly venues and the role they play within the community.
2. Evaluate different ownership and management structures and how governance relationships impact operational management.
3. Analyze the business and financial operations of a public assembly venue.
4. Describe the booking process, the entities involved, and the importance of relationships.
5. Investigate and create marketing and sales strategies for both a public assembly venue and an event that is booked in the venue.
6. Identify and analyze the ticket system options available to venue managers, as well as their importance in access management, financial accountability, and data collection.
7. Analyze the role and importance of ancillary revenue sources, as well as the need for creativity and entrepreneurship.
8. Describe the operational systems and processes required to maintain a venue and produce events.
9. Analyze the event planning process and how it is used to produce an event experience for guests and clients. 1
10. Evaluate management's role in developing and maintaining a safe and secure public assembly venue.

HRTM 5120. Hospitality Services Management
3 Credits (3)
This course explores and applies the design and management of service quality in global hospitality organizations.
Learning Outcomes
1. Investigate the design and management of service quality in global hospitality organizations to create authentic and memorable hospitality experiences.
2. Design and manage service delivery systems to create a culture of service excellence.
3. Define and discuss the relationship between service and financial performance in hospitality organizations.

HRTM 5130. Graduate Advanced Hotel Operations
3 Credits (3)
The duties and administration of a hotel front office, including housekeeping. Additional focus on the procedures of reservations and night audit. Students also gain exposure to property management systems. Same as HRTM 4130 with additional work for graduate credit.
Learning Outcomes
1. Describe day-to-day responsibilities for a hotel General Manager.
2. Explain departmental competencies for a hotel (Human Resources, Accounting, Revenue Management, Sales and Marketing, Front Office, Housekeeping, Food and Beverage, and Property Operation and Maintenance).
3. Compare and contrast management roles and responsibilities between limited service and full service hotels.
4. Describe hotel organizational, ownership, and franchising structures and their effect on hotel operations.
5. Explain the role of service throughout hotel operation departments.

HRTM 5140. Hotel Revenue and Sales Management
3 Credits (3)
Examines methods used for profitably managing capacity, including dynamic pricing and allocation of the rooms inventory across market segments to maximize revenues. Focuses on the integration of revenue management principles with information technology, management, marketing and sales concerns at the property and market level. Same as HRTM 4140 with additional work for graduate credit. Consent of Instructor required.
Learning Outcomes
1. Describe and discuss the role and function of revenue management in a hotel organization.
2. Evaluate pricing techniques and effects on demand.
3. Determine market segmentation for a hotel.
4. Demonstrate inventory management strategies.
5. Discuss legal and ethical aspects of revenue management.
6. Perform various analysis for a hotel as a function of revenue management.
7. Evaluate distribution channels for hotels.
8. Evaluate and recommend revenue management techniques.

HRTM 5145. Resort Management
3 Credits (3)
This course introduces students to the operation and management of full service resort properties, including the management of resort recreational amenities. Consent of instructor required. Must be in Graduate Student standing to enroll. Same as HRTM 4145 with additional work for graduate credit.
Learning Outcomes
1. Explain differences in operations and management between resorts and hotels.

2. Identify and explain concepts and terminology for various resort amenities and activities.
3. Evaluate resort amenities and activities for various market segments.
4. Identify and discuss trends in the resort industry.
5. Describe best practices in resort management.
6. Evaluate resort amenities, activities, markets and products.

HRTM 5210. The Hospitality Industry and Sustainable Competitive Strategy
3 Credits (3)
An examination of the hospitality industry, and its contemporary strategic management principles and practices. Key components, industry organization, and competitive environment of the hospitality industry are analyzed. Strategic decision making principles are examined to create sustainable competitive advantages for hospitality and service industry leaders and organizations.
Learning Outcomes
1. Analyze key components, industry organization, and competitive environment of the hospitality industry.
2. Examine strategic decision making principles to create sustainable competitive advantages for hospitality and service industry leaders and organizations.

HRTM 5220. Contemporary Global Issues in Hospitality
3 Credits (3)
Contemporary issues confronting the global hospitality industry.
Learning Outcomes
1. Discuss contemporary issues confronting the global hospitality industry.
2. Project how contemporary global issues will impact hospitality organizations.
3. Evaluate new developments in hotel and restaurant management.

HRTM 5230. Hotel, Restaurant and Tourism Industry Purchasing, Selection and Procurement
3 Credits (3)
Purchasing methods for the hotel, restaurant and tourism industries based on standards of quality, grade, care, and storage for food and nonfood supplies. Purchasing, installation, operation, and care of large foodservice equipment. Same as HRTM 4230 with additional work for graduate credit.
Learning Outcomes
1. Differentiate purchasing functions in different types of hotel, restaurant and tourism operations and determine how internal and external forces impact purchasing decisions.
2. Outline and describe the duties and responsibilities of hotel, restaurant and tourism purchasing managers.
3. Develop product recommendations for hotel, restaurant and tourism food and equipment through the use of various product evaluation methods.
4. Identify examples of unethical purchasing practices throughout history, research present a code of purchasing ethics for a hotel, restaurant or tourism company.
5. Analyze hotel, restaurant and tourism industry supplier selection criteria and recommend a supplier based on those criteria.
6. Apply mathematical models to calculate recipe costs as well as order quantities and times. Determine how to reduce AP prices.
7. Outline and describe each step of the flow of inventory and determine which controls are needed for security of inventory.
8. Explain product grades and explain grading procedures and procurement criteria for meats, poultry, eggs, dairy, produce, marine products, groceries, and nonfood items.

HRTM 5240. Sustainability in the Hospitality Industry
3 Credits (3)
This course provides a summary and definition of the concept and roots of sustainability and climate change as well as their impact and effect on the hospitality industry while providing the rationale for sustainable development for the industry. A review of environmentally sound management strategies for all operational management areas ranging from eco-design, energy, waste and water management, food security, sourcing of agricultural products leads to a detailed strategy for planning and evaluating the sustainability of a hospitality operation in terms of corporate responsibility and social entrepreneurship. The content is focused on a global perspective of sustainability in the industry. Same as HRTM 4240V with additional work for graduate credit.
Learning Outcomes
1. Recognize, interpret and summarize the global challenges facing the hospitality industry caused by climate change driving the need for sustainability in the industry.
2. Explain implementation strategies for responsible environmentally sound hospitality management practices for hotel, food and beverage and tourism businesses.
3. Evaluate sustainable development practices and the importance of personal and corporate social development.
4. Analyze, evaluate and communicate the sustainability practices of a hospitality operation.

HRTM 5310. Beverage Management
3 Credits (3)
Survey of all aspects of beverage management, including wine/beer/distilled spirits origins and trends, cost control, bar management, beverage purchasing, and wine appreciation. Same as HRTM 4310 with additional work for graduate credit. Consent of Instructor required.
Learning Outcomes
1. Identify beverage industry career opportunities and trends that impact hospitality beverage operations.
2. Discuss responsible alcohol service principles in compliance with legal and ethical standards.
3. Explain the basic components of bar and beverage operations' design, layout, and equipment.
4. Differentiate between the various beverage production processes and service standards.
5. Classify types of alcoholic and non-alcoholic beverages.
6. Develop beverage menus that align with food offerings, customer preferences, and business goals.
7. Describe the key principles of beverage inventory management and control.
8. Illustrate the role of beverage sales in operational profitability, including pricing strategies and marketing techniques.

HRTM 5330. Graduate Wine Appreciation
3 Credits (3)
An experiential examination of wine through lectures, guest speakers and focused tasting of wine and food. Topics include viticulture, wine making varietals, terroir, wine service, tasting and evaluation techniques, and food pairings.

Learning Outcomes

1. Discuss the historical and cultural significance of wine.
2. Compare and contrast the production processes for wines.
3. Describe and analyze the characteristics of popular wine varietals.
4. Describe how viticultural practices and geography/climate factors relate to the quality and variation in wines.
5. Perform evaluation and appraisal of wines based on quality, value, and intended use.
6. Apply knowledge of terminology related to labeling laws, practices, and geography of the major wine-growing regions of the world to the effective selection of both domestic and imported wines.
7. Pair wine with foods.
8. Examine the distribution and service systems for wine.
9. Critically research and evaluate current issues in wine production, marketing, and distribution.

HRTM 5402. AI Applications in Fiber and Food Systems
3 Credits (3)

Focusing on food and fiber systems, the course includes applications of AI to food processing, food safety, nutrition, and sustainability. Students in the course will explore demand forecasting, labor management, consumer behavior, and other economic and sociocultural aspects of food and fiber systems. The course will incorporate concepts of equitable access, job quality, transparency, data privacy and security, and responsible and ethical use of AI in fiber and food systems.

Learning Outcomes

1. Identify application areas in food and fiber systems for AI opportunities.
2. Evaluate AI tools for nutrition, food processing, food safety, supply chain management, and sustainability in food and fiber systems.
3. Assess the impact of AI tools on demand forecasting, labor management and consumer behavior in food and fiber systems.
4. Apply machine learning and AI methods to enhance decision-making across food and fiber value chains.
5. Develop and evaluate predictive and classification models using real-world data from food and fiber systems.
6. Discuss and apply ethical and responsible AI frameworks to food and fiber systems.

HRTM 5404. Emerging Topics in AI for Food and Agriculture
3 Credits (3)

Analyze emerging applications and uses of AI in food systems, agriculture, and the environment. Project impacts of emerging AI topics to agriculture, the environment, and food and fiber industries. Evaluate new developments in AI for application to food, fiber, agriculture, and the environment. Explore ethical dimensions of AI in agriculture.

Learning Outcomes

1. Analyze emerging applications and uses of AI in food systems, agriculture, and the environment.
2. Describe and discuss how emerging developments in AI can impact food, fiber, and agriculture businesses.
3. Describe and discuss impacts of emerging AI technologies to agriculture, the environment, and food and fiber industries.
4. Evaluate new developments in AI for application to food, fiber, agriculture, and the environment.

HRTM 5410. Hospitality Cost Control
3 Credits (3)

Familiarizes students with all aspects of cost control including financial data entry and hospitality accounting practices, financial report production, analysis and problem solving. Students will learn to understand the roles of the various stakeholders (owners, managers, employees and customers). Provides tools needed to communicate effectively about global financial issues affecting the hospitality business. Same as HRTM 4410 with additional work for graduate credit. Consent of Instructor required.

Learning Outcomes

1. Analyze relationships between hospitality business traffic, revenue, expense, and contribution margin as key variables associated with demand and profitability.
2. Explain professional purchasing, storage, and receiving techniques managers use to minimize spoilage and prevent product shortages.
3. Apply standardized recipes and effective menu planning techniques to efficiently manage food and beverage production systems.
4. Outline the steps managers take to control costs and achieve operational profit goals.
5. Categorize types of expenses accurately.
6. Calculate expenses by the cost per guest served and by the percentage of sales revenue.
7. Evaluate operational cost effectiveness through income (PL) statement analysis, including sales volume and all expense categories.
8. Prepare cost-volume-profit analysis(s) to evaluate the contribution of menu items to operational profits, including calculating break-even points.
9. Propose systems to prevent potential internal and external revenue theft threats. 1
10. Solve detailed virtual restaurant simulation exercises, including start-up and turnaround scenarios.

HRTM 5420. Hospitality Research Methods & Analysis
3 Credits (3)

Application of appropriate statistical procedures and research methodologies within the hospitality industry.

Learning Outcomes

1. Analyze hospitality operational data.
2. Develop the framework for researching hospitality operations and organizations.
3. Implement appropriate statistical procedures and research methodologies to hospitality operations.
4. Examine problems in hospitality, formulate and clarify research topics to address these problems.

HRTM 550. The World of Hospitality Higher Education
3 Credits (3)

Survey of the history, organization, and administration of hospitality higher education programs. Explores differences between types of degree programs – associate, bachelor, graduate and sources of funding – public, private, proprietary. Investigates the role of the faculty member in non-instructional activities, such as working with administrative and support departments, accreditation, service, community outreach, fundraising, and industry relations. Restricted to: HRTM Minor or Master of Science in Family and Consumer Sciences majors.

Learning Outcomes

1. Discuss the history of higher education and hospitality management programs.
2. Analyze how general higher education principles, laws, and finance apply to hospitality management programs.

3. Compare the characteristics, administration, and operations of programs based on type of degrees offered.
4. Compare the characteristics, administration, and operations of programs based on sources of funding.
5. Analyze the role of the faculty in hospitality education in collaborating with various educational departments and support services.
6. Analyze the role of the faculty in hospitality education in collaborating with external stakeholders.

HRTM 5510. The World of Hospitality Higher Education
3 Credits (3)
Survey of the history, organization, and administration of hospitality higher education programs. Explores differences between types of degree programs – associate, bachelor, graduate and sources of funding – public, private, proprietary. Investigates the role of the faculty member in non-instructional activities, such as working with administrative and support departments, accreditation, service, community outreach, fundraising, and industry relations. Restricted to: HRTM Minor or Master of Science in Family and Consumer Sciences majors.
Learning Outcomes
1. Discuss the history of higher education and hospitality management programs.
2. Analyze how general higher education principles, laws, and finance apply to hospitality management programs.
3. Compare the characteristics, administration, and operations of programs based on type of degrees offered.
4. Compare the characteristics, administration, and operations of programs based on sources of funding.
5. Analyze the role of the faculty in hospitality education in collaborating with various educational departments and support services.
6. Analyze the role of the faculty in hospitality education in collaborating with external stakeholders.

HRTM 598. Special Research Programs
1-4 Credits
Individual investigations, either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.
Prerequisite: consent of instructor.

HRTM 5991. Special Research Programs
1-4 Credits (1-4)
Individual investigations, either analytical or experimental. Consent of instructor required. Maximum of 4 credits per semester and no more than 6 credits toward a degree.
Learning Outcomes
1. Explain and deliver a summary and definition for planning research in hospitality and tourism.
2. Demonstrate effective academic reading skills, articulate your research goal, define parameters and organization for your literature search, appropriately document and cite sources from your search.
3. Develop a topic statement and the framework for researching specific hospitality operations and organizations.
4. Design and implement appropriate statistical procedures and research methodologies to hospitality operations.
5. Evaluate problems in hospitality, formulate and clarify research topics to address these problems.

HRTM 5992. Applied Management Project
3 Credits (3)
Students will develop a project scope based on problems presented within the hospitality industry. Projects incorporate concepts and skills developed in previous coursework. Students will take this course in their last semester of the Master of Hospitality Degree.
Learning Outcomes
1. Develop a project scope based on problems presented within the hospitality industry.
2. Use collaborative problem solving to execute the project.
3. Define and identify a business research problem and explain its importance to study.
4. Identify sources and strategies for locating related literature.
5. Plan research regarding the business problem.
6. Write the professional paper.
7. Present the professional paper.

HRTM 5996. Special Topics
1-4 Credits (1-4)
Specific subjects and credits to be announced in the Schedule of Classes. Consent of instructor required. Maximum of 4 credits per semester and a total of 9 credits toward a degree. May be repeated up to 9 credits.
Learning Outcomes
1. Varies

HRTM 5998. Graduate Hospitality Internship
3 Credits (3)
Hospitality and tourism industry professional, structured and supervised work experience for HRTM graduate students only.
Learning Outcomes
1. Develop and apply interviewing and negotiating skills during the process of seeking and being hired into an internship.
2. Recall and explain the strengths and weaknesses of departments and work units from the hospitality operation in which they interned.
3. Describe and explain interactions with the hospitality operation's guests and the development of a positive service oriented attitude as well as be able to describe the service management delivery system.
4. Compare and contrast the management styles, leadership skills, and effectiveness of supervisors and managers. analyze which type of style or skill fits best with their style.
5. Analyze which styles and leadership skills best fit their personal management abilities.
6. Identify new and different experiences encountered during the internship, distinguish the positive and negative aspects of the experience, and appraise these experiences as to their value to their future hospitality management career.
7. Apply coursework related knowledge to demonstrate coursework related knowledge to the internship position.
8. Synthesize the total internship learning experience by completing a comprehensive management report.

HRTM 5999. Master's Thesis
1-6 Credits (1-6)
Thesis. Consent of instructor required. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

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Hotel, Restaurant and Tourism Management - Bachelor of Science

Core Courses

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
English Composition - Level 2		
Choose one from the following:		3
ENGL 2210G	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1130G	Survey of Mathematics (Or Any Approved Math General Education Course)	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
ECON 1110G	Survey of Economics	
or ECON 2110G	Macroeconomic Principles	
or ECON 2120G	Principles of Microeconomics Honors	
HRTM 1120G	Introduction to Tourism	
Area III: Laboratory Sciences Course (4 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective [2]		*3-4*
Any "G" course, excluding Area I and crosslisted courses		
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
HRTM 1130	Introduction to Hospitality Management	3
HRTM 1310	Safety, Sanitation and Health in the Hospitality Industry [8]	1
HRTM 1320	Food Production and Service Fundamentals	3
HRTM 2130	Hotel Operations	3
HRTM 3210	Hotel, Restaurant, and Tourism Marketing	3
HRTM 3410	Hospitality Management Accounting	3
HRTM 3220	Hospitality and Travel Law	3
HRTM 3910	Professional Development [9]	1
HRTM 3230	Hospitality Leadership Management	3
HRTM 3310	Quantity Food Production and Service	4
HRTM 4998	Hospitality Internship	1
HRTM 4910	HRTM Internship Seminar	1
HRTM 4410	Hospitality Cost Control	3
HRTM 4135	Hospitality Facilities Management	3
HRTM 4999	Senior Capstone Experience [4]	3
Departmental Electives		*12*
Select 12 credits of Professional Departmental Electives in consultation with your HRTM Faculty Mentor [5]		
Non- Departmental Requirements (in addition to Gen.Ed/VWW) [6]		
ACES 1120	Freshman Orientation	1
ACCT 2110	Principles of Accounting I	3
Any MKTG 300 and above		3
MGMT 309	Human Behavior in Organizations	3
MGMT 332	Human Resources Management	3
Electives, to bring the total credits to 120 [6, 7]		**19**
Total Credits		**120-121**

1 MATH 1130G Survey of Mathematics is required for the degree but students may need to take prerequisites for MATH 1130G first.

2 See the General Education (p. 262) section of the catalog for a full list of courses. Please consult your HRTM faculty mentor to select appropriate courses.

3 Viewing A Wider World Requirement - Two courses in two different colleges, with at least one from outside ACES. See list of approved courses in the catalog. (300+ level courses with a "V" behind them.) See the Viewing a Wider World (p. 266) section of the catalog for a full list.

4 Complete during final semester.

5 **Departmental Electives (the following are typical offerings):**

- HRTM 4310 Beverage Management
- HRTM 4320 Restaurant Operations Management
- HRTM 4330 Wine Appreciation
- HRTM 4230 Hotel, Restaurant and Tourism Industry Purchasing, Selection, and Procurement
- HRTM 4235 Club Management and Marketing
- HRTM 4130 Advanced Hotel Operations
- HRTM 4140 Hotel Revenue and Sales Management
- HRTM 4145 Resort Management
- HRTM 4240V Sustainability in the Hospitality Industry
- HRTM 4110 Meetings, Conventions and Special Events

- HRTM 4115 Entertainment Business and Venue Management
- HRTM 4120 An Overview of Italian Tourism focused on Food, Wine, Art and Culture
- HRTM 4996 Special Topics
- HRTM 4991 Special Problems

[6] It is highly recommended that students take BFIN 341 Financial Analysis and Markets as an elective course. You will need assistance from HRTM to receive a prerequisite waiver to enroll in it.

[7] It is strongly suggested that students use their elective credits to earn a minor such as Marketing, Business Administration, Food Science and Technology, Human-Animal Interaction, or a Language.
**Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.*

[8] Students may waive HRTM 1310 Safety, Sanitation and Health in the Hospitality Industry if they show prove of a valid, not-expired ServSafe Food Safety Manager certificate. They will need to show continued proof of manager or food handler's certification in order to serve food to the public in HRTM 1320 Food Production and Service Fundamentals, HRTM 3310 Quantity Food Production and Service, HRTM 4320 Restaurant Operations Management and HRTM 4110 Meetings, Conventions and Special Events

[9] To gain instructor consent to enroll in HRTM 3910 Professional Development, students must provide verification of 400 hours of hospitality industry related work experience. Contact the HRTM office for details of the verification process. HRTM 3910 Professional Development. HRTM 3910 Professional Development is the prerequisite for enrolling in HRTM 4998 Hospitality Internship. HRTM 4998 Hospitality Internship is the prerequisite for enrolling in HRTM 4910 HRTM Internship Seminar.

A Suggested Plan of Study for Students

This roadmap assumes student placement in ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
HRTM 1130	Introduction to Hospitality Management	3
HRTM 1310	Safety, Sanitation and Health in the Hospitality Industry	1
ACES 1120	Freshman Orientation	1
MATH 1130G	Survey of Mathematics	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Choose any General Education course from Area V or VI [2, 3]		3
	Credits	**14**
Spring		
HRTM 1120G	Introduction to Tourism	3
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
ECON 1110G or ECON 2110G or ECON 2120G	Survey of Economics or Macroeconomic Principles or Principles of Microeconomics Honors	3
Any General Education from Area V or Area VI [2, 3]		3
Elective Course [4]		3
	Credits	**16**
Second Year		
Fall		
Choose one from the following:		3
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
General Education Elective [2]		3
Area III: Laboratory Science Course [2]		4
ACCT 2110	Principles of Accounting I	3
HRTM 1320	Food Production and Service Fundamentals	3
	Credits	**16**
Spring		
HRTM 2130	Hotel Operations	3
HRTM 3230	Hospitality Leadership Management	3
Any 300-level Marketing Course		3
Elective Course [4]		6
	Credits	**15**
Third Year		
Fall		
HRTM 3210	Hotel, Restaurant, and Tourism Marketing	3
HRTM 3410	Hospitality Management Accounting	3
HRTM 3310	Quantity Food Production and Service	4
Any Viewing a Wider World course [5]		3
Elective Course [4]		3
	Credits	**16**
Spring		
HRTM 3220	Hospitality and Travel Law	3
HRTM 3910	Professional Development	1
MGMT 332	Human Resources Management	3
Any HRTM Departmental Elective [6]		3
Any Viewing a Wider World course [5]		3
	Credits	**13**
Summer		
HRTM 4998	Hospitality Internship	1
	Credits	**1**
Fourth Year		
Fall		
HRTM 4910	HRTM Internship Seminar	1
HRTM 4410	Hospitality Cost Control	3
HRTM 4135	Hospitality Facilities Management	3
MGMT 309	Human Behavior in Organizations	3
HRTM Departmental Elective [6]		3
Elective Course [4]		3
	Credits	**16**

Spring		
HRTM 4999	Senior Capstone Experience	3
Departmental Elective Courses [6]		6
Elective Courses (if needed to reach 120 credits) [4]		4
	Credits	**13**
	Total Credits	**120**

[2] See the General Education (p. 262) section of the catalog for a full list of courses.

[3] Students must take only one Area V and one Area VI course.

[4] It is strongly suggested that students use their elective credits to earn a minor such as Marketing, Business Administration, Food Science and Technology, Human-Animal Interaction, or a Language.
**Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.*

[5] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

[6] **Departmental Electives (the following are typical offerings):**

- HRTM 4310 Beverage Management
- HRTM 4320 Restaurant Operations Management
- HRTM 4330 Wine Appreciation
- HRTM 4230 Hotel, Restaurant and Tourism Industry Purchasing, Selection, and Procurement
- HRTM 4235 Club Management and Marketing
- HRTM 4130 Advanced Hotel Operations
- HRTM 4140 Hotel Revenue and Sales Management
- HRTM 4145 Resort Management
- HRTM 4240V Sustainability in the Hospitality Industry
- HRTM 4110 Meetings, Conventions and Special Events
- HRTM 4115 Entertainment Business and Venue Management
- HRTM 4996 Special Topics
- HRTM 4991 Special Problems

Hotel, Restaurant and Tourism Management - Undergraduate Minor

A minor in the School of Hotel, Restaurant and Tourism Management consists of 18 or more credit hours of approved course work of which at least 12 must be numbered 300 or higher: all completed with a grade of "C-" or higher.

Please see the HRTM Director or a HRTM Faculty Mentor to approve your plan for completing the minor and approval to take specific classes. Please declare the HRTM minor in MyNMSU as soon as possible so we can track your progress toward completion

Requirements

Prefix	Title	Credits
Required Courses:		
HRTM 1130	Introduction to Hospitality Management	3
HRTM 3410	Hospitality Management Accounting	3
Choose one additional HRTM course (200-level):		**3**
HRTM 1120G	Introduction to Tourism	
HRTM 1320	Food Production and Service Fundamentals	
HRTM 2130	Hotel Operations I	
Choose nine credits of 300- or 400-level courses:		**9**
HRTM 3210	Hotel, Restaurant, and Tourism Marketing	
HRTM 3220	Hospitality and Travel Law	
HRTM 3230	Hospitality Leadership Management	
HRTM 3310	Quantity Food Production and Service	
HRTM 3910	Professional Development	
HRTM 4110	Meetings, Conventions and Special Events	
HRTM 4115	Entertainment Business and Venue Management	
HRTM 4135	Hospitality Facilities Management	
HRTM 4130	Hotel Operations II	
HRTM 4140	Hotel Revenue and Sales Management	
HRTM 4145	Resort Management	
HRTM 4230	Hotel, Restaurant and Tourism Industry Purchasing, Selection, and Procurement	
HRTM 4235	Club Management and Marketing	
HRTM 4240V	Sustainability in the Hospitality Industry	
HRTM 4310	Beverage Management	
HRTM 4320	Restaurant Operations Management	
HRTM 4330	Wine Appreciation	
HRTM 4410	Hospitality Cost Control	
HRTM 4910	HRTM Internship Seminar	
HRTM 4996	Special Topics	
HRTM 4998	Hospitality Internship	
HRTM 4991	Special Problems	
Total Credits		**18**

Please note that ACCT 2110 Principles of Accounting I is the prerequisite for HRTM 3410 Hospitality Management Accounting but does not count toward the minor. HRTM 1310 Safety, Sanitation and Health in the Hospitality Industry or a ServSafe Food Safety Manager certificate is a prerequisite for HRTM 1320 Food Production and Service Fundamentals and HRTM 3310 Quantity Food Production and Service but does not count toward the minor. Other courses have prerequisites that you may not have taken.

Students wishing to perform a HRTM internship as part of the minor must take the full sequence of internship courses: HRTM 3910 Professional Development, HRTM 4998 Hospitality Internship, and HRTM 4910 HRTM Internship Seminar.

Water Science and Management

Graduate Program Information

New Mexico faces serious challenges concerning the supply, development, quality, management and administration of water resources; responses to the challenges will have major impacts on the regional economy, environmental quality, and the quality of life of the residents of New Mexico. A major need exists to train the next generation of water resource researchers, educators, and managers to address these challenges, both inside and outside New Mexico. To help meet these needs, an interdisciplinary program in Water Science & Management (WSM) has been developed at NMSU by the departments of

- Agricultural Economics and Agricultural Business,
- Animal and Range Science,

- Civil Engineering,
- Geography, and
- Plant and Environmental Sciences.

The primary purposes of the interdisciplinary masters and doctoral degree programs in WSM are to provide graduate education for addressing state, national, and international water issues, and to train the next generation of water professionals needed to meet the challenges noted above.

Admission Requirements

Admission Requirements for the Master of Science (MS) in water science and management include all general requirements for a graduate degree as set forth in the NMSU Catalog, plus the following:

- Possession of a bachelor's degree from an accredited university grade point average of 3.5 or higher on a 4.0 scale. However, students with grade point averages between 3.0 and 3.5 will be given consideration, this degree being preparatory to the Water Science and Management degree.
- A letter of intent or statement of purpose that addresses individual professional and personal goals related to water science and management and discusses how these goals fit within the degree programs at NMSU. It is expected that the candidate will have made contact with prospective advisor(s) at NMSU and speak to how he or she would work with said advisor(s) to advance their research and study.
- Three letters of recommendation submitted directly from persons who know the applicant professionally, including a recommendation from the candidate's current employer/sponsor. These letters should provide evidence of professional ability, research experience and the potential for professional development.
- A brief resume or curriculum vitae not to exceed five pages that summarize the candidate's background and qualifications.

Admission Requirements for the Doctor of Philosophy (Ph.D.) in water science and management include all general requirements for a graduate degree as set forth in the NMSU Catalog, plus the following:

- Possession of a master's degree from an accredited university with a grade point average of 3.5 or higher on a 4.0 scale. However, students with grade point averages between 3.0 and 3.5 will be given consideration. This degree being preparatory to the Water Science and Management doctorate.
- Three letters of recommendation submitted directly from persons who know the applicant professionally, including a recommendation from the candidate's current employer/sponsor. These letters should provide evidence of professional ability, research experience, and the potential for professional development.
- In addition, applicants to the Ph.D. program should provide evidence of research experience. This could include a master's thesis, a professional paper, peer-reviewed manuscripts, consulting reports, or other evidence of experience conducting research.
- A letter of intent or statement of purpose that addresses individual professional and personal goals related to water science and management and discusses how these goals fit within the degree programs at NMSU. It is expected that the candidate will have made contact with prospective advisor(s) at NMSU and speak to how he or she would work with said advisor(s) to advance their research and study.
- A brief resume or curriculum vitae not to exceed five pages that summarize the candidate's background and qualifications.

Water Science & Management Graduate Courses

To view the list of core courses required for our Master of Science and Doctor of Philosophy degrees please see the Degrees (p. 492) tab.

Five (5) concentrations are offered in the program and are detailed on the program page:

- **Agricultural Water Resources** relates to the major use of ground and surface water in providing safe and secure food systems while ensuring ecosystem services. This field of study includes water allocation, water conservation and water management issues facing urban water supply and irrigated agriculture.
- **Watershed, Riparian and Aquatic Systems** includes the processes of organizing and guiding land and other resources used in a river basin to provide desired goods and services without adversely affecting soil and water resources. Watershed, riparian, and aquatic system management involves an array of nonstructural (vegetation management) practices, as well as an array of structural (engineering) activities, when conditions warrant.
- **Water Quality and Treatment** includes processes used to make water acceptable for desired end-uses. These can include use as drinking water, industrial processes, agricultural uses and environmental management. The goal of water treatment processes is to remove existing contaminants in the water or reduce the concentration of such contaminants so the water becomes fit for its desired end-use.
- **Water Economics and Policy** examines the demand for water by all its competing uses, including irrigated agriculture, energy, urban supply, and environmental restoration and management. Policies are examined for their influence on water supplies, water demands, and economic values of water reallocations among agricultural, environmental, energy, and urban users. It examines the role of water markets, water user decisions, institutional adjustments, and water-related policies with respect to resource costs, water quality, profitability, and environmental effects.
- **Water Informatics** is an interdisciplinary science primarily concerned with the collection, classification, manipulation, storage, retrieval and especially the dissemination of water information, including both human and machine readable documents. Examples of human readable documents include maps, field data sheets, operational schedules, and long term asset management plans with narrative text. Machine readable documents include files for geographic information systems (GIS), Global Positioning Systems (GPS), relational database management systems and emerging applications.

Degrees for the Department

Master Degree(s)

- Water Science and Management (Agricultural Water Resources) - Master of Science (p. 196)
- Water Science and Management (International Water Resilience) - Master of Science (p. 196)
- Water Science and Management (Water Economics and Policy) - Master of Science (p. 197)
- Water Science and Management (Water Informatics) - Master of Science (p. 197)
- Water Science and Management (Water Quality and Treatment) - Master of Science (p. 198)

- Water Science and Management (Watersheds and Aquatic/Riparian Wetlands) - Master of Science (p. 199)
- Water Science and Management - Master of Science (p. 195)

Doctoral Degree(s)

- Water Science and Management (Agricultural Water Resources) - Doctor of Philosophy (p. 239)
- Water Science and Management (International Water Resilience) - Doctor of Philosophy (p. 240)
- Water Science and Management (Water Economics and Policy) - Doctor of Philosophy (p. 240)
- Water Science and Management (Water Informatics) - Doctor of Philosophy (p. 241)
- Water Science and Management (Water Quality Treatments) - Doctor of Philosophy (p. 241)
- Water Science and Management (Watershed and Aquatic/Riparian Wetlands) - Doctor of Philosophy (p. 242)
- Water Science and Management - Doctor of Philosophy (p. 239)

Affiliated Faculty – S. Angadi, Ph.D. (University of Manitoba, Canada); S. Archambault, Ph.D. (UNM); A. Salim Bawazir, Ph.D. (NMSU); M.P. Bleiweiss, M.S. (California State-Los Angeles); W.Boeing, Ph.D. (Louisiana State); K. Boykin, Ph.D. (NMSU); C. E. Brewer, Ph.D. Iowa State); C. Brown, Ph.D. (San Diego State/California-Santa Barbara); S. W. Brown, Ph.D. (NMSU); M. Buenemann, Ph.D. (Oklahoma); K. C. Carroll, Ph.D. (Arizona); D. S. Cram, Ph.D. (NMSU); C. M. Downes, Ph.D. (New Mexico); D. W. DuBois, Ph.D. (Nevada); D. P. Dugas, Ph.D. (Oregon); W. M. Fedio, Ph.D. (University of Alberta, Canada); A. G. "Sam" Fernald, Ph.D. (Colorado State); R. Flores, Ph.D. (Kansas State); R. Foudazi, Ph.D. (Cape Peninsula University of Technology, South Africa); A. Ghassemi, Ph.D. (NMSU); R. M. Goss, Ph. D. (Nebraska); S. J. Guldan, Ph.D. (Minnesota); P. Gutierrez, Ph.D. (Oklahoma State University); J. Herrick, Ph.D. (Ohio State); B. H. Hurd, Ph.D. (California-Davis); M. D. Johnson, Ph.D. (NMSU); N. Khandan, Ph.D. (Drexel University); J. P. King, Ph.D. (Colorado State); S. Langarudi, Ph.D. (Worcester Polytechnic); A. S. Lara, Ph.D. (NMSU); B. Leinauer, Ph.D. (Hohenheim University, Germany); H. Luo, Ph.D. (Tulane); L. Papelis, Ph.D. (Stanford); G. A. Picchioni, Ph.D. (Texas A&M); R. C. Pratt, Ph.D. (Purdue); D. A. Rockstraw, Ph.D. (Oklahoma); R. Sallenave, Ph.D. (University of Guelph, Canada); Z. A. Samani, Ph.D. (Utah State); M. K. Shukla, Ph.D. (University of Agricultural Sciences-Vienna, Austria); G. Sims, Ph.D. (Purdue); G. B. Smith, Ph.D. (North Carolina State); R. G. Smits, Ph.D. (Purdue); S. N. Smirnov, Ph.D. (Novosibirsk University, Russia): R. St. Hilaire, Ph.D. (Iowa State); C. M. Steele, Ph.D. (King's College, University of London, UK); K. Stevens, M.S. (NMSU); B. L. Stringam, Ph.D. (Utah State); A. L. Ulery, Ph.D. (California-Riverside); J. Urquidi, Ph.D. (Texas Tech); F. A. Ward, Ph.D. (Colorado State); N. Webb, Ph.D. (University of Queensland, Australia); B. Widner, Ph.D. (Colorado State); P. Xu, Ph.D. (Ecole Nationale de Gunie Rural, France)

Water Science and Management Courses

WSAM 470. Environmental Impacts of Land Use and Contaminant Remediation
3 Credits (3)
The course will cover the integrated assessment of soil erosion, contaminant transport in soil and water, and contaminant remediation from site scale to watershed scales. Understanding of the controlling factors for each type land use impact will be gained through the use of risk assessment, case studies, and computer modeling. Case studies will illustrate the processes under various environmental applications. This course will also cover the application of solute transport principles and methods for the remediation of contaminated soil and groundwater. It will also discuss the contaminated site characterization, monitoring, and remediation design. Discussions of innovative methodologies will be supported with case studies.
Learning Outcomes
1. Apply knowledge of mathematics, science, and engineering to identify, formulate, and solve environmental problems.
2. Function on multidisciplinary teams and exhibit professional and ethical responsibility and communicate findings effectively.
3. Recognize the need for, and an ability to engage in, life-long learning.
4. Describe contemporary land-use impact and cleanup issues.
5. Use the techniques, skills, and modern environmental science and engineering tools necessary for current industry practice.

WSAM 550. Special Topics
1-4 Credits (1-4)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 9 credits.
Learning Outcomes
1. Readings, discussions, and/or field and laboratory investigation of selected problems.

WSAM 551. Earth Data Retrieval
3 Credits (3)
This course covers topics related to identifying sources, preprocessing, utilizing earth data that can be used to monitor some hydrological and water related variables, vegetation growth and related biophysical properties. The course focuses on developing students' skills on how to handle and analyze high-level large amounts of research data in different formats (i.e. .hdf). The course highlights the use of remote sensing and land surface models-based (NLDAS) earth observation datasets (e.g. NDVI, LST, Ta, and ET). The course uses some open-source tools including Python, API as well as MATLAB. Crosslisted with: RGSC 551.
Learning Outcomes
1. Identify, retrieve, and visualize earth observation datasets that are relevant to individual research activities.
2. Understand the nature and formats of earth observation data.
3. Handle, process, and conduct quantitative analysis of earth observation datasets using python, MATLAB, and cloud computing (GEE).
4. Development of qualitative reasoning and analytical thinking skills to address research questions related to earth observation datasets.

WSAM 575. Climate Studies, Water and Society
3 Credits (3)
The course provides a brief description of the Earth's climate system, an in-depth review and methodologies used to investigate climate change and variability, evidence of climate change on natural systems (water availability) vulnerability of human systems (e.g. agriculture) to climate change, and mitigation and adaptation strategies.
Learning Outcomes
1. Know, identify, and interrogate Earth's climate observation datasets.
2. Evaluate and understand Earth's climate systems.
3. Conduct meaningful investigations, prediction, and inferencing.
4. Critical thinking about climate change impacts on human and natural resources.

WSAM 585. Land Cover Analysis for Natural Resources
3 Credits (3)
This course is designed to help students understand, manipulate and extract Earth Observation (EO) data and to conduct land cover analysis

related to natural resources including water and vegetation. The course provides and highlights means to identify and access EO data in different formats, extract meaningful information, and to help students developing critical thinking skills. The course introduces tools such as python and ArcGIS Pro to handle different data formats (e.g. hdf) efficiently; develop and present creative maps. The course provides basic information about how to conduct land use, land cover change analysis, mapping vegetation, water related variables and plant and animal distribution analysis. Crosslisted with: RGSC 585.

Learning Outcomes

1. Identify sources of and obtain land cover GIS data.
2. Handle GIS data in different formats.
3. Extract meaningful information.
4. Development of qualitative reasoning and analytical thinking skills to address research questions related to natural resources.

WSAM 589. Landscape Hydrology Modeling
3 Credits (3)

The course "Landscape Hydrology Modeling" offers topics related to the physical hydrological processes that occur at different spatial and temporal scales in terms of understanding, quantitative evaluation, modeling, and visualization. It addresses precipitation, runoff, infiltration, and evaporation, as well as understanding impact of land use change on these processes. The course highlights and provide training on the use of hydrological modeling tools including WMS software, HydroVIS and ArcGIS software to help students understand, model, manipulate, and visualize hydrological data processes. The course offers hands-on learning experience on the use of these tools.

Learning Outcomes

1. Identify the different components of a landscape scale hydrologic system and quantitatively evaluate the associated physical processes including precipitation, runoff, streamflow, infiltration, evapotranspiration.
2. Retrieve and visualize a hydrologic system data along with the associated datasets.
3. Be able to model hydrological processes within a watershed and understand the streamflow generation process and the effect of vegetation and topography on streamflow generation.
4. Gain knowledge about, and be able to use, some of the available tools that can be used in spatial and temporal hydrological process modeling.

WSAM 590. System Dynamics
3 Credits (3)

This course takes a system dynamics approach to the study of economics and natural resources management. We will examine some of the example theories such as Solow-Swan model and endogenous growth theories as well as the tragedy of the commons, using system dynamics tools to uncover the feedback and explicitly examine its impact on the dynamic behavior of the system. Through these examples, we will learn how to develop, validate, and use system dynamics models for policy design and analysis.

Learning Outcomes

1. Identify common generic structures and behavioral modes in socioeconomic and ecological systems.
2. Define important feedback theories that explain the behavioral modes in socioeconomic and ecological systems.
3. Implement the system dynamics method to translate the feedback theories into dynamic simulation models.

WSAM 595. Hands-On Transboundary Aquifer and Community System Convergence Seminar
1 Credit (1)

An opportunity for graduate researchers to build partnerships with their colleagues in the IWR cohort and with our expert collaborators. Graduate researchers present their research methods, share lessons from their research activities, and report on experiences in the field and in the IWR program. An opportunity for academic, industry, and stakeholder project partners to share career development and research convergence insight with the cohort. May be repeated up to 18 credits.

Learning Outcomes

1. Students will learn about natural and social science convergence.
2. Convergence tool skill-building.
3. Students will learn how to lead the coordination of international, multidisciplinary research collaboration.

WSAM 598. Internship
1-9 Credits (1-9)

Out-of-classroom learning experiences to gain relevant education, experience, and expertise. Field-based learning providing transformative education and hands-on training. May be repeated up to 18 credits.

Learning Outcomes

1. Gain the experience necessary to engage confidently in community-centered hydrologic and social science approaches to water research.
2. Students will learn how to lead the coordination of international, cross-disciplinary research collaboration.
3. Gain experience applying academic and research knowledge in professional capacities.
4. Develop cross-sector communication skillsets.

WSAM 599. Masters Thesis
1-15 Credits (1-15)

Thesis. May be repeated up to 88 credits. Consent of Instructor required. Restricted to: Water and Science Management majors. Thesis/Dissertation Grading.

WSAM 600. Doctoral Research
1-15 Credits (1-15)

Assigned credit for research preformed. May be repeated up to 15 credits. Consent of Instructor required.

Learning Outcomes

1. Identify appropriate research methodologies.
2. Reflect on their own research, identifying lessons learned, strengths, and ways to improve.
3. Communicate confidently and constructively with faculty advisors.

WSAM 605. Arid Land Water Resources
3 Credits (2+2P)

The course will cover various issues of relevance to water resources and water supply management within the Southwest US and other semiarid and arid regions. Discussions may include development and sustainability, climate change and drought, socioeconomic and cultural, and transboundary issues. May be repeated up to 3 credits. Crosslisted with: ENVS 605.

WSAM 610. Water and Sustainable Economic Development
3 Credits (3)

For graduate students in the Water Science and Management or other research degree programs, use the water economics literature as a model for student research leading to an M.S. thesis or Ph.D. dissertation.

WSAM 700. Doctoral Dissertation
1-15 Credits (1-15)

Dissertation for Water Sciences and Management Majors May be repeated up to 88 credits. Restricted to: Water Sciences and Management majors. Thesis/Dissertation Grading.

Office Location: Stucky Hall Room 111

Phone: (575) 646-4198

Email: wsm@nmsu.edu

Website: http://wsm.nmsu.edu (https://wsm.nmsu.edu/)

Coordinating Institute

- New Mexico Water Resources Research Institute, (575) 646-4337

Sponsoring Departments

- *Agricultural Economics and Agricultural Business*, (575) 646-3215, https://aeab.nmsu.edu/
- *Animal and Range Sciences*, (575) 646-2514, https://anrs.nmsu.edu
- *Civil Engineering,* (575) 646-3801, http://ce.nmsu.edu
- *Geography,* (575) 646-3509, http://geography.nmsu.edu
- *Plant and Environmental Sciences*, (575) 646-3405, http://aces.nmsu.edu/academics/pes (http://aces.nmsu.edu/academics/pes/)

College of Arts and Sciences

Dean - *Enrico Pontelli*

Associate Dean (Research) - *Michèle Shuster*

Associate Dean (Academics) - *Joseph Lakey*

Executive Administrative Assistant - *Marissa Holguin*

Business Manager - *Lucille Casas*

Undergraduate programs offered in the College of Arts and Sciences prepare students for a variety of career opportunities and for graduate study. The broad curriculum offered provides both the motivation and the tools for lifelong learning experiences.

While the ultimate responsibility for planning an academic program in compliance with university, college and departmental requirements rests with the student, the college recognizes the importance of helping students navigate appropriate academic programs.

Students should consult the "Academic Regulations (p. 31)" section of the catalog regarding general limitations for total credit hours, independent study and registration under S/U option, registration deadlines, and conditions required to make academic progress and maintain good academic standing. Students may not revise or do additional course work after the semester has ended in order to raise a grade in any course. Exceptions will be made for students completing an official Incomplete grade.

College Undergraduate Degree Requirements

1. In accordance with NMSU policy, students in all majors in the College of Arts and Sciences must meet the Basic Academic Skills requirements in English and Mathematics prior to enrolling in upper division courses numbered 300 or higher. See "Basic Academic Skills (p. 31)" under Performance/Progress in the NMSU System Academic Regulations & Policies section.
2. University graduation requirements. See “Graduation/Commencement (p. 31)” in the Regulations & Policies section. In order to graduate, undergraduate students must have met all degree requirements for their program, earned a minimum of 120 university level credits, or more if required for the degree, of which at least 48 must be upper division (except for the Bachelor of Applied Studies, which requires 36 upper division credits) and must have a cumulative GPA of 2.0 in all courses taken at NMSU. Each student must complete at least 30 of the necessary credits for their Bachelor Degree at NMSU. A minimum of "C-" in all courses counting toward the major, supplemental major and minor is required of all students.

S/U Grading Option for Undergraduate Students

Instructors may establish individual standards for an S grade, but the minimum standard for an S grade in the College of Arts and Sciences courses is a C-.

Developmental and Applied Credit Limitations for Undergraduate Students

The College of Arts and Sciences will accept all applied coursework, which includes Occupational Education courses, BOT, FDMA, FYEX (not including FYEX 1112 The Freshman Year Experience and UNIV 350 Peer Education), ARTS/ARTH (applied), DANC (applied), MUSC (applied and participation), THEA (applied), NURS, A EN, AXED, and AEEC. These courses count towards overall credit hours to bring the student's total to the minimum credit hours required. Students must still complete all university requirements: General Education; Viewing a Wider World; the required number of upper division credits, as well as all requirements for their declared major degree. Students should contact their Arts and Sciences Student Records Specialist regarding the acceptability of specific courses.

Independent Study/Directed Reading Courses for Undergraduate Students

Students are limited to six credits in any independent study course. Independent study courses include directed reading and special topic courses, which do not carry a subtitle.

Majors, Minors and Supplementary Majors for Undergraduate Students

Except for the Bachelor of Applied Studies and Bachelor of Individualized Studies, students who wish to obtain a bachelor’s degree must select a major field or fields. For a listing of majors, the student should refer to the list of majors in this catalog. Course requirements for majors are listed under individual departments. Students should consult the department with any questions about requirements. Until a major is selected, the student is designated as undeclared.

Each major consists of not less than 24 credits in the major field, of which 18 or more must be in upper-division courses (300 and above). Some departments also require specific courses outside the major field. Please refer to the departmental section of the catalog for specific nondepartmental requirements. Students must earn a grade of C- or better for all course requirements indicated for each major, minor, or supplementary major, including any nondepartmental courses required. Students may not count an S grade towards completion of any major, minor or supplementary major requirement unless a course is automatically S/U for all enrolled students. A student may not earn a minor that bears the same name as a bachelor’s degree that the student is earning. (For example, a student earning a B.S. in Biology cannot also earn a minor in Biology.) It is imperative that students consult

the departmental sections of this catalog and the department(s) for advice in planning to fulfill requirements for their declared majors. The requirements for academic minors in the College of Arts and Sciences are found under each offering department or program section of this catalog.

Supplementary Majors

Requirements for supplementary majors are found as follows:

- the Supplementary Majors in Chicano Studies, Latin American Studies, and Linguistics (p. 806) are listed under Languages and Linguistics (p. 806);
- the Supplementary Major in Law and Society (p. 948) is listed under Political Science, Public Law and Administration (p. 936); and
- the Supplementary Major in Applied Mathematics (p. 840) is listed under Mathematical Sciences (p. 840).

Most students have considerable latitude in choosing elective courses. These are the courses beyond university and major requirements that a student must take to bring her or his total credits to the minimum overall credits required for the degree. This latitude provides students with opportunities to major in more than one field, to take a minor or to devise interdisciplinary programs tailored to individual interests or future career needs.

Regardless of the option elected, students should consult regularly with an advisor and track their progress towards degree completion and graduation using the online degree audit system STAR (Student Academic Requirements), at: http://www.myNMSU.edu (https://my.nmsu.edu).

Preprofessional Studies

NMSU offers a number of programs designed for transfer to professional schools through its undergraduate colleges. Several programs in the College of Arts and Sciences provide preparation for Law and Health professions.

- Pre-Health Professions advising is coordinated by the Center for Academic Advising and Student Support (CAASS).
- Pre-Law advising is coordinated by the Department of Government. Students interested in attending law school must first obtain a bachelor's degree but that degree can be in any subject. Many pre-law students take some law courses in their undergraduate program; law related courses are taught in government, philosophy, criminal justice and other departments. The Department of Government coordinates the interdisciplinary Supplementary Major in Law and Society. See the NMSU Department of Government webpage. The Department of Philosophy offers both a major and a minor in Justice, Political Philosophy, and Law. See the NMSU Department of Philosophy webpage.

Bachelor of Applied/Individualized Studies

The Interdisciplinary Studies Department extends New Mexico State University's reach beyond traditional academic programs to provide educational opportunities for students to meet their academic, professional, and personal learning goals. The Interdisciplinary Studies Department offers flexible degree programs in the **Bachelor of Applied Studies (BAS)** and the **Bachelor of Individualized Studies (BIS)**, giving students the opportunity to work with an advisor to develop their own interdisciplinary program, appropriate to their unique educational and career goals.

The Bachelor of Applied Studies is a program designed for those students who have procured an Associates of Applied Studies (AAS) at a community or two-year college. This major allows students to transfer credits and build from their Associates degree toward a university-level degree. The BAS degree helps minimize credits for associate degree graduates when pursuing a baccalaureate degree at NMSU by requiring a fewer number of upper-division credits: requiring 36 as opposed to the 48 upper-division courses required of other majors. The aim is to equip students to build from their applied backgrounds and knowledge to shift careers or to advance in their chosen career.

The Bachelor of Individualized Studies is a flexible degree program serving multiple needs. It can be designed to serve students desiring an academic program not offered at NMSU under a designated major, particularly students with broad or diverse academic and career interests. It can also allow students to complete a college degree when an initial major does not fit as well as planned. Its flexibility in accepting course credits also serves as a completion program for students who left college and now want to return to earn a Bachelor degree. A well-designed interdisciplinary curriculum emphasizes the value of approaching complex issues from multiple perspectives, equipping students with the requisite critical and analytical skills to become effective problem solvers in a chosen career.

Minors Recommended for BAS & BIS Majors

Students seeking a **Bachelor of Applied Studies** or the **Bachelor of Individualized Studies** degree are encouraged to complete one or more minors offered through various NMSU colleges. A minor is designated on a transcript and consists of a minimum of 18 credits, nine of which must be upper-division. Courses required to complete a minor may be in a single department or interdepartmental, are offered through various NMSU colleges, and are subject to availability. Students seeking to complete a minor must have the minor verified, prior to graduation, by the college academic department administering the minor. Specific requirements are listed in the college departmental listings of this catalog. ***Note: The NMSU College of Business allows a maximum of 30 business credit hours (excluding MATH 1350G) to count towards the BAS or BIS degrees. Also, the only College of Business minor allowed for these degrees is the Business Administration Minor.***

Bachelors Degrees

A

- Animation and Visual Effects (2D Production Studio) - Bachelor of Creative Media (p. 687)
- Animation and Visual Effects (3D & VFX Production Studio) - Bachelor of Creative Media (p. 688)
- Anthropology (Culture & Language) - Bachelor of Arts (p. 522)
- Anthropology - Bachelor of Arts (p. 519)
- Applied Studies - Bachelor of Applied Studies (p. 527)
- Applied Studies - Bachelor of Applied Studies (Online) (https://catalogs.nmsu.edu/global/nmsu-global/applied-studies-bas-online/)
- Art (Art History) - Bachelor of Arts (p. 542)
- Art (Museum Conservation) - Bachelor of Fine Arts (p. 545)
- Art (Studio Art) - Bachelor of Arts (p. 544)
- Art (Studio Art) - Bachelor of Fine Arts (p. 548)
- Artificial Intelligence - Bachelor of Science (p. 640)

B

- Biochemistry - Bachelor of Science (p. 595)
- Biology (Secondary Education) - Bachelor of Arts (p. 569)
- Biology - Bachelor of Arts (p. 571)
- Biology - Bachelor of Science (p. 573)

C

- Chemistry (Pre-Med) - Bachelor of Arts (p. 600)
- Chemistry (Secondary Education) - Bachelor of Arts (p. 603)
- Chemistry (Secondary Education) - Bachelor of Science (p. 607)
- Chemistry - Bachelor of Arts (p. 598)
- Chemistry - Bachelor of Science (p. 605)
- Communication Studies - Bachelor of Arts (p. 618)
- Communication Studies - Bachelor of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/communication-studies-ba-online/)
- Computer Science (Algorithm Theory) - Bachelor of Science (p. 647)
- Computer Science (Artificial Intelligence) - Bachelor of Science (p. 650)
- Computer Science (Big Data and Data Science) - Bachelor of Science (p. 652)
- Computer Science (Computer Networking) - Bachelor of Science (p. 655)
- Computer Science (Cybersecurity) - Bachelor of Science (p. 657)
- Computer Science (Human Computer Interaction) - Bachelor of Science (p. 660)
- Computer Science (Secondary Education) - Bachelor of Arts (p. 662)
- Computer Science (Software Development) - Bachelor of Science (p. 665)
- Computer Science - Bachelor of Arts (p. 642)
- Computer Science - Bachelor of Science (p. 644)
- Conservation Ecology - Bachelor in Conservation Ecology (p. 575)
- Criminal Justice - Bachelor of Criminal Justice (p. 701)
- Criminal Justice - Bachelor of Criminal Justice (Online) (https://catalogs.nmsu.edu/global/nmsu-global/criminal-justice-bcj-online/)
- Cybersecurity - Bachelor of Science (p. 667)

D

- Digital Film Making - Bachelor of Creative Media (p. 690)

E

- Economics - Bachelor of Arts (p. 709)
- English (Creative Writing) - Bachelor of Arts (p. 730)
- English (Literature, Language and Culture) - Bachelor of Arts (p. 734)
- English (Rhetoric, Digital Media and Professional Communication) - Bachelor of Arts (p. 736)
- English - Bachelor of Arts (p. 732)

G

- Gender and Sexuality Studies - Bachelor of Arts (p. 738)
- Gender and Sexuality Studies - Bachelor of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/gender-sexuality-studies-ba-online/)
- Genetics and Biotechnology - Bachelor of Science in Genetics (p. 577)
- Geography (Environmental Studies) - Bachelor of Science (p. 757)
- Geography (Geographic Information Science and Technology) - Bachelor of Science (p. 760)
- Geology (Earth and Environmental Sciences) - Bachelor of Science (p. 768)
- Geology (Earth Science Education) - Bachelor of Science (p. 771)
- Geology (Geological Sciences) - Bachelor of Science (p. 773)

H

- History - Bachelor of Arts (p. 790)

I

- Individualized Studies (Pre-Pharmacy) - Bachelor of Individualized Studies (p. 793)
- Individualized Studies - Bachelor of Individualized Studies (p. 792)
- Individualized Studies - Bachelor of Individualized Studies (Online) (https://catalogs.nmsu.edu/global/nmsu-global/individualized-studies-bis-online/)

J

- Journalism and Media Studies - Bachelor of Arts (p. 801)
- Justice, Political Philosophy, and Law - Bachelor of Arts (p. 914)

L

- Languages (French) - Bachelor of Arts (p. 826)
- Languages (German) - Bachelor of Arts (p. 828)
- Languages (Spanish) - Bachelor of Arts (p. 831)
- Linguistics - Bachelor of Arts (p. 833)

M

- Mathematics (Actuarial Science and Insurance) - Bachelor of Science (p. 857)
- Mathematics (Applied Mathematics) - Bachelor of Science (p. 859)
- Mathematics (Computational Mathematics) - Bachelor of Science (p. 861)
- Mathematics (Foundations) - Bachelor of Science (p. 863)
- Mathematics (General Mathematics) - Bachelor of Science (p. 864)
- Mathematics (Physics) - Bachelor of Science (p. 866)
- Mathematics (Probability and Statistics) - Bachelor of Science (p. 867)
- Mathematics (Secondary Mathematics Education) - Bachelor of Science (p. 869)
- Mathematics (Statistics for Data Science) - Bachelor of Science (Online) (https://catalogs.nmsu.edu/global/nmsu-global/mathematics-statistics-data-science-bs-online/)
- Microbiology - Bachelor of Science (p. 579)
- Music (Instrumental Performance) - Bachelor of Music (p. 901)

- Music (Piano Performance) - Bachelor of Music (p. 903)
- Music (Pre-Speech Language Pathology) - Bachelor of Arts (p. 898)
- Music (Theatre) - Bachelor of Arts (p. 899)
- Music (Vocal Performance) - Bachelor of Music (p. 905)
- Music - Bachelor of Arts (p. 896)
- Music Education (K12 Instrumental) - Bachelor of Music Education (p. 907)
- Music Education (K12 Vocal) - Bachelor of Music Education (p. 909)

P

- Philosophy - Bachelor of Arts (p. 915)
- Physics - Bachelor of Arts (p. 931)
- Physics - Bachelor of Science (p. 933)
- Political Science - Bachelor of Arts (p. 945)
- Psychology - Bachelor of Arts (p. 955)
- Psychology - Bachelor of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/psychology-ba-online/)

T

- Theatre Arts (Design/Technical/Management) - Bachelor of Arts (p. 965)
- Theatre Arts (Musical Theatre) - Bachelor of Arts (p. 966)
- Theatre Arts - Bachelor of Arts (p. 963)

Masters Degrees

A

- Anthropology - Master of Arts (p. 106)
- Art - Master of Arts (p. 108)
- Astronomy - Master of Science (p. 109)

B

- Bioinformatics - Master of Science (p. 112)
- Biology - Master of Science (p. 114)

C

- Chemistry - Master of Science (p. 127)
- Communication Studies (Analysis and Decision-Making) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/communication-studies-analysis-decision-making-ma-online/)
- Communication Studies (Leadership Communication) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/communication-studies-leadership-communication-ma-online/)
- Communication Studies - Master of Arts (p. 134)
- Computer Science - Master of Science (p. 137)
- Creative Writing - Master of Fine Arts (p. 139)
- Criminal Justice - Master of Criminal Justice (p. 141)
- Criminal Justice - Master of Criminal Justice (Online) (https://catalogs.nmsu.edu/global/nmsu-global/criminal-justice-mcj-online/)

D

- Data Analytics (Digital Agriculture) - Master of Data Analytics (Online) (https://catalogs.nmsu.edu/global/nmsu-global/data-analytics-digital-agriculture-mda-online/)
- Data Analytics - Master of Data Analytics (p. 143)
- Data Analytics - Master of Data Analytics (Online) (https://catalogs.nmsu.edu/global/nmsu-global/data-analytics-mda-online/)

E

- English (Technical and Professional Communication) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/english-technical-professional-communication-ma-online/)
- English - Master of Arts (p. 156)
- Experimental Psychology - Master of Arts (p. 159)

F

- Fine Arts - Master of Fine Arts (p. 162)

G

- Geographic Information Science and Technology - Master of Science (Online) (https://catalogs.nmsu.edu/global/nmsu-global/geographic-information-science-technology-ms-online/)
- Geography - Master of Applied Geography (p. 163)
- Geology - Master of Science (p. 166)

H

- History (Public History) - Master of Arts (p. 167)
- History - Master of Arts (p. 166)

M

- Mathematics - Master of Science (p. 172)
- Molecular Biology - Master of Science (p. 175)
- MPA-MCJ Program - Dual Degree (p. 176)
- Music (Collaborative Piano) - Master of Music (p. 176)
- Music (Conducting) - Master of Music (p. 177)
- Music (Music Education) - Master of Music (p. 177)
- Music (Music Education) - Master of Music (Online) (https://catalogs.nmsu.edu/global/nmsu-global/music-music-education-mm-online/)
- Music (Performance) - Master of Music (p. 178)

P

- Physics - Master of Science (p. 179)
- Political Science - Master of Arts (p. 180)
- Public Administration - Master of Public Administration (p. 181)
- Public History and Public Administration - Dual M.A. Degree (p. 185)

S

- Spanish - Master of Arts (p. 191)
- Spanish - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/spanish-ma-online/)

Doctoral Degrees

A

- Astronomy - Doctor of Philosophy (p. 204)

B

- Biology - Doctor of Philosophy (p. 208)

C

- Chemistry (Biochemistry) - Doctor of Philosophy (p. 210)
- Chemistry - Doctor of Philosophy (p. 210)
- Computer Science - Doctor of Philosophy (p. 210)

E

- Experimental Psychology - Doctor of Philosophy (p. 225)

G

- Geography - Doctor of Philosophy (p. 226)

M

- Mathematics - Doctor of Philosophy (p. 230)
- Molecular Biology - Doctor of Philosophy (p. 231)

P

- Physics - Doctor of Philosophy (p. 233)

R

- Rhetoric and Professional Communication - Doctor of Philosophy (p. 234)

T

- Transborder and Global Human Dynamics - Doctor of Philosophy (p. 236)

Supplemental Majors

- Applied Mathematics - Supplemental Major (p. 871)
- Chicano Studies - Supplemental Major (p. 839)
- Latin American Studies - Supplemental Major (p. 838)
- Law and Society - Supplemental Major (p. 948)
- Law and Society - Undergraduate Supplemental Major (p. 705)
- Linguistics - Supplemental Major (p. 839)

Graduate Certificates

- Collaborative Piano - Graduate Certificate (p. 246)
- Cultural Resource Management - Graduate Certificate (p. 246)
- Museum Studies - Graduate Certificate (p. 248)
- Music Pedagogy and Performance - Graduate Certificate (p. 249)
- Music Performance - Graduate Certificate (p. 249)
- Teaching Spanish for Heritage Language Learners - Graduate Certificate (p. 253)

Undergraduate Minors

- Aerospace Studies - Undergraduate Minor (p. 501)
- Algorithm Theory - Undergraduate Minor (p. 669)
- American Government and Politics - Undergraduate Minor (p. 947)
- Animation and Visual Effects - Undergraduate Minor (p. 691)
- Anthropology - Undergraduate Minor (p. 525)
- Archaeology - Undergraduate Minor (p. 525)
- Art - Undergraduate Minor (p. 549)
- Art History - Undergraduate Minor (p. 549)
- Astronomy - Undergraduate Minor (p. 555)
- Biochemistry - Undergraduate Minor (p. 609)
- Bioinformatics - Undergraduate Minor (p. 669)
- Biology - Undergraduate Minor (p. 581)
- Chemistry - Undergraduate Minor (p. 609)
- Communication Studies - Undergraduate Minor (p. 620)
- Comparative Politics - Undergraduate Minor (p. 947)
- Computer Systems - Undergraduate Minor (p. 669)
- Conservation Ecology - Undergraduate Minor (p. 582)
- Creative Writing - Undergraduate Minor (p. 692)
- Digital Film Making - Undergraduate Minor (p. 692)
- East Asian Studies - Undergraduate Minor (p. 836)
- Economics - Undergraduate Minor (p. 711)
- English - Undergraduate Minor (p. 740)
- Ethics - Undergraduate Minor (p. 917)
- Forensic Science - Undergraduate Minor (p. 704)
- French - Undergraduate Minor (p. 836)
- Gender & Sexuality Studies - Undergraduate Minor (p. 740)
- Genetics and Biotechnology - Undergraduate Minor (p. 582)
- Geographic Information Science and Technology - Undergraduate Minor (p. 763)
- Geography - Undergraduate Minor (p. 763)
- Geology - Undergraduate Minor (p. 776)
- German - Undergraduate Minor (p. 837)
- History - Undergraduate Minor (p. 792)
- Human Biology - Undergraduate Minor (p. 582)
- Human Rights - Undergraduate Minor (p. 705)
- International Relations - Undergraduate Minor (p. 947)
- International Studies - Undergraduate Minor (p. 837)
- Journalism and Media Studies - Undergraduate Minor (p. 805)
- Justice, Poltical Philosophy, and Law - Undergraduate Minor (p. 917)
- Linguistics - Undergraduate Minor (p. 837)
- Literature - Undergraduate Minor (p. 741)
- Mathematics - Undergraduate Minor (p. 871)
- Medical Anthropology - Undergraduate Minor (p. 525)
- Medieval and Early Modern Studies - Undergraduate Minor (p. 741)
- Microbiology - Undergraduate Minor (p. 583)
- Military Science - Undergraduate Minor (p. 878)
- Molecular Biology- Undergraduate Minor (p. 880)
- Museum Conservation - Undergraduate Minor (p. 549)
- Music - Undergraduate Minor (p. 911)
- Philosophy - Undergraduate Minor (p. 918)
- Physics - Undergraduate Minor (p. 935)
- Political Science - Undergraduate Minor (p. 948)
- Political Theory - Undergraduate Minor (p. 948)
- Psychology - Undergraduate Minor (p. 958)
- Public Administration - Undergraduate Minor (p. 948)
- Public Law - Undergraduate Minor (p. 948)

- Religious Studies - Undergraduate Minor (p. 526)
- Rhetoric and Professional Communication - Undergraduate Minor (p. 742)
- Social Media Management - Undergraduate Minor (p. 805)
- Software Development - Undergraduate Minor (p. 670)
- Spanish - Undergraduate Minor (p. 838)
- Sports Communication - Undergraduate Minor (p. 620)
- Strategic Communications - Undergraduate Minor (p. 805)
- Sustainability- Undergraduate Minor (p. 526)
- Theatre Arts - Undergraduate Minor (p. 968)

Graduate Minors

- Anthropology - Graduate Minor (p. 254)
- Archaeology - Graduate Minor (p. 254)
- Bioinformatics (with Computer Science) - Graduate Minor (p. 254)
- Communication Studies - Graduate Minor (p. 255)
- Computer Science - Graduate Minor (p. 255)
- Gender and Sexuality Studies - Graduate Minor (p. 256)
- Geographic Information Science and Technology - Graduate Minor (p. 257)
- History - Graduate Minor (p. 257)
- Mathematics - Graduate Minor (p. 259)
- Physics - Graduate Minor (p. 260)
- Psychology - Graduate Minor (p. 260)
- Security Studies - Graduate Minor (p. 261)

- In the College of Arts and Sciences, the Department of Chemistry and Biochemistry is accredited by the American Chemical Society.
- The Bachelor of Science in Computer Science and the Bachelor of Science in Physics are accredited by ABET.
- Music curricula in the Department of Music are accredited by the National Association of Schools of Music.
- The Master of Public Administration program in the Department of Government is accredited by the National Association of Schools of Public Affairs and Administration.

Aerospace Studies

Undergraduate Program Information

Air Force Reserve Officer Training Corps (AFROTC) is a nationwide program that allows students to pursue commissions (become officers) in the United States Air Force (USAF) while simultaneously attending college. AFROTC classes are held on college campuses throughout the United States and Puerto Rico; students can register through normal course registration processes. AFROTC consists of four years of Aerospace Studies classes (Heritage and Values of the United States Air Force, Team and Leadership Fundamentals, Leading People and Effective Communication, and National Security Affairs/Preparation for Active Duty), and a corresponding Leadership Laboratory for each year (where students apply leadership, demonstrate command and effective communication, develop physical fitness, and practice military customs and courtesies). College students enrolled in the AFROTC program (known as "cadets") who successfully complete both AFROTC training and college degree requirements will graduate and simultaneously commission as Second Lieutenants in the Active Duty Air Force.

Freshman and Sophomore Years (General Military Course or GMC)

This group provides a general background knowledge of the military establishment with emphasis on the Air Force. GMC courses may be taken out of sequence.

Prefix	Title	Credits
AERO 121 & AERO 122	Heritage and Values and Heritage and Values II	4
AERO 221	Team and Leadership Fundamentals	2
AERO 222	Team and Leadership Fundamentals II	2
Total Credits		**8**

Junior and Senior Years (Professional Officer Course or POC)

This group constitutes an in-depth study of topics that provides a broad preparation for a career as an Air Force officer. Students must have certain qualifications for entry and have a desire to be commissioned in the Air Force. These qualifications include, achieving a passing score on the Air Force Officer's Qualifying Test, passing a physical fitness test, and successfully completing a medical exam. They must also complete a four- or five-week summer orientation course.

Students may, with departmental approval, take POC courses out of normal sequence. However, compressed or dual enrollment in upper-division POC courses is normally prohibited. Through this department, you can also earn a minor in Aerospace Studies.

Prefix	Title	Credits
AERO 301	Leading People and Effective Communication	4
AERO 302	Leading People and Effective Communication II	4
AERO 401	National Security, Leadership Responsibilities and Commissioning Preparation	4
AERO 402	National Security, Leadership Responsibilities and Commissioning Preparation II	4
Total Credits		**16**

Leadership Laboratory

This is an integral and mandatory portion of the Aerospace Studies curriculum. Within the framework of the cadet wing, it provides a progression of experiences designed to develop each student's leadership potential and serves as an orientation to military life.

Minors for the Department

- Aerospace Studies - Undergraduate Minor (p. 501)

Lieutenant Colonel Adam B. Wieser, Department Head

Assistant Professors and Staff: Lt Col Xavier Flores; MSgt Crystal Brown; SSgt Mariah Rodriguez; Mr. Jason Smith and **Event Planner Senior,** Ms. Patti Alarcon

Aerospace Studies Courses

AERO 121. Heritage and Values
2 Credits (1.25+2P)
"Heritage and Values of the United States Air Force," is a survey course designed to introduce students to the United States Air Force and provides an overview of the basic characteristics, missions, and

organization of the Air Force. Includes Leadership Lab practicum. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

AERO 122. Heritage and Values II
2 Credits (1.25+2P)
"Heritage and Values of the United States Air Force," is a survey course designed to introduce students to the United States Air Force and provides an overview of the basic characteristics, and organization of the Air Force. Includes Leadership Lab practicum. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

AERO 221. Team and Leadership Fundamentals
2 Credits (1.25+2P)
"Teams and Leadership Fundamentals," focuses on laying the foundation for teams and leadership. The topics include skills that allow cadets to improve their leadership on a personal level and within a team. The courses will prepare cadets for their field training experience where they will be able to put the concepts learned into practice. The purpose is to instill a leadership mindset and to motivate sophomore students to transition from AFROTC cadet to AFROTC officer candidate. Includes Leadership Lab practicum. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

AERO 222. Team and Leadership Fundamentals II
2 Credits (1.25+2P)
"Team and Leadership Fundamentals," focuses on laying the foundation for teams and leadership. The topics include skills that will allow cadets to improve their leadership on a personal level and within a team. The courses will prepare cadets for their field training experience where they will be able to put the concepts learned into practice. The purpose is to instill a leadership mindset and to motivate sophomore students to transition from AFROTC cadet to AFROTC officer candidate. Includes Leadership Lab practicum. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

AERO 223. Air Force Leadership Development
1 Credit (2P)
This course prepares cadets to excel in field training. Cadets are prepared in all facets of field training, including: leadership competency evaluations, the Cadet's Guide to Field Training, individual drill evaluations, attention to detail, dining hall procedures, maintenance of living areas, and the group problem solving process. Restricted to: Main campus only.

AERO 301. Leading People and Effective Communication
4 Credits (3+2P)
"Leading People and Effective Communication," teaches cadets advanced skills and knowledge in management and leadership. Special emphasis is placed on enhancing leadership skills and communication. Cadets have an opportunity to try out these leadership and management techniques in a supervised environment as juniors and seniors. Includes Leadership Lab practicum.
Prerequisite(s): Completion of AERO 121/AERO 122 and AERO 221/AERO 222, or permission of instructor.

AERO 302. Leading People and Effective Communication II
4 Credits (3+2P)
"Leading People and Effective Communication," teaches cadets advanced skills and knowledge in management and leadership. Special emphasis is placed on enhancing leadership skills and communication. Cadets have an opportunity to try out these leadership and management techniques in a supervised environment as juniors and seniors. Include Leadership Lab practicum.
Prerequisite(s): Completion of AERO 121/AERO 122 and AERO 221/AERO 222, or permission of instructor.

AERO 401. National Security, Leadership Responsibilities and Commissioning Preparation
4 Credits (3+2P)
"National Security Affairs/Preparation for Active Duty," is designed for college seniors and gives them the foundation to understand their role as military officers in American society. It is an overview of the complex social and political issues facing the military profession and requires a measure of sophistication commensurate with the senior college level. The final semester provides information that will prepare the cadets for Active Duty. Includes Leadership Lab practicum.
Prerequisite(s): Completion of AERO 121/AERO 122, AERO 221/AERO 222, and AERO 301/AERO 302, or permission of instructor.

AERO 402. National Security, Leadership Responsibilities and Commissioning Preparation II
4 Credits (3+2P)
"National Security Affairs/Preparation for Active Duty," is designed for college seniors and gives them the foundation to understand their role as military officers in American society. It is an overview of the complex social and political issues facing the military profession and requires a measure of sophistication commensurate with the senior college level. The final semester provides information that will prepare the cadets for Active Duty. Includes Leadership Lab practicum.
Prerequisite(s): Completion of AERO 121/AERO 122, AERO 221/AERO 222, AERO 301/AERO 302, and AERO 401 or permission of instructor.

AERO 411. Aerospace Studies Independent Study
1 Credit (1)
This course provides in-depth research on specified topics of the United States Air Force and NMSU's Detachment 505 history. Consent of instructor required.
Prerequisite(s): AERO 301, AERO 302, AERO 401, AERO 402.

Phone: (575) 646-2136
Website: http://airforcerotc.nmsu.edu

Aerospace Studies - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
AERO 301	Leading People and Effective Communication	4
AERO 302	Leading People and Effective Communication II	4
AERO 401	National Security, Leadership Responsibilities and Commissioning Preparation	4
AERO 402	National Security, Leadership Responsibilities and Commissioning Preparation II	4
Select two from the following, one must be Viewing the Wider World:		6
ECON 324V	Developing Nations	
ELAD 3110V	Introduction to Educational Leadership in a Global Society	
GEOG 361V	Challenges and Opportunities of Globalization	
GEOG 365V	The City	
MGMT 388V	Leadership and Ethics	
POLS 360	World Politics	
POLS 364	National Security	
POLS 367	Terrorism	
POLS 380V	Political Ideologies	
Total Credits		**22**

Anthropology

Anthropologists study the human species and our closest non-human relatives. We seek to understand the human condition in the past and present so that we can shape our future.

Undergraduate Program Information

Anthropology is the study of humankind, a multidisciplinary endeavor that crosses the usual divides between social sciences, natural sciences, and humanities. In order to tackle this complicated subject from different angles, the discipline of anthropology is often divided into different subfields, including:

- **Archaeology**, which uses the material evidence of archaeological sites and artifacts to reconstruct past societies and interpret their behaviors;
- **Biological anthropology**, which seeks to understand humankind from a biological perspective, including the study of human origins, primate relatives, and human biological diversity;
- **Cultural anthropology**, which describes and compares living human cultures in order to understand human cultural diversity;
- **Linguistic anthropology**, which studies different systems of human communication in order to understand how culture is shared and maintained; and
- **Medical anthropology**, which takes a holistic approach to understanding health, illness, disease, sickness, and healing.

The Department of Anthropology offers the following undergraduate degrees and minors. Click on each link to see a description of the major or minor program requirements.

Undergraduate students can earn a:

- Bachelor of Arts degree in **Anthropology (https://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/anthropology-bachelor-arts/)**
- Bachelor of Arts degree in **Anthropology (Culture & Language)**, which includes a concentration in culture and language studies
- Minor(s) in **Anthropology (https://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/anthropology-undergraduate-minor/)**, **Archaeology (https://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/archaeology-undergraduate-minor/)**, **Medical Anthropology**, **Religious Studies (https://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/religious-studies-undergraduate-minor/)**, and **Sustainability (https://catalogs.nmsu.edu/nmsu/arts-sciences/anthropology/sustainable-development-undergraduate-minor/)**

Please visit the **Anthropology Catalog (https://catalogs.nmsu.edu/nmsu/course-listings/anth/)** for descriptions of all courses offered by the department.

Anthropology Master's Accelerated Program (MAP)

The Anthropology MAP Program permits qualified **undergraduate students** to earn a maximum of 9 credits of graduate-level coursework and have these **credits count both for the BA in Anthropology and the Master's degree in Anthropology.** The Anthropology MAP program is a dual credit program, not a dual degree program.

Students accepted to the Anthropology MAP Program may apply 9 credits of qualified elective courses towards the graduate MA degree in Anthropology or towards an interdisciplinary graduate minor or graduate certificate in Anthropology, Archaeology, Food Studies, the Graduate Certificate in Cultural Resource Management, or the Graduate Certificate in Museum Studies.

The NMSU Graduate School has established general rules and processes for all MAP programs at NMSU. They have been adapted to meet the particular requirements of the Department of Anthropology and the requirements of Anthropology's graduate programs. For details about the NMSU Graduate School MAPS program, please see: https://gradschool.nmsu.edu/current-students/masters-accelerated-program.html.

For questions about the Anthropology MAP Program, please contact Lois Stanford (lstanfor@nmsu.edu).

Graduate Program Information

The Anthropology Master of Arts Program at NMSU provides students with the knowledge, skills, and practical experience they need to transform their interests into a rewarding career. Our program strengths include applied research, especially in the areas of cultural resource management, museum studies, environmental anthropology, food security, and health and wellness. We value our M.A. students, and work to develop strong advising and mentoring relationships. Many of our graduates go on to successful careers in the public or private sector, while some choose to pursue a Ph.D. after completing their master's degree at NMSU.

In addition to the Anthropology Master of Arts degree, our program also offers two Graduate Certificates and several graduate minors. Click on each of the links below to see descriptions of the program requirements.

Graduate students can earn a:

- Master of Arts in **Anthropology (p. 106)**
  - An undergraduate anthropology degree is not required for admission; however, students who lack the equivalent of core undergraduate anthropology courses may be required to take them during their first year of the master's program.
- Graduate Certificates in **Cultural Resource Management (p. 246)** (CRM) and **Museum Studies (p. 248)**
  - These graduate certificates are separate from the M.A. degree and require a separate application. Many of our M.A. students also earn graduate certificates.
- Graduate minors in **Anthropology (p. 254)**, **Archaeology (p. 254)**, and **Food Studies (p. 256)**
  - Graduate minors are available to students earning their master's or Ph.D. degrees in other programs at NMSU.

Please visit the **Anthropology Catalog (https://catalogs.nmsu.edu/nmsu/course-listings/anth/)** for descriptions of all of our anthropology courses.

If you have additional questions or would like to schedule a campus visit or virtual meeting, please contact the Department of Anthropology, Graduate Advisor, Kathryn Olszowy (kolszowy@nmsu.edu)

Degrees for the Department

Bachelor Degree(s)

- Anthropology (Culture & Language) - Bachelor of Arts (p. 522)
- Anthropology - Bachelor of Arts (p. 519)

Master Degree(s)

- Anthropology - Master of Arts (p. 106)

Anthropology Master's Accelerated Program (MAP)

The Anthropology MAP Program permits qualified **undergraduate students** to earn a maximum of 9 credits of graduate-level coursework and have these **credits count both for the BA in Anthropology and the Master's degree in Anthropology.** The Anthropology MAP program is a dual credit program, not a dual degree program.

Students accepted to the Anthropology MAP Program may apply 9 credits of qualified elective courses towards the graduate MA degree in Anthropology or towards an interdisciplinary graduate minor or graduate certificate in Native American Studies, Anthropology, Archaeology, the Graduate Certificate in Cultural Resource Management, or the Graduate Certificate in Museum Studies.

The NMSU Graduate School has established general rules and processes for all MAP programs at NMSU. They have been adapted to meet the particular requirements of the Department of Anthropology and the requirements of Anthropology's graduate programs. For details about the NMSU Graduate School MAPS program, please see Honors College: https://honors.nmsu.edu/for-students/masters-accelerated-program-map.html.

For questions about the Anthropology MAP Program, please contact Dr. Rani T. Alexander (raalexan@nmsu.edu).

Eligibility:

Undergraduate students may petition to participate in the Master's Accelerated Program (MAP) in the Department of Anthropology if they meet the following requirements:

- Undergraduate students must be juniors or seniors and have completed 60 credit hours of coursework towards an undergraduate degree.
- Preferred 3.5 GPA.
- Completion of two or more of the undergraduate core courses, Anth 301, Anth 315, Anth 355, and Anth 350 is strongly preferred.
- Undergraduate students must have an assigned faculty advisor within the Department of Anthropology and obtain appropriate signatures before being approved for MAPS by the NMSU Graduate School.
- Students must be advised by financial aid advisor and obtain appropriate signatures before being approved for MAP by the NMSU Graduate School.
- MAP students must meet with their advisor at least once per semester before registration.
- Students accepted into the Anthropology MAP program, must participate in the Online Developing New Scholars Program (DNSP), offered by the Graduate School.
- Students may not have previously earned a Bachelor's Degree.
- Students have removed any Incomplete grades or holds at the time that they request admission to a graduate-level class.
- Students may not attempt more than 3 credits of graduate coursework in one semester.
- Students must earn a grade of B or higher to have graduate credits count under the MAP program. Graduate courses completed with a B- or lower are not eligible for MAP credit.
- Qualified graduate level courses included in the Anthropology MAP program are limited to a discrete list of electives numbered 500 and above. Eligible MAP courses are chosen only with approval of the student's MAP advisor and consent of instructor.
- For full program details and questions, please contact the Anthropology Department:**Home Page (nmsu.edu) (https://anthropology.nmsu.edu/)**.

Minors for the Department

- Anthropology - Graduate Minor (p. 254)
- Anthropology - Undergraduate Minor (p. 525)
- Archaeology - Graduate Minor (p. 254)
- Archaeology - Undergraduate Minor (p. 525)
- Food Studies - Graduate Minor (p. 256)
- Medical Anthropology - Undergraduate Minor (p. 525)
- Religious Studies - Undergraduate Minor (p. 526)
- Sustainability- Undergraduate Minor (p. 526)

Graduate Certificates

- Cultural Resource Management - Graduate Certificate (p. 246)
- Museum Studies - Graduate Certificate (p. 248)

Professor, Lois Stanford, Department Head

Professors Stanford, Walker; ***Associate Professors*** Jenks, Olszowy; ***Assistant Professors*** Brause, Hart, Marks, Richards; ***University Museum Curator*** Para; ***Emeritus Professors***, Alexander, Chaiken, Conelly, Eber, O'Leary, Pepion, Staski, Trevathan.

L. Stanford, Department Head, Ph.D. (Florida)-food studies, food justice, qualitative methods, Mexico, U.S.-Mexico border; H. Brause, Ph.D. (New Mexico)- environmental anthropology, water, small farmers, U.S.-Mexico border; T. Hart, Ph.D. (Connecticut)-- paleoethnobotany, prehistoric agriculture, Mesoamerican archaeology; K. Jenks, Ph.D. (Arizona)--cultural resource management, historical archaeology, Southwestern archaeology; A. Marks, Ph.D. (Tulane)- medical anthropology, pharmaceuticals, reproductive justice, feminist discourses, Latin America; K. Olszowy, Ph.D. (Binghamton) - economic development and chronic disease risk, sex/gender-based disparities in obesity risk, mental and physical health outcomes associated with natural disasters, child growth and development, and the biology of poverty; H. Para, Ph.D. (U Wales Trinity St. David)-Museum studies, collections management, archaeology, Native American history; K. Richards, Ph.D. (Washington State)-Southwestern archaeology, ceramics, Fremont archaeology; W. Walker, Ph.D. (Arizona)– Southwestern archaeology, theory and field method in archaeology, ritual prehistory.

Anthropology Courses

ANTH 1115G. Introduction to Anthropology
3 Credits (3)
Anthropology is the systematic study of the humanity both past and present. The course introduces students to the four subfields of anthropology, which include archaeology, biological, linguistic and cultural anthropology. Students will learn about the concepts and methods that anthropologists use to study our species and gain a broader perspective on the human experience.
Learning Outcomes

1. Describe and summarize terms, approaches, and cultural and biological adaptations in the four subfields of anthropology.

2. Explain and analyze conceptual and ethical arguments in the four subfields of anthropology.
3. Effectively communicate content, perspectives, and ideas in four subfields of anthropology.
4. Critically evaluate sources, approaches, and arguments in the four subfields of anthropology.

ANTH 1135G. Introduction to Biological Anthropology
3 Credits (3)
This course provides a basic introduction to the broad field of biological anthropology. The research interests of biological anthropologists include the history and development of modern evolutionary biology, molecular and population genetics, modern primates, the primate and human fossil record, and modern human biological diversity.
Corequisite: ANTH 1135L.
Learning Outcomes
1. Summarize the basic principles of evolution and recognize how they apply to the human species.
2. Recognize the biological and behavioral continuity of humans with all life, and especially other modern primate species.
3. Identify ways in which the human species is biologically and behaviorally unique.
4. Summarize fossil evidence for human evolution.
5. Distinguish the major Paleolithic industries and outline the behavioral and cognitive changes indicated by the fossil and archeological evidence.
6. Critically evaluate popular accounts of human variation and human evolution.
7. Interpret modern human dilemmas (e.g., overpopulation, co-evolution of disease, and genetic engineering) from an evolutionary perspective.
8. Discuss in class and analyze in writing scholarly arguments concerning course concepts.

ANTH 1135L. Introduction to Biological Anthropology Lab
1 Credit (2P)
This laboratory course expand on the topics covered in lecture course and uses scientific methods and principles to examine evidence for the process of evolution, the nature of heredity, human evolutionary history and family tree relationships, primate ecology and behavior, and modern human diversity. Hands-on experience with fossil and skeletal material will be an important part of the learning process. Corequisite(s): ANTH 1135G
Learning Outcomes
1. Demonstrate an understanding of the scientific method.
2. Employ principles of Mendelian genetics to determine genotype and phenotype probabilities, and calculate gene, genotype, and phenotype frequencies using the Hardy-Weinberg Equilibrium formula.
3. Demonstrate an understanding of cell structure and functions.
4. Use common lab and anthropometric equipment such as a compound microscope and calipers.
5. Discuss primate evolution, and compare and contrast members of the Primate order in terms of structure, behavior, and phylogeny.
6. Classify hominid species based upon selected traits such as anatomical changes associated with bipedalism, changes in the size and structure of the brain, and the development of culture.
7. Locate and describe the major bones of the human skeleton, and identify characteristics of human skeletons or skulls such as gender, age, and ancestry.
8. Discuss current research in genome analysis of various hominid populations.

ANTH 1136. Introduction to Historic Preservation
3 Credits (3)
Introduction to historic preservation, its history, goals, methods, legal basis, and economic importance. Explores public role in decision-making. Community Colleges only.
Learning Outcomes
1. Understand why historic preservation is important;
2. be familiar with what is important to preserve;
3. know who among the general public, state, and federal governments is responsible for preserving the past;
4. Have gained experience in how we all preserve.

ANTH 1140G. Introduction to Cultural Anthropology
3 Credits (3)
This is an introductory course that provides an overview of cultural anthropology as a subfield within the broader discipline of anthropology and as a research approach within the social sciences more generally. The course presents core concepts and methods of cultural anthropology that are used to understand the ways in which human beings organize and experience their lives through distinctive cultural practices. More specifically, this course explores social and cultural differences and similarities around the world through a variety of topics such as: language and communication, economics, ways of making a living, marriage and family, kinship and descent, race, ethnicity, political organization, supernatural beliefs, sex and gender, and globalization. This course ultimately aims to present a broad range of perspectives and practices of various cultural groups from across the globe. May be repeated up to 3 credits.
Learning Outcomes
1. Introduce students to the basic concepts and research methods of cultural anthropology as one of the disciplines of social science, including fundamental concepts, such as culture and society, which form the pillars of the discipline (e.g., cultural relativism, cultural persistence and change, world-view and enculturation).
2. Comprehend the importance of studying cultural anthropology.
3. Demonstrate knowledge of the practice of anthropological research in the modern world that is increasingly multicultural, transnational and globally interconnected (e.g., globalization and modern world system).
4. Demonstrate an awareness of how students' own cultures shape their experiences and the way they see the world, as well as help them understand and interact with other cultures.
5. Understand how beliefs, values and assumptions are influenced by culture, biology, history, economic, and social structures.
6. Gain a sense of relationship with people possessing different experiences from their own.
7. Gain a deeper understanding and appreciation for cultural anthropology as a broad discipline through learning about its practices, and differentiating cultural anthropology from other disciplines that study people
8. Become more sensitive and engaged global citizens from culturally relative perspectives.

ANTH 1160G. World Archaeology
3 Credits (3)
This course is an exploration of human evolution and cultural development throughout the world. Students will be introduced to basic

anthropological methods and theories and will learn how anthropological research has contributed to our understanding of major themes in human prehistory, including human evolution, the origins of culture, migration and colonization, animal and plant domestication, and the rise and fall of civilizations.

Learning Outcomes

1. Describe and explain the major developments in human prehistory.
2. Identify and describe major archaeological cultures throughout the world.
3. Employ critical thinking skills in the evaluation of competing theories about the past.
4. Select and use relevant archaeological evidence to explain how prehistoric populations adapted to their natural and cultural environments.
5. Demonstrate competency in written communication.

ANTH 2140G. Indigenous Peoples of North America
3 Credits (3)

This course is a general survey of the history and ethnology of indigenous groups in North America. The course is designed to give students a comprehensive view of major issues pertaining to the indigenous cultures of North America, such as family structure, social organization, subsistence and contemporary economies, environmental adaptation, Indian-White relations, religious practices, and contemporary issues.

Learning Outcomes

1. Demonstrate familiarity with common elements pertaining to the languages and social organization of indigenous peoples in North America.
2. Recognize fundamental differences and similarities among traditional indigenous cultures.
3. Describe social relations of indigenous peoples in relationship to other ethnic groups.
4. Identify and analyze important ways that European societies and cultures and indigenous societies and cultures interacted from the time of Columbus to the present.
5. Evaluate the impacts of Euroamerican policies and programs on indigenous cultures.
6. Distinguish major social issues facing contemporary indigenous communities in North America.
7. Understand objectives and limitations of cross-cultural analysis in anthropology as they relate to the study of indigenous peoples in North America.
8. Demonstrate research and communication skills as they relate to the study of indigenous peoples in North America.

ANTH 2996. Special Topics in Anthropology
1-4 Credits

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits.

Learning Outcomes

1. Varies

ANTH 301. Cultural Anthropology
3 Credits (3)

The course will introduce students to the basic concepts and methods in cultural anthropology, focusing on the critical role of culture in traditional society and in the modern world. We apply the anthropological perspective to study the components of cultural systems, including language and meaning, ways of making a living, kinship, worldview, power and political systems, and socio-cultural inequalities, among others, across different cultures. By "unpacking" culture, we focus on how local knowledge is put to work in grappling with practical problems of everyday life. May be repeated up to 3 credits.

Learning Outcomes

1. Students will explain the core concepts in cultural anthropology, including the complexities, contradictions, dynamics, and implications.
2. Students will identify the important methods of fieldwork, linking theory to application.
3. Students will explain the critical components of cultural systems and how they operate, comparing and contrasting their different manifestations across different cultures. This identification should also address the complexities, dynamics, and implications.
4. Students will develop anthropological field skills in carrying out field projects, analyzing observed practices, symbols, and activities.
5. Students will identify and explain factors that explain cultural persistence and the relevance of culture in the modern world.

ANTH 305V. Contemporary Native Americans
3 Credits (3)

Introduction to contemporary native peoples and cultures of North America. Emphasis on sociocultural and socioeconomic history, sociocultural change and persistence, present day reservation life, and current social and economic goals.

Learning Outcomes

1. Identify the major challenges within American Indian communities.
2. Analyze the components and causes of contemporary issues in Indian country.
3. Understand and be able to define sovereignty and self-determination and the relationship of Native nations to the U.S. government.
4. Develop an awareness of the historical and continuing efforts of resistance, adaptation, and endurance of Native peoples.
5. Integrate learned concepts to address contemporary Native American issues.
6. Possess foundation knowledge as preparation for higher-level coursework in NATV.

ANTH 306V. Peoples of Latin America
3 Credits (3)

The course presents an overview of different cultures in Latin America, covering a range of topics including history, environment, race and ethnicity, religion, health, music, food, popular culture, globalization, and violence. Within this context, the perspective of cultural anthropology looks at the commonality of patterns shared across Latin America, at the same time that we examine the construction of cultural diversity, a diversity that has persisted into the modern era. We also examine how different Latin American peoples use culture, i.e., through their food, music, religion, and politics among other elements, as a way of shaping and conserving their ethnic identity. The class includes a mixture of lecture, discussion, films, music, and good food…

Learning Outcomes

1. Students will explain the major prehistoric Latin American civilizations and their role in shaping distinctive modern cultures today.
2. Students will identify the major ecological zones in Latin America and corresponding cultural adaptations and subsistence strategies.
3. Students will explain the critical role of economic and political history throughout the Colonial Period and Independence in shaping the patterns of cultural diversity, racial boundaries, and ethnic identities.

4. Students will explain the role of cultural practices (such as religion, music, popular culture, and foodways) in supporting indigenous and minority populations' efforts to retain distinct cultural identities.
5. Students will explain the global and historical connections between Latin American and the United States, in particular the role that Latin American culture, migration, and traditions have played in shaping our society's development.

ANTH 312. The Ancient Maya
3 Credits (3)
Archaeological evidence of culture change in the Maya civilizations of Mexico and Central America from 2000 BC to the Spanish Conquest.

ANTH 313V. Ancient Mexico
3 Credits (3)
We will explore the archaeology the Aztecs, Zapotecs, and the Maya of Mexico and Central America from 3000BC up to and including the Spanish invasion of 1519-1521. We will examine how the legacies of these great civilizations were erased from written sources and how Mesoamerican heritage can be preserved and reclaimed for descendant communities and the public using archaeological remains. We will address: (1). the origins of agriculture and traditional food systems in Mesoamerica; (2). the rise of cities and urban centers; (3). writing, religion, social inequality, and the circulation of commodities; (4). Political disintegration, fragmentation, and collapse; (5). the formation and expansion of the Aztec and Tarascan empires; and (6). the consequences of the Spanish invasion and colonialism.
Learning Outcomes
1. Take a position on theories that explain how, when, and why human lifeways changed in ancient Mesoamerica.
2. Select and integrate relevant archaeological evidence to argue for and against a theoretical position.
3. Analyze the significance of sites, structures, artifacts, and ecofacts within their archaeological contexts and explain their relevance for people today.
4. Evaluate how practices in research, conservation, and tourism to archaeological sites promote stewardship of non-renewable archaeological resources and intangible heritage.
5. Critique and reflect on designs for virtual public tours of archaeological sites in Mexico or Central America and suggest improvements to best practices for the preservation and public presentation of archaeological resources.

ANTH 315. Archaeological Method and Theory
3 Credits (3)
This course introduces you to the discipline of archaeology, situating this discipline within the wider field of anthropology. The first part of the course presents a brief history of the discipline, introduces some foundational concepts, and explains common field research methods. The second part of the class takes you through the process of identifying, classifying, and interpreting archaeological materials. The third and final part of the class introduces you to different research areas and types of professional work within archaeology.
Learning Outcomes
1. Identify major figures, sites, and trends in the history of archaeology.
2. Identify and describe common field and laboratory methods used in archaeology.
3. Construct and critically evaluate material culture typologies.
4. Explain and provide examples of different models of archaeological inference.
5. Describe and apply different theoretical approaches to the study of the human past.
6. Identify and describe significant areas of archaeological research and work.

ANTH 318. Historical Archaeology
3 Credits (3)
This survey course explores the development of historical archaeology, its methods and theory, and popular research themes within the discipline. Students will be introduced to the ways that archaeologists identify and analyze historical-period documents, oral histories, features, and artifacts, and how they use these data to deepen our understanding of the recent past. Crosslisted with: ANTH 518.
Learning Outcomes
1. Critically evaluate historical sources.
2. Identify and analyze common historical-period artifacts and features.
3. Utilize historical and archaeological evidence in research.
4. Demonstrate how historical archaeology can be used to draw attention to and highlight the contributions of diverse populations in history.
5. Demonstrate improved oral and written communication skills.

ANTH 320. Anthropological Linguistics
3 Credits (3)
The study of language and culture with particular emphasis on the cultural factors in the communication process.

ANTH 330V. Magic Witchcraft and Religion
3 Credits (3)
Provides an introduction to method and theory for the study of religion, ritual, and spiritual practice. Review and discussion of case studies drawn from around the globe to enhance understanding of the varied ways that people in diverse cultural systems construct and change their religious traditions to serve practical and meaningful ends.
Learning Outcomes
1. Define and identify examples of magic, science, witchcraft, and religion. Develop an understanding of the variation in cultural and behavioral practices associated with each.
2. Develop knowledge and critique early approaches and concepts in the anthropology of religion and its role in explanations of cultural change.
3. Develop knowledge of variation in religion as a cultural system and the experiences of liminality in rites of passage.
4. Identify the statuses and roles of various kinds of religious practitioners and their positionalities vis a vis dominant and resistant ideologies and structural inequality.
5. Develop critical thinking skills that speak to the relevance of different forms of religious thought and ritual practice in our daily lives.

ANTH 345. Introduction to Museology
3 Credits (3)
This course provides a broad introduction to the museum world. Through discussion of readings, examination of case-studies, and practical assignments, students will gain an understanding of the museum as an institution, as well as learn the challenges and responsibilities that museums and their staff encounter. Topics include the history of museums, contemporary debates surrounding the definition of museums, ethical and legal issues, and community connections. The course will cover various types of museums—including art, history, ethnographic, indigenous, and scientific—and discuss how these thematic orientations impact museum practice. Students will also explore common museum

processes such as collecting, cataloguing, conservation, exhibition, research, and education through practical exercises using the collections of the University Museum in Kent Hall, as well as through case studies of museums around the world.

Learning Outcomes

1. Describe the major conceptual and practical influences on museums today—including issues of historical development, ethics, missions, and thematic orientations.
2. Critically engage with diverse types of museums as cultural institutions, their practices, and the communities with whom they engage.
3. Implement skills relevant to the museum profession, such as collections management, condition reporting, exhibition and programming planning, and research.

ANTH 349. Museum Anthropology
3 Credits (3)

This course provides an introduction to the methodological and theoretical approaches of museum anthropology. Students will gain experience with all these aspects of museum anthropology in the course by engaging with critical scholarship, analyzing case studies, and practicing collections-based research methods utilizing the collections of the University Museum. Through assignments students will analyze objects in the museum's collections using techniques of close looking, drawing, photography, sequences of making, and external research using scholarly sources. Students will gain skills in primary and secondary research, the analysis of material culture, and the practicalities of navigating research in museums.

Learning Outcomes

1. Describe major theoretical approaches to museum anthropology, and how these have changed over time.
2. Critically engage with the intersections between museums as institutions and the practice of anthropology, including the politics of representation.
3. Implement methodological research skills as a student-scholar by conducting independent research based on museum collections.
4. Convert collections-based research into written and media works characteristic of scholar-facing and public-facing practice in museum anthropology, curatorship, and museum studies.

ANTH 350. Anthropological Theory
3 Credits (3)

This course introduces students to historical and contemporary theory in anthropology with a focus on understanding why theory matters in our discipline. Key questions the course explores include: How have anthropologists thought about the concept of culture in different ways throughout the history of anthropology? What is the relevance of anthropological theory, both inside and outside the discipline? What new and promising trajectories do we see in anthropological theory today? May be repeated up to 3 credits.

Learning Outcomes

1. Trace the history of anthropological theory. You will recognize major figures and schools of thought in anthropological theory and be able to articulate their contributions to the field.
2. Critically analyze anthropological concepts of culture. Throughout the course, you will hone analysis skills through discussing and critiquing various anthropological perspectives on the culture concept.
3. Apply anthropological theory to contemporary anthropological "problems". Throughout the course, you will reflect on the usefulness of anthropological theory to the field and beyond. You will be able to articulate the connections made through writing and class discussion.

ANTH 351. Museum Field Methods
3 Credits (3)

This course introduces students to the fundamental concepts behind the creation of museum exhibitions. Drawing from the extensive collection of the University Museum, students will gain hands-on experience with exhibition development, resulting in the creation of a temporary public exhibition housed in the Museum's gallery space. By turning the museum inside out, this course will be a unique, behind-the-scenes, practical experience. Through readings and discussion, we will also examine historic and contemporary interpretations of exhibitions and collections from the origins of museums in cabinets of curiosity and Wunderkammer, to the surge in modern virtual exhibitions since 2020. Students will engage in practical applications that will prepare them for future academic work in museums studies and/or future employment or volunteer work in museums.

Learning Outcomes

1. Explain the basic concepts and terminology used in designing museum exhibits.
2. Differentiate the kinds of exhibitions and their intended audiences and purposes.
3. Describe the history of museum exhibitions and their evolution over time.
4. Discuss the challenges faced in designing and executing exhibitions, particularly regarding museum collections.
5. Apply the fundamental principles and practices of collections management.
6. Synthesize the fundamental principles and practices of museum exhibition planning and design including the role of the curator.

ANTH 355. Biological Anthropology
3 Credits (3)

An introduction to the fundamentals of the scientific method and organic evolution specific to the study of human origins and contemporary biological variation. Non-human primate diversity and behavior are also considered.

Learning Outcomes

1. Increase scientific literacy.
2. Improve specific skill areas including: Critical thinking; Expository writing; Analytical reading; Oral presentation skills.
3. Establish foundational knowledge as a basis for further study in: Evolutionary theory; Human variation and adaptation; Primatology; Human origins and evolution.

ANTH 356. Forensic Anthropology
3 Credits (3)

Overview of the field of forensic anthropology. Topics covered include basic human osteology; skeletal examination and documentation; skeletal trauma; personal identification; forensic taphonomy and the process of decomposition; archaeology and scene processing; sex, age, stature, and ancestry estimation; and contemporary issues and limitations in the field of forensic anthropology.

Learning Outcomes

1. Learn about the scientific method and how to apply scientific findings to field work.
2. Learn about the history and applications of forensic anthropology.

3. Gain a practical understanding of the methods, applications, and limitations of forensic anthropology as relates to police and other investigations.
4. Learn to identify human bones and the process of building a biological profile of human remains.
5. Learn about decomposition and how forensic anthropologists process and interpret crime scenes.

ANTH 357V. Medical Anthropology
3 Credits (3)
This course introduces students to evolutionary, ecological, interpretive, political-economic, and applied anthropological perspectives on health, illness, and healing to address some of the major questions in the field. How do humans adapt to changing environments that bring with them new illnesses and diseases? How do anthropologists understand the multiple meanings of health and illness cross-culturally? How can anthropologists effectively study health inequalities? What can medical anthropological perspectives contribute to addressing the health issues that we face in our current global context?
Learning Outcomes
1. Explain medical anthropology to someone unfamiliar with the field. Meeting this goal requires that you are able to: Define medical anthropology; Define health, illness, sickness, disease, and healing; Explain basic research methods in medical anthropology; Identify the different perspectives within medical anthropology.
2. Evaluate health problems from medical anthropological perspectives. Meeting this goal requires that you are able to: Accomplish goal
3. Identify different medical anthropological perspectives in research and reporting on health problems; Identify what is missing (based on your knowledge of medical anthropological perspectives) in addition to what is present in research and reporting on health problems.
4. Apply medical anthropological perspectives to current health problems. Meeting this goal requires that you are able to: Accomplish goals 1 and 2; Develop deeper understanding of medical anthropological perspectives by formulating "in your own words" definitions of medical anthropological perspectives; Identify multiple facets of major health issues.

ANTH 360V. Food and Culture Around the World
3 Credits (3)
Study of the interaction between food and human culture from an anthropological perspective. Examines the traditional role of food in local economies, social relations, and identity around the world. Also examines the impact of globalization on traditional food systems and cultures.
Learning Outcomes
1. Explore the evolutionary influences on human diet, eating practices, and cuisines.
2. Describe and compare the variety of food-getting strategies and understand how these lay the foundations for cuisines.
3. Trace the interconnected globalscapes of the food system.
4. Describe and explain the role of cooking in reproducing culture, shaping cultural traditions, and constructing traditional cuisines.
5. Describe the role of recipes and cook books in cuisine and nation-building.
6. Describe the significance of commensality in social relations and construction of cultural identities.
7. Identify the changes in the US food industry and subsequent impacts on consumption, cultural preferences, and health.
8. Detail responses (local food systems, food sovereignty, and ethnic cuisines) to the globalized food system.

ANTH 362V. Environmental Anthropology
3 Credits (3)
This course examines environmental studies from an anthropological perspective. The class focuses on how cultural values mediate environmental management. The class covers topics such as environmental anthropology, large scale development, biodiversity conservation, sustainable development, indigenous groups, consumption, and globalization.
Learning Outcomes
1. Students will define and demonstrate the impact of cultural values on how humans interact with the environment in designated cultures around the world.
2. Students will identify and explain how different cultural perspectives can be used to address environmental problems in specific cultures.
3. Students will critically reflect on their own environmental values, demonstrate how these values are shaped by our own culture, and identify cultural practices that can address environmental challenges.

ANTH 375. Pottery Analysis in Archaeology
3 Credits (3)
This course introduces the basic concepts, methods, and approaches used in the analysis of archaeological pottery. The purpose of the course is first to provide hands-on experience with the full range of analytical techniques routinely applied to ceramic materials recovered from archaeological sites, but to also provide a contextual framework for the interpretation and evaluation of these data. Classes consist of brief introductory lectures, and seminar presentation and discussion of course readings. Lab meetings consist of exercises designed to provide you with practical experience working with the materials and measures covered in lectures and readings. Crosslisted with: ANTH 575.
Learning Outcomes
1. Students will learn the theory underlying pottery analysis as well as some of the methods used to identify and interpret pottery;
2. Students will learn to think about the organization of pottery technology from a behavioral rather than a purely typological framework;
3. Students will have the opportunity to develop and then evaluate a research question or problem statement within a chosen theoretical framework, as well as have the opportunity to evaluate that question or questions using both qualitative and quantitative analyses;
4. Students will gain the skills needed to assess pottery analysis reports and undertake pottery analyses for senior thesis, M.A. theses, and CRM contexts.

ANTH 376. Lithic Technology Organization
3 Credits (3)
Advanced seminars and laboratory exercises to learn and develop techniques and methods that will help us determine how to interpret behavioral and cultural information from lithic (stone tool) data.
Prerequisite(s): ANTH 315.

ANTH 378. Lab Methods in Archaeology
3 Credits (3)
Introduction to laboratory techniques used in the analysis of archaeological materials.
Learning Outcomes
1. Identify different categories and types of archaeological materials.
2. Employ common methods for analyzing material culture.

3. Explain how research design determines analytical methods and shapes interpretations.
4. Discuss our ethical obligation to preserve collections for future researchers, while recognizing the challenges involved in this endeavor.

ANTH 385. Internship in Anthropology
3-12 Credits (3-12)
Applied or field experience to gain professional expertise. Placements with public agencies, NGOs, or research organizations. Topical focus tailored to student's individual needs through consultation with instructor. May be repeated up to 12 credits.
Prerequisite: Junior status, consent of instructor and GPA 2.8 or better.
Learning Outcomes
1. Student will meet with faculty advisor to set up contract and internship contacts.
2. Student will meet with internship supervisor and in collaboration determine volunteer hours and internship objectives.
3. Student will establish internship contract with faculty advisor that outlines volunteer hours per week and work expectations.
4. Student will complete a weekly log of internship activities that will be submitted to faculty advisor.
5. Student will complete additional readings and meet with faculty advisor, as determined by faculty advisor.
6. Student will complete and submit an internship report, as determined in collaboration with faculty advisor.

ANTH 388. Archaeological Field School
2-6 Credits (2-6P)
Training in archaeological field methods, including excavation of archaeological sites, mapping, and data management and analysis.
Learning Outcomes
1. Map sites/site features using various methods.
2. Identify artifacts, ecofacts, and features in archaeological contexts.
3. Document sites, features, and/or excavation units using appropriate forms.
4. Conduct excavations using arbitrary or natural levels.
5. Process/analyze archaeological materials in field/laboratory settings.
6. Work collaboratively and productively with a team in a challenging field setting.
7. Record your daily field activities, observations, and preliminary interpretations in a field journal.

ANTH 389. Archaeological Mapping
3 Credits (3)
Techniques for mapping archaeological sites and recording spatial distributions of archaeological data using a variety of surveying equipment and computer mapping software. This course will take you through the process of creating a detailed archaeological site plan map and record the information on the NM Cultural Resource Information System (NMCRIS). You will learn how to set up and operate a theodolite and GPS devices (both optical and total station, GNSS receivers). You will record data sufficient to make 1. a feature map; 2. a topographic map; and 3. an artifact density map on our chosen site. You will learn how to calculate horizontal distances and elevations. You will learn about the capabilities and common sources of error in the use of the equipment. You will transform your raw data and draw several kinds of maps using Surfer software.
Learning Outcomes
1. Learn different methods and use of survey instrumentation to create maps of archaeological sites.
2. Learn how to record and process field data needed to create a. a feature map; b. a topographic map; and c. an artifact density map on our chosen site.
3. Learn to calculate horizontal distance and elevation.
4. Use common mapping software – ARCGIS and Surfer to draw your maps.
5. Learn about the capabilities and common sources of error in survey instrumentation.
6. Produce accurate information and site maps needed to complete NMCRIS LA forms.

ANTH 399. Professionalism & Practice in Anthropology
3 Credits (3)
This course serves as a capstone for Anthropology majors. It offers students a writing focused opportunity to hone professional anthropological skills including critical thinking and communication strategies. All communication takes a position; it makes an argument. Students will learn and practice these skills through writing, rewriting and then rewriting again a research paper, a curriculum vitae/resume, employment letters of inquiry, and graduate school letters of inquiry. Restricted to Anthropology Majors. May be repeated up to 3 credits.
Learning Outcomes
1. Learn and practice written communication these skills through writing, rewriting and then rewriting again a research paper,
2. Learn and practice professional verbal and visual communications through research presentations, job interviews and elevator speeches
3. Identify and use anthropologically informed ethical responsibilities that pervade written, verbal and visual communication skills (e.g., goals for use of information, use of accurate information, protection of sources of information, honest attribution of credit to sources of scholarly work, sensitivity to others cultural traditions);

ANTH 402. Contemporary Medical Anthropology
3 Credits (3)
Contemporary Medical Anthropology This advanced seminar in medical anthropology addresses contemporary issues in the field of medical anthropology through theoretical and ethnographic texts. Topics span a wide range of studies in medical anthropology and may include such issues as the social production of health and illness, medical pluralism, discourses of mental health, the practice of complementary and alternative medicine, health disparities, the political economy of infectious disease, race and biological variation in biomedicine, and implementing biocultural perspectives. Crosslisted with: ANTH 546.
Prerequisite(s): ANTH 301 or ANTH 355 or ANTH 357V or consent of instructor.
Learning Outcomes
1. Discuss current issues relevant to the study of medical anthropology.
2. Apply medical anthropological concepts and ideas to theoretical and practical health issues.
3. Acquire skills in the critical appraisal of ethnographic literature.

ANTH 414. Archaeology of Magic, Witchcraft, and Religion
3 Credits (3)
The class offers an in-depth introduction to the Archaeology of Religion focusing on the theoretical framework of artifact agency. The course begins with a discussion of the role of material culture in society and religion (artifact agency theory) and then moves through a series of case studies that highlight important themes in the archaeology of

religion. These themes include the Religion among the Earliest Paleolithic Cultures, Relationships between Houses and Temples, Sacrifice (Artifact, Animal and Human), New Religious Movements, and Witchcraft Persecution.

Learning Outcomes

1. Students will develop a stronger understanding of the role of religious material culture in anthropology and archaeology.
2. Students will develop strong research skills by applying that knowledge of material culture theory in a term paper that explores artifact agency in an ancient religion.
3. Students will develop strong communication skills through the preparation of a written term paper and class power point presentation of that research.

ANTH 415. Applied Anthropology
3 Credits (3)

Examines the intellectual roots of applied anthropology and early case studies of anthropologists working as administrators. Examines the ethical and methodological approaches that applied anthropologists employ. Examination of case studies that show role of applied anthropologists in improving human service delivery, cultural preservation, planning and implementing programs of participatory change, advocacy, and economic development. Taught with ANTH 515.

Learning Outcomes

1. Students will explain the application of anthropological knowledge, methods, and theoretical approaches to address social problems, issues, and structures.
2. Students will present an overview of the history of applied anthropology, identifying major events in the development of the discipline.
3. Students will explain the similarities and differences between applied anthropology, activist anthropology, and engaged anthropology.
4. Students will conduct research and identify internship opportunities in the applied area of their interests.
5. Students will conduct an interview with an applied anthropologist and document the experiences and training required to become an applied anthropologist.
6. Students will identify an applied professional area of their interest and write a reflective essay, delineating the education, training, and strategies required to attain this professional goal.

ANTH 431V. Nutritional Anthropology
3 Credits (3)

This course provides biological, ecological, and cross-cultural perspectives on human nutrition. Topics covered include human nutritional evolution, dietary adaptation, variation in human foodways and habits, relationships between diet and health, nutrition transitions, and methods for studying human diet and nutrition in field settings.

Learning Outcomes

1. Understand the ways in which biology, culture, and ecology shape human nutritional outcomes and dietary patterns.
2. Be able to identify methods best suited to answering questions about human diet and nutrition in field settings.
3. Be able to develop a research question and basic research strategy.

ANTH 433V. Sex, Gender and Culture
3 Credits (3)

This seminar course introduces students to the anthropological study of gender. We take an integrated approach to the subject, considering the ways that that different kinds of anthropological research, including archaeology, biological anthropology, ethnography, etc.,expand our understanding of the various ways gender is defined across space and time, how it is lived, and what it means to us and others. Students will review the historical context and development of this subject within the field, and will explore such topics as sex versus gender, embodiment and gendered performance, gender hierarchies, the politics of reproduction, and globalization. May be repeated up to 3 credits.

Learning Outcomes

1. Identify and evaluate different anthropological approaches to the study of gender
2. Develop and employ analytical and critical thinking skills
3. Demonstrate proficiency in oral and written communication
4. Integrate and synthesize knowledge of gender-related topics in a research paper

ANTH 435. Human Health and Biological Variation
3 Credits (3)

Overview of contemporary human biological variation and adaptability within a scientific evolutionary and biocultural framework. Special emphasis is placed on human adaptation to the environment and the sociocultural, epidemiological, and evolutionary factors that underlay contemporary issues in human health and disease. Crosslisted with: ANTH 535.

Learning Outcomes

1. Develop critical thinking skills and scientific literacy through discussion, reading, and writing exercises and evaluating scientific theories, data, and research methods.
2. Develop an understanding of evolutionary theory, and how human organic evolution shapes variation, adaptation, and health in contemporary human populations.
3. Learn how human evolutionary history has shaped the global distribution of contemporary human biological diversity.
4. Understand the scientific critique of the biological race concept, and how social inequality, particularly racism, can become embodied.
5. Understand the various ways that humans adapt to the environment on different timescales.
6. Study life course theory and how experiences during development impact health across the life course.
7. Develop specific transferable skills, including written communication, public speaking, and information gathering (research), and for graduate students, research questions development, hypothesis testing, basic data analysis/visualization in Excel.

ANTH 436. Evolutionary Medicine
3 Credits (3)

This course provides an overview of evolutionary medicine, a field that applies evolutionary theory to understanding variation in human biology and health and treating and preventing disease. Topics covered in the course include evolutionary perspectives on diet and nutrition, chronic disease, infectious disease, cancer, stress, mental health, reproductive health, women's health, and child growth and development.

Learning Outcomes

1. Understand the basic principles of evolutionary theory.
2. Understand how anthropologists and medical and public health professionals can apply evolutionary theory to understand human health and disease.
3. Understand both the promise and limits of evolution as an explanatory paradigm for variation in human health and disease.
4. Be able to apply principles of evolutionary medicine to development of a research proposal.

5. Develop collaborative and oral presentation skills through a group presentation.

ANTH 449. Directed Reading
1-6 Credits
Comprehensive reading on selected topics. May be repeated for a maximum of 6 credits.
Prerequisite(s): Upper division anthropology majors with consent of instructor.

ANTH 449 H. Directed Reading Honors
1-3 Credits
Same as ANTH 449. Additional work to be arranged. May be repeated for a maximum of 6 credits.

ANTH 456. Native American Intersections in Museums
3 Credits (3)
This course explores the changing relationships and complex intersections between Native people and museums. We will examine how museum practices of collection and exhibition influence ways in which knowledge is formed and presented, and interrogate the role of museums as crucial sites for discourse around issues of ownership, indigenous knowledge and representation. Case studies revealing shifting meanings of objects, curatorial challenges, the development of tribal museums and repatriation complexities will be used to critically engage with Native responses via art, criticism and legal action. Crosslisted with: ANTH 556.

ANTH 458. Gender and Reproduction
3 Credits (3)
This course examines biocultural variation in reproductive health and birth practices. Human reproductive events like childbirth, contraception, abortion, surrogacy, fertility treatment, and conception, are not only biological in nature, but are also shaped by cultural beliefs and social, medical, and political institutions. Through cross-cultural case studies, we will examine how reproductive experiences are impacted by health-related ideas and medical technologies, and by national and international population policies. We will explore how pregnancy, menstruation, birth, menopause, and fertility control provide sites for gender formation, the reproduction of social inequalities, and state regulation of national populations.
Prerequisite: ANTH 301 or ANTH 355 or ANTH 357V or consent of instructor.
Learning Outcomes
1. Identify the fundamental concepts, modes of analysis, and central questions of the anthropology of reproduction.
2. Gain proficiency in the use of critical thinking skills in their assessment of ethnographic writing.
3. Apply knowledge of peoples' reproductive practices, and gendered identities and sexual lifeways in a range of social contexts.
4. Articulate, in oral and written forms, the central issues in reproduction and culture.

ANTH 463. Cultural Resource Management I
3 Credits (3)
This course introduces you to the field of cultural resource management (CRM) and to the federal and state laws and regulations that govern most archaeology and historic preservation projects conducted today. Class lectures, readings, and written assignments will cover the major relevant US federal laws (NHPA, NEPA, ARPA, NAGPRA); New Mexico state cultural resource laws, regulations, and permitting practices; and major international heritage laws. Particular emphasis will be placed on understanding how to evaluate and nominate cultural resources for listing on the National Register of Historic Places (NRHP). Good oral and written communication skills are essential for success in CRM, so students will be provided with numerous opportunities to develop these skills in class.
Learning Outcomes
1. Explain the goals of cultural resource management (CRM)
2. Describe the major laws and regulations that govern CRM in the United States, in the state of New Mexico, and abroad
3. Identify some common challenges with implementing these laws and regulations
4. Determine the eligibility of cultural resources for listing on the NRHP, and justify this determination

ANTH 464. Curation Crisis in Archaeology
3 Credits (3)
This collection management course will introduce students to collections curation, collections care, and collections-based research. Archaeological collections stewardship begins before an archaeologist steps foot into the field and continues well after the recovered collections reach the repository. This course provides students with an understanding of the curation#"crisis"#using archaeological collections curated at the University Museum as a case study and the responsibilities that archaeologists have to the collections they generate.
Learning Outcomes
1. Learn about the maintenance of archaeological collections
2. Learn about the management of, access to, and use of archaeological collections
3. Learn about the curation crisis at a small museum (e.g., Kent Hall University Museum)
4. Learn about collections-based research
5. Learn about various ways of disseminating archaeological collections to the public
6. Change the perception of the "just digging and we will deal with the collections later" approach.

ANTH 465. Introduction to Paleoethnobotany
3 Credits (3)
Paleoethnobotany, the study of the human use of plants in antiquity, uses plant remains recovered from archaeological sites to address a broad range of topics. Paleoethnobotanical data can be used to investigate social, economic, and environmental issues including the shift from hunting and gathering to farming, adaptations to climate shift, the development of state-level societies, and social hierarchies to name a few topics. This course introduces the deposition, preservation, sampling, recovery, identification, description, and interpretation of paleoethnobotanical remains. This course is arranged around 1) exploring the major classes of plant remains likely to be encountered in archaeological sites; 2) identifying these remains and organizing the data to make interpretable results; and 3) addressing key issues within the sub-discipline including preservation, analytical methods, sampling, collection, and interpretation.
Prerequisite: ANTH 315 or ANTH 378.
Learning Outcomes
1. Learn about macro and micro botanical analysis of archaeological plant material.
2. Understand the problems and range of archaeological research using paleoethnobotanical data.
3. Gain knowledge of paleoethnobotanical analysis from sampling to interpretation.

4. Consider the broader applications of paleoethnobotanical interpretation, including economics, identity, foodways, politics, symbolism, and historical ecology.
5. Perform basic laboratory analysis.
6. Write a basic report for cultural resource management projects.

ANTH 467. Archaeology of the American Southwest
3 Credits (3)
Description and analysis of the archaeology of the American Southwest including paleo-environmental reconstruction, culture change, and relations with contemporary cultures.
Prerequisite: ANTH 315.
Learning Outcomes
1. Learn the culture history of the American Southwest from the Ice-Age through the Spanish Colonial Period.
2. Students will learn the advances in archaeological method and theory developed in the American Southwest such as Tree-ring dating, Pottery Seriation, Paleoindian Archaeology.
3. Students will develop a research interest in the region through a paper specializing in a theme and subregion e.g. Architectural change in the four corners during the 13th century, the adoption of corn in the Late archaic borderlands of southern New Mexico.

ANTH 468. Applied Medical Anthropology
3 Credits (3)
This course introduces students to applications of medical anthropological perspectives to health care, international development, public health, and health policy.
Learning Outcomes
1. Discuss the usefulness of anthropological perspectives in addressing health issues in a variety of interdisciplinary and professional settings.
2. Assess the health impact of public policy from anthropological perspective.

ANTH 471. Archaeology of Food
3 Credits (3)
Food pervades all aspects of people's lives, from the most basic task of acquiring and consuming food to the intricate social meanings and political roles that we give to food in different social settings. Food is a requirement for life, yet it is always transformed by social meanings in specific cultural contexts. We will look at the theoretical and methodological tools that archaeologists use to study food and foodways in ancient societies from a global anthropological perspective. Together, we will explore how studying food and ancient foodways tells us more than just the methods and techniques of food acquisition, preparation, consumption, and discard, but also gives us a window into economic, symbolic, historic, and political realities of past peoples. This course will focus on the social contexts in which specific food practices occur and the social and cultural meanings that are ascribed, created, and reproduced in those contexts. Topics include why humans share food, feasting, politics, and power; food and identity; cannibalism, transitions in food systems; culture contact and exchange.
Prerequisite: ANTH 1115G, ANTH 1135, ANTH 1140, or ANTH 1160.
Learning Outcomes
1. Understand basic cultural and archaeological food theory.
2. Understand the ways archaeologists recover food remains, how they are analyzed, and how they are interpreted within the broader archaeological context.
3. Identify different theoretical perspectives in archaeological reports.
4. Be able to lead classroom discussions on the day's readings.
5. Be able to identify how food, and our understanding of food history, influences our day-to-day lives.
6. Be able to research the history of a particular food and present the findings.

ANTH 474. Human Osteology
3 Credits (3)
A survey of the functional, developmental, and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. May be repeated up to 3 credits. Crosslisted with: BIOL 424.

ANTH 477. Zooarchaeology
3 Credits (3)
Detailed study and analysis of taphonomic processes affecting animal bone recovered from archaeological and paleontological contexts. May be repeated up to 3 credits.

ANTH 485. Special Research Project
1-3 Credits
Anthropological, archaeological, or museum field work or laboratory experience in academic, private, state, or federal agencies. Must spend 30 hours in a field, museum, or laboratory setting per credit hour earned. May be repeated up to 6 credits.
Prerequisite(s): Complete 12 ANTH credits and consent of instructor.

ANTH 486. Community Engagement and Service Learning
3 Credits (3)
Course combines classroom instruction with a local community service project. Formal instruction component will examine social science research findings and perspectives on a locally relevant social issue or problem. In the service learning component, students will be trained and work on a local community service project. Students will develop field experience and methodological skills in community engagement. Projects and social issues may vary for different semesters.
Learning Outcomes
1. Students will demonstrate background knowledge of the local community service project, through assigned readings and class discussions.
2. Students will work collaboratively in groups to identify local community issues and methods for engaging in community participatory research methods.
3. Students will attend local community or organization meetings and participate in interviews with community members.
4. Students will demonstrate their development of specific field skills, including participant observation, open-ended interviews, and survey techniques.
5. Students will contribute a section to the class report on the local community service project, as outlined in the class project guidelines.

ANTH 488. Advanced Archaeological Field School
2-6 Credits (2-6P)
Additional training in archaeological field methods for students with previous fieldwork experience. Consent of Instructor required.
Learning Outcomes
1. Map sites/site features using various methods.
2. Identify artifacts, ecofacts, and features in archaeological contexts.
3. Document sites, features, and/or excavation units using appropriate forms.
4. Conduct excavations using arbitrary or natural levels.
5. Process/analyze archaeological materials in field/laboratory settings.

6. Work collaboratively and productively with a team in a challenging field setting.
7. Record your daily field activities, observations, and preliminary interpretations in a field journal.

ANTH 497. Special Topics
1-6 Credits (1-6)
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.
Prerequisite(s): Junior or above standing.

ANTH 500. Seminar in Anthropological Theory
3 Credits (3)
Detailed focus on specific areas of anthropological theory. Course subtitled in the Schedule of Classes. Course may be repeated.
Prerequisite(s): graduate standing in Anthropology or consent of instructor.

ANTH 502. Fundamentals of Anthropology
1-4 Credits (1-4)
Review of fundamental knowledge and theories in biological, cultural, or linguistic anthropology or archaeology. May be repeated up to 4 credits.
Learning Outcomes
1. Student meets with graduate advisor to determine undergraduate deficiencies in anthropology.
2. Student contract is established to determine work required to meet undergraduate deficiencies.
3. Student completes work and learning objectives for the designated undergraduate core anthropology course.
4. Undergraduate course instructor of core anthropology class assigns student grade.

ANTH 503. Anthropological Theory
3 Credits (3)
This seminar is designed to introduce graduate students to the major concepts and developments in anthropological theory. Students will develop an understanding of the major principles, contributions, and limitations of anthropological theory from the 1890s to the present. The course will address theoretical developments in biological anthropology, sociocultural anthropology, archaeology, and public and applied anthropology.
Learning Outcomes
1. Articulate the history of theoretical developments in multiple anthropological subfields and explain the holistic connections among them.
2. Explain and critique the major theoretical formulations of the field, including: human biological evolution and variation; cultural relativism; practice theory; life history and formation processes of archaeological, paleontological, and contemporary sites and specimens; historical contingency in culture change and globalization; human ecology and environmental anthropology, past and present; indigenous perspectives, participatory action research, and collaborative research designs; identity and the intersections of gender, sex, race, class, and other categories, past and present; origins and contemporary variation of inequality and socioeconomic disparities; political economy, domination and resistance, past and present; the development and critique of diverse narratives of the past drawn from archaeological/material, visual and performative, documentary, and oral historical media; stewardship of tangible and intangible cultural heritage,
3. Read and practice in the norms of written and verbal expression across multiple theoretical domains in anthropology.

ANTH 505. Issues in Anthropological Practice
3 Credits (3)
This is a course in professional development in which students design their thesis/non-thesis research projects and write a first draft of their capstone research proposal. The purpose is to connect the MA thesis or non-thesis research project to your future career. Professionals in anthropology should demonstrate competency in research and writing by completing an M.A. thesis or qualification equivalent (e.g. internship report, research report, which increasingly include public scholarship and the development of creative digital media). Successful completion of an original research project demonstrates that a student can conduct applied and collaborative research, complete a scope of work according to standards and guidelines of the agency, institution, or organization, and evaluate the research and contributions of colleagues and peers. Anthropologists are all called to participate in the investigation, management, and evaluation of cultural resources (tangible and intangible), address the intersectionalities within organizations and institutions that differentially impact social groups, and work with individuals and communities to achieve shared objectives that enhance engagement.
Learning Outcomes
1. Students will develop and implement a research project in anthropology. We will focus on research design—from defining the research problem, funding, lit review, logistics of fieldwork, analysis, and write-up. Students will move from exploring a topic of interest to developing a proposal for investigation.
2. Students will develop professional skills, ethics, values, and attitudes necessary for developing and implementing a research project and for employment in the field. They will map out a pathway to a career in anthropology. We will examine anthropological practice in academic and applied contexts. We will consider expectations and qualifications needed for different work environments and degree programs. Students will work towards matching NMSU's MA curriculum to their professional goals. You should make the curriculum and university resources work for you.

ANTH 506. Advanced Studies in Physical Anthropology
1-3 Credits
Lectures, seminars, or laboratory research in selected topics. May be repeated for a maximum of 12 credits.
Prerequisite(s): graduate standing in Anthropology or consent of instructor.

ANTH 507. Advanced Studies in Archaeology
1-3 Credits
Lectures, seminars, field or laboratory research in selected topics. May be repeated for a maximum of 12 credits.
Prerequisite(s): graduate standing in Anthropology or consent of instructor.

ANTH 508. Advanced Studies in Cultural Anthropology
1-3 Credits
Lectures, seminars, or field research in selected topics. May be repeated for a maximum of 12 credits.
Prerequisite(s): graduate standing in Anthropology or consent of instructor.

ANTH 512. Quantitative Analytical Methods in Anthropology
3 Credits (3)
This class is an introduction to statistical analysis of anthropological and social science data. Students will learn how quantitative and statistical

techniques are used in the analysis of anthropological problems and how to evaluate statistical arguments in the literature. No previous background in statistics is required. We will consider data collection, sampling and statistical populations, exploratory summaries of data, and the importance of choosing appropriate statistical techniques. All course work will emphasize anthropological interpretation through applied statistical methods. The course has a four-field focus (archaeology, biological anthropology, cultural anthropology, and linguistics), and students will work with readings, examples, and problem assignments from each subfield.

Learning Outcomes

1. Articulate the difference between descriptive and inferential statistics.
2. Explain the difference between a population and a sample and learn how to draw random samples (various methods – simple random, stratified, systematic, etc.) in the field and using numerical data and statistical procedures within SAS or other STATPACKS (SPSS, R).
3. Use appropriate graphs, tables, and measures of central tendency and dispersion to display and summarize distributions of nominal, ordinal, interval and ratio level data.
4. Understand the Normal Distribution and the assumptions required for hypothesis testing.
5. Perform hypothesis testing and interpret the results for univariate, bivariate, and multivariate statistical procedures, including Chi Square, T-tests, Non-parametric Comparison tests, ANOVA, Correlation, Simple Linear Regression, Multiple Regression, Cluster and Discriminant Analysis (as time permits).
6. Develop an exploratory statistical analysis for original anthropological data and write a final paper interpreting the results.

ANTH 514. Advanced Archaeology of Magic, Witchcraft, and Religion
3 Credits (3)

The class offers an in-depth introduction to the Archaeology of Religion focusing on the theoretical framework of artifact agency. The course begins with a discussion of the role of material culture in society and religion (artifact agency theory) and then moves through a series of case studies that highlight important themes in the archaeology of religion. These themes include the Religion among the Earliest Paleolithic Cultures, Relationships between Houses and Temples, Sacrifice (Artifact, Animal and Human), New Religious Movements, and Witchcraft Persecution.

Learning Outcomes

1. Students will develop a stronger understanding of the role of religious material culture in anthropology and archaeology and be required to lead class discussions.
2. Students will develop strong research skills by applying that knowledge of material culture theory in a term paper that explores artifact agency in an ancient religion.
3. Students will develop strong communication skills through the preparation of a written term paper and class power point presentation of that research.

ANTH 515. Applied Anthropology
3 Credits (3)

Examines the intellectual roots of applied anthropology and early case studies of anthropologists working as administrators. Examines the ethical and methodological approaches that applied anthropologists employ. Examination of case studies that show the role of applied anthropologists in improving human service delivery, cultural preservation, planning and implementing programs of participatory change, advocacy, and economic development. Taught with ANTH 415.

Learning Outcomes

1. Students will explain the application of anthropological knowledge, methods and theoretical approaches to address social problems, issues, and structures.
2. Students will present an overview of the history of applied anthropology, identifying major events in the development of the discipline.
3. Students will explain the similarities and differences between applied anthropology, activist anthropology, and engaged anthropology.
4. Students will conduct research and identify internship opportunities in the applied are of their interests.
5. Students will conduct an interview with an applied anthropologist and document the experiences and training required to become an applied anthropologist.
6. Students will identify an applied professional area of their interests and write a reflective essay, delineating the education, training, and strategies required to attain this professional goal.

ANTH 516. Advanced Archaeology of the American Southwest
3 Credits (3)

Advanced topics in Southwestern archaeology including ritual architecture, environmental reconstruction, violence, site formation processes, and experiment and research.

Learning Outcomes

1. Students will have an advanced understanding of the changes in subsistence, social organization, and material culture in the American Southwest from the Ice Age through the Spanish Entrada.
2. Students will understand the history of archaeological method and theory as it played out in the archaeology of the American Southwest. They will recognize that theory determines they questions ask about the ancient peoples of the region.
3. Graduate students will write a term paper (professional technical and scientific writing) that contributes to their MA projects either directly as part of a specific thesis or as extension of their interest in a topic (e.g. , identity, domestication, ritual violence) or method (e.g., pottery sourcing, faunal analysis).

ANTH 517. Advanced Topics in Mesoamerican Archaeology
3 Credits (3)

Specific subjects in Mesoamerican archaeology to be announced in the Schedule of Classes. May be repeated for a maximum of 6 credits.
Prerequisite: graduate standing.

ANTH 518. Advanced Historical Archaeology
3 Credits (3)

This survey course explores the development of historical archaeology, its methods and theory, and popular research themes within the discipline. Students will be introduced to the ways that archaeologists identify and analyze historical-period documents, oral histories, features, and artifacts, and how they use these data to deepen our understanding of the recent past. Crosslisted with: ANTH 318.

Learning Outcomes

1. Critically evaluate historical sources.
2. Identify and analyze common historical-period artifacts and features.
3. Utilize historical and archaeological evidence in research.
4. Demonstrate how historical archaeology can be used to draw attention to and highlight the contributions of diverse populations in history.
5. Demonstrate improved oral and written communication skills.

ANTH 519. Advanced Topics in Prehistoric Archaeology
3 Credits (3)
Seminar on specialized research archaeology.
Prerequisite: graduate standing.

ANTH 520. Ethnographic Field Methods
3 Credits (3)
Basic methodologies used in conducting qualitative ethnographic research. Projects in participant observation, ethnographic interviews, life history interviews, folk taxonomy construction, and coding of field notes.
Learning Outcomes
1. Students will demonstrate knowledge of the different types of field methods used in ethnographic field work.
2. Students will complete a series of ethnographic field projects, including participant observation, ethnographic interviews, narrative interviews, and photo voice interviews.
3. Following the completion of each project, students will meet, discuss, and review their individual projects.
4. Students will present final project to class, outlining their specific methods and plans for their future research.

ANTH 522. Archaeological Field School
2-6 Credits (2-6P)
Graduate-level training in archaeological field methods, including excavation of archaeological sites, mapping, and data management and analysis. Consent of Instructor required.
Learning Outcomes
1. Map sites/site features using various methods.
2. Identify artifacts, ecofacts, and features in archaeological contexts.
3. Document sites, features, and/or excavation units using appropriate forms.
4. Conduct excavations using arbitrary or natural levels.
5. Process/analyze archaeological materials in field/laboratory settings.
6. Process archaeological materials safely so that they can be analyzed in a laboratory environment.
7. Record your daily field activities, observations, and preliminary interpretations in a field journal.

ANTH 523. Archaeological Mapping
3 Credits (3)
Techniques for mapping archaeological sites and recording spatial distributions of archaeological data using a variety of surveying equipment and computer mapping software. This course will take you through the process of creating a detailed archaeological site plan map and record the information on the NM Cultural Resource Information System (NMCRIS). You will learn how to set up and operate a theodolite and GPS devices (both optical and total station, GNSS receivers). You will record data sufficient to make 1. a feature map; 2. a topographic map; and 3. an artifact density map on our chosen site. You will learn how to calculate horizontal distances and elevations. You will learn about the capabilities and common sources of error in the use of the equipment. You will transform your raw data and draw several kinds of maps using Surfer software.
Learning Outcomes
1. Learn different methods and use of survey instrumentation to create maps of archaeological sites.
2. Learn how to record and process field data needed to create a. a feature map; b. a topographic map; and c. an artifact density map on our chosen site.
3. Learn to calculate horizontal distance and elevation.
4. Use common mapping software – ARCGIS and Surfer to draw your maps.
5. Learn about the capabilities and common sources of error in survey instrumentation.
6. Produce accurate information and site maps needed to complete NMCRIS LA forms.

ANTH 529. Advanced Evolutionary Medicine
3 Credits (3)
This course provides an overview of evolutionary medicine, a field that applies evolutionary theory to understanding variation in human biology and health and treating and preventing disease. Topics covered in the course include evolutionary perspectives on diet and nutrition, chronic disease, infectious disease, cancer, stress, mental health, reproductive health, women's health, and child growth and development.
Learning Outcomes
1. Understand the basic principles of evolutionary theory.
2. Understand how anthropologists and medical and public health professionals can apply evolutionary theory to understand human health and disease.
3. Understand both the promise and limits of evolution as an explanatory paradigm for variation in human health and disease.
4. Be able to apply principles of evolutionary medicine to development of a research proposal.
5. Develop collaborative and oral presentation skills through a group presentation.

ANTH 531. Issues in Nutritional Anthropology
3 Credits (3)
This course provides biological, ecological, and cross-cultural perspectives on human nutrition. Topics covered include human nutritional evolution, dietary adaptation, variation in human foodways and habits, relationships between diet and health, nutrition transitions, and methods for studying human diet and nutrition in field settings.
Learning Outcomes
1. Understand the ways in which biology, culture, and ecology shape human nutritional outcomes and dietary patterns.
2. Be able to identify methods best suited to answering questions about human diet and nutrition in field settings.
3. Be able to develop a research question and basic research strategy.

ANTH 533. Advanced Issues in Sex, Gender, and Culture
3 Credits (3)
Survey of the history of anthropological ideas about gender and women, and a comparison of gender roles, relations, and ideologies across a range of cultures. May be repeated up to 3 credits.
Learning Outcomes
1. Explain to others how you understand the concepts of sex, women, gender, and culture.
2. Critically analyze the uses of these concepts across a range of different contexts including media, politics, cultural performance, and everyday interactions.
3. Apply theoretical concepts introduced in this class to a current anthropological research problem/topic.

ANTH 535. Adv. Human Health and Biological Variation
3 Credits (3)
Overview of contemporary human biological variation and adaptability within a scientific evolutionary and biocultural framework. Special emphasis is placed on human adaptation to the environment and the sociocultural, epidemiological, and evolutionary factors that underlay

contemporary issues in human health and disease. Crosslisted with: ANTH 435.

Learning Outcomes

1. Develop critical thinking skills and scientific literacy through discussion, reading, and writing exercises and evaluating scientific theories, data, and research methods.
2. Develop an understanding of evolutionary theory, and how human organic evolution shapes variation, adaptation, and health in contemporary human populations.
3. Learn how human evolutionary history has shaped the global distribution of contemporary human biological diversity.
4. Understand the scientific critique of the biological race concept, and how social inequality, particularly racism, can become embodied.
5. Understand the various ways that humans adapt to the environment on different timescales.
6. Study life course theory and how experiences during development impact health across the life course.
7. Develop specific transferable skills, including written communication, public speaking, and information gathering (research), and for graduate students, research questions development, hypothesis testing, basic data analysis/visualization in Excel.

ANTH 538. Plants, Culture, and Sustainable Development
3 Credits (3)

Study of role of indigenous cultures and indigenous knowledge systems in plant domestication, ethnoecology, and preservation of traditional crop diversity. Examination of issues related to conserving cultural diversity, food systems, food security and biodiversity.

Learning Outcomes

1. Students will explain the concepts of ecological anthropology, ethnoecology, and ethnobotany and their application to sustainable development.
2. Students will explain the contribution of conserving cultural and biological diversity to sustainable development in the modern world.
3. Students will demonstrate the role that indigenous food systems play in the management of ecological systems around the world.
4. Students will delineate and explain the role of emergent movements, including food sovereignty movements and international collaborative movements, in applying these concepts to solving worldwide sustainable development issues.

ANTH 539. Culture and Foodways
3 Credits (3)

Study of interaction between food and culture from anthropological perspective. Study of role of food in cultural history, social relations, ritual, and identity. Examination of impact of globalization of food systems on traditional cultures, local food systems, and food security.

Learning Outcomes

1. Students will demonstrate the role that food plays in constructing culture by delineating its role in specific cultural aspects.
2. Students will demonstrate the cultural significance of food within the context of "place" through food production, distribution, and consumption.
3. Students will identify and delineate the role of food in the diaspora, detailing how immigrant populations maintain cultural ties through food.
4. Students will explain the contradictions of culinary tourism, how the practice maintains local culinary traditions at the same time that it raises questions of authenticity.
5. Students will explain the role of cooking around the world and how cooking food maintains, reproduces, and transforms culture.
6. Students will explain the significance of commensality (food sharing and meals) in reproducing cultural ties, family bonds, and societal hierarchies.
7. Students will explain the recent history of international food activism and decolonizing food movements, identifying the role that these movements play in conserving indigenous, ethnic, and national identities.

ANTH 540. Cultural Resource Management
3 Credits (3)

Study of federal and state of New Mexico historic preservation laws and regulations and their application in current Cultural Resource Management and a review of relevant case studies.

ANTH 542. Cultural Resource Management II
3 Credits (3)

Continuation of ANTH 540. This course introduces students to the business and practice of doing contractual cultural resource management in the United States.

Learning Outcomes

1. Map an archaeological site (meeting New Mexico state standards for archaeological survey)
2. Document an archaeological site (using a Laboratory of Anthropology site form)
3. Prepare a written site description suitable for inclusion in a survey report
4. Analyze and present data using relevant software (e.g., Excel, Access)
5. Prepare a research proposal or report (meeting New Mexico state standards)

ANTH 543. Indigenous Ways of Knowing
3 Credits (3)

This course examines Indigenous knowledge and ways of knowing as a means to gain an appreciation of an epistemology and ontology that may be outside the boundaries of Eurocentric theory, concepts, and principles. Knowledge development through mythology and story telling is viewed from the nature of difference rather then comparative analysis.

Learning Outcomes

ANTH 545. Advanced Museology
3 Credits (3)

This course provides a broad introduction to the museum world. Through discussion of readings, examination of case-studies, and practical assignments, students will gain an understanding of the museum as an institution, as well as learn the challenges and responsibilities that museums and their staff encounter. Topics include the history of museums, contemporary debates surrounding the definition of museums, ethical and legal issues, and community connections. The course will cover various types of museums—including art, history, ethnographic, indigenous, and scientific—and discuss how these thematic orientations impact museum practice. Students will also explore common museum processes such as collecting, cataloguing, conservation, exhibition, research, and education through practical exercises using the collections of the University Museum in Kent Hall, as well as through case studies of museums around the world.

Learning Outcomes

1. Describe the major conceptual and practical influences on museums today—including issues of historical development, ethics, missions, and thematic orientations.

2. Critically engage with diverse types of museums as cultural institutions, their practices, and the communities with whom they engage.
3. Implement skills relevant to the museum profession, such as collections management, condition reporting, exhibition and programming planning, and research.

ANTH 546. Advanced Contemporary Medical Anthropology
3 Credits (3)
This advanced seminar in medical anthropology addresses contemporary issues in the field of medical anthropology through theoretical and ethnographic texts. Topics span a wide range of studies in medical anthropology and may include such issues as the social production of health and illness, medical pluralism, discourses of mental health, the practice of complementary and alternative medicine, health disparities, the political economy of infectious disease, race and biological variation in biomedicine, and implementing biocultural perspectives. Crosslisted with: ANTH 402.
Learning Outcomes
1. Discuss current issues relevant to the study of medical anthropology.
2. Apply medical anthropological concepts and ideas to theoretical and practical health issues.
3. Acquire skills in the critical appraisal of ethnographic literature.

ANTH 549. Advanced Museum Anthropology
3 Credits (3)
This course provides an introduction to the methodological and theoretical approaches of museum anthropology. Students will gain experience with all these aspects of museum anthropology in the course by engaging with critical scholarship, analyzing case studies, and practicing collections-based research methods utilizing the collections of the University Museum. Through assignments students will analyze objects in the museum's collections using techniques of close looking, drawing, photography, sequences of making, and external research using scholarly sources. Students will gain skills in primary and secondary research, the analysis of material culture, and the practicalities of navigating research in museums.
Learning Outcomes
1. Describe major theoretical approaches to museum anthropology, and how these have changed over time.
2. Critically engage with the intersections between museums as institutions and the practice of anthropology, including the politics of representation.
3. Implement methodological research skills as a student-scholar by conducting independent research based on museum collections.
4. Convert collections-based research into written and media works characteristic of scholar-facing and public-facing practice in museum anthropology, curatorship, and museum studies.

ANTH 550. Museum Field Methods
3 Credits (3)
This course introduces students to the fundamental concepts behind the creation of museum exhibitions. Drawing from the extensive collection of the University Museum, students will gain hands-on experience with exhibition development, resulting in the creation of a temporary public exhibition housed in the Museum's gallery space. By turning the museum inside out, this course will be a unique, behind-the-scenes, practical experience. Through readings and discussion, we will also examine historic and contemporary interpretations of exhibitions and collections from the origins of museums in cabinets of curiosity and Wunderkammer, to the surge in modern virtual exhibitions since 2020. Students will engage in practical applications that will prepare them for future academic work in museum studies and/or future employment or volunteer work in museums.
Learning Outcomes
1. Explain the basic concepts and terminology used in designing museum exhibits.
2. Differentiate the kinds of exhibitions and their intended audiences and purposes.
3. Describe the history of museum exhibitions and their evolution over time.
4. Discuss the challenges faced in designing and executing exhibitions, particularly regarding museum collections.
5. Apply the fundamental principles and practices of collections management.
6. Synthesize the fundamental principles and practices of museum exhibition planning and design including the role of the curator.

ANTH 556. Advanced Native American Intersections in Museums
3 Credits (3)
This course explores the changing relationships and complex intersections between Native people and museums. We will examine how museum practices of collection and exhibition influence ways in which knowledge is formed and presented, and interrogate the role of museums as crucial sites for discourse around issues of ownership, indigenous knowledge and representation. Case studies revealing shifting meanings of objects, curatorial challenges, the development of tribal museums and repatriation complexities will be used to critically engage with Native responses via art, criticism and legal action. Crosslisted with: ANTH 456.

ANTH 558. Advanced Gender and Reproduction
3 Credits (3)
This course examines biocultural variation in reproductive health and birth practices. Human reproductive events like childbirth, contraception, abortion, surrogacy, fertility treatment, and conception, are not only biological in nature, but are also shaped by cultural beliefs and social, medical, and political institutions. Through cross-cultural case studies, we will examine how reproductive experiences are impacted by health-related ideas and medical technologies, and by national and international population policies. We will explore how pregnancy, menstruation, birth, menopause, and fertility control provide sites for gender formation, the reproduction of social inequalities, and state regulation of national populations.
Learning Outcomes
1. Identify the fundamental concepts, modes of analysis, and central questions of the anthropology of reproduction.
2. Learn how to use a cross-cultural approach to understand reproductive health.
3. Gain proficiency in the use of critical thinking skills in their assessment of ethnographic writing.
4. Summarize key historical and contemporary debates in the field of reproductive health.
5. Apply knowledge of peoples' reproductive practices, and gendered identities and sexual lifeways in a range of social contexts.
6. Articulate, in oral and written forms, the central issues in reproduction and culture.

ANTH 560. Advanced Forensic Anthropology
3 Credits (3)
Overview of the field of forensic anthropology. Topics covered include basic human osteology; skeletal examination and documentation; skeletal trauma; personal identification; forensic taphonomy and the

process of decomposition; archaeology and scene processing; sex, age, stature, and ancestry estimation; and contemporary issues and limitations in the field of forensic anthropology.

Learning Outcomes

1. Understand how scientific findings from fields like biological anthropology are applied in forensic anthropology.
2. Understand the history and range of applications of forensic anthropology.
3. Gain a practical understanding of the methods, applications, and limitations of forensic anthropology as relates to police and other investigations.
4. Gain a practical understanding of how forensic anthropologists identify human bones and the process of building a biological profile of human remains.
5. Understand processes like decomposition and recovery of remains at crime scenes.

ANTH 564. Advanced Curation Crisis in Archaeology
3 Credits (3)

This collection management course will introduce students to collections curation, collections care, and collections-based research. Archaeological collections stewardship begins before an archaeologist steps foot into the field and continues well after the recovered collections reach the repository. This course provides students with an understanding of the curation#"crisis"#using archaeological collections curated at the University Museum as a case study and the responsibilities that archaeologists have to the collections they generate.

Learning Outcomes

1. Learn about the maintenance of archaeological and repository collections over time
2. Learn about the management of, access to, and use of archaeological collections
3. Learn about the curation crisis at a small museum (e.g., Kent Hall University Museum)
4. Learn about collections-based research
5. Learn about the development of a small as well as large archaeological database
6. Learn about various ways of disseminating archaeological collections to the public
7. Change the perception of the "just digging and we will deal with the collections later" approach.

ANTH 565. Paleoethnobotany
3 Credits (3)

Paleoethnobotany, the study of the human use of plants in antiquity, uses plant remains recovered from archaeological sites to address a broad range of topics. Paleoethnobotanical data can be used to investigate social, economic, and environmental issues including the shift from hunting and gathering to farming, adaptations to climate shift, the development of state-level societies, and social hierarchies to name a few topics. This course introduces the deposition, preservation, sampling, recovery, identification, description, and interpretation of paleoethnobotanical remains. This course is arranged around 1) exploring the major classes of plant remains likely to be encountered in archaeological sites; 2) identifying these remains and organizing the data to make interpretable results; and 3) addressing key issues within the sub-discipline including preservation, analytical methods, sampling, collection, and interpretation.

Prerequisite: ANTH 578 or ANTH 585.

Learning Outcomes

1. Learn about macro and micro botanical analysis of archaeological plant material.
2. Understand the problems and range of archaeological research using paleoethnobotanical data.
3. Gain knowledge of paleoethnobotanical analysis from sampling to interpretation.
4. Consider the broader applications of paleoethnobotanical interpretation, including economics, identity, foodways, politics, symbolism, and historical ecology.
5. Perform basic laboratory analysis.
6. Write a basic report for cultural resource management projects.

ANTH 567. Colonial New Mexico
3 Credits (3)

Between the 16th and 19th centuries, much of the region now known as New Mexico was colonized and government as New Mexico was colonized and governed as a Spanish colony and, later, as territories of the Republic of Mexico, United States, and Confederate States. These four centuries witnessed significant changes including the introduction of people, plants, animals, and diseases from Europe, Africa, and Asia; Indigenous responses to colonialism; epidemic diseases, revolutions, and wars; and the genesis of new cultural identities and practices. This class explores this turbulent period through the lens of historical archaeology.

Learning Outcomes

1. Identify and describe significant places, events, and people in New Mexico between AD 1500 and 1900 time line.
2. Explain the "Columbian exchange" in New Mexico, providing specific examples.
3. Differentiate and describe major material culture traditions pertaining to this place and time.
4. Investigate a topic, relating to this period and develop an original research paper.

ANTH 574. Advanced Human Osteology
3 Credits (3)

Advanced Human Osteology surveying the functional, developmental and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. May be repeated up to 3 credits. Crosslisted with: BIOL 574.

ANTH 575. Advanced Pottery Analysis in Archaeology
3 Credits (3)

This course introduces the basic concepts, methods, and approaches used in the analysis of archaeological pottery. The purpose of the course is first to provide hands-on experience with the full range of analytical techniques routinely applied to ceramic materials recovered from archaeological sites, but to also provide a contextual framework for the interpretation and evaluation of these data. Classes consist of brief introductory lectures, and seminar presentation and discussion of course readings. Lab meetings consist of exercises designed to provide you with practical experience working with the materials and measures covered in lectures and readings. Crosslisted with: ANTH 375.

Learning Outcomes

1. Students will learn the theory underlying pottery analysis as well as some of the methods used to identify and interpret pottery;
2. Students will learn to think about the organization of pottery technology from a behavioral rather than a purely typological framework;

3. Students will have the opportunity to develop and then evaluate a research question or problem statement within a chosen theoretical framework, as well as have the opportunity to evaluate that question or questions using both qualitative and quantitative analyses;
4. Students will gain the skills needed to assess pottery analysis reports and undertake pottery analyses for senior thesis, M.A. theses, and CRM contexts.

ANTH 576. Lithic Technology Organization
3 Credits (3)
Advanced seminars and laboratory exercises to learn and develop techniques and methods that will help us determine how to interpret behavioral and cultural information from lithic (stone tool) data. Consent of Instructor required.

ANTH 577. Advanced Zooarchaeology
3 Credits (3)
Detailed study and analysis of taphonomic processes affecting animal bone recovered from archaeological and paleontological contexts.

ANTH 578. Advanced Lab Methods in Archaeology
3 Credits (3)
In this course students learn how to process, analyze, and produce technical reports describing artifacts collected from archaeological sites.
Learning Outcomes
1. Identify different categories and types of archaeological materials.
2. Use relevant computer programs to inventory and analyze artifacts.
3. Explain how research design determines analytical methods and shapes interpretations.
4. Describe the methods and results of an artifact analysis in a technical report.
5. Discuss our ethical obligation to preserve collections for future researchers, while recognizing the challenges involved in this endeavor.

ANTH 579. Qualitative Data Analysis and Interpretation
3 Credits (3)
This course focuses on methods for qualitative data analysis, both computer-assisted and non-computer-assisted, and interpretation. It includes writing up data for academic articles or theses.

ANTH 585. Method and Theory in Archaeology
3 Credits (3)
Focus on major methodological and theoretical aspects of contemporary archeology.

ANTH 587. Field Work in Latin America
3-12 Credits
Covers anthropological field methods in Latin America that also incorporate in-field lab analysis. No S/U grading.
Prerequisite: consent of instructor.

ANTH 596. Readings
1-6 Credits
Individual study of selected readings and topics. May be repeated for a maximum of 6 credits. Consent of instructor required.

ANTH 597. Internship
1-9 Credits
Anthropological or archaeological internship in private, state, or federal agency. May be repeated for a maximum of 18 credits. Consent of instructor required. Restricted to ANTH majors.
Prerequisite(s): graduate standing.

ANTH 598. Special Research Problems
1-6 Credits (6)
Individual analytic or experimental investigations. May be repeated under different subtitles for a maximum of 6 credits. Consent of instructor required. Restricted to ANTH majors.
Prerequisite(s): graduate standing.

ANTH 599. Master's Thesis
1-15 Credits
Thesis. Consent of instructor required. Restricted to ANTH majors.
Prerequisite(s): graduate standing.

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Anthropology - Bachelor of Arts

The undergraduate anthropology major takes a holistic and comparative approach to the study of humanity in all places and times. It is spans the natural and social sciences, and challenges students to develop advanced skills in communication, critical thinking, and qualitative and quantitative research methods. This major requires 36 credits, including upper-division core courses in archaeology, biological anthropology, cultural anthropology, anthropological theory, and a capstone class focused on professional development. It also requires a one year proficiency in a foreign language or equivalent/placement.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. *Note: A grade of "C-" or better is required for all courses taken for the major. Students may not take any of these courses S/U.*

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Select one English course from the following list [1]		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication Honors	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication [2]		*3*
Area II: Mathematics		*3-4*
Any Mathematics course found in Area II will meet the requirement, excluding MATH 2134G [2]		
MATH 1350G	Introduction to Statistics (recommended)	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences [3,4]		*10-11*

Area III: Laboratory Sciences (4 credits)		
ANTH 1135G & ANTH 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab (recommended, not required)	
Area IV: Social/Behavioral Sciences (3 credits)		
The following are recommended but not required.		
ANTH 1115G	Introduction to Anthropology	
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1160G	World Archaeology	
ANTH 2140G	Indigenous Peoples of North America	
Either an Area III/IV: Laboratory Sciences or Social/Behavioral Sciences Course (4 or 3 credits)		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective [2]		*3-4*
Viewing A Wider World [5]		**6**
Departmental/College Requirements		
ANTH 301	Cultural Anthropology	3
ANTH 315	Introduction to Archaeology	3
ANTH 350	Anthropological Theory	3
ANTH 355	Biological Anthropology	3
ANTH 399	Professionalism & Practice in Anthropology	3
ANTH 301, ANTH 315, and ANTH 355 may be taken in any order that best suits the student's interests.		
Departmental Electives		
Select additional electives in anthropology to bring total credits in major to 36, including 27 upper-division.		15
Second Language Requirement: (required- see below)		
Electives, to bring the total credits to 120		**49-52**
Students must graduate with 48 upper-division.		
Total Credits		**120**

1 A grade of C- or better must be earned.

2 See the General Education (p. 262) section of the catalog for a full list of courses

3 Students taking nine or more credits in a specific subject area, even though the courses are not designated as General Education courses, will have met the general education requirements for that subject area.

4 All students must take one Area III: Laboratory Science (4 credits), one Area IV: Social/Behavioral Science Course (3 credits) and one additional course in either area (3-4 credits) in order to complete the requirement.

5 Students must complete two Viewing the Wider World Courses (p. 266) (VWW) for a total of 6 credits. One VWW must be from outside of the College of Arts and Sciences, and the second must be from outside of Anthropology. A student may substitute three credits taken as study abroad for one of the VWW course requirements.

Second Language Requirement

For the Bachelor of Arts in Anthropology, all majors must reach a one year proficiency in a foreign language (through 1120 level, completed with a C- or better) or equivalent/placement. The options to complete these requirements are listed below. The number of credits that a student needs to take may vary depending on what level of language proficiency they already possess. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree. Please note that language immersion courses are available through the Office of Experiential Learning and Education Abroad.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120 & FREN 2110 & FREN 2120	French I and French II and French III and French IV	3-14
GRMN 1110 & GRMN 1120 & GRMN 2110 & GRMN 2120	German I and German II and German III and German IV	3-14
JAPN 1110 & JAPN 1120 & JAPN 2110 & JAPN 2120	Japanese I and Japanese II and Japanese III and Japanese IV	3-14
SPAN 1110 & SPAN 1120 & SPAN 2110 & SPAN 2120	Spanish I and Spanish II and Spanish III and Spanish IV	3-14
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220 & SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	3-9

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
SIGN 2110	American Sign Language III	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 or 2120 level for the following courses:		
FREN 2120	French IV	3
or GRMN 2120	German IV	
or JAPN 2120	Japanese IV	
or SPAN 2120	Spanish IV	
OR		
Challenge the 1120/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
Any Mathematics course found in Area II will meet the requirement, excluding MATH 2134G		3
MATH 1130G	Survey of Mathematics	
MATH 1220G	College Algebra	
MATH 1350G	Introduction to Statistics (recommended)	
Area III/IV: Laboratory and Social/Behavioral Science: Select two of the Anthropology Gen Ed courses [1]		6-8
The following will count for the major:		
ANTH 1115G	Introduction to Anthropology	
ANTH 1135G & ANTH 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab	
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1160G	World Archaeology	
ANTH 2140G	Indigenous Peoples of North America	
HNRS 2161G	Window of Humanity	
HNRS 2172G	Archaeology: Search for the Past	
Area V: Humanities or Area IV: Creative and Fine Arts [2,3]		3
Second Language 1110 or Placement [4]		4
Area I: Communications, select one of the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area V: Humanities or Area VI: Creative and Fine Arts [2,3]		3
Second Language 1120 [4]		4
	Credits	**30-32**
Sophomore		
ANTH 301	Cultural Anthropology [5]	3
Area I: Communications, select one of the following		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication Honors	
ENGL 2210H	Professional and Technical Communication Honors	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Second Language 2110 [4]		3
Anthropology Elective Course or Core Course		3
General Education Elective Course [3]		3-4
ANTH 315	Introduction to Archaeology [5]	3
Area III: Laboratory Science Course [1]		4
Second Language 2120 [4]		3
Anthropology and Archaeology Field Schools are typically offered in Summer		
ANTH 388	Archaelogical Field School	
ANTH 488	Advanced Archaeological Field School	
Elective Course(s)		5
	Credits	**30-31**
Junior		
ANTH 350	Anthropological Theory	3
Viewing a Wider World Course [8]		3
Anthropology Elective (Upper Division) [11]		3
Minor Course or Elective Course [9]		3
ANTH 355	Biological Anthropology [5]	3
ANTH 399	Professionalism & Practice in Anthropology [10]	3
Viewing a Wider World Course [8]		3
Minor Course or Elective Course [9]		3
Minor Course or Elective Course [9]		3
Summer Field Opportunities:		
Archaeological Field School [10]		
Ethnographic Field School [10]		
Elective Course		3
Study Abroad		
	Credits	**30**
Senior		
Anthropology Elective Course (Upper Division) [11]		3
Anthropology Elective Course (Upper Division) [11]		3
Minor Course of Elective Course (Upper Division) [9]		3
Minor Course of Elective Course (Upper Division) [9]		3
Elective Course (Upper Division)		3
Elective Course (Upper Division)		3
Anthropology Elective Course (Upper Division) [11]		3
Minor Course or Elective Course (Upper Division) [9]		3
Elective Course(s)		6
	Credits	**30**
	Total Credits	**120-123**

1. Students must take one Area III: Laboratory Sciences course, one Area IV: Social/Behavioral Science Course and an additional course in either area in order to fulfill the General Education requirements.
2. Students must take one Area V: Humanities course and one Area VI: Creative and Fine Arts Course in order to fulfill their General Education requirements. Students completing the Concentration in Culture and Language may take LING 2110G for their Area V requirement.
3. See the General Education (p. 262) section of the catalog for a full list of courses.
4. Please note that immersion courses abroad are available through Study Abroad and may substitute for courses in the second language sequence. Language courses numbered 1110 and 1120 are needed for the basic foreign language requirement for the BA in Anthropology. Language courses numbered 2110 and 2120 are required for students pursuing the Concentration in Language and Culture.

[5] Core courses ANTH 301 Cultural Anthropology, ANTH 315 Introduction to Archaeology, and ANTH 355 Biological Anthropology may be taken in any order that best suits the student's academic development.

[6] Summer course offerings commonly include ANTH 388 Archaelogical Field School, ANTH 488 Advanced Archaeological Field School, which follows logically from the ANTH 315 Introduction to Archaeology core class.

[7] Students are encouraged to Study Abroad or begin a minor in a related field, and a VWW course can often be an entry to a minor. Three credits of Study Abroad may substitute for one VWW requirement. Students completing the Concentration in Culture and Language may take LING 302V as one VWW requirement.

[8] Anthropology students often complete minors in related fields. It is recommended but not required.

[9] Please note that ANTH 399 Professionalism & Practice in Anthropology is a capstone course for the degree and ideally should be taken after completion or in conjunction with the Anthropology core courses.

[10] For summer field opportunities, consult a faculty advisor. Applications for summer field courses are usually due by mid-March.

[11] A minimum of 27 upper division credits in Anthropology is required overall. A minimum of 36 total credits in Anthropology is required for the B.A. degree.

Anthropology (Culture & Language) - Bachelor of Arts

The BA in Anthropology with a concentration in Culture and Language supports Anthropology majors who wish to develop a focus in cultural anthropology, linguistics, and foreign languages that develops the knowledge, skills, and abilities to navigate an increasingly globalized world. The concentration provides coursework that underpins successful international study abroad experiences, which enables students to gain cross-cultural experience needed for employment in transnational and international organizations and agencies.

A total of 12 credits earned with C- or above is required for the concentration, along with non-departmental second language requirement demonstrating two years proficiency in a second language or equivalent/placement.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Select one English course from the following list [1]		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication [2]		*3*
Area II: Mathematics		*3-4*
Any Mathematics course found in Area II will meet the requirement, excluding MATH 2134G [2]		
MATH 1350G	Introduction to Statistics (recommended)	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences [3,4]		*10-11*
Area III: Laboratory Sciences (4 credits)		
ANTH 1135G & ANTH 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab (recommended, not required)	
or HNRS 1135G	Introduction to Biological Anthropology	
or HNRS 1135L	Introduction to Biological Anthropology Lab	
Area IV: Social/Behavioral Sciences (3 credits)		
The following are recommended but not required.		
ANTH 1115G	Introduction to Anthropology	
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1160G	World Archaeology	
ANTH 2140G	Indigenous Peoples of North America	
Either an Area III/IV: Laboratory Sciences or Social/Behavioral Sciences Course (4 or 3 credits)		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective [2]		*3-4*
Viewing A Wider World [6]		**6**
Departmental/College Requirements		
ANTH 301	Cultural Anthropology [7]	3
ANTH 315	Archaeological Method and Theory [7]	3
ANTH 350	Anthropological Theory [7]	3
ANTH 355	Biological Anthropology [7]	3
ANTH 399	Professionalism & Practice in Anthropology	3
Concentration		
LING 2110G	Introduction to the Study of Language and Linguistics [5]	3
or LING 302V	Language and Society	
Select 9 credits from the following:		9
ANTH 305V	Contemporary Native Americans	
ANTH 306V	Peoples of Latin America	
ANTH 313V	Ancient Mexico	
ANTH 330V	Magic Witchcraft and Religion	
ANTH 360V	Food and Culture Around the World	
ANTH 362V	Environmental Anthropology	
ANTH 433V	Sex, Gender and Culture	
Courses in Language and Culture through the NMSU Office of Experiential Learning and Education Abroad, including FacultyLed International Programs [8]		3-6
Departmental Electives		
Select additional electives in anthropology to bring total credits in major to 36, including 27 upper-division.		21
Second Language Requirement: (required- see below) [9]		**3-14**
Electives, to bring the total credits to 120		**11-28**
Students must graduate with 48 upper-division.		
Total Credits		**120**

[1] A grade of C- or better must be earned.

[2] See the General Education (p. 262) section of the catalog for a full list of courses

[3] Students taking nine or more credits in a specific subject area, even though the courses are not designated as General Education courses, will have met the general education requirements for that subject area.

[4] All students must take one Area III: Laboratory Science (4 credits), one Area IV: Social/Behavioral Science Course (3 credits) and one additional course in either area (3-4 credits) in order to complete the requirement.

[5] Students completing the concentration in Culture and Language may take either LING 2110G Introduction to the Study of Language and Linguistics or LING 302V Language and Society, but not both to satisfy the core requirement (3 credits).
**Note: Students currently enrolled in the Anthropology program and who have completed* ANTH 320 Anthropological Linguistics *have fulfilled this requirement. Please see the Anthropology department head to process a substitution form.*

[6] Students must complete two Viewing the Wider World Courses (p. 266) (VWW) for a total of 6 credits. One VWW must be from outside of the College of Arts and Sciences, and the second must be from outside of Anthropology. A student may substitute three credits taken as study abroad for one of the VWW course requirements.

[7] ANTH 301 Cultural Anthropology, ANTH 315 Archaeological Method and Theory, and ANTH 355 Biological Anthropology may be taken in any order that best suits the student's interests.

[8] Study abroad and FLIP courses approved by the Anthropology Department Head.

[9] Please note that immersion courses abroad are available through Study Abroad and may substitute for courses in the second language sequence. Please see second language options below for other equivalencies and proficiency options.

Second Language Requirement

For the Bachelor of Arts in Anthropology, all majors must reach a one year proficiency in a foreign language (through 1120 level, completed with a C- or better) or equivalent/placement. Students who choose to earn the Concentration in Culture and Language must reach a two year proficiency in a foreign language (through 2120 level with a C- or better) or equivalent/placement. The options to complete these requirements are listed below. The number of credits that a student needs to take may vary depending on what level of language proficiency they already possess. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree. Please note that language immersion courses are available through the Office of Experiential Learning and Education Abroad.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120 & FREN 2110 & FREN 2120	French I and French II and French III and French IV	3-14
GRMN 1110 & GRMN 1120 & GRMN 2110 & GRMN 2120	German I and German II and German III and German IV	3-14
JAPN 1110 & JAPN 1120 & JAPN 2110 & JAPN 2120	Japanese I and Japanese II and Japanese III and Japanese IV	3-14
SPAN 1110 & SPAN 1120 & SPAN 2110 & SPAN 2120	Spanish I and Spanish II and Spanish III and Spanish IV	3-14
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220 & SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	3-9

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
SIGN 2110	American Sign Language III	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 or 2120 level for the following courses:		
FREN 2120 or GRMN 2120 or JAPN 2120 or SPAN 2120	French IV German IV Japanese IV Spanish IV	3
OR		
Challenge the 1120/2210 level for the following courses:		
PORT 1120 or SPAN 2210	Portuguese II Spanish for Heritage Learners III	3

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
Any Mathematics course found in Area II will meet the requirement, excluding MATH 2134G		3

MATH 1130G	Survey of Mathematics	
MATH 1220G	College Algebra	
MATH 1350G	Introduction to Statistics (recommended)	
Area III/IV: Laboratory and Social/Behavioral Science: Select one of the Anthropology Gen Ed Courses [1,3]		6-8
The following will count for the major:		
ANTH 1115G	Introduction to Anthropology	
ANTH 1135G & ANTH 1135L or HNRS 1135G *and* HNRS 1135L	Introduction to Biological Anthropology or Introduction to Biological Anthropology *and* Introduction to Biological Anthropology Lab	
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1160G	World Archaeology	
ANTH 2140G	Indigenous Peoples of North America	
HNRS 2161G	Window of Humanity	
HNRS 2172G	Archaeology: Search for the Past	
Area V: Humanities or Area IV: Creative and Fine Arts [2,3]		3
Second Language 1110 or Placement [4]		4
Second Language 1120 [4]		4
Area I: Communications, select one of the following		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
LING 2110G or LING 302V	Introduction to the Study of Language and Linguistics or Language and Society	3
	Credits	**30-32**
Sophomore		
ANTH 301	Cultural Anthropology [5]	3
Area I: Communications, select one of the following		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Second Language 2110 [4]		3
Second Language 2120 [4]		3
Anthropology Elective Course, Concentration Elective, or Core Course		3
General Education Elective Course [3]		3-4
ANTH 315	Archaeological Method and Theory [5]	3
Area III: Laboratory Science Course [1]		4
Elective Courses		5
Anthropology and Archaeology Field Schools are typically offered in Summer [6]		
ANTH 388	Archaeological Field School	
ANTH 488	Advanced Archaeological Field School	
	Credits	**30-31**
Junior		
ANTH 350	Anthropological Theory	3
Viewing a Wider World Course [3,7]		3
Anthropology Elective or Concentration Elective (Upper Division)		3
ANTH 355	Biological Anthropology [5]	3
ANTH 399	Professionalism & Practice in Anthropology [9]	3
Viewing a Wider World Course [3,7]		3
Minor Course or Elective Course [8]		3
Minor Course or Elective Course [8]		3
Minor Course or Elective Course [8]		3
Elective Course [8]		3
Summer Field Opportunities: [10]		
Archaeological Field School [10]		
Ethnographic Field School [10]		
Study Abroad (credits may be applied to Concentration coursework) [4]		
	Credits	**30**
Senior		
Anthropology Elective Course (Upper Division)		3
Concentration Elective Course		3
Concentration Elective Course		3
Minor Course or Elective Course (Upper Division) [8]		3
Minor Course or Elective Course (Upper Division) [8]		3
Minor Course or Elective Course (Upper Division) [8]		3
Elective Course (Upper Division)		3
Elective Course (Upper Division)		3
Elective Course(s)		6
	Credits	**30**
	Total Credits	**120-123**

1 Students must take one Area III: Laboratory Sciences course, one Area IV: Social/Behavioral Science Course and an additional course in either area in order to fulfill the General Education requirements.

2 Students must take one Area V: Humanities course and one Area VI: Creative and Fine Arts Course in order to fulfill their General Education requirements.

3 See the General Education (p. 262) section of the catalog for a full list of courses.

4 Please note that immersion courses abroad are available through Study Abroad and may substitute for courses in the second language sequence. Language courses numbered 1110 and 1120 are needed for the basic foreign language requirement for the BA in Anthropology. Language courses numbered 2110 and 2120 are required for students pursing the Concentration in Language and Culture.

5 Core courses ANTH 301 Cultural Anthropology, ANTH 315 Archaeological Method and Theory, and ANTH 355 Biological Anthropology may be taken in any order that best suits the student's academic development.

6 Summer Course offerings commonly include ANTH 388 Archaeological Field School, ANTH 488 Advanced Archaeological Field School, which follows logically from the ANTH 315 Archaeological Method and Theory core class.
Archaeological Field School is 6 credits and counts as upper division Anthropology elective class. It is also required for employment placement in the archaeology and cultural resource management industry.

7 Students are encouraged to Study Abroad or begin a minor in a related field, and a VWW course can often be an entry to a minor. Three credits of Study Abroad may substitute for one VWW requirement. Students completing the Concentration in Culture and Language may take LING 302V as one VWW requirement.

8 Anthropology students often complete minors in related fields. It is recommended but not required.

9 Please note that ANTH 399 Professionalism & Practice in Anthropology is a capstone course for the degree and ideally should be taken after completion or in conjunction with the Anthropology core courses.

10 For summer field opportunities, consult a faculty advisor. Applications for summer field courses are usually due by mid-March. Honors students in Anthropology are encouraged to seek out National Science

Foundation - Research Experiences for Undergraduates Sites Programs in the Division of Social and Behavioral Sciences.
The NMSU Honors College also offers the Honors College Scholarship for a self-designed international travel and research experience. Sophomore and Junior Crimson Scholars are eligible to apply.

Anthropology - Undergraduate Minor

Students who earn an undergraduate minor in Anthropology must earn 18 credits, distributed as follows:

Prefix	Title	Credits
Required Courses		
Select one from the following:		3
ANTH 301	Cultural Anthropology	
ANTH 315	Introduction to Archaeology	
ANTH 350	Anthropological Theory	
ANTH 355	Biological Anthropology	
Upper division Anthropology courses 300 or above		9
Anthropology courses (any level)		6
Total Credits		**18**

Students who earn a B.A. in Anthropology may **not** also earn a minor in Anthropology. Students earning the minor must pass 18 credits with grades of C- or higher. Nine of the credits must be upper-division. Students may count S only in courses in which all grades are S/U.

Archaeology - Undergraduate Minor

The Undergraduate Minor in Archaeology is an interdisciplinary program through which students develop a deeper understanding of global culture change and the long-term anthropogenic impacts to our planet. Archaeologists use the material evidence of landscapes, sites, and artifacts to reconstruct past lifeways and interpret human behavioral variation and cultural change. They apply their knowledge to promote stewardship of cultural resources and respect for diverse pasts. The minor offers students the opportunity to acquire training in archaeology through experiential learning of field data collection techniques, laboratory analysis of archaeological materials, and cross disciplinary skills needed for careers in cultural resource management (CRM), historic preservation, and heritage conservation.

The minor requires 18 credit hours, distributed as follows.

- At least 12 credits must be earned in upper division (300+) courses.
- At least one course and no more than two courses (6 credits) must be earned in a field other than Anthropology.
- In addition to the required core class, students must earn at least 6 credits in Archaeology Area Studies and at least 6 credits in Archaeology Field/Lab Methods.

Prefix	Title	Credits
Required Courses		**18**
ANTH 315	Introduction to Archaeology (required Archaeological Method & Theory course)	
Select 6-9 credits in Archaeology Area Studies from the following:		
ANTH 1160G	World Archaeology	
HNRS 2172G	Archaeology: Search for the Past	
ANTH 312	The Ancient Maya	
ANTH 313V	Ancient Mexico	
ANTH 318	Historical Archaeology	
ANTH 414	Archaeology of Magic, Witchcraft, and Religion	
ANTH 463	Cultural Resource Management I	
ANTH 467	Archaeology of Ancient Southwest	
HIST 371	Greek Civilization: From Helen of Troy to Alexander the Great	
HIST 372	Roman Civilization	
Select 6-9 credits in Archaeology Field/Lab Methods from the following:		
ANTH 388	Archaeological Field School	
or ANTH 488	Advanced Archaeological Field School	
ANTH 389	Archaeological Mapping	
ANTH 375	Pottery Analysis in Archaeology	
ANTH 376	Lithic Technology Organization	
ANTH 378	Lab Methods in Archaeology	
ANTH 464	Curation Crisis in Archaeology	
ANTH 474	Human Osteology	
ANTH 477	Zooarchaeology	
GEOG 353	Geomorphology	
GEOG 381	Cartography and GIS	
GEOL 1110G	Physical Geology	
GEOL 1150	Introduction to Rocks and Minerals (pre/co-requisite GEOL 1110G)	
Total Credits		**18**

Notes:

- Students who earn a B.A. in Anthropology may also earn a minor in Archaeology.
- Students earning the minor must pass 18 credits with grades of C- or higher.
- Students may count S grades only in courses in which all grades are S/U.
- Alternate courses may be substituted with approval of the Anthropology Department Head.
- Students who wish to work professionally in archaeology are encouraged to take an archaeological field school, as this training is required by most employers. The NMSU summer field school (ANTH 388/488), like most field training programs, requires student to apply for admission. Applications are typically due in mid-March. Information is available on our field school website: https://anthropology.nmsu.edu/projects/field-school.html.

Medical Anthropology - Undergraduate Minor

Program Overview and Objective

The goal of the Undergraduate Minor in Medical Anthropology is to help students develop a critical biocultural understanding of human health, disease, and illness. Students will learn about cultural, epidemiological, and evolutionary approaches to understanding health, wellness, and the body; culture and healing systems; social and structural determinants of health disparities; global/international health; human variation and adaptation; and engaging with diverse communities on health issues. The minor is particularly appropriate for students who are pursuing careers in health professions.

Students who earn a minor in Medical Anthropology must complete 18 credits. ANTH 357V Medical Anthropology is required. A grade of C- or better must be obtained for each course. Students may count S grades

only in courses in which all grades are S/U, and no more than 6 hours of S credit can be accepted. Students may count no more than 15 credits in Anthropology. Please contact the Department of Anthropology regarding the minor.

Prefix	Title	Credits
Required Course		
ANTH 357V	Medical Anthropology	3
Elective Courses (within Department)		**15**
Select a minimum of 9 credits and a maximum of 12 credits		
ANTH 402	Contemporary Medical Anthropology	
ANTH 431V	Nutritional Anthropology	
ANTH 435	Human Health and Biological Variation	
ANTH 436	Evolutionary Medicine	
ANTH 458	Gender and Reproduction	
ANTH 468	Applied Medical Anthropology	
ANTH 385	Internship in Anthropology (with permission of Anthropology Department Head)	
Elective Courses (outside of Department)		
Select a minimum of 3 credits and a maximum of 6 credits		
BIOL 353	Pre-Professional Human Anatomy (prerequisite BIOL 2110G/L)	
BIOL 353 L	Pre-Professional Human Anatomy Laboratory	
BIOL 354	Physiology of Humans (prerequisite BIOL 2110G/L)	
BIOL 354 L	Laboratory of Human Physiology	
CEPY 1120G	Human Growth and Behavior	
PHLS 3110V	Human Sexuality	
PHLS 3130V	Global Environmental Health Issues	
PHLS 3120V	Women's Health Issues	
PHLS 4620V	Cross-Cultural Aspects of Health	
PSYC 325	Health Psychology (prerequisite PSYC 1110G)	
Students may substitute other offerings in Human Biology, Anatomy, and Physiology (check prerequisites) with permission of Anthropology Department Head.		
Total Credits		**18**

Sustainability- Undergraduate Minor

The Undergraduate Minor in Sustainability is an interdisciplinary program through which students develop a deeper understanding of the relations between humans and the natural environment. The minor offers students the opportunity to cross disciplines and construct a coherent interdisciplinary program that focuses on:

- Human interactions with the natural environment
- Society's role in depleting and transforming natural resources
- Critical issues in sustainable development
- New strategies for conserving natural resources and/or sustainable agricultural production

NMSU occupies a unique strategic position as a land grant institution in a multi-cultural regional setting, combined with its geographic location on a binational border. Students in different programs can use the minor in sustainable development to enhance their undergraduate degree and prepare themselves professionally to seek careers and graduate degrees in sustainable and international development.

A minor in Sustainability is available for students who want to include sustainable development in their academic training. The minor requires **18 credit hours**.

NMSU occupies a unique strategic position as a land grant institution in a multi-cultural regional setting, combined with its geographic location on a binational border. Students in different programs can use the minor in sustainability to enhance their undergraduate degree and prepare themselves professionally to seek careers and graduate degrees in sustainable and international development.

A minor in Sustainablility is available for students who want to include sustainable development in their academic training. The minor requires **18 credit hours**.

Requirements

Prefix	Title	Credits
Core Courses [1]		
Choose 18 credits from the following:		18
AEEC 3110V	World Agriculture and Food Problems	
or GEOG 315V	World Agriculture and Food Problems	
AEEC 3120V	Natural Resource Economics	
or ECON 337V	Natural Resource Economics	
AEEC 3130V	Water Resource Economics	
or ECON 384V	Water Resource Economics	
AXED 3210V	John Muir: Lessons in Sustainability	
EPWS 380V	Science & Society	
ANTH 360V	Food and Culture Around the World	
ANTH 362V	Environmental Anthropology	
GEOG 325V	New Mexico and the American West	
GEOG 357	Climatology	
GEOG 361V	Challenges of Globalization	
GEOG 363V	Cultural Geography	
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	
HIST 300	Special Topics (Subtitle Environmental History)	
HIST 308V	The History of Food	
HNRS 321V	Agriculture in an Interconnected World	
PHLS 3130V	Global Environmental Health Issues	
PHYS 303V	Energy and Society in the New Millennium	
POLS 324	Environmental Policy & Administration	
SOCI 3310V	Social Issues in the Rural Americas	
SOCI 4335V	Advanced Environmental Sociology	

[1] Students who wish to substitute 3 credits of internship for one of the above listed classes may do so with permission of the Department Head, Anthropology. Suggested internship courses would include ANTH 385 Internship in Anthropology, ANTH 486 Community Engagement and Service Learningg, or GEOG 401 Internship/Co-op.

Religious Studies - Undergraduate Minor

The Undergraduate Minor in Religious Studies introduces students to the diversity and history of religious experiences enabling them to evaluate critically the roles religion plays in cultures of the world. Students engage with the study of religion across disciplines including

Anthropology, Art History, History, Native American Studies, Government, History, Native American Studies, and Sociology. The curriculum covers archaeological evidence of religion, new religious movements, religious iconography, forms of religious organization, politics and religion, and religious violence. The minor is particularly appropriate for students who pursue careers impacted by religious practices and beliefs such as health professions, legal careers, government agencies, religious vocations, and charitable organizations.

Students must take the required core class ANTH 330V Magic Witchcraft and Religion. Students must pass a total of 18 credits of which at least 9 are upper division. Students must earn C- or higher grades in each course and cannot count S/U courses unless all grades in the course are S/U. No more than 9 credits (upper or lower division) can be earned in any one department. Please contact the Department of Anthropology regarding substitutions and questions for the minor.

Requirements

Prefix	Title	Credits
Required Courses		
ANTH 330V	Magic Witchcraft and Religion	3
Select 15 credits from the following: [1]		15
At least 9 credits must be upper division		
ANTH 2140G	Indigenous Peoples of North America	
ANTH 313V	Ancient Mexico	
ANTH 414	Archaeology of Magic, Witchcraft, and Religion	
NATV 4120V	Native American Visual Culture	
ANTH 455	Federal Indian Policy	
ARTH 311	Art of China I: Neolithic to Song Dynasty	
ARTH 444	Art and Life in Renaissance Italy	
ENGL 2521	The Bible as Literature	
ENGL 392V	Mythology	
ENGL 407	Milton	
HIST 2245G	Islamic Civilizations to 1800	
HIST 2250G	East Asia to 1600	
HIST 471	China through the Ming Dynasty	
HIST 473	History of Japan	
HNRS 2160G	New Testament as Literature	
HNRS 2172G	Archaeology: Search for the Past	
HNRS 326V	Art and Mythology	
HNRS 348V	Comparative Mythology: Myth, Ritual, and the Life Cycle	
PHIL 1140G	Philosophy and World Religions	
PHIL 331	Philosophy of Religion	
SOCI 3110V	Sociology of Religion	
Total Credits		**18**

Applied Studies - Bachelor of Applied Studies

The Bachelor of Applied Studies (BAS) degree is designed specifically for students who have already procured an Associates degree in an Applied Studies field. The BAS promotes the mission and purpose of NMSU by making available flexible degree options and by providing a pathway of study for community college graduates with technical and applied degrees from an accredited institution. The BAS degree helps minimize credit loss for associate degree graduates when pursuing a baccalaureate degree at NMSU by requiring a fewer number of upper-division credits. The student population targeted for this program differs significantly from traditional degree programs at NMSU. The BAS offers opportunity for current and prospective students and welcomes those employed full-time, veterans, active duty military personnel or active duty family members, transfers from other institutions, those returning to college after time away, and students wishing to complete their upper-division coursework at a distance.

To Declare a BAS

Students entering the BAS program are required to:

- Have an Associate of Applied Science or a similar degree from a regionally accredited institution
- Have completed the English and Mathematics Basic Skills Requirements of NMSU (see Regulations - Basic Academic Skills) (p. 31)
- Declare the BAS degree by the last date to drop with a "W" in a student's final semester of study (see the NMSU Academic Calendar for date)
- In some circumstances, students who have earned an Associate's credential other than an Associate of Applied Science from a regionally accredited institution can, in consultation with an academic advisor, petition the Associate Dean for Academics in the College of Arts and Sciences to be admitted into the BAS program.

Degree Requirements

To graduate with the Bachelor of Applied Studies degree, you must complete at minimum 120 credit hours (or more, depending on the number and type of credits acquired in your Associate degree and as determined by your academic advisor). (*Note: The NMSU College of Business allows a maximum of 30 business credit hours to count towards the BAS degree. Also, the only College of Business minor allowed is the Business Administration Minor.)*

Within the total credit hours, you must

- Complete the university's general education requirements (p. 262) (at least 32-35 credit hours of approved New Mexico Common Core courses).
- Complete a minimum of 36 credit hours of upper-division courses (300-499 level), including six credits of Viewing a Wider World (VWW) from courses in two separate colleges at NMSU. You may substitute three credits of VWW with credits taken in study abroad. All 36 upper-division credits must have a grade of C- or better.
- Not have completed the requirements, or be a candidate, for another baccalaureate degree.

In addition, it is strongly recommended that students arrange to satisfy the requirements of at least one undergraduate minor program.

Second Language Requirement

For the Bachelor of Applied Studies there is no second language requirement for the degree.

Art

Undergraduate Program Information

Within the scope of the university's land-grant mission, the Department of Art utilizes our unique geographic location to serve and reflect diverse border communities. The program supports innovative and hybrid techniques, investigation of materials through both studio

practice and a museum conservation program, as well as exhibition and curatorial opportunities. Establishing a foundation in critical and cultural discourse includes in-depth examination of theory, methodology, and materiality of art and art history. Capitalizing on the expertise of the department's faculty, as well as a state-of-the-art facility, students are provided with multiple platforms for artistic and critical engagement, as well as professional advancement. The curriculum fosters learning through collaborative and cross-disciplinary approaches and encourages exploration through a variety of research and curatorial practices. Critique and discourse are contextualized within historical and contemporary frameworks, with the possibility of developing new strategies of inquiry into culture and knowledge production. The faculty of nationally and internationally recognized practicing artists, historians, and conservators, in conjunction with a vibrant roster of visiting artists and researchers, create opportunities for active engagement across varied disciplines.

The department offers four undergraduate degrees: a Bachelor of Arts (BA) with a concentration in Studio Art, a BA with a concentration in Art History, a Bachelor of Fine Arts (BFA) in Studio Art and a BFA in Museum Conservation. Our studio degrees provide students with the opportunity to either specialize or diversify their program of study in the following media areas: graphic design and media arts, ceramics, sculpture, metals and jewelry, photography and lens-based media, painting and drawing and museum conservation. We also support students who are interested in research practices in installation, performance and multi-media.

BA in Art History – This program is designed to give students a broad familiarity with the visual arts through the study of aesthetics, cultural contexts, visual and iconographic traditions, stylistic development and technical practices.

BA in Studio Art – The BA provides a solid background in materials, techniques and idea development across all media areas combined with art historical studies. Students have the opportunity to specialize or generalize in various medias. This degree offers more space for electives, making it useful for students who wish to double major or incorporate minor(s) into their degree program.

BFA in Studio Art – The BFA curriculum offers a more intense investigation into contemporary visual arts. Students who wish to embark on a professional career in art apply to the BFA program through a portfolio process in their sophomore year. Areas of potential specialization include photography and lens-based media, graphic design and media arts, ceramics, drawing, painting, jewelry/metalsmithing, and sculpture, or students may elect to focus on multiple specializations for an intermedia concentration. This degree culminates with a BFA thesis exhibition.

BFA in Museum Conservation - the BFA in Museum Conservation is an interdisciplinary degree, combining the studio arts, art history, anthropology, history, chemistry and conservation technologies to yield skills in the conservation of material objects of all types and historical value. NMSU offers one of only a few undergraduate degrees in museum conservation in the country.

The study of art provides an appropriate background for the pursuit of careers in studio art and art history in such areas as: the visual arts; graphic design and advertising; conservation; libraries and archives; museums and galleries; architecture and interior design; photography, video and cinematography; crafts; education and art therapy; publishing; theatre and set/lighting design; television; industry and business; communication; management and research in the creative and academic areas. A major in art also provides students with a broad humanistic background appropriate to preparation for advanced degrees in other fields.

Graduate Program Information

The Department of Art offers a Master of Fine Arts in Studio Art and Master of Arts with an emphasis in Art History. Graduate students focus on an individualized program of study, supported by required coursework and mentorship with the graduate faculty. MFA students are encouraged to work across disciplines and cultivate their personal research within the broad context of 21st-century art, art history and theory. The department supports work in and across the following areas: ceramics, graphic design, time-based media, lens-based media, jewelry and metalsmithing, painting and drawing, sculpture and museum conservation.

Degrees for the Department

Bachelor Degree(s)

- Art (Art History) - Bachelor of Arts (p. 542)
- Art (Museum Conservation) - Bachelor of Fine Arts (p. 545)
- Art (Studio Art) - Bachelor of Arts (p. 544)
- Art (Studio Art) - Bachelor of Fine Arts (p. 548)

Master Degree(s)

- Art - Master of Arts (p. 108)
- Fine Arts - Master of Fine Arts (p. 162)

Minors for the Department

- Art - Undergraduate Minor (p. 549)
- Art History - Undergraduate Minor (p. 549)
- Museum Conservation - Undergraduate Minor (p. 549)

Professor, Margaret Goehring, Department Head

Professors Cully, Furuhashi, Goehring ***Associate Professors*** Clark, d'Agostino, Lamb ***Assistant Professors*** Kerr-DiCarlo, Metcalf, Samaniego; ***Museum Director*** Sage***; College Assistant Professors*** Dickinson

J. Clark, MFA (Cranbrook Academy of Art)- Ceramics; C. Cully, MFA (University of Arizona)– Painting and Drawing; B. d'Agostino MFA (University of Maryland Baltimore Country)– Graphic Design; J. Dickinson MFA (Southern Methodist University)--Foundations; M. Furuhashi, MFA (University of Illinois- Champagne)- Jewelry and Metals; M. Goehring, Ph.D. (Case Western Reserve)– Art History; E. Kerr-DiCarlo, Ph.D. (Courtauld Institute, University of London)--Museum Conservation and Art History; B. Lamb, MFA (University of New Mexico)-Photography; M. Metcalf, Ph.D. (UCLA)--Art History; M. Sage, MFA (MICA)– University Art Museum Director; Carissa Samaniego, MFA (UC Boulder)--Sculpture

Art History Courses

ARTH 1115G. Orientation in Art
3 Credits (2+3P)
A multicultural examination of the principles and philosophies of the visual arts and the ideas expressed through them.
Learning Outcomes

1. Identify elements of art principles of design.
2. Articulate the relationship of art to the human experience.
3. Write and discuss critically using the vocabulary of art.

4. Interpret art within cultural, social, personal, and historical contexts.
5. Critically analyze an original work of art.

ARTH 2110G. History of Art I
3 Credits (3)
This survey course explores the art and architecture of ancient pre-historic cultures through the end of the fourteenth century. While focused primarily on the art of the Western civilizations, this course will also provide insights into the works of other major cultures in order to provide alternate views of art and history. Emphasis will be placed on the relationship of artworks to political, social, spiritual, intellectual, and cultural movements that affect and are affected by their creation and development.
Learning Outcomes
1. Identify major artworks from a variety of regions and time periods.
2. Investigate the methods of producing various works of art.
3. Articulate an understanding and appreciation for the political, social, spiritual, intellectual, and cultural contexts of art forms.
4. Comprehend and apply terms, methodologies and concepts common to studies of art history, developing a language to further understanding of art.
5. Compare works across a range of historical styles and periods.

ARTH 2120G. History of Art II
3 Credits (3)
This survey course will explore the architecture, sculpture, ceramics, paintings, drawings, and glass objects from the 14th century to the modern era. While focused primarily on the art of the Western civilizations, this course will also provide insights into the works of other major cultures in order to provide alternate views of art and history. Emphasis will be placed on the relationship of artworks to political, social, spiritual, intellectual, and cultural movements that affect and are affected by their creation and development.May be repeated up to 3 credits.
Learning Outcomes
1. Identify major artworks from a variety of regions and time periods.
2. Investigate the methods of producing various works of art.
3. Articulate an understanding and appreciation for the political, social, spiritual, intellectual, and cultural contexts of art forms.
4. Comprehend and apply terms, methodologies and concepts common to studies of art history, developing a language to further understanding of art.
5. Compare works across a range of historical styles and periods.

ARTH 2136. Writing in Art
3 Credits (3)
This class looks at the variety of writings associated with art history and studio art practice. It explores the discipline of art history itself, and introduces students to the specific ways in which art historians study art. Within a workshop setting, students will practice approaches to research, understanding art and writing about art. Students will also be introduced to professional writing practices, including digital formats, relating to studio art.
Learning Outcomes
1. Develop visual literacy in looking at art.
2. Analyze a complex art historical argument.
3. Apply art specific vocabulary to critically-based writings and discussions of art.
4. Develop writing skills to articulate the relationship of art to the human experience.

ARTH 2996. Special Topics in Art History
3 Credits (3)
Presents various topics. May be repeated up to 9 credits.

ARTH 300. Special Topics in Art History
3 Credits (3)
Specific subjects to be announced in the Schedule of Classes, individual topics may not be repeated . Restricted to Las Cruces campus only. May be repeated up to 12 credits.
Prerequisite: ARTH 2110G, ARTH 2120G, and ARTH 2136 or consent of instructor.
Learning Outcomes
1. Analysis of specific problems in art history
2. Evaluate approaches to specific problems in art history

ARTH 311. Art of China I: Neolithic to Song Dynasty
3 Credits (3)
Survey of the art of China from the neolithic period to the end of the Song dynasty. Non-majors welcome.
Prerequisite: ARTH 2110G, ARTH 2120G, and ARTH 2670 or HIST 2250G and HIST 2251G or consent of instructor.
Learning Outcomes
1. identify the principal periods and dynasties up to the Song dynasty and the major political, philosophical and religious ideas that emerged during those periods.
2. describe the principal stylistic characteristics of two-dimensional and three-dimensional artworks and architecture for each period
3. Analyze how the form, function and style of art corresponds to religious beliefs and funerary practices
4. identify some of the major monuments of Chinese painting and be able to discuss their specific historical contexts and meaning
5. Identify basic elements of Buddhist and Taoist iconography

ARTH 312. Art of China II: Song Dynasty to Today
3 Credits (3)
Survey of art, architecture and landscape design of China from the Song Dynasty to the present day Crosslisted with: ARTH 512.
Prerequisite(s): ARTS 2671 or ARTH 2110G or HIST 2250G and HIST 2251G or consent of instructor.

ARTH 336. Race and Art
3 Credits (3)
Traces race, representation and appropriation through a historical and cultural lens. Issues of identity up to and including contemporary visual expression are examined. Non-majors welcomed. Each topic may be taken one time.
Prerequisite: ARTH 2110G, ARTH 2120G, and ARTH 2136 or consent of instructor.
Learning Outcomes
1. Recognize how identity is perceived and constructed and the contemporary challenges to the creation of the "Other"
2. identify and place art objects within political, social, artistic and philosophical contexts.
3. Acquire the tools to determine how issues of race and identity are being explored and understood today.
4. Interpret and evaluate the relationship of art to the human experience

ARTH 342. Global Modernisms
3 Credits (3)
Examines themes and monuments from the late 19th century to 1968, emphasizing modern and avant-garde cultural practices.

Prerequisite: ARTH 2110G, ARTH 2120G, ARTH 2136, or consent of instructor.

Learning Outcomes

1. Identify and place art objects within political, social, artistic and philosophical contexts.
2. Summarize the major styles and practices that emerged in the Twentieth Century
3. Analyze the importance of context for these major styles
4. Explain different methodologies of Art History and their relevance for understanding Twentieth Century Art
5. Apply art specific vocabulary to critically based writings and discussions of the art objects studied
6. Develop analytical processes, writing skills and research methodology to interpret and articulate the relationship of art to the human experience.

ARTH 343. Contemporary Global Art Practices
3 Credits (3)

Examines the myriad of contemporary art practices, media, and forms from 1968 to the present.

Prerequisite: ARTH 2120G, ARTH 2136; or consent of instructor.

Learning Outcomes

1. Identify and place art objects within political, social, artistic and philosophical contexts.
2. Summarize the major styles and practices that emerge in the Contemporary period
3. Analyze the importance of context for these major styles and practices
4. Explain different methodologies of Art History and their relevance for understanding Contemporary Art
5. Apply art specific vocabulary to critically based writings and discussions of the art objects studied
6. Develop analytical processes, writing skills and research methodology to interpret and articulate the relationship of art to the contemporary human experience.

ARTH 344. Gender, Sexuality, and Art in the Americas
3 Credits (3)

This course examines woman power/trans/ queer discourses of both the global south and those of people of color in the United States in relation to art from Latin, Central, and North America.

Prerequisite: ARTH 2110G, ARTH 2120G, and ARTS 2136, or consent of instructor.

Learning Outcomes

1. Identify and analyze arguments and problems within gender and sexualities of the global south
2. Locate works of art in relation to the cultures from which they originate, historicizing and contextualizing them in socio-political histories
3. Identify and employ methodology(ies) and theoretical approaches salient to the specific forms of art practice which they are studying
4. Evaluate, comment upon, and formulate approaches to the artistic practices of people of the Americas based in feminist, decolonial methodologies

ARTH 345. Latin American Film
3 Credits (3)

Surveys films and their histories from Latin American and the LatinX diaspora.

Prerequisite: ARTH 2110G, ARTH 2120G, and ARTS 2136, or consent of instructor.

Learning Outcomes

1. Discuss, distinguish among, and analyze film techniques, genres, distribution systems, and movements, particularly as they relate to Latin America
2. Demonstrate an historical understanding of the political histories, movements, and changes in Latin America
3. Locate films in relation to the cultures from which they originate, historicizing and contextualizing them in socio-political histories
4. Identify and employ methodology(ies) and theoretical approaches salient to filmic

ARTH 346. Museum and Curatorial Studies
3 Credits (3)

This museum and curatorial studies course surveys practices, objects, and histories.

Prerequisite: ARTH 2110G, ARTH 2120G, and ARTS 2136, or consent of instructor.

Learning Outcomes

1. Historicize the development of museums, patronage, collecting, looting, and restitution; noting distinctions between cultures, geographic regions, and nation-state systems
2. Identify and analyze arguments and problems within museum studies
3. Distinguish between the professional positions, institutional functions, and governing missions within and among of distinct types of art institutions
4. Evaluate, comment upon, and formulate approaches to exhibition design in both their practical and ideological functions

ARTH 444. Art and Life in Renaissance Italy
3 Credits (3)

Examines how Italian Renaissance textual and visual culture offered Europe new ways of seeing and portraying itself. 1350-1550. Topics include: Florence, Venice, Rome, Leonardo, Michelangelo, titian, humanism, the Medici, and republican and courtly culture.

Prerequisite(s): ARTH 2110G, ARTH 2120G, ARTS 2671, or consent of instructor.

ARTH 477. Independent Research in Art History
1-9 Credits (1-9)

Advanced research on special problems to be conducted under supervision of art history faculty. May be taken up to 12 credits. Consent of instructor required.

Learning Outcomes

1. Student will analyze approaches to a problem in art history
2. Student will evaluate approaches to a problem in art history
3. Student will formulate approaches to address a problem in art history

ARTH 478. Seminar in Art History
3 Credits (3)

Reading, research, and discussion of advanced problems. Topics will be announced in the course schedule. Each topic may be only taken once. Non-art/art history majors, contact instructor for consent.

Prerequisite: ARTH 2110G, ARTH 2120G and ARTH 2136, and one 300 level ARTH course or consent of instructor.

Learning Outcomes

1. Analyze problems in art history
2. Propose a hypothesis relating to a problem in art history and support conclusions through research
3. Evaluate various approaches to problems in art history

ARTH 479. Methodologies and Theories of Art and Art History
3 Credits (3)

Theories and methodologies in art, art history and art criticism; taught with ARTH 579

Prerequisite: ARTH 2110G, ARTH 2120G, ARTH 2136 and one 300 level art history course or consent of instructor.

Learning Outcomes

1. understand the history of the discipline of art history, its origins, and its institutional developments
2. Assess the strengths and limitations of various approaches and methods to interpreting works of art
3. identify the methodology employed in an art historical argument
4. apply a variety of methodological and critical approaches to interpreting a work of art and assess the strengths and limitations of those applications
5. recognize strategies of art practice that correspond to different methodological and critical approaches

ARTH 500. Special Topics in Art History
3 Credits (3)

Specific subjects to be announced in the Schedule of Classes. Individual topics may only be taken one time. Students must be Graduate students to enroll.

Learning Outcomes

1. Analyze specific problems in Art History
2. Evaluate approaches to specific problems in Art History

ARTH 511. Art of China I: Neolithic to Song Dynasty
3 Credits (3)

Survey of the art of China from the neolithic period to the Song dynasty. Student must be a Graduate student to enroll.

Learning Outcomes

1. Identify the principal periods and dynasties up to the Song dynasty and the major political, philosophical and religious ideas that emerged during those periods.
2. Describe the principal stylistic characteristics of two-dimensional and three-dimensional artworks and architecture for each period
3. Analyze how the form, function and style of art corresponds to religious beliefs and funerary practices.
4. Identify some of the major monuments of Chinese painting and be able to discuss their specific historical contexts and meaning
5. Identify basic elements of Buddhist and Daoist iconography

ARTH 536. Race and Art
3 Credits (3)

This course explores the visual expression of race and identity in art and visual culture from a diverse geographical and historical range. Each topic may only be taken one time. Crosslisted with: ARTH 336. Students must be Graduate students to enroll.

Learning Outcomes

1. Recognize how identity is perceived and constructed and the contemporary challenges to the creation of the "Other"
2. Identify and place art objects within political, social, artistic and philosophical contexts.
3. Acquire the tools to determine how issues of race and identity are being explored and understood today.
4. Interpret and evaluate the relationship of art to the human experience.
5. Formulate a question concerning race and art and using analysis, evaluate the research on that question and create an original argument.

ARTH 542. Global Modernisms
3 Credits (3)

Examines themes and monuments of created from the end of the 19th century to 1968 emphasizing modern and avant-garde cultural practices. Crosslisted with: ARTH 342. Students must be Graduate students to enroll.

Learning Outcomes

1. Identify and place art objects within political, social, artistic and philosophical contexts.
2. Summarize the major styles that emerged in the early Twentieth Century to 1968
3. Analyze the importance of context for these major styles
4. Explain different methodologies of Art History and their relevance for understanding the art of this period
5. Apply art specific vocabulary to critically based writings and discussions of the art objects studied
6. Formulate a question in art history relating to the topic of the course, evaluate and assess research, and create an original argument concerning that problem

ARTH 543. Contemporary Global Art Practices
3 Credits (3)

Examines the myriad of contemporary art practices, media, and forms from 1968 to the present. Crosslisted with: ARTH 343. Students must be in Graduate standing to enroll.

Learning Outcomes

1. Identify and place art objects within political, social, artistic and philosophical contexts.
2. Summarize the major styles and practices that emerge in the Contemporary period
3. Analyze the importance of context for these major styles and practices
4. Explain different methodologies of Art History and their relevance for understanding Contemporary Art
5. Apply art specific vocabulary to critically based writings and discussions of the art objects studied
6. Formulate a question in contemporary art, evaluate and assess research, and create an original argument concerning that problem

ARTH 544. Gender, Sexuality, and Art in the Americas
3 Credits (3)

This course examines woman power/trans/ queer discourses of both the global south and people of color in the United States in relation to art from Latin, Central, and North America. Cross-listed with ARTH 344. Students must be in graduate standing to enroll.

Learning Outcomes

1. Identify and analyze arguments and problems within gender and sexualities of the global south
2. Locate works of art in relation to the cultures from which they originate, historicizing and contextualizing them in socio-political histories

3. Identify and employ methodology(ies) and theoretical approaches salient to the specific forms of art practice which they are studying
4. Evaluate, comment upon, and formulate approaches to the artistic practices of people of the Americas based in feminist, decolonial methodologies

ARTH 545. Latin American Film
3 Credits (3)
Surveys films and their histories from Latin American and the LatinX diaspora. Taught with ARTH 345. Students must be in graduate standing to enroll.
Learning Outcomes
1. Discuss, distinguish among, and analyze film techniques, genres, distribution systems, and movements, particularly as they relate to Latin America
2. Demonstrate an historical understanding of the political histories, movements, and changes in Latin America
3. Locate films in relation to the cultures from which they originate, historicizing and contextualizing them in socio-political histories
4. Identify and employ methodology(ies) and theoretical approaches salient to filmic works

ARTH 546. Museum and Curatorial Studies
3 Credits (3)
This museum and curatorial studies course surveys practices, objects, and histories. Taught with ARTH 346. Students must be in graduate standing to enroll.
Learning Outcomes
1. Historicize the development of museums, patronage, collecting, looting, and restitution; noting distinctions between cultures, geographic regions, and nation-state systems
2. Identify and analyze arguments and problems within museum studies
3. Distinguish between the professional positions, institutional functions, and governing missions within and among of distinct types of art institutions
4. Evaluate, comment upon, and formulate approaches to exhibition design in both their practical and ideological functions

ARTH 578. Seminar in Art History
3 Credits (3)
Reading, research, and discussion of advanced problems in art history; rotating topics will be announced in the course schedule. Individual topics may only be taken once. Student must be Graduate students to enroll.
Learning Outcomes
1. Analyze advanced problems in art history
2. Evaluate approaches to advanced problems in art history

ARTH 579. Graduate Seminar: Art Theory, Criticism, Historiography
3 Credits (3)
Theories and methodologies in art history and art criticism.
Prerequisite: graduate standing.

ARTH 597. Independent Study in Art History
3 Credits (3)
Supervised independent study in topics in art history. Students must be in graduate standing to enroll.
Learning Outcomes
1. Student will formulate a question in art history, evaluate and assess research, and create an original argument concerning that problem

ARTH 599. Art History Thesis
1-15 Credits (1-15)
Art history master's thesis research. Students must be in Graduate standing to enroll.
Learning Outcomes
1. Student will formulate a question in art history, evaluate and assess research, and create an original argument concerning that problem

Studio Art Courses

ARTS 1121. Studio Core I: Concept Development-Process and Play
3 Credits (2+4P)
This course is designed to introduce students to the process of making art from conception through research and execution without the expectation of technical proficiency in any one media area. This course focuses on a deceptively simple question. "What is Contemporary Art, and how can we make it?" Through the exploration of basic visual design concepts, collaborative learning, and interdisciplinary studio production, this course will help us to discover what it means to be an artist in the 21st century.
Learning Outcomes
1. Cultivate Creative Thinking by developing and enhancing the ability to think creatively and generate original ideas through the embracing of divergent thinking and exploration of the artistic process.
2. Apply Creative Problem Solving to address artistic challenges and demonstrate the capacity to find innovative solutions.
3. Demonstrate ability to integrate multidisciplinary strategies to enhance creative expression.
4. Use creative thinking to explore and express emotional experiences and cultural perspectives.
5. Engage in reflective practices to analyze and understand one's own creative process and critically assess its effectiveness.

ARTS 1122. Studio Core II: Formal Structure Tools & Techniques
3 Credits (3)
Introduce students to formal design concepts as well as to various technical skills and tools in order to explore and develop innovative forms of artistic expression.
Learning Outcomes
1. Analyze and interpret visual elements within artworks, recognizing the application of formal design concepts.
2. Demonstrate an understanding of how formal design concepts contribute to effective visual communication and apply an understanding of how aesthetics enhance the overall impact and quality of artistic creation.
3. Explore and apply technical skills across a range of artistic mediums, including traditional and digital formats.

ARTS 1145G. Visual Concepts
3 Credits (2+4P)
Visual Concepts is an introduction to the philosophies of art, visual thinking, and principles of visual organization. Designed to give students a broad view of aesthetic traditions, ideologies, and techniques basic to the creation and evaluation of art. Principles and concepts are taught in a common lecture and applied in parallel small studio sections. For non-art majors only.
Learning Outcomes
1. Develop understanding of history, major styles and contemporary issues in art.
2. Introduce students to the language of visual perception and aesthetic evaluation.

3. Introduce students to the fundamental processes of visual perception and artistic expression.
4. Develop students' confidence in using various art materials for artistic expression.
5. Develop students' ability to verbalize ideas and processes in art making.
6. Develop student's ability to communicate through writing about art and art experiences.

ARTS 1240. Design I
3 Credits (3)
This course introduces the fundamentals of two-dimensional design as it applies to fine art and commercial contexts. Emphasis will be on basic color theory, elements of dynamic composition, vocabulary of visual arts and design, and development of visual conceptual skills. Students will use a variety of materials and techniques. Restricted to Community Colleges campuses only.
Learning Outcomes
1. Produce art works that apply and organize the elements of two-dimensional form (line, shape, value, texture, color and space).
2. Produce artworks that apply the principles of two-dimensional design (harmony, variety, repetition, balance, rhythm, proportion, dominance, movement, and economy).
3. Demonstrate effective use of materials and techniques with consideration for craftsmanship and presentation.
4. Use visual art vocabulary in the development and critique of work
5. Explore concepts and ideas: from conceptual, realistic/referential to non-representational

ARTS 1250. Design II
3 Credits (3)
This course introduces the basic formal (aesthetic), spatial, and physical aspects of 3-D form as they can be applied to sculptural and functional design. Techniques that explore structure, mass, volume, scale, surface, form, and function are covered, along with various media, which may include paper, wood, clay, and/or metal. Restricted to Community Colleges campuses only.
Learning Outcomes
1. Apply the artistic qualities of the elements of art and principles of design to three-dimensional form.
2. Create 3 dimensional form using varied sculptural methods, construction techniques and media.
3. Produce 3 D design projects safely with proper use of equipment and materials.
4. Apply realistic, referential, and abstract concepts and ideas to projects.
5. Demonstrate knowledge of 3-D related art vocabulary, origin and trends in sculpture, and 3-D design fundamentals.

ARTS 1310. Introduction to Ceramics
3 Credits (2+4P)
This course introduces the technical processes and conceptual concerns of working with ceramic material. Various methods of forming functional and expressive works out of clay are explored. Methods used include handbuilding and throwing, basic clay bodies, slip and glaze, and atmospheric firing.
Learning Outcomes
1. Explain the transformation of the ceramic material from raw clay form to glazed ceramic object
2. Demonstrate proficiency of technical ceramic skills
3. Explain larger concepts and design principles
4. Apply basic 3-D design principles in the formation of a work of art, as they apply to the ceramic media
5. Create ceramic works of art based on conceptual prompts
6. Critically evaluate a variety of artwork
7. Gain an understanding of the history of ceramic art from a multicultural perspective

ARTS 1320. Ceramics I
3 Credits (2+4P)
An introduction to the medium of clay incorporating hand building and wheel throwing to introduce the student to both the sculptural and utilitarian uses of clay. The student will also be introduced to a variety of glazing and firing techniques
Learning Outcomes
1. Demonstrate through critical discourse or writing an introductory knowledge of the history of ceramics, and ceramic language and terminology.
2. Demonstrate through mechanical application an introductory knowledge of the properties of clays, glazes, and a variety firing techniques.
3. Produce a body of work that exemplifies good ceramic design through the effective use of form, surface, and color.
4. Through the production a body of work demonstrate competency in hand building and throwing on the wheel.

ARTS 1410. Introduction to Photography
3 Credits (2+4P)
This course introduces the making of photographic images from a broad viewpoint to consider both as an art practice and as a cultural practice. The course covers technical information on camera use and functionality, composition and visual design, digital workflow and editing, professional functions of manipulating and enhancing images, and printing correctly and effectively. The historical aspects of photography are also covered.
Learning Outcomes
1. Gain fluency with basic camera function as well as a working knowledge of other photographic equipment and software to produce technically competent photographs.
2. Have a familiarity with current image-editing software to enhance images as well as developing a digital workflow for the management of digital images.
3. Be able to develop creative solutions to visual photographic problems.
4. Gain awareness of contemporary issues in contemporary art photographic practice that can be applied to the one's own individual practice.
5. Develop the ability to critically analyze and discuss photographic images.
6. Print and produce a final project that demonstrates synthesis of ideas presented in the course readings, critiques, and individual research.
7. Demonstrate photographic terminology, and the many ways photographs function in society, both currently and historically.

ARTS 1520. Digital Media I
3 Credits (2+4P)
This course provides an introduction to two of Adobe's major software applications, Illustrator and Photoshop, which are essential in creating artwork, designing promotional materials, websites and more. Part of the course deals with creating a variety of documents using the major tools of each program, and gaining an understanding of the contemporary

graphic design industry and basic elements and principles of design. Community Colleges only.

Learning Outcomes

1. Demonstrate appropriate skills in configuring and navigating computer systems software applications as appropriate to digital image making needs including organization of files using keywords and running batch processes.
2. Exhibit an understanding of a layer based bitmap editing program, through photo retouching, precise use of selection tools, and color adjustment techniques.
3. Create imagery using a vector based illustration program which demonstrates an understanding of vector based drawing tools.
4. Integrate the use of bitmap and vector images using bitmap and vector based image making applications to demonstrate a basic understanding of composition, color, and appropriate image size and resolution.

ARTS 1543. Digital and Analog Drawing: Bridging Tradition and Technology

3 Credits (3)

An introduction to the historical foundations and contemporary potential of drawing that combines digital and traditional approaches. students will develop their ability to create and manipulate images by hand and with the aid of a computer, and learn to compare, translate, and integrate visuals made by old and new technologies. Students will gain a better understanding of digital tools, their expressive capacities, and their application within the context of drawing.

Learning Outcomes

1. Demonstrate proficiency in traditional drawing fundamentals (including line, value, perspective, and proportion) as well as the formal principles of composition.
2. Develop a working knowledge of traditional drawing materials and supports; digital drawing and 3d-modeling software, such as Adobe Photoshop, Adobe Illustrator, and SketchUp and competency in hardware (including scanners, printers, vinyl/laser cutters, monitors, and projectors.
3. Apply observational drawing skills to digital drawing while demonstrating an understanding of digital drawing's unique materiality.
4. Demonstrate critical thinking and problem-solving skills through the analysis and critique of traditional and digital drawings.
5. Understand historical foundations of drawing and articulate how this intersects with contemporary technologies and approaches.

ARTS 1610. Drawing I

3 Credits (2+4P)

This course introduces the basic principles, materials, and skills of observational drawing. Emphasis is placed on rendering a 3-D subject on a 2-D surface with visual accuracy. Other topics include historical and contemporary references as well as an investigation of linear perspective, line, value, shape, space & composition.

Learning Outcomes

1. Produce drawings that demonstrate techniques and mechanics of observational drawing.
2. Demonstrate competency in the following practices: measuring and sighting, gesture, contour line, negative space, shape, value, space, volume, plane and texture.
3. Create drawings primarily from observation with black and white traditional drawing media.
4. Demonstrate effective verbal or written response to one's own art and the art of others.

ARTS 1630. Painting I

3 Credits (2+4P)

This course introduces the tradition of painting as a medium for artistic expression. Students will investigate materials, tools, techniques, history and concepts of painting. Emphasis is placed on developing descriptive and perceptual skills, color theory, and composition.

Prerequisite: ARTS 1610.

Learning Outcomes

1. Produce paintings that demonstrate the tradition of methods, techniques, materials, and tools of oil painting.
2. Construct a variety of support structures and grounds on which paintings are created
3. Examine the historical origins and practices of painting from the personal, social and cultural perspective.
4. Identify and apply environmentally safe painting practices, care of tools, equipment, and facilities, as well as disposal of mediums, solvents and paints.
5. Apply basic color theory to representational and non-representational painting.

ARTS 1710. Introduction to Printmaking

3 Credits (2+4P)

This course provides direct experience of exploring basic printmaking processes, including relief, intaglio, and monoprint processes, as well as the investigation of materials/media, tools, techniques, history, and concepts of printmaking. Emphasis is given to solving problems through thematic development while producing a portfolio of prints.

Learning Outcomes

1. Properly operate a printing press and safely handle materials and equipment.
2. Demonstrate an adequate ability to utilize basic historical printmaking techniques that are widely relevant to contemporary, artistic expressions.
3. Utilize formal elements of art and design (line, shape, value, texture, space, and color), to create prints that are formally sophisticated.
4. Create imagery that contains conceptual depth, which can be interpreted by viewers with regard to social, cultural, political, geographical, and/or psychological experiences and relevance.

ARTS 1711. Computer-Based Illustration

3 Credits (2+4P)

Introduction to the principles of computerized drawing and design. Using the basic concepts, drawing tools, and vocabulary of Adobe Illustrator.

Prerequisite: ARTS 1610, ARTS 1240, or consent of instructor.

Learning Outcomes

1. Demonstrate drawing with the pen tool.
2. Demonstrate the use of blending color and creating shapes.
3. Create spot colors and effectively use them in a page layout.
4. Demonstrate formatting and creating typography.
5. Demonstrate the use of layers, effects, graphic styles, symbols, and brushes
6. Demonstrate competency in creating digital graphics using of Adobe Illustrator software

ARTS 1712. Digital Graphics

3 Credits (2+4P)

Importing and exporting images and text into various desktop publishing formats. Exploring imaging, drawing, and page layout applications. Introduction to typography.
Prerequisite: ARTS 1520.
Learning Outcomes
1. Demonstrate competency in the use of InDesign software.
2. Create appropriate visual solutions based on target marketing information.
3. Demonstrate competency in the design and production of advertising and promotional materials.
4. Present ideas and concepts effectively and competently.
5. Visually demonstrate design solutions to be used in a portfolio

ARTS 1713. Web Page Design
3 Credits (2+4P)
Introduction to the creation of well-designed and organized Web sites. Emphasis on building creative but functional user-friendly sites. Introduction to HTML, Flash, Java Script, and Web-authoring software. Community Colleges only.
Prerequisite: ARTS 1520.
Learning Outcomes
1. Outline the structure and functionality of a typical website.
2. Demonstrate design and layout skills.
3. Demonstrate competency in the use of Dreamweaver software.
4. Demonstrate competency in the use of photo editing software.
5. Demonstrate skills learned for website functionality.
6. Create an Internet compatible website.

ARTS 1810. Jewelry and Small Metal Construction I
3 Credits (2+4P)
This course introduces the basic techniques, materials, and tools traditionally used in the creation of jewelry and/or small-scale sculptural objects.
Learning Outcomes
1. Apply basic jewelry fabrication techniques (such as: piercing, cold connections, soldering, metal forming, casting and stone setting) to complete projects.
2. Create design sketches of the objects prior to fabrication.
3. Demonstrate knowledge of materials and safe practices for making jewelry, as well as small functional and non-traditional objects.
4. Analyze projects through critiques, oral presentations, and discussions.

ARTS 2010. Portfolio Development
3 Credits (2+4P)
This course presents the practicalities of building an art career with emphasis on developing a professional portfolio through visual aids, resumes, statements, and presentations. It covers professional practices of the studio artist including self-promotion, contracts, research tools for exhibition venues and other art related opportunities.
Prerequisites: ARTS 1712, ARTS 2611, and ARTS 1520, or consent of instructor.
Learning Outcomes
1. Develop a portfolio package with visual aids, photographic documentation, resumes, bios and artist statements.
2. Analyze the qualifications, procedures and portfolio requirements necessary for professional art related opportunities.
3. Complete an oral presentation on a series of personal works.
4. Distinguish pathways for navigating the business side of being a professional artist.

ARTS 2430. Photographic Portraiture
3 Credits (2+2P)
This course covers the study of professional photography that involves people, including studio and environmental portraits. Topics include studio and exterior lighting techniques, and selecting lighting equipment and supplies. Restricted to: Community Colleges only.
Prerequisite(s): ARTS 1410 or FDMA 1545.
Learning Outcomes
1. Demonstrate successful operation of studio lighting equipment and accurately define lighting equipment terminology
2. Illustrate the principles of photographic lighting
3. Demonstrate and apply how to use and modify natural light effectively
4. Demonstrate understanding of different approaches such as formal, informal, candid, vernacular and their cultural implications
5. Distinguish historic and contemporary cultural notions informing different types of portraits

ARTS 2431. Introduction to Graphic Design
3 Credits (2+4P)
Introduction to the principles of visual communication and digital media, letterforms, typography and identity marks. Projects produced using conventional and digital tools.
Learning Outcomes
1. Demonstrate working knowledge of the graphic design software.
2. Identify and apply basic design concepts for the purpose of visual communication.
3. Conduct visual research and create presentations on design topics.
4. Solve graphic design problems through solving fundamental communication challenges by sketching, drawing, typographic composition, use of image and color.

ARTS 2440. Photo Finishing & Presentation
2 Credits (1+2P)
Use of visual language for personal expression. Freelance photography; care of original photos; preparation of portfolios, photographic markets, exhibitions and judging, galleries and copyrights. Students will prepare a photographic portfolio. Restricted to: Community Colleges only.
Prerequisite(s): FDMA 1545.
Learning Outcomes
1. Define your target market and create a complete “Personal Promotional Package”
2. Produce a professional Resume Cover Letter.
3. Produce a professional looking Business Card, Letterhead Mailing Labels
4. Produce a single page Promotional Piece, (and possible follow-up material)
5. Produce a PDF Formatted Portfolio (Create in Photoshop Export as PDF)
6. Produce a clean, professional looking traditional hard portfolio with 20-30 pieces
7. Present the Entire Promotional Portfolio and promo materials in a “Job Interview”

ARTS 2610. Drawing II
3 Credits (2+4P)

This course introduces color and colored media as an element of composition while emphasizing descriptive and perceptual drawing skills and conceptual approaches to contemporary drawing. Restricted to ART and ANVE/DFM majors.
Prerequisite(s): ARTS 1610.

Learning Outcomes

1. Create drawings in wet and dry color media.
2. Practice analyzing and visually translating observed subjects from realistic, referential, and/or objective form, to non-representational or abstract imagery in drawings.
3. Compose fully developed drawings that include a conceptual or historical basis.
4. Engage in effective written and oral critique in response to one's own art and the art of others.

ARTS 2611. Advanced Computer-Base Illustration
3 Credits (2+4P)
Design custom graphics and create special effects with filtering, special effects on type, graphing, technical illustrations, and three-dimensional drawing using Adobe Illustrator.
Prerequisites: ARTS 1212, ARTS 1711, and ARTS 1520, or consent of instructor.

Learning Outcomes

1. Demonstrate competency in the use of Adobe Illustrator software.
2. Create appropriate visual solutions based on target marketing information.
3. Demonstrate competency in the design and production of advertising and promotional materials.
4. Present ideas and concepts effectively and competently.
5. Visually demonstrate design solutions to be used in a portfolio

ARTS 2616. Aspects of Drawing
2-3 Credits
Continued work in drawing with emphasis on personal creative endeavor. Community Colleges only.
Prerequisites: ARTS 1610 and ARTS 2610.

Learning Outcomes

1. Advanced skill level in the visual dynamics of line involved in the creation of drawing.
2. Advanced skill level in the visual dynamics of shape involved in the creation of drawing.
3. Advanced skill level in the visual dynamics of value involved in the creation of drawing.
4. Advanced skill level in the visual dynamics of color involved in the creation of drawing.
5. Advanced skill level in the visual dynamics in the combination of line, shape, value and color involved in the creation of drawing.

ARTS 2630. Painting II
3 Credits (2+4P)
This course focuses on the expressive and conceptual aspects of painting, building on the observational, compositional, technical, and critical skills gained previously. Students will investigate a variety of approaches to subject matter, materials, and creative processes through in-class projects, related out-of-class assignments, library research or museum/gallery attendance, written responses, and critiques. Prerequisite(s): ARTS 1610 and ARTS 1630

Learning Outcomes

1. Produce paintings building on the skills and techniques learned in Painting I
2. Solve unique format, support, ground, over and under texturing surface challenges
3. Practice analyzing and translating observed subjects from realistic, referential, and/or objective form, to non-representational imagery
4. Create paintings that explore personal content, stylization, symbolism, narrative, and/or iconography

ARTS 2635. Painting III
2-3 Credits
Continuation of ARTS 2630.
Prerequisites: ARTS 1610, ART 1240 (for art majors), ART 1630, or consent of instructor.

Learning Outcomes

1. Color mixing and color relationships
2. Create illusions of space and volume
3. The student will strengthen his or her own personal artistic style.
4. Knowledge of the proper use and maintenance of painting tools
5. Explore and learn the technique of a master painter of the past.
6. Awareness of nature, "eye hand response," and an imaginative or personal use of the medium.
7. Awareness of the creative process, exploring unforeseen possibilities
8. An ability to work independently.
9. Understanding of painting styles and arts vocabulary

ARTS 2839. Introduction to Sculpture
3 Credits (2+4P)
Beginning sculpture students "explore space" while learning new processes and skills, including mold making, welding and woodworking.

Learning Outcomes

1. Be able to utilize a variety of traditional materials and sculpture processes, including: mold making, metal fabrication/wood fabrication, and the creative integration of mixed media.
2. You will learn to differentiate between objects and installations, and be prepared to explore sculpture in upper division, topics based courses.

ARTS 2993. Art Workshop
0.5 Credits (.5)
Required for all freshman and sophomore Art majors for four semesters, this workshop is designed to build professional student cohorts within the Department of Art; incorporate visiting artist and scholar lectures into the curriculum; and actively involve students in exhibitions and gallery and departmental events. May be repeated up to 4 credits. Crosslisted with: ARTS 308. Restricted to: BA Studio Art, BA Art History BFA Studio Art, BFA Museum Conservation majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Varies

ARTS 2996. Special Topics in Studio
1-3 Credits
Specific subjects and credits to be announced in the Schedule of Classes. No more than 9 credits toward a degree.
Prerequisite: consent of instructor.

Learning Outcomes

1. Varies

ARTS 308. Art Workshop
0.5 Credits (.5)
Required for all junior and senior Art majors for four semesters, this workshop is designed to build professional student cohorts within the

Department of Art; incorporate visiting artist and scholar lectures into the curriculum; and actively involve students in exhibitions and gallery and departmental events. May be repeated up to 4 credits. Crosslisted with: ARTS 208. Restricted to: BA studio art, BA Art History BFA studio art, BFA Museum Conservation majors.

ARTS 340. Internship in Art
1-9 Credits (3P)
This course provides students with the opportunity for workplace learning as an important component in their program of study. Students can identify an internship in graphic design, photography, conservation or other studio areas; or within broader arts institutions such as museums, galleries and visual arts centers which will provide them with professional experience that will support the successful achievement of their career goals in art. May be repeated up to 9 credits.
Prerequisite: ARTH 2110G, ARTH 2120G, ARTS 2136 and eighteen credits of ARTS/ARTH 2000 or ARTS/ARTH 300 studio courses.

ARTS 350. Special Topics in Intermediate Drawing and Painting
3 Credits (2+4P)
Intermediate drawing and painting course focusing on the following topics: Realism, Color, Narrative, and Abstraction. Other topics may be offered as well. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits.
Prerequisite: ARTS 1610 and ARTS 1630, or consent of instructor.
Learning Outcomes
1. Apply fundamental elements and principles of design to art production specific to an intermediate level drawing and painting course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in drawing and painting.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary drawing and painting.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to drawing and painting.

ARTS 355. Special Topics in Intermediate Graphic Design
3 Credits (2+4P)
Intermediate graphic design course focusing on the following topics: web design, typography, motion graphics, publication design. Other topics may be offered as well. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits.
Prerequisite: ARTS 2431 or consent of instructor.
Learning Outcomes
1. Apply fundamental elements and principles of design to art production specific to an intermediate level graphic design course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in graphic design.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary graphic design.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary graphic design.

ARTS 360. The Figure
3 Credits (2+4P)
Introduction to working from live models, anatomical skeletons, source images and the imagination in a variety of two-dimensional media, including painting and drawing. An emphasis is placed on anatomical accuracy and with a focus on the figure as an expressive subject. May be repeated up to 6 credits.
Prerequisite: ARTS 1610 or consent of instructor.
Learning Outcomes
1. Develop the ability to accurately observe and represent the human form from direct observation, focusing on proportions, anatomy, and spatial relationships.
2. Demonstrate a comprehensive understanding of human anatomy by accurately representing skeletal and muscular structures in proportionate and lifelike figure drawings.
3. Demonstrate proficiency in creating expressive and dynamic gesture drawings that convey movement, balance, and energy while maintaining anatomical plausibility.
4. Examine the figure as a subject for individual artistic expression, integrating personal interpretation and creative decision-making into assignments exploring how the human form can be used as a vehicle for storytelling, expressing emotion, and conveying conceptual content.

ARTS 365. Intermediate Sculpture Special Topics
3 Credits (2+4P)
Intermediate sculpture students will expand their fabrication skills in metal, wood and mixed media. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits. May be repeated up to 12 credits.
Prerequisite: ARTS 2839 or consent of instructor.
Learning Outcomes
1. Apply fundamental elements and principles of design to art production specific to an intermediate level sculpture course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in sculpture.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary sculpture.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary sculpture.

ARTS 370. Special Topics in Intermediate Digital Photography
3 Credits (2+4P)
Intermediate digital photography course addressing techniques and production of photo media within the context of contemporary art. Rotating topics include: Networks, Photo-book and Video art, among others. Each topic may only be taken one time. May be repeated up to 12 credits.
Prerequisite: ARTS 1410, or consent of instructor.
Learning Outcomes
1. Apply fundamental elements and principles of design to art production specific to an intermediate level photography course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in photography.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography.

ARTS 373. Intermediate Analog Photography
3 Credits (2+4P)

Introduction to skills and techniques of black and white film photography within the context of contemporary art. Emphasis on analog camera work and darkroom procedures. 35 mm SLR or rangefinder film camera required for course. May be repeated up to 6 credits.
Prerequisite(s): ARTS 1410, or consent of instructor.

ARTS 374. Intermediate Ceramics Multiples (Design and Production)
3 Credits (2+4P)
Intermediate ceramics course focusing on an introduction to the technical processes of throwing, prototyping, mold making, glaze calculation, and alternative firing.
Prerequisite: ARTS 1310 or consent of instructor.
Learning Outcomes
1. Develop the basic visual and tactile problem solving skills necessary to making one part and two part molds.
2. Demonstrate competency is using these techniques to translate basic cylindrical, spherical, and rectangular forms.
3. Develop ability to make successful clay casts from properly made molds.
4. Apply the principles of design to creating multiples: Balance, Emphasis, Rhythm, Contrast, Proportions, and Scale, Movement.
5. Develop basic skills in glazing and a variety of other surface design techniques.
6. Apply the visual element to glazing and surface design of ceramic forms: Line, Shape, Mass, Value, Color, Texture, Pattern, Space.
7. Through research, writing, and class critiques develop the ability to think, speak and write about the conceptual relevance to creating multiples in contemporary art.

ARTS 375. Intermediate Ceramics Sculptural Concerns
3 Credits (2+4P)
Intermediate ceramics course focusing on the refinement of technical skills with an emphasis on conceptual development related to materiality.
Prerequisite(s): ARTS 1310 or consent of instructor.
Learning Outcomes
1. Refine and master the basic skills in all the standard ceramic building techniques. This includes wheel throwing, coil building, and slab building.
2. Demonstrate competency is using these techniques to replicate complex geometric, organic, and figurative forms
3. Through the guidance of course assignments begin to develop original conceptual themes and natives to translate into sculptural forms.
4. Through the guidance of course assignments begin to develop original conceptual themes and natives to translate into sculptural form.
5. Refine and master glazing and surface design techniques. Begin to develop ability to mix glazes and slips.
6. Demonstrate clear understanding of the visual element to glazing and surface design: Line, Shape, Mass, Value, Color, Texture, Pattern, Space
7. Through research, writing, and class critique refine the ability to think, speak and write about contemporary ceramic sculpture in a competent and nuanced way.

ARTS 376. University Art Museum Research Internship
1-9 Credits
A competitive research internship in the NMSU University Art Museum. Requirements determined by instructor/supervising UAM professional. Students must contact the UAM in advance for instructions on how to apply. May be repeated up to 9 credits.
Prerequisite: ARTH 2110G, ARTH 2120G, ARTS 2136, ARTS 403 or consent of instructor.
Learning Outcomes
1. Students will demonstrate ability to execute variety of skills related to the running of an art museum (e.g. art handling, exhibitions, marketing, education, research, etc).

ARTS 385. Special Topics in Intermediate Metals/Jewelry
3 Credits (2+4P)
Intermediate Metals/Jewelry course focusing on the following topics: design and production, materiality and sculptural concern. Techniques may include casting, complex construction, forming, and mix media. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits.
Prerequisite(s): ARTS 1810 or consent of instructor.
Learning Outcomes
1. Apply fundamental elements and principles of design to art production specific to an intermediate level metals/jewelry course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in metals/jewelry.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary metals/jewelry.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary metals/jewelry.

ARTS 394. Special Topics in Studio
3 Credits (3)
Specific subjects and credits to be announced in the Schedule of Classes online. Topics cannot be repeated. May be repeated up to 9 credits.

ARTS 399. Conservation Principles: Methodology, Examination, Documentation
3 Credits (3)
This course offers an introduction to museum conservation and historic preservation, exploring essential techniques and contemporary challenges in the field. Students will gain an understanding of various approaches to conservation practices, treatment methods and related materials, as well as theoretical and ethical issues museum conservators must consider. The course focuses on fundamental skills in conservation examination (assessing the construction and condition of artworks/artefacts and preparing accurate reports), and documentation (recording condition utilizing digital photo documentation, stereomicroscopy, and specialized lighting techniques). Classes emphasize hands-on learning, equipping students with the fundamental skills needed to accurately assess and document condition, and methods used to analyze materials.
Learning Outcomes
1. Identify and apply various methods of digital documentation to cultural heritage objects.
2. Define and apply terminology specific to museum conservation, photo-documentation, and condition reporting.
3. Design condition reports for various types of media (e.g. paintings, archaeological objects, prints).
4. Apply critical thinking and problem-solving skills when presented with preparing written documentation and examining cultural heritage objects.
5. Describe major historical restorations and approaches to treatment.

ARTS 401. Museum Conservation Techniques I
3 Credits (2+3P)

Introduces the student to conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. This course also includes how to document the condition of an object during the conservation process.
Prerequisite: ARTS 399 or consent of instructor.
Learning Outcomes

1. Identify and explain strengths and weaknesses of the theory of conservation
2. Analyze a ceramic object through testing and observation; evaluate the results of an object to be conserved.
3. Create and defend a conservation treatment plan based on the conservation theory and the principles of conservation for cultural objects, tests results, observations, and personal experience in the lab.
4. Apply conservation and restoration techniques to the ceramic object in the lab, after analyzing, evaluating and creating a treatment plan for the object.
5. Create a Condition Report of the ceramic object by describing the condition and its treatment during the conservation process.

ARTS 402. Museum Conservation Techniques II
3 Credits (2+3P)
Continues conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation.
Prerequisite: ARTS 399 and ARTS 401 or consent of instructor.
Learning Outcomes

1. Analyze different types of materials by examining two objects, a painted canvas and a painted wood panel, through testing and observation and evaluate the results of the objects to be conserved.
2. Create and defend a conservation treatment plan based on the conservation theory and the principles of conservation for cultural objects, tests results, observations, and personal experience in the lab.
3. Apply conservation and restoration techniques to both objects in the lab, a painted canvas and a painted wood panel, after analyzing, evaluating and creating a treatment plan for the object.
4. Create a Condition Report for each object, describing the condition of the object, history, the problems the object presents, its treatment during the conservation process, and any remaining issues after treatment.

ARTS 403. Preventative Conservation/Collections Care
3 Credits (3)
Introduces the student on how to mitigate the deterioration and damage of cultural property in a museum setting through the formulation and implementation of policies and procedures. The course addresses most aspects of collections management and care for objects in storage, exhibitions and during transportation.
Learning Outcomes

1. Understand the principles of Preventive Conservation and Collections Care and develop conservation skills through recognizing, describing, explaining, locating, and reporting symptoms and causes of the agents of deterioration that affect all types of art objects
2. Apply methods of Preventive Conservation and collections care for causes of deterioration in museum collections
3. Analyze and Evaluate several museums and create a Museum Assessment that could serve a plan of action to remediate any problems encountered.
4. Create a plan for re-organizing a museum based on the Museum Assessment
5. Create a binder based on the readings from class that includes all the causes of deterioration of materials, how to prevent deterioration, and environmental control of collections.

ARTS 404. Applied Projects in Museum Conservation
3 Credits (3)
This course provides student with the practical application of techniques and policies learned in previous museum conservation coursework with the underpinnings of basic museum and conservation practices, particularly in collection care, preventive conservation, conservation, ethics, teamwork and security. Rotating special projects. May be repeated up to 6 credits.
Prerequisite: ARTS 399, ARTS 401, ARTS 402, ARTS 403 or consent of instructor.
Learning Outcomes

1. Analyze and examine the different types of materials that compose one or various objects through testing and observation and evaluate the results of the object/s to be conserved.
2. Create and defend the conservation treatment plan based on conservation theory and the principles of conservation for cultural objects, the tests results, and the observations.
3. Apply conservation and restoration techniques to the object/s in the lab after analyzing, evaluating and creating a treatment plan for the object/s.
4. Create Condition Reports, one for each object, by describing the condition of the object and its treatment during the conservation process.

ARTS 440. Internship in Art
1-9 Credits (3P)
This course provides students with the opportunity for workplace learning as an important component in their program of study. Students can identify an internship in graphic design, photography, conservation or other studio areas; or within broader arts institutions such as museums, galleries and visual arts centers which will provide them with professional experience that will support the successful achievement of their career goals in art. May be repeated up to 9 credits.
Prerequisite: ARTH 2110G, ARTH 2120G, ARTS 2136 and eighteen credits of ARTS/ARTH 2000 or ARTS/ARTH 300 studio courses.

ARTS 450. Special Topics In Advanced Drawing and Painting
3-6 Credits (2-4+4P)
Advanced drawing and painting course focusing on the following topics: Identity, Place, Spirituality, Body, and among others. Topics will be announced in the course schedule. May be repeated up to 12 credits.
Prerequisite: 3 credits of ARTS 350, or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an advanced level drawing and painting course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering advanced level tools and processes in drawing and painting.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary drawing and painting.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary drawing and painting

ARTS 455. Special Topics in Advanced Graphic Design
3-6 Credits (2-4+4P)
Advanced graphic design course focusing on the following special topics: special projects, identity design, storytelling, portfolio. Other topics may be offered as well. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 15 credits.
Prerequisite: 3 credits of ARTS 355, or consent of instructor.
Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an advanced level graphic design course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering advanced level tools and processes in graphic design.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary graphic design.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary graphic design.

ARTS 465. Advanced Sculpture Special Topics
3-6 Credits (2-4+4P)
Thematic classes deepen students' knowledge of contemporary sculpture and extended media through a series of interpretive assignments that culminates in a unified body of work. Special topics will be announced in the course schedule. May be repeated up to 12 credits.
Prerequisite: ARTS 365 or permission of the instructor.
Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an intermediate level sculpture course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in sculpture.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary sculpture.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary sculpture.

ARTS 470. Advanced Digital Photography
3-6 Credits (2-4+4P)
Advanced digital photography course addressing technique and production of photo media within the context of contemporary art. Rotating topics may include: Temporality, Photo-installation and Video Art, among others. Each topic may only be taken once. May be repeated up to 12 credits.
Prerequisite: ARTS 370 or consent of instructor.
Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an advanced digital photography course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering advanced level tools and processes in digital photography.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography.

ARTS 474. Advanced Ceramics Design and Production
3-6 Credits (3-6)
Advanced ceramics course focusing on the technical processes of throwing, prototyping, mold making, glaze calculation, and alternative firing. Discussions may also include issues of professional practice, marketing, and branding. May be repeated up to 6 credits.
Prerequisite(s): ARTS 374 and ARTS 375, or consent of instructor.
Learning Outcomes

1. Refine the basic visual and tactile problem solving skills necessary to making two part molds, and develop the ability to make complex multipart molds.
2. Demonstrate competency is using these techniques to translate complex geometric and organic forms
3. Develop pertinent conceptual reasoning for creating multiples of a form in ceramic material.
4. Demonstrate clear understanding of the principles of design in designing ceramic multiples: Balance, Emphasis, Rhythm, Contrast, Proportions, and Scale, Movement.
5. Develop basic skills in glazing and a variety of other surface design techniques.
6. Demonstrate clear understanding of the visual element of art to the glaze and surface design of ceramic multiples: Line, Shape, Mass, Value, Color, Texture, Pattern, Space,
7. Through research, writing, and class critiques refine the ability to think, speak and write about the conceptual relevance to creating multiples in contemporary art and articulate.

ARTS 475. Advanced Ceramics Sculptural Concerns
3-6 Credits (2-4+4P)
Advanced ceramics course focusing on conceptual development as it relates the creation of a unified body of work. Topics may include discussions of advanced techniques, professional practices, and contemporary issues in ceramics. May be repeated up to 15 credits.
Prerequisite(s): ARTS 374 and ARTS 375, or consent of instructor.
Learning Outcomes

1. Strive to innovate the standard ceramic building techniques in a way that contributes to, and is informed by, the field of ceramic sculpture.
2. Develop a cohesive body of work, which explores completely original concepts and themes.
3. Demonstrate clear understand of the principles of design by challenging them in an informed way.
4. Refine and master glazing and surface design techniques. Begin to develop ability to mix glazes and slips.
5. Demonstrate clear understanding of the visual element of art by challenging them in an informed way.
6. Through research, writing, and class critique refine the ability to think, speak and write about contemporary ceramic sculpture in a

competent, nuanced, and critical way. Begin to measure one's work against the larger context of contemporary art.

ARTS 485. Special Topics in Advanced Metals/Jewelry
3-6 Credits (2-4+4P)
Advanced Metals/Jewelry course focusing on the following topics: conceptual development and personal aesthetic and style, professional practices, contemporary issues in Metals/Jewelry, and senior exhibition. Techniques may include enameling, coloring, historical processes, and digital technology. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits.
Prerequisite: 6 credits of ARTS 385, or consent of instructor.
Learning Outcomes
1. Apply fundamental elements and principles of design to art production specific to an intermediate level metal/jewelry course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in metal/jewelry.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary metal/jewelry.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary metal/jewelry.

ARTS 490. Museum Conservation Internship
1-6 Credits (1-6)
The goal of this internship is to provide a student with a practical learning experience in preventative conservation techniques and policies so that they can relate what they have learned in the classroom from ART 403 Preventative Conservation/Collections Care to applied situations. It will provide the student an opportunity to learn skills and knowledge needing in working with museum collections. Tasks and projects will be assigned by the instructor. 3 credits required for BFA in Museum Conservation. May be repeated up to 6 credits.
Prerequisite(s): ARTS 403.

ARTS 493. Studio Core III: Professional Practices
3 Credits (3)
This course teaches how to engage as a professional practicing artist, including how to find opportunities and jobs, documenting and archiving artwork, installing art for display, shipping art, and how to apply for exhibitions and grants, among other topics.
Learning Outcomes
1. Demonstrate professionalism through understanding and application of professional standards.
2. Create a comprehensive portfolio of creative output, including written statements contextualizing this research.
3. Analyze and evaluate both one's own artwork as well as the work of others.
4. Develop an ethical framework for artistic practice and decision-making.
5. Demonstrate an awareness of the broader artistic landscape and the importance of community engagement.

ARTS 494. Special Topics in Studio
3 Credits (3)
Specific subjects and credits to be announced in the Schedule of Classes online. May be repeated up to 9 credits.

ARTS 495. Studio Core IV: Thesis Production & Display
3 Credits (3)
Special research and independent study leading to undergraduate BFA and graduate MFA thesis-exhibition. The course focuses on thesis development as well as practical training in exhibition and installation.
Learning Outcomes
1. Develop and demonstrate project management skills to plan, organize, and execute artistic projects efficiently.
2. Explore strategies for presenting artworks professionally, both in physical and digital formats.
3. Understand principles of exhibition design, including spatial considerations and audience engagement.
4. Showcase a range of artworks that demonstrate proficiency in synthesis, thesis development, and effective presentation.

ARTS 496. Fundamentals of Studio Management
1 Credit (1)
Advanced studio course designed to introduce students to the fundamentals of studio management. Includes training in proper tools use and maintenance; safety procedures; and practical experience with studio oversight. Concurrent registration in advanced level studio course of the same media area required. May be repeated for a maximum of 3 credits. Restricted to majors. Graded S/U.
Prerequisite: consent of instructor.

ARTS 499. Problems in Studio Art
1-6 Credits (1-6)
Individualized study in specialized studio areas not covered by other advanced courses. May be repeated up to 9 credits. Consent of Instructor required.

ARTS 501. Museum Conservation Techniques I
3 Credits (2+3P)
Introduces the student to conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. This course also includes how to document the condition of an object during the conservation process. May be repeated up to 3 credits. Crosslisted with: ARTS 401.

ARTS 502. Museum Conservation Techniques II
3 Credits (2+3P)
Continues conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. Crosslisted with: ARTS 402.
Prerequisite(s): ARTS 501.

ARTS 503. Preventive Conservation/Collections Care
3 Credits (3)
Introduces the student on how to mitigate the deterioration and damage of cultural property in a museum setting through the formulation and implementation of policies and procedures. The course addresses most aspects of collections management and care for objects in storage, exhibitions and during transportation. Crosslisted with: ARTS 403.

ARTS 504. Applied Projects in Museum Conservation
3 Credits (3)
This course provides students with the practical application of techniques and policies learned in previous conservation coursework with the underpinnings of basic museum and conservations practices, particularly in collection care, preventative conservation, conservation, ethics, teamwork and security. May be repeated up to 6 credits. Crosslisted with: ARTS 404.
Prerequisite(s): ARTS 401, ARTS 402, ARTS 403 OR ARTS 501, ARTS 502, ARTS 503.

ARTS 540. Internship in Art
1-9 Credits (3P)
This course provides students with the opportunity for workplace learning as an important component in their program of study. Students can identify an internship in graphic design, photography, conservation or other studio areas; or within broader arts institutions such as museums, galleries and visual arts centers which will provide them with professional experience that will support the successful achievement of their career goals in art. May be repeated up to 9 credits. Crosslisted with: ARTS 440 and ARTS 340.

ARTS 550. Drawing and Painting Workshop
3-6 Credits (2-4+4P)
Graduate level drawing and painting course focusing on the development of concepts, expression and visual form. May be repeated up to 27 credits.
Prerequisite(s): Graduate standing.

ARTS 555. Graphic Design
3 Credits (3)
May be repeated up to 27 credits.

ARTS 565. Sculpture Media
3-9 Credits
May be repeated up to 27 credits.

ARTS 570. Photography Seminar
3-9 Credits (3-9)
Graduate students develop and implement a research program using photographic media and processes. Outcomes and program developed in consultation with photography faculty.
Prerequisite: .
Learning Outcomes
1. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography at the graduate level.

ARTS 575. Ceramic Arts
3-9 Credits
May be repeated up to 27 credits.

ARTS 576. Museum/Gallery Research Internship
1-9 Credits
Research internship in museum or gallery. Requirements determined by instructor in cooperation with supervising museum/gallery professional. For art history credit. May be repeated for a maximum of 9 credits.
Prerequisite: graduate standing.

ARTS 585. Metals and Jewelry Design
3-9 Credits
May be repeated up to 27 credits.

ARTS 595. Problems in Studio
1-6 Credits
Individualized study in specialized studio areas not covered by other advanced courses. May be repeated up to 12 credits. Consent of Instructor required.

ARTS 596. Graduate Studio Seminar
3 Credits (3)
Explores issues in contemporary art making and their relationship to personal work. Presentation of research in oral, visual, and written form. May be repeated for a maximum of 18 credits. Restricted to majors.
Prerequisite(s): Graduate standing.

ARTS 598. Studio Thesis
1-15 Credits
Special research in studio, leading to an exhibition and written thesis statement.

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University Art Museum Website: https://uam.nmsu.edu

Art (Art History) - Bachelor of Arts

The art history program is designed to give the student a broad familiarity with the visual arts through the factual and theoretical study of aesthetics, cultural contexts, iconography, stylistic development and technical practices. Students explore a range of methodologies and theoretical lenses through which to study objects and images. Art history coursework opens up broader questions about structures of race, class, sexuality, gender, identity and power as it relates to art, with a particular emphasis on the unique lens of the border region in which we are located. Art history is fundamentally interdisciplinary, therefore, students should take related courses in anthropology, history, languages and literature, music history, philosophy, religion, and theatre history.

Students are strongly encouraged to study at least one other language to prepare them for advanced research in the discipline, as the study of art is especially dependent on written sources in other languages. A degree in art history is excellent preparation for a range of careers, including in museum and galleries, education, travel and tourism, auction houses and estate sales, art and copyright law, equity analysis and public relations, arts correspondence and journalism, appraisal, libraries and archives, and more.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		

English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits) [1]		
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts		
ARTH 2110G	History of Art I	3
General Education Elective		
ARTH 2120G	History of Art II	3
Viewing a Wider World [3]		**6**
Departmental/College Requirements		
Both ART 2110G and ART 2120G count towards Area VI and the General Education elective and Departmental/College Requirements		
ARTS 1121	Studio Core I: Concept Development-Process and Play	3
ARTH 2136	Writing in Art	3
ARTH 479	Methodologies and Historiography of Art History and Art Theory	3
Choose one introductory ARTS course [4]		3
Choose two 300-level art history courses [4]		6
Choose two 400-level art history courses [4]		6
Choose 9 credits of 300/400-level ARTH courses [4]		9
Choose 9 credits of ARTS or ARTH electives		9
Electives, to bring the total credits to 120 [5]		**38-40**
While 6 credits can be either ARTS at any level or ARTH at upper-division level, 3 credits must be Upper-Division level ARTS/ARTH		
Total Credits		**120**

1 See the General Education (p. 262) section of the catalog for a full list of courses.

2 A Mathematics General Education course is required for the degree but students may need to take any prerequisites needed to enter the course selected first.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 Please see the Courses (p. 528) tab of the Art Department page within this catalog to determine which courses are Studio Art (ARTS) and which are Art History (ARTH).

5 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study

This roadmap assumes student placement in ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in Mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		**Credits**
ENGL 1110G or ENGL 1110H	Composition I (C- or better) or Composition I Honors	4
ARTH 2136	Writing in Art	3
ARTH 2110G	History of Art I	3
ARTS 1121	Studio Core I: Concept Development-Process and Play	3
Area III: Laboratory Science Course [1]		4
Area II: Mathematics Course (C- or better) [1]		3-4
Area IV: Social/Behavioral Sciences Course [1]		3
Elective Courses		7
	Credits	**30-31**
Sophomore		
ARTH 2120G	History of Art II	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Choose one from the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
ARTS Course (1000-2000 level) Course (C- or better) [3]		3
ARTH Course (300-level) (C- or better) [3]		3
ARTH Course (300-level) (C- or better) [3]		3
Either a ARTS Course (2000/400-level) or an ARTH Course (300/400-level) (C- or better in either [3]		3
Elective Courses(s)		9
	Credits	**30**
Junior		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course [1]		3-4
ARTH Course (300/400-level) (C- or better) [3]		3
Either an ARTS Course (any level) or an ARTH course (300/400-level) (C- or better) [3]		3
Area V: Humanities Course [1]		3
Viewing a Wider World [4]		3
ARTH Course (300/400-level) (C- or better) [3]		3
ARTH Course (300/400-level) (C- or better) [3]		3
Elective Course(s)		9
	Credits	**30-31**
Senior		
Viewing a Wider World [4]		3
ARTH Course (400-level) (C- or better) [3]		3
ARTH 479	Methodologies and Historiography of Art History and Art Theory (C- or better)	3
Upper-Division ARTS/ARTH Elective Course (C- or better in either) [3]		3
ARTH Course (400-level) (C- or bettter) [3]		3
Elective Course(s)		15
	Credits	**30**
	Total Credits	**120-122**

1 See the General Education (p. 262) section of the catalog for a full list of courses.

[2] Students must complete a Second Language requirement, see the Requirements (p. 542) tab for more information about the ways to complete this.

[3] Please see the Courses (p. 528) tab of the Art Department page within this catalog to determine which courses are Studio Arts (ARTS) and which are Art History (ARTH).

[4] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Art (Studio Art) - Bachelor of Arts

The Bachelor of Arts is designed to give the student a broad interdisciplinary understanding of the areas of painting/drawing, digital art, graphic design, printmaking, sculpture, photography, ceramics, conservation, jewelry and metalsmithing, through a series of introductory and special topics courses and the history and appreciation of art in the context of a liberal education. Students are required to take 30 credits of upper-level studio art classes and 18 credits of Art History.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits) [1]		
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts		
ARTH 2110G	History of Art I	3
General Education Elective		
ARTH 2120G	History of Art II	3
Viewing a Wider World [3]		**6**
Departmental/College Requirements		
Both ART 2110G and ART 2120G count towards Area VI and the General Education elective and Departmental/College Requirements		
ARTS 1121	Studio Core I: Concept Development-Process and Play	3
ARTS 1122	Studio Core II: Formal Structure Tools & Techniques	3
ARTH 2136	Writing in Art	3
Choose five Introductory Studio Art courses from the following:		15
ARTS 1310	Introduction to Ceramics	
ARTS 1410	Introduction to Photography	
ARTS 1610	Drawing I	
ARTS 1543	Digital and Analog Drawing: Bridging Tradition and Technology	
ARTS 1710	Introduction to Printmaking	
ARTS 1810	Jewelry and Small Metal Construction I	
ARTS 1630	Painting I	
ARTS 2431	Introduction to Graphic Design	
ARTS 2839	Introduction to Sculpture	
ARTS 2996	Special Topics in Studio	
Choose one 300-level ARTH course		3
Choose two 300-400 ARTH courses		6
Choose five 300-level ARTS courses		15
Choose five 400-level ARTS courses		15
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**17-19**
Total Credits		**120**

[1] See the General Education (p. 262) section of the catalog for a full list of courses.

[2] A Mathematics General Education course is required for the degree but students may need to take any prerequisites needed to enter the course selected first.

[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

[4] Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts- Art with a concentration in Studio Art there is no second language requirement for the degree.

A Suggested Plan of Study

This roadmap assumes student placement in ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in Mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G or ENGL 1110H	Composition I (C- or better) or Composition I Honors	4
ARTH 2136	Writing in Art (C- or better)	3
ARTS 1121	Studio Core I: Concept Development-Process and Play (C- or better)	3
Elective Course or FYEX 1112		2-3
Area II: Mathematics Course [2]		3-4
ARTS 1122	Studio Core II: Formal Structure Tools & Techniques ((C- or better))	3
ARTH 2110G	History of Art I (C- or better)	3
Introductory ARTS Course (C- or better) [1]		3
Introductory ARTS Course (C- or better) [1]		3
Introductory ARTS Course (C- or better) [1]		3
	Credits	**30-32**
Sophomore		
Choose one from the following:		3

ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Choose from one of the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
ARTH 2120G	History of Art II (C- or better)	3
Area IV: Social/Behavioral Sciences Course		3
Introductory ARTS Course (C- or better) [1]		3
Introductory ARTS Course (C- or better) [1]		3
Area III: Laboratory Science Course [2]		4
ARTS Course (300-level) (C- or better) [3]		3
ARTS Course (300-level) (C- or better) [3]		3
ARTH Course (300-level) (C- or better) [3]		3
	Credits	**31**
Junior		
Area V: Humanities Course [2]		3
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course [1]		3-4
ARTS Course (300-level) (C- or better) [3]		3
ARTS Course (300-level) (C- or better) [3]		3
ARTS Course (300-level) (C- or better) [3]		3
ARTH Course (300/400-level) (C- or better) [3]		3
Elective Courses		9
Viewing the Wider World Course [4]		3
	Credits	**30-31**
Senior		
Viewing a Wider World Course [4]		3
ARTH course (300/400-level) [3]		3
ARTS Course (400-level) (C- or better) [3]		3
ARTS Course (400-level) (C- or better) [3]		3
ARTS Course (400-level) (C- or better) [3]		3
ARTS Course (400-level) (C- or better) [3]		3
ARTS Course (400-level) (C- or better) [3]		3
Elective Courses		8
	Credits	**29**
	Total Credits	**120-123**

1 **Introductory ARTS Courses:** Certain ARTS 100-level courses, in addition to the ones below, may count but only apply for Transfer Students.
- ARTS 1310 Introduction to Ceramics
- ARTS 1410 Introduction to Photography
- ARTS 1610 Drawing I
- ARTS 1630 Painting I
- ARTS 1710 Introduction to Printmaking
- ARTS 1810 Jewelry and Small Metal Construction I
- ARTS 2431 Introduction to Graphic Design
- ARTS 2839 Introduction to Sculpture

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 Please see the Courses (p. 528) tab of the Art Department page within this catalog to determine which courses are Studio Art (ARTS) and which are Art History (ARTH).

4 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

5 Students can take one 4 credit Upper-Division Elective or can take one 3 credit Upper-Division and a 1 credit Elective to fulfill the requirement.

Art (Museum Conservation) - Bachelor of Fine Arts

Art Conservation is the study of the preservation and restoration of art as well as of other cultural and natural objects. The Bachelor of Fine Arts degree with an concentration in Museum Conservation provides an academic structure within which students master specific sets of practical skills while developing broad professional and theoretical perspectives toward the issue of conserving objects in a museum or collection setting. By combining theory with practice, the program offers students the interpretive, quantitative and administrative skills needed for careers as conservators, curators, registrars, collections managers, exhibit designers and museum administrators, all of whom must have specialized training in the care and handling of works of art to be successful.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1,2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social Behavioral Science Course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts		
ARTH 2110G	History of Art I	3
General Education Elective		
ARTH 2120G	History of Art II	3
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
Both ARTH 2110G and ARTH 2120G count towards Area VI and the General Education elective and Departmental/College Requirements		
Both CHEM 1215G and CHEM 1225G count towards Area III and Area III-IV General Education elective and Department/College Requirements		
Science		
Select Option A or Option B:		16
Option A [4]		
CHEM 313	Organic Chemistry I	
CHEM 314	Organic Chemistry II	

Choose one sequence from the following for eight credits:		8
CHEM 315	Organic Chemistry Laboratory	
CHEM 1215G & CHEM 1225G	General Chemistry I Lecture and Laboratory for STEM Majors and General Chemistry II Lecture and Laboratory for STEM Majors	
CHEM 1216 & CHEM 1226	General Chemistry I Lecture and Laboratory for CHEM Majors and General Chemistry II Lecture and Laboratory for CHEM Majors	
Option B [5]		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
CHEM 2120	Integrated Organic Chemistry and Biochemistry	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
or EPWS 303	Economic Entomology	
Art Department requirements		
ARTS 1121	Studio Core I: Concept Development-Process and Play	3
ARTS 1630	Painting I	3
ARTS 1610	Drawing I	3
ARTH 2136	Writing in Art	3
ARTS 401	Museum Conservation Techniques I	3
ARTS 402	Museum Conservation Techniques II	3
ARTS 403	Preventative Conservation/Collections Care	3
ARTS 490	Museum Conservation Internship	3
Choose three 300-400 ARTH courses		9
Choose two ARTS courses or 300-400 level ARTS course		6
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
History/Anthropology		
ANTH 315	Introduction to Archaeology	3
Select three credits of HIST with the approval of the program advisor.		3
Select nine credits of ANTH with the approval of the program advisor.		9
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 [7]		**2-4**
Total Credits		**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. A Mathematics General Education course is required for the degree but students may need to take any prerequisites needed to enter the course first.
3. See the Viewing a Wider World (p. 266) section for a full list of courses
4. Recommended for students planning to attend graduate school in art conservation.
5. Recommended for students who do NOT plan to attend graduate school in art conservation.
6. Courses are open by permission of the instructor only.
7. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts- Art with a concentration in Museum Conservation there is no second language requirement for the degree.

A Suggested Plan of Study (Option A)

This roadmap assumes student placement in ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		**Credits**
ENGL 1110G or ENGL 1110H	Composition I (C- or better) or Composition I Honors	4
Area II: Mathematics Course (C- or better) [1]		3-4
Area IV: Social/Behavioral Sciences Course [1]		3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
ARTH 2136	Writing in Art (C- or better)	3
Choose one from the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors (C- or better) [2]	4
ARTS 1121	Studio Core I: Concept Development-Process and Play	3
ARTH 2110G	History of Art I (C- or better)	3
Elective Course		1
	Credits	**30-31**
Sophomore		
Area V: Humanities Course [1]		3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors (C- or better) [2]	4
ARTH 2120G	History of Art II (C- or better)	3
ARTS 1610	Drawing I (C- or better) [2]	3
ARTS Course (2000 or 300-level) (C- or better) [3]		3
CHEM 313	Organic Chemistry I (C- or better) [2]	3
ARTS 1630	Painting I [2]	3
ARTS Course (200-level) (C- or better) [3]		3
ARTH Course (300-level) (C- or better) [3]		3
Elective Course		2
	Credits	**30**
Junior		
Viewing a Wider World Course [4]		3
CHEM 314	Organic Chemistry II (C- or better) [2]	3
CHEM 315	Organic Chemistry Laboratory (C- or better)	2
ANTH 315	Introduction to Archaeology (C- or better) [2]	3
ARTH Course (300-level) (C- or better) [3]		3

ARTS 403	Preventative Conservation/Collections Care (C- or better) [2]	3
ARTH Course (300-level) (C- or better) [3]		3
Viewing a Wider World Course [4]		3
Elective Courses		7
	Credits	**30**
Senior		
HIST Elective Course (C- or better) [2,5]		3
ANTH Elective Course (C- or better) [2,6]		3
ARTS 490	Museum Conservation Internship (C- or better) [2]	3
ARTS 401	Museum Conservation Techniques I (C- or better) [2]	3
ANTH Elective Course (C- or better) [2,6]		3
ANTH Elective Course (C- or better) [2,6]		3
ARTS 402	Museum Conservation Techniques II (C- or better) [2]	3
Elective Courses		9
	Credits	**30**
	Total Credits	**120-121**

1 See the General Education (p. 262) section of the catalog for a full list of courses.
2 For students interested in graduate school in this major, it is highly recommended to obtain a B- or better for all Museum Conservation Requirements
3 Please see the Courses (p. 528) tab of the Art Department page within this catalog to determine which courses are Studio Arts (ARTS) and which are Art History (ARTH).
4 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5 Work with your program advisor to select an approved HIST course to meet this requirement.
6 Work with your program advisor to select an approved ANTH course to meet this requirement.

A Suggested Plan of Study (Option B)

This roadmap assumes student placement in ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		**Credits**
ENGL 1110G	Composition I	4
Area II: Mathematics Course (C- or better) [1]		3-4
Area IV: Social/Behavioral Sciences Course [1]		3
Choose one from the following:		3
AXED 2120G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
ARTH 2136	Writing in Art (C- or better)	3
Choose from one of the following:		3
ENGL 2210G	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors (C- or better) [2]	4
ARTS 1121	Studio Core I: Concept Development-Process and Play	3
ARTH 2110G	History of Art I (C- or better) [1]	3
Elective Course		2
	Credits	**31-32**
Sophomore		
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors (C- or better) [2]	4
ARTS 1610	Drawing I (C- or better) [2]	3
ARTS 1630	Painting I (C- or better) [2]	3
ARTH 2120G	History of Art II (C- or better)	3
CHEM 2120	Integrated Organic Chemistry and Biochemistry	3
ARTS Course (200 or 300-level) (C- or better) [3]		3
ARTH Course (300-level) (C- or better) [3]		3
Area V: Humanities Course [1]		3
Elective Courses		4
	Credits	**29**
Junior		
Viewing a Wider World Course [4]		3
ANTH 315	Introduction to Archaeology (C- or better) [2]	3
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory (C- or better)	3
ARTS Course (200 or 300-level) (C- or better) [3]		3
ARTS 403	Preventative Conservation/Collections Care (C- or better) [2]	3
ARTH Course (300-level) (C- or better) [3]		6
ARTS 401	Museum Conservation Techniques I (C- or better) [2]	3
HIST Elective Course [3]		3
Elective Courses		3
	Credits	**30**
Senior		
Viewing a Wider World [4]		3
ANTH Elective Courses (C- or better) [2,6]		9
ARTS 402	Museum Conservation Techniques II (C- or better) [2]	3
Elective Course (Upper Division)		3
Elective Courses		12
	Credits	**30**
	Total Credits	**120-121**

1 See the General Education (p. 262) section of the catalog for a full list of courses.
2 For students interested in graduate school in this major, it is highly recommended to obtain a B- or better for all Museum Conservation Requirements
3 Please see the Courses (p. 528) tab of the Art Department page within this catalog to determine which courses are Studio Art (ARTS) and which are Art History (ARTH).
4 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5 Work with your program advisor to select an approved HIST course to meet this requirement.

[6] Work with your program advisor to select an approved ANTH course to meet this requirement.

Art (Studio Art) - Bachelor of Fine Arts

The studio art curriculum is designed to give the student a broad, transdisciplinary understanding of the field of visual arts, including appreciation and criticism, art history, ceramics, drawing, graphic design and media arts, jewelry/metalsmithing, painting, photography, printmaking, sculpture and museum conservation. This program is recommended for those students who wish to embark on a professional career in art. The Bachelor of Fine Arts degree is a professional baccalaureate degree, which requires a senior thesis exhibition and capstone class in the final semester of study. Students seeking a BFA must apply in the spring of their sophomore year for acceptance into the BFA program - this is done via a portfolio review.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1,2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits) [1]		
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts		
ARTH 2110G	History of Art I	3
General Education Elective		
ARTH 2120G	History of Art II	3
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
Both ARTH 2110G and ARTH 2110G count towards Area VI and the General Education elective and Departmental/College Requirements		
ARTS 1121	Studio Core I: Concept Development-Process and Play	3
ARTS 1122	Studio Core II: Formal Structure Tools & Techniques	3
ARTH 2136	Writing in Art	3
ARTS 493	Studio Core III: Professional Practices	3
ARTS 495	Studio Core IV: Thesis Production & Display	3
Choose five Introductory ARTS courses		15
Choose five 300-level ARTS courses		15
Choose one 300-level ARTH course		3
Choose five 400-level ARTS courses		15
Choose one 300/400-level ARTS course		3
Choose two 300/400-level ARTH courses		6
Second Language: (not required)		
Electives, to bring the total credits to 120 [5]		**8-10**
Total Credits		**120**

[1] See the General Education (p. 262) section of the catalog for a full list of courses

[2] A Mathematics General Education course is required for the degree but students may need to take any prerequisites needed to enter the course first.

[3] See the Viewing a Wider World (p. 266) section for a full list of courses

[4] **Introductory ARTS Courses:** Certain ARTS 1000/2000-level courses, in addition to the ones below, may count but only apply for Transfer Students.

- ARTS 1310 Introduction to Ceramics
- ARTS 1410 Introduction to Photography
- ARTS 1610 Drawing I
- ARTS 1630 Painting I
- ARTS 1710 Introduction to Printmaking
- ARTS 1810 Jewelry and Small Metal Construction I
- ARTS 2431 Introduction to Graphic Design
- ARTS 2839 Introduction to Sculpture
- ARTS 1611 Digital and Analog Drawing

[5] Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts- Art with a emphasis in Studio Art there is no second language requirement for the degree.

A Suggested Plan of Study

This roadmap assumes student placement in ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		Credits
ENGL 1110G or ENGL 1110H	Composition I (C- or better) or Composition I Honors	4
ARTH 2136	Writing in Art (C- or better)	3
Introductory Studio Art Course (C- or better) [1]		3
ARTS 1121	Studio Core I: Concept Development-Process and Play (C- or better)	3
ARTS 1122	Studio Core II: Formal Structure Tools & Techniques	3
Area II: Mathematics Course [2]		3-4
ARTH 2110G	History of Art I (C- or better)	3
Introductory ARTS Course (C- or better) [1]		3
Introductory ARTS Course (C- or better) [1]		3
Introductory ARTS Course (C- or better) [1]		3
	Credits	**31-32**

Second Year		
Choose one from the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
ARTH 2120G	History of Art II (C- or better)	3
Introductory ARTS Course (C- or better) [1]		3
Introductory ARTS Course (C- or better) [1]		3
Area III: Laboratory Sciences Courses [2]		4
Area IV: Social Sciences course		3
ARTS Course (300-level) (C- or better) [3]		3
ARTS course (300-level)(C- or better) [3]		3
ARTH Course (300-level) (C- or betteR) [3]		3
	Credits	**31**
Third Year		
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course [2]		3-4
ARTS Course (300-level) (C- or better) [3]		3
ARTS Course (300-level)(C- or better) [3]		3
ARTS Course (300-level)(C- or better) [3]		3
ARTH Course (300/400-level) (C- or better) [3]		3
ARTH Course (300/400-level)(C- or better) [3]		3
ARTS Course (400-level) (C- or better) [3]		3
ARTS Course (400-level)(C- or better)		
ARTS Course (300/400-level)(C- or better)		3
Area V: Humanities Course [2]		3
Elective course		3-4
	Credits	**30-32**
Fourth Year		
Viewing a Wider World Course [4]		3
Viewing a Wider World Course [4]		3
ARTS Courses (400-level) (C- or better) [3]		3
ARTS Course (400-level)(C- or better) [3]		3
ARTS Course (400-level)(C- or better) [3]		3
ARTS Course (400-level)(C- or better) [3]		3
ARTS 493	Studio Core III: Professional Practices	3
ARTS 495	Studio Core IV: Thesis Production & Display	3
Elective Course(s)		4
	Credits	**28**
	Total Credits	**120-123**

[1] **Introductory ARTS Courses:** Certain ARTS 200-level courses, in addition to the ones below, may count but only apply for Transfer Students.

- ARTS 1310 Introduction to Ceramics
- ARTS 1410 Introduction to Photography
- ARTS 1610 Drawing I
- ARTS 1630 Painting I
- ARTS 1710 Introduction to Printmaking
- ARTS 1810 Jewelry and Small Metal Construction I
- ARTS 2431 Introduction to Graphic Design
- ARTS 2839 Introduction to Sculpture
- ARTS 1611 Digital and Analog Drawing

[2] See the General Education (p. 262) section of the catalog for a full list of courses.

[3] Please see the Courses (p. 528) tab of the Art Department page within this catalog to determine which courses are Studio Art (ARTS) and which are Art History (ARTH).

[4] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Art - Undergraduate Minor

The Studio Art minor requires 18 credits. Students earning a BA or BFA in Studio Art cannot get a minor in Studio Art. Students earning a BA in Art History or BFA in Museum Conservation can get a minor in Studio Art by passing at least 6 credits in the minor beyond the requirements of the major.

Prefix	Title	Credits
Required Courses		
Studio art or art history at the 300-400 level		9
Select three from the following:		9
ARTH 2110G	History of Art I	
ARTH 2120G	History of Art II	
ARTS 1310	Introduction to Ceramics	
ARTS 1410	Introduction to Photography	
ARTS 1610	Drawing I	
ARTS 1630	Painting I	
ARTS 1810	Jewelry and Small Metal Construction I	
ARTS 1710	Introduction to Printmaking	
ARTH 2136	Writing in Art	
ARTS 2431	Introduction to Graphic Design	
ARTS 2839	Introduction to Sculpture	
Total Credits		**18**

Art History - Undergraduate Minor

The Art History minor requires 18 credits. Students earning a BA in Art History cannot get a minor in Art History. Students earning a BA in Studio Art, BFA in Studio Art, or BFA in Museum Conservation can get a minor in Art History by passing at least 6 credits in the minor beyond the requirements of the major.

Prefix	Title	Credits
Required Courses		
ARTH 2110G	History of Art I	3
ARTH 2120G	History of Art II	3
ARTH 2136	Writing in Art	3
ARTH courses at the 300-499 level		9
Total Credits		**18**

Museum Conservation - Undergraduate Minor

The Museum Conservation minor requires 18 credits. Students cannot earn both a bachelor's degree in the Department of Art and the Museum Conservation minor unless they pass at least 6 credits in the minor beyond the requirements of the major. An undergraduate minor in

Museum conservation requires the completion of 9 credits of the three 400 level museum conservation courses listed below, and 9 credits of the courses selected from one of the three tracks listed below.

Prefix	Title	Credits
Required Courses		
ARTS 401	Museum Conservation Techniques I (Spring)	3
ARTS 402	Museum Conservation Techniques II (Fall)	3
ARTS 403	Preventative Conservation/Collections Care (Directed Readings)	3
Select one from the following tracks:		9
Anthropology		
Art		
History		
Total Credits		**18**

Track 1: Anthropology

Prefix	Title	Credits
Select 9 credits from the following:		9
ANTH 315	Archaeological Method and Theory	
ANTH 345	Introduction to Museology	
ANTH 349	Museum Anthropology	
ANTH 313V	Ancient Mexico	
ANTH 330V	Magic Witchcraft and Religion	
ANTH 464	Curation Crisis in Archaeology	
ANTH 467	Archaeology of Ancient Southwest	
ANTH 318	Historical Archaeology	
ANTH 378	Lab Methods in Archaeology	
Total Credits		**9**

Track 2: Art

Prefix	Title	Credits
Select 9 credits from the following:		9
ARTH 2110G	History of Art I	
ARTH 2120G	History of Art II	
ARTS 1310	Introduction to Ceramics	
ARTS 1410	Introduction to Photography	
ARTS 1610	Drawing I	
ARTS 1630	Painting I	
ARTS 1710	Introduction to Printmaking	
ARTS 1810	Jewelry and Small Metal Construction I	
ARTH 2136	Writing in Art	
ARTS 2839	Introduction to Sculpture	
Any 300-400 level ARTH course		
Total Credits		**9**

Track 3: History

Prefix	Title	Credits
Select 9 credits from the following:		9
HIST 371	Ancient Greece	
HIST 397	Introduction to Public History	
HIST 483	Historic Preservation	
HIST 486	Interpreting Historic Places for the Public	
Total Credits		**9**

Astronomy

Undergraduate Program Information

The Department of Astronomy offers an undergraduate astronomy minor degree, which requires 18-20 credits. The Department does not offer a BS degree, but encourages interested students to enroll in the physics program as a first step toward a career in astronomy. Our 100- and 300-level courses meet various university general education requirements. All students are invited to share with us this exciting area of study, through our basic and advanced undergraduate courses

Prefix	Title	Credits
Course List [1]		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	4
ASTR 1120G	The Planets Lecture & Laboratory	4
ASTR 301V	Revolutionary Ideas in Astronomy	3
ASTR 305V	The Search for Life in the Universe	3
ASTR 308V	Into the Final Frontier	3
ASTR 400	Undergraduate Research	1-3
ASTR 401	Topics in Modern Astrophysics	3
ASTR 402	Astronomical Observations and Techniques	3

[1] Other courses at the 300 and 400-levels are offered on an occasional basis. Consult the "Course Descriptions" section in this catalog.

Graduate Program Information

The Department of Astronomy offers graduate work leading to the Doctor of Philosophy and Master of Science degrees. To be admitted as a regular student to the NMSU Graduate School as a major in astronomy, a student must present a suitable undergraduate background with emphasis (12-16 credits) on junior-senior level physics and mathematics. There is also an option of a Master's Accelerated Program (MAP).

Information on assistantships and fellowships in teaching and research can be obtained from the department.

Each entering graduate student will be assigned a committee that will guide the student in choice of courses, suggest training if needed to remedy deficiencies and determine specific degree requirements in accord with the student's needs and objectives, and in agreement with departmental policies. The program requires 33 traditional course credit hours (11 classes), 4 seminar class credit hours, plus research in astronomy. Each student must demonstrate, no later than during the third year, sufficient academic and research ability to qualify for continuation in doctoral studies.

The MS degree in astronomy is closely connected with the astronomy Ph.D. program, and questions concerning requirements should be directed to the department.

Qualifying, Comprehensive and Final examinations are described elsewhere in this catalog. Questions concerning styles of the examinations should be directed to the department head.

The department has access to several different observing facilities. NMSU operates the Apache Point Observatory on behalf of the Astrophysical Research Corporation and the observatory is home to several telescopes:

- the ARC 3.5m telescope,
- a 1-meter telescope as part of the global SONG (http://astronomy.nmsu.edu/song-wiki/) project
- the ARCSAT 0.5m telescope, and
- the Sloan Digital Sky Survey (SDSS) 2.5m telescope.

The Department is a full partner in the SDSS project. The Department also operates the Dunn Solar Telescope and the Visitor's Center at the Sunspot Solar Observatory. The Department also operates a 24-inch telescope on Tortugas Mountain, near the NMSU campus.

The department is home to the NASA Planetary Data System Atmosphere Node, where solar system exploration data are archived.

Degrees for the Department

Master Degree(s)

- Astronomy - Master of Science (p. 109)

Doctoral Degree(s)

- Astronomy - Doctor of Philosophy (p. 204)

Minors for the Department

- Astronomy - Undergraduate Minor (p. 555)

Professor, Jason Jackiewicz, Department Head

Professors: Chanover, Jackiewicz***; Associate Professors***: Burchett, Finlator, Lyra, Nielsen, Prescott; ***Assistant Professors:*** Monty, Shetye; ***Observatory Specialist***: Edwards

J. Burchett, Ph.D. (University of Massachusetts) - galaxy clusters, inter-galactic medium, cosmic simulations;

N. Chanover, Ph.D. (New Mexico State University) - planetary astronomy;

K. Finlator, Ph.D. (University of Arizona) - galaxy evolution, the intergalactic medium, cosmological reionization;

J. Jackiewicz, Ph.D. (Boston College) - solar physics, helioseismology, stellar structure and evolution, planetary interiors;

W. Lyra (Uppsala University) - planet formation, habitability;

S. Monty (Australian National University) - galactic archaeology; near-field cosmology; stellar populations;

E. Nielsen, Ph.D. (University of Arizona) - extrasolar planets;

M. Prescott, Ph.D. (University of Arizona) - Lyman-alpha nebulae, kinematics of gas within cosmic web;

J. Shetye, Ph.D. (Armagh Observatory) - solar physics, Sun-Earth connection.

Professors Emeritus:

C. Churchill, J. Holtzman, J. Murphy, R. Walterbos

Affiliated Faculty:

R.T.J. McAteer, N. Vogt

Astronomy Courses

ASTR 1115G. Introduction to Astronomy Lecture & Laboratory
4 Credits (3+2P)
This course surveys observations, theories, and methods of modern astronomy. The course is predominantly for non-science majors, aiming to provide a conceptual understanding of the universe and the basic physics that governs it. Due to the broad coverage of this course, the specific topics and concepts treated may vary. Commonly presented subjects include the general movements of the sky and history of astronomy, followed by an introduction to basic physics concepts like Newton's and Kepler's laws of motion. The course may also provide modern details and facts about celestial bodies in our solar system, as well as differentiation between them – Terrestrial and Jovian planets, exoplanets, the practical meaning of "dwarf planets", asteroids, comets, and Kuiper Belt and Trans-Neptunian Objects. Beyond this we may study stars and galaxies, star clusters, nebulae, black holes, and clusters of galaxies. Finally, we may study cosmology--the structure and history of the universe.The lab component of this course includes hands-on exercises that work to reinforce concepts covered in the lecture, and may include additional components that introduce students to the night sky. May be repeated up to 4 credits.
Learning Outcomes

1. Students will discuss the night sky as seen from Earth, including coordinate systems, the apparent daily and yearly motions of the sun, Moon, and stars, and their resulting astronomical phenomena.
2. Students will list and apply the steps of the scientific method.
3. Students will describe the scale of the Solar System, Galaxy, and the Universe.
4. Students will explain telescope design and how telescopes and spectra are used to extract information about Astronomical objects.
5. Students will describe the formation scenarios and properties of solar system objects.
6. Students will describe gravity, electromagnetism, and other physical processes that determine the appearance of the universe and its constituents.
7. Students will describe methods by which planets are discovered around other stars and current results.
8. Students will describe the structure, energy generation, and activity of the sun.
9. Students will compare our sun to other stars and outline the evolution of stars of different masses and its end products, including black holes. 1
10. Students will describe the structure of the Milky Way and other galaxies and galaxy clusters. 1
11. Students will describe the origin, evolution, and expansion of the universe based on the Big Bang Theory and recent Astronomical observations. 1
12. Students will describe conditions for life, its origins, and possible locations in the universe.

ASTR 1116. Introduction to Astronomy Lab, Special
1 Credit (1)
This lab-only listing exists only for students who may have transferred to NMSU having taken a lecture-only introductory astronomy class, to allow them to complete the lab requirement to fulfill the general education requirement. Consent of Instructor required. , at some other institution). Restricted to Las Cruces campus only.
Prerequisite(s): Must have passed Introduction to Astronomy lecture-only.

Learning Outcomes

1. Course is used to complete lab portion only of ASTR 1115G or ASTR 112
2. Learning outcomes are the same as those for the lab portion of the respective course.

ASTR 1120G. The Planets Lecture & Laboratory
4 Credits (3+2P)
Comparative study of the planets, moons, comets, and asteroids which comprise the solar system. Emphasis on geological and physical processes which shape the surfaces and atmospheres of the planets. Laboratory exercises include analysis of images returned by spacecraft. Intended for non-science majors, but some basic math required. May be repeated up to 4 credits.

Learning Outcomes

1. Students will describe the sky as seen from Earth, the apparent daily and yearly motions of the Sun, Moon, planets and stars, and resulting astronomical phenomena.
2. Students will apply the process of the scientific method in an astrophysical setting.
3. Students will describe the structure of the solar system and explain the development of the currently accepted model of solar system formation.
4. Students will explain how telescopes and spectra are used to extract information about astronomical objects.
5. Students will describe properties of minor solar system objects, such as dwarf planets, moons, asteroids, meteoroids, and comets.
6. Students will compare and contrast bulk and unique properties of the Terrestrial and Jovian worlds.
7. Students will describe how gravity and other physical processes determine the appearance of the solar system and its constituents.

ASTR 301V. Revolutionary Ideas in Astronomy
3 Credits (3)
Examines recent fundamental scientific revolutions that have shaped our view of Earth and the universe. Topics in astronomy range from exoplanets to black holes to dark energy and raise questions about the very nature of how we use the scientific method to see the unseen, and how this shapes science research today.
Prerequisite(s): Any general education science course.

ASTR 305V. The Search for Life in the Universe
3 Credits (3)
Use of information from several of the sciences to explore the likelihood that life exists elsewhere in the universe. Subjects include an overview of historical ideas about the possibility of life elsewhere in the universe, the chemistry and biology of life on Earth, recent explorations for life within our solar system, and current search strategies for life in the universe and their scientific basis.

ASTR 308V. Into the Final Frontier
3 Credits (3)
Exploration of space: a brief review of the history of space flight, the Apollo program, joint U.S.-Soviet space missions, and unstaffed exploration of the planets. Emphasis on knowledge gained through these efforts. Includes new space initiatives. Same as HNRS 308V.

ASTR 330V. Planetary Exploration
3 Credits (3)
A current planetary exploration mission is studied within the context of the solar system. The data acquired and principles involved in executing the mission, as well as social, political, ethical and economic implications of planetary exploration, are examined. May be repeated up to 3 credits.

Learning Outcomes

1. Students will describe the various types of interplanetary missions used to explore solar system objects.
2. Students will explain the roles and responsibilities of the groups of scientists and engineers that comprise a mission team.
3. Students will describe the social, political, ethical, and financial challenges associated with planetary exploration.

ASTR 400. Undergraduate Research
1-3 Credits
Supervised individual study or research. May be repeated up to 9 credits.

Learning Outcomes

1. Students will learn basic astronomical research techniques in observation and theory.
2. Students will communicate their findings in venues such as department meetings.

ASTR 401. Topics in Modern Astrophysics
3 Credits (3)
This course is designed for students interested in astrophysics who have some background in math and physics and want to learn about basic astrophysics and interesting current topics. The course will cover basic astrophysical concepts such as orbital mechanics, light, and radiative processes and transfer. These concepts will be applied to the discussion of exciting modern topics involving planets, exoplanets, stars, galaxies, and/or cosmology, with topical emphasis determined by the instructor.
Prerequisite(s): MATH 1521G and (PHYS 2110 or PHYS 1310G).

ASTR 402. Astronomical Observations and Techniques
3 Credits (3)
Designed for students interested in astrophysics who have some background in math and astronomy and want to learn about techniques for obtaining and analyzing astronomical data. This course will review the properties of light and discuss the process of experimental design. The course will describe basic observational tools such as telescopes and detectors. It will discuss how data is obtained, and how features of the detector and the Earth's atmosphere can be corrected for. Some topics in basic astronomical data analysis will be discussed, with topical emphasis determined by the instructor. Some simple data analysis projects will be assigned. May be repeated up to 3 credits.
Prerequisite: MATH 1511G and (PHYS 2140 or PHYS 1320G) and (ASTR 1120G, ASTR 1115G, or ASTR 401).

Learning Outcomes

1. Review the properties of light and discuss the process of experimental design.
2. Describe basic observational tools such as telescopes and detectors.
3. Discuss how data is obtained, and how features of the detector and the Earth's atmosphere can be corrected for.
4. Discuss topics in basic astronomical data analysis.

ASTR 403. Fundamentals of Astronomy
3 Credits (3)
This course is designed to ensure a basic, quantitative knowledge of fundamental topics in astronomy and astrophysics. These topics include orbital mechanics, properties of radiation, principles of stellar radiation and spectra, structure and dynamics of the Milky Way, properties of galaxies, and basic cosmology. While this course is designed for first year graduate students, it is also cross-listed as a undergraduate course for students who have already had some exposure to astronomy and are prepared for a fast-paced review of fundamental topics and concepts in astronomy. Undergraduates will have a reduced homework load. Consent of Instructor required. Crosslisted with: ASTR 505.

Prerequisite(s): ASTR 401 or demonstrated background in astronomy and problem solving.

ASTR 499. Directed Study for Undergraduates
1-6 Credits
This course is for student who wish to minor in Astronomy but have already fulfilled all of the 6 credits of ASTR 400. This course will be administered by individual faculty who develop a meeting schedule with a student or students. It will count toward the minor requirements. May be repeated up to 6 credits.
Learning Outcomes
1. Students will learn basic astronomical research techniques in observation and theory.
2. Students will communicate their findings in venues such as department meetings.

ASTR 500. Seminar
1 Credit (1)
Organized group study treating selected topics.

ASTR 503. Fundamentals of Astrophysics
3 Credits (3)
This course is designed to ensure a basic, quantitative knowledge of fundamental topics in astronomy and astrophysics. These topics include orbital mechanics, properties of radiation, principles of stellar radiation and spectra, structure and dynamics of the Milky Way, properties of galaxies, and basic cosmology.
Learning Outcomes
1. Ensure a basic, quantitative knowledge of fundamental topics in astronomy and astrophysics.
2. Discuss orbital mechanics, properties of radiation, principles of stellar radiation and spectra, structure and dynamics of the Milky Way, properties of galaxies, and basic cosmology.

ASTR 506. Dynamics and Hydrodynamics
3 Credits (3)
Graduate level course on basic stellar dynamics and fundamentals of hydrodynamics. May be repeated up to 3 credits.
Learning Outcomes
1. Learn and be able to apply basics of stellar dynamics and hydrodynamics.

ASTR 530. Gas and Radiative Processes
3 Credits (3)
This course will introduce the basic physics of the the primary gaseous environments in the universe and their observational signatures. Astrophysical environment to be addressed will include the atmospheres of stars, the interstellar medium, the circumgalactic medium, and the intergalactic medium. Physical processes covered will include gas hydrodynamics, radiative and collisional excitation and ionization balance in astrophysics, atomic processes and detailed balancing, heating and cooling balance, and evolution. From the observational point of view, the course will discuss the spectral signatures of these processes, including stellar spectra, 21-cm spectra, emission line spectra from HII regions and planetary nebulae, and absorption lines from the interstellar medium, circumgalactic medium, and intergalactic medium.
Learning Outcomes
1. Introduce the basic physics of the the primary gaseous environments in the universe and their observational signatures.
2. Describe the atmospheres of stars, the interstellar medium, the circumgalactic medium, and the intergalactic medium.
3. Understand principles of gas hydrodynamics, radiative and collisional excitation and ionization balance in astrophysics, atomic processes and detailed balancing, heating and cooling balance, and evolution.
4. Discuss spectral signatures of these processes, including stellar spectra, 21-cm spectra, emission line spectra from HII regions and planetary nebulae, and absorption lines from the interstellar medium, circumgalactic medium, and intergalactic medium.

ASTR 535. Observational Techniques
3 Credits (3)
Up-to-date introduction to modern observational astronomy in a two-semester sequence. Topics include: introduction to computers, error analysis in data, the different types of optical telescopes, and optical and infrared photometry, image processing, and detectors. May be repeated up to 3 credits.
Learning Outcomes
1. Discuss an introduction to computers, error analysis in data, the different types of optical telescopes, and optical and infrared photometry, image processing, and detectors.

ASTR 545. Stellar Spectroscopy
3 Credits (3)
This course covers the physics of stellar atmospheres with emphasis on using spectra as a diagnostic tool for understanding the properties of stars. Topics include spectral classification, radiative transfer, gas equilibrium physics, line and continuum opacities, adiabatic and superadiabatic convection, and extraction of observed quantities from spectra for deducing physical conditions of the source.

ASTR 555. Galaxies I
3 Credits (3)
Fundamentals of the properties of galaxies and galaxy components, including stars and stellar populations, gas and dust, central black holes, and dark matter. Includes a detailed description of the properties of the Milky Way Galaxy.

ASTR 565. Stellar Interiors
3 Credits (3)
Internal constitutions of stars, computation of stellar models, and stellar evolution.

ASTR 598. Special Research Programs
1-6 Credits
Individual investigations, either analytical or experimental.

ASTR 599. Master's Thesis
1-15 Credits (1-15)
Master's level research in astrophysics or observational astronomy. May be repeated up to 88 credits.
Learning Outcomes
1. Varies

ASTR 600. Pre-dissertation Research
1-15 Credits
Research.

ASTR 601. Thesis Proposal Preparation
1 Credit (1)
This is a one-credit course that introduces students to Departmental expectations regarding the Thesis Proposal and provides rigorous training in proposal-writing. Drawing heavily from the presentation in the course textbook, Writing Science by Joshua Schimel, students will practice devising, developing, and proposing three new ideas for astronomical research over the course of the academic term. Classroom activity will consist of a mixture of short lecture-discussions and focused

peer-editing sessions; homework will consist of readings and writing assignments. While the course will assist students in developing their thesis proposals, its topics are general enough to be useful for any proposal. Students taking Pre-Dissertation Research in their fifth semester are required to register for this course, while students in their fourth and fifth years who have not yet defended their thesis proposals are strongly encouraged to join them. This course should not change the total number of credits for which students are expected to register in a semester

Learning Outcomes

1. Provide continuing programmatic/structural support to students as they transition from structured coursework/cumes to unstructured thesis work.
2. Suppress the temptation for students to distance physically starting in the third year.
3. Optimize balance between programmatic progress and ongoing research/outreach commitments.
4. Clarify thesis proposal expectations and improve consistency between experiences of different students.
5. Suppress thesis proposal inflation.
6. Train students in ideation and proposal writing.

ASTR 605. Interstellar Medium
3 Credits (3)
Basics of radiative transfer and processes in the interstellar medium. Properties of dust and infrared emission from grains. Applications to neutral atomic and molecular gas and ionized plasmas in galaxies. May be repeated up to 3 credits.

ASTR 616. Galaxies II
3 Credits (3)
Galaxy formation within a cosmological context. Topics include an introduction to cosmology, the growth of linear and nonlinear structures, the formation of dark matter halos, galaxy growth and feedback processes, and their observational signatures in the intergalactic and circumgalactic media.

ASTR 620. Planetary Processes
3 Credits (3)
Evaluation and analysis of observational data on solar system objects to determine their nature and physical conditions, with emphasis upon atmospheres (composition, structure, thermodynamics, evolution, etc.). Restricted to Astronomy Majors. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluation and analysis of observational data on solar system objects to determine their nature and physical conditions, with emphasis upon atmospheres (composition, structure, thermodynamics, evolution, etc.)

ASTR 621. Planetary System Formation
3 Credits (3)
The physical processes involved in planetary system formation are addressed. Specific foci include molecular cloud collapse, disk processes, and competing theories of planet formation within disks. Additional topics to be discussed may include: the solar wind, planetary magnetic fields, planetary ring processes, and mineralogy. May be repeated up to 3 credits. Restricted to: ASTR majors.

ASTR 630. Advanced Methods in Astrophysics
3 Credits (3)
Provides basic background in numerical and statistical methods relevant to astrophysical research. Topics include a review of probability and probability distribution functions, Bayesian and frequentist approaches, data simulation, parameter estimation, Markov Chain Monte Carlo, image processing, feature detection, inversions or other topics. May be repeated up to 3 credits.

Learning Outcomes

1. Perform basic background in numerical and statistical methods relevant to astrophysical research.
2. Review of probability and probability distribution functions, Bayesian and frequentist approaches, data simulation, parameter estimation, Markov Chain Monte Carlo, image processing, feature detection, inversions or other topics.

ASTR 670. Heliophysics, Space Plasmas, and Space Weather
3 Credits (3)
Explore the Sun and its processes. the heliopshere, and its interactions with the planets. Topics include: A introductory description of space weather and its physics; energy interaction with the space environment; the quiet Sun and its interactions with planetary atmospheres (with an emphasis on Earth); Magnetohydrodynamics; frozen-in flux; the solar wind; magnetized fluid dynamics; the active Sun(flares and coronal mass ejections); the effects of Space Weather. May be repeated up to 3 credits.

Learning Outcomes

1. Manipulate the equations of electromagnetism for any astrophysical plasma, and thereby predict the behavior of any plasma under specific conditions.
2. Use the equations of electromagnetism to explain temporal and spatial size scales throughout the heliosphere.
3. Interpret the role magnetism plays in both the storage and release of energy in plasmas.
4. Analyze the effect and impact of solar particles and radiation on Earth, and at other planets.

ASTR 671. Solar Astrophysics
3 Credits (3)
Solar astrophysics, including observational and theoretical aspects of the Sun's atmosphere. Although focused on the Sun, the course will be conducted so be of general interest to all astronomy graduate students

Learning Outcomes

1. Develop critical thinking skills in study the solar atmosphere.
2. Asses the validity of solar MHD and other approximations in uncovering the physics of the Sun.
3. Investigate the evolution of solar features at multiple size scales.
4. Determine the connections of the solar plasma oscillations and particle acceleration to energy release processes.

ASTR 698. Special Topics.
1-9 Credits
Special topics.

ASTR 700. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

Phone: (575) 646-4438

Website: http://astro.nmsu.edu/ (http://astro.nmsu.edu)

Astronomy - Undergraduate Minor

The department offers a minor created for majors in a variety of scientific fields, and two minor emphases specifically designed to address the needs and interests of students from the Colleges of Education and Engineering. Any undergraduate, however, may pursue any of the three minor tracks.

Requirements

The requirements for the regular minor requires 19 credits, from the following:

Prefix	Title	Credits
Requirements		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
or ASTR 1120G	The Planets Lecture & Laboratory	
Select two from the following: [1]		6
ASTR 301V	Revolutionary Ideas in Astronomy	
ASTR 305V	The Search for Life in the Universe	
ASTR 308V	Into the Final Frontier	
ASTR 330V	Planetary Exploration	
Select 9 credits between the following groups: [2]		9
Group A		
Select 6-9 credits from the following: [2]		
ASTR 401	Topics in Modern Astrophysics	
ASTR 402	Astronomical Observations and Techniques	
Group B		
Select 3-9 credits from the following: [2,4]		
A E 424	Aerospace Systems Engineering	
BIOL 451	Physiology of Microorganisms	
BIOL 467	Evolution	
BIOL 473	Ecology of Microorganisms	
CSCI 4405	Artificial Intelligence I	
CSCI 4140	Database Management Systems I	
CSCI 4215	Parallel Programming	
CHEM 433	Physical Chemistry I	
E E 395	Introduction to Digital Signal Processing	
E E 400	Undergraduate Research	
E E 444	Advanced Image Processing	
E E 446	Digital Image Processing	
E E 454	Antennas and Radiation	
E E 460	Space System Mission Design and Analysis	
E E 465	Machine Learning I	
E E 473	Introduction to Optics	
E E 478	Fundamentals of Photonics	
ENGR 401	Engineering Capstone I	
ENGR 402	Engineering Capstone II	
GEOL 465	Isotope Geochemistry	
MATH 4210	Complex Variables	
MATH 4220	Fourier Series and Boundary Value Problems	
PHYS 451	Intermediate Mechanics I	
PHYS 461	Intermediate Electricity and Magnetism I	
PHYS 480	Thermodynamics	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
STAT 4220	Statistics: Theory and Applications	
Total Credits		**15**

1. Three credits of ASTR 400 Undergraduate Research may replace one of these courses.
2. ASTR 401 Topics in Modern Astrophysics and ASTR 402 Astronomical Observations and Techniques are the preferred classes but are generally offered only in alternate years. Three credits of ASTR 400 Undergraduate Research may replace one of these courses, but not the same three if used above.
3. Cross-listed with graduate classes and require special permission.
4. Alternative 400-level courses in the physical sciences, engineering, or related fields, including one-time seminars, may be proposed on a case-by-case basis to fulfill this requirement, drawn from the fields of astronomy, biochemistry, biology, chemistry, computer science, geology, geophysics, mathematics, physics, statistics or from engineering. Proposals should include a clear justification that connects the course materials to a particular topic in astronomy or astrophysics.

Emphasis: Education

The requirements for the education track minor requires 18-20 credits from the following:

Prefix	Title	Credits
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	4
ASTR 1120G	The Planets Lecture & Laboratory	4
Select two from the following:		6
ASTR 301V	Revolutionary Ideas in Astronomy	
ASTR 305V	The Search for Life in the Universe	
ASTR 308V	Into the Final Frontier	
ASTR 330V	Planetary Exploration	
Select 4-6 credits from the following: [5]		4-6
ASTR 400	Undergraduate Research	
ASTR 401	Topics in Modern Astrophysics	
ASTR 402	Astronomical Observations and Techniques	
EDUC 4310	Methods of Teaching Elementary School Science	
EDUC 4410	Teaching Science at the Middle and High School Level	
Total Credits		**18-20**

5. This requirement will generally be fulfilled by two 3-credit courses. Students may request the 4 credit option instead, if an appropriate topic and instructor for 1 credit of ASTR 400 Undergraduate Research are available. ASTR 401 Topics in Modern Astrophysics and ASTR 402 Astronomical Observations and Techniques are generally offered only in alternate years, and have prerequisites.

Emphasis: Engineering

The requirements for the engineering track minor requires 18-19 credits from the following:

Prefix	Title	Credits
Required Courses		
Select 3-4 credits from the following:		3-4
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	

ASTR 1120G	The Planets Lecture & Laboratory	
PHYS 1310G	Calculus -Based Physics I	
PHYS 1320G	Calculus -Based Physics II	
Select one from the following:		3
ASTR 301V	Revolutionary Ideas in Astronomy	
ASTR 305V	The Search for Life in the Universe	
ASTR 308V	Into the Final Frontier	
ASTR 330V	Planetary Exploration	
Select 12 credits from the following two groups:		12
Group A		
Select 6-9 credits from the following: [6]		
A E 428	Aerospace Capstone Design	
ASTR 400	Undergraduate Research	
ASTR 401	Topics in Modern Astrophysics [7]	
ASTR 402	Astronomical Observations and Techniques [7]	
E E 400	Undergraduate Research	
M E 400	Undergraduate Research	
Group B		
Select 3-6 credits from the following: [9]		
A E 424	Aerospace Systems Engineering	
BIOL 451	Physiology of Microorganisms	
BIOL 467	Evolution	
BIOL 473	Ecology of Microorganisms	
CSCI 4405	Artificial Intelligence I	
CSCI 4140	Database Management Systems I	
CSCI 4215	Parallel Programming	
CHEM 433	Physical Chemistry I	
E E 454	Antennas and Radiation	
E E 460	Space System Mission Design and Analysis	
E E 473	Introduction to Optics	
E E 478	Fundamentals of Photonics	
GEOL 465	Isotope Geochemistry	
MATH 4210	Complex Variables	
MATH 4220	Fourier Series and Boundary Value Problems	
PHYS 451	Intermediate Mechanics I	
PHYS 461	Intermediate Electricity and Magnetism I	
PHYS 480	Thermodynamics	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
STAT 4220	Statistics: Theory and Applications	
Total Credits		**18-19**

[6] Taking any of the non-astronomy classes for this requirement requires prior approval from the head of astronomy on a case-by-case basis, with a clear connection being established between the proposed research or design project and a particular topic in astronomy or astrophysics (astronomy instrumentation or observational projects are particularly encouraged); no more than 3 non-ASTR credits can be counted toward the minor.

[7] Generally offered in alternate years.

[8] Cross-listed with graduate classes and require special permission.

[9] Alternative 400/4000-level courses in the physical sciences, engineering, or related fields, including one-time seminars, may be proposed on a case-by-case basis to fulfill this requirement, drawn from the fields of astronomy, biochemistry, biology, chemistry, computer science, geology, geophysics, mathematics, physics, statistics, or from engineering. Proposals should include a clear justification that connects the course materials to a particular topic in astronomy or astrophysics.

Biology

Undergraduate Program Information

A student may earn the Bachelor of Arts in biology or the Bachelor of Science in biology, genetics, microbiology, or conservation ecology through major studies in the Department of Biology. The Bachelor of Science in biology or microbiology is recommended for premedical and predental students, for those preparing to teach biology and other sciences at the secondary and college levels, for those interested in the numerous fields of biological research and applied biology, and for those planning on obtaining an advanced degree in biology.

Freshmen should begin taking required biology and chemistry courses in their first year. Degree plans for specific areas of interest can be obtained from the Biology Success Center (https://bio.nmsu.edu/success2.html) in Foster Hall room 204. More information on the Department of Biology is available on our web site (http://bio.nmsu.edu).

A student must earn a grade of C- or better to receive credit for any nondepartmental or departmental requirement for any major or minor offered by the Department of Biology.

Students who wish to explore a minor or supplementary course work in a specific discipline to enhance their academic experience are encouraged to speak with an advisor. The Biology Department offers minors in biology, microbiology, human biology, conservation ecology, or genetics and biotechnology. A student may not earn a major and a minor in the same discipline.

A student must fulfill a second language requirement to receive a Bachelor of Arts or Bachelor of Science degree in the Biology and Microbiology majors. ***This requirement does not apply to the Conservation Ecology major, offered jointly with the Department of Fisheries, Wildlife and Conservation Ecology, or the Genetics and Biotechnology major, offered jointly with the Department of Plant and Environmental Science.*** To meet the second language requirement, the student must do one of the following:

- Complete two semesters of second language courses numbered 1110 and 1120 with a grade of C- or better. Spanish speakers should complete SPAN 1210 Elementary Spanish for Heritage Learners I, SPAN 1220 Spanish for Heritage Learners II or SPAN 2210 Spanish for Heritage Learners III with a C- or better to fulfill the requirement.
- Challenge the 1120 level of French, Chinese, German, Japanese, or Spanish; or the 1130 level for the Spanish-for Heritage Learners student or the 1130 level for Portuguese.
- Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level. (i.e. equivalent to FREN 2120G French IV, GRMN 2120 German IV, SPAN 2120 Spanish IV, etc.)
- Complete two semesters of American Sign Language, courses SIGN 1110 American Sign Language I and SIGN 1120 American Sign Language II, with a grade of C- or better.
- Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.
- Obtain certification of a working knowledge of a Native American language from the American Indian program director.

- Obtain certification of a working knowledge of a second language if such language is not taught at NMSU from the head of the Department of Languages and Linguistics.
- In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

Graduate Program Information

The Department of Biology offers research and coursework that cover the natural world whether it is at the molecular, organismic, or ecosystem level. Our goal is to prepare students for careers in diverse areas such as ecology, microbiology, evolution, botany, health science, and biology education through formal coursework, research experiences, interactive seminars, and professional development activities. Biology graduate students conduct their own research in a productive environment using state-of-the-art facilities. The Biology Department offers the following degree emphasis:

- Thesis Masters research program in Biology (M.S.)
- Non-thesis Masters program in Biology (M.S.)
- Non-thesis Masters program in Biology (Biotechnology emphasis) (M.S.)
- Doctorate research program in Biology (Ph.D.)

For research toward the Master of Science or the Doctorate of Philosophy, students can choose among the Department's three areas of emphasis:

1. Behavioral, Ecological, and Evolutionary Biology
2. Cell and Organismal Biology
3. Microbiology

There are two formal course requirements for all Biology Graduate students, with the exception of students in the accelerated non-thesis MS Biotechnology option. These core courses are

Prefix	Title	Credits
BIOL 510	Current Topics in Biology	3
BIOL 540	Science and Ethics	1-3

All graduate students develop their curriculum plan in consultation with their faculty advisor and graduate committee. Graduate students may also take a minor in other graduate departments and programs. Sample course sequences within the Department's three different emphases are described in the Biology Graduate Handbook available for download from the Graduate Student section of the Biology website (https://bio.nmsu.edu/students/grads.html).

All prospective applicants must submit all required materials specified in the Department Graduate Application Packet available in the Graduate Student section of the Biology website (https://bio.nmsu.edu/students/grads.html).

Degrees for the Department

Bachelor Degree(s)

- Biology (Secondary Education) - Bachelor of Arts (p. 569)
- Biology - Bachelor of Arts (p. 571)
- Biology - Bachelor of Science (p. 573)
- Conservation Ecology - Bachelor in Conservation Ecology (p. 575)
- Genetics and Biotechnology - Bachelor of Science in Genetics (p. 577)
- Microbiology - Bachelor of Science (p. 579)

Master Degree(s)

- Biology - Master of Science (p. 114)

Doctoral Degree(s)

- Biology - Doctor of Philosophy (p. 208)

Minors for the Department

- Biology - Undergraduate Minor (p. 581)
- Conservation Ecology - Undergraduate Minor (p. 582)
- Genetics and Biotechnology - Undergraduate Minor (p. 582)
- Human Biology - Undergraduate Minor (p. 582)
- Microbiology - Undergraduate Minor (p. 583)

C. Shuster, Professor, Department Head
Donovan Bailey, Professor, Associate Department Head

Professors Bailey, Boecklen, Curtiss, Hanley, Hansen, James, Mabry, Milligan, C. Shuster, M. Shuster, Serrano, Unquez, Wright, Xu; ***Associate Professors*** Castillo; ***Assistant Professors*** Corcoran, Heinrich, Jaszczak, Linscott, Orr

C. D. Bailey, Ph.D. (Cornell)– plant systematics; W. J. Boecklen, Ph.D. (Northern Arizona)– plant/ insect and community ecology; M. G. Castillo, Ph.D. (Wisconsin)– microbiology/immunology; A. Corcoran, Ph.D. (University of California-Los Angeles) – algal ecology; J. Curtiss, Ph.D. (University of Colorado at Boulder)– cell and development; K. A. Hanley, Ph.D. (California-San Diego)– evolution, ecology, and control of flaviviruses; I. A. Hansen, Ph.D. (University of Wurzburg)– molecular vector biology; K. K. Heinrich, D.A. (Idaho State)- biology education and ecology; *A. C. James, Ph.D. (University of Rochester)- science education; J.S. Jaszczak, Ph.D. (University of Virginia)- developmental and neurobiology; T. M. Linscott, Ph.D. (University of Idaho)*– ecophysiology and evolution; K. E. Mabry, Ph.D. (California-Davis)– behavioral ecology; B. G. Milligan, Ph.D. (California-Davis)– plant evolutionary biology; T. J. Orr, Ph.D. (University of California, Riverside)- reproductive physiology/ecology; E. E. Serrano, Ph.D. (Stanford)– biophysics, neuroscience; C. B. Shuster, Ph.D. (Tufts)– cell and developmental biology; M. Shuster, Ph.D. (Tufts)– biology education; G. A. Unguez, Ph.D. (California-Los Angeles)– developmental biology; T. F. Wright, Ph.D. (California-San Diego)– animal behavior and evolution; J. Xu, Ph.D. (Military Medical University, Shanghai)– mosquito-malaria interactions.

Biology Courses

BIOL 1120G. Human Biology
3 Credits (3)
This course is an introduction to modern biological concepts with an emphasis on the relevance to humans and their relationships with the environment.
Learning Outcomes
1. Explain that biology is a scientific discipline based on observations and experimentations.
2. Explain the process of scientific inquiry and explain how scientific knowledge is discovered and validated.
3. Describe the chemical basis of living organisms and how biomolecules contribute to the structure and function of cells.

4. Develop a basic familiarity with cells and cell organelles.
5. Describe the structure and function of DNA as well as how DNA is used in the production of proteins
6. Describe the basic principles of genetics and heredity leading to human diversity.
7. Identify the major features of the systems in the human body, and understand the anatomy and physiology of them
8. Describe the roles of the organ systems in maintaining homeostasis
9. Explain the principles of evolution by means of natural selection explaining the diversity of life. 1
10. Describe how science and technology have impacted life in particular to society and the environment (e.g. medicine, forensic science, agriculture, ecology, sustainability).

BIOL 1120L. Human Biology Laboratory
1 Credit (3P)
This course introduces exercises, experiences, and activities exploring biological concepts and theories relevant to humans and their relationship to the environment in a laboratory setting.
Prerequisite(s)/Corequisite(s): BIOL 1120G.
Learning Outcomes
1. Understand general principles of cell structure and function.
2. Understand general principles of genetics.
3. Understand basic human anatomy and physiology.
4. Communicate scientific information effectively.
5. Demonstrate an understanding of the scientific method.
6. Knowledge of appropriate laboratory skills
7. Apply quantitative reasoning and scientific thinking to real world problems.

BIOL 1130G. Introductory Anatomy & Physiology (non-majors)
4 Credits (3+3P)
This course introduces the anatomy (structure) and physiology (function) of the human body, which includes the study of basic chemistry, molecules, cells, tissues, organs, organ systems, and terminology related to these concepts. May be repeated up to 4 credits. Restricted to Community Colleges campuses
Learning Outcomes
1. (Lecture) Define and explain anatomy and physiology.
2. (Lecture) Use anatomic directional, regional, and sectional terminology related to the human body.
3. (Lecture) Explain and describe the basic chemical principles of the human body including the structure and function of carbohydrates, lipids, proteins and nucleic acids.
4. (Lecture) Develop a basic familiarity with cells and cell organelles that include cell division, DNA replication, and protein synthesis.
5. (Lecture) Describe the structure and function of the major tissues in the human body.
6. (Lecture) Identify and describe the basic anatomical features of the integumentary, skeletal, muscle, nervous, endocrine, cardiovascular, lymphatic, digestive, respiratory, urinary and reproductive systems.
7. (Lecture) Describe the basic physiological roles of the integumentary, skeletal, muscle, nervous, endocrine, cardiovascular, lymphatic, digestive, respiratory, urinary and reproductive systems.
8. (Lecture) Apply and describe the principles of homeostasis in the human body.
9. (Laboratory) Use and apply proper anatomic terms 1
10. (Laboratory) Develop skills using the microscope correctly. 1
11. (Laboratory) Identify basic tissue types. 1
12. (Laboratory) Discuss and describe the basic anatomical features of the integumentary, skeletal, muscle, nervous, endocrine, cardiovascular, lymphatic, digestive, respiratory, urinary and reproductive systems. 1
13. (Laboratory) Demonstrate and describe physiological roles of the integumentary, skeletal, muscle, nervous, endocrine, cardiovascular, lymphatic, digestive, respiratory, urinary and reproductive systems.

BIOL 1190G. Contemporary Problems in Biology
4 Credits (3+3P)
Fundamental concepts of biology will be presented using examples from relevant problems in ecology, medicine and genetics. For nonscience majors only. Community Colleges only.
Learning Outcomes
1. Identify the unity and diversity of living things
2. Identify the structure and function of cells an biological molecules
3. Recognize and demonstrate patterns of inheritance
4. Describe mechanisms of evolution
5. Describe the human body systems including immune response
6. Discuss population dynamics and ecological systems
7. Describe the process of scientific inquiry, solve problems scientifically, and communicate on a scientific level
8. Apply quantitative analysis and scientific thinking to scientific and real world problems

BIOL 1996. Topics in Biology
1-3 Credits (1-3)
Introductory level coverage of biological topics. May be repeated up to 9 credits.
Learning Outcomes
1. Varies

BIOL 2110G. Principles of Biology: Cellular and Molecular Biology
3 Credits (3)
This course introduces students to major topics in general biology. This courses focuses on the principles of structure and function of living things at the molecular, cellular and organismic levels of organization. Major topics included are introduction to the scientific process, chemistry of cells, organization of cells, cellular respiration, photosynthesis, cell division, DNA replication, transcription, and translation. Must be taken with BIOL 2110L to meet general education requirements. May be repeated up to 3 credits.
Prerequisite/Corequisite: a C- or better in MATH 1215 or higher and a C- or better in (CHEM 1120G or CHEM 1215G or CHEM 1216).
Learning Outcomes
1. Apply the scientific method to develop and evaluate hypotheses and propose an experiment to test a scientific hypothesis related to cell biology and molecular biology.
2. Describe the distinguishing characteristics of various biological molecules (water, carbohydrates, lipids, proteins, and nucleic acids).
3. Compare and contrast the basic features of cells and how prokaryotic cells differ from eukaryotic cells.
4. Understand how organisms maintain homeostasis in a dynamic environment.
5. Describe how biological molecules are acquired and how they are subsequently used to meet the metabolic needs of organisms.
6. Describe membrane structure and function.

7. Describe and analyze the nature of bioenergetic transformations and metabolism within the cell.
8. Describe the processes of cellular respiration and photosynthesis.
9. Analyze with specific detail the processes of DNA replication, transcription, and translation. 1
10. Analyze with specific detail the types, mechanisms, and regulation of cellular division. 1
11. Assess important applications of cell and molecular biology to energy use, medicine, and other day-to-day processes.

BIOL 2110L. Principles of Biology: Cellular and Molecular Biology Laboratory
1 Credit (3P)
This course introduces students to major topics in general biology. This courses focuses on the principles of structure and function of living things at the molecular, cellular and organismic levels of organization. Major topics included are introduction to the scientific process, chemistry of cells, organization of cells, cellular respiration, photosynthesis, cell division, genetics, DNA replication, transcription, and translation. May be repeated up to 1 credit.
Prerequisite: MATH 1215 or higher, and a C- or better in (CHEM 1120G or CHEM 1215G or CHEM 1216).
Prerequisite/Corequisite: BIOL 2110G.
Learning Outcomes
1. Describe and apply the scientific method to solve problems in biological context
2. Demonstrate knowledge of laboratory safety skills and procedures.
3. Practice principles of scientific method while conducting laboratory activities and experiments.
4. Perform laboratory activities using relevant laboratory equipment, chemical reagents, and supplies to observe biological specimens, to measure variables, and to design and conduct experiments.
5. Operate light microscopes, prepare wet mount slides, and use stains.
6. Exhibit ability to use pipettes and other volumetric measuring devices, chemical glassware, balances, pH meters or test papers, spectrophotometers, and separation techniques, such as chromatography and/or electrophoresis to perform activities relevant to other course competencies.
7. Analyze and report data generated during laboratory activities and experiments.

BIOL 2210. Human Anatomy and Physiology I for the Health Sciences
4 Credits (3+3P)
This course is the first of two that serve as an introduction to human anatomy and physiology for biology majors and allied health students. The course entails describing, explaining, and analyzing structure and function from the submicroscopic to the organismal level with emphasis on anatomic, directional, and sectional terminology, basic cellular structure and metabolism, tissue differentiation and characteristics, and organ system structure and function; Specifically the integumentary, skeletal, muscular, and nervous systems. Restricted to: Community Colleges only.
Learning Outcomes
1. Describe and apply anatomical terminology.
2. Describe multi cellular organization.
3. Distinguish and describe major tissue types.
4. Describe the structure and function of the integumentary system.
5. Describe the structure and function of the skeletal system.
6. Describe the structure and function of the muscular system.
7. Describe the structure and function of the nervous system.
8. Describe the structure and function of the special senses.
9. Define homeostasis and describe specific examples for the integumentary, skeletal, muscular, and nervous systems.

BIOL 2225. Human Anatomy and Physiology II
4 Credits (3+3P)
This course is the second of two that serve as an introduction to human anatomy and physiology for biology majors and allied health students. The course entails describing, explaining, and analyzing structure and function from the submicroscopic to the organismal level with emphasis on specific cellular, tissue, and organ structure and physiology, and organ system structure and function; specifically the endocrine, cardiovascular, respiratory, urinary, and reproductive systems. Additionally, an analysis of these concepts is included: fluid and electrolyte balance, pregnancy, growth and development from zygote to newborn, and heredity. Restricted to: Community Colleges only. May be repeated up to 4 credits.
Prerequisite: BIOL 2210.
Learning Outcomes
1. Identify and describe the major anatomical features of the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems.
2. Analyze the physiological roles of the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems in maintaining homeostasis in the human body.
3. Explain how fluid and electrolyte balance is maintained in the human body.
4. Compare and contrast the anatomy and physiology of male and female reproductive systems.
5. Describe pregnancy from conception to parturition including human growth and development from zygote to newborn.
6. Explain heredity and genetic control.

BIOL 2310. Microbiology
3 Credits (3P)
Introduction to the basic principles of microbiology, microbial pathogenesis, host defenses and infectious diseases. The course will emphasize concepts related to the structure and function of microorganisms, including their mechanisms of metabolism and growth. Host parasite interactions will also be emphasized, including mechanisms of microbial pathogenesis and mechanisms of host defenses against infectious diseases. Restricted to Community Colleges campuses only.
Prerequisite(s): CHEM 1120G or CHEM 1215G or CHEM 1225G.
Corequisite(s): BIOL 2310L.
Learning Outcomes
1. Describe and compare the structure and function of prokaryotic and eukaryotic cells.
2. Describe and compare the techniques used for staining of and microscopic observation of bacteria including morphology.
3. Describe the nutritional requirements for bacterial growth and the impact of environmental factors on bacterial growth (temperature, pH, oxygen, etc.).
4. Describe and compare the mechanisms of aerobic respiration, anaerobic respiration, and fermentative metabolism.
5. Describe the mechanism of bacterial growth by binary fission, and laboratory methods used for observing and measuring bacterial growth.

6. Describe the mechanisms of bacterial DNA replication, RNA transcription, and translation, and compare and contrast witheukaryotic cells.
7. Describe the structure and replication strategies of viruses.
8. Describe and contrast mechanisms of innate nonspecific immunity and adaptive specific immunity.
9. Describe immune hypersensitivity reactions, autoimmune diseases, and immunodeficiency diseases. 1
10. Differentiate between host microberelationships, mechanisms of microbial pathogenesis, differentiate between communicable and noncommunicable diseases and describe mechanisms of direct and indirect transmission of communicable diseases.

BIOL 2310L. Microbiology Lab
1 Credit (3P)
This course will emphasize both the theory and hands-on application of techniques used in a microbiology laboratory for the growth and identification of bacterial species. Students will learn microscopy skills and staining techniques for the observation of bacteria. Students will also learn aseptic techniques used for isolation of bacteria, inoculation of cultures, and interpretation of selective and differential growth media for the identification of bacterial species.
Prerequisite: BIOL 2310 or BIOL 2320 or concurrent enrollment.
Learning Outcomes
1. Demonstrate skills of microscopy.
2. Demonstrate skills of bacterial staining.
3. Demonstrate aseptic technique for inoculation of bacterial growth media.
4. Interpret results from selective and differential media.
5. Demonstrate appropriate use of diagnostic reagents.
6. Interpret results of diagnostic assays.
7. Identify unknown bacterial species through the use of a dichotomous key, inoculation and interpretation of laboratory assays, and application of the scientific method.

BIOL 2320. Public Health Microbiology
3 Credits (3)
This course introduces microbiology on the health profession level. It incorporates cell structure, metabolism, growth, controls of growth, infectious epidemiology, etiology, pathogenicity, and relative virulence of pathogens. It will lead to students assessing a clinical infection scenario from the microbiological perspective that includes making diagnoses based on data from appropriate diagnostic tests, investigating appropriate treatment options, and making recommendations for prevention.
Prerequisite: BIOL 2110G and BIOL 2110L.
Learning Outcomes
1. Identify key physical features of various infectious agents and describe their structure and function in the pathogen
2. Describe the microbiological, serological, biochemical and genetic tests that are used to identify infectious agents in a laboratory setting and be able to interpret test results in order to identify the pathogen
3. Explain how structural and metabolic differences between infectious agents and human host can be exploited for chemotherapy
4. Explain the observed effect of a particular environmental change on the growth of a given microorganism, and the relationship between bacterial growth patterns and selected foodborne illnesses
5. Describe several mechanisms by which pathogens generate genetic diversity and the role genetic diversity plays in resistance to therapy and treatment failure
6. Explain the role of innate, and adaptive immunity in host defense
7. Describe general virulence strategies used by variety of pathogens, and different types of vaccines along with recommendations for vaccinations of specific populations
8. Demonstrate understanding of signs and symptoms of selected diseases, and be able to relate disease agents with environmental reservoirs and transmission

BIOL 2505. Pathophysiology
3 Credits (3)
This course is designed to provide the conscientious student with a solid foundation for understanding the pathophysiological processes of the human organism. Successful completion of this course will promote the general student learning outcomes listed below. Corequisite/Prerequisites(s): AHS 154 or BIOL 2225. Restricted to: Community Colleges only.
Prerequisite(s): AHS 153 or BIOL 2210.
Learning Outcomes
1. To describe the general concepts of disease processes and factors associated with disease causation.
2. To identify the function of basic cellular structures, determining the process of cellular malfunctions.
3. To describe the response of the body to injury and immunologic challenge.
4. To discuss the etiology, pathogenesis, and treatment modalities of frequently occurring diseases.

BIOL 2511. Human Pathophysiology
3 Credits (3)
The first in a two-course sequence that covers changes in body physiology that result from disease or injury. Includes a general introduction to pathophysiology as well as an overview of altered cellular and tissue biology, injury, inflammation, and neoplasia. Students will also explore deviation from fluid, hemodynamic, and endocrinologic balance. Topics related to the science of pathophysiology, including pathology, pathogenesis, etiology, epidemiology, and clinical manifestations, are also discussed throughout the course where relevant. Grade of C- or higher in microbiology is recommended. Restricted to Community Colleges campuses only.
Prerequisite(s): Grade of C- or higher in BIOL 2210 and BIOL 2225.
Learning Outcomes
1. The cellular adaptations occurring in atrophy, hypertrophy, hyperplasia, dysplasia, and metaplasia; the types and causes of cellular injury; and the types of necrosis.
2. The different compartments for body fluids; the factors that affect water movement; the processes that drive and affect capillary exchange; the mechanisms causing edema; the electrolytes in body compartments; the various electrolyte imbalances; the body mechanisms that maintain acid-base balance; and the various acid-base imbalances and how they are compensated for .
3. The interrelationships of DNA, RNA, and proteins; the various types of mutations; the various types of mutagens, the various types of numerical and structural chromosomal aberrations; the various genetic terms; the single-gene disorders discussed in class; the multifactorial disorders discussed in class.
4. The relationships between genes, environment, and multifactorial diseases; the criteria used to define multifactorial disease; the

characteristics of multifactorial traits; and the various features of the threshold model.

5. The terms related to tumor/cancer biology, classification, and nomenclature; the various features of cancer biology, including the characteristics of cancer and the genetic basis of cancer; features related to cancer invasion and metastasis; and the clinical manifestations and treatments of cancer.
6. Features related to Innate and adaptive immunity; features related to the first, second, and third lines of defense; the mechanisms and manifestations of inflammation; components/mechanisms related to the complement, clotting, and kinin systems; mechanisms of wound healing; and features of dysfunctional wound healing.
7. Aspects/mechanisms of specific (adaptive) immunity, features related to the structure, function, and classification of immunoglobulins; features related to haptens, antigens, immunogens, and epitopes; the different types of antigens; features related to immunological memory; and features related to the different types of active and passive immunity.
8. Aspects related to allergy, autoimmunity, and alloimmunity; aspects/mechanisms/examples related to the four basic types of hypersensitivity reactions; mechanisms and examples related to autoimmunity; and aspects/mechanisms related to immunodeficiency.
9. The risk factors for infection; the six components of the chain of infection; general concepts, terms, and processes/mechanisms related to basic microbiology; and the mechanisms of microbial pathogenicity. 1
10. General concepts, terms, and processes/mechanisms related to normal hormonal action; mechanisms of hormonal alterations; processes/mechanisms related to the pathophysiology of the various disorders discussed in class; and the clinical manifestations and treatment of the hormonal alterations discussed in class.

BIOL 2512. Human Pathophysiology II
3 Credits (3)

The second in a two-course sequence that covers changes in body physiology that result from disease or injury. This course focuses on the pathophysiology of the nervous, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems. Topics related to the science of pathophysiology, including pathology, pathogenesis, etiology, epidemiology, and clinical manifestations, are also discussed throughout the course where relevant. Grade of C- or higher in microbiology is recommended. Restricted to Community Colleges campuses only. May be repeated up to 3 credits.

Prerequisite: Grade of C- or higher in BIOL 2210, BIOL 2225, and BIOL 2511.

Learning Outcomes

1. The different types of sensory modalities; the different dysfunctions of the general and special senses; the different pain theories discussed in class; the various aspects of the neuroanatomy and neuromodulation of pain; the various clinical descriptions of pain; the various aspects of temperature regulation; components of the pathogenesis of fever; the various disorders of temperature regulation; the various aspects of sleep disorders; the various components of visual dysfunction; and the various aspects of auditory, gustatory, and olfactory dysfunction.
2. The various alterations in cognitive systems; the various alterations in arousal; the outcomes of alterations in arousal; the various alterations in awareness; the various seizure disorders; the various data processing deficits; various alterations in cerebral hemodynamics; and alterations in neuromotor function.
3. The various disorders of the central and peripheral nervous systems; and the various disorders of the neuromuscular junction.
4. The components of normal blood; the process/stages of hematopoiesis; the various normal RBC laboratory values; the components and functions of the lymphatic system; the various types of imbalances of erythropoiesis; the various types of anemias and their causes; the various types of polycythemia and their causes; the processes related to hemostasis; the various alterations of white blood cells and their causes; and the various alterations of lymphoid and hemostatic function.
5. The various diseases of the veins; the various diseases of the arteries; the various aspects of atherosclerosis; features related to the pathogenesis and consequences of coronary artery disease; the disorders of the heart wall and their consequences; the various aspects of valvular dysfunction; aspects of the pathogenesis and manifestations of rheumatic disease; the causes, pathogenesis, and manifestations of infective endocarditis; the causes, manifestations, and pathophysiology of heart failure; and the various types of shock.
6. The various signs and symptoms of pulmonary disease; the various conditions caused by pulmonary disease/injury; the various disorders of the chest wall and pleura; and the causes, manifestations, and pathophysiology of selected pulmonary disorders.
7. The features and consequences of upper and lower urinary tract obstruction; the various types of urinary tract infection; the causes, pathogenesis, and clinical manifestations of glomerulonephritis; the various features of nephrotic and nephritic syndrome; and the various features (etiology, pathophysiology, and clinical manifestations) of both acute kidney injury and chronic kidney disease.
8. The various clinical manifestations of gastrointestinal dysfunction; the various aspects (etiology, pathophysiology, and clinical manifestations) of disorders of motility; the causes, manifestations, and pathophysiology of gastritis; features related to the causes, manifestations, and pathophysiology of peptic ulcer disease; features related to the etiology, pathogenesis and pathophysiology of selected malabsorption syndromes, inflammatory bowel diseases, diverticular disease of the colon, appendicitis, and irritable bowel syndrome; the various types of vascular insufficiency; the various disorders of nutrition and their causes and clinical manifestations; and the various disorders of the accessory organs of digestion.
9. The various features associated with alterations of sexual maturity (delayed puberty and precocious puberty); features related to the etiology, pathogenesis, and pathophysiology of the various disorders of the male reproductive system, including disorders of the urethra, disorders of the penis, disorders of the scrotum, disorders of the testes, disorders of the epididymis, disorders of the prostate gland, and disorders of the male breast; features related to the etiology, pathogenesis, and pathophysiology of male sexual dysfunction; features associated with abnormalities of reproductive tract development; the various hormonal and menstrual alterations and their causes and clinical manifestations; the various conditions related to infection, inflammation, and pelvic organ prolapse (uterine prolapse, cystocele, rectocele, and enterocele); conditions involving benign growths and cancer (endometriosis, cervical cancer, vaginal cancer, vulvar cancer, endometrial cancer, uterine sarcoma, and ovarian cancer); features related to the etiology, pathogenesis, and pathophysiology of female sexual dysfunction (disorders of desire, vaginismus, anorgasmia, and dyspareunia); features related to

infertility; and features related to the etiology, pathogenesis, and pathophysiology of breast cancer.

BIOL 2610G. Principles of Biology: Biodiversity, Ecology, and Evolution
3 Credits (3)
This course is an introduction to the dynamic processes of living things. Major topics include the mechanisms of evolution, biological diversity, Mendelian genetics, and ecology.
Prerequisite/Corequisite: grade of C- or better in MATH 1215 or higher, or a Math Placement Exam score adequate to enroll in mathematics courses beyond MATH 1215.
Learning Outcomes
1. Understand the scientific method and apply it to biological topics of genetics, evolution, ecology, and biodiversity.
2. Apply quantitative reasoning and scientific thinking to real world problems.
3. Identify and describe the basic principles of evolution.
4. Analyze the relationships between the genetics of populations and evolution.
5. Analyze the processes of speciation.
6. Describe how the hierarchical classification scheme is used to categorize organisms.
7. Describe how DNA research has modernized bio systematics.
8. Compare and contrast the general characteristics of each of the living domains and kingdoms.
9. Relate the structure of organisms to the way they function. 1
10. Explain how the life histories of organisms are adapted for different environments. 1
11. Relate the complexity of behavior to the overall complexity of an organism. 1
12. Describe the ecological roles played by organisms in each kingdom. 1
13. Compare basic ecological principles at the population and community levels of organization. 1
14. Describe and compare energy relationships and the cycling of materials in ecosystems. 1
15. Identify and describe the basic principles of Mendelian genetics.

BIOL 2610L. Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory
1 Credit (3P)
This laboratory course is an introduction to the dynamic processes of living things. This course introduces students to the methods used in the study of Mendelian genetics, evolution, ecology, and biological diversity. Designed for students continuing in life sciences.
Prerequisite/Corequisite: BIOL 2610G; grade of C- or better in MATH 1215 or higher, or a Math Placement Exam score adequate to enroll in mathematics courses beyond MATH 1215.
Learning Outcomes
1. Describe and apply the scientific method to generate testable hypotheses in evolution and ecology.
2. Design and conduct laboratory experiments using relevant laboratory equipment and methods.
3. Analyze and report data generated during laboratory activities and experiments.
4. Communicate scientific results from experiments in Mendelian genetics, evolution, ecology, and biodiversity.

BIOL 2996. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 6 credits. Community Colleges only.
Learning Outcomes
1. Varies

BIOL 301. Principles of Ecology
3 Credits (3)
A survey of ecology including general theory, the adaptations of organisms, population dynamics, species interactions, and the structure and function of natural communities and ecosystems. MATH 1511G and A ST 311 recommended. Same as ENVS 301. Crosslisted with: ENVS 301.
Prerequisite(s): BIOL 2610G, MATH 1220G.

BIOL 302. Molecular Biology Techniques Laboratory
3 Credits (6P)
This combined lecture and laboratory course emphasizes molecular biology laboratory practices through the hands-on application of commonly applied techniques, protocols, and equipment. The topics covered include both the fundamental development of empirical data as well as data analysis using stand-alone and web-based resources. Consent of instructor required.
Prerequisite(s): BIOL 2110G or equivalent, and MATH 1220G.

BIOL 305. Principles of Genetics
3 Credits (3)
Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.
Prerequisite: (BIOL 2610G and BIOL 2110G, or BIOL 2110G and BCHE 140, and either CHEM 1215G or CHEM 1216).
Learning Outcomes
1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

BIOL 309. Guided Biological Research Lab
3 Credits (3)
This laboratory course provides a guided experience to hands-on research in biology. It is intended for early-career undergraduates who have finished the introductory sequence of Biology courses. Topics will vary with instructor.
Prerequisite(s): BIOL 2610G, BIOL 2110G, and MATH 1220G.

BIOL 311. General Microbiology
3 Credits (3)
Principles of physiology, molecular biology, ecology, and taxonomy of microorganisms.
Prerequisite(s): BIOL 2110G and MATH 1220G.

BIOL 311 L. General Microbiology Laboratory
2 Credits (4P)
Microbiology techniques and procedures, including isolation and identification of microorganisms and biotechnology procedures that employ microorganisms.
Prerequisite(s)/Corequisite(s): BIOL 2320 or BIOL 311. Prerequisite(s): BIOL 2110G and MATH 1220G.

BIOL 312. Plant Taxonomy
3 Credits (2+3P)

Classification and identification of representative plant families and local plants. Emphasis on ability to use technical sources. Saturday field trips may be recommended.
Prerequisite(s): BIOL 2610G and MATH 1220G.

BIOL 313. Structure and Function of Plants
3 Credits (2+3P)
Structure, function, and survey of plants. BIOL 2110G recommended.
Prerequisite(s): BIOL 2610G, MATH 1220G, and sophomore-level standing.

BIOL 314. Plant Physiology
3 Credits (3)
Photosynthesis, respiration, water relation of plants, minerals and organic nutrition, growth and development.
Prerequisite(s): BIOL 2110G and CHEM 1225G.

BIOL 322. Zoology
3 Credits (2+3P)
Structure, function, and survey of animals. BIOL 2110G recommended.
Prerequisite(s): BIOL 2610G, MATH 1220G, and at least sophomore-level standing.

BIOL 350. Special Topics
1-4 Credits
Specific subjects announced in Schedule of Classes and offered as scheduled courses. May be repeated for unlimited credit.

BIOL 351. Biology Internship
1-6 Credits
Substantial off-campus experience in biology selected by student in consultation with regular biology faculty member. Internship must be approved by faculty member. Student will supply mutually agreed upon documentation of internship activities after the internship is completed. May be repeated up to 6 credits. Restricted to: BIOL, MBIO, CEC, GEBT majors. Graded: S/U Grading (S/U, Audit).
Prerequisite(s): 45 college credits, 2.5 or better GPA, consent of instructor.

BIOL 353. Pre-Professional Human Anatomy
4 Credits (4)
Pre-professional clinincally-oriented survey of human anatomy. Designed primarily for pre-nursing majors. Provides comprehensive anatomical training for students planning careers in health and allied health sciences, such as medicine, dentistry, nursing, physical therapy, physicians aid, human nutrition, and food science. Suitable as a biology elective. Concurrent enrollment in BIOL 353 L is recommended but not required. May be repeated up to 4 credits.
Prerequisite(s): BIOL 2110G and either CHEM 1120G, CHEM 1215G, or CHEM 1216.

BIOL 353 L. Pre-Professional Human Anatomy Laboratory
1 Credit (3P)
Laboratory experience in human anatomy using anatomical models and cat dissections. Designed as a learning aid to support and augment BIOL 353 pre-professional Human Anatomy. For students planning careers in health and allied health sciences such as medicine, dentistry, nursing, physical therapy, physicians aid, human nutrition, and food science. May be repeated up to 1 credits.
Prerequisite(s)/Corequisite(s): BIOL 353. Prerequisite(s): BIOL 2110G and either CHEM 1120G, CHEM 1215G, or CHEM 1216.

BIOL 354. Physiology of Humans
3 Credits (3)
Principles of integrative functions in humans. A systems approach emphasizing tissues, organs, and their regulation.
Prerequisite(s): BIOL 2110G and MATH 1220G.

BIOL 354 L. Laboratory of Human Physiology
1 Credit (3P)
Laboratory to accompany BIOL 354.
Prerequisite(s): MATH 1220G and either BIOL 2221, BIOL 381, BIOL 354, or concurrent enrollment in BIOL 354.

BIOL 377. Cell Biology
3 Credits (3)
Fundamentals of eukaryotic cell structure, organization, and function. Emphasis on membranes, subcellular organelle systems, cytoskeleton, and cell cycle. Includes basic aspects of molecular biology. May be repeated up to 3 credits. BIOL 2610G recommended.
Prerequisite(s): (BIOL 2110G, BIOL 305 or GENE 315) and MATH 1220G.

BIOL 381. Animal Physiology
3 Credits (3)
Principles of integrative function in animals, emphasizing tissues, organs, organ systems, and regulation. Includes adaptations of animals to their environments. BIOL 2610G and BIOL 377 recommended.
Prerequisite(s): BIOL 2110G and junior-level standing, MATH 1220G.

BIOL 382. Plant Signalling and Development
3 Credits (3)
This is a course that introduces plant signalling pathways and their role in development to students. The lectures are structured to facilitate in-class discussions on the current state and future directions in this field. Topics will cover a wide range of biological questions and the methods used to study them. May be repeated up to 3 credits.
Prerequisite(s): BIOL 305 or GENE 315, and MATH 1220G.

BIOL 385. An Introduction to Cancer
3 Credits (3)
This course will cover 3 areas of cancer research and their interdisciplinary connections: clinical cancer research, epidemiology and public health, and basic cancer research. May be repeated up to 3 credits.
Prerequisite(s): BIOL 305 or GENE 315 or equivalent and MATH 1220G.

BIOL 398. Biology Research Programs
1-3 Credits
Directed studies and research experiences, by arrangement with instructor. May be repeated for a maximum of 6 credits.

BIOL 402. Biology Honors Thesis
1-3 Credits (1-3)
Provides guidance in how to write a scientific paper in the sciences. Students will produce an honors thesis based on previous independent research. Consent of instructor required.
Prerequisite(s): MATH 1220G and consent of instructor.

BIOL 412. Seminar in Microbiology
1 Credit (1)
Seminar to aid students in assessment and presentation of current topics in microbiology.
Prerequisite(s): BIOL 311, BIOL 311 L, and MATH 1220G.

BIOL 417. Topics in Environmental Microbiology
3 Credits (3)
This is an advanced undergraduate course based on current literature in Environmental Microbiology, and is a seminar-style, discussion-based class. Topics typically include marine microbiology, ancient DNA, and the human microbiome. Crosslisted with: BIOL 577.
Prerequisite(s): MATH 1220G, BIOL 477 or consent of instructor.

BIOL 424. Human Osteology
3 Credits (3)

A survey of the functional, developmental, and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. Students are recommended to take ANTH 355 or an equivalent before enrolling in this course. BIOL 424L should be taken concurrently when it is offered. Crosslisted with: ANTH 474.

BIOL 427. Symbiosis
3 Credits (3)
In-depth treatment of the ecology, evolution, and mechanisms that are found in symbiotic systems. May be repeated up to 3 credits. Crosslisted with: BIOL 527.
Prerequisite(s): BIOL 2610G, BIOL 2110G, and MATH 1220G.

BIOL 436. Disease Vector Biology
3 Credits (3)
Fundamentals of disease vector biology with emphasis on molecular biology. Explores an overview of vector borne diseases, insect endocrinology, insect immunity, olfaction, vector genome projects and transgenic insect techniques. Includes student presentations and literature discussions. Crosslisted with: BIOL 536
Prerequisite(s): BIOL 2110G, BIOL 305, and MATH 1220G.

BIOL 442. Genomics Technology
3 Credits (3)
The course introduces current genomic techniques in genome sequencing, transcriptome analysis, detection of genetic variation, and metagenomics. May be repeated up to 3 credits. Crosslisted with: BIOL 562.
Prerequisite(s): BIOL 2110G, BIOL 305 or BIOL 478 or GENE 315, and MATH 1220G.

BIOL 446. Bioinformatics and NCBI Database
3 Credits (3)
The course discusses how to use NCBI database and bioinformatic tools for research with genomics approaches. The topics include nucleotide and protein sequence analysis, similarity search with blast algorithms, gene/genome annotation, protein structure analysis, gene expression analysis, and metagenomic study.
Prerequisite(s): BIOL 2110G, BIOL 305 or BIOL 478 or GENE 315, and MATH 1220G.

BIOL 450. Special Topics
1-3 Credits
Specific subjects announced in the Schedule of Classes and offered as scheduled courses. May be repeated for unlimited credit.

BIOL 451. Physiology of Microorganisms
3 Credits (3)
Aspects of cellular physiology unique to prokaryotes. BCHE 395 recommended.
Prerequisite(s): C- or better in BIOL 311, MATH 1220G.

BIOL 455. Biometry
3 Credits (3)
Biometry is the analysis of biological data using mathematical and statistical models. The course will cover basic theories of probability and statistics and will introduce principles of sampling, estimation, experimental design, and hypothesis testing. Students will analyze biological data using computer programs and will perform tests for goodness-of-fit, independence, analysis of variance, correlation, and regression.
Prerequisite: BIOL 2610G or BIOL 2110G, and MATH 1220G.

Learning Outcomes
1. Cover basic theories of probability and statistics.
2. Understand principles of sampling, estimation, experimental design, and hypothesis testing.
3. Analyze biological data.
4. Perform tests for goodness-of-fit, independence, analysis of variance, correlation, and regression.

BIOL 459. Darwinism Versus Creationism
3 Credits (3)
This course examines the debate regarding Creationism versus Darwinism as explanations for the origin and diversification of life on Earth. Topics covered include the nature and philosophy of science, new-world creationism, old-world creationism, intelligent design, history of evolutionary thought, modern evolutionary theory, and the Creationism-Darwinism debate at the societal, political, and educational interfaces. The course structure will include formal lectures and in-class discussion of assigned readings.
Prerequisite(s): BIOL 2610G or BIOL 2110G, and MATH 1220G.

BIOL 459 H. Darwinism versus Creationism Honors
3 Credits (3)
This course will examine the history and philosophy surrounding the debate between Darwinism and Creationism. The course will also examine the consequences of the debate at the interface of sociology, economics, politics, and education. The Honors version of the course (BIOL 459H) will require a term paper in addition to the requirements of BIOL 459. Crosslisted with: BIOL 459.
Prerequisite(s): BIOL 2610G or BIOL 2110G, and MATH 1220G.

BIOL 462. Conservation Biology
3 Credits (3)
Examination of the value of biological diversity, the natural processes that control biological diversity, and the ways in which human activities have resulted in the loss of biological diversity, both regionally and globally.
Prerequisite(s): BIOL 301 and either MATH 1430G or MATH 1511G.

BIOL 467. Evolution
3 Credits (3)
Covers theory, historical background, population variation, natural selection, adaptation, speciation.
Prerequisite(s): BIOL 2610G, BIOL 305 or GENE 320, and MATH 1220G.

BIOL 469. Biology of Emerging Infectious Diseases
3 Credits (3)
This class will investigate the evolutionary and ecological drivers of disease emergence. The effect of emerging diseases on human health will be addressed throughout the class, but the class will also consider the consequences of disease emergence for the health of wildlife and plant populations. Additionally, the class will consider the mechanisms used to control disease emergence and why they succeed or fail.
Prerequisite(s): MATH 1220G, Introductory Genetics (BIOL 305 or equivalent) or consent of the instructor.

BIOL 470. Developmental Biology
3 Credits (3)
The purpose of this course is to introduces students to the principles that govern the development of a single fertilized egg cell into a complex multicellular organism. These principles, and often the molecular mechanisms by which they are accomplished, appear to be universal for all multicellular organisms including both plants and animals. We will explore issues such as: how cells become committed to particular cell fates and how this commitment is maintained; how organs acquire particular shapes, sizes and positions; the developmental causes of some human diseases; how the environment affects development; and,

how changes in development provide the material basis for evolutionary change.
Prerequisite(s): BIOL 2110G, BIOL 305, and MATH 1220G.

BIOL 473. Ecology of Microorganisms
3 Credits (2+3P)
The metabolic interactions of microorganisms in the environment, with emphasis on their roles in ecological processes.
Prerequisite(s): MATH 1220G, BIOL 311 or consent of instructor.

BIOL 474. Immunology
3 Credits (3)
Basic concepts of the immune response.
Prerequisite(s): MATH 1220G, BIOL 305, and CHEM 2115 or CHEM 313.

BIOL 475. Virology
3 Credits (3)
Mechanisms of viral infections of animals and man. BCHE 395 or BIOL 305 are recommended.
Prerequisite(s): BIOL 311 and MATH 1220G.

BIOL 476. Soil Microbiology
3 Credits (3)
Nature and physiology of soil microorganisms, how they affect plant growth and recycle nutrients. Land framing, bioremediation, and other environmental problems as influenced by soil microorganisms. SOIL 2110 and BIOL 311 recommended. Same as SOIL 476.

BIOL 476 L. Soil Microbiology Laboratory
1 Credit (3P)
Enumeration of soil microorganisms, their activities, and transformations they mediate. Same as SOIL 476L.
Prerequisite(s)/Corequisite(s): BIOL 476.

BIOL 477. Applied and Environmental Microbiology
4 Credits (4)
A lecture-laboratory course on the microorganisms and the reactions they mediate which either impact the environment or have industrial applications. Reading of current literature will be emphasized. Topics include bioremediation, water quality, and aspects of industrial and food microbiology.
Prerequisite(s): MATH 1220G, BIOL 311, and 311 L, or consent of instructor.

BIOL 478. Molecular Biology of Microorganisms
3 Credits (3)
The biochemical basis for gene mutation, recombination, and expression with emphasis on prokaryotes. Includes fundamentals of recombinant DNA technology. BIOL 305 and BCHE 395 recommended.
Prerequisite(s): BIOL 311 and MATH 1220G.

BIOL 479. Medical Microbiology
3 Credits (3)
An in-depth overview of microbial pathogens associated with human infectious disease. Etiological agents, pathogenesis, and processes leading to the disease state and the therapies of infectious disease.
Prerequisite(s): MATH 1220G and BIOL 311 required, BIOL 474 recommended.

BIOL 479 L. Medical Microbiology Laboratory
1 Credit (1)
Overview of common procedures used by medical microbiologists to identify agents of disease or microbial pathogen traits. May be repeated up to 1 credits.
Prerequisite(s)/Corequisite(s): BIOL 479. Prerequisite(s): MATH 1220G, BIOL 311, BIOL 311 L.

BIOL 480. Animal Behavior
3 Credits (3)
A survey of the field of animal behavior. BIOL 322 recommended. May be repeated up to 3 credits.
Prerequisite: MATH 1220G or higher, BIOL 2610G, and junior-level standing.
Learning Outcomes
1. Distinguish between proximate mechanisms and ultimate causation.
2. Engage in the scientific process as applied to animal behavior.
3. Interpret and produce graphical representations of data.
4. Describe general patterns of animal behavior across a wide range of contexts.

BIOL 484. Animal Communication
3 Credits (3+3P)
An examination of how animals produce and perceive signals, what factors influence the form of signals in different sensory modalities, and how conflicts between senders and receivers affect signaling strategies. Weekly discussion from the primary literature and group research products. May be repeated up to 3 credits.
Prerequisite: BIOL 2610G or consent of instructor, and MATH 1220G or higher.
Learning Outcomes
1. Describe how animal signals are produced, transmitted, and received in various taxa,
2. Understand how evolutionary, ecological and economic principles help predict how animals will communicate,
3. Describe general patterns of animal communication across a range of social contexts.

BIOL 488. Principles of Conservation Genetics
3 Credits (3)
Fundamentals of the genetics of small populations. Genetic technologies used in studying small populations. Application of genetics and evolution to the conservation of biological populations.
Prerequisite(s): MATH 1220G and BIOL 305.

BIOL 490. Neurobiology
3 Credits (3)
Fundamentals of neurobiology with an emphasis on properties of neurons and glia, principles of synaptic transmission, development of nervous system and organization of motor and sensory systems.
Prerequisite(s): BIOL 2110G, MATH 1430G or equivalent.

BIOL 498. Biology Research Programs
1-3 Credits
Directed studies and research experiences, by arrangement with instructor. May be repeated for a maximum of 6 credits.

BIOL 509. Guided Biological Research Lab
3 Credits (3P)
This laboratory course provides a guided experience to hands-on research in biology. It is intended for early-career graduate students wishing an introduction to research practices. Topics will vary with instructor. Crosslisted with: BIOL 309.

BIOL 510. Current Topics in Biology
3 Credits (3)
Introduction to diverse topics in modern biology, including dynamic areas of current research.

BIOL 514. Plant Physiology
3 Credits (3)

Overview of photosynthesis, respiration, water relations of plants, minerals and organic nutrition, growth and development. May be repeated up to 2 credits.
Prerequisite: BIOL 2110G and CHEM 1225G.

Learning Outcomes

1. Describe how individual plants survive in variable environments. This means that students will be able to: a. Summarize the chemical and physical bases for major plant processes. b.Explain how major plant processes interact to support plant growth and development. c. Describe the adaptive forms of physiological processes and their underlying anatomical modifications.
2. Predict consequences of environmental change on physiological processes within individual plants.
3. Apply course concepts to real-world scenarios that involve plant function and plant development.
4. Describe experimental approaches used to understand physiological processes within individual plants.

BIOL 520. Molecular Cell Biology
3 Credits (3)
An in-depth look at cellular processes and structures at the molecular level. Emphasis is placed on formal student presentations and discussions of current literature.
Prerequisite: BIOL 377 or equivalent.

BIOL 527. Symbiosis
3 Credits (3)
In-depth treatment of the ecology, evolution, and mechanisms that are found in symbiotic systems. May be repeated up to 3 credits. Crosslisted with: BIOL 427.
Prerequisite(s): Graduate status.

BIOL 536. Advanced Disease Vector Biology
3 Credits (3)
Fundamentals of disease vector biology with emphasis on molecular biology. Explores an overview of vector borne diseases, insect endocrinology, insect immunity, olfaction, vector genome projects and transgenic insect techniques. Includes student presentations and literature discussions. Taught with: BIOL 436.
Prerequisite(s): BIOL 2110G and BIOL 305.

BIOL 540. Science and Ethics
1-3 Credits (1-3)
Ethical concerns facing researchers in the basic and applied biological sciences. Coverage of responsible conduct in research including scientific integrity and research misconduct, mentor/trainee responsibilities, data management, authorship, publication practices, human subjects, animal welfare, intellectual property, conflicts of interest and effort and collaborative science. Emphasis on ethical reasoning skills. Discussion of ethical and societal implications of issues selected from a broad range of contemporary research areas (genetics, reproductive biology, environmental sciences, nanoscience, drug discovery, bioengineering, neuroscience). Subtitled. May be repeated up to 4 credits. Crosslisted with: PHIL 540.

BIOL 541. Professional Development Seminar
1-3 Credits
Practical aspects of career enhancement including job seeking, professional presentations, grant proposals, etc.
Prerequisite: consent of instructor.

BIOL 550. Special Topics
1-3 Credits
Readings, discussions, and/or field and laboratory investigation of selected problems. Possible topics: human genetics, systematic entomology, or parasitism in animals. May be repeated for unlimited credit.
Prerequisite: consent of instructor, and designation of a specific topic before registration.

BIOL 562. Advanced Genomics Technology
3 Credits (3)
This course covers current genomics techniques in genome sequencing, transcriptome analysis, detection of genetic variation, and metagenomics. May be repeated up to 3 credits. Consent of Instructor required. Crosslisted with: BIOL 442.

BIOL 565. Biology In The K-6 Curriculum
3 Credits (3)
Linking important biological concepts to the K-6 curriculum and standards. Addressing known content area challenges with effective pedagogical approaches. Aligning content, standards, classroom activities and assessment. Does not fulfill requirements for degrees in biology. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.

Learning Outcomes

1. Explain that biology is a scientific discipline based on observations and experimentations.
2. Explain the process of scientific inquiry and explain how scientific knowledge is discovered and validated.
3. Describe the chemical basis of living organisms and how biomolecules contribute to the structure and function of cells.
4. Develop a basic familiarity with cells and cell organelles.
5. Describe the structure and function of DNA as well as how DNA is used in the production of proteins
6. Describe the basic principles of genetics and heredity leading to human diversity.
7. Identify the major features of the systems in the human body, and understand the anatomy and physiology of them
8. Describe the roles of the organ systems in maintaining homeostasis
9. Explain the principles of evolution by means of natural selection explaining the diversity of life. 1
10. Describe how science and technology have impacted life in particular to society and the environment (e.g. medicine, forensic science, agriculture, ecology, sustainability) 1
11. Describe the benefits of a case study approach to teaching 1
12. Align biology content with specific K-6 (e.g. NGSS) science standards 1
13. Design an instructional case study (complete with teaching notes and assessment) to address specific K-6 science standards

BIOL 566. Advanced Bioinformatics and NCBI Database
3 Credits (3)
The course discusses how to use NCBI database and bioinformatic tools for research with genomics approaches. The topics include nucleotide and protein sequence analysis, similarity search with blast algorithms, gene/genome annotation, protein structure analysis, gene expression analysis, and metagenomic study. Consent of Instructor required.

BIOL 568. Communities and Ecosystems
3 Credits (3)
Community ecology is an interdisciplinary field that integrates numerous theories, concepts, and methods to study the patterns and dynamics of biotic assemblages. Because biotic groups affect the biogeophysical and biogeochemical processes that govern Earth system functioning, community ecology also plays an increasingly large role in the study of ecosystem ecology, a discipline which seeks to understand the processes

governing nutrient and energy flow across the Earth system. This course will explore the theories and methods for study of biodiversity, biogeography, and community assembly, as well as the pathways through which communities exert influence on ecosystem functioning. Topics will also include evolutionary influences on communities, the integration of community ecology into conservation and land management, and community ecology in an era of rapid environmental change.

BIOL 577. Advanced Topics in Environmental Microbiology
3 Credits (3)
This course is based on current literature in Environmental Microbiology, and is a seminar-style, discussion-based class. Topics typically include marine microbiology, ancient DNA and the human microbiome.
Prerequisite(s): Consent of instructor.

BIOL 581. Physiology of Animals
3 Credits (3)
Comprehensive treatment of integrative physiology of animals, emphasizing tissues, organ systems, and regulatory control, including neuroendocrine function, circulation, respiration, and excretion. Term paper required. BIOL 2610G, BIOL 377 recommended.
Prerequisite: BIOL 2110G.

BIOL 582. Advanced Plant Signalling and Development
3 Credits (3)
This is a course that introduces plant signalling pathways and their role in development to students. The lectures are structured to facilitate in-class discussions on the current state and future directions in this field. Topics will cover a wide range of biological questions and the methods used to study them. May be repeated up to 3 credits.
Prerequisite(s): BIOL 305 or GENE 315, and MATH 1220G.

BIOL 587. Behavioral and Evolutionary Ecology
3 Credits (3)
This course will investigate the causes and consequences of phenotypic variation and the adaptive value of phenotypic traits.

BIOL 589. Speciation and Adaptation
1-3 Credits (1-3)
Examination of the two great themes of evolutionary biology. Begins with an historical overview of perspectives on these evolutionary processes, and then moves through the foundations of modern research to focus on recent advances driven by improvements in theory and technology. Emphasis on synthesis of the primary literature through lectures, discussion, and written assignments.
Learning Outcomes
1. Students will actively participate in discussions focused on both classic foundational texts as well as recent research in this field.
2. Students are expected to lead class discussions on relevant evolution topics.
3. Students will learn to write a literature review paper on a specific topic in the field of evolutionary biology.

BIOL 590. Neuroscience
1-3 Credits
Detailed examination of the principles underlying nervous system organization and function. Emphasis on recent advances in multidisciplinary, integrated approaches to study the nervous system. May be repeated up to 9 credits.

BIOL 598. Special Research Programs
1-9 Credits
Individual investigations either analytical or experimental.

BIOL 599. Master's Thesis
15 Credits
Thesis.

BIOL 600. Doctoral Research
1-15 Credits
Research.

BIOL 610. Seminar
1-3 Credits (1-3)
Oral presentation and discussion of journal articles and ongoing research projects. May be repeated up to 6 credits. Graded: S/U Grading (S/U, Audit).

BIOL 612. Microbiology Seminar
1 Credit (1)
Seminar to aid graduate students in assessment and presentation of classical and current topics in microbiology.

BIOL 697. University Teaching Experience
1-3 Credits
Certain graduate students will be permitted to teach up to one-third of one of the biology courses. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. May be repeated up to 3 credits.
Learning Outcomes
1. Varies.

BIOL 698. Selected Topics
1-3 Credits
Selected topics for doctoral students.

BIOL 700. Doctoral Dissertation
15 Credits
Dissertation.

Genetics Courses

GENE 1110. Experimental Systems in Genetics
1 Credit (1)
Survey of molecular, biochemical, organismal, and computer science based approaches to investigate how genes determine important traits. Historical development and topics of current interest will be discussed.
Learning Outcomes
1. To give the students a historical perspective on the field of genetics.
2. To familiarize the students to introductory concepts and vocabulary to the field of genetics.
3. Introduce experimental systems within the field of genetics and to give perspective to current genetic research.
4. As this course is designed for beginning students as an overview of faculty and research labs on campus. The students majoring in genetics are encouraged to meet with faculty and to explore opportunities available to them on campus

GENE 303V. Genetics and Society
3 Credits (3)
Relates the science of genetics with social ramifications. Ways in which genetics and evolution interact with social, political, and economic issues. Includes genetic engineering, gene therapy, DNA finger-printing, ancient DNA, plant and animal improvement, and future prospects. Students required to formulate value judgments on contemporary biological issues that will impact society. Crosslisted with: AGRO 303V.
Learning Outcomes
1. Explain foundational genetic concepts and modern biotechnological techniques, including whole genome sequencing and genetic variation.

2. Analyze the implications of genetic technologies, such as cloning, gene therapy, genetic testing, and DNA forensics, to society.
3. Evaluate ethical issues surrounding genetic applications, including genetic discrimination, eugenics, and ownership of genetic information.
4. Develop and defend informed arguments about controversial topics in genetics (cloning and stem cells), using scientific evidence and ethical reasoning.
5. Collaborate on a group project (a term paper) to research and present real-world genetics-related issues and their impact on society.

GENE 305. Principles of Genetics
3 Credits (3)
Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.
Prerequisite: (BIOL 2610G and BIOL 2110G, or BIOL 2110G and BCHE 140, and either CHEM 1215G or CHEM 1216).
Learning Outcomes
1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

GENE 305 L. Genetic Techniques
1 Credit (3P)
Experimental procedures used in genetic research including: sexual transmission genetics, eukaryotic DNA isolation, DNA marker development and genotyping, polymerase chain reaction, and cytogenetics.
Prerequisite(s)/Corequisite(s): GENE 315, or AGRO/ANSC/BIOL/HORT 305.

GENE 315. Molecular Genetics
3 Credits (3)
Covers fundamental principles of DNA structure and replication, transcription, translation, gene regulation, recombinant DNA technology, and a survey of genomics and bioinformatics. Recommend CHEM 313.
Prerequisite(s): CHEM 1225G and BIOL 2110G.

GENE 320. Hereditary and Population Genetics
3 Credits (3)
Covers fundamental principles of reproduction, variation, and heredity in plants and animals including: Mendelian inheritance, mitosis, meiosis, genetic linkage, random mating, genetic drift, natural selection, inbreeding, migration, mutation, interrelationships between individuals, populations and communities and the environment.
Prerequisite: CHEM 1215G & BIOL 2110G.
Learning Outcomes
1. Deduce correctly how a trait is being inherited from one generation to another in any species.
2. Explain correctly concepts associated with Mendelian, quantitative, and population genetics.
3. Solve numerical problems correctly associated with Mendelian inheritance of traits, gene linkage and recombination, quantitative inheritance of traits, and population genetics.

GENE 391. Genetics Internship
1-6 Credits (1-6)
Professional work experience in genetics under the joint supervision of an employer and a faculty member. Documentation of proposed internship activities must be submitted prior to the start of the internship. A written report is required after the internship is completed. No more than 6 credits toward a degree. May be repeated up to 6 credits. Graded: S/U Grading (S/U, Audit).

GENE 440. Genetics Seminar
1 Credit (1)
Organization, preparation, and presentation of genetic studies in model microorganism, plant, or animal systems that have been used to solve problems in molecular, cellular, and developmental biology.
Prerequisite: Seniors only; GENE 315 & GENE 320.
Learning Outcomes
1. Evaluate and discuss scientific literature associated with the use of a genetic model (microorganism, plant, or animal).
2. Identify several types of peer-reviewed journal articles.
3. Lead a discussion of a peer-reviewed journal article in genetics.
4. Develop and present a three-minute “lightning talk”.
5. Organize, develop, and deliver a presentation on a topic in genetics.

GENE 449. Special Problems
1-3 Credits (1-3)
Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 3 credits toward a degree. Consent of instructor required.

GENE 450. Special Topics
1-3 Credits (1-3)
Specific subjects to be announced in the schedule of classes. Maximum of 3 credits per semester and a total of 3 credits toward a degree. Consent of instructor required.

GENE 452. Applied Bioinformatics
3 Credits (3)
Survey and application of publicly available bioinformatic tools that treat genomic DNA, cDNA, and protein sequences, RNA abundance, as well as tools that allow inference based on phylogenetic relationships.
Prerequisite: AGRO/ANSC/BIOL/HORT 305 or GENE 315 and GENE 320, and BCHE 341, or BCHE 395.
Learning Outcomes
1. Define bioinformatics and its relevance in different fields or disciplines.
2. Interpret gene sequence and expression information derived from genomic and transcriptomic databases.
3. Identify the importance of sequencing the genomes of organisms and determine the relationships of sequence to the structure, function, and diversity of DNA, RNA, and proteins.
4. Implement information derived from bioinformatics to solve specific biological problems (disease resistance in animals and plants).
5. Organize a round-table discussion of a peer-reviewed journal demonstrating the application of bioinformatics software/program(s) or databases to study (a) gene expression, (b) multiple sequence alignments, or (c) genomics and develop a presentation and research project proposal related to bioinformatics.

GENE 486. Genes and Genomes
3 Credits (3)
Extensive coverage of nuclear and organelle genome structure in plants and animals, genome restructuring including duplication, anueploidy,

chromosome translocations and inversions, comparative genomics, and molecular systematics.
Prerequisites: AGRO/ANSC/BIOL/HORT 305 or GENE 315, and GENE 320.

Name: Biology Department

Office Location: Foster Hall room 275

Phone: (575) 646-3611

Website: http://bio.nmsu.edu/ (http://bio.nmsu.edu)

Biology (Secondary Education) - Bachelor of Arts

The Bachelor of Arts curriculum is intended for students who desire a broad education with emphasis in biology in a program chosen by the student in consultation with an academic advisor. The Bachelor of Arts is recommended for those who plan to teach at the Secondary General Science Education (Grades 6-12) level or to use a background in life science in business or other endeavors.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [2]		*3-4*
MATH 1430G	Applications of Calculus I	
or MATH 1511G	Calculus and Analytic Geometry I	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social/Behavioral Sciences course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory (Departmental Requirement)	4
Viewing a Wider World [3]		**3**
Departmental Requirements		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 301	Principles of Ecology	3
BIOL 305	Principles of Genetics	3
BIOL 377	Cell Biology	3
BIOL 467	Evolution	3
Biology Electives		*12*
Select sufficient upper-division biology electives to bring total upper-division credits to 24. [4]		
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
CHEM 2120	Integrated Organic Chemistry and Biochemistry	3
CHEM 2120L	Integrated Organic Chemistry and Biochemistry Lab	1
Select 3-4 credits from one of the following departments: astronomy, computer science, geology or physics		*3-4*
EDUC 3120	Multicultural Education	3
EDUC 3997	Secondary Field Experience	3
EDUC 4410	Teaching Science at the Middle and High School Level [5]	3
EDUC 4820	Secondary Student Teaching [6]	9
EDUC 4821	Middle and High School Student Teaching Seminar [6]	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
READ 4330	Content Area Literacy [5]	3
Second Language Requirement (See below)		**0-8**
The number of credits required to satisfy this requirement will vary depending on the option a student choses.		
Electives, to bring the total credits to 120 [7]		**11-21**
Selective sufficient electives to bring the total to 120, including at least 48 upper-division credits.		
Total Credits		**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. Either MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need prerequisite courses before entering one of these.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. Choice of Biology electives should be done in consultation with an advisor.
5. Requires TEP admittance.
6. Requires STEP admittance.
7. Elective credit may vary depending on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credit in the requirement list is the amount needed to bring the total to 120 credits and may vary based on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss this with their advisor.

Second Language Requirement

For the Bachelor of Arts in Biology there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II	3-6
or SPAN 2210	Spanish for Heritage Learners III	

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
FREN 1120	French II	4
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
OR		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory [1]	4
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1220G	College Algebra [1]	3
Area IV: Social and Behavioral Science Course [2]		3
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**17**
Semester 2		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [1]	4
Choose from one of the following:		4
MATH 1430G	Applications of Calculus I [1]	
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I or Calculus and Analytic Geometry I Honors	
Choose from one of the following Area I Oral Communication General Education Courses:		3
COMM 1115G	Introduction to Communication	
HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
	Credits	**15**
Second Year		
Semester 1		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
BIOL 305	Principles of Genetics [1]	3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [1]	4
Choose electives to bring credits to 15. [3]		4
	Credits	**14**
Semester 2		
BIOL 377	Cell Biology [1]	3
Upper-division Biology Elective Course [1]		3
EDUC 3120	Multicultural Education	3
First Course in Second Language Series		4
Area V: Humanities Course [2]		3
	Credits	**16**
Third Year		
Semester 1		
Upper-division Biology Elective Course [1]		3

SPED 3105	Introduction to Special Education in a Diverse Society	3
CHEM 2120	Integrated Organic Chemistry and Biochemistry	3
CHEM 2120L	Integrated Organic Chemistry and Biochemistry Lab	1
Next Second Language Course in Series [1]		3-4
Choose electives to bring credits to 15. [3]		2
	Credits	**15-16**
Semester 2		
BIOL 301	Principles of Ecology	3
Upper-division Biology Elective Course [1]		3
Upper-division Biology Elective Course [1]		3
EDUC 3997	Secondary Field Experience	3
Viewing A Wider World [4]		3
	Credits	**15**
Fourth Year		
Semester 1		
BIOL 467	Evolution	3
EDUC 4410	Teaching Science at the Middle and High School Level [5]	3
READ 4330	Content Area Literacy [5]	3
Science elective course with prefix ASTR, CSCI, GEOL, or PHYS.		3
Choose elective courses to bring credits to 15. [3]		4
	Credits	**16**
Semester 2		
EDUC 4820	Secondary Student Teaching [6]	9
EDUC 4821	Middle and High School Student Teaching Seminar [6]	3
The 15 credit rule to qualify for financial aid is waived during the final student teaching semester.		
	Credits	**12**
	Total Credits	**120-121**

1. These courses have prerequisites or co-requisites and it is the student's responsibility for checking and fulfilling all course requirements listed for these courses.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. Elective credit may vary depending on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credit in the requirement list is the amount needed to bring the total to 120 credits and may vary based on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss this with their advisor.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. Course requires TEP admittance.
6. Course requires STEP admittance.

Biology - Bachelor of Arts

The Bachelor of Arts curriculum is intended for students who desire a broad education with emphasis in biology in a program chosen by the student in consultation with an academic advisor. The Bachelor of Arts is recommended for those who plan to teach at the primary levels or to use a background in life science in business or other endeavors.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [2]		*3-4*
MATH 1430G	Applications of Calculus I	
or MATH 1511G	Calculus and Analytic Geometry I	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social/Behavioral Sciences course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory (Departmental Requirement)	4
Viewing a Wider World [3]		**6**
Departmental Requirements		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 301	Principles of Ecology	3
BIOL 305	Principles of Genetics	3
BIOL 377	Cell Biology	3
BIOL 467	Evolution	3
Biology Electives		*12*
Select sufficient upper-division biology electives to bring total upper-division credits to 24. [4]		
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Organic Chemistry Requirement		*4-8*
CHEM 2120 & 2120L	Integrated Organic Chemistry and Biochemistry and Integrated Organic Chemistry and Biochemistry Lab	4
OR		
CHEM 313 & CHEM 314 & CHEM 315	Organic Chemistry I and Organic Chemistry II and Organic Chemistry Laboratory	8
Select 3-4 credits from one of the following departments: astronomy, computer science, geology or physics		*3-4*
Second Language Requirement (See below)		**0-8**

The number of credits required to satisfy this requirement will vary depending on the option a student choses.	
Electives, to bring the total credits to 120 [5]	**19-33**
Selective sufficient electives to bring the total to 120, including at least 48 upper-division credits.	
Total Credits	**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. Either MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need prerequisite courses before entering one of these.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. Choice of Biology electives should be done in consultation with an advisor.
5. Elective credit may vary depending on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credit in the requirement list is the amount needed to bring the total to 120 credits and may vary based on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss this with their advisor.

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Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II	3-6
or SPAN 2210	Spanish for Heritage Learners III	

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
FREN 1120	French II	4
or PORT 1120	Portuguese II	
or SPAN 1120	Spanish II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

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A Suggested Plan of Study for Students

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First Year		
Semester 1		**Credits**
MATH 1220G	College Algebra [1]	3
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory [1]	4
Area IV: Social and Behavioral Science Course [2]		3
Elective Course		3
	Credits	**17**
Semester 2		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [1]	4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
Choose from one of the following:		3-4
MATH 1430G	Applications of Calculus I [1]	
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I or Calculus and Analytic Geometry I Honors	
Choose from one of the following Area I Oral Communication General Education Courses:		3
COMM 1115G	Introduction to Communication	

HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
	Credits	**14-15**
Second Year		
Semester 1		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [1]	4
BIOL 305	Principles of Genetics [1]	3
Elective Course [3]		5
	Credits	**15**
Semester 2		
BIOL 377	Cell Biology [1]	3
First Course in Second Language Series		3-4
Upper-division Biology Elective Course [1]		3
Area VI: Creative and Fine Arts Course [2]		3
Area V: Humanities Course [2]		3
	Credits	**15-16**
Third Year		
Semester 1		
CHEM 313	Organic Chemistry I [1]	3
Upper-division Biology Elective Course [1]		3
Next Second Language Course in Series [1]		3-4
VWW: Viewing a Wider World Course [4]		3
Elective Course [3]		2
	Credits	**14-15**
Semester 2		
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
Upper-division Biology Elective Course [1]		3
Science Elective Course with prefix ASTR, C S, GEOL or PHYS		4
Elective Course [3]		3
	Credits	**15**
Fourth Year		
Semester 1		
BIOL 301	Principles of Ecology [1]	3
Upper-division Biology Elective Course [1]		3
VWW: Viewing a Wider World Course [4]		3
Upper-division Elective Course [3]		3
Upper-division Elective Course [3]		3
	Credits	**15**
Semester 2		
BIOL 467	Evolution	3
Upper-division Elective Course [1]		3
Elective Course [3]		4
Elective Course [3]		4
	Credits	**14**
	Total Credits	**119-122**

1. These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. Elective credit may vary depending on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credit in the requirement list is the amount needed to bring the total to 120 credits and may vary based on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss this with their advisor.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Biology - Bachelor of Science

The major in biology provides a solid academic base for those planning to enter any of the various fields of the biological sciences. The program allows considerable latitude. Degree plans for specific areas of interest can be obtained from the Biology Success Center (https://bio.nmsu.edu/success2.html) in Foster Hall room 204.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [2]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
PHYS 2230G	General Physics for Life Science I	
or PHYS 1230G	Algebra-Based Physics I	
PHYS 2230L	Laboratory to General Physics for Life Science I	
or PHYS 1230L	Algebra-Based Physics I Lab	
PHYS 2240G	General Physics for Life Science II	
or PHYS 1240G	Algebra-Based Physics II	
PHYS 2240L	Laboratory to General Physics for Life Science II	
or PHYS 1240L	Algebra-Based Physics II Lab	
Area IV: Social/Behavioral Sciences coure (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory (Departmental Requirement)	4
Viewing a Wider World [3]		**6**
Departmental/College Requirements		

BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 301	Principles of Ecology	3
BIOL 305	Principles of Genetics	3
BIOL 377	Cell Biology	3
BIOL 455	Biometry [4]	3
or A ST 311	Statistical Applications	
BIOL 467	Evolution	3
Select sufficient upper-division biology electives to bring total upper-division credits to 28. [5]		18
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
Organic Chemistry and Biochemistry Requirement		*7-11*
CHEM 2120 & 2120L	Integrated Organic Chemistry and Biochemistry and Integrated Organic Chemistry and Biochemistry Lab	
and additional 3 credit Biology upper-division elective		
OR		
CHEM 313 & CHEM 314 & CHEM 315 & BCHE 395	Organic Chemistry I and Organic Chemistry II and Organic Chemistry Laboratory and Biochemistry I	
Second Language Requirement (see below)		**0-8**
The number of credits required to satisfy this requirement will vary depending on the option a student choses.		
Electives, to bring the total credits to 120 [6]		**15-27**
Select sufficient electives to bring the total to 120 credits, including at least 48 upper-division credits.		
Total Credits		**120**

1 See the General Education (p. 262) Section of the catalog for a full list of courses.

2 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisite courses needed to enter MATH 1511G first.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 Only BIOL 455 will count as Departmental Requirements, students taking A ST 311 will need 3 more credits of upper-division Biology.

5 At least one upper-division course must include a laboratory and/or field experience. The laboratory/field requirement can be satisfied by any BIOL course above the 300 level that includes a laboratory or is a field course—including BIOL 350 Special Topics or BIOL 450 Special Topics.

6 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credits in the requirement list is the amount needed to bring the total to 120 credits and may vary depending on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss this with their advisor.

Second Language Requirement

For the Bachelor of Science in Biology there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120	French I and French II	8
GRMN 1110 & GRMN 1120	German I and German II	8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II	3-6
or SPAN 2210	Spanish for Heritage Learners III	

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
FREN 1120	French II	3-4
or PORT 1120	Portuguese II	
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:
In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
MATH 1220G	College Algebra [1]	3
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution [1]	3
BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory [1]	1
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
Area IV: Social and Behavioral Science Course [2]		3
Elective Course		1
	Credits	**15**
Semester 2		
MATH 1250G	Trigonometry & Pre-Calculus [1]	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [1]	4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
Choose from one of the following Area I General Education Courses:		3
COMM 1115G	Introduction to Communication	
HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
	Credits	**15**
Second Year		
Semester 1		
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [1]	4
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
BIOL 305	Principles of Genetics	3
	Credits	**14**
Semester 2		
BIOL 377	Cell Biology [1]	3
Upper-division Biology Elective Course [1]		3
Area V: Humanities Course [2]		3
Area VI: Creative and Fine Arts Course [2]		3
First Second Language Course in Series		3-4
	Credits	**15-16**
Third Year		
Semester 1		
CHEM 313	Organic Chemistry I [1]	3
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I [1]	4
Second Second Language Course in Series [1]		3-4
VWW: Viewing a Wider World Course [3]		3
Elective Course		1
	Credits	**14-15**
Semester 2		
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II [1]	4
CHEM 314 & CHEM 315	Organic Chemistry II and Organic Chemistry Laboratory [1]	5
Choose from one of the following:		3
BIOL 455	Biometry [1]	
A ST 311	Statistical Applications [1]	
Upper-division Biology Elective Course [1]		3
	Credits	**15**
Fourth Year		
Semester 1		
BCHE 395	Biochemistry I	3
BIOL 301	Principles of Ecology	3
Upper-division Biology Elective Course [1]		3
Upper-division Biology Elective Course [1]		3
VWW: Viewing a Wider World Course [3]		3
	Credits	**15**
Semester 2		
BIOL 467	Evolution	3
Upper-division Biology Elective Course [1]		3
Upper-division Biology Elective Course [1]		6
Additional Elective Course		4
	Credits	**16**
	Total Credits	**119-121**

1. These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Conservation Ecology - Bachelor in Conservation Ecology

Co-directors of the Program:

Professor, Charles Shuster, Department Head, Biology
Professor, Matthew Gompper, Department Head, Fish, Wildlife and Conservation Ecology

Professors Bailey, Boecklen, Boeing, Caldwell, Cowley, Desmond, Gompper, Hanley, Houde, James, Milligan, Roemer, Smith, Wright; ***Associate Professors*** Cain, Mabry; ***Assistant Professors*** Orr

New Mexico State University offers an interdisciplinary, undergraduate program in Conservation Ecology. The goal of this program is to train biologists for the current and future challenges that we face in the conservation and wise use of our Earth's natural resources. An overriding principle of the program is to provide a solid foundation in basic science coupled with a practical approach towards sustainability and stewardship. The curriculum encompasses several disciplines and includes a wide variety of courses from the Biology; Fish, Wildlife and Conservation Ecology; Geography; and Range Science departments.

The educational experience will provide students with an overview of global biodiversity and an understanding of the ecological and evolutionary processes that have created and sustained it. Courses in population and community ecology coupled with population viability analysis and risk assessment will give students the necessary background to understand the theory and development of these fields as well as the tools to tackle real-world problems. Courses in basic genetics, evolution, and conservation genetics will expose students to the importance of conserving genetic variation in order to maintain adaptive potential within populations, thereby sustaining the evolutionary process. Students will also receive background on wildlife law and environmental policy, information vital for assisting governing bodies in making decisions regarding the protection and wise use of our natural resources. Skills obtained in the application of geographic information systems, molecular genetics, and professional communication can also be acquired through various electives. In sum, we seek to provide undergraduate students with an education that will allow them the opportunity to contribute to the conservation of all life on Earth.

The requirements are listed below. In addition, each required course must be passed with a grade of C- or better.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1 [1]		*4*
English Composition - Level 2		*3*
ENGL 2210G	Professional and Technical Communication (preferred)	
or ENGL 2210H	Professional and Technical Communication	
Oral Communication [1]		*3*
Area II: Mathematics		*3-4*
MATH 1430G	Applications of Calculus I [2]	
or MATH 1511G	Calculus and Analytic Geometry I	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Choose one from the following (3 credits):		
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
FWCE 1110G	Introduction to Natural Resources Management	4
Viewing a Wider World		**3**
One VWW course will be met with the 9-credit rule [3]		
Major Requirements		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 301	Principles of Ecology	3
or FWCE 301	Wildlife Ecology	
BIOL 305	Principles of Genetics	3
or AGRO 305	Principles of Genetics	
BIOL 312	Plant Taxonomy	3
or RGSC 316	Rangeland Plants	
BIOL 313	Structure and Function of Plants	3
BIOL 322	Zoology	3
BIOL 455	Biometry	3
or FWCE 457	Ecological Biometry	
BIOL 462	Conservation Biology	3
BIOL 467	Evolution	3
BIOL 488	Principles of Conservation Genetics	3
FWCE 2110	Principles of Fish and Wildlife Management	3
FWCE 330	Natural History of the Vertebrates	4
FWCE 402	Seminar in Natural Resource Management	1
FWCE 409	Introduction to Population Ecology	3
FWCE 447	Wildlife Law and Policy	3
FWCE 464	Fish and Wildlife Management, Law, and Policy	3
Physiology Requirement		*3-4*
BIOL 314	Plant Physiology	
BIOL 354 & 354 L	Physiology of Humans and Laboratory of Human Physiology	
BIOL 381	Animal Physiology	
ANSC 370	System Physiology of Farm Animals	
FWCE 432	Environmental Biology of Fishes	
Diversity of Life Requirement		*6-8*
BIOL 480	Animal Behavior	
EPWS 303	Economic Entomology	
EPWS 462	Parasitology	
FWCE 430	Avian Field Ecology	
FWCE 431	Mammalogy	
FWCE 467	Herpetology	
FWCE 482	Ichthyology	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
CHEM 2120 & 2120L	Integrated Organic Chemistry and Biochemistry and Integrated Organic Chemistry and Biochemistry Lab	4
Choose one from the following:		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	

PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
Choose one from the following:		4
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**6-10**
Select additional electives to bring total to 120 credits including 48 upper division credits. [5]		
Total Credits		**120**

1 See the General Education (p. 262) Section of the catalog for a full list of courses.

2 Either MATH 1430G Applications of Calculus I or MATH 1521G Calculus and Analytic Geometry II is required for the degree but students may need to take any prerequisites needed to enter these courses.

3 One Viewing a Wider World (p. 266) course will be satisfied using the 9-hour rule: students with Biology as home department use FWCE courses and students with Fish, Wildlife and Conservation Ecology as home department use BIOL courses.

4 Other related courses may include BIOL 436 Disease Vector Biology, BIOL 442 Genomics Technology, BIOL 446 Bioinformatics and NCBI Database, BIOL 469 Biology of Emerging Infectious Diseases, ECON 337V Natural Resource Economics, GEOG 381 Cartography and GIS, GEOG 481 Fundamentals of GIS, GEOL 1110G Physical Geology, GEOL 424 Soil Chemistry, POLS 378 U.S.-Mexico Border Politics, RGSC 318 Watershed Management, RGSC 325 Rangeland Restoration Ecology, RGSC 452 Vegetation Measurements for Rangeland Assessment.

5 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credits in the requirements list is the amount needed to bring the total to 120 credits and may vary based on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Science in Conservation Ecology there is no second language requirement for the degree.

Genetics and Biotechnology - Bachelor of Science in Genetics

Codirectors of the Program:

Professor, Charles Shuster , Department Head, Biology
Professor, Niall Hanan, Interim Department Head, Plant and Environmental Sciences

Professors Bailey, Cramer, Hanley, Houde, James, Milligan, Randall, Serrano, C. Shuster, M. Shuster, Smith, Unguez, Zhang; ***Associate Professors*** Curtiss, JXu ***Assistant Professors*** Lozado

Have you ever wondered why your hair or eye color, facial features, or the build of your body resembles that of your parents, grandparents, or other close relatives? What factors are responsible for generating all the variety of colors and shapes of flowers, trees, and different types of animals? If these questions have crossed your mind, then you have been thinking about Genetics; the science of heredity. Genetics is studied at the DNA/gene/genome level (molecular genetics, biotechnology, genomics and bioinformatics), the level of organisms (classical or Mendelian genetics), and within/among populations of individuals (population and quantitative genetics).

One of the most significant scientific accomplishments in history has been the use of genomic technologies to recently identify most human genes, as well as, most genes for a number of other animals, plants, fungi, and bacteria. Geneticists now have tremendous opportunities to use molecular, biochemical, mathematical, and computer science-based (bioinformatics) approaches to investigate how these genes determine observable traits. This information can be used to significantly advance human health and well being, and to meet the food and fiber needs of the world.

A degree in Genetics can provide excellent preparation for careers in academic research and technical support, teaching, agriculture, the biotechnology industry, medicine and health sciences, forensic science, technical writing, and sales or marketing. It is also an excellent background for students wishing to enter a graduate program, medical school, and veterinary school.

Undergraduates in the Genetics program must earn a grade of C- or better to receive credit for Departmental and Non-Departmental required courses. Within the Departmental Required courses, Tier I courses must be taken by all majors, for a total of 31 credit hours*. To accommodate differing interests among students, a series of Tier II courses comprising 9-11 credits are provided. Ethical considerations of genetic based technologies will be infused throughout the curriculum, with a focused course on Science and Ethics in the Tier III portion of the core curriculum.

**Note: This includes BIOL 2610G which also counts as a General Education elective.*

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, other Non-Departmental requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirements		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics		
MATH 1521G	Calculus and Analytic Geometry II [2]	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Area IV: Social/Behavioral Sciences (3 credits) [1]		

Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution (Tier I Requirement also)	3
Viewing a Wider World [3]		**6**
Departmental/College Requirements		
Tier I Requirements		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 377	Cell Biology	3
BIOL 446	Bioinformatics and NCBI Database	3
or GENE 452	Applied Bioinformatics	
BIOL 455	Biometry	3
or A ST 311	Statistical Applications	
BIOL 467	Evolution	3
GENE 1110	Experimental Systems in Genetics	1
GENE 305 L	Genetic Techniques	1
GENE 315	Molecular Genetics	3
GENE 320	Hereditary and Population Genetics	3
GENE 440	Genetics Seminar	1
Choose 3 credits from the following:		3
GENE 391	Genetics Internship	
GENE 449	Special Problems	
BIOL 302	Molecular Biology Techniques Laboratory	
BIOL 309	Guided Biological Research Lab	
Tier II Requirements		*9-11*
Select one course from each of the three following categories.		
1. Molecular and Applied Genetics: AGRO 462, ANSC 423, BIOL 442, BIOL 475, BIOL 478, BIOL 488, GENE 486		
2. Physiology: ANSC 421, BIOL 354, BIOL 381, BIOL 385, BIOL 451, BIOL 474, EPWS 314, HORT 471		
3. Organism Structure: ANSC 370, BIOL 311, BIOL 313, BIOL 322, BIOL 382, BIOL 470, BIOL 490, EPWS 302, EPWS 373		
Tier III Courses		*3*
Select one from the following:		
AGRO 303V	Genetics and Society	
HNRS 306V	Science, Ethics and Society	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
BCHE 395	Biochemistry I	3
BCHE 396	Biochemistry II, Lecture and Laboratory	4
PHYS 2230G	General Physics for Life Science I	3
or PHYS 1230G	Algebra-Based Physics I	
PHYS 2240G	General Physics for Life Science II	3
or PHYS 1240G	Algebra-Based Physics II	
Electives, to bring the total credits to 120 [4]		**17-19**
Select electives to bring total to 120 credits including 48 upper division credits.		
Recommended Electives		
HNRS courses [5]		
Total Credits		**120**

1 See the General Education Section (p. 262) of the catalog for a full list of courses.

2 MATH 1521G Calculus and Analytic Geometry II is required for the degree but students may need to take prerequisite courses before entering MATH 1521G Calculus and Analytic Geometry II.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credits in the requirements list is the amount needed to bring the total to 120 credits and may vary based on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss elective requirements with their advisor.

5 Students interested in graduating with University Honors should consult with an advisor to select 18 credits of relevant Honors (HNRS) courses.

Second Language Requirement

For the Bachelor of Science in Genetics with a major in Genetics and Biotechnology there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
GENE 1110	Experimental Systems in Genetics	1
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
Area IV: Social/Behavioral Science Course [1]		3
	Credits	**15**
Spring		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
MATH 1220G	College Algebra	3
Area V: Humanities Course [1]		3
Elective		1
	Credits	**15**
Second Year		
Fall		
CHEM 313	Organic Chemistry I	3
MATH 1250G	Trigonometry & Pre-Calculus	4
GENE 315	Molecular Genetics	3
Choose one from the following:		3

ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Area I: Oral Communication [1]		3
	Credits	**16**
Spring		
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I or Calculus and Analytic Geometry I Honors	4
GENE 320	Hereditary and Population Genetics	3
Elective Course		3
	Credits	**15**
Third Year		
Fall		
BCHE 395	Biochemistry I	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
PHYS 2230G	General Physics for Life Science I	3
Area IV: Creative and Fine Arts		3
Elective		2
	Credits	**15**
Spring		
BIOL 377	Cell Biology	3
BCHE 396	Biochemistry II, Lecture and Laboratory	4
GENE 305 L	Genetic Techniques	1
PHYS 2240G	General Physics for Life Science II	3
Choose from one of the following:		3
A ST 311	Statistical Applications	
BIOL 455	Biometry	
Elective		2
	Credits	**16**
Fourth Year		
Fall		
BIOL 467	Evolution	3
BIOL 302	Molecular Biology Techniques Laboratory	3
Tier II: Organism Structure Course		3-4
Choose from one of the following:		3
BIOL 446	Bioinformatics and NCBI Database	
GENE 452	Applied Bioinformatics	
VWW: Viewing a Wider World Course [2]		3
	Credits	**15-16**
Spring		
GENE 440	Genetics Seminar	1
AGRO 303V	Genetics and Society	3
Tier II: Molecular and Applied Genetics Course		3
Tier II: Physiology Course		3-4
VWW: Viewing a Wider World Course		3
Elective		
	Credits	**13-14**
	Total Credits	**120-122**

[1] See the General Education (p. 262) section of the catalog for a full list of courses.

[2] See the Viewing a Wider World (p. 266) section for a full list of courses.

Microbiology - Bachelor of Science

The major in microbiology provides a solid academic base for those planning to enter any of the various fields of microbiology.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics		
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [2] Calculus and Analytic Geometry I Honors	4
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
Choose one sequence from the following (4 credits)		
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
Choose one sequence from the following (4 credits)		
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
Area IV: Social/Behavioral Sciences course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory (Departmental Requirement)	4
Viewing A Wider World [3]		**6**
Departmental Requirements		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 305	Principles of Genetics	3
BIOL 311	General Microbiology	3
BIOL 311 L	General Microbiology Laboratory	2
BIOL 451	Physiology of Microorganisms [4]	3
or BIOL 475	Virology	
BIOL 455	Biometry	3

or A ST 311	Statistical Applications	
BIOL 474	Immunology	3
BIOL 478	Molecular Biology of Microorganisms	3
BIOL 479	Medical Microbiology	3
BIOL 479 L	Medical Microbiology Laboratory	1
Microbiology Electives		*6*
Select six additional credits from the following list to bring total upper-division credits in microbiology to 24: BIOL 412, BIOL 427, BIOL 451, BIOL 469, BIOL 473, BIOL 475, BIOL 476, BIOL 477		
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
BCHE 395	Biochemistry I	3
Second Language Requirement (see below)		**0-8**
The number of credits required to satisfy this requirement will vary depending on the option a student choses.		
Electives, to bring the total credits to 120 [5]		**18-26**
Select sufficient electives to bring total credits to 120 including 48 upper-division credits.		
Total Credits		**120**

1 See the General Education (p. 262) section of the catalog for a full list of courses.

2 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take prerequisites courses before entering MATH 1511G.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 Students may take both BIOL 451 Physiology of Microorganisms and BIOL 475 Virology; the second course will count as a microbiology elective.

5 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credits in the requirement list is the amount needed to bring the total to 120 credits and may vary depending on the degree. Students may have to take more or less courses on a case-by-case basis and each student should discuss this with their advisor.

Second Language Requirement

For the Bachelor of Science in Microbiology there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II	3-6
or SPAN 2210	Spanish for Heritage Learners III	

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
FREN 1120	French II	4
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
PORT 1120	Portuguese II	3
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may

vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1220G	College Algebra [1]	3
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory [1]	4
Area IV: Social and Behavioral Science Course [2]		3
Elective Course		1
	Credits	**15**
Semester 2		
MATH 1250G	Trigonometry & Pre-Calculus [1]	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [1]	4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
Choose from one of the following:		3
COMM 1115G	Introduction to Communication	
HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
	Credits	**15**
Second Year		
Semester 1		
Choose from one of the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [1]	4
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory [1]	5
	Credits	**16**
Semester 2		
BIOL 305	Principles of Genetics [1]	3
CHEM 313	Organic Chemistry I [1]	3
Area V: Humanities Course [2]		3
Choose from one of the following:		3
BIOL 455	Biometry [1]	
A ST 311	Statistical Applications [1]	
Initial Second Language Course in series		3
	Credits	**15**
Third Year		
Semester 1		
CHEM 314	Organic Chemistry II [1]	3
CHEM 315	Organic Chemistry Laboratory [1]	2
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I [1]	4
BIOL 474	Immunology	3
Next Second Language Course in series [1]		3
	Credits	**15**
Semester 2		
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II [1]	4
BCHE 395	Biochemistry I [1]	3
Upper-division Biology Elective (Microbiology) [1]		3
Area V: Creative and Fine Arts Course [2]		3
VWW: Viewing a Wider World Course [3]		3
	Credits	**16**
Fourth Year		
Semester 1		
BIOL 478	Molecular Biology of Microorganisms	3
Upper-division Biology Elective (Microbiology) [1]		3
VWW: Viewing a Wider World Course [3]		3
Upper-division Elective Course [1]		3
Elective Course		3
	Credits	**15**
Semester 2		
BIOL 479 & 479 L	Medical Microbiology and Medical Microbiology Laboratory [1]	4
Choose from one of the following:		3
BIOL 451	Physiology of Microorganisms [1]	
BIOL 475	Virology [1]	
Upper-division Elective Course [1]		3
Elective Course		3
	Credits	**13**
	Total Credits	**120**

1. These courses have prerequisites and/or co-requisites and it is the students responsibility for checking and fulfilling all requirements for these courses.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Biology - Undergraduate Minor

The courses of the Biology minor represent core biological content, critical for a general view of biology. A student cannot earn a bachelor's degree in Biology and also earn a minor in Biology.

Requirements

A minor in Biology must include 20 credits in Biology, of which at least 9 credits must be numbered 300 and above.

No more than 3 credits of special topics or individual study courses may be applied to the minor. A grade of C- or better must be earned in all courses.

Prefix	Title	Credits
Required Courses		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4

BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 301	Principles of Ecology	3
or BIOL 377	Cell Biology	
BIOL 305	Principles of Genetics	3
BIOL 467	Evolution	3
Elective		**3**
Select any Biology courses to bring the total credits to 20.		
Total Credits		**20**

Conservation Ecology - Undergraduate Minor

A minor in Conservation Ecology is available for students who choose to major in other areas, but wish to include Conservation Ecology in their academic training. A minor in Conservation Ecology must include a minimum of 20 credits in the discipline with 9 of these coming from upper-division courses.

Requirements

Prefix	Title	Credits
Core Curriculum		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
BIOL 301	Principles of Ecology	3
or FWCE 301	Wildlife Ecology	
BIOL 462	Conservation Biology	3
FWCE 2110	Principles of Fish and Wildlife Management	3
FWCE 402	Seminar in Natural Resource Management	1
Select 6 credits from the following:		6
BIOL 312	Plant Taxonomy	
or RGSC 316	Rangeland Plants	
BIOL 313	Structure and Function of Plants	
BIOL 322	Zoology	
BIOL 467	Evolution	
BIOL 480	Animal Behavior	
BIOL 488	Principles of Conservation Genetics	
ECON 384V	Water Resource Economics	
ECON 337V	Natural Resource Economics	
EPWS 303	Economic Entomology	
EPWS 462	Parasitology	
FWCE 330	Natural History of the Vertebrates	
FWCE 409	Introduction to Population Ecology	
FWCE 430	Avian Field Ecology	
FWCE 431	Mammalogy	
FWCE 447	Wildlife Law and Policy	
FWCE 464	Management of Aquatic and Terrestrial Ecosystems	
FWCE 467	Herpetology	
FWCE 482	Ichthyology	
Total Credits		**20**

Genetics and Biotechnology - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
GENE 1110	Experimental Systems in Genetics	1
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
GENE 305 L	Genetic Techniques	1
GENE 452	Applied Bioinformatics	3
Select two from the following:		6
BIOL 305	Principles of Genetics	
GENE 315	Molecular Genetics	
GENE 320	Hereditary and Population Genetics	
Total Credits		**18**

Human Biology - Undergraduate Minor

The Human Biology minor is intended to provide academic recognition for students who wish to focus a significant amount of attention on courses that deal with human beings from a wide variety of biological standpoints. Thus, course work may encompass topics representing a range of viewpoints such as biological function, human ecology, human origins, and psychology. Successful completion of this minor will provide students with a valuable interdisciplinary perspective on the human condition. This program consists of a minimum of 18 hours, that includes a minimum of 12 from within the Biology Department and a minimum of 3 outside the department. Successful completion of the minor will be certified by the Biology Department. A grade of C- or better is required of all minor courses.

Requirements

Prefix	Title	Credits
Required Departmental Courses		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
Select 3-4 credits from the following: [1]		3-4
BIOL 353	Pre-Professional Human Anatomy	
BIOL 354	Physiology of Humans	
Additional Courses		
Select sufficient credits to total 18 credits from within and outside Biology department:		11
Within Department		
Select a minimum of 5 credits from the following:		
BIOL 1120G	Human Biology	
BIOL 305	Principles of Genetics	
BIOL 353 L	Pre-Professional Human Anatomy Laboratory	
BIOL 354 L	Laboratory of Human Physiology	
BIOL 385	An Introduction to Cancer	
BIOL 424	Human Osteology	
BIOL 469	Biology of Emerging Infectious Diseases	

BIOL 470	Developmental Biology
BIOL 474	Immunology
BIOL 490	Neurobiology
Outside Department	
Select a minimum of 3 credits; maximum 6 credits from the following:	
ANTH 1135G & ANTH 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab
ANTH 355	Biological Anthropology
ANTH 357V	Medical Anthropology
ANTH 435	Human Health and Biological Variation
ANTH 436	Evolutionary Medicine
ANTH 458	Gender and Reproduction
HNRS 2170G	The Human Mind
HNRS 306V	Science, Ethics and Society
PHLS 3110V	Human Sexuality
PSYC 2250	Brain and Behavior
Total Credits	**18-19**

[1] Any of BIOL 353 Pre-Professional Human Anatomy, or BIOL 354 Physiology of Humans not taken as a departmental requirement can be taken as one of the departmental elective courses.

Microbiology - Undergraduate Minor

A student cannot earn a bachelor's degree in Microbiology and also earn a minor in Microbiology.

Requirements

Prefix	Title	Credits
Required Courses		
BIOL 311	General Microbiology	3
BIOL 311 L	General Microbiology Laboratory	2
BCHE 395	Biochemistry I	3
Select elective courses from this list to bring the total credits to 20:		12-11
BIOL 412	Seminar in Microbiology	
BIOL 451	Physiology of Microorganisms	
BIOL 473	Ecology of Microorganisms	
BIOL 474	Immunology	
BIOL 475	Virology	
BIOL 477	Applied and Environmental Microbiology	
BIOL 478	Molecular Biology of Microorganisms	
BIOL 479	Medical Microbiology	
BIOL 479 L	Medical Microbiology Laboratory	
Total Credits		**20-19**

Chemistry and Biochemistry

Undergraduate Program Information

A degree in chemistry or biochemistry enables a student to pursue a wide variety of careers in: research, production, sales, management and teaching. These degrees are also an excellent preparation for professional studies in medicine, dentistry, forensics, veterinary science, optometry, pharmacology, pharmacy and law.

The NMSU **Bachelor of Science Chemistry major** is certified by the American Chemical Society (ACS). Graduates who complete the program are also eligible for immediate election to membership in the ACS.

The NMSU **Bachelor of Science Biochemistry major** is accredited by the American Society of Biochemistry and Molecular Biology (ASBMB). BS Biochemistry majors are eligible to obtain degree certification through examination.

The department offers **concentrations in Secondary Education** for the Bachelor of Arts in Chemistry major and the Bachelor of Science in Chemistry major. These concentrations follow the same Chemistry degree plans but also provide the Education courses that lead to a certification as a secondary education teacher in science.

The department also offers a **Pre-Med concentration** for the Bachelor of Arts in Chemistry major. The concentration in Pre-Medical Studies provides foundational knowledge to students who are preparing to take the MCAT exam. Graduates will successfully complete medical school pre-requisite coursework and obtain an interdisciplinary understanding of healthcare that includes scientific, humanistic, and social science perspectives.

All departmental and nondepartmental requirements may not be taken S/U, unless the course only offers S/U grading option, and must earn a C- or better final grade.

This department does not have a foreign language requirement for any of its degrees.

Graduate Program Information

The Department of Chemistry and Biochemistry offers programs leading to the **MS and Ph.D. degrees in Chemistry** in the areas of physical, organic, inorganic, and analytical chemistry, and we offer a **concentration in Biochemistry**. Admission to these programs without deficiency is based on an undergraduate program essentially equivalent to that pursued by a chemistry or biochemistry major at this university. All applying students must submit undergraduate transcripts, a personal statement and CV, and arrange for 3 letters of recommendation. All foreign students from undergraduate programs taught in a language other than English must additionally submit TOEFL or IELTS scores and demonstrate adequate English speaking and writing skills. GRE scores are not required to apply.

The core course work required of students entering the Chemistry MS or PhD programs with no previous graduate study in chemistry or biochemistry consists of courses exploring the concepts of Energy, Structure, Dynamics, and Measurements as applied to all disciplines of chemistry. Students enrolled in the Biochemistry concentration take core course work in Biochemistry. All graduate students also take short courses in Safety, Research Ethics, and Professional Development. Successful completion of a Qualifying Exam taken after the first year of coursework will determine whether a student is qualified to pursue continued study at the M.S. or Ph.D. level. Ph.D. candidates must take at least 6 additional credits of specialized coursework chosen in consultation with the thesis committee while M.S. candidates must take at least 3 additional credits. Ph.D. candidates must successfully complete a Comprehensive Exam in order to be eligible to write and defend a Ph.D. thesis. All students are expected to participate in discussion groups and department colloquia.

Students enrolled in the Biochemistry concentration take core course work in Biochemistry

Since research is central in both the M.S. and Ph.D. programs, the early selection of a research advisor is encouraged. Students may choose to rotate through up to 3 research labs during their first semester before selecting a research advisor. Financial support is provided to all graduate students during their first year through teaching assistantships. Continued support may be provided through a research or teaching assistantship, depending upon individual laboratory funding. All support is contingent upon satisfactory academic and research performance. In addition, numerous traineeships and fellowships are available to qualified students. Inquiries regarding these opportunities should be directed to the graduate program coordinator.

Degrees for the Department

Bachelor Degree(s)

- Biochemistry - Bachelor of Science (p. 595)
- Chemistry (Pre-Med) - Bachelor of Arts (p. 600)
- Chemistry (Secondary Education) - Bachelor of Arts (p. 603)
- Chemistry (Secondary Education) - Bachelor of Science (p. 607)
- Chemistry - Bachelor of Arts (p. 598)
- Chemistry - Bachelor of Science (p. 605)

Master Degree(s)

- Chemistry (Biochemistry) - Master of Science (p. 127)
- Chemistry - Master of Science (p. 127)

Doctoral Degree(s)

- Chemistry (Biochemistry) - Doctor of Philosophy (p. 210)
- Chemistry - Doctor of Philosophy (p. 210)

Minors for the Department

- Biochemistry - Undergraduate Minor (p. 609)
- Chemistry - Undergraduate Minor (p. 609)

Shelley Lusetti, Department Head

Professors Houston, Lusetti, Maio, Yukl; ***Associate Professors*** Ashley, Baker, Talipov, Tello-Aburto; ***Assistant Professors*** Folkman, Frank, Gold, Guberman-Pfeffer, Vincent-Ruz, Windorff; ***College Professor*** Dunlavy; ***College Associate Professor*** Chinnasamy; ***College Assistant Professors*** Beltran, Marcheschi; ***Emeritus Professors*** Arterburn, Eiceman, Gopalan, Herndon, Johnson, Kuehn, Lara, Lyons, Quintana, Rayson, Smirnov

S. Lusetti, Department Head, Ph.D. (Wisconsin–Madison)– biochemistry; enzymology of DNA repair; *A. K. Ashley, Ph.D. (Colorado State)– biochemistry and toxicology; DNA replication and repair, cancer; C. A. Baker, Ph.D. (Florida State)– analytical chemistry; separation science, micro- and nanotechnologies for neuroscience and astrobiology; S. J. Folkman, Ph.D. (Colorado State University)- electrochemistry, materials; inorganic, green chemistry, for sustainability; C. E. Frank, Ph.D. (Rutgers- New Brunswick)- solid state inorganic chemistry; crystal growth, magnetic, topological, and multifunctional materials; B. Gold, Ph.D. (Florida State)– organic chemistry; synthetic methods for chemical biology; bioorganic and medicinal chemistry; M. J. Guberman-Pfeffer, Ph.D. (University of Connecticut)– physical chemistry; energy and electron transfer in biosystems; science accessibility; K. D. Houston, Ph.D. (Texas- MD Anderson)– biochemistry; molecular mechanisms of hormone action in tumorigenesis; W. A. Maio, Ph.D. (Johns Hopkins)– organic chemistry; total synthesis of marine natural products and explorations of new chemical methods; M. R. Talipov, Ph.D. (Bashkir State)– theoretical physical chemistry; electronic structure calculations, ab initio calculations, density functional theory calculations; R. Tello-Aburto, Ph.D. (Iowa) - medicinal and natural products chemistry, asymmetric organic synthesis; P. Vincent-Ruz, Ph.D. (Pittsburgh) - chemistry education research, equity and justice, quantitative methods; C. J. Windorff, Ph.D. (UC-Irvine)- inorganic chemistry; organometallic f-element and transition metal chemistry, redox chemistry; E. T. Yukl, Ph.D. (Oregon Health and Science)– biochemistry; x-ray crystallography and spectroscopy of bacterial metalloproteins*

Biochemistry Courses

BCHE 140. Explorations in Chemistry and Biochemistry
1 Credit (1)
In introduction to the experience of chemistry and biochemistry degrees. In this course, students will prepare a degree plan and personal statement. Career opportunities in chemistry and biochemistry will be presented and discussed. Graded S/U.
Learning Outcomes
1. Demonstrate knowledge and understanding of the sub-disciplines of Chemistry and Biochemistry.
2. Demonstrate knowledge and understanding of the requirements for the Chemistry and Biochemistry majors and career opportunities available to these majors.
3. Adopt strategies to prepare for future success in a job search or graduate school application.
4. Learn about undergraduate research opportunities in chemistry and biochemistry.

BCHE 241. Introduction to Research in Biochemistry
1-3 Credits
Techniques and procedures of biochemical research. May be repeated for a maximum of 3 credits.
Prerequisites: 8 credits of chemistry and 3.0 GPA in chemistry.

BCHE 395. Biochemistry I
3 Credits (3)
Principles governing chemistry and physics of life processes with emphasis on the relationships between molecular structure and cell function. Basic principles of biochemical processes, enzymology, and the structure/function of the major classes of biomolecules with introductions to metabolism. Introduction to catabolic metabolism. May be repeated up to 3 credits.
Prerequisite: C- or better in CHEM 314.
Learning Outcomes
1. Understand the structure, reactivity, and metabolic function of the presented biological molecules and apply that knowledge to biomolecules encountered in future experiences. Examples include the 20 common amino acids, carbohydrate molecules of glycolysis, carboxylic acids of the citric acid cycle, lipid components of biological membranes, and many catalytic enzymes.
2. Understand the theory and application of many of the experimental techniques of Biochemistry.
3. Understand biochemical regulation and the interconnectedness of metabolic processes. A large fraction of contemporary biochemical research is devoted to delineating biochemical regulation. Details of biochemical regulation will be interwoven with material presented

throughout the semester, stressing the principles of regulation that are common in many organisms.
4. Understand enzyme kinetics and enzyme mechanism.

BCHE 395H. Biochemistry I Honors
3 Credits (3)
Principles governing chemistry and physics of life processes with emphasis on the relationships between molecular structure and cell function. Basic principles of biochemical processes, enzymology, and the structure/function of the major classes of biomolecules with introductions to metabolism. Introduction to catabolic metabolism. Taught with BCHE 395 with additional experiential-focused work required.
Prerequisite: C- or better in CHEM 314.
Learning Outcomes
1. Understand the structure, reactivity, and metabolic function of the presented biological molecules and apply that knowledge to biomolecules encountered in future experiences: Examples include the 20 common amino acids, carbohydrate molecules of glycolysis, carboxylic acids of the citric acid cycle, lipid components of biological membranes, and many catalytic enzymes.
2. Understand the theory and application of many of the experimental techniques of Biochemistry.
3. Understand biochemical regulation and the interconnectedness of metabolic processes. A large fraction of contemporary biochemical research is devoted to delineating biochemical regulation. Details of biochemical regulation will be interwoven with material presented throughout the semester, stressing the principles of regulation that are common in many organisms.
4. Understand enzyme kinetics and enzyme mechanism.
5. Demonstrate proficiency in problem-based learning and scientific communication.

BCHE 396. Biochemistry II, Lecture and Laboratory
4 Credits (2.5+3P)
Introduction to anabolic metabolism and hormonal regulation. Biochemical principles of the mechanism and regulation of replication, transcription, recombination and translation in prokaryotes and eukaryotes. Introduction to DNA-based information technology. Taught with BCHE 396 H. May be repeated up to 4 credits.
Prerequisite: C- or better in BCHE 395.
Learning Outcomes
1. Recognize the essential biochemical reactions and enzymatic mechanisms required for nucleic acid, amino acid, and fatty acid synthesis.
2. Learn the biochemical reaction mechanisms associated with key elements of the central dogma of molecular biology.
3. Identify the reactions and enzymes required for DNA maintenance and replication, transcription and RNA polymerization, and the translation of mRNA to primary amino acid sequence and protein synthesis.
4. Conduct experiments safely.
5. Select and manipulate plasmids to achieve desired recombinant DNA for experimentation.
6. Obtain relevant DNA sequence information from public databases.
7. Transform and isolate plasmid DNA to be used for cloning procedures.
8. Design DNA specific primers for PCR reactions.
9. Perform restriction digest and ligation reactions. 1
10. Analyze DNA sequence to validate the outcome of recombinant DNA experimentation. 1
11. Demonstrate scientific dissemination skills by attending scientific seminars or review primary literature and provide summary via written or oral presentation.

BCHE 396 H. Biochemistry II Honors, Lecture and Laboratory
4 Credits (2.5+3P)
Introduction to anabolic metabolism and hormonal regulation. Biochemical principles of the mechanism and regulation of replication, transcription, recombination and translation in prokaryotes and eukaryotes. Introduction to DNA-based information technology. Taught with BCHE 396 with additional work required. May be repeated up to 3 credits.
Prerequisite: C- or better in BCHE 395.
Learning Outcomes
1. Recognize the essential biochemical reactions and enzymatic mechanisms required for nucleic acid, amino acid, and fatty acid synthesis.
2. Learn the biochemical reaction mechanisms associated with key elements of the central dogma of molecular biology.
3. Identify the reactions and enzymes required for DNA maintenance and replication, transcription and RNA polymerization, and the translation of mRNA to primary amino acid sequence and protein synthesis.
4. Conduct experiments safely.
5. Select and manipulate plasmids to achieve desired recombinant DNA for experimentation.
6. Obtain relevant DNA sequence information from public databases.
7. Transform and isolate plasmid DNA to be used for cloning procedures.
8. Design DNA specific primers for PCR reactions.
9. Perform restriction digest and ligation reactions. 1
10. Analyze DNA sequence to validate the outcome of recombinant DNA experimentation. 1
11. Demonstrate scientific dissemination skills by attending scientific seminars or review primary literature and provide summary via written or oral presentation.

BCHE 432. Physical Biochemistry
3 Credits (3)
This course focuses on the theoretical principles of biophysical techniques and how they are applied to biological problems. Primary literature is used heavily to explain concepts and applications along with periodic demonstrations of biophysical techniques using department instruments. Students taking this course will be expected to present primary literature highlighting the applications of various techniques.
Prerequisite: CHEM 430 or CHEM 433.
Learning Outcomes
1. Understand the theoretical principles of spectroscopic and biophysical techniques.
2. Understand the appropriate applications for various instruments.
3. Be able to interpret spectroscopic and biophysical data.
4. Understand and describe biophysical literature.
5. Be able to describe biophysical studies to a diverse audience of scientists and non-scientists.

BCHE 440. Biochemistry Seminar
1 Credit (1)

Introduction to current literature in biochemistry and molecular biology. Selected topics in the field will be presented by the faculty. Students will present written and oral reports from literature searches. Restricted to: BCHE majors.
Prerequisite: BCHE 396.
Learning Outcomes
1. Students are proficient in reading scientific literature.
2. Students are proficient in the oral communication of scientific literature.

BCHE 441. Advanced Research in Biochemistry
1-3 Credits
Investigation of biochemical problems and the development of special techniques. May be repeated for a maximum of 3 credits.
Prerequisites: consent of instructor, 16 credits of chemistry and 3.0 GPA in chemistry for nonmajors.

BCHE 451. Special Topics
1-3 Credits
Selected topics of current interest designated by title and credit. May be repeated up to 12 credits.
Learning Outcomes
1. Increase depth of knowledge in a specific area of biochemistry.
2. Learn how to read and critically review primary research papers in a specific area of biochemistry.
3. Gain experience in presenting primary research papers in a specific area of biochemistry.

BCHE 452. Chemical Carcinogenesis
3 Credits (3)
Chemical-dependent DNA mutagenesis, cancer development, and progression, with an emphasis on current research.
Prerequisite: CHEM 314 or CHEM 2120.
Learning Outcomes
1. Students can describe the fundamental principles of multistage carcinogenesis, including initiation, promotion, and progression.
2. Students can explain the role of DNA mutagenesis and repair mechanisms in the development and prevention of cancer.
3. Students can summarize the basic principles of toxicokinetics and explain how carcinogens are metabolized and interact with biological systems.
4. Analyze and critically evaluate primary scientific literature related to chemical carcinogenesis.
5. Assess the significance and implications of recent advancements in carcinogenesis research.

BCHE 455. Independent Studies
1-3 Credits
Independent studies directed by consulting faculty.
Prerequisite: consent of instructor.

BCHE 542. Biochemistry I
3 Credits (3)
Principles governing chemistry and physics of life processes with emphasis on the relationships between molecular structure and cell function. In depth principles of biochemical processes, enzymology, and the structure/function of the major classes of biomolecules. Enzyme reaction and regulatory mechanisms in central metabolism and principles of bioenergetics are covered.
Prerequisite: CHEM 314 and CHEM 430 or CHEM 433; or BCHE 395 or equivalent.
Learning Outcomes
1. Understand the structure, reactivity, and metabolic function of the presented biological molecules and apply that knowledge to biomolecules encountered in future experiences: examples include the 20 common amino acids, carbohydrate molecules of glycolysis, carboxylic acids of the citric acid cycle, lipid components of biological membranes, and many catalytic enzymes.
2. Understand the theory and application of many of the experimental techniques of Biochemistry.
3. Understand biochemical regulation and the interconnectedness of metabolic processes: a large fraction of contemporary biochemical research is devoted to delineating biochemical regulation.
4. Apply the principles of enzyme kinetics as a technique to determine enzyme mechanism and regulation.
5. Propose novel enzyme reaction mechanisms based on the understanding of various classes of enzyme mechanisms and the known function of cofactors.
6. Details of biochemical regulation will be interwoven with material presented throughout the semester, stressing the principles of regulation that are common in many organisms.

BCHE 545. Molecular and Biochemical Genetics
3 Credits (3)
An accelerated treatment of the molecular basis of gene expression. Discussion of chemical, enzymological, and genetic techniques of molecular biology.
Prerequisite/Corequisite: BCHE 542.
Learning Outcomes
1. Understand and explain fundamental concepts in biochemical genetics: describe the molecular structure and function of DNA, RNA, and proteins.
2. Analyze genetic mechanisms and their applications: Evaluate the processes of DNA repair, recombination, and site-specific recombination.
3. Develop and apply scientific inquiry and problem-solving skills: Formulate and articulate relevant research questions based on course material by demonstrate the ability to apply biochemical and genetic concepts to experimental design and interpretation and engaging in critical thinking through weekly question submissions and article discussions and communicating scientific concepts effectively and construct clear, well-reasoned written and verbal explanations of biochemical genetics concepts.
4. Demonstrate the ability to communicate complex genetic mechanisms to peers: Properly cite and reference academic sources, including AI-generated content when applicable: Understand and adhere to ethical guidelines regarding plagiarism, academic integrity, and responsible scientific conduct by completing a plagiarism tutorial and apply best practices in scientific writing and Engaging in respectful, collaborative discussions and maintain a professional attitude in all course interactions.
5. Apply knowledge to broader scientific and biomedical contexts: Relate biochemical genetic principles to real-world applications, including genetic engineering, biotechnology, and medical research.
6. Compare and contrast the mechanisms of DNA replication, transcription, and translation in prokaryotic and eukaryotic systems.
7. Explain the biochemical principles underlying gene expression and its regulation.
8. Recognize the importance of biochemical genetics in understanding diseases and developing therapeutic strategies.

9. Appreciate the evolutionary and functional implications of genetic mechanisms across biological systems. 1
10. Discuss epigenetic modifications and chromatin remodeling in gene regulation. 1
11. Analyze the role of non-coding RNAs and other regulatory elements in gene expression. 1
12. Interpret and critically assess primary scientific literature related to biochemical genetics and Synthesize experimental evidence to support or refute scientific hypotheses. 1
13. Identify key methodologies used in genetic and biochemical research.

BCHE 546. Biochemistry II: Central and Intermediary Metabolism
3 Credits (3)
Intermediary metabolism: catabolic and anabolic pathways of carbohydrates, lipids, amino acids, and nucleic acids, including their regulation.
Prerequisite: BCHE 542, or BCHE 395 with consent of instructor.
Learning Outcomes
1. Apply knowledge of the structure, reactivity, and metabolic function of scores of biological molecules: examples include the 20 amino acids, carbohydrate molecules of glycolysis, carboxylic acids of the citric acid cycle, lipid components of biological membranes, and many catalytic enzymes.
2. Apply the function of enzymes, enzymatic cofactors to the design and regulation of both catabolic and anabolic pathways.
3. Master an understanding of biochemical regulation and the interconnectedness of metabolic processes and a large fraction of contemporary biochemical research is devoted to delineating biochemical regulation.
4. Identify resources and communicate the connection between metabolism and disease or mutational analysis for basic research.
5. Develop an appreciation of the unity of life processes at the molecular level, the field of Biochemistry offers a unique perspective on human existence, you will begin to understand that we are not as different, nor as separate, from the animals, plants, and microbes of this world as is commonly assumed.

BCHE 598. Special Research Programs
1-3 Credits
May be repeated for a maximum of 6 credits. Same as CHEM 598. Graded S/U.

BCHE 599. Master's Thesis
15 Credits
May be repeated for a maximum of 6 credits. Same as CHEM 599.

BCHE 600. Research
1-15 Credits
May be repeated for a maximum of 20 credits. PR/U grading. Same as CHEM 600.

BCHE 647. Physical Biochemistry
3 Credits (3)
Fundamental applications of physical chemistry to the investigation of biological metabolites and biological macromolecules, including proteins, oligo-nucleotides, and molecular arrays with an emphasis on understanding biological functions based on chemical structures. Taught with BCHE 432. May be repeated up to 3 credits.
Prerequisite: C- or better in CHEM 430 or CHEM 433 or BCHE 542.
Learning Outcomes
1. Understand the theoretical principles of spectroscopic and biophysical techniques.
2. Understand the appropriate applications for various instruments.
3. Be able to interpret spectroscopic and biophysical data.
4. Understand and describe biophysical literature.
5. Be able to describe biophysical studies to a diverse audience of scientists and non-scientists.

BCHE 649. Topics in Biochemistry
1-3 Credits
Selected topics of current interest designated by title and credit. May be repeated for a maximum of 3 credits.

BCHE 652. Chemical Carcinogenesis
3 Credits (3)
Chemical-dependent DNA mutagenesis, cancer development, and progression, with an emphasis on current research.
Learning Outcomes
1. Students can describe the fundamental principles of multistage carcinogenesis, including initiation, promotion, and progression.
2. Students can explain the role of DNA mutagenesis and repair mechanisms in the development and prevention of cancer.
3. Students can summarize the basic principles of toxicokinetics and explain how carcinogens are metabolized and interact with biological systems.
4. Analyze and critically evaluate primary scientific literature related to chemical carcinogenesis.
5. Assess the significance and implications of recent advancements in carcinogenesis research.

BCHE 700. Doctoral Dissertation
20 Credits
May be repeated for a maximum of 20 credits. Graded PR/U. Same as CHEM 700.

Chemistry Courses

CHEM 1111. Basic Chemistry
3 Credits (3)
For students whose preparatory science or math training has been deficient. Does not meet the chemistry requirement in any curriculum.
Prerequisite: Enhanced ACT composite score of at least 18 or a grade of C- or better in CCDM 114 N.
Learning Outcomes
1. The goals and objectives for CHEM 1111 are to equip students with the necessary problem solving skills to be successful in CHEM 1215G/1225G

CHEM 1120G. Introduction to Chemistry Lecture and Laboratory (non majors)
4 Credits (3+3P)
This course covers qualitative and quantitative areas of non-organic general chemistry for non-science majors and some health professions. Students will learn and apply principles pertaining, but not limited to, atomic and molecular structure, the periodic table, acids and bases, mass relationships, and solutions. The laboratory component introduces students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment.
Prerequisite: CCDM 114N or A S 103 or MATH 1215 or higher.
Learning Outcomes
1. (Lecture) Use the different systems of measurements and perform conversions within the same system of measurement and between different systems of measurements

2. (Lecture) Identify elements from their name or symbol, use the periodic table to describe reactivity patterns of elements and to predict compound formation.
3. (Lecture) Describe the basic structure of an atom using subatomic particles, and apply these concepts to nuclear reactions.
4. (Lecture) Describe ion formation and the difference between covalent and ionic compounds. Name and write formulas for ionic and simple molecular compounds.
5. (Lecture) Write and balance chemical reactions. Use balanced reactions in stoichiometric calculations.
6. (Lecture) Describe the differences between the solid, liquid and gas phases. Use the gas laws in calculations, and apply these laws to everyday situations.
7. (Lecture) Explain different types of energy, and how energy is released or absorbed in a reaction
8. (Lecture) Describe acid and base behavior.
9. (Lecture) Explain the intermolecular attractive forces that determine physical properties; apply this knowledge to qualitatively evaluate these forces and predict the physical properties that result. 1
10. (Lecture) Explain the intermolecular attractive forces that determine physical properties; apply this knowledge to qualitatively evaluate these forces and predict the physical properties that result 1
11. (Laboratory) Practice concepts associated with laboratory safety, including the possible consequences of not adhering to appropriate safety guidelines. 1
12. (Laboratory) Demonstrate the computational skills needed to perform appropriate laboratory-related calculations to include, but not be limited to determining the number of significant figures in numerical value, solving problems using values represented in exponential notation, solving dimensional analysis problems, and manipulating mathematical formulas as needed to determine the value of a variable. 1
13. (Laboratory) Perform laboratory observations (both qualitative and quantitative) using sensory experience and appropriate measurement instrumentation (both analog and digital). 1
14. (Laboratory) Record quantitatively measured values to the correct number of significant figures and assign the correct units. 1
15. (Laboratory) Master basic laboratory techniques including, but not limited to weighing samples (liquid and solid), determining sample volumes, measuring the temperature of samples, heating and cooling a sample or reaction mixture, decantation, filtration, and titration. 1
16. (Laboratory) Draw appropriate conclusions based on data and analyses. 1
17. Present experimental results in laboratory reports of appropriate length, style and depth, or through other modes as required. 1
18. Determine chemical formulas and classify different types of reactions. 1
19. Relate laboratory experimental observations, operations, calculations, and findings to theoretical concepts presented in the complementary lecture course.

CHEM 1215G. General Chemistry I Lecture and Laboratory for STEM Majors
4 Credits (3+3P)
This course covers descriptive and theoretical chemistry.
Prerequisite: (1) grade of C- or better in MATH 1215 or higher, or a Mathematics Placement Exam Score adequate to enroll in mathematics courses beyond MATH 1215, or grade of C- or better in CHEM 1111.

CHEM 1216. General Chemistry I Lecture and Laboratory for CHEM Majors
4 Credits (3+3P)
As the first of a two-semester sequence, this course teaches fundamental concepts in chemistry, including the electronic structure of atoms, chemical periodicity, nature of chemical bonds, molecular structure, the three phases of matter, etc. Designed for majors in chemical and other physical sciences, including engineering. May be appropriate for the life science major. It is assumed that the students are familiar with college algebra, chemical nomenclature, stoichiometry, and scientific measurements. The laboratory component is designed to complement the theory and concepts presented in lecture, and will introduce students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment.
Prerequisite(s): Eligible to take MATH 1250G and an ACT composite score of 22 or higher.
Learning Outcomes
1. Apply the mole concept to amounts at a microscopic level and use this to perform stoichiometric calculations for reactions in solution, gases and thermochemistry.
2. Calculate solution concentrations in various units.
3. Apply the gas laws and kinetic molecular theory to relate atomic level behavior to macroscopic properties.
4. Explain the electronic structure of atoms, isotopes and ions in terms of its subatomic particles.
5. Analyze how periodic properties (e.g. electronegativity, atomic and ionic radii, ionization energy, electron affinity, metallic character) and reactivity of elements results from electronic configurations of atoms.
6. Understand the nature of chemical bonds (ionic and covalent). Apply knowledge of electronic structure to determine molecular structure and polarity.
7. Understand the formation of different phases of matter and the underlying fundamental intermolecular interactions.
8. Describe physical states and changes, and distinguish these from chemical changes.
9. Describe the energy conversions that occur in chemical reactions and state changes, relating heat of reaction to thermodynamic properties such as enthalpy and internal energy; apply these principles to measure and calculate energy changes in reaction. 1
10. Apply principles of general chemistry to specific real-world problems in environment, engineering and health-related fields.

CHEM 1225G. General Chemistry II Lecture and Laboratory for STEM Majors
4 Credits (3+3P)
This course is intended to serve as a continuation of general chemistry principles for students enrolled in science, engineering, and certain preprofessional programs. The course includes, but is not limited to a theoretical and quantitative coverage of solutions and their properties, kinetics, chemical equilibrium, acids and bases, entropy and free energy, electrochemistry, and nuclear chemistry. Additional topics may include (as time permits) organic, polymer, atmospheric, and biochemistry.
The laboratory component is designed to complement the theory and concepts presented in lecture, and will introduce students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment.
Prerequisite(s): C- or better in CHEM 1215G and C- or better in MATH 1215 or higher.

Learning Outcomes

1. Explain the intermolecular attractive forces that determine physical properties and phase transitions, and apply this knowledge to qualitatively evaluate these forces from structure and to predict the physical properties that result.
2. Calculate solution concentrations in various units, explain the effects of temperature, pressure and structure on solubility, and describe the colligative properties of solutions, and determine solution concentrations using colligative property values and vice versa.
3. Describe the dynamic nature of chemical equilibrium, and apply LeChatelier's Principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures as well as describe the equilibrium constant and use it to determine whether equilibrium has been established, and calculate equilibrium constants from equilibrium concentrations and vice versa.
4. Describe the different models of acids and base behavior and the molecular basis for acid strength, as well as apply equilibrium principles to aqueous solutions, including acid/base and solubility reactions, and calculate pH and species concentrations in buffered and unbuffered solutions.
5. Explain titration curves as well as calculate concentrations of reactants.
6. Explain and calculate the thermodynamic functions, enthalpy, entropy and Gibbs free energy, for a chemical system, and relate these functions to equilibrium constants Student Learning Outcomes – Laboratory
7. Demonstrate and apply concepts associated with laboratory safety, including the possible consequences of not adhering to appropriate safety guidelines.
8. Demonstrate the computational skills needed to perform appropriate laboratory related calculations to include, but not be limited to determining the number of significant figures in numerical value with the correct units, solving problems using values represented in exponential notation, solving dimensional analysis problems, and manipulating mathematical formulas as needed to determine the value of a variable.
9. Perform laboratory observations (both qualitative and quantitative) using sensory experience and appropriate measurement instrumentation (both analog and digital).
10. Prepare solutions with an acceptable accuracy to a known concentration using appropriate glassware.
11. Perform basic laboratory operations related to, but not limited to, colligative properties of solutions, chemical equilibria, acid/base titrations, electrochemistry.
12. Draw conclusions based on data and analyses from laboratory experiments.
13. Relate laboratory experimental observations, operations, calculations, and findings to theoretical concepts presented in the complementary lecture course.

CHEM 1226. General Chemistry II Lecture and Laboratory for CHEM Majors
4 Credits (3+3P)

As the second of a two-semester sequence, this course teaches fundamental concepts in chemistry, including solutions, equilibria, electrochemistry, thermodynamics and kinetics. Designed for majors in chemical and other physical sciences, including engineering. May be appropriate for the life science major. It is assumed that the students are familiar with college algebra, chemical nomenclature, stoichiometry, and scientific measurements. The laboratory component is designed to complement the theory and concepts presented in lecture, and will introduce students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment.

Prerequisite(s): C- or better in CHEM 1216.

Learning Outcomes

1. Describe the colligative properties of solutions and explain them using intermolecular forces. Determine solution concentrations using colligative property values and vice versa.
2. Explain rates of reactions, rate laws, and half-life; determine the rate, rate law and rate constant of a reaction and calculate concentration as a function of time and vice versa. Understand the principle of catalysis.
3. Explain the collision model of reaction dynamics, including activation energy, catalysts and temperature; Derive a rate law from a reaction mechanism and evaluate the consistency of a mechanism with a given rate law.
4. Describe the dynamic nature of chemical equilibrium and its relation to reaction rates; apply Le Chatelier's Principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures.
5. Describe the equilibrium constant and use it to determine whether equilibrium has been established; calculate equilibrium constants from equilibrium concentrations (including pressures) and vice versa.
6. Describe the different models of acids and base behavior, and the molecular basis for acid strength.

CHEM 2111. Explorations in Chemistry and Biochemistry
1 Credit (1)

In introduction to the experience of chemistry and biochemistry degrees. In this course, students will prepare a degree plan and personal statement. Career opportunities in chemistry and biochemistry will be presented and discussed.

Learning Outcomes

1. Demonstrate knowledge and understanding of the subdisciplines of Chemistry and Biochemistry.
2. Demonstrate knowledge and understanding of the requirements for the Chemistry and Biochemistry majors and career opportunities available to these majors.
3. Adopt strategies to prepare for future success in a job search or graduate school application.
4. Learn about undergraduate research opportunities in chemistry and biochemistry.

CHEM 2115. Survey of Organic Chemistry and Laboratory
4 Credits (3+3P)

This course is a one -semester survey of organic and biological chemicals. Students will be introduced to nomenclature, molecular structure, properties, and reactions of hydrocarbons, alcohols, carbonyls, organic acids and bases, carbohydrates, lipids, and proteins. The handling of organic chemicals, simple organic reactions, tests for functional groups, and synthesis will be learned in the laboratory component of this course.

Prerequisite: C- or better in CHEM 1225G or CHEM 1226.

Learning Outcomes

1. Identify common organic functional groups.
2. Translate between the IUPAC names and structures of simple organic molecules.
3. Predict the products of certain organic chemical reactions from reagents and conditions presented.

4. Predict physical and chemical behavior of organic molecules based on structure.
5. Synthesize several classes of organic compounds in the laboratory that were previously studied in the lecture component of this course.
6. Recognize and name the four basic bioorganic units and certain of their derivatives and macromolecules.
7. Construct 3 dimensional models of organic compounds.
8. Understand and apply safety principles associated with Organic Chemistry laboratory operations and activities.
9. Present experimental results in laboratory reports of appropriate length, style and depth, or through other modes as required. 1
10. Draw/recognize stereochemistry and explain its relevance to bioorganic molecules.

CHEM 2120. Integrated Organic Chemistry and Biochemistry
3 Credits (3)
This course is a one- semester introduction to Organic Chemistry and Biochemistry designed for students in health and environmental occupations. The course surveys organic compounds in terms of structure, physical, and chemical properties, followed by coverage of the chemistry of specific classes of organic compounds in the biological environment. Students will apply course concepts to everyday organic and biological chemistry problems in preparation for careers in health and environmental fields. May be repeated up to 3 credits.
Prerequisite: CHEM 1120G or CHEM 1215G.
Corequisite: CHEM 2120L.
Learning Outcomes
1. Identify and name basic organic compounds.
2. Construct/draw organic compounds from the names.
3. Predict the products of certain organic chemical reactions from reagents and conditions presented.
4. Recognize and name the four basic bioorganic units and certain of their derivatives and macromolecules.
5. Compare and contrast the function and location of the four bioorganic units and their macromolecules and cofactors.
6. Draw/recognize stereochemistry and explain its relevance to bioorganic molecules.
7. Discuss the pathways and functions of some of the cellular metabolic processes.
8. Recognize and describe metabolic cellular processes and macromolecular structure with respect to health and/or disease state.

CHEM 2120L. Integrated Organic Chemistry and Biochemistry Lab
1 Credit (1,3P)
This course provides experiences with the physical properties and laboratory synthesis of organic compounds.
Corequisite: CHEM 2120.
Learning Outcomes
1. Discuss the chemical, structural, and physical differences among the different functional groups.
2. Prepare, label, and use solutions of appropriate and known concentrations.
3. Recognize chiral organic molecules, and explain their biological significance.
4. Understand and be able to identify the process of organic reactions: nucleophilic and electrophilic, redox reactions, and enzyme catalyzed reactions.
5. Predict the products of substitution, elimination, condensation, and redox reactions.
6. Explain why certain lipids and amino acids are essential while others are not.

CHEM 2130. Organic Chemistry I
3 Credits (3)
This course is the first of a two semester sequence of Organic Chemistry, the chemistry of carbon containing compounds, as required for chemistry, medical science, and engineering majors. The course includes theoretical, qualitative, and quantitative discussion of Organic Chemistry concepts, including but not limited to a review of electronic structure and bonding, acids and bases, stereochemistry, an introduction to organic compounds, isomers, substitution and elimination reactions of alkyl halides, reactions of alkenes, alkynes, alcohols, ethers, epoxides, amines, and thiols, mass and infrared spectrometry, ultraviolet/visible spectroscopy, and nuclear magnetic resonance.
Prerequisite: CHEM 1225G or CHEM 1226.
Learning Outcomes
1. Review properties of elements and molecules discussed in general chemistry (electronegativity, bonding, formal charge, octet rule).
2. Review chemical reactions discussed in general chemistry (products, reactants, balanced equations, byproducts).
3. Classify organic compounds and their properties by functional group, including substitution and elimination reactions of alkyl halides, reactions of alkenes, alkynes, alcohols, ethers, epoxides, amines, and thiols.
4. Use common and IUPAC rules of nomenclature to name organic compounds.
5. Review the structure and stability of compounds.
6. Comprehend the relationship between structure and reactivity.
7. Comprehend configurations of organic compounds (resonance structures, stereochemistry, isomers).
8. Interpret spectral properties and use in structure determination.
9. Correctly describe the four-five step synthesis of a simple organic molecule using reactions learned in the class.

CHEM 2135. Organic Chemistry II
3 Credits (3)
This course is the second of a two semester sequence of Organic Chemistry, the chemistry of carbon containing compounds, as required for chemistry, medical science, and engineering majors. The course will emphasize structure, main physical properties, chemical reactivity, and reaction mechanisms relating to alcohols, arenes and carbonyl compounds, as well as continued integration of mass and infrared spectrometry, ultraviolet/visible spectroscopy, and nuclear magnetic resonance technique and analysis.
Prerequisite: CHEM 2130 or CHEM 313.
Learning Outcomes
1. Identify functional groups and other key features of different organic compounds.
2. Correctly name organic compounds using the proper nomenclature (IUPAC and common names).
3. Analyze relationships among molecular structure, chemical reactivity, physical and spectral properties.
4. Understand chemical reactivity and reaction mechanisms relating, but not limited to dienes, arenes, alcohols, ethers, amines, phenols, and carbonyl compounds, i.e. aldehydes, ketones, carboxylic acids and derivatives.

5. Write out correctly the mechanisms of electrophilic aromatic substitution, formation and hydrolysis of acetals and ketals, formation and hydrolysis of imines and enamines, conjugate addition of nucleophiles to α,β-unsaturated carbonyl compounds, Fischer esterification and hydrolysis of esters under both acidic and basic conditions, transesterification under acidic and basic conditions, amide hydrolysis under acidic and basic conditions, the aldol reaction and condensation, and the Claisen condensation/Dieckmann cyclization for examples that are different than those studied in class.
6. Relate structures to spectral properties, interpreting IR, thirteenC and oneH NMR.
7. Describe the six-seven step synthesis of a simple organic molecule using reactions learned in this class.
8. Convert the Fischer projection of a carbohydrate to its corresponding Haworth projection, or convert the Haworth projection of a carbohydrate to its Fischer projection.
9. Recognize derivatives of carbonic and phosphoric acids, alkaloids, carbohydrates, peptides, steroids, prostaglandins, aglycones, carbohydrate anomers, reducing sugars, waxes, fats, and oils.

CHEM 2991. Introduction to Research
1-3 Credits (3+9P)
Techniques and procedures of chemical research. May be repeated for a maximum of 3 credits.
Prerequisites: 8 credits of chemistry and a 3.0 GPA in chemistry.
Learning Outcomes
1. Varies

CHEM 2996. Special Topics in Chemistry
1-6 Credits (1-6)
Specific subjects in Chemistry. These subjects will be announced in the 'Schedule of Classes'. It may be repeated under different topics for a maximum of 12 credits.
Learning Outcomes
1. Varies

CHEM 313. Organic Chemistry I
3 Credits (3)
An introduction to the structure, properties, nomenclature, and reactivity of organic molecules. Topics include functional groups, stereochemistry, reaction mechanisms, and multi-step synthesis. Emphasis is placed on substitution and elimination reactions, reactions of alkenes, alkynes, alcohols, phenols, and radicals. Builds on general chemistry concepts such as bonding, acid-base reactions, and molecular stability to develop a foundational understanding of organic reactivity.
Prerequisite: C- or better in CHEM 1225G or CHEM 1226.
Learning Outcomes
1. Demonstrate knowledge of the properties of elements and molecules discussed in general chemistry (electronegativity, bonding, formal charge, octet rule).
2. Demonstrate knowledge of the chemical reactions discussed in general chemistry, specifically Acid / Base Reactions (products, reactants, balanced equations).
3. Classify organic compounds and their properties by functional group, including substitution and elimination reactions of alkyl halides, reactions of alkenes, alkynes, radicals, alcohols, and phenols.
4. Use common and IUPAC rules of nomenclature to name organic compounds.
5. Demonstrate knowledge of the structure and stability of organic compounds.
6. Demonstrate comprehension of the relationship between organic structure and reactivity.
7. Demonstrate comprehension of the configurations of organic compounds (resonance structures, stereochemistry, isomers).
8. Correctly describe the four-five step synthesis of a simple organic molecule using various reactions.
9. Critically interpret molecular structures, predict chemical behavior based on structure, and articulate the relationship between form and function in organic compounds.

CHEM 314. Organic Chemistry II
3 Credits (3)
An in-depth focus on reactions and mechanisms as they relate to organometallic compounds, alcohols, ethers, ketones, aldehydes, carboxylic acid derivatives, an amines. May be repeated up to 3 credits.
Prerequisite(s): C- or better in CHEM 313.
Learning Outcomes
1. Identify several new functional groups and other key features of organic compounds
2. Interpret 1H / 13C NMR, IR, UV-Vis, and Mass spectrometry data and have the ability to correlate structural elements with spectral features
3. Understand the chemical reactivity and reaction mechanisms relating, but not limited, to organometallic compounds, alcohols, ethers, ketones, aldehydes, carboxylic acids, and amines. Mechanistic highlights include: etherification, acetal formation / removal, alcohol oxidation, carbonyl addition reactions, enolate (and related) reactions, formation of carboxylic acid derivatives, and nucleophilic acyl substitution processes. Apply these mechanistic and reactivity considerations to these same groups when they appear as substructures in larger biologically-important molecules (e.g. carbohydrates, amino acids, and lipids).
4. Design concise, three to five step syntheses of simple organic molecules using reactions learned in both CHEM 313 and 314
5. Qualitatively assess stability, solubility properties, chemical reactivity, spectral properties, and potential reactions that would lead to preparation, simply via visual inspection of structure.

CHEM 315. Organic Chemistry Laboratory
2 Credits (6P)
Techniques, preparative and analytical methods in organic chemistry.
Prerequisite: C- or better in CHEM 313 or consent of instructor.
Prerequisite/Corequisite: CHEM 314.
Learning Outcomes
1. Students engage in safe laboratory practices and understand the importance of personal protective equipment (PPE) for the handling of laboratory glassware, chemical reagents, and the operation of analytical instrumentation.
2. Students demonstrate the ability to record scientific observations and critically evaluate data to determine the identity, purity, and yield of products.
3. Through laboratory reports, students summarize and discuss their findings in a clear and concise manner.
4. Students identify and characterize organic molecules by utilizing physical / spectroscopic means, including melting / boiling point determination, Infra-red (IR) Nuclear Magnetic Resonance (NMR) spectroscopies.
5. Students demonstrate proficiency in performing common laboratory techniques, including reflux, distillation, recrystallization, vacuum filtration, aqueous extraction, and thin layer chromatography.

6. Related to pre- / co-requisite coursework in CHEM 313 / 314, students demonstrate an ability to determine the outcome of simple organic reactions, utilizing a basic understanding of mechanisms and the relative reactivity of functional groups.

CHEM 351. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.
Prerequisite: consent of instructor.

CHEM 371. Analytical Chemistry
4 Credits (2+6P)
The fundamental principles of quantitative chemical measurements including concepts in statistics, chemical equilibrium, and physical properties and phenomena that underlie modern analytical instrumentation.
Prerequisite: C- or better in CHEM 1225G or CHEM 1226.
Learning Outcomes
1. Evaluate and interpret the sources and effects of error and uncertainty in measurements.
2. Apply statistical tools to evaluate and interpret data from chemical analyses.
3. Apply knowledge of acid/base equilibria for the preparation of buffers and the execution of titration-based analyses.
4. Understand the design and application of standards and calibration in chemical analysis.
5. Quantify chemical concentrations via spectroscopy.
6. Understand the fundamental equilibria governing chemical separations.

CHEM 422. Environmental Chemistry
3 Credits (3)
Chemistry of organic and metal ion pollutants in the environment and principles important to their remediation including bioremediation. Restricted to: Main campus only. Crosslisted with: ENVS 422
Prerequisite(s): CHEM 1225G and either CHEM 2120 or CHEM 313.
Learning Outcomes
1. Describe and explain the solid, liquid, and gas phases of the environment and how they interact.
2. Understand the chemical reactions and processes that occur between various phases of the environment.
3. Learn how the chemical processes can be managed to promote environmental remediation, including the techniques and calculations used.

CHEM 424. Soil Chemistry
3 Credits (3)
Same as SOIL/GEOL 424.

CHEM 430. Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy
3 Credits (3)
Lecture course covering the basic four areas of Physical Chemistry at the advanced undergraduate level. Topics include: Statistical Mechanics, Thermodynamics, Kinetics, Quantum Chemistry, Group Theory, and Spectroscopy at the advanced undergraduate level.
Prerequisite: CHEM 1225G or 1226; MATH 1521G or higher; PHYS 1240G, 2140, 2240 or PHYS 1320G.
Learning Outcomes
1. Students will master the theoretical basis and underlying laws governing Physical Chemistry (Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy) at the advanced undergraduate level of expertise. In particular, students will develop critical thinking and problem solving skills in the above four areas of Physical Chemistry.

CHEM 433. Physical Chemistry I
3 Credits (3)
This course will cover topics relevant to the quantum description of the Chemical world at the undergraduate level, with an emphasis on acquiring sufficient background knowledge necessary for subsequent graduate level courses. May be repeated up to 3 credits.
Prerequisite: CHEM 1225G or CHEM 1226; MATH 1521G; PHYS 2140 or PHYS 1320G, or consent of instructor.
Learning Outcomes
1. Students will develop critical thinking and problem-solving skills with direct application to basic Quantum Chemistry and Spectroscopy. Topics the students will master include (but are not limited to): The Schrodinger Equation, One-Electron Atoms, (i.e. the hydrogen atom), Many-Electron Atoms, Molecular Symmetry (Group Theory), Working with and generating Character Tables, Electric Dipole Spectroscopy, Vibrational Spectroscopy, Rotational Spectroscopy.

CHEM 433 H. Physical Chemistry I Honors
3 Credits (3)
Same as CHEM 433. Additional work to be arranged. May be repeated up to 3 credits.
Prerequisite: CHEM 1225G or CHEM 1226; MATH 1521G or MATH 1521H; PHYS 2140 or PHYS 1320G, or consent of instructor.
Learning Outcomes
1. Students will develop critical thinking and problem-solving skills with direct application to basic Quantum Chemistry and Spectroscopy. Topics the students will master include (but are not limited to): The Schrodinger Equation, One-Electron Atoms, (i.e. the hydrogen atom), Many-Electron Atoms, Molecular Symmetry (Group Theory), Working with and generating Character Tables, Electric Dipole Spectroscopy, Vibrational Spectroscopy, Rotational Spectroscopy.

CHEM 441. Advanced Research
1-3 Credits (3+9P)
Investigation of chemical problems and the development of special techniques. May be repeated for a maximum of 3 credits.
Prerequisites: consent of instructor, 16 credits of chemistry and 3.0 GPA in chemistry for nonmajors.

CHEM 443. Senior Seminar
1 Credit (1)
Discussions of current chemical research, impact of chemistry on society and/or ethics as applied to chemists.
Prerequisite: CHEM 430.
Learning Outcomes
1. Students are proficient in reading and analyzing scientific literature.
2. Students are proficient in the oral communication of scientific literature.

CHEM 451. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.
Prerequisite: consent of instructor.

CHEM 455. Independent Studies
1-3 Credits
Independent studies directed by consulting faculty.
Prerequisite: consent of instructor.

CHEM 456. Inorganic Structure and Bonding
3 Credits (3)
Study of structure and bonding of inorganic elements with a focus on transition metals. An introduction to symmetry, group theory, and spectroscopy will be included. May be repeated up to 3 credits.
Prerequisite: (MATH 1521G or MATH 1521H) and C- or better in CHEM 314.
Learning Outcomes
1. Students will learn about inorganic coordination complexes with a focus on transition metals, and may include the main group and f-elements. Students will learn about inorganic nomenclature and to analyze complexes using Lewis acid-base concepts.
2. Students will learn bonding theories, including group theory and symmetry point groups. Students will learn introductory concepts in organometallic chemistry and electronic spectroscopy.

CHEM 471. Advanced Integrated Inorganic and Physical Chemistry Laboratory
3 Credits (9P)
Laboratory course covering Inorganic and Physical Chemistry techniques at the advanced undergraduate level. Topics may include: Transition metal/Main group synthesis in air and air free environments, Period f-element synthesis, UV-Vis spectroscopy, FT-IR spectroscopy, NMR spectroscopy, Isothermal Titration Calorimetry.
Prerequisite/Corequisite: CHEM 430 and CHEM 315.
Learning Outcomes
1. Students will engage in experiential learning to become proficient in the listed techniques at the advanced undergraduate level of expertise. Students will develop critical thinking and problem solving skills. Students will learn essential laboratory data documentation, record keeping, and communication skills.

CHEM 472. Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory
3 Credits (9P)
Laboratory course covering Protein Biochemistry and Instrumental Analysis techniques at the advanced undergraduate level. Topics may include: Affinity-based protein purification, basic protein quantification, protein activity assay, multi-variant analysis, diode array UV/VIS spectroscopy, ICP-MS, absorption and emission spectroscopy, raman spectroscopy, fluorescence, and separation science (HPLC, GCMS). Includes data analysis lab.
Prerequisite: CHEM 371.
Prerequisite/Corequisite: BCHE 395.
Learning Outcomes
1. Students will engage in experiential learning to become proficient in the listed techniques at the advanced undergraduate level of expertise. Students will develop critical thinking and problem solving skills. Students will learn essential laboratory data documentation, record keeping, and communication skills.

CHEM 474. Radiochemistry
3 Credits (1+6P)
The course contains a lecture and a laboratory component. The lecture component will introduce students to the fundamentals of radiation, radiation detection, and radiation safety. The applications of radiation in industry, medicine, and energy production will also be discussed. A primary focus will include actinide chemistry. The laboratory section will introduce students to practical concepts covered in the lecture portion of class, the handling of radioactive material and the spectroscopic identification of radioactive materials.
Prerequisite: C- or better in CHEM 1225G and C- or better in MATH 1511G.
Learning Outcomes
1. From the lecture portion of the course students will gain familiarity with identifying different types of radiation, be able to describe radioactivity, radiation detection, how radiation interacts with matter, explain historic and modern uses of radiation.
2. In the laboratory section of the course students will be able to follow and perform radiation safety protocols, understand and apply basic radiochemical spectroscopic and counting techniques, and the safe handling of radioactive materials.

CHEM 475. Central Concepts in Chemistry - Safety
1 Credit (1)
Students will obtain university safety training plus departmental-specific safety guidelines for the research laboratory
Learning Outcomes
1. Students completing this course will be knowledgeable of all safety guidelines delineated by the University, College, and Department.
2. When possible accident case-studies will be incorporated within the curriculum.

CHEM 476. Central Concepts in Chemistry - Research Ethics
1 Credit (1)
Students will complete Federal Agency (NSF, NIH, etc.) on-line training modules in responsible conduct in research and discuss relevant case-studies of research misconduct.
Learning Outcomes
1. Completion of this class will yield researchers fully aware of federal and professional guidelines regarding the ethical conduction and dissemination of data and conclusions.

CHEM 477. Central Concepts in Chemistry - ProfessionalDevelopment
1 Credit (1)
Students will receive basic instruction in research dissemination strategies (presentations) and career planning.
Learning Outcomes
1. Completion of this class will yield researchers fully aware of research dissemination strategies, be able to set career goals, and create a plan to attain those goals.

CHEM 501. Central Concepts in Chemistry - Energy
3 Credits (3)
This course will provide the students with a detailed examination of several topics in chemical energetics. These topics include: (1) basic thermodynamics concepts, (2) statistical thermodynamics (3) chemical equilibria, and (4) intermolecular interactions.
Learning Outcomes
1. Students completing this course will gain an understanding of chemical thermodynamics and equilibria as they relate to all areas of chemistry.

CHEM 502. Central Concepts in Chemistry - Structure
3 Credits (3)
This course will provide the students with a detailed examination of several topics in chemical reactivity. These topics include: (1) principles of chemical bonding and (2) organic and inorganic structure determination.
Learning Outcomes
1. Students completing this course will understand the fundamental components of molecular interactions and their impact on molecular structure and function in all areas of chemistry.

2. In addition, they will learn the theory and practice of physical techniques used to determine molecular structure.

CHEM 503. Central Concepts in Chemistry - Dynamics
3 Credits (3)
This course will provide the students with a detailed examination of several topics in chemical reactivity. These topics include: (1) basic kinetic concepts, (2) fundamental gas phase kinetics (3) organic and inorganic reaction mechanisms.
Learning Outcomes
1. Students who successfully complete this course will understand the fundamentals of chemical dynamics: from simple gas or solution phase reaction mechanisms to biomolecular interactions.

CHEM 504. Central Concepts in Chemistry - Measurements
3 Credits (3)
This course will provide the students with a detailed examination of several topics in chemical measurements. These topics include: (1) spectroscopic, electrochemical and chromatographic techniques, (2) statistical methods of measurement and validation relevant to biomolecules, synthetic polymers and mixtures.
Learning Outcomes
1. The collection of quantitative data is central to all subdisciplines of chemistry.
2. Students completing this course will understand the basic principles of chemical measurements and the uncertainties inherently associated with those measurements.
3. They will also gain knowledge of tools available to minimize those uncertainties in data interpretation.

CHEM 507. Chemistry of the Elements
1-3 Credits (1-3)
Discussion of the reactions and structures of inorganic compounds. This course is made up of three independent modules of 1 credit each. It may be taught in one, two or three modules. Module 1: Synthesis and preparation of inorganic or organometallic compounds. Module 2: Analysis of inorganic or organometallic compounds. Module 3: Applications of inorganic or organometallic compounds. May be repeated up to 3 credits.
Learning Outcomes
1. By the end of module one, students will have a general understanding of synthetic techniques or strategies used for the preparation of inorganic or organometallic molecular or extended structure systems.
2. Model One may include a focus on solution, hydrothermal, pyrochemical, solid-state or other synthetic techniques.
3. By the end of module two, students will understand the basics of different analysis methods used for inorganic or organometallic molecular or extended structure systems.
4. Model Two, the analysis methods may cover solution, solid, or gas phase methods.
5. Model Two, the module will cover aspects of spectroscopic methods such as paramagnetic NMR, EPR, UV-vis-NIR, IR, and analysis methods covered may include single or powder X-ray diffraction, magnetometry, and more.
6. By the end of module three, students will understand the industrial applications relevant to inorganic or organometallic molecular or extended structure systems: some of these may include the generation of energy, industrial catalysis, materials science, and more.

CHEM 510. Graduate Student Seminar
1 Credit (1)
Research seminar for graduate students in Chemistry. Enrollment required each semester for all graduate students. Masters or Doctoral candidates presenting a research seminar enroll for a letter grade. All other participating students enroll using the S/U grading option.
Learning Outcomes
1. Graduate students will gain experience organizing a research presentation.
2. Graduate students will develop oral presentation skills.

CHEM 514. Organic Structure Determination
1-3 Credits (1-3)
This course is made up of three independent modules of 1 credit each. May be taught in one, two or three modules. Module 1: Infrared Spectroscopy and Other Spectroscopic Methods, Applications of infrared spectroscopy to the structure determination of organic compounds. Module 2: Mass Spectrometry, Application of mass spectrometry to the structure determination of organic compounds. Module 3: NMR spectroscopy, Applications of NMR spectroscopy to the structure determination of organic compounds. May be repeated up to 3 credits.
Learning Outcomes
1. By the end of module one, students will have a general understanding of the physical basis of infrared spectroscopy and molecular vibrations, be able to describe and use the frequency, shape and intensity of diagnostic absorptions in the IR spectra to correlate with common organic functional groups, recognize the utility of the fingerprint region of an IR spectrum to establish identity of small organic compounds, and integrate IR knowledge with other spectroscopic methods for the structure determination of small organic compounds.
2. By the end of module two, students will understand the basis of mass spectrometry as a tool for structure determination, have a general understanding of the different techniques commonly used for sample ionization, describe fragmentation patterns for common classes of organic compounds: alkanes, alkenes, alkynes, aromatic hydrocarbons, alcohols, ethers, amines and carbonyl compounds, use molecular ion and fragmentation pattern information to propose structures of small organic molecules, integrate mass spectrometry knowledge with other spectroscopic methods for the structure determination of small organic compounds.
3. By the end of module three, students will understand the physical basis of the nuclear magnetic resonance experiment and the relationship between nuclear and magnetic properties of atoms, describe and use the concepts of chemical and magnetic equivalence, chemical shift, and anisotropic effects in oneH NMR spectra, use information from homonuclear (oneH-oneH) and heteronuclear (oneH-thirteenC) coupling experiments to propose structures of small organic molecules, use information from twoD-NMR experiments (COSY, HMQC, HMBC, NOESY) to propose structures of small organic molecules including stereochemistry, integrate NMR knowledge with other spectroscopic methods for the structure determination of small organic compounds.

CHEM 515. Modern Organic Chemistry
1-3 Credits (1-3)
Recent developments in synthesis and theoretical principles of organic chemistry. This course is made up of three independent modules of 1 credit each. May be taught in one, two, or three modules. Module 1: Structure and Reactivity. Module 2: Reactions. Module 3: Synthesis. May be repeated up to 3 credits.

Learning Outcomes

1. By the end of module one, students will have a general understanding of the fundamental basis of structure and reactivity of organic compounds.
2. Module one, topics can include but are not limited to: structure and bonding, reactivity and stability, aromaticity, stereochemistry, conformational, steric and stereoelectronic effects.
3. By the end of module two, students will have a general understanding of current synthetically useful reactions for organic compounds.
4. Module two, topics can include but are not limited to: additions and eliminations, substitutions, pericyclic, radical and photochemical reactions, functional group interconversions, oxidations and reductions, protecting groups.
5. By the end of module three, students will have a general understanding of the basis for organic synthesis.
6. Module three, topics can cover but are not limited to retrosynthesis and planning, comparative analysis, strategies and tactics for the synthesis of medium to complex targets.
7. Module three, emphasis is placed in showcasing the utility of catalytic, asymmetric, chemo-, regio- and stereo-selective transformations.

CHEM 520. Comprehensive Literature Review Seminar for Graduate Students
1 Credit (1)
Graduate student presents a literature review on an approved topic. The seminar presentation will include cover new developments of primary significance to the topic based on current research papers and culminate in a testable hypothesis. A passing grade allows the student to take the comprehensive exam.

Learning Outcomes

1. Student will prepare an abstract of their presentation understandable to a broad chemistry/biochemistry audience
2. Student will demonstrate a reasonable understanding of every concept introduced
3. Student will present a well-organized topic leading to a logical hypothesis
4. Student will demonstrate the ability to develop a data-supported hypothesis

CHEM 526. Advanced Analytical Chemistry
3 Credits (3)
Equilibria, and the theories of gravimetric, volumetric, and instrumental analysis.

CHEM 527. Separations
3 Credits (3)
Covers the fundamentals of separation methods and relationships to modern analytical techniques such as gas chromatography and liquid chromatography.

CHEM 598. Special Research Programs
1-3 Credits
Individual investigations, either analytical or experimental. Graded S/U.

CHEM 599. Master's Thesis
15 Credits
Thesis preparation.

CHEM 600. Research
1-15 Credits
Course used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.

CHEM 619. Topics in Organic Chemistry
1-3 Credits
Selected topics of current interest designated by subtitle.

CHEM 629. Advanced Topics in Analytical Chemistry
3 Credits (3)
Discussion of advanced topics in the field of analytical chemistry. May be repeated with different subtitles. Consent of instructor required.

CHEM 639. Topics in Physical Chemistry
1-3 Credits
Selected topics of current interest designated by subtitle.

CHEM 700. Doctoral Dissertation
17 Credits
Dissertation preparation.

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Biochemistry - Bachelor of Science

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. Students may not receive both a Bachelor of Science in Biochemistry degree and a Bachelor of Arts in Chemistry degree. All departmental and nondepartmental requirements may not be taken S/U and must earn a C- or better final grade.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1 [1]		*4*
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication (Recommended)	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
COMM 1115G	Introduction to Communication (Recommended)	3
or HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [2]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [3]	
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [3]	
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Area V: Humanities [1]		*3*

Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World [4]		**6**
Departmental/College Requirements		
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
CHEM 371	Analytical Chemistry	4
BCHE 140	Explorations in Chemistry and Biochemistry	1
or CHEM 2111	Explorations in Chemistry and Biochemistry	
BCHE 395	Biochemistry I	3
or BCHE 395H	Biochemistry I Honors	
BCHE 396	Biochemistry II, Lecture and Laboratory	4
or BCHE 396 H	Biochemistry II Honors, Lecture and Laboratory	
BCHE 440	Biochemistry Seminar	1
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	3
Select 6 credits of the following:		6
BCHE 432	Physical Biochemistry	
BCHE 451	Special Topics	
BCHE 452	Chemical Carcinogenesis	
CHEM 451	Special Topics (by petition only)	
CHEM 456	Inorganic Structure and Bonding	
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory	
CHEM 474	Radiochemistry	
TOX 361	Basic Toxicology	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
A ST 311	Statistical Applications	3
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 311	General Microbiology	3
BIOL 311 L	General Microbiology Laboratory	2
BIOL 305	Principles of Genetics	3
or GENE 320	Hereditary and Population Genetics	
BIOL 377	Cell Biology	3
Select one from the following:		3
PHYS 2110	Mechanics [5]	
PHYS 1230G	Algebra-Based Physics I	
PHYS 2230G	General Physics for Life Science I	
PHYS 1310G	Calculus -Based Physics I	
Select one from the following:		3
PHYS 2140	Electricity and Magnetism [6]	
PHYS 1240G	Algebra-Based Physics II	
PHYS 2240G	General Physics for Life Science II	
PHYS 1320G	Calculus -Based Physics II	
Select one from the following:		1
PHYS 2110L	Experimental Mechanics [7]	
PHYS 1230L	Algebra-Based Physics I Lab	
PHYS 2230L	Laboratory to General Physics for Life Science I	
PHYS 1310L	Calculus -Based Physics I Lab	
Select one from the following:		1
PHYS 2140L	Electricity & Magnetism Laboratory [7]	
PHYS 1240L	Algebra-Based Physics II Lab	
PHYS 2240L	Laboratory to General Physics for Life Science II	
PHYS 1320L	Calculus -Based Physics II Lab	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120		
Select sufficient electives to bring total credits to 120, including 48 upper division.		20
Total Credits		**120**

1 See the General Education (p. 262) section of the catalog for a full list of courses

2 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

3 CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors is intended for students that completed high school Chemistry. Students with no prior Chemistry or those desiring a refresher are strongly encouraged to take CHEM 1111 Foundations of Chemistry prior to CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors enrollment. CHEM 1111 Foundations of Chemistry fulfills the pre-requisite for CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors. CHEM 1216 General Chemistry I Lecture and Laboratory for CHEM Majors and CHEM 1226 General Chemistry II Lecture and Laboratory for CHEM Majors are recommended and are acceptable General Education substitutions for CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors and CHEM 1225G General Chemistry II Lecture and Laboratory for STEM Majors but will need a degree audit exception that can be coordinated with your advisor.

4 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

5 PHYS 2110 Mechanics is the recommended Physics I course for B.S. majors. PHYS 1230G Algebra-Based Physics I, PHYS 2230G General Physics for Life Science I, and PHYS 1310G Calculus -Based Physics I are acceptable and are recommended in the decreasing order listed.

6 PHYS 2140 Electricity and Magnetism is the recommended Physics II course for B.S. majors. PHYS 1240G Algebra-Based Physics II, PHYS 2240G General Physics for Life Science II, and PHYS 1240G Algebra-Based Physics II are acceptable and are recommended in the decreasing order listed. Students are highly cautioned to check prerequisites for the individual courses when schedule planning.

7 Students are strongly encouraged to verify prerequisite/corequisite requirements for Physics labs when schedule planning.

Second Language Requirement

For the Bachelor of Science with a major in Biochemistry there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [3]	4
BCHE 140	Explorations in Chemistry and Biochemistry	1
Area IV: Social and Behavioral Science Course [2]		3
	Credits	**16**
Semester 2		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [1] or Calculus and Analytic Geometry II Honors	4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory [1]	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
Area V: Humanities Course [2]		3
	Credits	**15**
Second Year		
Semester 1		
BIOL 305 or GENE 320	Principles of Genetics [1] or Hereditary and Population Genetics	3
CHEM 313	Organic Chemistry I [1]	3
CHEM 371	Analytical Chemistry	4
Choose from one of the following:		4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics [1]	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab [1]	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I [1]	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab [1]	
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**17**
Semester 2		
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
CHEM 314 & CHEM 315	Organic Chemistry II and Organic Chemistry Laboratory [1]	5
Choose from one of the following:		4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [1]	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab [1]	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II [1]	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab [1]	
	Credits	**15**
Third Year		
Semester 1		
A ST 311	Statistical Applications [1]	3
BIOL 377	Cell Biology [1]	3
BCHE 395 or BCHE 395H	Biochemistry I [1] or Biochemistry I Honors	3
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
Elective Course		3
	Credits	**15**
Semester 2		
BCHE 396 or BCHE 396 H	Biochemistry II, Lecture and Laboratory or Biochemistry II Honors, Lecture and Laboratory	4
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory [1]	5
VWW: Viewing a Wider World Course [4]		3
Elective Course		3
Elective Course		3
	Credits	**18**
Fourth Year		
Semester 1		
BCHE 440	Biochemistry Seminar [1]	1
Select from the following:		3
BCHE 452	Chemical Carcinogenesis	
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory	
TOX 361	Basic Toxicology	
Elective Course		2
Elective Course		3
Elective course		3
	Credits	**12**
Semester 2		
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	3
Select from the following: [3]		3
BCHE 432	Physical Biochemistry	
BCHE 451	Special Topics	
CHEM 456	Inorganic Structure and Bonding	
CHEM 474	Radiochemistry	
CHEM 451	Special Topics (by petition)	
Elective Course		3
VWW: Viewing a Wider World Course [4]		3
	Credits	**12**
	Total Credits	**120**

1. These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors is intended for students that completed high school Chemistry. Students with no prior Chemistry or those desiring a refresher are strongly encouraged to take CHEM 1111 Foundations of Chemistry prior to CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors enrollment.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

[5] Courses fulfilling the "Select 6 credits from the following" requirement may be taught in either Fall or Spring. Students are encouraged to check course schedules closely when choosing courses. The BCHE 432 Physical Biochemistry is highly recommended for all Biochemistry majors.

Chemistry - Bachelor of Arts

The Bachelor of Arts curriculum is designed to provide flexibility with less depth in chemistry, physics, and mathematics. The program may be used by students planning extensive study in other areas and requires emphasis in a second field of study. Students may not receive both a Bachelor of Science in Biochemistry degree and a Bachelor of Arts in Chemistry degree. All departmental and nondepartmental requirements may not be taken S/U and must earn a C- or better final grade.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [2]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [4]	
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
CHEM 2111	Explorations in Chemistry and Biochemistry	1
or BCHE 140	Explorations in Chemistry and Biochemistry	
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
CHEM 371	Analytical Chemistry	4
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
CHEM 443	Senior Seminar	1
Select one from the following:		3
CHEM 456	Inorganic Structure and Bonding	
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory	
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	
Upper division Chemistry Elective [5]		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Select one from the following:		4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics [6]	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Select one from the following:		4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [7]	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Select 18 credits from an Emphasis area [9]		**18**
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120		
Select sufficient electives to bring total credits to 120, including 48 upper-division. [10]		**30**
Total Credits		**120**

[1] See the General Education (p. 262) section of the catalog for a full list of courses

[2] MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

[4] CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors is intended for students that completed high school Chemistry. Students with no prior Chemistry or those desiring a refresher are strongly encouraged to take CHEM 1111 Foundations of Chemistry prior to CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors enrollment. CHEM 1111 Foundations of Chemistry fulfills the pre-requisite for CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors.
CHEM 1216 General Chemistry I Lecture and Laboratory for CHEM Majors and CHEM 1226 General Chemistry II Lecture and Laboratory for CHEM Majors are recommended and are acceptable General Education substitutions for CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors and CHEM 1225G General Chemistry II Lecture and Laboratory for STEM Majors but will need a degree audit exception that can be coordinated with your advisor.

[5] The additional chemistry course can be one 3-credit CHEM course or three 1-credit CHEM courses. BCHE 395 Biochemistry I or BCHE 395H

Biochemistry I Honors can also be used to fulfill the additional chemistry course requirement.

6 PHYS 2110 Mechanics is the Physics I course recommended for all Chemistry majors. PHYS 1230G Algebra-Based Physics I, PHYS 2230G General Physics for Life Science I, and PHYS 1310G Calculus -Based Physics I are acceptable and are recommended in the decreasing order listed.

7 PHYS 2140 Electricity and Magnetism is the Physics II course recommended fro all Chemistry majors. PHYS 1240G Algebra-Based Physics II, PHYS 2240G General Physics for Life Science II, and PHYS 1240G Algebra-Based Physics II are acceptable and are recommended in the decreasing order listed. Students are highly cautioned to check prerequisites for the individual courses when schedule planning.

8 Students are strongly encouraged to check prerequisite/corequisite requirements for Physics labs when schedule planning.

9 The Emphasis area is composed of courses outside either chemistry or biochemistry degrees (non-departmental and departmental requirements cannot be used for emphasis area credit). These courses must have a common theme, which complement (whenever possible) principles learned on either chemistry or biochemistry. For example, astronomy and physics courses could be taken as an emphasis area in astrophysics. See a faculty mentor for approval of the courses to be used for an emphasis area. A minimum of 18 credits can be used as an Emphasis area (which could constitute a minor in some cases), but at least nine credits must be upper – division.

10 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts with a major in Chemistry there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
CHEM 1215G or CHEM 1216	General Chemistry I Lecture and Laboratory for STEM Majors [3] or General Chemistry I Lecture and Laboratory for CHEM Majors	4
CHEM 2111	Explorations in Chemistry and Biochemistry	1
Area IV: Social and Behavioral Science Course [2]		3
	Credits	**16**

Semester 2		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [1] or Calculus and Analytic Geometry II Honors	4
Area V: Humanities Course [2]		3
CHEM 1225G or CHEM 1226	General Chemistry II Lecture and Laboratory for STEM Majors or General Chemistry II Lecture and Laboratory for CHEM Majors	4
	Credits	**14**

Second Year

Semester 1		
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
CHEM 313	Organic Chemistry I [1]	3
CHEM 371	Analytical Chemistry [1]	4
Select one of the following:		4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics [1]	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab [1]	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Elective Course		3
	Credits	**17**

Semester 2		
CHEM 314 & CHEM 315	Organic Chemistry II and Organic Chemistry Laboratory [1]	5
Select one of the following:		4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [1]	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab [1]	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II [1]	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab [1]	
CHEM Emphasis Area Course [4]		3
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**15**

Third Year

Semester 1		
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
VWW: Viewing a Wider World Course [5]		3
Elective Course		3
Elective Course		3
Elective Course		2
	Credits	**14**

Semester 2		
CHEM Emphasis Area Course [4]		3
CHEM Emphasis Area Course [4]		3
CHEM Upper-Division Elective Course [1]		3
Elective Course		4

Choose one from the following: [6]		
CHEM 456	Inorganic Structure and Bonding	
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	
Elective Course (3 credits)		
	Credits	**13**
Fourth Year		
Semester 1		
VWW: Viewing a Wider World Course [5]		3
CHEM Emphasis Area Upper-Division Course [4]		3
CHEM Upper-Division Elective Course		3
Upper-Division Elective Course		3
Elective Course		3
Choose one from the following: [6]		3
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory (if CHEM 456 or CHEM 472 was not completed in the previous term)	
Elective Course (3 credits)		
	Credits	**18**
Semester 2		
CHEM 443	Senior Seminar [1]	1
CHEM Emphasis Area Upper-Division Course [4]		3
CHEM Emphasis Area Upper-Division Course [4]		3
Upper-Division Elective Course		3
Elective Course		3
	Credits	**13**
	Total Credits	**120**

1. These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors is intended for students that completed high school Chemistry. Students with no prior Chemistry or those desiring a refresher are strongly encouraged to take CHEM 1111 Foundations of Chemistry prior to CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors enrollment. CHEM 1111 Foundations of Chemistry fulfills the pre-requisite for CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors.
4. The Emphasis area is composed of courses outside either chemistry or biochemistry degrees (non-departmental and departmental requirements cannot be used for emphasis area credit). These courses must have a common theme, which complement (whenever possible) principles learned on either chemistry or biochemistry. For example, astronomy and physics courses could be taken as an emphasis area in astrophysics. See a faculty mentor for approval of the courses to be used for an emphasis area. A minimum of 18 credits can be used as an Emphasis area (which could constitute a minor in some cases), but at least nine credits must be upper – division.
5. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
6. Selection course option - Departmental requirement includes a choice of one of the following: CHEM 456 Inorganic Structure and Bonding, CHEM 471 Advanced Integrated Inorganic and Physical Chemistry Laboratory, or CHEM 472 Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory. If the student wishes to now take the CHEM offerings in the specific term they should add an elective course for 3 credits, however, the student must complete at least one of the above courses.

Chemistry (Pre-Med) - Bachelor of Arts

The Bachelor of Arts curriculum is designed to provide flexibility with less depth in chemistry, physics, and mathematics. The concentration in Pre-Medical Studies provides foundational knowledge to students who are preparing to take the MCAT exam. Graduates will successfully complete medical school pre-requisite coursework and obtain an interdisciplinary understanding of healthcare that includes scientific, humanistic, and social science perspectives. Students may not receive both a Bachelor of Science in Biochemistry degree and a Bachelor of Arts in Chemistry (Pre-Med concentration) degree. All departmental and nondepartmental requirements may not be taken S/U and must earn a C- or better final grade.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [2]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [4]	
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [4]	
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
CHEM 2111	Explorations in Chemistry and Biochemistry	1
or BCHE 140	Explorations in Chemistry and Biochemistry	
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2

CHEM 371	Analytical Chemistry	4
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
CHEM 443	Senior Seminar	1
BCHE 395	Biochemistry I	3
or BCHE 395H	Biochemistry I Honors	
BCHE 396	Biochemistry II, Lecture and Laboratory	4
or BCHE 396 H	Biochemistry II Honors, Lecture and Laboratory	
TOX 361	Basic Toxicology	3
Select one from the following:		3
CHEM 456	Inorganic Structure and Bonding	
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory	
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	
Upper division Chemistry Elective [5]		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Select one from the following:		4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics [6]	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Select one from the following:		4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [7]	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 2110L	Principles of Biology: Cellular and Molecular Biology Laboratory	1
BIOL 305	Principles of Genetics	3
or GENE 320	Hereditary and Population Genetics	
Select one from the following:		6-7
SPMD 2210 & SPMD 2225	Anatomy and Physiology I and Anatomy and Physiology II	
BIOL 353 & BIOL 354	Pre-Professional Human Anatomy and Physiology of Humans	
BIOL 377	Cell Biology	3
HNRS 413	Medical Shadowing	2
SOCI 1110G	Introduction to Sociology	3
Select 4 Pre-Med elective courses from the following:		12
ANTH 355	Biological Anthropology	
ANTH 357V	Medical Anthropology	
ANTH 402	Contemporary Medical Anthropology	
ANTH 435	Human Health and Biological Variation	
BIOL 311	General Microbiology	
BIOL 385	An Introduction to Cancer	
BIOL 474	Immunology	
SPMD 3050	Therapeutic Modalities	
SPMD 4450	Pathophysiology and Human Function(s)	
SPMD 4510	Neurophysiology and Human Function	
PHLS 4610	Health Disparities: Determinants and Interventions	
PHLS 4620V	Cross-Cultural Aspects of Health	
PHLS 3130V	Global Environmental Health Issues	
PHLS 3120V	Women's Health Issues	
SOCI 3120V	Introduction to Population Studies	
SOCI 3245V	Comparative Family Systems	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120		
Select sufficient electives to bring total credits to 120, including 48 upper-division. [9]		5-6
Total Credits		**121**

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4. CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors is intended for students that completed high school Chemistry. Students with no prior Chemistry or those desiring a refresher are strongly encouraged to take CHEM 1111 prior to CHEM 1215G enrollment. CHEM 1111 is an acceptable pre-requisite for CHEM 1215G.CHEM 1216 General Chemistry I Lecture and Laboratory for CHEM Majors and CHEM 1226 General Chemistry II Lecture and Laboratory for CHEM Majors are recommended and are acceptable General Education substitutions for CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors and CHEM 1225G General Chemistry II Lecture and Laboratory for STEM Majors but will need a degree audit exception that can be coordinated with your advisor.
5. The additional chemistry course can be one 3-credit CHEM course or three 1-credit CHEM courses.
6. PHYS 2110 Mechanics is the Physics I course recommended for all Chemistry majors. PHYS 1230G Algebra-Based Physics I, PHYS 2230G General Physics for Life Science I, and PHYS 1310G Calculus -Based Physics I are acceptable and are recommended in the decreasing order listed.
7. PHYS 2140 Electricity and Magnetism is the Physics II course recommended fro all Chemistry majors. PHYS 1240G Algebra-Based Physics II, PHYS 2240G General Physics for Life Science II, and PHYS 1240G Algebra-Based Physics II are acceptable and are recommended in the decreasing order listed. Students are highly cautioned to check prerequisites for the individual courses when schedule planning.
8. Students are strongly encouraged to check prerequisite/corequisite requirements for Physics labs when schedule planning.
9. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts with a major in Chemistry there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
CHEM 1215G or CHEM 1216	General Chemistry I Lecture and Laboratory for STEM Majors or General Chemistry I Lecture and Laboratory for CHEM Majors	4
CHEM 2111	Explorations in Chemistry and Biochemistry	1
SOCI 1110G	Introduction to Sociology	3
	Credits	**16**
Semester 2		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [1] or Calculus and Analytic Geometry II Honors	4
CHEM 1225G or CHEM 1226	General Chemistry II Lecture and Laboratory for STEM Majors or General Chemistry II Lecture and Laboratory for CHEM Majors	4
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 2110L	Principles of Biology: Cellular and Molecular Biology Laboratory	1
Area V: Humanities Course [2]		3
	Credits	**18**
Second Year		
Semester 1		
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
CHEM 313	Organic Chemistry I [1]	3
CHEM 371	Analytical Chemistry [1]	4
Select one of the following:		4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics [1]	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab [1]	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
BIOL 305 or GENE 320	Principles of Genetics or Hereditary and Population Genetics	3
	Credits	**17**
Semester 2		
CHEM 314 & CHEM 315	Organic Chemistry II and Organic Chemistry Laboratory [1]	5
Select one of the following:		4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [1]	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab [1]	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II [1]	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab [1]	
SPMD 2210 or BIOL 353	Anatomy and Physiology I or Pre-Professional Human Anatomy	3
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**15**
Third Year		
Semester 1		
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
BCHE 395 or BCHE 395H	Biochemistry I or Biochemistry I Honors	3
SPMD 2225 or BIOL 354	Anatomy and Physiology II or Physiology of Humans	3
HNRS 413	Medical Shadowing	2
VWW: Viewing a Wider World Course [4]		3
Pre-Med Elective Course		3
	Credits	**17**
Semester 2		
Pre-Med Elective Course [3]		3
BCHE 396 or BCHE 396 H	Biochemistry II, Lecture and Laboratory or Biochemistry II Honors, Lecture and Laboratory	4
BIOL 377	Cell Biology	3
Choose one from the following: [5]		3
CHEM 456	Inorganic Structure and Bonding	
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	
	Credits	**13**
Fourth Year		
Semester 1		
VWW: Viewing a Wider World Course [4]		3
Pre-Med Elective Course [3]		3
Elective Course		3
Choose one from the following: [5]		3
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory (if CHEM 456 or CHEM 472 was not completed in the previous term)	
Elective Course (3 credits)		
	Credits	**12**
Semester 2		
CHEM 443	Senior Seminar [1]	1
TOX 361	Basic Toxicology	3
Pre-Med Elective Course [3]		3

Pre-Med Elective Course [3]	3
Elective Course	3
Credits	**13**
Total Credits	**121**

1. These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. The Emphasis area is composed of courses outside either chemistry or biochemistry degrees (non-departmental and departmental requirements cannot be used for emphasis area credit). These courses must have a common theme, which complement (whenever possible) principles learned on either chemistry or biochemistry. For example, astronomy and physics courses could be taken as an emphasis area in astrophysics. See a faculty mentor for approval of the courses to be used for an emphasis area. A minimum of 18 credits can be used as an Emphasis area (which could constitute a minor in some cases), but at least nine credits must be upper – division.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. Selection course option - Departmental requirement includes a choice of one of the following: CHEM 456 Inorganic Structure and Bonding, CHEM 471 Advanced Integrated Inorganic and Physical Chemistry Laboratory, or CHEM 472 Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory. If the student wishes to now take the CHEM offerings in the specific term they should add an elective course for 3 credits, however, the student must complete at least one of the above courses.

Chemistry (Secondary Education) - Bachelor of Arts

The Bachelor of Arts curriculum is designed to provide flexibility with less depth in chemistry, physics, and mathematics. The Secondary Education concentration curriculum prepares high-quality teachers for public schools and leads to a Minor in Secondary Education which leads to the New Mexico–Initial Teaching License, Secondary General Science Education (Grades 6-12). Students may receive both a Bachelor of Science in Biochemistry degree and a Bachelor of Arts in Chemistry (Secondary Education) degree. All departmental and nondepartmental requirements must earn a C- or better final grade or an S if the course is designated for S/U grading.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [2]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [3]	
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [3]	
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World [4]		**3**
Departmental/College Requirements		
CHEM 2111	Explorations in Chemistry and Biochemistry	1
or BCHE 140	Explorations in Chemistry and Biochemistry	
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
CHEM 371	Analytical Chemistry	4
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
CHEM 443	Senior Seminar	1
Select one from the following:		3
CHEM 456	Inorganic Structure and Bonding	
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory	
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	
Additional Upper Division Chemistry credits [5]		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Select one from the following:		4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics [6]	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Select one from the following:		4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [7,8]	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Secondary Education Requirements		

EDUC 3120	Multicultural Education	3
EDUC 3997	Secondary Field Experience	3
EDUC 4410	Teaching Science at the Middle and High School Level [9]	3
EDUC 4820	Secondary Student Teaching [10]	9
EDUC 4821	Middle and High School Student Teaching Seminar [10]	3
READ 4330	Content Area Literacy [9]	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120		
Select sufficient electives to bring total credits to 120, including 48 upper-division. [11]		24
Total Credits		**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
3. CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors is intended for students that completed high school Chemistry. Students with no prior Chemistry or those desiring a refresher are strongly encouraged to take CHEM 1111 prior to CHEM 1215G enrollment. CHEM 1111 is an acceptable pre-requisite for CHEM 1215G. CHEM 1216 General Chemistry I Lecture and Laboratory for CHEM Majors and CHEM 1226 General Chemistry II Lecture and Laboratory for CHEM Majors are recommended and are acceptable General Education substitutions for CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors and CHEM 1225G General Chemistry II Lecture and Laboratory for STEM Majors but will need a degree audit exception that can be coordinated with your advisor.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses. VWW 3-credit Upper-division rule can be met with Secondary Education Minor.
5. The additional chemistry course can be one 3-credit CHEM course or three 1-credit CHEM courses. BCHE 395 Biochemistry I or BCHE 395H Biochemistry I Honors can also be used to fulfill the additional chemistry course requirement.
6. PHYS 2110 Mechanics is the Physics I course recommended for all Chemistry majors. PHYS 1230G Algebra-Based Physics I, PHYS 2230G General Physics for Life Science I, and PHYS 1310G Calculus -Based Physics I are acceptable and are recommended in the decreasing order listed.
7. PHYS 2140 Electricity and Magnetism is the Physics II course recommended fro all Chemistry majors. PHYS 1240G Algebra-Based Physics II, PHYS 2240G General Physics for Life Science II, and PHYS 1240G Algebra-Based Physics II are acceptable and are recommended in the decreasing order listed. Students are highly cautioned to check prerequisites for the individual courses when schedule planning.
8. Students are strongly encouraged to check prerequisite/corequisite requirements for Physics labs when schedule planning.
9. Requires Teacher Education Program (TEP) admittance
10. Requires application for Student Teaching Entrance (STEP)
11. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor. Since the degree leads to a General Science teaching license, we strongly recommend that courses in Biology, Astronomy, Geology, etc. are included in the elective credits.

Second Language Requirement

For the Bachelor of Arts with a major in Chemistry there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
CHEM 1215G or CHEM 1216	General Chemistry I Lecture and Laboratory for STEM Majors or General Chemistry I Lecture and Laboratory for CHEM Majors	4
CHEM 2111	Explorations in Chemistry and Biochemistry	1
Area IV: Social and Behavioral Science Course [2]		3
	Credits	**16**
Semester 2		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [1] or Calculus and Analytic Geometry II Honors	4
CHEM 1225G or CHEM 1216	General Chemistry II Lecture and Laboratory for STEM Majors or General Chemistry I Lecture and Laboratory for CHEM Majors	4
Area V: Humanities Course [2]		3
Elective Course		3
	Credits	**17**
Second Year		
Semester 1		
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
CHEM 313	Organic Chemistry I [1]	3
CHEM 371	Analytical Chemistry [1]	4
Select one of the following:		4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics [1]	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab [1]	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	

SPED 3105	Introduction to Special Education in a Diverse Society	3
	Credits	**17**
Semester 2		
CHEM 314 & CHEM 315	Organic Chemistry II and Organic Chemistry Laboratory [1]	5
Select one of the following:		4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [1]	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab [1]	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II [1]	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab [1]	
Elective Course		3
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**15**
Third Year		
Semester 1		
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
VWW: Viewing a Wider World Course [3]		3
EDUC 3120	Multicultural Education	3
EDUC 3997	Secondary Field Experience	3
Elective Course		3
	Credits	**15**
Semester 2		
CHEM Upper-Division Elective Course [1]		3
Elective Course		12
Choose one from the following: [4]		
CHEM 456	Inorganic Structure and Bonding	
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	
	Credits	**15**
Fourth Year		
Semester 1		
EDUC 4410	Teaching Science at the Middle and High School Level	3
READ 4330	Content Area Literacy	3
Elective Course		3
Choose one from the following: [4]		3
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory (if CHEM 456 or CHEM 472 was not completed in the previous term)	
Elective Course (3 credits)		
	Credits	**12**
Semester 2		
CHEM 443	Senior Seminar	1
EDUC 4820	Secondary Student Teaching	9
EDUC 4821	Middle and High School Student Teaching Seminar	3
	Credits	**13**
	Total Credits	**120**

1 These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 Selection course option - Departmental requirement includes a choice of one of the following: CHEM 456 Inorganic Structure and Bonding, CHEM 471 Advanced Integrated Inorganic and Physical Chemistry Laboratory, or CHEM 472 Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory. If the student wishes to now take the CHEM offerings in the specific term they should add an elective course for 3 credits, however, the student must complete at least one of the above courses.

Chemistry - Bachelor of Science

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. All departmental and non-departmental requirements may not be taken S/U and must earn a C- or better final grade.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [2]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [3]	
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [3]	
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World [4]		**6**
Departmental/College Requirements		
BCHE 395	Biochemistry I	3
or BCHE 395H	Biochemistry I Honors	
CHEM 2111	Explorations in Chemistry and Biochemistry	1
or BCHE 140	Explorations in Chemistry and Biochemistry	

CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
CHEM 371	Analytical Chemistry	4
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
CHEM 443	Senior Seminar	1
CHEM 456	Inorganic Structure and Bonding	3
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory	3
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	3
Upper division Chemistry Elective [5]		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	4
Select two from the following:		6
MATH 2530G	Calculus III	
MATH 3160	Introduction to Ordinary Differential Equations	
MATH 2415	Introduction to Linear Algebra	
PHYS 315	Modern Physics	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120		
Select sufficient electives to bring total credits to 120, including 48 upper-division. [6]		31-32
Total Credits		**120-119**

Note: Students should work closely with their advisors and review carefully the prerequisites for and the sequential nature of courses required for the Bachelor of Science.

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
3. CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors is intended for students that completed high school Chemistry. Students with no prior Chemistry or those desiring a refresher are strongly encouraged to take CHEM 1111 Foundations of Chemistry prior to CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors enrollment. CHEM 1111 Foundations of Chemistry is an acceptable prerequisite for CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors.
   CHEM 1216 General Chemistry I Lecture and Laboratory for CHEM Majors and CHEM 1226 General Chemistry II Lecture and Laboratory for CHEM Majors is highly recommended for B.S. Chemistry majors and are acceptable General Education substitutions for CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors and CHEM 1225G General Chemistry II Lecture and Laboratory for STEM Majors but will need a degree audit exception that can be coordinated with your advisor.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
5. The Upper Division Chemistry elective must be a CHEM course and the requirement can be satisfied by one 3-credit course or three 1-credit courses.
6. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Science with a major in Chemistry there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
CHEM 1215G or CHEM 1216	General Chemistry I Lecture and Laboratory for STEM Majors or General Chemistry I Lecture and Laboratory for CHEM Majors	4
CHEM 2111	Explorations in Chemistry and Biochemistry	1
Area IV: Social and Behavioral Science Course [2]		3
	Credits	**16**
Semester 2		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
CHEM 1225G or CHEM 1226	General Chemistry II Lecture and Laboratory for STEM Majors or General Chemistry II Lecture and Laboratory for CHEM Majors	4
Area V: Humanities Course [2]		3
Elective Course		3
	Credits	**17**
Second Year		
Semester 1		
CHEM 313	Organic Chemistry I	3
CHEM 371	Analytical Chemistry	4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	4
Elective Course		3
Elective Course		3
	Credits	**17**
Semester 2		
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3

CHEM 314 & CHEM 315	Organic Chemistry II and Organic Chemistry Laboratory [1]	5
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [1]	4
Choose from one of the following:		3
MATH 2530G	Calculus III	
MATH 3160	Introduction to Ordinary Differential Equations [1]	
	Credits	**15**
Third Year		
Semester 1		
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
Area VI: Creative and Fine Arts Course [2]		3
VWW: Viewing a Wider World Course [3]		3
Choose one of the following:		3
PHYS 315	Modern Physics	
MATH 2415	Introduction to Linear Algebra	
	Credits	**12**
Semester 2		
CHEM 456	Inorganic Structure and Bonding	3
Upper Division Chemistry Elective Course		3
Elective Course		3
Elective Course		3
	Credits	**12**
Fourth Year		
Semester 1		
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory [1]	3
VWW: Viewing a Wider World Course [3]		3
Elective Course [4]		3
Elective Course [4]		3
Elective Course [4]		3
	Credits	**15**
Semester 2		
CHEM 443	Senior Seminar [1]	1
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	3
BCHE 395	Biochemistry I	3
Elective Course [4]		3
Elective Course [4]		3
Elective Course [4]		3
	Credits	**16**
	Total Credits	**120**

1. These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. Students who need to enroll in 15 credits a semester for Financial Aid purposes will need to enroll in additional elective credits to meet that requirement.

Chemistry (Secondary Education) - Bachelor of Science

The Bachelor of Science curriculum is designed to provide an in-depth curriculum in chemistry, physics, and mathematics and is certified by the American Chemical Society. The Secondary Education concentration curriculum prepares high-quality teachers for public schools and leads to a Minor in Secondary Education which leads to the New Mexico–Initial Teaching License, Secondary General Science Education (Grades 6-12). All departmental and nondepartmental requirements must earn a C- or better final grade or an S if the course is designated for S/U grading.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [2]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [3]	
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [3]	
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World [4]		**3**
Departmental/College Requirements		
BCHE 395	Biochemistry I	3
CHEM 2111	Explorations in Chemistry and Biochemistry	1
or BCHE 140	Explorations in Chemistry and Biochemistry	
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
CHEM 371	Analytical Chemistry	4
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
CHEM 443	Senior Seminar	1
CHEM 456	Inorganic Structure and Bonding	3
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory	3

CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	3
Upper division Chemistry Elective [5]		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	4
Select two from the following:		6
MATH 2530G	Calculus III	
MATH 3160	Introduction to Ordinary Differential Equations	
MATH 2415	Introduction to Linear Algebra	
PHYS 315	Modern Physics	
Secondary Education Requirements		
EDUC 3120	Multicultural Education	3
EDUC 3997	Secondary Field Experience	3
EDUC 4410	Teaching Science at the Middle and High School Level [6]	3
EDUC 4820	Secondary Student Teaching [7]	9
EDUC 4821	Middle and High School Student Teaching Seminar [7]	3
READ 4330	Content Area Literacy [6]	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120		
Select sufficient electives to bring total credits to 120, including 48 upper-division. [8]		9
Total Credits		**120**

Note: Students should work closely with their advisors and review carefully the prerequisites for and the sequential nature of courses required for the Bachelor of Science.

1 See the General Education (p. 262) section of the catalog for a full list of courses

2 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

3 CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors is intended for students that completed high school Chemistry. Students with no prior Chemistry or those desiring a refresher are strongly encouraged to take CHEM 1111 prior to CHEM 1215G enrollment. CHEM 1111 is an acceptable pre-requisite for CHEM 1215G. CHEM 1216 General Chemistry I Lecture and Laboratory for CHEM Majors and CHEM 1226 General Chemistry II Lecture and Laboratory for CHEM Majors is highly recommended for B.S. Chemistry majors and are acceptable General Education substitutions for CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors and CHEM 1225G General Chemistry II Lecture and Laboratory for STEM Majors but will need a degree audit exception that can be coordinated with your advisor.

4 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses. VWW 3-credit Upper-division rule can be met with Secondary Education Minor.

5 The Upper Division Chemistry elective must be a CHEM course and the requirement can be satisfied by one 3-credit course or three 1-credit courses.

6 Requires Teacher Education Program (TEP) admittance

7 Requires application for Student Teaching Entrance (STEP)

8 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Science with a major in Chemistry there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
CHEM 1215G or CHEM 1216	General Chemistry I Lecture and Laboratory for STEM Majors or General Chemistry I Lecture and Laboratory for CHEM Majors	4
CHEM 2111	Explorations in Chemistry and Biochemistry	1
Area IV: Social and Behavioral Science Course [2]		3
	Credits	**16**
Semester 2		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
CHEM 1225G or CHEM 1226	General Chemistry II Lecture and Laboratory for STEM Majors or General Chemistry II Lecture and Laboratory for CHEM Majors	4
Area V: Humanities Course [2]		3
SPED 3105	Introduction to Special Education in a Diverse Society	3
	Credits	**17**
Second Year		
Semester 1		
CHEM 313	Organic Chemistry I	3
CHEM 371	Analytical Chemistry	4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	4
Elective Course		3
EDUC 3120	Multicultural Education	3
	Credits	**17**
Semester 2		
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3

CHEM 314 & CHEM 315	Organic Chemistry II and Organic Chemistry Laboratory [1]	5
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [1]	4
Choose from one of the following:		3
MATH 2530G	Calculus III	
MATH 3160	Introduction to Ordinary Differential Equations [1]	
	Credits	**15**
Third Year		
Semester 1		
CHEM 430	Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy	3
Area VI: Creative and Fine Arts Course [2]		3
EDUC 3997	Secondary Field Experience	3
Choose one of the following:		3
PHYS 315	Modern Physics	
MATH 2415	Introduction to Linear Algebra	
BCHE 395	Biochemistry I	3
	Credits	**15**
Semester 2		
CHEM 456	Inorganic Structure and Bonding	3
Upper Division Chemistry Elective Course		3
Elective Course		3
READ 4330	Content Area Literacy	3
CHEM 472	Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory	3
	Credits	**15**
Fourth Year		
Semester 1		
CHEM 471	Advanced Integrated Inorganic and Physical Chemistry Laboratory [1]	3
VWW: Viewing a Wider World Course [3]		3
Elective Course [4]		3
EDUC 4410	Teaching Science at the Middle and High School Level	3
	Credits	**12**
Semester 2		
CHEM 443	Senior Seminar [1]	1
EDUC 4820	Secondary Student Teaching	9
EDUC 4821	Middle and High School Student Teaching Seminar	3
	Credits	**13**
	Total Credits	**120**

1. These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. Students who need to enroll in 15 credits a semester for Financial Aid purposes will need to enroll in additional elective credits to meet that requirement.

Biochemistry - Undergraduate Minor

The courses of the Biochemistry minor represent core biochemical content. A student cannot earn a bachelor's degree in Biochemistry or Chemistry and also earn a minor in Biochemistry. A student cannot earn minors in both Biochemistry and Chemistry.

Prefix	Title	Credits
Required Courses		
BCHE 395	Biochemistry I	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
One additional Upper Division Biochemistry (BCHE) course		1-3
Total Credits		**18-20**

The following (BCHE) courses do not count towards minor:

Prefix	Title	Credits
BCHE 140	Explorations in Chemistry and Biochemistry	1
BCHE 440	Biochemistry Seminar	1

Toxicology and Supplemental Instruction (SI) courses are not accepted.

Courses provisionally allowed:

Prefix	Title	Credits
BCHE 441	Advanced Research in Biochemistry (3 credits maximum)	1-3
BCHE 451	Special Topics (by petition only)	1-3

Chemistry - Undergraduate Minor

The courses of the Chemistry minor represent core chemical content. A student cannot earn a bachelor's degree in Chemistry or Biochemistry and also earn a minor in Chemistry. A student cannot earn minors in both Biochemistry and Chemistry.

Prefix	Title	Credits
Required Courses		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
CHEM 313 & CHEM 314	Organic Chemistry I and Organic Chemistry II	
Additional Courses		
Select sufficient additional upper division CHEM/BCHE credits to bring total credits to at least 18		6
Total Credits		**14**

The following courses do not count towards a minor in Chemistry:

Prefix	Title	Credits
CHEM 1111	Foundations of Chemistry	3
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
CHEM 2991	Introduction to Research	1-3
CHEM 351	Special Topics	1-3
CHEM 443	Senior Seminar	1
No BCHE courses except BCHE 395 of BCHE 395H		

Supplemental instruction (SI) courses are not accepted.

Courses provisionally allowed:

Prefix	Title	Credits
CHEM 441	Advanced Research (3 credits maximum)	1-3
CHEM 451	Special Topics (by petition only)	1-3

Communication Studies

Undergraduate Program Information

Communication Studies focuses on the complex role that human communication plays in everyday life. The undergraduate program in Communication Studies is designed to enhance students' interpersonal, presentation, and critical thinking skills. A successful graduate should be able to work effectively with people, assimilate, organize and analyze information, solve problems, make effective presentations, and demonstrate leadership. The program prepares students for careers in several professions, such as training and development, public relations, law, advertising and sales, government service, mediation, customer relations, human resources, international service, fundraising, and the ministry.

Graduate Program Information

The Master of Arts in Communication Studies provides students with a social-scientific approach to the study of human interaction, using both quantitative and qualitative methods. Our curriculum is designed to explore how communication occurs interpersonally, within organizations, in social and mediated systems, and between and within cultures. Students take courses in interpersonal, organizational, and cultural communication. All graduate students take courses in communication theory and both qualitative and quantitative research methods. In addition, students can take courses in topics such as conflict management, leadership, persuasion, as well as family, health, nonverbal, and small-group communication.

The program offers a wide variety of courses, allowing students to select topics based on their special interests. In addition to courses, students can gain practical experience through departmental professional activities, such as graduate teaching assistantships, research, and colloquia.

Master's Accelerated Program Information

The Master's Accelerated Program is an opportunity for qualified, advanced undergraduate students with a GPA of 3.25 or higher to begin their graduate studies while still undergraduates. Students accepted into the program will be able to take up to 12 credits that can be applied to a Master's degree in Communication Studies at New Mexico State University. This equates to one-third of the required credits to obtain a graduate degree in Communication Studies at NMSU.

For a complete list of the qualifications and course requirements for the MAP program, see the Master of Arts in Communication Studies program.

Degrees for the Department

Bachelor Degree(s)

- Communication Studies - Bachelor of Arts (p. 618)
- Communication Studies - Bachelor of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/communication-studies-ba-online/)

Master Degree(s)

- Communication Studies (Analysis and Decision-Making) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/communication-studies-analysis-decision-making-ma-online/)
- Communication Studies (Leadership Communication) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/communication-studies-leadership-communication-ma-online/)
- Communication Studies (Organizational Communication) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/communication-studies-organizational-communication-ma-online/)
- Communication Studies - Master of Arts (p. 134)

Minors for the Department

- Communication Studies - Graduate Minor (p. 255)
- Communication Studies - Graduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/communication-studies-graduate-minor-online/)
- Communication Studies - Undergraduate Minor (p. 620)
- Communication Studies - Undergraduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/communication-studies-undergraduate-minor-online/)
- Sports Communication - Undergraduate Minor (p. 620)

Department Head: Greg G. Armfield, Ph.D.

Professors: G. Armfield, J. Flora, and A. Hubbell

Assistant Professors: L. Dajches, G. Morales, and D. Shi

College Assistant Professors: J. Feltz and D. Romero

Greg G. Armfield, Ph.D. (University of Missouri-Columbia) – Communication and Sport, Organizational Communication, Leadership, and Religion

Leah Dajches, Ph.D. (University of Arizona) – Mass Communication, Fandom Studies, and Social Influence/Persuasion

Jason Feltz, Ed.D. (Grand Canyon University) – Leadership and Organizational Communication

Jeanne Flora, Ph.D. (University of Kansas) – Family Communication and Interpersonal Communication

Anne Hubbell, Ph.D. (Michigan State University) – Health Communication and Organizational Communication

Gabriela Morales, Ph.D. (University of New Mexico) – Communication & Culture and Health Communication

Dae Romero, MA. (New Mexico State University) – Communication & Identity and Intersectionality

Duli Shi, Ph.D. (University of Maryland, College Park) – Strategic Communication and Organizational Communication

Communication Studies Courses

COMM 1115G. Introduction to Communication
3 Credits (1+2P)
This survey course introduces the principles of communication in the areas of interpersonal, intercultural, small group, organizational, public speaking, mass, and social media. May be repeated up to 3 credits.
Learning Outcomes
1. Describe basic communication terms, forms and concepts.
2. Identify basic communication research methods and theories.
3. Explain the significance of ethics and diversity in communication processes.
4. Apply various concepts and skills in multiple communication contexts.

COMM 1130G. Public Speaking
3 Credits (3)
This course introduces the theory and fundamental principles of public speaking, emphasizing audience analysis, reasoning, the use of evidence, and effective delivery. Students will study principles of communication theory and rhetoric and apply them in the analysis, preparation and presentation of speeches, including informative, persuasive, and impromptu speeches. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate effective speech preparation.
2. Demonstrate effective speech delivery through use of language, nonverbal elements and the creation of presentation aids.
3. Analyze a potential audience and tailor a speech to that audience.
4. Evaluate presentations according to specific criteria.
5. Explain common propaganda techniques and logical fallacies, and identify them in the speeches of others.
6. Recognize diversity and ethical considerations in public speaking.

COMM 2110. Communication Theory
3 Credits (3)
This course provides an exploration of major theories, concepts and methods of research in the study of human communication. May be repeated up to 3 credits.
Learning Outcomes
1. Identify, explain, and illustrate key concepts and principles of the major traditions of communication theory.
2. Analyze practical problems and situations using theories.
3. Integrate research correctly and ethically from credible sources to support the primary purpose of communication.

COMM 2996. Special Topics
1-3 Credits (1-3)
Specific subjects and credits to be announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes
1. Define and describe key concepts and principles related to the group study or selected topic as identified by the course subtitle.
2. Apply key concepts and principles related to the group study or selected topic as identified by the course subtitle.

COMM 2997. Independent Study
1-3 Credits (1-3)
Individualized, self-paced projects for students with a special interest in communication topics. Students must be sophomore standing to enroll. May be repeated up to 6 credits.
Prerequisite: COMM 1115G.
Learning Outcomes
1. The student will study a selected topic and conduct a literature review or comparable research assignment.
2. The student will apply knowledge and understanding of the topic in a final paper or project.

COMM 3110. Communication Theory and Discovery
3 Credits (3)
The course explores the nature of communication science, major communication theories, and how communication research is conducted and interpreted.
Learning Outcomes
1. Understand philosophical underpinnings of communication theories and methods
2. Understand the relationship between theory and research methods in the field of communication
3. Apply concepts, theories, and research findings to various contexts outside of the classroom
4. Become an intelligent consumer of research: have the ability to read, comprehend, demonstrate understanding and critically evaluate communication and other research reported in scholarly journals and published documents as well as in the popular press.

COMM 3120. Persuasion Theory and Practice
3 Credits (3)
Students will be introduced to the field of persuasion and social influence. We will review current and classical theories as well as research on attitudes and attitude change. We will explore, construct, and analyze persuasive messages using persuasive theories, and we will focus on subtopics within persuasion like interpersonal and mass communication.
Learning Outcomes
1. Differentiate the major theories in the field of persuasive communication.
2. Design persuasive messages using principles from the theories covered in class.
3. Analyze and understand the workings of a persuasive message.
4. Become a (more) critical consumer of persuasive messages.
5. Apply and recognize persuasive communication theories in your own life.

COMM 3510. Organizational Communication
3 Credits (3)
Communication strategies and patterns of private and governmental organizations, including research on the communication process. May be repeated up to 3 credits.
Learning Outcomes
1. Evaluate the organizational theory, concepts, and research discussed in class and their implications for the field of organizational communication.
2. Explain the role communication plays in each of the organizational communication processes discussed in class.
3. Critically assess communication practices within all types of organizations.

4. Evaluate the ethical issues brought forth in organizational communication.

COMM 3530. Conflict Management
3 Credits (3)
Communication strategies to manage and negotiate conflict in intrapersonal, interpersonal, group, and organizational settings. May be repeated up to 3 credits.
Learning Outcomes
1. Analyze the role of communication in conflict and conflict management processes.
2. Analyze the components of conflict that lead to constructive or destructive communication patterns.
3. Evaluate the effectiveness and appropriateness of strategies, methods, and responses that are appropriate to a given conflict situation.

COMM 3610. Interpersonal Communication
3 Credits (3)
Theories of interpersonal communication and relational communication including study of relevant models, contexts and constructs. May be repeated up to 3 credits.
Learning Outcomes
1. To define and describe communication and interpersonal communication.
2. To identify and describe concepts and behaviors related to nonverbal, verbal, relational, interpretive, role, self, and goal competence in the context of interpersonal communication.
3. To compare and apply concepts of interpersonal communication competence by reflecting on examples from communication in personal and everyday relationships.
4. To define, apply, and analyze concepts of family communication competence in media portrayals of, and in one's own experience of, family communication.
5. To define, apply, and analyze concepts of romantic communication competence in either a personal romantic relationship or in the example of a couple observed/interviewed.

COMM 3710. Communication and Culture
3 Credits (3)
Cultural and intercultural communication theory and behavior, with a concentration on the development of specific communication skills which should facilitate effective intercultural communication. May be repeated up to 3 credits.
Learning Outcomes
1. Define culture and other related concepts.
2. Explain processes of enculturation and acculturation.
3. Apply the concepts to one's own experience.
4. Create new ways of presenting material about culture and communication.

COMM 4210. Political Communication
3 Credits (3)
Presidential and congressional campaigns, political persuasion techniques, political advertising, power in language, and media aspects of political information. Ideology, resistance to political manipulation, and dependence of democracies on communication. May be repeated up to 3 credits.
Learning Outcomes
1. Identify and explain key concepts in political communication, and apply that knowledge to your own life experiences and views on the world.
2. Read and critically analyze current research in political communication.
3. Become informed and critical consumers of political messages and the news media.

COMM 4220. Communication Technologies
3 Credits (3)
Development and evolution of human communication technologies from prehistory through the future of computer-mediated communication networks. Examines behavioral, cognitive, social, cultural, and political issues of new communication technologies and their use and management. May be repeated up to 3 credits.
Learning Outcomes
1. Understand the key concepts, theories, and research findings regarding scholarly investigations of new media technologies.
2. Apply concepts, theories, and research findings related to social media to a variety of social issues and one's own lived experiences.
3. Develop the ability to think about social media critically and analytically.
4. Learn how to effectively communicate ideas, information, and messages through new media technologies (particularly, social media platforms) in order to achieve a specific goal.
5. Articulate the benefits and drawbacks of living in a digital world.

COMM 4230. Strategic Communication
3 Credits (3)
This course covers history, theory, and research related to the use of strategic organizational communication to change attitudes. The course is a survey course designed to help you understand how organizations create targeted, creative, research-based communication to accomplish their objectives. Students will examine the role of communication in organizational planning and execution of advertising, marketing, public relations, and social change. Strategic Communication provides insight into how communicators use critical and creative thinking to gather, organize, evaluate and deliver information in a culturally diverse world.
Learning Outcomes
1. Understand the definition of strategic communication and its analysis levels.
2. Understand the career options you might have with strategic communication.
3. Get familiar with ethical strategic communication practices.
4. Learn how to conduct strategic communication planning.
5. Analyze an organization's diverse stakeholder groups.
6. Derive effective message tactics and campaign designs with different media.
7. Develop a campaign plans book for your selected client.

COMM 4310. Sports Communication
3 Credits (3)
This course provides a senior-level exploration of the role sports and sports communication plays in contemporary culture. Readings will examine the interrelationship between sports and media in society, the identities that fans assume when engaging in fanship and sports viewership, the pervasiveness of sports communication practices in the sports industry, the role of media in story telling, and the way cultural

identifiers of class, ethnicity, and gender play out in the media. This is taught with COMM 5310. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate the historical impact of sports on society.
2. Understand the evolution of sports media and ESPN and its impact on American culture.
3. Assess existing and future sports communication research and media theory.
4. Assess the current trends in sports media and the culture of sports.
5. Transfer knowledge of sports communication to a critical appreciation of sports media; including the study of image repair and framing theory.

COMM 4520. Small Group Communication
3 Credits (3)

Principles and methods of modern group discussion with emphasis on the role of the group in problem solving. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize and develop a complex understanding of the theories and principles of group communication.
2. Become an intelligent consumer of group research literature.
3. Adopt and articulate a clearly developed communication perspective toward group research.
4. Gain an understanding of the within-group phenomena.

COMM 4530. Leadership Communication
3 Credits (3)

Examination of traditional theories and concepts of leader-follower dynamics; presentation of cognitive, systems, and symbolic interpretative views of leadership with an emphasis on persuasion and motivation in leader-follower interactions. May be repeated up to 3 credits.

Learning Outcomes

1. Apply leadership concepts and theories.
2. Analyze leadership philosophies.
3. Identify the fundamental ways leadership is practiced in organizations.
4. Assess your own leadership traits and behaviors.
5. Develop your own personal leadership philosophy.

COMM 4550. Case Studies in Leadership Communication
3 Credits (3)

Students will assess, synthesize, integrate and evaluate research in the area of leadership and organizational communication. Students will interact with modern topics related to communication and organizations through the analysis and discussion of various cases pulled from current events in organizational research.

Learning Outcomes

1. Practice case analysis related to organizational theories and skills.
2. Apply leadership communication concepts and theories to real life scenarios.
3. Develop critical thinking skills for inclusive leaders.
4. Examine the role of the inclusive model of leadership within organizations.
5. Develop your own case studies related to current organizational topics.
6. Examine emerging organizational ethics issues such as gender, ethics, and morality within leadership.
7. Develop an understanding of the personal and organizational factors related to leading teams and organizations.

COMM 4560. Ethics & Diversity in Leadership Communication
3 Credits (3)

To provide students with an opportunity to explore the issues related to ethical decision-making and personal ethical development as they apply to interpersonal communication, followership, organizations, diversity, and organizational citizenship.

Learning Outcomes

1. Practice personal ethical decision-making in organizations.
2. Apply ethical leadership concepts and theories to real-life scenarios.
3. Develop critical thinking skills for inclusive leaders.
4. Examine the role of individual morals and philosophies in organizational ethics.
5. Develop your own personal philosophy of organizational ethics.
6. Examine emerging organizational ethics issues.
7. Develop an understanding of the personal and organizational factors related to ethics and diversity.

COMM 4620. Deception and Communication
3 Credits (3)

Deceptive communication including nonverbal indicators of lies, types of lies, and influence of relationships on lying behavior and interpretation. May be repeated up to 3 credits.

Learning Outcomes

1. Students will acquire basic knowledge of research on Deception.
2. Students will be able to identify reasons for why people lie.
3. Students will be able to apply the course concepts to real world situations.
4. Students will be able to tell the difference between what is "true" and what is "false" about how we deceive in the popular press and movies/TV.
5. Students will learn about THE two theories in the area of Deception and be able to differentiate between them.

COMM 4630. Family Communication
3 Credits (3)

This course examines cutting edge research on family communication, as well as classic theories and research findings that have influenced and revolutionized the way scholars conceptualize family interaction. May be repeated up to 3 credits.

Learning Outcomes

1. To develop a communication perspective on the family as a system.
2. To identify and distinguish between theories of family interaction.
3. To recognize and explain how family communication patterns and processes affect communication between family members.
4. To analyze communication processes that are unique to family subsystems such as romantic, parent-child, sibling, and extended family relationships.
5. To analyze the role of family interaction in the development and course of mental and physical health problems.
6. To analyze theories of family stress and the impact of specific family stressors on family interaction and well-being.
7. To apply theories and concepts to real-life scenarios.

COMM 4640. Nonverbal Communication
3 Credits (3)

Study of and experimentation with nonverbal aspects of human communication as vital components of the total communication process. May be repeated up to 3 credits.

Learning Outcomes

1. To analyze nonverbal channels of communication between persons, including channels such as the voice, face, eyes, posture, gestures, space, territory, clothing, paralanguage, and touch.
2. To analyze how nonverbal behaviors collectively communicate functions such as dominance, deception, intimacy, and turn-taking.
3. To analyze individual and social factors affecting the production of nonverbal behaviors, and the effects of such behaviors on others' attitudes, perceptions, cognitions, and relationships.
4. To analyze the origins of nonverbal communication, by examining developmental trends, continuities with other animal species, cultural similarities and differences, and physiological bases.
5. To examine applications of nonverbal research and theory to infant development, personality, gender, relational satisfaction, relationship development, culture, aging, and social media.

COMM 4720. International Communication
3 Credits (3)

Exploration of the forms and channels of communication is substantially influenced by international cultural and political factors. Covers: global communication technology; news, information, and entertainment flows; and international diplomacy and negotiation. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate an understanding of the history of international communications, and the issues and controversies that have appeared.
2. Demonstrate an understanding of the international agencies responsible for the regulation of media, including content, and technologies.

COMM 4730. Environmental Communication
3 Credits (3)

Examines the link between communication and environment within the context of communication scholarship. Topics include sense of place, cultural approaches to interacting with environment as well as exploring current themes surrounding environment. May be repeated up to 3 credits.

Learning Outcomes

1. Identify ways in which public discourses socially construct relationships between nature and humans.
2. Demonstrate an understanding of critical and cultural approaches to environmental communication.
3. Identify key issues in environmental conflicts, risk communication, and democratic participation in policy-making.
4. Demonstrate an ability to critically evaluate environmental advocacy, deliberation, and public relations.

COMM 4750. Health Communication
3 Credits (3)

Examination of central issues in communication theory and practice as applied to health care. Includes communication in health care organizations, media dissemination of health information, role of communication in disease prevention and health promotion, and symbolic meaning of illness within cultures. May be repeated up to 3 credits.

Learning Outcomes

1. Students will gain an understanding of health communication theories and concepts.
2. Students will be able to apply theories and concepts to a real-world health issue.
3. Students will be able to differentiate among health communication theories and concepts.

COMM 4996. Selected Topics
1-6 Credits (1-6)

Individual and/or group study of selected topics. To be identified by subtitle. May be repeated up to 12 credits.

Learning Outcomes

1. Gain basic knowledge regarding the group study or selected topic as identified by the course subtitle.
2. Gain expert insight into the selected topic identified by the course subtitle.

COMM 4997. Independent Study
1-3 Credits (1-3)

Individualized, self-paced projects for advanced students. Students must be in junior standing to enroll. May be repeated up to 6 credits.

Prerequisite: COMM 1115G.

Learning Outcomes

1. The student will study a selected topic and conduct a literature review or comparable research assignment.
2. The student must demonstrate both quantity and quality of knowledge and understanding of the topic in a final written paper.

COMM 4998. Communication Internship
3 Credits (3)

Internship opportunity to apply what has been learned to a real-world situation. Students must be in junior standing to enroll. Students must be in Junior or Senior Standing. May be repeated up to 6 credits.

Prerequisite: COMM 3510.

Learning Outcomes

1. Apply course concepts and discussion topics to the internship experience.
2. Differentiate between good and poor communication skills.
3. Evaluate the complex communication phenomena within the workplace.
4. Apply a valuable experiential education outside of the classroom.

COMM 5110. Theories of Communication
3 Credits (3)

The theories covered in this course are intended to provide you with a foundational background for future graduate courses that will explore theoretical and topical areas of study in more depth. May be repeated up to 3 credits.

Learning Outcomes

1. Learn how theories are developed, analyzed, evaluated, and applied.
2. Be able to assess, synthesize, and evaluate communication theories.
3. Gain a broad overview of the field of human communication theory.
4. Appreciate the diversity of theoretical ideas within communication literature.
5. Develop a deeper understanding through the exploration of selected topics.
6. Begin to solidify a theoretical stance of your own that will motivate and guide further studies.

COMM 5120. Persuasion Theory
3 Credits (3)
Work with an actual persuasion campaign, such as public information, political, or commercial marketing campaigns. Includes case studies of large-scale persuasion efforts, current theoretical models of persuasion processes, and methods for studying, evaluating, and refining messages for optimal effects. May be repeated up to 3 credits.
Learning Outcomes
1. Become a critical consumer of persuasive messages and persuasive campaigns.
2. Create persuasive messages utilizing principles from one or more of the theories covered in class.
3. Apply concepts, theories, and research findings to various contexts outside of the classroom.

COMM 5130. Quantitative Research Methods
3 Credits (3)
Seminar in the quantitative study of human communication phenomena, research desgin, and statistical analysis. May be repeated up to 3 credits.
Learning Outcomes
1. Understand the logic of social science research.
2. Compare different research methods (experiment, survey, content analysis, and so on).
3. Develop and write clear hypotheses.
4. Understand how to assess the validity and reliability of measures.
5. Design a survey to test your hypotheses.
6. Use statistical analyses to answer questions in the field of communication.
7. Discuss the limitations of your study and the implications for your conclusions.
8. Become a better consumer of statistics and social science research.

COMM 5140. Qualitative Research Methods in Communication
3 Credits (3)
Survey of qualitative research methods in the study of human communication, including historical and critical approaches, interviewing, participant-observation, and communication ethnography. Students apply methods to their own research. May be repeated up to 3 credits.
Learning Outcomes
1. Learn about the nature and application of qualitative research in social and organizational research.
2. Learn to conceptualize qualitative research and to formulate problem statements and research questions.
3. Learn how to design a qualitative research study.
4. Learn about qualitative data collection procedures--observation, interviews, focus group interviews, and collection and use of documents and archival data.
5. Apply research design and data collection skills by undertaking a pilot research study.

COMM 5210. Political Communication
3 Credits (3)
Political communication theory, research, and issues. Empirical studies of campaigns, movements, news media, voter decision-making, political participation, socialization, and knowledge. Political theory, field research, communication science findings and research methods. May be repeated up to 3 credits.
Learning Outcomes
1. Identify and explain key concepts in political communication, and apply that knowledge to your own life experiences and views on the world.
2. Read and critically analyze current research in political communication.
3. Become informed and critical consumers of political messages and the news media.

COMM 5220. Communication Technologies
3 Credits (3)
Seminar on design, usage, and social impact of electronic mail, communication through computer networks, and new technologies of organizational communication such as group decision support systems (GDSS). Each student will study an actual application of a major communication technology in an organization. May be repeated up to 3 credits.
Learning Outcomes
1. Understand the key concepts, theories, and research findings regarding scholarly investigations of new media technologies.
2. Apply concepts, theories, and research findings related to social media to a variety of social issues and one's own lived experiences.
3. Develop the ability to think about social media critically and analytically.
4. Learn how to effectively communicate ideas, information, and messages through new media technologies (particularly, social media platforms) in order to achieve a specific goal.
5. Articulate the benefits and drawbacks of living in a digital world.

COMM 5230. Strategic Communication
3 Credits (3)
This course covers history, theory, and research related to the use of strategic organizational communication to change attitudes. The course is a survey course designed to help you understand how organizations create targeted, creative, research-based communication to accomplish their objectives. Students will examine the role of communication in organizational planning and execution of advertising, marketing, public relations, and social change. Strategic Communication provides insight into how communicators use critical and creative thinking to gather, organize, evaluate and deliver information in a culturally diverse world. Graduate students will be required to fulfill advanced research and presentation requirements.
Learning Outcomes
1. Understand the definition of strategic communication and its analysis levels.
2. Understand the career options you might have with strategic communication.
3. Get familiar with ethical strategic communication practices.
4. Learn how to conduct strategic communication planning.
5. Analyze an organization's diverse stakeholder groups.
6. Derive effective message tactics and campaign designs with different media.
7. Develop a campaign plans book for your selected client.

COMM 5310. Sports Communication
3 Credits (3)
This seminar provides a graduate-level exploration of the role sports and sports communication plays in contemporary culture. Readings will examine the interrelationship between sports and media in society, the identities that fans assume when engaging in fanship and sports

viewership, the pervasiveness of sports communication practices in the sports industry, the role of media in story telling, and the way cultural identifiers of class, ethnicity, and gender play out in the media. This is taught with COMM 4310. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate the historical impact of sports on society.
2. Understand the evolution of sports media and ESPN and its impact on American culture.
3. Assess existing and future sports communication research and media theory.
4. Assess the current trends in sports media and the culture of sports.
5. Transfer knowledge of sports communication to a critical appreciation of sports media; including the study of image repair and framing theory.

COMM 5510. Organizational Communication
3 Credits (3)

Communication strategies and patterns of private and governmental organizations, including research on communication systems. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize and develop a complex understanding of the theories and principles of organizational culture and communication.
2. Become an intelligent consumer of organizational culture.
3. Plan, design, execute, interpret, and/or critically evaluate the conclusions of an original organizational communication research project.
4. Adopt and articulate a clearly developed communication perspective toward organizational research.

COMM 5530. Leadership Communication
3 Credits (3)

This course examines traditional theories and concepts of leadership and also highlights popular and historic leaders. May be repeated up to 3 credits.

Learning Outcomes

1. Equip students with effective leadership skills.
2. Apply leadership concepts and theories to real-life scenarios.
3. Develop critical thinking skills for inclusive leaders.
4. Analyze leadership philosophies.
5. Identify the fundamental ways leadership is practiced in organizations.
6. Develop your own personal philosophy of organizational ethics.
7. Develop skills to be able to identify modern trends in organizations and emerging organizational leaders.

COMM 5550. Case Studies in Leadership Communication
3 Credits (3)

Students will assess, synthesize, integrate and evaluate research in the area of leadership and organizational communication. Students will interact with modern topics related to communication and organizations through the analysis and discussion of various cases pulled from current events in organizational research. COMM 5550 is the graduate version of COMM 4550. Additional work will be required for Graduate Students.

Learning Outcomes

1. Practice case analysis related to organizational theories and skills.
2. Apply leadership communication concepts and theories to real life scenarios.
3. Develop critical thinking skills for inclusive leaders.
4. Examine the role of the inclusive model of leadership within organizations.
5. Develop your own case studies related to current organizational topics.
6. Examine emerging organizational ethics issues such as gender, ethics, and morality within leadership.
7. Develop an understanding of the personal and organizational factors related to leading teams and organizations.

COMM 5560. Ethics & Diversity in Leadership Communication
3 Credits (3)

To provide students with an opportunity to explore the issues related to ethical decision-making and personal ethical development as they apply to interpersonal communication, followership, organizations, diversity, and organizational citizenship. Additional work will be required for Graduate Students.

Learning Outcomes

1. Practice personal ethical decision-making in organizations.
2. Apply ethical leadership concepts and theories to real-life scenarios.
3. Develop critical thinking skills for inclusive leaders.
4. Examine the role of individual morals and philosophies in organizational ethics.
5. Develop your own personal philosophy of organizational ethics.
6. Examine emerging organizational ethics issues.
7. Develop an understanding of the personal and organizational factors related to ethics and diversity.

COMM 5610. Interpersonal Communication
3 Credits (3)

Theories of interpersonal communication and communication within a relationship, including study of relevant models, contexts, and constructs. May be repeated up to 3 credits.

Learning Outcomes

1. To define interpersonal communication, explore relationship types, and analyze demographic trends in personal relationships.
2. To examine the human need for interpersonal relationships, as well as social networks, the development of social skills, and the role of social support.
3. To analyze how people develop and communicate their identity within relationships.
4. To examine the role of communication in developing and maintaining relationships, with a focus on relational stages, turning points, dialectics, uncertainty, expectations, self-disclosure, affection, intimacy, influence, conflict, power, as well as cultural influences to close relationships.
5. To analyze relational hurt, relational transgressions, relational deterioration, and termination from a communication perspective.
6. To analyze and review current theory and peer-reviewed research in interpersonal communication.
7. To examine practical applications of interpersonal communication that have the potential to help or harm people, and to explore the gaps and links between theory and practice.

COMM 5630. Family Communication
3 Credits (3)

This course examines cutting edge research on family communication, as well as classic theories and research findings that have influenced and revolutionized the way scholars conceptualize family interaction. Topics include basic family communication processes, communication in family

subsystems, communication during family stress, and the role of family interaction in health and well-being. Students will explore how family relationships are built, maintained, and destroyed by communication as well as the potentially important and long lasting effects of family relationships on individuals. May be repeated up to 3 credits.

Learning Outcomes

1. To develop a communication perspective on the family as a system.
2. To identify and distinguish between theories of family interaction.
3. To recognize and explain how family communication patterns and processes affect communication between family members.
4. To analyze communication processes that are unique to family subsystems such as romantic, parent-child, sibling, and extended family relationships.
5. To analyze theories of family stress and the impact of specific family stressors on family interaction and well-being.
6. To analyze the role of family interaction in the development and course of mental and physical health problems.
7. To analyze and review current theory and peer-reviewed research in family communication.
8. To examine practical applications of family communication that have the potential to help or harm people, and to explore the gaps and links between theory and practice.

COMM 5640. Nonverbal Communication
3 Credits (3)

This course focuses on human physical behaviors as the basis of communication between persons. This physical behavior includes such variables as the voice, face, eyes, posture, gesture, space, territory, clothing, and touch. The content of the course considers the individual and social factors affecting the production of such behaviors, and the effects of such behaviors on others' attitudes, perceptions, cognitions, and relationships. Applications of research and theory in nonverbal communication to infant development, personality, sex differences, marital satisfaction, relationship development, culture, aging, and brain functioning are also studied throughout the course. May be repeated up to 3 credits.

Learning Outcomes

1. To analyze nonverbal channels of communication between persons, including channels such as the voice, face, eyes, posture, gestures, space, territory, clothing, paralanguage, and touch.
2. To analyze how nonverbal behaviors collectively communicate functions such as dominance, deception, intimacy, and turn-taking.
3. To analyze individual and social factors affecting the production of nonverbal behaviors, and the effects of such behaviors on others' attitudes, perceptions, cognitions, and relationships.
4. To analyze the origins of nonverbal communication, by examining developmental trends, continuities with other animal species, cultural similarities and differences, and physiological bases.
5. To examine applications of nonverbal research and theory to infant development, personality, gender, relational satisfaction, relationship development, culture, aging, and social media.
6. To analyze and review current theory and peer-reviewed research in nonverbal communication.

COMM 5710. Communication and Culture
3 Credits (3)

Cultural and intercultural communication theory and research. Focuses on discovering and describing distinctive ways of speaking within and between cultures.

Learning Outcomes

1. Analyze the complex intersections between communication and culture.
2. Understanding the definition of culture.
3. Analyze how culture is expressed.
4. Learn how culture is studied.
5. Understand what happens when we engage in intercultural communication.

COMM 5994. MA Project
1-6 Credits (1-6)

Project credits are used for the master's degree project option. May be repeated up to 6 credits.

Learning Outcomes

1. Propose and defend the project during the first semester.
2. Complete and defend the project during the second semester.

COMM 5996. Special Topics
1-9 Credits (1-9)

Individual and/or group study of special topics. To be identified by subtitle. May be repeated up to 99 credits.

Learning Outcomes

1. Gain basic knowledge regarding the group study or selected topic as identified by the course subtitle.
2. Gain expert insight into the selected topic identified by the course subtitle.

COMM 5997. Independent Study
1-6 Credits (1-6)

Individualized, self-paced projects. May be repeated up to 99 credits.

Learning Outcomes

1. The student will study a selected topic and conduct a literature review or comparable research assignment.
2. The student must demonstrate both quantity and quality of knowledge and understanding of the topic in a final written paper.

COMM 5998. Communication Internship for Graduate Students
3 Credits (3)

Internship opportunity to apply what students have learned to the real world. May be repeated up to 3 credits.

Learning Outcomes

1. Apply course concepts and discussion topics to the internship experience.
2. Differentiate between good and poor communication skills.
3. Evaluate the complex communication phenomena within the workplace.
4. Apply a valuable experiential education outside of the classroom.

COMM 5999. Master's Thesis
1-15 Credits (1-15)

Thesis. May be repeated up to 88 credits.

Learning Outcomes

1. Submit Thesis Proposal and defend the first semester of enrollment.
2. Complete Thesis and defend during the second semester of enrollment.

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Communication Studies - Bachelor of Arts

In addition to completing the general education requirements of the university and the college, students majoring in communication studies must complete 21 credits of core COMM courses and 15 credits of COMM electives for a total of 36 credits. Any exception to these policies requires approval from the department head.

All COMM courses must be completed with a grade of C- or better.

Undergraduate Course Rotation:

Fall

COMM 3510 Organizational Communication

COMM 3610 Interpersonal Communication

COMM 3710 Communication and Culture

Spring

COMM 3110 Communication Theory and Discovery

COMM 3120 Persuasion Theory and Practice

COMM 4998 Communication Internship

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1 [1]		*4*
English Composition - Level 2 [1]		*3*
Oral Communication		
COMM 1115G	Introduction to Communication (Communication Core Course)	3
or HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics [1]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits) [1]		
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Science Course (4 or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing a Wider World [2]		**6**
Departmental/College Requirements		
Core Courses		*18*
The department requires 21 total credits of Core Courses with the classes listed below and COMM 1115G from the General Education requirements		
COMM 3110	Communication Theory and Discovery	
COMM 3120	Persuasion Theory and Practice	
COMM 3510	Organizational Communication	
COMM 3710	Communication and Culture	
COMM 3610	Interpersonal Communication	
COMM 4998	Communication Internship	
Departmental Elective Courses		*18*
Second Language Requirement: (required- see below)		**0-8**
Electives to bring total credits to 120 [3]		**35-46**
Total Credits		**120**

1 For Information regarding the General Education Course Requirements see the General Education (p. 262) section of the catalog.

2 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

3 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in Communication Studies, there is a one-year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II	3-6
or SPAN 2210	Spanish for Heritage Learners III	

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110 & SIGN 1120	American Sign Language I and American Sign Language II	3-6

Option 3:

Prefix	Title	Credits
Challenge or complete the 1120 level for the following courses:		
FREN 1120	French II	4
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
OR		
Challenge or complete the 1120/1220/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	
or SIGN 1120	American Sign Language II	

Option 4:

Participate in an experiential learning study abroad course sponsored by NMSU or an approved International Internship that enhances the students' cultural competency through cultural understanding and experience. Please meet with the head of the Department of Communication Studies for information. Students must pass the course with a C- or higher.

Option 5:

Pass (with a C-or higher) any three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 6:

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 7:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 8:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 9:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
Choose one from the following: [1]		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
MATH 1130G	Survey of Mathematics	3
FYEX 1112	The Freshman Year Experience	3
Choose one from the following: [2]		3
ENGL 2130G	Advanced Composition	
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Area IV: Social/Behavioral Science Course [2]		3
Area VI: Creative and Fine Arts Course [2]		3
Area III: Laboratory Science Course [2]		4
Area V: Humanities Course [2]		3
Elective Course		1
	Credits	**30**
Sophomore		
COMM 3110	Communication Theory and Discovery (offered Spring only)	3
COMM 3710 or COMM 3610	Communication and Culture (offered Fall only) or Interpersonal Communication	3
Area III: Laboratory Science Course OR Area IV: Social/Behavioral Science Course [2]		3-4
First Course in Second Language Requirement [2]		3-4
Second Course in Secound Language Requirements [2]		3-4
COMM 3120	Persuasion Theory and Practice (offered Spring only)	3
COMM Elective Course		3
Elective Course(s)		9
	Credits	**30-33**
Junior		
COMM 3610 or COMM 3710	Interpersonal Communication (offered Fall only) or Communication and Culture	3
COMM Elective Course(s)		6
VWW - Viewing a Wider World Courses(s) [3]		6
COMM 3510	Organizational Communication (offered Fall only)	3
Elective Course(s)		9
Upper-Division Elective Course(s)		3
	Credits	**30**
Senior		
COMM Elective Course		3
Upper-Division Elective Course(s)		24
Choose one from the following:		3
COMM 4998	Communication Internship (offered Spring only)	
COMM Elective Course (3 credits)		
	Credits	**30**
	Total Credits	**120-123**

1 These courses may have prerequisites and/or co-requisites, and it is the student's responsibility to fulfill all requirements.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Communication Studies - Undergraduate Minor

A minor in Communication Studies consists of 18 credits; at least 9 of those credits must be in courses numbered 3000 or above. All courses must be completed with grades of C- or better.

Prefix	Title	Credits
Required Courses		
COMM 1115G	Introduction to Communication	3
or HNRS 2175G	Introduction to Communication Honors	
COMM 3510	Organizational Communication	3
COMM 3710	Communication and Culture	3
COMM 3610	Interpersonal Communication	3
Additional Courses		
Select 6 credits of additional Communication Studies courses		6
Total Credits		**18**

Sports Communication - Undergraduate Minor

The minor in Sports Communication provides students with the critical understanding and experience in content creation needed to excel in a variety of aspects of the sports industry. Students will learn the principles of communication and journalism as they apply to sports-related events, topics, and people. The minor offers courses familiarizing students with the skills and tools needed to produce sport content for a variety of media, as well as courses that will teach students to be effective communicators within and for sport organizations. Several courses also offer students the opportunity to develop a critical understanding of the role sports and sports organizations play in larger social processes and issues, issues of equity and equality, and the impact of media images.

The minor in Sports Communication consists of 18 credits, of which the majority of courses should be upper division COMM or JOUR courses. All courses taken for the minor must be completed with a grade of C- or better.

Prefix	Title	Credits
Minor in Sports Communication (18 credits)		
Required Courses (12 credits)		
JOUR 210	Copyediting	
JOUR 306	Sports Writing and Reporting	
or JOUR 310	Media Writing II	
COMM 4310	Sports Communication	
JOUR 460V	Sports & Entertainment P.R.	
Elective: Take one of the following (3 credits)		
COMM 3530	Conflict Management	
COMM 4230	Strategic Communication	
COMM 4520	Small Group Communication	
COMM 5230	Strategic Communication	
SOCI 3620V	Sports and Society: A Global Perspective	
SPMD 3250	Introduction to Exercise Science: Exercise Physiology and Biomechanics	
SPMD 3550	Psychology of Sport	
SPMD 4540	Psychology of Coaching in Sport	
Choose one of the following required Internship or Practicum experiences (3 credits):		
COMM 4998	Communication Internship	
FDMA 495	Internship	
JOUR 407	Media Internship	
JOUR 408	Media Practicum	
Total Credits		**18**

Suggested Plan of Study

It is only a suggested plan of study for students and is not intended to guarantee that courses will be offered during a specific spring or fall semester. Course availability may vary from fall to spring semester and may be subject to modification or change. It's best to take a course when offered or consult the Department that oversees the course scheduling.

First Year		
Fall		**Credits**
JOUR 210	Copyediting	0,3
	Credits	**0-3**
Spring		
JOUR 310	Media Writing II ((fall only))	3
or JOUR 306	or Sports Writing and Reporting	
JOUR 460V	Sports & Entertainment P.R.	3
	Credits	**6**
Second Year		
Fall		
JOUR 306	Sports Writing and Reporting	3
or JOUR 310	or Media Writing II	
Required Elective		3
	Credits	**6**
Spring		
COMM 4310	Sports Communication	3
or COMM 5310	or Sports Communication	
COMM 4998	Communication Internship	3
or COMM 5998	or Communication Internship for Graduate Students	
or FDMA 495	or Internship	
or JOUR 407	or Media Internship	
or JOUR 408	or Media Practicum	
	Credits	**6**
	Total Credits	**18-21**

Computer Science

Computer Science is the area of study that encompasses all of the theory and practice of computing. The mission of the Department of Computer Science at New Mexico State University is to provide formal education in the core disciplines of computer science, as well as to prepare our graduates for research, development and academic careers. For more information on the Department of Computer Science, please visit the web site https://computerscience.nmsu.edu.

Undergraduate Program Information

The undergraduate computer science programs prepare students for graduate study in computer science and for employment in positions involving the design, construction and application of computer systems. Undergraduate degree programs include a Bachelor of Science (**ABET accredited**), Bachelor of Arts, Bachelor of Science in Cybersecurity,

Bachelor of Science in Artificial Intelligence, four minor degree tracks, and seven concentrations. The B.S. degree is the traditional computer science degree program, while the B.A. degree offers a more open, flexible degree plan that is easier to combine with studies in other disciplines. The minors are for non-Computer Science majors and offer specialized tracks in algorithm theory, bioinformatics, computer systems and software development. The concentrations are for Computer Science majors and provide a focus on specialized areas such as algorithm theory, artificial intelligence, big data and data science, networking, cybersecurity, human computer interaction, and software development. With technology underpinning almost every area of human endeavor today, students across NMSU should consider pursuing a minor or at least taking some computer science courses. Computer science majors should review their programs of study in consultation with their advisors each semester, preferably using the most recent Undergraduate Catalog.

Master's Accelerated Program (MAP)

Undergraduate students interested in obtaining a Master of Science degree offered by the department can take advantage of the Master's Accelerated Program (MAP) which provides them with an opportunity to take up to 12 graduate credits during their undergraduate that can be applied toward their undergraduate and graduate degrees. This allows students enrolled in MAP to complete the MSc. degree in five years.

To be admitted, students must have at least a 3.3 GPA (some conditional admissions are given to students slightly below 3.3) and have completed at least two out of three required 300/3000-level courses. To get the full benefit of this program, students should apply as a junior, **before taking** any CSCI 400/4000-level electives.

Graduate Program Information

The department offers both Master of Science and Doctor of Philosophy graduate degrees in computer science, along with a Master of Science in Bioinformatics. The department also offers an online Professional Master of Data Analytics. We also encourage students in other disciplines to do a graduate minor in computer science. Detailed requirements for each program are provided in the corresponding degree program.

The department offers expertise in several research areas, such as: artificial intelligence and knowledge representation; computer and wireless networks; computer security and cryptography; data mining and machine learning; game design and human-computer interaction; bioinformatics; high performance computing; software engineering and programming languages; theory of computing; and assistive technologies.

A number of laboratories have been established to coordinate research activities, including

- the Cryptography, Privacy and Security Research (CrySPR) lab (Dr. Vishwanathan);
- the Knowledge representation, Logic and Advanced Programming (KLAP) lab (Dr. Pontelli and Dr. Tran);
- the Participatory Live Experiences (PLEX) lab (Dr. Hamilton);
- the Knowledge Discovery and Data Mining (KDD) lab (Dr. Cao);
- the Programming Languages, Environments, and Automated Software Engineering (PLEASE) lab (Dr. Cook);
- the Bioinformatics Research lab (Dr. Song);
- the Private Resilient and Secure Machinery (PRISM) Research lab (Dr. Panwar); and
- the Network and Systems Optimization Lab (NSOL) (Dr. Misra).

Department members are also directing the iCREDITS interdisciplinary Center of Research Excellence in Design of Intelligent Technologies for Smartgrids, offering educational and research opportunities in smartgrids.

Entrance Requirements for Graduate Study in Computer Science

The Graduate Record Exam (GRE) General Test is not required for admission; however, high GRE scores will strengthen a candidate's application and are highly regarded in the awarding of Graduate Assistantships. To be admitted without undergraduate deficiencies, an entering student must have completed undergraduate preparation substantially equivalent to that required for the Bachelor of Science degree in Computer Science at New Mexico State University; in particular, this includes courses equivalent to

Prefix	Title	Credits
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
CSCI 2310	Discrete Mathematics for Computer Science	4

Deficiencies should be satisfied as early in the student graduate program as possible, through the regular undergraduate courses, the CSCI 4545 Object Oriented Programming Transition- CSCI 4560 Discrete Math for Computer Science Transition transition courses, or through tests administered by faculty members in the relevant areas. Students should consult with their Graduate Advisor to address issues related to deficiencies. Deficiencies are also assigned to applicants whose transcripts denote low grades in selected areas. Admission is often denied to candidates with little background in Computer Science. Instructions for prospective applicants can be found at https://computerscience.nmsu.edu.

Admission to the doctoral program is selective and students are encouraged to contact and receive endorsement by a faculty in the department.

Entrance Requirements for Graduate Study in Bioinformatics

The Graduate Record Exam (GRE) General Test is not required for admission; however, high GRE scores will strengthen a candidate's application and are highly regarded in the awarding of Graduate Assistantships. Students wishing to enroll in the Master program in Bioinformatics must meet the following criteria:

1. Hold a BS degree, from an accredited institution of higher learning, in either a computational field (e.g., Computer Science) or in life sciences (preferably Biology, Biochemistry, or Environmental Sciences)
2. Hold a minimum grade point average of 3.2

Applicants will be expected to provide a Career statement, motivating the interest in bioinformatics and a minimum of three letters of reference.

Graduate Assistantships

Graduate assistantships (in the form of Teaching and Research assistantships) are expected to be available during the academic year. Inquiries should be addressed to the departmental Graduate Committee.

Research assistantships are available at the discretion of individual research project leaders in the Department or elsewhere on campus. Submitting detailed vitae, letters of reference, and GRE test scores are encouraged when applying for any assistantship.

Degrees for the Department

Bachelor Degree(s) & Dual Degree(s)

- Artificial Intelligence - Bachelor of Science (p. 640)
- Computer Science (Algorithm Theory) - Bachelor of Science (p. 647)
- Computer Science (Artificial Intelligence) - Bachelor of Science (p. 650)
- Computer Science (Big Data and Data Science) - Bachelor of Science (p. 652)
- Computer Science (Computer Networking) - Bachelor of Science (p. 655)
- Computer Science (Cybersecurity) - Bachelor of Science (p. 657)
- Computer Science (Human Computer Interaction) - Bachelor of Science (p. 660)
- Computer Science (Secondary Education) - Bachelor of Arts (p. 662)
- Computer Science (Software Development) - Bachelor of Science (p. 665)
- Computer Science - Bachelor of Arts (p. 642)
- Computer Science - Bachelor of Science (p. 644)
- Cybersecurity - Bachelor of Science (p. 667)

Master Degree(s)

- Bioinformatics - Master of Science (p. 112)
- Computer Science - Master of Science (p. 137)
- Computer Science - Master of Science (Online) (https://catalogs.nmsu.edu/global/nmsu-global/computer-science-master-science-online/)
- Data Analytics (Digital Agriculture) - Master of Data Analytics (Online) (https://catalogs.nmsu.edu/global/nmsu-global/data-analytics-digital-agriculture-mda-online/)
- Data Analytics - Master of Data Analytics (p. 143)
- Data Analytics - Master of Data Analytics (Online) (https://catalogs.nmsu.edu/global/nmsu-global/data-analytics-mda-online/)

Doctoral Degree(s)

- Computer Science - Doctor of Philosophy (p. 210)

Minors for the Department

Computer Science undergraduate and graduate minors are for non-Computer Science majors only. A student cannot earn more than one of the undergraduate minors unless they pass at least 6 credits in the second minor beyond the requirements of the first minor. The maximum number of undergraduate minors that a student may earn is two. Most courses for the minors listed below have prerequisites. Please check the undergraduate catalog for individual course prerequisites. Students interested in pursuing a computer science minor are encouraged to pick up more information at the departmental office.

- Algorithm Theory - Undergraduate Minor (p. 669)
- Bioinformatics (with Computer Science) - Graduate Minor (p. 254)
- Bioinformatics - Undergraduate Minor (p. 669)
- Computer Science - Graduate Minor (p. 255)
- Computer Systems - Undergraduate Minor (p. 669)
- Software Development - Undergraduate Minor (p. 670)

Faculty

Professor Son Tran, Department Head

Professor Huiping Cao, Associate Department Head

Professors Cao, Cook, Misra, Pontelli, Song, Tran;

Associate Professors Pivkina, Vishwanathan;

Assistant Professors Darian, Gaurav, Hamilton, Le, Lopez, Lopez-Morales, Naveed Ul Mustafa, Wayllace;

Affiliated NMSU Global Professors Nogueira

- *H. Cao,* Associate Department Head*, Ph.D. (Hong-Kong) – data mining, databases, data integration, applied machine learning;*
- *J. Cook, Ph.D. (Colorado) – software engineering, high performance computing;*
- *S. Darian, Ph.D. (CU Boulder) – human computer interaction, online communities, media design, citizen data science, digital activism ;*
- *G. Panwar, Ph.D. (New Mexico State) – security and privacy in distributed systems, edge computing systems, and smart grids; applied cryptography; and machine learning privacy and security;*
- *W. Hamilton, Ph.D. (Texas A&M) – media design, online communities, online education, and video game design/culture*;
- *T. Le, Ph.D. (Singapore Management University, Singapore) – data mining and machine learning, dimensionality reduction, visualization, topic models, embedding and generative models;*
- *P. Lopez, Ph.D. (New Mexico State) – computer science education, grading for equity, image processing, e-textiles;*
- *S. Misra, Ph.D. (Arizona State) – communication networks, social networks, high performance computing, security and privacy;*
- *E. Lopez-Morales, Ph.D. (Texas A&M University at Corpus Christi) – computer security, cyber-physical systems security, satellite security, industrial control systems security, cyber deception;*
- *Naveed Ul Mustafa, Ph.D. (Bilkent University, Ankara, Turkey) – computer architecture, hardware security, persistent memory, trusted execution environment;*
- *I. Pivkina, Ph.D. (Kentucky) – artificial intelligence, computer science education, data mining;*
- *E. Pontelli, Ph.D. (New Mexico State) – parallel processing, logic programming, knowledge representation, bioinformatics, assistive technologies;*
- *M. Song, Ph.D. (Washington) – statistical computing, systems biology, bioinformatics, computer vision;*
- *S. Tran,* Department Head, *Ph.D. (Texas-El Paso) – knowledge representation, planning, logic programming, non-monotonic reasoning, multi-agent systems;*
- *R. Vishwanathan, Ph.D. (North Texas) – cryptography, theoretical and applied, security, privacy;*
- *C. Wayllace, Ph.D. (Washington at St. Louis) – Human-aware AI, human-AI interaction, intelligent tutoring systems, goal recognition, and reinforcement learning;*

College Faculty

- *Mai Abo Shakra, MSc. in Computer Science (New Mexico State)*

Affiliated NMSU Global Professors

- *M. Nogueira, Ph.D. (University of Texas at El Paso) – knowledge representation and reasoning, machine learning, smart manufacturing;*

Computer Science Courses

CSCI 1110. Computer Science Principles
4 Credits (3+2P)
This course provides a broad and exciting introduction to the field of computer science and the impact that computation has today on every aspect of life. It focuses on exploring computing as a creative activity and investigates the key foundations of computing: abstraction, data, algorithms, and programming. It looks into how connectivity and the Internet have revolutionized computing and demonstrates the global impact that computing has achieved, and it reveals how a new student in computer science might become part of the computing future.
Prerequisite: MATH 1215 or higher.
Learning Outcomes
1. Identify and differentiate programming constructs like IF, FOR, and WHILE.
2. Convert numbers between Hexadecimal, Binary and Decimal.
3. Write pseudo code to manipulate a robot.
4. Use an ASCII table to translate HEX strings into characters.
5. Encrypt and Decrypt simple messages with a Caeser Cypher.

CSCI 1115G. Modern Computing in Practice
4 Credits (3+2P)
This course provides a survey of practical and theoretical foundations for how computers work and how they support fundamental organizational needs. The course covers broad aspects of the hardware, software, and mathematical basis of computers. Lab assignments provide hands-on applications to use simple basic software tools to write simple programs, build and edit websites, analyze data with spreadsheets, choose an office productivity suite, and demonstrate computer literacy to potential employers. May be repeated up to 4 credits.
Prerequisite: MATH 1130G or MATH 1215 or higher.
Learning Outcomes
1. Students will create simple python programs using conditional statements and loops.
2. Students will analyze data with spreadsheet formulas, charts, and tools.
3. Students will create and publish a personal website using website building tools.
4. Students will edit HTML and CSS to format a website manually.
5. Students will practice the skill of performing software QA and providing actionable feedback to developers.
6. Students will become aware of common cybersecurity risks.
7. Students will learn basic vocabulary and context for broad aspects of hardware, software, and computer science theory such as Security, Privacy, Cloud Computing, the Internet, the Web, Operating Systems, Discrete Math, and Information Systems.
8. Students will be exposed to various sub-fields of CS including artificial intelligence, security, data analytics, UX, web development, and QA testing.
9. Students will reason about the societal impacts of technology. 1
10. Students will incorporate their new knowledge and skills into their resume.

CSCI 1120. Introduction to Computer Animation
3 Credits (3)
Introductory course for learning to program with computer animation as well as learning basic concepts in computer science. Students create interactive animation projects such as computer games and learn to use software packages for creating animations in small virtual worlds using 3D models. Recommended for students considering a minor/major in computer science or simply interested in beginning computer animation or programming.

CSCI 1210. Computer Programming Fundamentals
3 Credits (2+2P)
This course is an introduction to problem-solving methods and algorithm development. Students will learn how to design, code, debug, and document programs. Students will explore basic programming concepts including variables, data types, operators and expressions. Students will learn about input/output mechanisms, including command prompt interaction, and reading and writing data to files. Students will be introduced to control structures such as branching, conditionals, iteration, and loops and arrays. They will also learn how to define and use functions/methods to structure code and improve code reuse. May be repeated up to 3 credits.
Prerequisite(s): MATH 1215 or higher.
Learning Outcomes
1. Demonstrate an understanding of procedural programming techniques by implementing programs which employ structured programming techniques.
2. Implement control flow structures in programs to execute statements in a specified order, repeat sequences of statements, and execute different statements based on conditions.
3. Apply modularization principles by defining and using functions/methods to structure code and improve code reuse and maintainability.
4. Write code utilizing data structures such as arrays, simple classes and objects, to provide useful access to, and operations on, data.
5. Input/output mechanisms to collect user input and display data, including implementing error handling mechanisms to handle invalid input and output operations. the concept of recursion and identify base case and inductive step.

CSCI 1220. Computer Programming Fundamentals: Python
3 Credits (3)
This course is an introduction to fundamental programming concepts, with a focus on problem-solving techniques and algorithm development using the Python programming language. Students will learn how to create basic scripts, work with data types and variables, use control structures, and build functions. The course is designed for students with little or no prior experience in programming and is intended to provide a foundation in programming that can be applied in a variety of fields.
Prerequisite: MATH 1215 or higher.
Learning Outcomes
1. Apply programming concepts to design and develop solutions for computational problems.
2. Utilize optimal flow-control strategy for solving a given problem.
3. Design and implement functions to support organization, decomposition and reusability of code.
4. Evaluate and select data structures to efficiently organize and store information for a given problem.
5. Demonstrate the concept of scope to control access to global, local, and class variables.

6. Create and use a simple class to demonstrate object-oriented programming principles.
7. Utilize basic file input/output with text-based files.

CSCI 1225. Python Programming II
3 Credits (3)
This course covers advanced Python programming, including classes, objects, and inheritance, embedded programming in domain applications, database interaction, and advanced data and text processing. The focus will be on preparing students to use Python in their own areas.
Prerequisite(s): CSCI 1220 or CSCI 4520.

CSCI 1235. R Programming I
3 Credits (3)
This course is an introduction to data processing in the R language, covering fundamental script configuration, data types and data collections, R control structures, and basic creation of graphs and data visualizations. This course will not focus on the statistical capabilities of R, though some basic statistical computations will be used.
Prerequisite(s): MATH 1220G.
Learning Outcomes
1. Show proficiency in installing R, navigating the RStudio interface, setting work directories, executing scripts, and using built-in R functions for data analysis.
2. Create and implement custom R functions to streamline and automate data processing.
3. Demonstrate the ability to create, manipulate, and use various R data structures including vectors, matrices, arrays, data frames, lists, and factors for effective data operations.
4. Acquire skills to import and export data in various formats including CSV and RData, and install and use essential R packages for data analysis.
5. Utilize R's control flow constructs like conditional statements and loops to write robust R scripts for data analysis.
6. Use apply family functions, such as apply(), sapply(), lapply(), and tapply(), to enhance data manipulation and analysis, particularly when dealing with missing values.
7. Generate, customize, and save various types of plots including scatter plots, bar charts, pie charts, histograms, and box plots for data visualization.
8. Apply exploratory data analysis techniques, including measuring central tendency, dispersion, and constructing five-number summaries, to analyze data distributions.
9. Manipulate string data using R functions and regular expressions to prepare text for analysis.

CSCI 1240. C++ Programming I
3 Credits (2+2P)
This course is an introduction to problem-solving methods and algorithm development using C++. Students will learn how to design, code, debug, and document programs. Students will explore basic programming concepts including variables, data types, operators and expressions. They will also learn how to work with the C++ preprocessor directives and libraries. Students will learn about input/output mechanisms, including command prompt interaction, reading and writing data to files. Students will be introduced to control structures such as branching, conditionals, iteration, and loops and arrays. They will also learn how to define and use functions to structure code and improve code reuse.
Prerequisite: MATH 1215 or higher.
Learning Outcomes
1. Implement programs which employ structured programming techniques.
2. Implement control flow structures.
3. Apply modularization principles by defining and using functions/methods to structure code and improve code reuse and maintainability.
4. Write code utilizing data structures such as arrays, using pointers, and simple classes to provide useful access to, and operations on, data.
5. Use input/output mechanisms to collect user input and display data, including implementing error handling mechanisms to handle invalid input and output operations.

CSCI 1720. Computer Science I
4 Credits (3+2P)
Computational problem solving; problem analysis; implementation of algorithms using Java. Object-oriented concepts, arrays, searching, sorting, and recursion.
Prerequisite: (A C- or better in either MATH 1220 or higher) OR (Math placement into MATH 1250 or higher) OR (A C- or better in CSCI 1110).
Learning Outcomes
1. Develop algorithms to solve problems.
2. Implement algorithms using the fundamental programming features of sequence, selection, iteration, and recursion.
3. Apply an understanding of primitive and object data types.
4. Design and implement classes based on given attributes and behaviors.
5. Explain the fundamental concepts of object-oriented programming.

CSCI 2210. Object-Oriented Programming
4 Credits (3+2P)
This course is an introduction to object-oriented programming. Including: Classes and objects, and associated topics such as constructors, properties, and methods, inheritance, polymorphism, encapsulation, abstraction, exception handling and best practices. May be repeated up to 4 credits.
Prerequisite: At least a C- in CSCI 1720 or ENGR 140.
Learning Outcomes
1. Implement object-oriented designs based on project requirements.
2. Use encapsulation to write programs that are loosely coupled and easy to debug, maintain and modify.
3. Use inheritance to define simple class hierarchies that allow code to be reused by distinct subclasses.
4. Implement and reason about control flow in a program using polymorphism to solve common programming problems.

CSCI 2220. Introduction to Data Structures and Algorithms
4 Credits (3+2P)
Design, implement, and use fundamental abstract data types including linked lists, stacks, queues, and trees. Analyze the time and space complexity of algorithms, such as sorting.
Prerequisite: At least a C- in CSCI 1720, or placement.
Learning Outcomes
1. Implement basic data structures such as linked lists, stacks, queues, and trees in a high-level programming language.
2. Compare alternative implementations of data structures with respect to time and space complexity.

3. Explain the advantages and disadvantages of a variety of sorting algorithms.

CSCI 2230. Assembly Language and Machine Organization
4 Credits (3+2P)
Computer structure and system organization, instruction execution, memory addressing modes, hardware/software interface. Programming in assembly language.
Prerequisite: At least a C- in CSCI 1720 or ENGR 140.
Learning Outcomes
1. Describe the architecture of a microcontroller, the interconnections between the components, and the major units inside the CPU.
2. Use signed and unsigned numbers, bitwise operations, branching instructions, and the corresponding flags in the status register.
3. Use immediate, direct, indirect addressing modes in assembly instructions.
4. Map high-level programming language features to assembly instructions, such as loops, conditionals, procedure calls, value and reference parameter passing, return values, and recursion.
5. Interface with input/output devices via instructions, memory addressing, or interrupts.
6. Design and implement an assembly language program.

CSCI 2310. Discrete Mathematics for Computer Science
4 Credits (3+2P)
Discrete mathematics required for Computer Science, including the basics of logic, number theory, methods of proof, sequences, mathematical induction, set theory, counting, and functions. Taught with CSCI 4560.
Prerequisite: At least C- in CSCI 1720.
Learning Outcomes
1. Use logic to specify precise meaning of statements, demonstrate the equivalence of statements, and test the validity of arguments.
2. Construct and recognize valid proofs using different techniques including the principle of mathematical induction.
3. Use summations, formulas for the sum of arithmetic and geometric sequences.
4. Explain and apply the concepts of sets and functions.
5. Apply counting principles to determine the number of various combinatorial configurations.

CSCI 2410. Practical Programming
2 Credits (1+1P)
A hands-on dive into practical programming skills development. Students will practice skills such as implementing algorithms that manipulate data in arrays and other data structures, implementing and using hashing-based data collections, using I/O in programs to access and create data, and object-oriented programming. Students will also focus on honing their use of tools such as command line, integrated development environments, debuggers, and profilers for software development. May be repeated up to 2 credits.
Learning Outcomes
1. Perform simple manipulation of arrays and other basic data structures.
2. Better utilize objects and object oriented programming.
3. Utilize different tools for building, debugging, and improving their programs.
4. Will be able to learn and use a new programming language quickly.
5. Use basic I/O capabilities in a variety of languages.
6. Use documentation to learn important features of a programming languages.
7. Write programs that solve interview-like problems.

CSCI 2996. Special Topics
1-3 Credits (1-3)
Varies.
Learning Outcomes
1. Varies.

CSCI 3410. Introduction to Intelligent Agents Using Science Fiction
3 Credits (3)
This course uses science-fiction movies to introduce fundamental principles and techniques in agents and multi-agent systems. It is a gentle introduction to decision theory, machine learning, multi-agent systems, and ethics in agent-based systems.
Learning Outcomes
1. Use decision-theoretic models and algorithms to represent and solve simple planning and reasoning problems under uncertainty.
2. Use Markov Decision Processes to model and solve planning and reinforcement learning problems.
3. Use game-theoretic models and algorithms to represent and solve simple game- theoretic problems.
4. Understand the tradeoffs between the different agent models.
5. Understand the challenges for ensuring that AI agents are safe as they play an increasingly large role in modern society.

CSCI 3710. Software Development
4 Credits (3+2P)
Software specification, design, testing, maintenance, documentation; informal proof methods; team implementation of a large project. Taught with CSCI 4575.
Prerequisite: At least a C- in CSCI 2210 and CSCI 2220.
Learning Outcomes
1. Understand and explain the activities and structure of different styles of software development processes, including waterfall, (spiral,) iterative, and agile methodologies.
2. Apply requirements knowledge and techniques to create functional and non-functional requirements for a software system.
3. Apply high and low level design ideas to create an object-oriented design of a software system.
4. Use good design and programming ideas to implement individual and team software systems in compiled OOP languages.
5. Apply white and black box testing techniques and tools to individual and team software development.
6. Use UML class diagrams (and sequence diagrams) to capture aspects of system design and/or requirements (domain).
7. Use practical software development tools, including version control systems, automated build tools, and testing tools.

CSCI 3720. Data Structures and Algorithms
4 Credits (3+2P)
Introduction to efficient data structure and algorithm design. Order notation and asymptotic run-time of algorithms. Recurrence relations and solutions. Abstract data type dynamic set and data structures based on trees. Classic algorithm design paradigms: divide-and-conquer, dynamic programming, greedy algorithms. Taught with CSCI 5110.
Prerequisite: At least a C- in CSCI 2220 and CSCI 2310.

Learning Outcomes

1. Analyze the growth of functions via asymptotic notation.
2. Evaluate the asymptotic running time of a given algorithm.
3. Solve recurrence relations of the kinds encountered in algorithm analysis.
4. Design algorithms using the divide-and-conquer technique.
5. Design algorithms using the greedy technique.
6. Design algorithms using the dynamic-programming technique.
7. Use and analyze data structures based on trees.
8. Analyze the design, correctness, and time complexity of basic graph algorithms.

CSCI 3730. Compilers and Automata Theory
4 Credits (3+2P)
Methods, principles, and tools for programming language processor design; basics of formal language theory (finite automata, regular expressions, context-free grammars); development of compiler components. Taught with CSCI 4580.
Prerequisite: At least a C- in CSCI 2210, CSCI 2220, and CSCI 2230.
Learning Outcomes

1. Understand the language theory concepts of regular languages, context free languages, regular expressions, context free grammars, and formal language hierarchy.
2. Use Thompson's construction to convert from regular expression to NFA, and subset construction to convert from NFA to DFA.
3. Apply recursive descent parsing in programming a parser of a small grammar.
4. Understand the ideas in LL and LR parsing of context-free language classes.
5. Understand and use table-driven top-down (LL(1)) and bottom up (SLR) parsing to parse a sentence.

CSCI 3790. Algorithm Design & Implementation
3 Credits (3)
Introduction to efficient data structure and algorithm design. Basic graph algorithms. Balanced search trees. Classic algorithm design paradigms: divide-and-conquer, greedy scheme, and dynamic programming. Taught with CSCI 4590.
Prerequisite: At least a C- in CSCI 2220, or consent of instructor.

CSCI 3997. Independent Study
1-6 Credits (1-6)
Faculty supervised investigation, to culminate in a written report. May be repeated up to 6 credits.
Learning Outcomes

1. Varies.

CSCI 4105. Programming Language Structure I
3 Credits (3)
Syntax, semantics, implementation, and application of programming languages; abstract data types; concurrency. Not for Computer Science graduate students.
Prerequisite: At least a C- in CSCI 3730 and CSCI 3710.
Learning Outcomes

1. Analyze the strengths and weaknesses of various programming languages for solving specific classes of problems.
2. Develop strategies to efficiently learn and adapt to new programming languages.
3. Evaluate and justify the choice of programming paradigms and languages for new and unfamiliar problems.
4. Identify and explain the primary components of a running program.
5. Implement programs using the principles of functional programming.
6. Implement programs using the principles of logic programming.
7. Design and implement simple parallel programs using threads.
8. Write programs in at least five different programming languages, demonstrating proficiency in syntax and idiomatic usage.
9. Write and analyze C programs to demonstrate an understanding of low-level architecture details.

CSCI 4110. Computing Ethics and Social Implications of Computing
1 Credit (1)
An overview of ethics for computing majors includes: history of computing, intellectual property, privacy, ethical frameworks, professional ethical responsibilities, and risks of computer-based systems.
Prerequisite: At least a C- in CSCI 3710.
Learning Outcomes

1. Understand the fundamental technologies and operation of the web.
2. Design and develop responsive interactive web sites.
3. Deploy web applications on Cloud Computing Platforms.
4. Leverage modern tools and packages to develop full stack web applications.
5. Be fluent in the application of emerging web technologies like browser extensions, WebSockets, and WebRTC.
6. Use existing materials and references on the web to learn new skills.

CSCI 4120. Operating Systems I
3 Credits (3)
Operating system principles and structures, and interactions with architectures. Not for Computer Science graduate students.
Prerequisite: At least a C- in CSCI 2230 and CSCI 3710.
Learning Outcomes

1. Explain OS control and management of hardware resources.
2. Explain OS management and execution of processes.
3. Explain OS control and management of real and virtual memory.
4. Explain classical concurrency issues and their solutions.
5. Analyze and implement threads.
6. Analyze OS interaction with networks and architecture.

CSCI 4130. Linux System Administration
3 Credits (3)
Basic system administration for Linux environments. Topics include user managements, file systems, security, backups, system monitoring, kernel configuration and other relevant aspects of system administration. Not for Computer Science graduate students.
Learning Outcomes

1. Understand the history and basic concepts of Linux and explain the differences between Linux distributions.
2. Demonstrate the installation of a Linux VM, use of basic Linux commands, and navigate the Linux file system.
3. Understand the basics of shell environments and types and write basic shell scripts to automate tasks.
4. Understand Linux file system security, user and group management, file system hierarchy and disk management.
5. Install, update, remove, and configure software, firewalls, and network settings, in Linux.
6. Monitor system performance and, analyze and troubleshoot system logs.
7. Understand device and configuration management automation.

CSCI 4140. Database Management Systems I
3 Credits (3)
Database design and implementation; models of database management systems; privacy, security, protection, recovery. Not for Computer Science graduate students. Taught with CSCI 5140.
Prerequisite: At least a C- in CSCI 2220 and CSCI 2310.
Learning Outcomes
1. Utilize the basic concepts of relational database model.
2. Utilize database query languages (e.g. SQL).
3. Identify data integrity and security requirements.
4. Analyze, capture, and model user requirements for building database systems using conceptual models.
5. Design and normalize relational schemas.
6. Apply application development methods to implement a database system.

CSCI 4205. Computer Security
3 Credits (3)
Introduction to the art and science of computer security. Fundamentals of computer security including elementary cryptography, authentication and access control, security threats, attacks, detection and prevention in application software, operating systems, networks and databases. Not for Computer Science graduate students. Taught with CSCI 5205.
Prerequisite: At least a C- in CSCI 2220, CSCI 2230 or consent of instructor.
Learning Outcomes
1. Describe fundamental concepts in security and privacy.
2. Understand requirements of security in different contexts.
3. Describe practical implementation challenges in security/privacy system design.
4. Explain at a high-level symmetric and public key cryptography.
5. Explain various access control mechanisms such as authentication, authorization.
6. Understand aspects of secure system design that a computer programmer/engineer needs to account for.

CSCI 4206. Hardware Security
3 Credits (3)
Hardware security covers the intersection of hardware and security attacks/defenses. Students will study a variety of approaches to hardware security in this course, e.g., micro-architectural side channels, cache side-channel attacks, memory attacks, speculative-based attacks, etc. Students will also learn about the various computer architectural components that can be exploited for launching security attacks. Taught with CSCI 5206. Preferable to have knowledge of CSCI 4230 (Architectural Concepts I).
Prerequisite: At least a C- in CSCI 2230.
Learning Outcomes
1. Understand how computer architectural components can be exploited for launching security attacks.
2. Build an insight of developing defense mechanism again hardware-based security attacks.
3. Explain micro-architectural side channels.
4. Understand cache side channel attacks.
5. Demonstrate knowledge of memory attacks.
6. Explain Speculative execution based attacks.
7. Understand Rowhammer.
8. Explain trusted execution environment as a security mechanism.

CSCI 4210. Introduction to Smart Grids
3 Credits (3)
This course is an introduction to the technologies and design strategies associated with the Smart Grid. The emphasis will be on the development of communications, energy delivery, coordination mechanisms, and management tools to monitor transmission and distribution networks. Topics include: Smart grid introduction and evolution; Power systems; Networking and transport control; Artificial intelligence & agent coordination; Data mining for smart grids. Taught with CSCI 5210.
Prerequisite: At least a C- in CSCI 2220 and a C- in ENGR 230; or Consent of instructor.
Learning Outcomes
1. Get basic understanding of how conventional power system is operated and protected.
2. Understand and use basic knowledge of communication techniques in smart grids.
3. Understand and use basic knowledge for the coordination of the different units in smart grids.
4. Understand and apply data mining techniques for protecting smart grids.

CSCI 4215. Parallel Programming
3 Credits (3)
Programming of shared memory and distributed memory machines; tools and languages for parallel programming; techniques for parallel programming; parallel programming environments. Not for Computer Science graduate students. Taught with CSCI 5215.
Prerequisite: At least a C- in CSCI 3730 or consent of instructor.
Learning Outcomes
1. Describe existing parallel architectures including shared memory versus distributed memory platforms.
2. Apply basic techniques for organizing parallel computations.
3. Apply basic techniques for performance measurement and theoretical limitations of parallelism.
4. Explain alternative parallel techniques and hardware.
5. Perform performance Analysis of different parallel programming techniques.
6. Program shared memory machines using threads, processes, and the OpenMP library.
7. Program using a message passing paradigm and obtain working knowledge of the Message Passing Interface (MPI).

CSCI 4220. Cloud and Edge Computing
3 Credits (3)
The course presents a top-down view of cloud computing, from applications and administration to programming and infrastructure. Its main focus is on the concepts of networking and parallel programming for cloud computing and large scale distributed systems which form the cloud infrastructure. The topics include: overview of cloud computing, cloud systems, parallel processing in the cloud, distributed storage systems, virtualization, security in the cloud, and multicore operating systems. Students will study state-of-the-art approaches to cloud computing followed by large cloud corporations, namely Google, Amazon, Microsoft, and Yahoo. Students will also apply what they learn through project developments using Amazon Web Services. Not for graduate Computer Science majors. Taught with: CSCI 5220.
Prerequisite: Background in CSCI 4245/CSCI 5245 is preferred or consent of instructor.

Learning Outcomes

1. Explain the role of cloud computing and IoT.
2. Explain security techniques in cloud and IoT networks.
3. Summarize the features and associated risks of different service models.
4. Design a model or prototype as a solution of the identified problem.
5. Understand the differences between various infrastructure deployment models such as on-prem, hybrid, public, and private.

CSCI 4225. Introduction to Cryptography
3 Credits (3)
The course covers basic cryptographic primitives, such as symmetric, public-key ciphers, digital signature schemes, and hash functions, and their mathematical underpinnings. Course helps students understand basic notions of security in a cryptographic sense: chosen plaintext and chosen ciphertext attacks, games, and reductions. Course also covers computational number theory relevant to cryptography. Consent of Instructor required. Taught with: CSCI 5225.
Prerequisite: CSCI 2310 (or equivalent) with a C or better.
Learning Outcomes

1. Describe basic cryptographic primitives, including symmetric ciphers, asymmetric ciphers, digital signatures, message authentication codes, and hash functions.
2. Understand the mathematical, fundamental underpinnings of cryptography, and how to reason about the security of crypto primitives: indistinguishability (IND) properties of ciphertexts, CPA/CCA games, and reductions to fundamental math assumptions.
3. Be able to discuss number theory/algebra underpinning the design of cryptographic primitives, in some depth.

CSCI 4230. Architectural Concepts I
3 Credits (3)
Comparison of architectures to illustrate concepts of computer organization; relationships between architectural and software features. Not for Computer Science graduate students.
Prerequisite: At least a C- in CSCI 2230 and CSCI 3730.
Learning Outcomes

1. Explain the concepts in instruction set architecture.
2. Analyze the behavior of pipelined CPU data path and control.
3. Analyze behavior and performance of memory hierarchies with different cache designs.
4. Describe the implementation of binary integer and floating point representation and arithmetic.
5. Identify and analyze performance of instruction level parallelism and multi-core parallelism.
6. Describe virtual memory and architectural support for operating systems.
7. Understand the organization of various kinds of secondary storage devices, and their performance and tradeoffs.
8. Create software that demonstrates performance of architectural features and evaluate the effects of software change.

CSCI 4235. Cellular Networks and Mobile Computing
3 Credits (3)
This course will offer a solid introduction to major global wireless standards and comparisons of the different wireless technologies and their applications and examine each technology and how to utilize several different systems for the best results. A basic understanding of Computer Networks is preferable as a course prerequisite.

Learning Outcomes

1. Understand user associations and routing in a cellular/mobile network.
2. Develop insight into interaction of elements within the cellular/mobile core.
3. Understand the concept of end-to-end delivery of a packet and/or signal.
4. Develop an understanding of what happens with the hand-off at each step along the communications path.
5. Be able to explain differences in core architecture between different generations of cellular and mobile network technologies.

CSCI 4240. Software Reverse Engineering
3 Credits (3)
This class provides students with fundamental experience in software reverse engineering with a focus on malware reverse engineering. Students will learn operational security for safely analyzing untrusted code in a sandbox environment. Students will learn control flow integrity attacks, binary control flow analysis, and how to analyze live program behavior. Taught together with CSCI 5240.
Learning Outcomes

1. Students will learn how malware behaves, spreads, and is controlled.
2. Students will learn how to safely analyze malware in controlled environments.
3. Students will learn how malware seeks to hide in systems.
4. Students will learn to perform static analysis of binaries using simple tools.
5. Students will learn how malware obfuscates itself to avoid analysis, including using crypto packers, polymorphism, and sandbox detection.
6. Students will learn to perform decompilation and control-flow analysis of binaries using Ghidra.
7. Students will learn to dynamically analyze malware in a sandbox environment while observing network traffic, resource consumption, and system calls.
8. Students will learn to detect malware running with operating-system level permissions (rootkits).
9. Students will learn memory forensics techniques to detect malware hidden within benign processes.

CSCI 4245. Computer Networks I
3 Credits (3)
Fundamental concepts of computer communication networks: layered network architecture, network components, protocol stack and service. Example of application, transport, network and data link layers, protocols primarily drawn from the Internet (TCP, UDP, and IP) protocol multimedia networks; network management and security. Not for Computer Science graduate students. Taught with CSCI 5245.
Prerequisite: At least a C- in CSCI 2220 and CSCI 2230.
Learning Outcomes

1. Explain the layered model of networking using the OSI and TCP/IP models.
2. Explain TCP and UDP as particular transport layer protocols.
3. Explain and analyze routing and forwarding mechanisms.
4. Implement application layer protocols.
5. Explain other network issues such as multicasting, audio/video data streaming, and Domain Name System.

CSCI 4250. Human-Centered Computing
3 Credits (3)
Covers iterative, human-centered interface design, including prototyping and evaluation. Basics of graphic design and visualization. Not for Computer Science graduate students. Taught with CSCI 5250.
Prerequisite: At least C- in CSCI 3710.
Learning Outcomes
1. Describe, analyze, and/or critique a device interface using a design vocabulary.
2. Enact a human-centered process of interaction design: gather data; develop a data-driven design; iterate design through testing; and evaluate results.
3. Conduct human-computer interaction research by proposing, developing, and conducting experiments; analyzing data; and developing synthesized results.
4. Communicate design and evaluation with presentations, demos, and reports.
5. Implement a variety of interaction techniques.

CSCI 4255. Digital Game Design
3 Credits (3)
An introduction to digital game design. Topics include design, development, and playtesting of games. The course is structured to use team-based learning. Not for Computer Science graduate students. Taught with CSCI 5255.
Prerequisite/Corequisite: CSCI 3710.
Learning Outcomes
1. Describe, analyze, and/or critique games with a consistent vocabulary.
2. Design, develop, and playtest games.
3. Understand the formal systems of games.
4. Communicate game designs through demonstrations and presentations.

CSCI 4260. Visual Programming
3 Credits (3)
Design and implementation of programs using visual (i.e. dataflow or diagrammatic) programming techniques, with an emphasis on real-time data processing. Students will learn how to design visual programs, including how to handle cycles and state maintenance, and will learn to process audio, video, and other data using visual programs. Not for Computer Science graduate students. Taught with CSCI 5260.
Prerequisite: At least a C- in CSCI 2220 and CSCI 2310.
Learning Outcomes
1. Develop software in graph-based visual environments.
2. Understand flows of control in visual programming environments.
3. Use signals, digital and analog, to drive software.
4. Communicate software design and evaluation with presentations, demos, and reports.

CSCI 4265. Modern Web Technologies
3 Credits (3)
In this course, we will take a full-stack approach to modern web application design. We will start with the fundamentals including HTML5, CSS3, Javascript, JSON, and the underlying networking concepts and protocols driving the modern web. We will then move on to more advanced topics including javascript backend development with Node.js, NoSQL database design with MongoDB, cloud computing, and re- sponsive web design. Finally, we cover advanced topics including the design and im- plementation of browser extensions and real-time web technologies like WebRTC and WebSockets. Consent of Instructor required. Taught with: CSCI 5265.
Learning Outcomes
1. Understand the fundamental technologies and operation of the web.
2. Design and develop responsive interactive web sites.
3. Deploy web applications on Cloud Computing Platforms.
4. Leverage modern tools and packages to develop full stack web applications.
5. Be fluent in the application of emerging web technologies like browser extensions, WebSockets, and WebRTC.
6. Use existing materials and references on the web to learn new skills.

CSCI 4270. Principles of Virtual Reality
3 Credits (3)
This course is an introduction to building systems and doing research in / on virtual reality. We cover system design, development, and evaluation, with an emphasis on recent research in the space. We cover a range of methods, qualitative and quantitative, in order to develop insights into effective VR designs. Students in this class will develop a foundation in VR development; learn about current topics in VR; and design, develop, evaluate, and report on a VR system.
Prerequisite: CSCI 4250.
Learning Outcomes
1. Design and develop systems in virtual reality.
2. Understand the variety of development techniques in VR.
3. Understand the state-of-the-art in VR systems.
4. Communicate understanding of people, designs, and evaluations through presentations, demos, and/or reports.

CSCI 4305. Bioinformatics
3 Credits (3)
Introduction to bioinformatics and computational biology. Computational approaches to sequences analysis, protein structure prediction and analysis, and selected topics from current advances in bioinformatics. Not for Computer Science graduate students. Taught with CSCS 5305.
Prerequisite: At least a C- in CSCI 2220 and CSCI 2310.
Learning Outcomes
1. Explain the biology motivation of a bioinformatics question.
2. Formulate a computational problem and its solution to address a molecular biology question.
3. Implement basic bioinformatics algorithms such as sequence alignment, pattern matching, and genome assembly.
4. Evaluate the performance of a bioinformatics algorithm on real data sets.
5. Argue the correctness of a bioinformatics algorithm.
6. Analyze the complexity of a bioinformatics algorithm.

CSCI 4310. Bioinformatics Programming
3 Credits (3)
Computer programming to analyze high-throughput molecular biology data including genomic sequences, bulk and single-cell transcriptome, epigenome, and other omics data. Quality control, library size normalization, confounding effect removal, clustering, statistical modeling, trajectory inference, and visualization. Taught with CSCI 5310.
Learning Outcomes
1. Write R scripts and functions to manipulate biological sequences, genome annotation, and gene expression data.
2. Perform high-throughput data analysis with established R packages.
3. Detect differential gene expression on RNA sequencing data.

4. Perform single-cell RNA sequencing data analysis (quality control, library size normalization, confounding effect removal, modeling).
5. Assess statistical significance of analytical results.
6. Create automatic data analysis pipeline to link multiple software packages.

CSCI 4405. Artificial Intelligence I
3 Credits (3)
Fundamental principles and techniques in artificial intelligence systems. Intelligent Agents; solving problems by searching; local search techniques; game-playing agents; constraint satisfaction problems; knowledge representation and reasoning. Further selected topics may also be covered. Not for Computer Science graduate students. Taught with CSCI 5405.
Prerequisites: At least a C- in CSCI 2220 and CSCI 2310.
Learning Outcomes
1. Use various search algorithms commonly used in problem-solving.
2. Use various methods for solving constraint satisfaction problems.
3. Use propositional and first-order logic to represent knowledge.
4. Use logical inference methods to derive conclusions from a knowledge base.
5. Use adversarial search for game-playing agents.
6. Analyze the different search strategies.
7. Design and Implement heuristic search for problem-solving.
8. Understand how adversarial attacks can affect decision-making and problem-solving in classical AI.

CSCI 4410. Computer Graphics I
3 Credits (3)
Languages, programming, devices, and data structures for representation and interactive display of complex objects. Not for Computer Science graduate students. Taught with CSCI 5405.
Prerequisite: At least C- in CSCI 3730 or CSCI 3710.
Learning Outcomes
1. Demonstrate understanding of techniques used in three-dimensional graphics.
2. Apply Computer Graphics lightning and shading to model a scene.
3. Understand client-server graphics using WebGL.
4. Apply Geometric and Solid modeling techniques.
5. Develop and implement Computer Graphics algorithms.

CSCI 4415. Introduction to Data Mining
3 Credits (3)
Techniques for exploring large data sets and discovering patterns in them. Data mining concepts, metrics to measure its effectiveness. Methods in classification, clustering, frequent pattern analysis. Selected topics from current advances in data mining. Taught with CSCI 5415.
Prerequisite: At least a C- in CSCI 2220 and CSCI 2310.
Learning Outcomes
1. Explain and recognize different data mining tasks such as data pre-processing, visualization, classification, regression, clustering, association rules, and anomaly detection.
2. Apply classical data mining / machine learning algorithms for classification, clustering, association rules, and anomaly detection.
3. Evaluate and compare the performance of different data mining / machine learning algorithms.
4. Utilize data mining algorithms to analyze data in real applications using a data mining tool.

CSCI 4420. Applied Machine Learning I
3 Credits (3)
An introductory course on practical machine learning. An overview of concepts for both unsupervised and supervised learning. Topics include classification, regression, clustering, and dimension reduction. Classical methods and algorithms such as linear regression, neural networks, support vector machines, and ensemble approaches. Recent techniques such as deep learning. Focused on applying of machine learning techniques in application domains. Not for Graduate Majors. Taught with: CSCI 5420.
Prerequisite: At least a C- in CSCI 2220, MATH 1511G; or consent of instructor.
Learning Outcomes
1. Implement and utilize different data processing techniques.
2. Differentiate and assess several dimension reduction techniques.
3. Utilize several classifiers (SVM, Decision tree, k-Nearest Neighbor, and logistic regression) and differentiate their advantages and disadvantages.
4. Explain and demonstrate regression analysis.
5. Describe and illustrate clustering approaches.
6. Apply ensemble learning approaches.
7. Implement several neural network classifiers, including deep learning models.

CSCI 4425. Introduction to Deep Learning
3 Credits (3)
The course covers basic concepts of neural networks which include transition of classical machine learning to hierarchical feature learning, feedforward networks, regularization, optimization, hyperparameter tuning, deep convolutional networks and their applications in computer vision, deep sequence models, and deep generative models. Taught together with CSCI 5425.
Prerequisite: At least a C- in CSCI 2220 or CSCI 1220, and CSCI 2310, or consent of instructor.
Learning Outcomes
1. Have significant familiarity with different state-of-the-art theories and practices of deep learning.
2. Be able to apply deep learning to a variety of tasks suitable for data science-based projects of academia and industry.
3. Understand much of the current literature on the topic, review papers, and extend their knowledge through further study.
4. Design and evaluate novel deep learning models.
5. Train and test deep learning models on real-life and benchmark datasets using Python libraries such as TensorFlow and PyTorch.

CSCI 4430. Graph Data Mining
3 Credits (3)
The course covers graph terminology, representation, and techniques to extract patterns from large graph data. The topics include random and scale-free graph generation, link analysis (PageRank), graph representation learning, graph neural networks, deep graph generation, community detection, frequent subgraph mining, graph classification, influence maximization, and knowledge graph mining.
Prerequisite: At least a C- in CSCI 2220 or CSCI 1220, and CSCI 2310, or consent of instructor.
Learning Outcomes
1. Have significant familiarity with different state-of-the-art theories and practices of graph data mining.
2. Graph representation and graph querying using graph manipulating toolbox/library.

3. Use random and scale-free graph models to generate graphs and visualize complex network properties.
4. Apply algorithms such as PageRank, spectral clustering, and non-negative matrix factorization.
5. Implement graph representation learning algorithms and graph neural networks.
6. Understand much of the current literature on the topic, review papers, extend their knowledge through further study, and present findings of the papers.

CSCI 4435. Text Mining and Natural Language Processing
3 Credits (3)
This course is an introduction to text mining and natural language processing (NLP). It covers NLP techniques for extracting insights from unstructured text data. Topics include text classification, semantic textual similarity, topic modeling, sentiment analysis, text summarization, text generation, and machine translation.
Prerequisite: At least a C- in CSCI 2220 and CSCI 2310.
Learning Outcomes
1. Describe and apply techniques for text processing, text representation, and text modeling.
2. Describe and apply machine learning algorithms for text mining and NLP tasks such as text classification, semantic textual similarity, topic modeling, sentiment analysis, text summarization, text generation, and machine translation.
3. Utilize Python and popular libraries for implementing NLP-based applications.
4. Evaluate the performance of text mining and NLP algorithms.

CSCI 4440. Generative Artificial Intelligence
3 Credits (3)
Covers the theory and applications of generative artificial intelligence. Concentration will be on specific topics such as large language models, adversarial neural networks, neural symbolic computing, and inductive logic programming. May be repeated up to 3 credits.
Learning Outcomes
1. Understand the theoretical foundation of generative AI tools.
2. Understand the strengths and weaknesses of generative AI tools and identify appropriate tools for a given application.
3. Utilize advanced generative AI tools such as multi-modal LLMs for problem-solving and developing practical applications.
4. Understand the ethical consequence of using generative AI tools.

CSCI 4505. Java Programming
3 Credits (2+2P)
Programming in the Java language. More advanced than CSCI 1210. Recommended for nonmajors only. Not for Computer Science undergraduate standing students.

CSCI 4510. C++ Programming
3 Credits (3)
Programming in the C++ language. Taught with CSCI 1240. More advanced than CSCI 1240. Recommended for nonmajors only. Not for Computer Science undergraduate students.
Learning Outcomes
1. Use various data types and the corresponding operations.
2. Write C++ programs that contain expressions, program control, functions, arrays, and input/output.
3. Explain basic object-oriented programming concepts.
4. Demonstrate proficiency in using classes, inheritance, pointers, streams, and recursion.

CSCI 4520. Python Programming I
3 Credits (3)
This course is an introduction to programming in the Python language, covering fundamental scripts, data types and variables, functions, and simple object creation and usage. The focus will be on preparing students to use Python in their own areas. No prior programming experience is required. Taught with CSCI 1220. More advanced than CSCI 1220.
Learning Outcomes
1. Develop an algorithm to solve a problem.
2. Demonstrate the ability to use Python data types: int, float, strings, and lists; and the built-in functions associated with those data types.
3. Edit and debug programs using the Spyder IDE for Python.
4. Implement algorithms using the Python features of assignment, input, output, branches, loops, and functions.
5. Explain the fundamental concepts of object-oriented programming with Python.
6. Design and implement Python classes based on given attributes and behaviors.
7. Work with existing Python modules such as math, random, and os.
8. Write Python programs that input data from files and store results in files.

CSCI 4525. Python Programming II
3 Credits (3)
This course covers advanced Python programming, including classes, objects, and inheritance, embedded programming in domain applications, database interaction, and advanced data and text processing. The focus will be on preparing students to use Python in their own areas. For graduate students only. Has more advanced work than CSCI 1225, and does not count towards Computer Science major requirements. Computer Science students are excluded from taking this course.
Prerequisite(s): CSCI 1220 or CSCI 4520.
Learning Outcomes
1. Write Python applications for solving data-analysis problems.
2. Represent and interpret data using Python libraries NumPy, pandas, and the re (regular expression) package.
3. Apply exception handling in Python applications for error handling.
4. Perform data loading, cleansing, and processing using Python.
5. Connect to a relational database using Python, to create, load, and process data.
6. Retrieve data from websites using Python and web APIs.
7. Create data visualizations with Python libraries to improve the problem-solving process.
8. Write object-oriented programs with Python classes.

CSCI 4530. R Programming I
3 Credits (3)
This course is an introduction to data processing in the R language, covering fundamental script configuration, data types and data collections, R control structures, and basic creation of graphs and data visualizations. This course will not focus on the statistical capabilities of R, though some basic statistical computations will be used. For graduate students only. Has more advanced work than CSCI 1235. Does not count towards Computer Science major requirements. Student should have a good understanding of college algebra or higher, before enrolling.

Learning Outcomes

1. Show proficiency in installing R, navigating the RStudio interface, setting work directories, executing scripts, and using built-in R functions for data analysis.
2. Create and implement custom R functions to streamline and automate data processing.
3. Demonstrate the ability to create, manipulate, and use various R data structures including vectors, matrices, arrays, data frames, lists, and factors for effective data operations.
4. Acquire skills to import and export data in various formats including CSV and RData, and install and use essential R packages for data analysis.
5. Utilize R's control flow constructs like conditional statements and loops to write robust R scripts for data analysis.
6. Use apply family functions, such as apply(), sapply(), lapply(), and tapply(), to enhance data manipulation and analysis, particularly when dealing with missing values.
7. Generate, customize, and save various types of plots including scatter plots, bar charts, pie charts, histograms, and box plots for data visualization.
8. Apply exploratory data analysis techniques, including measuring central tendency, dispersion, and constructing five-number summaries, to analyze data distributions.
9. Manipulate string data using R functions and regular expressions to prepare text for analysis.

CSCI 4540. Computer Science I Transition
3 Credits (3)

Computational problem solving; problem analysis; implementation of algorithms. Recursive structures and algorithms. For Computer Science graduate students only; cannot be used to meet a Computer Science student's program of study. Taught with CSCI 1720.

Learning Outcomes

1. Develop algorithms to solve problems.
2. Implement algorithms using the fundamental programming features of sequence, selection, iteration, and recursion.
3. Apply an understanding of primitive and object data types.
4. Design and implement classes based on given attributes and behaviors.
5. Explain the fundamental concepts of object-oriented programming.

CSCI 4545. Object Oriented Programming Transition
3 Credits (3)

Introduction to problem analysis and problem solving in the object-oriented paradigm. Practical introduction to implementing solutions in the C++ language. Hands-on experience with useful development tools. Cannot be used in a Computer Science student's program of study. Taught with CSCI 2210.

Prerequisite: At least a C- in CSCI 1720 or CSCI 4540 or consent of instructor.

Learning Outcomes

1. Develop an algorithm to solve a problem.
2. Implement algorithms using the C and C++ languages including imperative and object-oriented language features.
3. Demonstrate a noticeable increase in understanding of problem analysis and program design.
4. Demonstrate proficiency in using control structures including if statements (single selection), switch (multiple selection), and loops (repetition).
5. Demonstrate proficiency in using arrays and functions.
6. Create UML class and relationship diagrams.
7. Design a class to model a real-world person, place, thing, or event.
8. Use editing and debugging software to create, debug, and test C and C++ programs.
9. Understand the basic terminology used in object-oriented programming. 1
10. Create a make file to build an executable from a set of C or C++ source files.

CSCI 4550. Introduction to Data Structures Transition
3 Credits (3)

Design, implementation, use of fundamental abstract data types and their algorithms: lists, stacks, queues, deques, trees; imperative and declarative programming. Internal sorting; time and space efficiency of algorithms. Cannot be used in a C S student's program of study. Consent of Instructor required. Taught with CSCI 2220.

Prerequisite: At least a C- in CSCI 1720 or CSCI 4540 or consent of instructor.

Learning Outcomes

1. Be able to implement and use lists.
2. Be able to implement and use stacks.
3. Be able to implement and use queues.
4. Be able to implement and use trees.
5. Be able to perform the run time analysis of basic algorithms using Big O notation.
6. Be able to implement, use, and analyze searching algorithms.
7. Be able to solve a problem recursively.
8. Take a problem statement from a user and convert it into a Java program that fulfills the user's needs.
9. Create object oriented Java classes that effectively separate and hide implementation details from client applications.

CSCI 4555. Machine Programming and Organization Transition
3 Credits (3)

Computer structure, instruction execution, addressing techniques; programming in machine and assembly languages. Cannot be used in a Computer Science student's program of study. Taught with CSCI 2230.

Prerequisite: At least a C- in CSCI 1720 or CSCI 4540 or consent of instructor.

Learning Outcomes

1. Describe the architecture of a microcontroller, the interconnections between the components, and the basic units inside the CPU.
2. Use signed and unsigned numbers, the associated branching instructions, and the corresponding flags in the status register.
3. Explain immediate, direct, indirect addressing modes, their opcode and operands, and their utilities.
4. Map high-level programming language features to assembly instructions, including loops, conditionals, procedure calls, value and reference parameter passing, return values, and recursion.
5. Interface with I/O devices including LED and sensors via digital input and output, and analog-to-digital conversion.
6. Program timers/counters and interrupts to control real-time applications.
7. Design an assembly program.

CSCI 4560. Discrete Math for Computer Science Transition
3 Credits (3)

Logical connectives, sets, functions, relations, graphics, trees, proofs, induction, and application to computer science. For Computer Science graduate students only. Cannot be used in a Computer Science student's program of study. Taught with CSCI 2310.
Prerequisite: At least a C- in CSCI 1720 or CSCI 4540 or consent of instructor.

Learning Outcomes

1. Use logic to specify precise meaning of statements, demonstrate the equivalence of statements, and test the validity of arguments.
2. Construct and recognize valid proofs using different techniques including the principle of mathematical induction.
3. Use summations, formulas for the sum of arithmetic and geometric sequences.
4. Explain and apply the concepts of sets and functions.
5. Apply counting principles to determine the number of various combinatorial configurations.

CSCI 4575. Software Development Transition
3 Credits (3)

Software specification, design, testing, maintenance, documentation; informal proof methods; team implementation of a large project. For Computer Science graduate students only. Cannot be used in a Computer Science student's program of study. Taught with CSCI 3710.
Prerequisite(s): At least a C- in CSCI 2210 or CSCI 4545, in CSCI 2220 or CSCI 4550, or consent of instructor.

Learning Outcomes

1. Understand and explain the activites and structure of different styles of software development processes, including waterfall, (spiral,) iterative, and agile methodologies.
2. Apply requirements knowledge and techniques to create functional and non-functional requirements for a software system.
3. Apply high and low level design ideas to create an object-oriented design of a software system.
4. Use good design and programming ideas to implement individual and team software systems in compiled OOP languages.
5. Apply white and black box testing techniques and tools to individual and team software development.
6. Use UML class diagrams (and sequence diagrams) to capture aspects of system design and/or requirements (domain).
7. Use practical software development tools, including version control systems, automated build tools, and testing tools.

CSCI 4580. Compilers and Automata Transition
3 Credits (3)

Methods, principles, and tools for programming language processor design; basics of formal language theory (finite automata, regular expressions, context-free grammars); development of compiler components. For Computer Science graduate students only; cannot be used in a students program of study. Taught with CSCI 3730.
Prerequisite: At least a C in (CSCI 2210 or CSCI 4545), in (CSCI 2220 or CSCI 4550), in (CSCI 2230 or CSCI 4555), or consent of instructor.

Learning Outcomes

1. Understand the language theory concepts of regular languages, context free languages, regular expressions, context free grammars, and formal language hierarchy.
2. Use Thompson's construction to convert from regular expression to NFA, and subset construction to convert from NFA to DFA.
3. Apply recursive descent parsing in programming a parser of a small grammar.
4. Understand the ideas in LL and LR parsing of context-free language classes.
5. Understand and use table-driven top-down (LL(1)) and bottom up (SLR) parsing to parse a sentence.

CSCI 4590. Algorithm Design and Implementation
3 Credits (3)

This course introduces the basic knowledge of designing classical algorithms and implementing these algorithms using a programming language. In particular, the course teaches various data structures, including graphs and balanced binary search trees, and efficient schemes to implement these data structures. This course also teaches basic algorithm design techniques including divide-and-conquer, greedy scheme, and dynamic programming. This course covers graph algorithms, including graph traversals (depth-first search and breadth-first search), connectivity, shortest paths, and minimum spanning trees. Graduate standing. Not for Computer Science students. Taught with CSCI 3430.
Prerequisite: At least a C- in CSCI 2220, or Consent of Instructor.

Learning Outcomes

1. Use and implement sorting algorithms.
2. Design and implement graph algorithms.
3. Design and implement algorithms using the divide-and-conquer technique.
4. Design and implement algorithms using the greedy technique.
5. Design and implement algorithms using the dynamic programming technique.
6. Apply and implement balanced search trees.
7. Use and implement hashing techniques.
8. Perform the run time analysis of basic algorithms using Big O notation.

CSCI 4980. Senior Project
4 Credits (4)

Capstone course in which Computer Science majors work in teams and apply computer science skills to complete a large project. Restricted to: Computer Science majors or Cybersecurity majors.
Prerequisite: At least a C- in CSCI 3730 and CSCI 3710.

Learning Outcomes

1. Apply design and development principles in the construction of software systems of varying complexity.
2. Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
3. Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
4. Use current techniques, skills, and tools necessary for computing practice.
5. Analyze a problem, and identify and define the computing requirements appropriate to its solution.
6. Function effectively as teams to accomplish a common goal.
7. Communicate effectively with a range of audiences.

CSCI 4996. Special Topics
1-12 Credits

Topics announced in the Schedule of Classes. May be repeated up to 12 credits.

Learning Outcomes

1. Varies.

CSCI 4999. Senior Thesis
4 Credits (4)
Capstone course in which Computer Science majors apply computer science skills to complete a research project, culminating in a written thesis report. Restricted to: Computer Science majors or Bachelor of Science in Cybersecurity degree.
Prerequisite: At least a C- in CSCI 3730 and CSCI 3710.
Learning Outcomes

1. Apply design and development principles in the construction of software systems of varying complexity.
2. Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
3. Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
4. Use current techniques, skills, and tools necessary for computing practice.
5. Analyze a problem, identify, and define the computing requirements appropriate to its solution.
6. Communicate effectively with a range of audiences via presentations and technical reports.

CSCI 5110. Data Structure and Algorithms Transition
3 Credits (3)
Introduction to efficient data structure and algorithm design. Order notation and asymptotic run-time of algorithms. Recurrence relations and solutions. Abstract data type dynamic set and data structures based on trees. Classic algorithm design paradigms: divide-and-conquer, dynamic programming, greedy algorithms. For Computer Science graduate students only. Taught with CSCI 3720.
Prerequisite: At least a C- in (CSCI 2220 or CSCI 4550) and a C- in (CSCI 2310 or CSCI 4560), or consent of instructor.
Learning Outcomes

1. Analyze the growth of functions via asymptotic notation.
2. Evaluate the asymptotic running time of a given algorithm.
3. Solve recurrence relations of the kinds encountered in algorithm analysis.
4. Design algorithms using the divide-and-conquer technique.
5. Design algorithms using the greedy technique.
6. Design algorithms using the dynamic-programming technique.
7. Use and analyze data structures based on trees.
8. Analyze the design, correctness, and time complexity of basic graph algorithms.

CSCI 5140. Database Management Systems I
3 Credits (3)
Database design and implementation; models of database management systems; privacy, security, protection, recovery; taught with CSCI 4140; requires more advanced graduate work than taught with CSCI 4140. Students are expected to have solid knowledge of data structures and discrete mathematics.
Learning Outcomes

1. Utilize the basic concepts of relational database model.
2. Utilize database query languages (e.g. SQL).
3. Identify data integrity and security requirements.
4. Analyze, capture, and model user requirements for building database systems using conceptual models.
5. Design and normalize relational schemas.
6. Apply application development methods to implement a database system.

CSCI 5205. Computer Security
3 Credits (3)
Introduction to the art and science of computer security. Fundamentals of computer security including elementary cryptography, authentication and access control, security threats, attacks, detection and prevention in application software, operating systems, networks and databases. Taught with CSCI 4205. Requires more advanced graduate work than CSCI 4205. Recommended knowledge of materials in CSCI 2220.
Prerequisite: At least a C- in CSCI 2230 or consent of instructor.
Learning Outcomes

1. Describe fundamental concepts in security and privacy.
2. Understand requirements of security in different contexts.
3. Describe practical implementation challenges in security/privacy system design.
4. Explain at a high-level symmetric and public key cryptography.
5. Explain various access control mechanisms such as authentication, authorization.
6. Understand aspects of secure system design that a computer programmer/engineer needs to account for.

CSCI 5206. Hardware Security
3 Credits (3)
Hardware security covers the intersection of hardware and security attacks/defenses. Students will study a variety of approaches to hardware security in this course, e.g., micro-architectural side channels, cache side-channel attacks, memory attacks, speculative-based attacks, etc. Students will also learn about the various computer architectural components that can be exploited for launching security attacks. Taught with CSCI 4206. Preferable to have knowledge of CSCI 4230.
Prerequisite: At least a C- in CSCI 2230.
Learning Outcomes

1. Understand how computer architectural components can be exploited for launching security attacks.
2. Build an insight into developing defense mechanisms against hardware-based security attacks.
3. Explain micro-architectural side channels.
4. Understand cache side-channel attacks.
5. Demonstrate knowledge of memory attacks.
6. Explain Speculative execution based attacks.
7. Understand Rowhammer.
8. Explain trusted execution environment as a security mechanism.

CSCI 5210. Introduction to Smart Grids
3 Credits (3)
This course is an introduction to the technologies and design strategies associated with the Smart Grid. The emphasis will be on the development of communications, energy delivery, coordination mechanisms, and management tools to monitor transmission and distribution networks. Topics include: Smart grid introduction and evolution; Power systems; Networking and transport control; Artificial intelligence & agent coordination; Data mining for smart grids. Taught with CSCI 4210. Requires more advanced work than CSCI 4210.
Prerequisite: At least a C- in CSCI 2220 and a C- in ENGR 230 or Consent of Instructor.

Learning Outcomes

1. Get basic understanding of how conventional power system is operated and protected.
2. Understand and use basic knowledge of communication techniques in smart grids.
3. Understand and use basic knowledge for the coordination of the different units in smart grids.
4. Understand and apply data mining techniques for protecting smart grids.

CSCI 5215. Parallel Programming
3 Credits (3)

Programming of shared memory and distributed memory machines; tools and languages for parallel programming; parallelizing compilers; parallel programming environments; taught with CSCI 4215; requires more advanced graduate work than CSCI 4215. Students are expected to have knowledge of programming and machine organization equivalent to CSCI 2210 and CSCI 2230.

Learning Outcomes

1. Describe existing parallel architectures including shared memory versus distributed memory platforms.
2. Apply basic techniques for organizing parallel computations.
3. Apply basic techniques for performance measurement and theoretical limitations of parallelism.
4. Explain alternative parallel techniques and hardware.
5. Perform performance Analysis of different parallel programming techniques.
6. Program shared memory machines using threads, processes, and the OpenMP library.
7. Program using a message passing paradigm and obtain working knowledge of the Message Passing Interface (MPI).

CSCI 5220. Cloud and Edge Computing
3 Credits (3)

The course presents a top-down view of cloud computing, from applications and administration to programming and infrastructure. Its main focus is on the concepts of networking and parallel programming for cloud computing and large scale distributed systems which form the cloud infrastructure. The topics include: overview of cloud computing, cloud systems, parallel processing in the cloud, distributed storage systems, virtualization, security in the cloud, and multicore operating systems. Students will study state-of-the-art approaches to cloud computing followed by large cloud corporations, namely Google, Amazon, Microsoft, and Yahoo. Students will also apply what they learn through project developments using Amazon Web Services. Might have additional requirements for graduate students. To enroll in this course a background in CSCI 4245/CSCI 5245 is preferred or have consent from the instructor. Taught with: CSCI 4220. Requires more advanced graduate work than CSCI 4220.

Learning Outcomes

1. Explain the role of cloud computing and IoT.
2. Explain security techniques in cloud and IoT networks.
3. Summarize the features and associated risks of different service models.
4. Design a model or prototype as a solution to the identified problem.
5. Understand the differences between various infrastructure deployment models such as on-prem, hybrid, public, and private.

CSCI 5225. Introduction to Cryptography
3 Credits (3)

The course covers basic cryptographic primitives, such as symmetric, public-key ciphers, digital signature schemes, and hash functions, and their mathematical underpinnings. Course helps students understand basic notions of security in a cryptographic sense: chosen plaintext and chosen ciphertext attacks, games, and reductions. Course also covers computational number theory relevant to cryptography. Taught with: CSCI 4225. Requires more advanced graduate work than CSCI 4225.
Prerequisite: CSCI 2310 (or equivalent) with a C or better.

Learning Outcomes

1. Describe basic cryptographic primitives, including symmetric ciphers, asymmetric ciphers, digital signatures, message authentication codes, and hash functions.
2. Understand the mathematical, fundamental underpinnings of cryptography, and how to reason about the security of crypto primitives: indistinguishability (IND) properties of ciphertexts, CPA/CCA games, and reductions to fundamental math assumptions.
3. Be able to discuss number theory/algebra underpinning the design of cryptographic primitives, in some depth.

CSCI 5235. Cellular Networks and Mobile Computing
3 Credits (3)

This course will offer a solid introduction to major global wireless standards and comparisons of the different wireless technologies and their applications and examine each technology and how to utilize several different systems for the best results. Taught together with CSCI 4235. A basic understanding of Computer Networks is preferable as a course prerequisite.

Learning Outcomes

1. Understand user associations and routing in a cellular/mobile network.
2. Develop insight into interaction of elements within the cellular/mobile core.
3. Understand the concept of end-to-end delivery of a packet and/or signal.
4. Develop an understanding of what happens with the hand-off at each step along the communications path.
5. Be able to explain differences in core architecture between different generations of cellular and mobile network technologies.

CSCI 5240. Software Reverse Engineering
3 Credits (3)

This class provides students with fundamental experience in software reverse engineering with a focus on malware reverse engineering. Students will learn operational security for safely analyzing untrusted code in a sandbox environment. Students will learn control flow integrity attacks, binary control flow analysis, and how to analyze live program behavior. Taught together with CSCI 4240.

Learning Outcomes

1. Students will learn how malware behaves, spreads, and is controlled.
2. Students will learn how to safely analyze malware in controlled environments.
3. Students will learn how malware seeks to hide in systems.
4. Students will learn to perform static analysis of binaries using simple tools.
5. Students will learn how malware obfuscates itself to avoid analysis, including using crypto packers, polymorphism, and sandbox detection.
6. Students will learn to perform decompilation and control-flow analysis of binaries using Ghidra.

7. Students will learn to dynamically analyze malware in a sandbox environment while observing network traffic, resource consumption, and system calls.
8. Students will learn to detect malware running with operating-system level permissions (rootkits).
9. Students will learn memory forensics techniques to detect malware hidden within benign processes.

CSCI 5245. Computer Networks I
3 Credits (3)
Fundamental concepts of computer communication networks: layered network architecture, network components, protocol stack and service. Example of application, transport, network and data link layers, protocols primarily drawn from the Internet (TCP, UDP, and IP) protocol suite; local and wide area networks, wireless and mobile networks, multimedia networks; network management and security; taught with CSCI 4245; requires more advanced graduate work than CSCI 4245. Students are expected to have solid knowledge of data structures, machine-level programming. Knowledge of statistics (at the level of MATH 371 or MATH 470) is recommended.
Learning Outcomes
1. Explain the layered model of networking using the OSI and TCP/IP models.
2. Explain TCP and UDP as particular transport layer protocols.
3. Explain and analyze routing and forwarding mechanisms.
4. Implement application layer protocols.
5. Explain other network issues such as multicasting, audio/video data streaming, and Domain Name System.

CSCI 5250. Human-Centered Computing
3 Credits (3)
Covers iterative, human-centered interface design, including prototyping and evaluation. Basics of graphic design and visualization. Taught with SCI 4250. Requires more advanced graduate work than CSCI 4250 with an emphasis on studying recent research in human-computer interaction. Students are expected to have knowledge of software engineering equivalent to CSCI 3710.
Learning Outcomes
1. Describe, analyze, and/or critique a device interface using a design vocabulary.
2. Enact a human-centered process of interaction design: gather data; develop a data-driven design; iterate design through testing; and evaluate results.
3. Conduct human-computer interaction research by proposing, developing, and conducting experiments; analyzing data; and developing synthesized results.
4. Communicate design and evaluation with presentations, demos, and reports.
5. Implement a variety of interaction techniques.

CSCI 5255. Digital Game Design
3 Credits (3)
An introduction to digital game design. Topics include design, development, and playtesting of games. The course is structured to use team-based learning. Taught with CSCI 4255. Requires more advanced graduate work than CSCI 4255 with deeper attention to a team game project.
Learning Outcomes
1. Describe, analyze, and/or critique games with a consistent vocabulary.
2. Design, develop, and playtest games.
3. Understand the formal systems of games.
4. Communicate game designs through demonstrations and presentations.

CSCI 5260. Visual Programming
3 Credits (3)
Design and implementation of programs using visual (i.e. dataflow or diagrammatic) programming techniques, with an emphasis on real-time data processing. Students will learn how to design visual programs, including how to handle cycles and state maintenance, and will learn to process audio, video, and other data using visual programs. Students must be in graduate standing to enroll. Taught with CSCI 4260. Requires more advanced graduate work than CSCI 4260.
Learning Outcomes
1. Develop software in graph-based visual environments.
2. Understand flows of control in visual programming environments.
3. Use signals, digital and analog, to drive software.
4. Communicate software design and evaluation with presentations, demos, and reports.

CSCI 5265. Modern Web Technologies
3 Credits (3)
In this course, we will take a full-stack approach to modern web application design. We will start with the fundamentals including HTML5, CSS3, Javascript, JSON, and the underlying networking concepts and protocols driving the modern web. We will then move on to more advanced topics including javascript backend development with Node.js, NoSQL database design with MongoDB, cloud computing, and re-sponsive web design. Finally, we cover advanced topics including the design and im- plementation of browser extensions and real-time web technologies like WebRTC and WebSockets. Taught with: CSCI 4265. Requires more advanced graduate work than CSCI 4265.
Learning Outcomes
1. Understand the fundamental technologies and operation of the web.
2. Design and develop responsive interactive web sites.
3. Deploy web applications on Cloud Computing Platforms.
4. Leverage modern tools and packages to develop full stack web applications.
5. Be fluent in the application of emerging web technologies like browser extensions, WebSockets, and WebRTC.
6. Use existing materials and references on the web to learn new skills.

CSCI 5305. Bioinformatics
3 Credits (3)
Introduction to bioinformatics and computational biology. Computational approaches to sequences analysis, protein structure prediction and analysis, and selected topics from current advances in bioinformatics; taught with CSCI 4305; requires more advanced graduate work than CSCI 4305. Students are expected to have a knowledge of algorithms and data structures equivalent to CSCI 3720 or exposure to Biology (equivalent to BIOL 2310 or BIOL 311).
Learning Outcomes
1. Explain the biology motivation of a bioinformatics question.
2. Formulate a computational problem and its solution to address a molecular biology question.
3. Implement basic bioinformatics algorithms such as sequence alignment, pattern matching, and genome assembly.
4. Evaluate the performance of a bioinformatics algorithm on real data sets.

5. Argue the correctness of a bioinformatics algorithm.
6. Analyze the complexity of a bioinformatics algorithm.

CSCI 5310. Bioinformatics Programming
3 Credits (3)
Computer programming to analyze high-throughput molecular biology data including genomic sequences, bulk and single-cell transcriptome, epigenome, and other omics data. Quality control, library size normalization, confounding effect removal, clustering, statistical modeling, trajectory inference, and visualization. Taught with CSCI 4310. Requires more advanced graduate work than CSCI 4310.
Learning Outcomes
1. Write R scripts and functions to manipulate biological sequences, genome annotation, and gene expression data.
2. Perform high-throughput data analysis with established R packages.
3. Detect differential gene expression on RNA sequencing data.
4. Perform single-cell RNA sequencing data analysis (quality control, library size normalization, confounding effect removal, modeling).
5. Assess statistical significance of analytical results.
6. Create automatic data analysis pipeline to link multiple software packages.

CSCI 5405. Artificial Intelligence I
3 Credits (3)
Fundamental principles and techniques in artificial intelligence systems. Knowledge representation formalisms; heuristic problem solving techniques; automated logical deduction; robot planning methods; algorithmic techniques for natural language understanding, vision and learning; taught with CSCI 4405; requires more advanced graduate work than CSCI 4405. Students are expected to have strong knowledge of algorithms and data structures (at the level of CSCI 3720).
Learning Outcomes
1. Use various search algorithms commonly used in problem-solving.
2. Use various methods for solving constraint satisfaction problems.
3. Use propositional and first-order logic to represent knowledge.
4. Use adversarial search for game-playing agents.
5. Analyze the different search strategies.
6. Design and Implement heuristic search for problem-solving.
7. Use logical inference methods to derive conclusions from a knowledge base.
8. Understand how adversarial attacks can affect decision-making and problem-solving in classical AI.

CSCI 5410. Computer Graphics I
3 Credits (3)
Languages, programming, devices, and data structures for representation and interactive display of complex objects. Taught with C S 476. Requires more advanced graduate work than CSCI 4410. Students are expected to have knowledge of compilers design and software engineering equivalent to CSCI 3730 and CSCI 3710.
Learning Outcomes
1. Demonstrate understanding of techniques used in three-dimensional graphics.
2. Apply Computer Graphics lightning and shading to model a scene.
3. Understand client-server graphics using WebGL.
4. Apply Geometric and Solid modeling techniques.
5. Develop and implement Computer Graphics algorithms.

CSCI 5415. Introduction to Data Mining
3 Credits (3)
Techniques for exploring large data sets and discovering patterns in them. Data mining concepts, metrics to measure its effectiveness. Methods in classification, clustering, frequent pattern analysis. Selected topics from current advances in data mining. Students are expected to have a preparation in Discrete Mathematics and Data Structures equivalent to C S 272 and CSCI 2310. Requires more advanced graduate work than CSCI 4415. Taught with: CSCI 4415.
Learning Outcomes
1. Explain and recognize different data mining tasks such as data pre-processing, visualization, classification, regression, clustering, association rules, and anomaly detection.
2. Apply classical data mining / machine learning algorithms for classification, clustering, association rules, and anomaly detection.
3. Evaluate and compare the performance of different data mining / machine learning algorithms.
4. Utilize data mining algorithms to analyze data in real applications using a data mining tool.

CSCI 5420. Applied Machine Learning I
3 Credits (3)
An introductory course on practical machine learning. An overview of concepts for both unsupervised and supervised learning. Topics include classification, regression, clustering, and dimension reduction. Classical methods and algorithms such as linear regression, neural networks, support vector machines, and ensemble approaches. Recent techniques such as deep learning. Focused on applying of machine learning techniques in application domains. Taught with: CSCI 4420. Requires more advanced graduate work than CSCI 4420.
Learning Outcomes
1. Implement and utilize different data processing techniques.
2. Differentiate and assess several dimension reduction techniques.
3. Utilize several classifiers (SVM, Decision tree, k-Nearest Neighbor, and logistic regression) and differentiate their advantages and disadvantages.
4. Explain and demonstrate regression analysis.
5. Describe and illustrate clustering approaches.
6. Apply ensemble learning approaches.
7. Implement several neural network classifiers, including deep learning models.

CSCI 5425. Introduction to Deep Learning
3 Credits (3)
The course covers basic concepts of neural networks which include transition of classical machine learning to hierarchical feature learning, feedforward networks, regularization, optimization, hyperparameter tuning, deep convolutional networks and their applications in computer vision, deep sequence models, and deep generative models. Taught with CSCI 4425. Requires more advanced graduate work than CSCI 4425.
Prerequisite: At least a C- in CSCI 2220 or CSCI 1220, and CSCI 2310, or consent of instructor.
Learning Outcomes
1. Have significant familiarity with different state-of-the-art theories and practices of deep learning.
2. Be able to apply deep learning to a variety of tasks suitable for data science-based projects of academia and industry.
3. Understand much of the current literature on the topic, review papers, and extend their knowledge through further study.
4. Design and evaluate novel deep learning models.

5. Train and test deep learning models on real-life and benchmark datasets using Python libraries such as TensorFlow and PyTorch.

CSCI 5430. Graph Data Mining
3 Credits (3)
The course covers graph terminology, representation, and techniques to extract patterns from large graph data. The topics include random and scale-free graph generation, link analysis (PageRank), graph representation learning, graph neural networks, deep graph generation, community detection, frequent subgraph mining, graph classification, influence maximization, and knowledge graph mining. Taught with CSCI 4430. Requires more advanced graduate work than CSCI 4430.
Prerequisite: At least a C- in C S 272 or CSCI 1220, and CSCI 2310, or consent of instructor.
Learning Outcomes
1. Have significant familiarity with different state-of-the-art theories and practices of graph data mining.
2. Graph representation and graph querying using graph manipulating toolbox/library.
3. Use random and scale-free graph models to generate graphs and visualize complex network properties.
4. Apply algorithms such as PageRank, spectral clustering, and non-negative matrix factorization.
5. Implement graph representation learning algorithms and graph neural network.
6. Understand much of the current literature on the topic, review papers, extend their knowledge through further study, and present findings of the papers.

CSCI 5435. Text Mining and Natural Language Processing
3 Credits (3)
This course is an introduction to text mining and natural language processing (NLP). It covers NLP techniques for extracting insights from unstructured text data. Topics include text classification, semantic textual similarity, topic modeling, sentiment analysis, text summarization, text generation, and machine translation.
Prerequisite: At least a C- in CSCI 2220/C S 272 or C S 463/CSCI 4550 and C S 278/CSCI2310 (or C S 465/CSCI 4560).
Learning Outcomes
1. Describe and apply techniques for text processing, text representation, and text modeling.
2. Describe and apply machine learning algorithms for text mining and NLP tasks such as text classification, semantic textual similarity, topic modeling, sentiment analysis, text summarization, text generation, and machine translation.
3. Utilize Python and popular libraries for implementing NLP-based applications.
4. Evaluate the performance of text mining and NLP algorithms.

CSCI 5440. Generative Artificial Intelligence
3 Credits (3)
Covers the theory and applications of generative artificial intelligence. Concentration will be on specific topics such as large language models, adversarial neural networks, neural symbolic computing, and inductive logic programming. Taught together with CSCI 4440.
Prerequisite: At least a C- in CSCI 4405 or CSCI 5405.
Learning Outcomes
1. Understand the theoretical foundation of generative AI tools.
2. Understand the strengths and weaknesses of generative AI tools and identify appropriate tools for a given application.
3. Utilize advanced generative AI tools such as multi-modal LLMs for problem-solving and developing practical applications.
4. Understand the ethical consequence of using generative AI tools.

CSCI 5505. Analysis of Algorithms
3 Credits (3)
Techniques for design and analysis of algorithms; time and space complexity; proving correctness of programs. Particular algorithms such as sorting, searching, dynamic programming. NP complete problems. Students are expected to have knowledge of algorithms and data structures equivalent to CSCI 3720.
Learning Outcomes
1. Prove algorithm correctness by loop-invariant.
2. Prove an algorithm to be incorrect by counterexamples.
3. Develop efficient divide-and-conquer algorithms.
4. Design and analyze binary search tree algorithms.
5. Construct dynamic programming solutions.
6. Prove the correctness of dynamic programming solutions by contraposition.
7. Traverse graphs efficiently.
8. Find paths in graphs efficiently.
9. Determine if a problem is NP-Complete or NP-Hard. 1
10. Basic concepts of quantum computing.

CSCI 5510. Automata, Languages, Computability
3 Credits (3)
Regular and context-free languages, pushdown and finite-state automata, Turing machines, models of computation, halting problems. Students are expected to have knowledge of algorithms equivalent to CSCI 3720.
Learning Outcomes
1. Describe the language accepted by an automaton or generated by a regular expression or a context-free grammar.
2. Design automata, regular expressions and context-free grammars accepting or generating a certain language.
3. Prove properties of languages, grammars, and automata with formal mathematical methods.
4. Convert between equivalent deterministic and non-deterministic finite automata, and regular expressions.
5. Convert between equivalent context-free grammars and pushdown automata.
6. Define Turing machines performing simple tasks.

CSCI 5605. Operating Systems II
3 Credits (3)
Advanced topics related to operating system principles, guided by the current literature. Students are expected to have knowledge of computer architectures and operating systems equivalent to CSCI 4230 and CSCI 4120.
Learning Outcomes
1. Further an understanding of the principles of operating systems.
2. Develop insight into process management and scheduling issues.
3. Understand memory management operation.
4. Develop an understanding of file system implementation and of multiple levels of hardware support and management.
5. Develop a deep understanding of the concepts of cooperating processes, including communication, synchronization, and deadlock (detection and avoidance).
6. Be able to evaluate operating system features.

7. Develop an understanding of the distributed operating system environment.

CSCI 5750. Artificial Intelligence II
3 Credits (3)
Covers advanced theory and application of artificial intelligence. Concentration on several specific research areas, such as knowledge representation, problem solving, common-sense reasoning, natural language understanding, automated tutoring systems, learning systems. Students are expected to have knowledge of artificial intelligence equivalent to CSCI 4405.
Learning Outcomes
1. Apply selected planning algorithms in solving problems.
2. Identify problems where knowledge representation and reasoning techniques are applicable.
3. Be able to apply answer set programming in problem solving.
4. Be aware of various advanced research topics in Artificial Intelligence.

CSCI 5810. Advanced Software Engineering
3 Credits (3)
Advanced tools and methods for developing large software systems. Topics include object-oriented modeling and design, component architectures, templates and generic programming, software configuration and revision control, static and dynamic analysis tools, model, checking, advanced testing, and verification. Students are expected to have knowledge of software engineering equivalent to CSCI 3710.
Learning Outcomes
1. Be able to explain modern software development process ideas.
2. Be able to apply agile software development techniques in a project.
3. Be able to specify, design, and develop a complex software system in a team.
4. Be able to properly utilize both black box and white box testing techniques.
5. Be able to explain how unsound and incomplete formal methods can aid in system verification and validation.
6. Be able to utilize sound and complete formal methods to prove properties of a system.

CSCI 5820. Database Management Systems II
3 Credits (3)
Advanced data models and abstractions, dependencies, implementations, languages, database machines, and other advanced topics. Students are expected to have knowledge of data base management systems equivalent to CSCI 4140.
Learning Outcomes
1. Analyze storage and file structures of an RDBMS.
2. Analyze and apply indexing techniques of an RDBMS.
3. Analyze query evaluation approaches of an RDBMS.
4. Analyze the mechanisms of transaction management in an RDBMS.

CSCI 5840. Computer Networks II
3 Credits (3)
Advanced topics in computer networks. Covers advanced topics in networking, with emphasis on wireless, and IP networks. Students are expected to have knowledge of computer networks equivalent to CSCI 4245 and statistics equivalent.
Learning Outcomes
1. Understand design of link layer protocols.
2. Understand challenges and implementations for multimedia streaming.
3. Be able to use basic security constructs in the networking context.
4. Understand the concepts of edge and cloud computing.
5. Understand the concepts and challenges of Internet of Things.
6. Learn concepts of distributed networking.
7. Learn and evaluate future internet architectures.

CSCI 5860. Algorithms in Systems Biology
3 Credits (3)
The course will introduce important algorithms and computational models used in systems biology to study molecular mechanisms for cellular dynamics, processes, and systems. Cellular processes, such as metabolism and signal transduction, are studied as systems and networks quantitatively from high throughput molecular measurements. The topics include molecular biological systems, network alignment, model simulation, network inference, model optimization, and hybrid models. Students will be able to construct models and analyze their properties in the context of molecular biological systems. Students are expected to have knowledge of algorithms and data structures equivalent to CSCI 3720.
Learning Outcomes
1. Create mathematical representation of biological systems.
2. Infer biological network topology from observed omics data set.
3. Simulate the behavior of a biological system using a mathematical model.
4. Characterize behaviors of biological systems.
5. Estimate parameters in a biological system model.
6. Validate a model's statistical relevance given observed data.

CSCI 5991. Special Research Problems
1-6 Credits (1-6)
Faculty-supervised investigation, to culminate in a written report. Maximally 6 credits can be applied to the student program of study. Written agreement with faculty supervisor is the required consent. May be repeated up to 18 credits.
Learning Outcomes
1. Research experience for graduate student.

CSCI 5994. Master's Project
1-6 Credits
Project-oriented capstone course to be completed by Master of Science students under supervision of their advisor. Maximum of 6 credits may be applied toward Master of Science degree. Restricted to Computer Science majors. May be repeated up to 6 credits.

CSCI 5996. Special Topics
1-6 Credits
Topic announced in the Schedule of Classes. May be repeated up to 6 credits.

CSCI 5999. Master's Thesis
1-6 Credits (1-6)
Thesis to be developed by Master of Science Students under supervision of their advisor. May be repeated up to 6 credits.
Learning Outcomes
1. Varies.

CSCI 6991. Pre-dissertation Research
1-15 Credits

Pre-dissertation research. May be repeated up to 88 credits.

CSCI 7000. Doctoral Dissertation
1-15 Credits
Dissertation. May be repeated up to 88 credits.

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Artificial Intelligence - Bachelor of Science

The Bachelor of Science in Artificial Intelligence (AI) is rigorously focused on educating the student in the fundamental disciplines of AI. It will prepare computing and IT professionals who are capable of leading technological, methodological, and policy changes in industry and government, both locally and nationally, with an emphasis on the development and application of AI technologies.

General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
Area I: Communications [1]		*9-10*
English Composition - Level 1 [2]		
ENGL 1110G	Composition I	
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
or ENGL 2210M	Professional and Technical Communication for Multilingual Students	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics [3]		*3-4*
MATH 1511G	Calculus and Analytic Geometry I	4
or MATH 1430G	Applications of Calculus I	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences [2]		
Area IV: Social & Behavioral Sciences [2]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective [2]		*3-4*
Viewing a Wider World [4]		**6**
Departmental Requirements		**47**
CSCI 1720	Computer Science I	
CSCI 2210	Object-Oriented Programming	
CSCI 2220	Introduction to Data Structures and Algorithms	
CSCI 2310	Discrete Mathematics for Computer Science	
CSCI 2410	Practical Programming	
CSCI 3410	Introduction to Intelligent Agents Using Science Fiction	
CSCI 3710	Software Development	
CSCI 3720	Data Structures and Algorithms	
CSCI 4110	Computing Ethics and Social Implications of Computing	
CSCI 4980	Senior Project [5]	
or CSCI 4999	Senior Thesis	
CSCI 4405	Artificial Intelligence I	
CSCI 4140	Database Management Systems I	
CSCI 4420	Applied Machine Learning I	
CSCI 4415	Introduction to Data Mining	
Additional Selective Requirements		
Select one of the following		*3*
CSCI 4435	Text Mining and Natural Language Processing	
CSCI 4440	Generative Artificial Intelligence	
Select 9 credits from the following		*9*
CSCI 4425	Introduction to Deep Learning	
CSCI 4430	Graph Data Mining	
CSCI 4265	Modern Web Technologies	
CSCI 4255	Digital Game Design	
CSCI 4270	Principles of Virtual Reality	
CSCI 4250	Human-Centered Computing	
Select 9 credits from the following: [5]		*9*
CSCI 4225	Introduction to Cryptography	
CSCI 4230	Architectural Concepts I	
CSCI 4410	Computer Graphics I	
CSCI 4996	Special Topics	
CSCI 4996	Special Topics [6]	
CSCI 4205	Computer Security	
CSCI 4130	Linux System Administration	
CSCI 4260	Visual Programming	
CSCI 4245	Computer Networks I	

CSCI 4305	Bioinformatics	
CSCI 4310	Bioinformatics Programming	
CSCI 4215	Parallel Programming	
CSCI 4220	Cloud and Edge Computing	
SOCI 4150	Networked and Connected	
SOCI 4155	Textual Analysis of Digital and Social Media	
SOCI 4160	Visualizing Social Life	
E E 406	Quantum Computing	
E E 408	Noncooperative Game Theory	
E E 444	Advanced Image Processing	
E E 446	Digital Image Processing	
E E 465	Machine Learning I	
I E 425	Supply Chain Modeling and Analysis	
I E 467	Discrete-Event Simulation Modeling	
ICT 439	Advanced Digital Forensics and Incident Response	
ICT 450	Ethical Hacking	
M E 486	Introduction to Robotics	
BCIS 482	Management of Information Security	
BCIS 461	Business Analytics I	
BCIS 466	Business Analytics II	
PSYC 2220	Cognitive Psychology	
PSYC 2250	Brain and Behavior	
PSYC 320	Learning	
PSYC 380	Perception	
PSYC 383	Memory	
PSYC 430	Human-Computer Psychology	
PSYC 442	Thinking	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		**3**
Select one from the following:		
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
Second Language Requirements: (not required)		
Electives, to bring the total credits to 120 [7]		**5**
Total Credits		**120-124**

1. Students with Area I transfer credits may sometimes complete this requirement with 9 credits
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. Either MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter either first.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. The current CSCI 4110 Computing Ethics and Social Implications of Computingcourse will need to be developed to become a full course for the need of this program.
6. The project or thesis must be related to AI.
7. A course can satisfy only one requirement. Courses outside of the department might require additional pre-requisites.
8. Must be taken for 3 credits to count as a course.
9. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Science in Artificial Intelligence, there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in Mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		**Credits**
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
MATH 1430G or MATH 1511G	Applications of Calculus I [1] or Calculus and Analytic Geometry I	3
ENGL 1110G or ENGL 1110H or ENGL 1110M	Composition I or Composition I Honors or Composition I	4
Area III: Laboratory Science Course [2]		3
Area IV: Social/ Behavioral Sciences Course [2]		3
Area V: Humanities Courses [2]		3
Electives as needed to meet the minimum credit requirement for financial aid [6]		2
	Credits	**30**
Sophomore		
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 2410	Practical Programming	2
CSCI 3710	Software Development	4
CSCI 3410	Introduction to Intelligent Agents Using Science Fiction	3
ENGL 2210G or ENGL 2210H or ENGL 2210M	Professional and Technical Communication or Professional and Technical Communication or Professional and Technical Communication for Multilingual Students	3
Area III or IV [2]		3
Viewing the Wider World [3]		3
Select one from the following:		3
CSCI 4435	Text Mining and Natural Language Processing	
CSCI 4440	Generative Artificial Intelligence	
Elective credits if needed for financial aid requirements [6]		5
	Credits	**30**
Junior		
CSCI 3720	Data Structures and Algorithms	4
CSCI 4405	Artificial Intelligence I	3
CSCI 4140	Database Management Systems I	3
Elective Courses from List 1 or 2 [4]		9
Area 6: Humanities [2]		3

Non-Departmental Requirement in addition to Gen. Ed/WWW [5]		3
Viewing a Wider World [3]		3
Elective credits if needed for financial aid requirements [6]		2
	Credits	**30**
Senior		
CSCI 4980 or CSCI 4999	Senior Project or Senior Thesis	4
CSCI 4420	Applied Machine Learning I	3
CSCI 4415	Introduction to Data Mining	3
Elective Courses from List 1 and 2 [4]		9
Upper division electives to bring total upper division to 48 [3]		4
Electives as needed to meet minimum credit requirements [6]		6
CSCI 4110	Computing Ethics and Social Implications of Computing	1
	Credits	**30**
	Total Credits	**120**

1 MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter this course.

2 See the list of General Education (p. 262) section of the catalog for a full list of courses

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

4 See list of Computer Science electives (p. 644) in Degree Requirement Section. Students are encouraged to consider elective courses that concentrate on a certain topic.

5 **Non-Departmental Requirement: one of the following**

- MATH 1350G Introduction to Statistics
- MATH 2350G Statistical Methods
- A ST 311 Statistical Applications
- STAT 3110 Statistics for Engineers and Scientists
- STAT 4210 Probability: Theory and Applications

6 *Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.*

Students are encouraged to consult with their advisor regarding the possibility of enrolling in the combined BS+MS accelerated program (MAP) in Computer Science.

Computer Science - Bachelor of Arts

The Bachelor of Arts in Computer Science is an open, flexible degree plan that offers the student both a rigorous undergraduate degree program in Computer Science and an extensive open credit hour allotment to pursue knowledge in other domains. It is an excellent choice to combine into a double major program, and is an option for the student who has an interest in learning both domain knowledge in some areas outside of Computer Science, and in acquiring a Computer Science background sufficient to pursue a strong technology career.

Students planning to undertake graduate work in Computer Science are encouraged to pursue the Bachelor of Science degree rather than the Bachelor of Arts degree.

General Requirements Exception

A grade of a least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications [1]		
English Composition - Level 1 [2]		*4*
English Composition - Level 2 [2]		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics [3]		
Choose one from the following:		3-4
MATH 1430G	Applications of Calculus I	
MATH 1511G	Calculus and Analytic Geometry I	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits) [2]		
Area IV: Social & Behavioral Sciences (3 credits) [2]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective [2]		*3-4*
Three of the six Statistics/Applied Statistics course can potentially fulfill this requirement (See below)		
Viewing a Wider World [4]		**6**
Departmental/College Requirements		
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3730	Compilers and Automata Theory	4
CSCI 3710	Software Development	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4980	Senior Project	4
or CSCI 4999	Senior Thesis	
CSCI 4140	Database Management Systems I	3

Computer Science Electives		
List 1:		
Select 6-7 credits from the following: [5]		6-7
CSCI 3790	Algorithm Design & Implementation	
or CSCI 3720	Data Structures and Algorithms	
CSCI 4225	Introduction to Cryptography	
CSCI 4270	Principles of Virtual Reality	
CSCI 4265	Modern Web Technologies	
CSCI 4425	Introduction to Deep Learning	
CSCI 4430	Graph Data Mining	
CSCI 4105	Programming Language Structure I	
CSCI 4230	Architectural Concepts I	
CSCI 4120	Operating Systems I	
CSCI 4405	Artificial Intelligence I	
CSCI 5410	Computer Graphics I	
CSCI 4255	Digital Game Design	
CSCI 4205	Computer Security	
CSCI 4996	Special Topics [6]	
CSCI 4130	Linux System Administration	
CSCI 4260	Visual Programming	
CSCI 4245	Computer Networks I	
CSCI 4250	Human-Centered Computing	
CSCI 4305	Bioinformatics	
CSCI 4420	Applied Machine Learning I	
CSCI 4415	Introduction to Data Mining	
CSCI 4310	Bioinformatics Programming	
CSCI 4215	Parallel Programming	
CSCI 4220	Cloud and Edge Computing	
CSCI 3410	Introduction to Intelligent Agents Using Science Fiction	
CSCI 4235	Cellular Networks and Mobile Computing	
CSCI 4240	Software Reverse Engineering	
CSCI 4435	Text Mining and Natural Language Processing	
CSCI 4440	Generative Artificial Intelligence	
List 2:		
Select 6 credits from the following: [5]		6
CSCI 4225	Introduction to Cryptography	
CSCI 4270	Principles of Virtual Reality	
CSCI 4265	Modern Web Technologies	
CSCI 4425	Introduction to Deep Learning	
CSCI 4430	Graph Data Mining	
CSCI 4405	Artificial Intelligence I	
CSCI 4410	Computer Graphics I	
CSCI 4255	Digital Game Design	
CSCI 4205	Computer Security	
CSCI 4130	Linux System Administration	
CSCI 4996	Special Topics	
CSCI 4260	Visual Programming	
CSCI 4245	Computer Networks I	
CSCI 4250	Human-Centered Computing	
CSCI 4305	Bioinformatics	
CSCI 4420	Applied Machine Learning I	
CSCI 4415	Introduction to Data Mining	
CSCI 4310	Bioinformatics Programming	
CSCI 4215	Parallel Programming	
CSCI 4220	Cloud and Edge Computing	
CSCI 3410	Introduction to Intelligent Agents Using Science Fiction	
CSCI 4235	Cellular Networks and Mobile Computing	
CSCI 4240	Software Reverse Engineering	
CSCI 4435	Text Mining and Natural Language Processing	
CSCI 4440	Generative Artificial Intelligence	
Non-departmental Requirements (in addition to Gen.Ed/VWW)		
Select two upper-division courses in any one department except Computer Science		6-8
Choose one from the following:		3
MATH 1350G	Introduction to Statistics (can count towards General Education Elective requirement)	
MATH 2350G	Statistical Methods (can count towards General Education Elective requirement)	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
A ST 311	Statistical Applications	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 [7]		**19-25**
Select upper division electives to bring total upper division to 48		
Total Credits		**120**

1. Students with Area I transfer credits may sometimes complete this requirement with 9 credits
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. Either MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter either first.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. A course can satisfy only one requirement.
6. Must be taken for 3 credits to count as one course.
7. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts with a major in Computer Science, there is no second language requirement for the degree.

A Suggested Plan of Study For Students

This roadmap assumes student placement in MATH 1220G and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

This roadmap adds the MATH 1511G prerequisites into the plan, MATH 1220G and MATH 1250G will not appear on the requirements tab. Any students who test into MATH 1511G can supplement MATH 1220G and MATH 1250G with elective credits.

Freshman		Credits
CSCI 1110	Computer Science Principles [1]	4
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
MATH 1220G	College Algebra [2]	3
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
CSCI 1720	Computer Science I	4
MATH 1511G or MATH 1430G or MATH 1511H	Calculus and Analytic Geometry I or Applications of Calculus I or Calculus and Analytic Geometry I Honors	4
Area III: Laboratory Science Course [3]		4
Area IV: Social/ Behavioral Sciences Course [3]		3
Electives as needed to meet the minimum credit requirement for financial aid [4]		1-3
	Credits	**30-32**
Sophomore		
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
Area V: Humanities Course [3]		3
Electives Courses as needed to meet minimum credit requirements [4]		5-6
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
Electives as needed to meet the minimum credit requirement for financial aid [4]		3
	Credits	**30-31**
Junior		
CSCI 3730	Compilers and Automata Theory	4
CSCI 3710	Software Development	4
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course [3]		3-4
CSCI elective, List 1 [5]		3
CSCI elective, List 1 [5]		3
Upper division Course from another department		3-4
Viewing a Wider World Course [6]		3
General Education Elective Course [3]		3-4
Select one from the following:		3
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
A ST 311	Statistical Applications	
Electives as needed to meet the minimum credit requirement for financial aid [4]		1
	Credits	**30-33**
Senior		
CSCI 4140	Database Management Systems I	3
CSCI elective, List 1 [5]		3
CSCI elective, List 1 [5]		3
Upper division course from another department		3-4
Viewing a Wider World Course [6]		3
Area VI: Creative and Fine Arts [3]		3
CSCI 4980 or CSCI 4999	Senior Project or Senior Thesis	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
Upper division electives to bring total upper division to 48 [4]		3-7
Electives as needed to meet the minimum credit requirement for financial aid [4]		4-7
	Credits	**30-38**
	Total Credits	**120-134**

1. Required for students who do not pass MATH 1215 Intermediate Algebra or do not pass the CS placement exam and is not counted towards graduation
2. MATH 1511G Calculus and Analytic Geometry I is the starting requirement for this degree but students may need to take MATH 1220G College Algebra and MATH 1511G Calculus and Analytic Geometry I before enrolling in it. If a student tests into MATH 1511G Calculus and Analytic Geometry I then elective credits can replace MATH 1220G College Algebra/MATH 1250G Trigonometry & Pre-Calculus in the roadmap.
3. See the General Education (p. 262) section of the catalog for a full list of courses.
4. Any course offered by the university. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
5. For electives see List 1 or List 2 of Computer Science electives (p. 642) in Degree Requirement Section.
6. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Computer Science - Bachelor of Science

The Bachelor of Science in Computer Science is the traditional undergraduate degree in Computer Science. It is rigorously focused on educating the student in the fundamental disciplines of Computer Science. It prepares the student for any technological field in industry, and also provides the preparation for graduate studies in Computer Science. It is the main undergraduate degree in the Computer Science department, and should be the choice of a single-major Computer Science student. This degree is accredited by the ABET Computing Accreditation Commission (CAC) under the General and Computer Science Program Criteria.

General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students who plan to seek employment immediately after the bachelor level should strongly consider taking one of the concentration area curricula in addition to the general and departmental requirements. An elective course cannot be used for more than two concentrations.

A course that is required for one concentration cannot be used as an elective course of another one.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
Area I: Communications [1]		
English Composition - Level 1 [2]		*4*
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [3]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
Area III: Laboratory Sciences		
Choose two different courses from the following:		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
BIOL 2110L	Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOG 1110G	Physical Geography	
GEOL 1110G	Physical Geology	
HNRS 2116G	Earth, Time and Life	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Area IV: Social/Behavioral Sciences (3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II [3]	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [4]		**6**
Departmental/College Requirements		
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3730	Compilers and Automata Theory	4
CSCI 3710	Software Development	4
CSCI 3720	Data Structures and Algorithms	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4980	Senior Project	4
or CSCI 4999	Senior Thesis	
CSCI 4105	Programming Language Structure I	3
CSCI 4120	Operating Systems I	3
CSCI 4140	Database Management Systems I	3
Select 6 credits from the following: [5]		6
CSCI 4225	Introduction to Cryptography	
CSCI 4270	Principles of Virtual Reality	
CSCI 4265	Modern Web Technologies	
CSCI 4425	Introduction to Deep Learning	
CSCI 4430	Graph Data Mining	
CSCI 4230	Architectural Concepts I	
CSCI 4405	Artificial Intelligence I	
CSCI 4410	Computer Graphics I	
CSCI 4255	Digital Game Design	
CSCI 4205	Computer Security	
CSCI 4996	Special Topics	
CSCI 4130	Linux System Administration	
CSCI 4245	Computer Networks I	
CSCI 4260	Visual Programming	
CSCI 4250	Human-Centered Computing	
CSCI 4305	Bioinformatics	
CSCI 4420	Applied Machine Learning I	
CSCI 4415	Introduction to Data Mining	
CSCI 5310	Bioinformatics Programming	
CSCI 4215	Parallel Programming	
CSCI 4220	Cloud and Edge Computing	
CSCI 4235	Cellular Networks and Mobile Computing	
CSCI 4240	Software Reverse Engineering	
CSCI 4435	Text Mining and Natural Language Processing	
CSCI 4440	Generative Artificial Intelligence	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 2415	Introduction to Linear Algebra	3
or MATH 4230	Applied Linear Algebra	
Select one from the following:		3
MATH 3110	Introduction to Modern Algebra	
MATH 3120	Introduction to Analysis	
MATH 3140	Introduction to Numerical Methods	
MATH 3160	Introduction to Ordinary Differential Equations	
MATH 4320	Logic and Set Theory	
MATH 4330	Elementary Number Theory	
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	

Lab Science Courses		
Select one from the following: [5]		4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
BIOL 2110L	Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Second Language Requirements: (not required)		
Electives, to bring the total credits to 120 [7]		**14**
Students who plan to seek employment immediately after the bachelor level should strongly consider taking one of the concentration area curricula in addition to the general and departmental requirements. [8]		
Total Credits		**120**

1. Students with Area I transfer credits may sometimes complete this requirement with 9 credits
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. A course can satisfy only one requirement.
6. Must be taken for 3 credits to count as a course.
7. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
8. For concentration coursework see,
   - Algorithm Theory (p. 647)
   - Artificial Intelligence (p. 650)
   - Big Data and Data Science (p. 652)
   - Cybersecurity (p. 657)
   - Computer Networking (p. 655)
   - Human Computer Interaction (p. 660)
   - Software Development (p. 665)

Second Language Requirement

For the Bachelor of Science with a major in Computer Science (including all Concentration Areas), there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		**Credits**
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Area IV: Social/ Behavioral Sciences Course [2]		3
Area V: Humanities Course [2]		3
	Credits	**30**
Sophomore		
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3710	Software Development	4
CSCI 3730	Compilers and Automata Theory	4
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
MATH 2415 or MATH 4230	Introduction to Linear Algebra or Applied Linear Algebra	3
Area VI: Creative and Fine Arts [2]		3
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
Elective credits if needed for financial aid requirements [3]		3+
	Credits	**31-34**
Junior		
CSCI 3720	Data Structures and Algorithms	4
CSCI 4105	Programming Language Structure I	3
CSCI 4140	Database Management Systems I	3
Computer Science 4000-level Elective [4]		3
MATH elective (upper division) [5]		3
Lab Science Elective [6]		4
Lab Science Elective [6]		4

Viewing a Wider World [7]		3
Viewing a Wider World [7]		3
Elective credits if needed for financial aid requirements [3]		3
	Credits	**33**
Senior		
CSCI 4980 or CSCI 4999	Senior Project or Senior Thesis	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4120	Operating Systems I	3
Lab Science Elective [6]		4
Computer Science 4000-level Elective [4]		3
Upper division electives to bring total upper division to 48 [3]		4
Electives as needed to meet minimum credit requirements [3]		7
	Credits	**26**
	Total Credits	**120-123**

1 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

2 See the General Education (p. 262) section of the catalog for a full list of courses

3 Students who plan to graduate with a concentration need to complete the specific requirements for the chosen concentration.
Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

4 See list of Computer Science electives (p. 644) in Degree Requirement Section.

5 **Math Electives:**
- MATH 3110 Introduction to Modern Algebra
- MATH 3120 Introduction to Analysis
- MATH 3140 Introduction to Numerical Methods
- MATH 3160 Introduction to Ordinary Differential Equations
- MATH 4320 Logic and Set Theory
- MATH 4330 Elementary Number Theory

6 See list of Lab Science (p. 644) courses in the Degree Requirement Section.

7 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

Students planning to undertake graduate work in computer science are encouraged to consult with their advisor regarding the possibility of taking other computer science electives to satisfy their departmental requirements or to consider the combined BS+MS accelerated program (MAP).

Computer Science (Algorithm Theory) - Bachelor of Science

The Bachelor of Science in Computer Science is the traditional undergraduate degree in Computer Science. It is rigorously focused on educating the student in the fundamental disciplines of Computer Science. It prepares the student for any technological field in industry, and also provides the preparation for graduate studies in Computer Science. It is the main undergraduate degree in the Computer Science department, and should be the choice of a single-major Computer Science student. This degree is accredited by the ABET Computing Accreditation Commission (CAC) under the General and Computer Science Program Criteria.

General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students who plan to seek employment at the bachelor level are advised to take one of the concentration area curricula in addition to the general and departmental requirements. An elective course cannot be used for more than two focuses. A course that is required for one concentration cannot be used as an elective course of another one.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
Area I: Communications [1]		
English Composition - Level 1 [2]		*4*
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [3]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
Area III: Laboratory Sciences		
Choose two different courses from the following:		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	

GEOG 1110G	Physical Geography	
GEOL 1110G	Physical Geology	
HNRS 2116G	Earth, Time and Life	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Area IV: Social/Behavioral Sciences (3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II [3]	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [4]		**6**
Departmental/College Requirements		
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3730	Compilers and Automata Theory	4
CSCI 3710	Software Development	4
CSCI 3720	Data Structures and Algorithms	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4980	Senior Project	4
or CSCI 4999	Senior Thesis	
CSCI 4105	Programming Language Structure I	3
CSCI 4120	Operating Systems I	3
CSCI 4140	Database Management Systems I	3
Select 6 credits from the following: [5]		6
CSCI 4225	Introduction to Cryptography	
CSCI 4270	Principles of Virtual Reality	
CSCI 4265	Modern Web Technologies	
CSCI 4425	Introduction to Deep Learning	
CSCI 4430	Graph Data Mining	
CSCI 4230	Architectural Concepts I	
CSCI 4405	Artificial Intelligence I	
CSCI 4410	Computer Graphics I	
CSCI 4255	Digital Game Design	
CSCI 4205	Computer Security	
CSCI 4996	Special Topics	
CSCI 4130	Linux System Administration	
CSCI 4260	Visual Programming	
CSCI 4245	Computer Networks I	
CSCI 4250	Human-Centered Computing	
CSCI 4305	Bioinformatics	
CSCI 4420	Applied Machine Learning I	
CSCI 4415	Introduction to Data Mining	
CSCI 4310	Bioinformatics Programming	
CSCI 4215	Parallel Programming	
CSCI 4220	Cloud and Edge Computing	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 2415	Introduction to Linear Algebra	3
or MATH 4230	Applied Linear Algebra	
Select one from the following:		3
MATH 3110	Introduction to Modern Algebra	
MATH 3120	Introduction to Analysis	
MATH 3140	Introduction to Numerical Methods	
MATH 3160	Introduction to Ordinary Differential Equations	
MATH 4320	Logic and Set Theory	
MATH 4330	Elementary Number Theory	
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
Lab Science Courses		
Select one from the following: [5]		4
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Second Language Requirements: (not required)		
Electives, to bring the total credits to 120 [7]		**14**
The specific requirements for the concentration in Algorithm Theory are as follows:		
Select 3-4 credits from the following:		
CSCI 3720	Data Structures and Algorithms	
CSCI 3790	Algorithm Design & Implementation	
Select 9 credits from the following:		
CSCI 4405	Artificial Intelligence I	
CSCI 4410	Computer Graphics I	
CSCI 4420	Applied Machine Learning I	
CSCI 4415	Introduction to Data Mining	
Total Credits		**120**

1. Students with Area I transfer credits may sometimes complete this requirement with 9 credits
2. See the General Education (p. 262) section of the catalog for a full list of courses

[3] MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.

[4] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

[5] A course can satisfy only one requirement.

[6] Must be taken for 3 credits to count as a course.

[7] Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Area IV: Social/ Behavioral Sciences Course [2]		3
Area V: Humanities Course [2]		3
	Credits	**30**
Sophomore		
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3730	Compilers and Automata Theory	4
CSCI 3720	Data Structures and Algorithms	4
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
MATH 2415 or MATH 4230	Introduction to Linear Algebra or Applied Linear Algebra	3
Area VI: Creative and Fine Arts [2]		3
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
Elective credits if needed for financial aid requirements [3]		3+
	Credits	**31-34**
Junior		
CSCI 3710	Software Development	4
CSCI 4105	Programming Language Structure I	3
CSCI 4140	Database Management Systems I	3
Computer Science 4000-level Elective [4]		3
MATH elective (upper division) [5]		3
Lab Science Elective [6]		4
Lab Science Elective [6]		4
Viewing a Wider World [7]		3
Viewing a Wider World [7]		3
Elective credits if needed for financial aid requirements [3]		3
	Credits	**33**
Senior		
CSCI 4980 or CSCI 4999	Senior Project or Senior Thesis	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4120	Operating Systems I	3
Lab Science Elective [6]		4
Computer Science 4000-level Elective [4]		3
Upper division electives to bring total upper division to 48 [3]		4
Electives as needed to meet minimum credit requirements [3]		7
	Credits	**26**
	Total Credits	**120-123**

[1] MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

[2] See the General Education (p. 266) section of the catalog for a full list of courses

[3] Students who plan to graduate with a concentration need to complete the specific requirements for the chosen concentration.
Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

[4] See list of Computer Science electives (p. 647) in Degree Requirement Section.

[5] **Math Electives:**

- MATH 3110 Introduction to Modern Algebra
- MATH 3120 Introduction to Analysis
- MATH 3140 Introduction to Numerical Methods
- MATH 3160 Introduction to Ordinary Differential Equations
- MATH 4320 Logic and Set Theory
- MATH 4330 Elementary Number Theory

[6] See list of Lab Science (p. 647) courses in the Degree Requirement Section.

[7] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

Students planning to undertake graduate work in computer science are encouraged to consult with their advisor regarding the possibility of taking other computer science electives to satisfy their departmental requirements.

Computer Science (Artificial Intelligence) - Bachelor of Science

The Bachelor of Science in Computer Science is the traditional undergraduate degree in Computer Science. It is rigorously focused on educating the student in the fundamental disciplines of Computer Science. It prepares the student for any technological field in industry, and also provides the preparation for graduate studies in Computer Science. It is the main undergraduate degree in the Computer Science department, and should be the choice of a single-major Computer Science student. This degree is accredited by the ABET Computing Accreditation Commission (CAC) under the General and Computer Science Program Criteria.

General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students who plan to seek employment at the bachelor level are advised to take one of the concentration area curricula in addition to the general and departmental requirements. An elective course cannot be used for more than two focuses. A course that is required for one concentration cannot be used as an elective course of another one.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
Area I: Communications [1]		
English Composition - Level 1 [2]		*4*
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [3]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
Area III: Laboratory Sciences		
Choose two different courses from the following:		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOG 1110G	Physical Geography	
GEOL 1110G	Physical Geology	
HNRS 2116G	Earth, Time and Life	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Area IV: Social/Behavioral Sciences (3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II [3]	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [4]		**6**
Departmental/College Requirements		
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3730	Compilers and Automata Theory	4
CSCI 3710	Software Development	4
CSCI 3720	Data Structures and Algorithms	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4980	Senior Project	4
or CSCI 4999	Senior Thesis	
CSCI 4105	Programming Language Structure I	3
CSCI 4120	Operating Systems I	3
CSCI 4140	Database Management Systems I	3
Select 6 credits from the following: [5]		6
CSCI 4225	Introduction to Cryptography	
CSCI 4270	Principles of Virtual Reality	
CSCI 4265	Modern Web Technologies	
CSCI 4425	Introduction to Deep Learning	
CSCI 4430	Graph Data Mining	
CSCI 4230	Architectural Concepts I	
CSCI 4405	Artificial Intelligence I	
CSCI 4410	Computer Graphics I	
CSCI 4255	Digital Game Design	
CSCI 4205	Computer Security	
CSCI 4996	Special Topics [6]	
CSCI 4130	Linux System Administration	

CSCI 4260	Visual Programming	
CSCI 4245	Computer Networks I	
CSCI 4250	Human-Centered Computing	
CSCI 4305	Bioinformatics	
CSCI 4420	Applied Machine Learning I	
CSCI 4415	Introduction to Data Mining	
CSCI 4310	Bioinformatics Programming	
CSCI 4215	Parallel Programming	
CSCI 4220	Cloud and Edge Computing	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 2415	Introduction to Linear Algebra	3
or MATH 4230	Applied Linear Algebra	
Select one from the following:		3
MATH 3110	Introduction to Modern Algebra	
MATH 3120	Introduction to Analysis	
MATH 3140	Introduction to Numerical Methods	
MATH 3160	Introduction to Ordinary Differential Equations	
MATH 4320	Logic and Set Theory	
MATH 4330	Elementary Number Theory	
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
Lab Science Courses		
Select one from the following: [5]		4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Second Language Requirements: (not required)		
Electives, to bring the total credits to 120 [7]		**14**
The specific requirements for the concentration in Artificial Intelligence are as follows:		
Select 3-4 credits from the following:		
CSCI 3790	Algorithm Design & Implementation	
CSCI 3720	Data Structures and Algorithms	
Select 9 credits from the following:		
CSCI 4405	Artificial Intelligence I	
CSCI 4420	Applied Machine Learning I	
CSCI 4415	Introduction to Data Mining	
Total Credits		**120**

1. Students with Area I transfer credits may sometimes complete this requirement with 9 credits
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. A course can satisfy only one requirement.
6. Must be taken for 3 credits to count as a course.
7. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G and ENGL 1110G . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		**Credits**
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Area IV: Social/ Behavioral Sciences Course [2]		3
Area V: Humanities Course [2]		3
	Credits	**30**
Sophomore		
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3730	Compilers and Automata Theory	4
CSCI 3720	Data Structures and Algorithms	4
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
MATH 2415 or MATH 4230	Introduction to Linear Algebra or Applied Linear Algebra	3
Area VI: Creative and Fine Arts [2]		3
Select one from the following:		3
A ST 311	Statistical Applications	

STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
Elective credits if needed for financial aid requirements [3]		3+
	Credits	**31-34**
Junior		
CSCI 3710	Software Development	4
CSCI 4105	Programming Language Structure I	3
CSCI 4140	Database Management Systems I	3
Computer Science 4000-level Elective [4]		3
MATH elective (upper division) [5]		3
Lab Science Elective [6]		4
Lab Science Elective [6]		4
Viewing a Wider World [7]		3
Viewing a Wider World [7]		3
Elective credits if needed for financial aid requirements [3]		3
	Credits	**33**
Senior		
CSCI 4980 or CSCI 4999	Senior Project or Senior Thesis	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4120	Operating Systems I	3
Lab Science Elective [6]		4
Computer Science 4000-level Elective [4]		3
Upper division electives to bring total upper division to 48 [3]		4
Electives as needed to meet minimum credit requirements [3]		7
	Credits	**26**
	Total Credits	**120-123**

1. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. Students who plan to graduate with a concentration need to complete the specific requirements for the chosen concentration.
   Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
4. See list of Computer Science electives (p. 650) in Degree Requirement Section.
5. **Math Electives:**
   - MATH 3110 Introduction to Modern Algebra
   - MATH 3120 Introduction to Analysis
   - MATH 3140 Introduction to Numerical Methods
   - MATH 3160 Introduction to Ordinary Differential Equations
   - MATH 4320 Logic and Set Theory
   - MATH 4330 Elementary Number Theory
6. See list of Lab Science (p. 650) courses in the Degree Requirement Section.
7. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

Students planning to undertake graduate work in computer science are encouraged to consult with their advisor regarding the possibility of taking other computer science electives to satisfy their departmental requirements.

Computer Science (Big Data and Data Science) - Bachelor of Science

The Bachelor of Science in Computer Science is the traditional undergraduate degree in Computer Science. It is rigorously focused on educating the student in the fundamental disciplines of Computer Science. It prepares the student for any technological field in industry, and also provides the preparation for graduate studies in Computer Science. It is the main undergraduate degree in the Computer Science department, and should be the choice of a single-major Computer Science student. This degree is accredited by the ABET Computing Accreditation Commission (CAC) under the General and Computer Science Program Criteria.

General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students who plan to seek employment at the bachelor level are advised to take one of the concentration area curricula in addition to the general and departmental requirements. An elective course cannot be used for more than two focuses. A course that is required for one concentration cannot be used as an elective course of another one.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
Area I: Communications [1]		
English Composition - Level 1 [2]		*4*
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
or ENGL 2210M	Professional and Technical Communication for Multilingual Students	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [3]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*

Area III: Laboratory Sciences		
Choose two different courses from the following:		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOL 1110G	Physical Geology	
GEOG 1110G	Physical Geography	
HNRS 2116G	Earth, Time and Life	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Area IV: Social/Behavioral Sciences (3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II [3]	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [4]		**6**
Departmental/College Requirements		
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3730	Compilers and Automata Theory	4
CSCI 3710	Software Development	4
CSCI 3720	Data Structures and Algorithms	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4980	Senior Project	4
or CSCI 4999	Senior Thesis	
CSCI 4105	Programming Language Structure I	3
CSCI 4120	Operating Systems I	3
CSCI 4140	Database Management Systems I	3
Select 6 credits from the following: [5]		6
CSCI 4225	Introduction to Cryptography	
CSCI 4270	Principles of Virtual Reality	
CSCI 4265	Modern Web Technologies	
CSCI 4425	Introduction to Deep Learning	
CSCI 4430	Graph Data Mining	
CSCI 4230	Architectural Concepts I	
CSCI 4405	Artificial Intelligence I	
CSCI 4410	Computer Graphics I	
CSCI 4255	Digital Game Design	
CSCI 4205	Computer Security	
CSCI 4996	Special Topics [6]	
CSCI 4130	Linux System Administration	
CSCI 4260	Visual Programming	
CSCI 4245	Computer Networks I	
CSCI 4250	Human-Centered Computing	
CSCI 4305	Bioinformatics	
CSCI 4420	Applied Machine Learning I	
CSCI 4415	Introduction to Data Mining	
CSCI 4310	Bioinformatics Programming	
CSCI 4215	Parallel Programming	
CSCI 4220	Cloud and Edge Computing	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 2415	Introduction to Linear Algebra	3
or MATH 4230	Applied Linear Algebra	
Select one from the following:		3
MATH 3110	Introduction to Modern Algebra	
MATH 3120	Introduction to Analysis	
MATH 3140	Introduction to Numerical Methods	
MATH 3160	Introduction to Ordinary Differential Equations	
MATH 4320	Logic and Set Theory	
MATH 4330	Elementary Number Theory	
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
Lab Science Courses		
Select one from the following: [5]		4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Second Language Requirements: (not required)		
Electives, to bring the total credits to 120 [7]		**14**
The specific requirements for the concentration in Big Data and Data Science are as follows:		
CSCI 3710	Software Development (required)	
Select 9 credits from the following:		

CSCI 4405	Artificial Intelligence I	
CSCI 4415	Introduction to Data Mining	
CSCI 4250	Human-Centered Computing	
CSCI 4420	Applied Machine Learning I	
Total Credits		**120**

1. Students with Area I transfer credits may sometimes complete this requirement with 9 credits
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. A course can satisfy only one requirement.
6. Must be taken for 3 credits to count as a course.
7. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G and ENGL 1110G . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		**Credits**
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Area IV: Social/ Behavioral Sciences Course [2]		3
Area V: Humanities Course [2]		3
	Credits	**30**
Sophomore		
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3730	Compilers and Automata Theory	4
CSCI 3720	Data Structures and Algorithms	4
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
MATH 2415 or MATH 4230	Introduction to Linear Algebra or Applied Linear Algebra	3
Area VI: Creative and Fine Arts [2]		3
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
Elective credits if needed for financial aid requirements [3]		3+
	Credits	**31-34**
Junior		
CSCI 3710	Software Development	4
CSCI 4105	Programming Language Structure I	3
CSCI 4140	Database Management Systems I	3
Computer Science 4000-level Elective [4]		3
MATH elective (upper division) [5]		3
Lab Science Elective [6]		4
Lab Science Elective [6]		4
Viewing a Wider World [7]		3
Viewing a Wider World [7]		3
Elective credits if needed for financial aid requirements [3]		3
	Credits	**33**
Senior		
CSCI 4980 or CSCI 4999	Senior Project or Senior Thesis	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4120	Operating Systems I	3
Lab Science Elective [6]		4
Computer Science 4000-level Elective [4]		3
Upper division electives to bring total upper division to 48 [3]		4
Electives as needed to meet minimum credit requirements [3]		7
	Credits	**26**
	Total Credits	**120-123**

1. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1521G first.
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. Students who plan to graduate with a concentration need to complete the specific requirements for the chosen concentration.
   Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
4. See list of Computer Science electives (p. 652) in Degree Requirement Section.
5. **Math Electives:**
   - MATH 3110 Introduction to Modern Algebra
   - MATH 3120 Introduction to Analysis
   - MATH 3140 Introduction to Numerical Methods
   - MATH 3160 Introduction to Ordinary Differential Equations
   - MATH 4320 Logic and Set Theory
   - MATH 4330 Elementary Number Theory
6. See list of Lab Science (p. 652) courses in the Degree Requirement Section.

[7] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

Students planning to undertake graduate work in computer science are encouraged to consult with their advisor regarding the possibility of taking other computer science electives to satisfy their departmental requirements.

Computer Science (Computer Networking) - Bachelor of Science

The Bachelor of Science in Computer Science is the traditional undergraduate degree in Computer Science. It is rigorously focused on educating the student in the fundamental disciplines of Computer Science. It prepares the student for any technological field in industry, and also provides the preparation for graduate studies in Computer Science. It is the main undergraduate degree in the Computer Science department, and should be the choice of a single-major Computer Science student. This degree is accredited by the ABET Computing Accreditation Commission (CAC) under the General and Computer Science Program Criteria.

General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students who plan to seek employment at the bachelor level are advised to take one of the concentration area curricula in addition to the general and departmental requirements. An elective course cannot be used for more than two focuses. A course that is required for one concentration cannot be used as an elective course of another one.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
Area I: Communications [1]		
English Composition - Level 1 [2]		*4*
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
or ENGL 2210M	Professional and Technical Communication for Multilingual Students	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [3]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
Area III: Laboratory Sciences		
Choose two different courses from the following:		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOG 1110G	Physical Geography	
GEOL 1110G	Physical Geology	
HNRS 2116G	Earth, Time and Life	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Area IV: Social/Behavioral Sciences (3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II [3]	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [4]		**6**
Departmental/College Requirements		
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3730	Compilers and Automata Theory	4
CSCI 3710	Software Development	4
CSCI 3720	Data Structures and Algorithms	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4980	Senior Project	4
or CSCI 4999	Senior Thesis	
CSCI 4105	Programming Language Structure I	3
CSCI 4120	Operating Systems I	3
CSCI 4140	Database Management Systems I	3
Select 6 credits from the following: [5]		6
CSCI 4225	Introduction to Cryptography	
CSCI 4265	Modern Web Technologies	
CSCI 4425	Introduction to Deep Learning	
CSCI 4430	Graph Data Mining	
CSCI 4270	Principles of Virtual Reality	

CSCI 4230	Architectural Concepts I	
CSCI 4405	Artificial Intelligence I	
CSCI 4410	Computer Graphics I	
CSCI 4255	Digital Game Design	
CSCI 4205	Computer Security	
CSCI 4996	Special Topics [6]	
CSCI 4130	Linux System Administration	
CSCI 4260	Visual Programming	
CSCI 4245	Computer Networks I	
CSCI 4250	Human-Centered Computing	
CSCI 4305	Bioinformatics	
CSCI 4415	Introduction to Data Mining	
CSCI 4310	Bioinformatics Programming	
CSCI 4420	Applied Machine Learning I	
CSCI 4215	Parallel Programming	
CSCI 4220	Cloud and Edge Computing	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 2415	Introduction to Linear Algebra	3
or MATH 4230	Applied Linear Algebra	
Select one from the following:		3
MATH 3110	Introduction to Modern Algebra	
MATH 3120	Introduction to Analysis	
MATH 3140	Introduction to Numerical Methods	
MATH 3160	Introduction to Ordinary Differential Equations	
MATH 4320	Logic and Set Theory	
MATH 4330	Elementary Number Theory	
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
Lab Science Courses		
Select one from the following: [5]		4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Second Language Requirements: (not required)		
Electives, to bring the total credits to 120 [7]		**14**

The specific requirements for the concentration in Computer Networking are as follows:

CSCI 4245	Computer Networks I (required)	
CSCI 4220	Cloud and Edge Computing (required)	
Select 6 credits from the following:		
CSCI 4265	Modern Web Technologies	
CSCI 4230	Architectural Concepts I	
CSCI 4205	Computer Security	
CSCI 4130	Linux System Administration	
CSCI 4215	Parallel Programming	
Total Credits		**120**

1. Students with Area I transfer credits may sometimes complete this requirement with 9 credits
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. A course can satisfy only one requirement.
6. Must be taken for 3 credits to count as a course.
7. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G and ENGL 1110G . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		**Credits**
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Area IV: Social/ Behavioral Sciences Course [2]		3
Area V: Humanities Course [2]		3
	Credits	**30**
Sophomore		
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3730	Compilers and Automata Theory	4
CSCI 3720	Data Structures and Algorithms	4

COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
MATH 2415 or MATH 4230	Introduction to Linear Algebra or Applied Linear Algebra	3
Area VI: Creative and Fine Arts [2]		3
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
Elective credits if needed for financial aid requirements [3]		3+
	Credits	**31-34**
Junior		
CSCI 3710	Software Development	4
CSCI 4105	Programming Language Structure I	3
CSCI 4140	Database Management Systems I	3
Computer Science 4000-level Elective [4]		3
MATH elective (upper division) [5]		3
Lab Science Elective [6]		4
Lab Science Elective [6]		4
Viewing a Wider World [7]		3
Viewing a Wider World [7]		3
Elective credits if needed for financial aid requirements [3]		3
	Credits	**33**
Senior		
CSCI 4980 or CSCI 4999	Senior Project or Senior Thesis	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4120	Operating Systems I	3
Lab Science Elective [6]		4
Computer Science 4000-level Elective [4]		3
Upper division electives to bring total upper division to 48 [3]		4
Electives as needed to meet minimum credit requirements [3]		7
	Credits	**26**
	Total Credits	**120-123**

1. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. Students who plan to graduate with a concentration needs to complete the specific requirements for the chosen concentration.
   Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
4. See list of Computer Science electives (p. 655) in Degree Requirement Section.
5. **Math Electives:**
   - MATH 3110 Introduction to Modern Algebra
   - MATH 3120 Introduction to Analysis
   - MATH 3140 Introduction to Numerical Methods
   - MATH 3160 Introduction to Ordinary Differential Equations
   - MATH 4320 Logic and Set Theory
   - MATH 4330 Elementary Number Theory
6. See list of Lab Science (p. 655) courses in the Degree Requirement Section.
7. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

Students planning to undertake graduate work in computer science are encouraged to consult with their advisor regarding the possibility of taking other computer science electives to satisfy their departmental requirements.

Computer Science (Cybersecurity) - Bachelor of Science

The Bachelor of Science in Computer Science is the traditional undergraduate degree in Computer Science. It is rigorously focused on educating the student in the fundamental disciplines of Computer Science. It prepares the student for any technological field in industry, and also provides the preparation for graduate studies in Computer Science. It is the main undergraduate degree in the Computer Science department, and should be the choice of a single-major Computer Science student. This degree is accredited by the ABET Computing Accreditation Commission (CAC) under the General and Computer Science Program Criteria.

General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students who plan to seek employment at the bachelor level are advised to take one of the concentration area curricula in addition to the general and departmental requirements. An elective course cannot be used for more than two focuses. A course that is required for one concentration cannot be used as an elective course of another one.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
Area I: Communications [1]		
English Composition - Level 1 [2]		*4*
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
or ENGL 2210M	Professional and Technical Communication for Multilingual Students	

Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [3]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
Area III: Laboratory Sciences		
Choose two different courses from the following:		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
BIOL 2110L	Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOG 1110G	Physical Geography	
GEOL 1110G	Physical Geology	
HNRS 2116G	Earth, Time and Life	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Area IV: Social/Behavioral Sciences (3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II [3]	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [4]		**6**
Departmental/College Requirements		
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3730	Compilers and Automata Theory	4
CSCI 3710	Software Development	4
CSCI 3720	Data Structures and Algorithms	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4980	Senior Project	4
or CSCI 4999	Senior Thesis	
CSCI 4105	Programming Language Structure I	3
CSCI 4120	Operating Systems I	3
CSCI 4140	Database Management Systems I	3
Select 6 credits from the following: [5]		6
CSCI 4225	Introduction to Cryptography	
CSCI 4270	Principles of Virtual Reality	
CSCI 4265	Modern Web Technologies	
CSCI 4425	Introduction to Deep Learning	
CSCI 4430	Graph Data Mining	
CSCI 4230	Architectural Concepts I	
CSCI 4405	Artificial Intelligence I	
CSCI 4410	Computer Graphics I	
CSCI 4255	Digital Game Design	
CSCI 4205	Computer Security	
CSCI 4996	Special Topics [6]	
CSCI 4130	Linux System Administration	
CSCI 4260	Visual Programming	
CSCI 4245	Computer Networks I	
CSCI 4250	Human-Centered Computing	
CSCI 4305	Bioinformatics	
CSCI 4420	Applied Machine Learning I	
CSCI 4415	Introduction to Data Mining	
CSCI 4310	Bioinformatics Programming	
CSCI 4215	Parallel Programming	
CSCI 4220	Cloud and Edge Computing	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 2415	Introduction to Linear Algebra	3
or MATH 4230	Applied Linear Algebra	
Select one from the following:		3
MATH 3110	Introduction to Modern Algebra	
MATH 3120	Introduction to Analysis	
MATH 3140	Introduction to Numerical Methods	
MATH 3160	Introduction to Ordinary Differential Equations	
MATH 4320	Logic and Set Theory	
MATH 4330	Elementary Number Theory	
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
Lab Science Courses		
Select one from the following: [5]		4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
BIOL 2110L	Principles of Biology: Cellular and Molecular Biology Laboratory	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	

PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Second Language Requirements: (not required)		
Electives, to bring the total credits to 120 [7]		**14**
The specific requirements for the concentration in Cybersecurity are as follows: [8]		
CSCI 4205	Computer Security (require)	
CSCI 4245	Computer Networks I (require)	
CSCI 4225	Introduction to Cryptography	
Choose 6 credits from the following:		
CSCI 4225	Introduction to Cryptography	
CSCI 4230	Architectural Concepts I	
CSCI 4250	Human-Centered Computing	
CSCI 4220	Cloud and Edge Computing	
Total Credits		**120**

1. Students with Area I transfer credits may sometimes complete this requirement with 9 credits
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. A course can satisfy only one requirement.
6. Must be taken for 3 credits to count as a course.
7. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		**Credits**
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Area IV: Social/ Behavioral Sciences Course [2]		3
Area V: Humanities Course [2]		3
	Credits	**30**
Sophomore		
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3730	Compilers and Automata Theory	4
CSCI 3720	Data Structures and Algorithms	4
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
MATH 2415 or MATH 4230	Introduction to Linear Algebra or Applied Linear Algebra	3
Area VI: Creative and Fine Arts [2]		3
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
Elective credits if needed for financial aid requirements [3]		3+
	Credits	**31-34**
Junior		
CSCI 3710	Software Development	4
CSCI 4105	Programming Language Structure I	3
CSCI 4140	Database Management Systems I	3
Computer Science 4000-level Elective [4]		3
MATH elective (upper division) [5]		3
Lab Science Elective [6]		4
Lab Science Elective [6]		4
Viewing a Wider World [7]		3
Viewing a Wider World [7]		3
Elective credits if needed for financial aid requirements [3]		3
	Credits	**33**
Senior		
CSCI 4980 or CSCI 4999	Senior Project or Senior Thesis	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4120	Operating Systems I	3
Lab Science Elective [6]		4
Computer Science 4000-level Elective [4]		3
Upper division electives to bring total upper division to 48 [3]		4
Electives as needed to meet minimum credit requirements [3]		7
	Credits	**26**
	Total Credits	**120-123**

1. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. Students who plan to graduate with a concentration need to complete the specific requirements for the chosen concentration.
Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students

may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

[4] See list of Computer Science electives (p. 657) in Degree Requirement Section.

[5] **Math Electives:**

- MATH 3110 Introduction to Modern Algebra
- MATH 3120 Introduction to Analysis
- MATH 3140 Introduction to Numerical Methods
- MATH 3160 Introduction to Ordinary Differential Equations
- MATH 4320 Logic and Set Theory
- MATH 4330 Elementary Number Theory

[6] See list of Lab Science (p. 657) courses in the Degree Requirement Section.

[7] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

Students planning to undertake graduate work in computer science are encouraged to consult with their advisor regarding the possibility of taking other computer science electives to satisfy their departmental requirements.

Computer Science (Human Computer Interaction) - Bachelor of Science

The Bachelor of Science in Computer Science is the traditional undergraduate degree in Computer Science. It is rigorously focused on educating the student in the fundamental disciplines of Computer Science. It prepares the student for any technological field in industry, and also provides the preparation for graduate studies in Computer Science. It is the main undergraduate degree in the Computer Science department, and should be the choice of a single-major Computer Science student. This degree is accredited by the ABET Computing Accreditation Commission (CAC) under the General and Computer Science Program Criteria.

General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students who plan to seek employment at the bachelor level are advised to take one of the concentration area curricula in addition to the general and departmental requirements. An elective course cannot be used for more than two focuses. A course that is required for one concentration cannot be used as an elective course of another one.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
Area I: Communications [1]		
English Composition - Level 1 [2]		*4*
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
or ENGL 2210M	Professional and Technical Communication for Multilingual Students	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [3]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
Area III: Laboratory Sciences		
Choose two different courses from the following:		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOG 1110G	Physical Geography	
GEOL 1110G	Physical Geology	
HNRS 2116G	Earth, Time and Life	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Area IV: Social/Behavioral Sciences (3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II [3]	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [4]		**6**
Departmental/College Requirements		
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3730	Compilers and Automata Theory	4

CSCI 3710	Software Development	4
CSCI 3720	Data Structures and Algorithms	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4980	Senior Project	4
or CSCI 4999	Senior Thesis	
CSCI 4105	Programming Language Structure I	3
CSCI 4140	Database Management Systems I	3
CSCI 4120	Operating Systems I	3
Select 6 credits from the following: [5]		6
CSCI 4225	Introduction to Cryptography	
CSCI 4270	Principles of Virtual Reality	
CSCI 4265	Modern Web Technologies	
CSCI 4425	Introduction to Deep Learning	
CSCI 4430	Graph Data Mining	
CSCI 4425	Introduction to Deep Learning	
CSCI 4230	Architectural Concepts I	
CSCI 4405	Artificial Intelligence I	
CSCI 4410	Computer Graphics I	
CSCI 4255	Digital Game Design	
CSCI 4205	Computer Security	
CSCI 4996	Special Topics [6]	
CSCI 4130	Linux System Administration	
CSCI 4260	Visual Programming	
CSCI 4245	Computer Networks I	
CSCI 4250	Human-Centered Computing	
CSCI 4305	Bioinformatics	
CSCI 4420	Applied Machine Learning I	
CSCI 4415	Introduction to Data Mining	
CSCI 4310	Bioinformatics Programming	
CSCI 4215	Parallel Programming	
CSCI 4220	Cloud and Edge Computing	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 2415	Introduction to Linear Algebra	3
or MATH 4230	Applied Linear Algebra	
Select one from the following:		3
MATH 3110	Introduction to Modern Algebra	
MATH 3120	Introduction to Analysis	
MATH 3140	Introduction to Numerical Methods	
MATH 3160	Introduction to Ordinary Differential Equations	
MATH 4320	Logic and Set Theory	
MATH 4330	Elementary Number Theory	
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
Lab Science Courses		
Select one from the following: [5]		4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Second Language Requirements: (not required)		
Electives, to bring the total credits to 120 [7]		**14**
The specific requirements for the concentration in Human Computer Interaction are as follows:		
CSCI 3710	Software Development	
CSCI 4250	Human-Centered Computing (required)	
Select 6 credits from the following:		
CSCI 4255	Digital Game Design	
CSCI 4260	Visual Programming	
CSCI 4410	Computer Graphics I	
Total Credits		**120**

1. Students with Area I transfer credits may sometimes complete this requirement with 9 credits
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. A course can satisfy only one requirement.
6. Must be taken for 3 credits to count as a course.
7. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4

ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Area IV: Social/ Behavioral Sciences Course [2]		3
Area V: Humanities Course [2]		3
	Credits	**30**
Sophomore		
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3730	Compilers and Automata Theory	4
CSCI 3720	Data Structures and Algorithms	4
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
MATH 2415 or MATH 4230	Introduction to Linear Algebra or Applied Linear Algebra	3
Area VI: Creative and Fine Arts [2]		3
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
Elective credits if needed for financial aid requirements [3]		3+
	Credits	**31-34**
Junior		
CSCI 3710	Software Development	0-4
CSCI 4105	Programming Language Structure I	3
CSCI 4140	Database Management Systems I	3
Computer Science 4000-level Elective [4]		3
MATH elective (upper division) [5]		3
Lab Science Elective [6]		4
Lab Science Elective [6]		4
Viewing a Wider World [7]		3
Viewing a Wider World [7]		3
Elective credits if needed for financial aid requirements [3]		3
	Credits	**29-33**
Senior		
CSCI 4980 or CSCI 4999	Senior Project or Senior Thesis	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4120	Operating Systems I	3
Lab Science Elective [6]		4
Computer Science 4000-level Elective [4]		3
Upper division electives to bring total upper division to 48 [3]		4
Electives as needed to meet minimum credit requirements [3]		7
	Credits	**26**
	Total Credits	**116-123**

1. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. Students who plan to graduate with a concentration need to complete the specific requirements for the chosen concentration.
   Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
4. See list of Computer Science electives (p. 660) in Degree Requirement Section.
5. **Math Electives:**
   - MATH 3110 Introduction to Modern Algebra
   - MATH 3120 Introduction to Analysis
   - MATH 3140 Introduction to Numerical Methods
   - MATH 3160 Introduction to Ordinary Differential Equations
   - MATH 4320 Logic and Set Theory
   - MATH 4330 Elementary Number Theory
6. See list of Lab Science (p. 660) courses in the Degree Requirement Section.
7. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

Students planning to undertake graduate work in computer science are encouraged to consult with their advisor regarding the possibility of taking other computer science electives to satisfy their departmental requirements.

Computer Science (Secondary Education) - Bachelor of Arts

The Bachelor of Arts in Computer Science is an open, flexible degree plan that offers the student both a rigorous undergraduate degree program in Computer Science and an extensive open credit hour allotment to pursue knowledge in other domains. It is an excellent choice to combine into a double major program, and is an option for the student who has an interest in learning both domain knowledge in some areas outside of Computer Science, and in acquiring a Computer Science background sufficient to pursue a strong technology career.

Students planning to undertake graduate work in Computer Science are encouraged to pursue the Bachelor of Science degree rather than the Bachelor of Arts degree.

General Requirements Exception

A grade of a least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U (except for EDUC 4820 Secondary Student Teaching which is graded as S/U).

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or

elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications [1]		
English Composition - Level 1 [2]		*4*
English Composition - Level 2 [2]		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics [3]		
Choose one from the following:		3-4
MATH 1430G	Applications of Calculus I	
MATH 1511G	Calculus and Analytic Geometry I	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits) [2]		
Area IV: Social & Behavioral Sciences (3 credits) [2]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective [2]		*3-4*
Three of the six Statistics/Applied Statistics course can potentially fulfill this requirement (See below)		
Viewing a Wider World [4]		**3**
Departmental/College Requirements		
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3730	Compilers and Automata Theory	4
CSCI 3710	Software Development	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4980	Senior Project	4
CSCI 4140	Database Management Systems I	3
Computer Science Electives		
List 1:		
Select 6-7 credits from the following: [5]		6-7
CSCI 3790	Algorithm Design & Implementation	
or CSCI 3720	Data Structures and Algorithms	
CSCI 4225	Introduction to Cryptography	
CSCI 4270	Principles of Virtual Reality	
CSCI 4265	Modern Web Technologies	
CSCI 4425	Introduction to Deep Learning	
CSCI 4430	Graph Data Mining	
CSCI 4105	Programming Language Structure I	
CSCI 4230	Architectural Concepts I	
CSCI 4120	Operating Systems I	
CSCI 4405	Artificial Intelligence I	
CSCI 4410	Computer Graphics I	
CSCI 4255	Digital Game Design	
CSCI 4205	Computer Security	
CSCI 4996	Special Topics [6]	
CSCI 4130	Linux System Administration	
CSCI 4260	Visual Programming	
CSCI 4245	Computer Networks I	
CSCI 4250	Human-Centered Computing	
CSCI 4305	Bioinformatics	
CSCI 4420	Applied Machine Learning I	
CSCI 4415	Introduction to Data Mining	
CSCI 4310	Bioinformatics Programming	
CSCI 4215	Parallel Programming	
CSCI 4220	Cloud and Edge Computing	
List 2:		
Select 6 credits from the following: [5]		6
CSCI 4225	Introduction to Cryptography	
CSCI 4270	Principles of Virtual Reality	
CSCI 4265	Modern Web Technologies	
CSCI 4430	Graph Data Mining	
CSCI 4425	Introduction to Deep Learning	
CSCI 4996	Special Topics	
CSCI 4205	Computer Security	
CSCI 4255	Digital Game Design	
CSCI 4410	Computer Graphics I	
CSCI 4405	Artificial Intelligence I	
CSCI 4130	Linux System Administration	
CSCI 4245	Computer Networks I	
CSCI 4250	Human-Centered Computing	
CSCI 4260	Visual Programming	
CSCI 4305	Bioinformatics	
CSCI 4420	Applied Machine Learning I	
CSCI 4415	Introduction to Data Mining	
CSCI 4310	Bioinformatics Programming	
CSCI 4215	Parallel Programming	
CSCI 4220	Cloud and Edge Computing	
Non-departmental Requirements (in addition to Gen.Ed/VWW)		
Choose one from the following:		3
MATH 1350G	Introduction to Statistics (can count towards General Education Elective requirement)	
MATH 2350G	Statistical Methods (can count towards General Education Elective requirement)	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
A ST 311	Statistical Applications	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 [7]		**7-3**
Select upper division electives to bring total upper division to 48		
Requirements for Secondary Education		**27**
EDUC 3120	Multicultural Education	
EDUC 3997	Secondary Field Experience	
EDUC 4420	Teaching Mathematics at the Middle and High School Level [8]	
EDUC 4820	Secondary Student Teaching [9]	
EDUC 4821	Middle and High School Student Teaching Seminar [9]	
READ 4330	Content Area Literacy [8]	

SPED 3105	Introduction to Special Education in a Diverse Society	
Total Credits		**120**

1. Students with Area I transfer credits may sometimes complete this requirement with 9 credits
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. Either MATH 1430G Applications of Calculus I or MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter either first.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses. 3 credits of VWW can be met using the upper division rule for the EDUC classes.
5. A course can satisfy only one requirement.
6. Must be taken for 3 credits to count as one course.
7. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
8. Requires admittance into the Teacher Education Program TEP.
9. Requires admittance into Student Teaching STEP.

Second Language Requirement

For the Bachelor of Arts with a major in Computer Science, there is no second language requirement for the degree.

A Suggested Plan of Study For Students

This roadmap assumes student placement in MATH 1220G and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

This roadmap adds the MATH 1511G prerequisites into the plan, MATH 1220G and MATH 1250G will not appear on the requirements tab. Any students who test into MATH 1511G Calculus and Analytic Geometry I can supplement MATH 1220G College Algebra and MATH 1250G Trigonometry & Pre-Calculus with elective credits.

Freshman		**Credits**
CSCI 1110	Computer Science Principles [1]	4
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
MATH 1220G	College Algebra [2]	3
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
CSCI 1720	Computer Science I	4
MATH 1511G or MATH 1430G or MATH 1511H	Calculus and Analytic Geometry I or Applications of Calculus I or Calculus and Analytic Geometry I Honors	4
Area III: Laboratory Science Course [3]		4
Area IV: Social/ Behavioral Sciences Course [3]		3
Electives as needed to meet the minimum credit requirement for financial aid [4]		1-3
	Credits	**30-32**
Sophomore		
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
Area V: Humanities Course [3]		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
EDUC 3120	Multicultural Education	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Area 6: Create and Fine Arts		3
	Credits	**31**
Junior		
CSCI 3730	Compilers and Automata Theory	4
CSCI 3710	Software Development	4
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course [3]		3-4
CSCI elective, List 1/2 [5]		3
CSCI elective, List 1/2 [5]		3
General Education Elective Course [3]		3-4
EDUC 3997	Secondary Field Experience	3
READ 4330	Content Area Literacy [6]	3
Select one from the following:		3
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
A ST 311	Statistical Applications	
Electives as needed to meet the minimum credit requirement for financial aid [4]		1
	Credits	**30-32**
Senior		
CSCI 4140	Database Management Systems I	3
CSCI elective, List 1/2 [5]		3
CSCI elective, List 1/2 [5]		3
Viewing a Wider World Course [7]		3
EDUC 4420	Teaching Mathematics at the Middle and High School Level [6]	3
EDUC 4820	Secondary Student Teaching [8]	9
EDUC 4821	Middle and High School Student Teaching Seminar [8]	3
CSCI 4980 or CSCI 4999	Senior Project or Senior Thesis	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
	Credits	**32**
	Total Credits	**123-127**

1. Required for students who do not pass MATH 1215 Intermediate Algebra or do not pass the CS placement exam and is not counted towards graduation
2. MATH 1511G Calculus and Analytic Geometry I is the starting requirement for this degree but students may need to take MATH 1220G College Algebra and MATH 1511G Calculus and Analytic

Geometry I before enrolling in it. If a student tests into MATH 1511G Calculus and Analytic Geometry I then elective credits can replace MATH 1220G College Algebra/MATH 1250G Trigonometry & Pre-Calculus in the roadmap.

3 See the General Education (p. 262) section of the catalog for a full list of courses.

4 Any course offered by the university. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

5 For electives see List 1 or List 2 of Computer Science electives (p. 642) in Degree Requirement Section.

6 Requires admittance into the Teacher Education Program TEP.

7 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

8 Requires admittance into Student Teaching STEP.

Computer Science (Software Development) - Bachelor of Science

The Bachelor of Science in Computer Science is the traditional undergraduate degree in Computer Science. It is rigorously focused on educating the student in the fundamental disciplines of Computer Science. It prepares the student for any technological field in industry, and also provides the preparation for graduate studies in Computer Science. It is the main undergraduate degree in the Computer Science department, and should be the choice of a single-major Computer Science student. This degree is accredited by the ABET Computing Accreditation Commission (CAC) under the General and Computer Science Program Criteria.

General Requirements Exception

A grade of at least C- must be earned in each of the courses taken to satisfy the departmental and non-departmental requirements. No course may be counted as satisfying both a departmental and a non-departmental requirement. No course taken to satisfy either a departmental or a non-departmental requirement may be taken S/U.

Requirements

Students who plan to seek employment at the bachelor level are advised to take one of the concentration area curricula in addition to the general and departmental requirements. An elective course cannot be used for more than two focuses. A course that is required for one concentration cannot be used as an elective course of another one.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
Area I: Communications [1]		
English Composition - Level 1 [2]		*4*
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [3]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
Area III: Laboratory Sciences		
Choose two different courses from the following:		
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOG 1110G	Physical Geography	
GEOL 1110G	Physical Geology	
HNRS 2116G	Earth, Time and Life	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Area IV: Social/Behavioral Sciences (3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II [3]	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [4]		**6**
Departmental/College Requirements		
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3730	Compilers and Automata Theory	4
CSCI 3710	Software Development	4
CSCI 3720	Data Structures and Algorithms	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4980	Senior Project	4
or CSCI 4999	Senior Thesis	

CSCI 4105	Programming Language Structure I	3
CSCI 4120	Operating Systems I	3
CSCI 4140	Database Management Systems I	3
Select 6 credits from the following: [5]		6
CSCI 4225	Introduction to Cryptography	
CSCI 4270	Principles of Virtual Reality	
CSCI 4265	Modern Web Technologies	
CSCI 4425	Introduction to Deep Learning	
CSCI 4430	Graph Data Mining	
CSCI 4230	Architectural Concepts I	
CSCI 4405	Artificial Intelligence I	
CSCI 4410	Computer Graphics I	
CSCI 4255	Digital Game Design	
CSCI 4205	Computer Security	
CSCI 4996	Special Topics [6]	
CSCI 4130	Linux System Administration	
CSCI 4260	Visual Programming	
CSCI 4245	Computer Networks I	
CSCI 4250	Human-Centered Computing	
CSCI 4420	Applied Machine Learning I	
CSCI 4305	Bioinformatics	
CSCI 4415	Introduction to Data Mining	
CSCI 4310	Bioinformatics Programming	
CSCI 4215	Parallel Programming	
CSCI 4220	Cloud and Edge Computing	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 2415	Introduction to Linear Algebra	3
or MATH 4230	Applied Linear Algebra	
Select one from the following:		3
MATH 3110	Introduction to Modern Algebra	
MATH 3120	Introduction to Analysis	
MATH 3140	Introduction to Numerical Methods	
MATH 3160	Introduction to Ordinary Differential Equations	
MATH 4320	Logic and Set Theory	
MATH 4330	Elementary Number Theory	
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
Lab Science Courses		
Select one from the following: [5]		4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Second Language Requirements: (not required)		
Electives, to bring the total credits to 120 [7]		**14**
The specific requirements for the concentration in Software Egngieering are as follows:		
CSCI 3710	Software Development (required)	
Select 9 credits from the following list:		
CSCI 4265	Modern Web Technologies	
CSCI 4410	Computer Graphics I	
CSCI 4205	Computer Security	
CSCI 4130	Linux System Administration	
CSCI 4245	Computer Networks I	
CSCI 4250	Human-Centered Computing	
CSCI 4215	Parallel Programming	
Total Credits		**120**

1. Students with Area I transfer credits may sometimes complete this requirement with 9 credits
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. MATH 1511G Calculus and Analytic Geometry I and MATH 1511G Calculus and Analytic Geometry I are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. A course can satisfy only one requirement.
6. Must be taken for 3 credits to count as a course.
7. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
CSCI 1720	Computer Science I	4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4

MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Area IV: Social/ Behavioral Sciences Course [2]		3
Area V: Humanities Course [2]		3
	Credits	**30**
Sophomore		
CSCI 2230	Assembly Language and Machine Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3730	Compilers and Automata Theory	4
CSCI 3720	Data Structures and Algorithms	4
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
MATH 2415 or MATH 4230	Introduction to Linear Algebra or Applied Linear Algebra	3
Area VI: Creative and Fine Arts [2]		3
Select one from the following:		3
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
Elective credits if needed for financial aid requirements [3]		3+
	Credits	**31-34**
Junior		
CSCI 3710	Software Development	4
CSCI 4105	Programming Language Structure I	3
CSCI 4140	Database Management Systems I	3
Computer Science 4000-level Elective [4]		3
MATH elective (upper division) [5]		3
Lab Science Elective [6]		4
Lab Science Elective [6]		4
Viewing a Wider World [7]		3
Viewing a Wider World [7]		3
Elective credits if needed for financial aid requirements [3]		3
	Credits	**33**
Senior		
CSCI 4980 or CSCI 4999	Senior Project or Senior Thesis	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4120	Operating Systems I	3
Lab Science Elective [6]		4
Computer Science 4000-level Elective [4]		3
Upper division electives to bring total upper division to 48 [3]		4
Electives as needed to meet minimum credit requirements [3]		7
	Credits	**26**
	Total Credits	**120-123**

1. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1521G first.
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. Students who plan to graduate with a concentration need to complete the specific requirements for the chosen concentration.

Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

4. See list of Computer Science electives (p. 665) in Degree Requirement Section.
5. **Math Electives:**
   - MATH 3110 Introduction to Modern Algebra
   - MATH 3120 Introduction to Analysis
   - MATH 3140 Introduction to Numerical Methods
   - MATH 3160 Introduction to Ordinary Differential Equations
   - MATH 4320 Logic and Set Theory
   - MATH 4330 Elementary Number Theory
6. See list of Lab Science (p. 665) courses in the Degree Requirement Section.
7. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

Students planning to undertake graduate work in computer science are encouraged to consult with their advisor regarding the possibility of taking other computer science electives to satisfy their departmental requirements.

Cybersecurity - Bachelor of Science

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications [1]		
English Composition - Level 1 [2]		*4*
English Composition - Level 2 [2]		*3*
Oral Communication		*3*
Area II: Mathematics [3]		
Choose one from the following:		3-4
MATH 1430G	Applications of Calculus I	
MATH 1511G	Calculus and Analytic Geometry I	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
Area III: Laboratory Sciences Course (8 credits) [2]		
Area IV: Social & Behavioral Sciences (3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [4]		**6**
Departmental/College Requirements		
Choose one sequence from the following:		7-8

CSCI 1720 & CSCI 2210	Computer Science I and Object-Oriented Programming	
CSCI 1210 & CSCI 2210	Computer Programming Fundamentals and Object-Oriented Programming	
CSCI 2220	Introduction to Data Structures and Algorithms	4
CSCI 2230	Assembly Language and Machine Organization	4
or E E 212	Introduction to Computer Organization	
CSCI 2310	Discrete Mathematics for Computer Science	4
CSCI 3710	Software Development	4
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4120	Operating Systems I	3
CSCI 4130	Linux System Administration	3
CSCI 4140	Database Management Systems I	3
CSCI 4205	Computer Security	3
CSCI 4206	Hardware Security	3
CSCI 4225	Introduction to Cryptography	3
CSCI 4235	Cellular Networks and Mobile Computing [5]	3
or E E 490	Selected Topics	
CSCI 4240	Software Reverse Engineering	3
CSCI 4245	Computer Networks I	3
Choose one from the following:		3
E E 200	Linear Algebra, Probability and Statistics Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
CJUS 412	Introduction to Security Technology and Loss Prevention	3
BCIS 482	Management of Information Security	3
ICT 339	Introduction to Digital Forensics and Incident Response	3
CSCI 4220	Cloud and Edge Computing	3
CSCI 4980	Senior Project	4
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 [6]		**10**
Select upper division electives to bring total upper division to 48		
Total Credits		**120-122**

1. Students with Area I transfer credits may sometimes complete this requirement with 9 credits
2. See the General Education (p. 262) section of the catalog for a full list of courses, excluding CSCI 1115G Modern Computing in Practice
3. Either MATH 1511G Calculus and Analytic Geometry I or MATH 1430G Applications of Calculus I are required for the degree but students may need to take any prerequisites needed to enter MATH 1511G or MATH 1521G first.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. Can be replaced with E E 490 Selected Topics.
6. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study For Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
Choose one from the following: [1]		3-4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I or Calculus and Analytic Geometry I Honors	
MATH 1430G	Applications of Calculus I	
Area III: Laboratory Science Course [2]		4
Area IV: Social/Behavioral Sciences Course [2]		3
	Credits	**14-15**
Semester 2		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
CSCI 1720	Computer Science I	4
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Area V: Humanities Course [2]		3
	Credits	**17**
Second Year		
Semester 1		
Area VI: Creative and Fine Arts Course [2]		3
Area III: Laboratory Sciences Course [2]		4
CSCI 2210	Object-Oriented Programming	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
	Credits	**15**
Semester 2		
VWW [3,5]		3
CSCI 2230 or E E 212	Assembly Language and Machine Organization or Introduction to Computer Organization	4
CSCI 2310	Discrete Mathematics for Computer Science	4
Choose one from the following:		3
E E 200	Linear Algebra, Probability and Statistics Applications	
STAT 3110	Statistics for Engineers and Scientists	
STAT 4210	Probability: Theory and Applications	
	Credits	**14**

Third Year		
Semester 1		
Viewing a Wider World Course [3]		3
CSCI 3710	Software Development	4
BCIS 482	Management of Information Security	3
CSCI 4235	Cellular Networks and Mobile Computing	3
CSCI 4220	Cloud and Edge Computing (Recommended)	3
	Credits	**16**
Semester 2		
Viewing a Wider World Course [3]		3
CSCI 4205	Computer Security	3
CJUS 412	Introduction to Security Technology and Loss Prevention	3
CSCI 4240	Software Reverse Engineering	3
Elective Course [4]		3
	Credits	**15**
Fourth Year		
Semester 1		
CSCI 4120	Operating Systems I	3
CSCI 4140	Database Management Systems I	3
CSCI 4130	Linux System Administration	3
ICT 339	Introduction to Digital Forensics and Incident Response	3
Elective Course [4]		3
	Credits	**15**
Semester 2		
CSCI 4110	Computing Ethics and Social Implications of Computing	1
CSCI 4206	Hardware Security	3
CSCI 4225	Introduction to Cryptography	3
CSCI 4245	Computer Networks I	3
CSCI 4980	Senior Project	4
	Credits	**14**
	Total Credits	**120-121**

1 MATH 1511G Calculus and Analytic Geometry I or MATH 1430G Applications of Calculus I is the starting requirement for this degree but students may need to take prerequisites before enrolling.
**If a student tests into MATH 1521G Calculus and Analytic Geometry II then elective credits can replace this requirement in the roadmap.*

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 Any course offered by the university. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

5 Students need to fill in one credit to meet the requirement of 15 credit hours.

Algorithm Theory - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
CSCI 1720	Computer Science I	0,4
CSCI 2210	Object-Oriented Programming	0,4
CSCI 2220	Introduction to Data Structures and Algorithms	0,4
CSCI 3720	Data Structures and Algorithms	0,4
Select 3-4 credits from the following:		3-4
CSCI 2310	Discrete Mathematics for Computer Science	
MATH 1531	Introduction to Higher Mathematics	
Select 6-7 credits from the following:		6-7
CSCI 3730	Compilers and Automata Theory	
CSCI 4405	Artificial Intelligence I	
CSCI 4410	Computer Graphics I	
MATH 3140	Introduction to Numerical Methods	
MATH 4320	Logic and Set Theory	
Total Credits		**12-27**

Bioinformatics - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
CSCI 1720	Computer Science I	0,4
CSCI 2220	Introduction to Data Structures and Algorithms	0,4
CSCI 3710	Software Development	0,4
CSCI 4305	Bioinformatics	3
CSCI 4310	Bioinformatics Programming	3
Select one from the following:		3
CSCI 4140	Database Management Systems I	
CSCI 4215	Parallel Programming	
BIOL 305	Principles of Genetics	
CHEM 433	Physical Chemistry I	
MATH 3110	Introduction to Modern Algebra	
PHYS 315	Modern Physics	
Total Credits		**13-25**

Computer Systems - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
CSCI 1720	Computer Science I	0,4
CSCI 2210	Object-Oriented Programming	0,4
CSCI 2220	Introduction to Data Structures and Algorithms	0,4
CSCI 2230	Assembly Language and Machine Organization	0,4
CSCI 3730	Compilers and Automata Theory	0,4
or CSCI 3710	Software Development	
CSCI 4230	Architectural Concepts I	3
or CSCI 4120	Operating Systems I	

Select one from the following:		3
CSCI 4410	Computer Graphics I	
CSCI 4140	Database Management Systems I	
CSCI 4245	Computer Networks I	
CSCI 4130	Linux System Administration	
CSCI 4215	Parallel Programming	

Software Development - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
CSCI 1720	Computer Science I	0,4
CSCI 2210	Object-Oriented Programming	0,4
CSCI 2220	Introduction to Data Structures and Algorithms	0,4
CSCI 3710	Software Development	0,4
Select 6-7 credits from the following:		6-7
CSCI 3730	Compilers and Automata Theory	
CSCI 4405	Artificial Intelligence I	
CSCI 4410	Computer Graphics I	
CSCI 4105	Programming Language Structure I	
CSCI 4120	Operating Systems I	
CSCI 4140	Database Management Systems I	
CSCI 4245	Computer Networks I	
CSCI 4250	Human-Centered Computing	
CSCI 4215	Parallel Programming	

Creative Media

Undergraduate Program Information

New Mexico State University's Creative Media Institute (CMI) prepares students to become digital storytellers using state of the art, industry-standard tools. The Creative Media Institute is dedicated to developing and nurturing the artistic endeavors of student filmmakers through industry-standard education, research and collaboration in the art, craft and production of the moving image through storytelling, resulting in a Bachelor of Creative Media degree. The program provides learning opportunities for newly admitted NMSU students, and provides some credit transfer opportunities for students with an associate degree from a NMSU community college or other two-year degree granting institution. The Bachelor of Creative Media provides a liberal arts background enabling students to pursue further education, professional training or employment in the digital media-based industry. Study in the CMI program fosters collaborative expression based on a clear understanding of media culture, history, design and practice. CMI also offers students the opportunity for internships in digital video, animation, visualization and simulation, industrial and educational video at varied production facilities on and off campus.

Theory and practice are integrated at every step as students manipulate text, sound and images using industry-standard technology. CMI houses a state of the art digital projection system screening room, post-production lab, animation lab, production space, motion capture laboratory and THX sound mixing theatre.

Due to limited capacity, new students wishing to continue in the CMI program after their freshman year are required to complete an application process. Transfer students from other institutions, including NMSU Community Colleges, must complete the application process. Transfer students should contact an Academic Advisor from the College of Arts and Sciences Advising Office for information about joining one of the two degree programs offered in CMI. Space is limited and varies each year. The quality of the student's work as demonstrated in the application and prior course work are additional criteria of the admission decision. Exact details and procedures for applying to the CMI program can be found on the CMI website at: cmi.nmsu.edu (http://cmi.nmsu.edu).

Graduate Program Information

The MFA Creative Writing Program is housed in the Creative Media Institute.

The Master of Fine Arts Degree in Creative Writing is a 3-year program. Students choose a major genre: poetry or fiction, though classes in nonfiction, writing, screenwriting and others are offered. Students must complete 54 hours of graduate-level course work, submit a creative writing thesis, give a public reading from the thesis, and pass an oral examination.

Our mission is to emphasize the creation and critical analysis of literature, so that our students can be part of the national conversation about writing, graduating with a publishable manuscript. By providing our students with a set of skills, we prepare them to contribute to their communities as writers, publishing professionals and teachers.

Creative Writing - Master of Fine Arts

Students pursuing the MFA in Creative Writing devote themselves to concentrated study and development of a chosen genre: poetry or fiction. Students

- complete 54 hours of graduate-level coursework,
- participate and pass (as of Fall 27) in a third-semester review,
- present a book-length thesis of original work with an introduction or afterward,
- perform a public reading from the thesis, and
- pass an oral examination in the final semester.

All MFA courses are restricted to students accepted into the MFA program.

Students wishing to apply to the MFA should consult application information on the **Graduate School website**. Applications are due by February 1 for Fall admission to the MFA.

Support in the form of a Graduate Assistantships is awarded through a competitive selection process; this application is folded into the application for admission and should be submitted by the February 1 deadline. All Graduate Assistantships in Creative Writing begin in the Fall semester.

Degrees for the Department

Bachelors Degree(s)

- Animation and Visual Effects (2D Production Studio) - Bachelor of Creative Media (p. 687)
- Animation and Visual Effects (3D & VFX Production Studio) - Bachelor of Creative Media (p. 688)
- Digital Film Making - Bachelor of Creative Media (p. 690)

Master Degree(s)

- Creative Writing - Master of Fine Arts (p. 139)

Minors for the Department

Currently, the Animation and Visual Effects and Digital Filmmaking minors are closed to any students outside of the major. The minor in Creative Writing is open to all majors.

- Animation and Visual Effects (2D Production Studio) - Bachelor of Creative Media (p. 687)
- Animation and Visual Effects (3D & VFX Production Studio) - Bachelor of Creative Media (p. 688)
- Animation and Visual Effects - Undergraduate Minor (p. 691)
- Creative Writing - Undergraduate Minor (p. 692)
- Digital Film Making - Undergraduate Minor (p. 692)

Department Head, Amy Lanasa

Professors Greenfield, Lanasa, Lapid, Lau, Voisine; ***Associate Professors*** Fowler, Hobson, Marks; ***Assistant Professors*** Chase, Krumrie, Yapyapan; ***College Associate Professors*** Bakshi; ***College Assistant Professors*** Corral, Nirmalakhandan, Santiago, Shrage, Swander

Film & Digital Media Courses

FDMA 1120. Desktop Publishing
3 Credits (2+2P)
This course is designed to teach introductory skills for designing and creating publications and presentations with layout software. The course will focus on graphics and typographic design, fonts, and other skills for print and web publishing.
Learning Outcomes
1. Demonstrate knowledge of fundamental features and navigation of desktop publishing software.
2. Combine text and images for effective communication.
3. Develop a balanced composition through use of color, contrast, and alignment.
4. Place images within a composition and wrap around text.
5. Produce documents with professional layout and typography skills.
6. Create attractive and effective designs.
7. Combine knowledge of typography, images, and design principles to produce professional print and web media.
8. Create or add to a professional design portfolio for future use.

FDMA 1210. Digital Video Production I
3 Credits (2+4P)
An introduction to digital video production. Students learn camera operation, lights and audio equipment. Hands-on production is completed in the studio and on location.
Learning Outcomes
1. Plan and produce a digital video project
2. Apply post-production workflow
3. Work in team and as individual to complete digital video projects.

FDMA 1220. Introduction to Digital Video Editing
3 Credits (3)
In this course, students learn the basics of the post-production process for non-linear video editing. Students work with multiple video formats and create short movies for multiple distribution platforms. Skills include media management and professional terminology. Sections on the Main Campus will be restricted to CMI students.
Learning Outcomes
1. Define concepts related to digital video editing.
2. Use non-linear video editing software for editing a short film
3. Enhance storytelling through the use of continuity, timing, cutaways, intercutting, compositing, transitioning, jump cutting, montaging and animating.
4. Use text, titles, transitions, video effects, sound effects, dialogue, and visual assets for digital video editing.

FDMA 1360. Web Design I
3 Credits (2+2P)
This course provides an introduction to web development techniques, theory, and design. Students will learn HTML, CSS application, and strategies for effective site navigation and design, along with industry standard web editing software to develop various websites. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): ARTS 1520 OR FDMA 1515.
Learning Outcomes
1. Acquire and utilize web design terminology.
2. Create basic web pages using HTML.
3. Demonstrate how to use industry-standard, web editing software.
4. Design professional pages that are easy to navigate and quick to load.
5. Develop a basic comprehension of CSS
6. Prepare and export a variety of graphics to be used online.
7. Compare and contrast designing for web media vs. print media.
8. Analyze the importance of web presence in today's business/social climate

FDMA 1410. Audio Production I
3 Credits (2+2P)
Students will learn about and apply essential tools and techniques in analog and digital audio production. Topics include acoustic science, microphones, recording and mixing techniques, analog and digital audio hardware and software, including, multi-track, computer-based recording and editing systems. Restricted to: Community Colleges only. May be repeated up to 3 credits.
Learning Outcomes
1. Apply tools and techniques in analog and digital audio production
2. Illustrate the fundamentals of acoustic science.
3. Model professional behavior used in audio recording.

FDMA 1415. Principles of Sound
3 Credits (2+2P)
The creation of a professional quality original media soundtrack is possible for relatively low production/post production cost. This class is designed to give the student and overview of creating sound for a variety of digital media. Topics include acoustic principles, sound design, audio hardware, recording techniques; and editing, processing, and multi-track mixing, using software applications. Restricted to: Community Colleges only.
Prerequisite(s)/Corequisite(s): FDMA 1220.
Learning Outcomes
1. Record and edit wild sound effects and synced dialogue
2. Discover, upload, and edit on-linemusic, ambience and sound effect loops
3. Implement audio design theories

4. Create an aesthetic soundtrack which incorporates multiple elements and dimensions
5. Design, edit, process, mix and master a synced multi-track soundtrack
6. Demonstrate capable use of digital audio production and post-production workflow
7. Produce short audio projects which meet media industry technical standards

FDMA 1510. Introduction to 3D Animation
3 Credits (3)
This course provides an overview of 3D animation production processes. Students will be introduced to basic story development and the creation of computer-generated assets and cinematic sequences. The course will survey specialty areas of digital animation and various software and techniques applied in entertainment and information media. Students will review and critique other's animation, as well as plan and produce original animation for review by classmates and as part of a CGI demo reel.
Prerequisite(s): FDMA 2382 or FDMA 2381 or consent of instructor.
Learning Outcomes
1. Demonstrate a fundamental understanding of 3D animation history and principles.
2. Analyze animation work of other artists.
3. Appropriately utilize the various media technologies for digital 3D animation.
4. Demonstrate and apply basic techniques of digital 3D animation.
5. Demonstrate and apply basic processes of creating CGI for a narrative. 6 .Apply some basic strategies for developing and creating a story visually, and create original animations.
6. Present original animations to instructor and classmates for critique.
7. Create a CGI demo reel of work completed during the course.

FDMA 1515. Introduction to Digital Image Editing - Photoshop
3 Credits (2+2P)
In this course, students will learn how to use the tools in Adobe Photoshop to create new images and edit existing images. Tools used will include selections, layers, and adjustments, among other pixel editing tools. Basic composition and output will be emphasized in all projects. May be repeated for a maximum of 6 credits.
Learning Outcomes
1. Make and refine selections
2. Adjust color and tone in an image
3. Eliminate unwanted objects in an image
4. Apply layers to organize and create effects
5. Create brushes, styles and vector shapes
6. Prepare image for print and screen output
7. Apply masking and layers to non-destructively edit an image
8. Effectively utilize blending modes and layer styles 1
9. Apply adjustment layers 1
10. Apply design principles including typography

FDMA 1531. Evolution of Electronic Games
3 Credits (2+2P)
Focus on the evolution of video games and how they have shaped mainstream entertainment. May be repeated up to 6 credits.
Learning Outcomes
1. Analyze the historical development of video games from early arcade machines to modern consoles and mobile platforms.
2. Evaluate the impact of technological advancements on video game design, graphics, and gameplay mechanics.
3. Identify key milestones, influential games, creators, and major companies that shaped the video game industry.
4. Examine how video games have influenced and been influenced by other forms of media and popular culture.
5. Assess the social, cultural, and economic impacts of video games as they evolved into a mainstream form of entertainment.
6. Discuss current trends and predict future directions in video game development and the gaming industry.

FDMA 1535. Introduction to Illustrator
3 Credits (2+2P)
Students receive instruction on vector graphics creation using vector illustration software. The students will create professional-quality artwork for print publishing and multimedia graphics. Instruction includes creating and manipulating basic shapes, drawing with the pen tool, using various brushes, working with type and preparing graphics for web, print, and digital publication. May be repeated for a maximum of 6 credits.
Learning Outcomes
1. Apply a variety of shape blending options
2. Create and apply new gradients
3. Apply Gradient Meshes and Envelopes
4. Create symbols, brushes and vector shapes
5. Apply Pathfinder and other effects
6. Effectively utilize the pen tool to draw and edit shapes
7. Effectively utilize Vector tools
8. Prepare image for print and screen output
9. Apply clipping masks 1
10. Prepare image for use in another program 1
11. Apply design principles including typography

FDMA 1536. Advanced Computer Illustration
3 Credits (2+2P)
Advanced techniques in 2D vector drawing and fundamentals of 3D illustration for use in print, web, and multimedia applications. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): FDMA 1535.
Learning Outcomes
1. Demonstrate proficiency in using advanced features of Illustrator.
2. Identify and create different illustrator/art styles using advanced techniques for shading, perspective, light, reflection.
3. Produce high quality digital imagery incorporating basic principles of composition.
4. Create a series of illustrations demonstrating a design competency in layout foundation and illustrative moods or client/project based solutions.
5. Create high quality portfolio pieces that demonstrate an advanced knowledge of design, composition and Illustrator techniques.
6. The students will produce finished printed portfolio pieces demonstrating a comprehensive knowledge of typographical, design, illustrative and layout skills

FDMA 1545. Introduction to Photography & Digital Imaging
3 Credits (2+2P)
This course is a study of the principles and techniques of photography using digital equipment, and discusses how digital cameras, imaging editing, and technology have changed the world of photography. Students

will learn about studies in resolution, lighting, software, editing, printing, and web applications. They will gain fundamental knowledge in the rapidly expanding technology of photography and imaging, and be able to incorporate the knowledge into all areas of digital graphics.

Learning Outcomes

1. Exhibit proper usage of the principles and techniques of photography using digital equipment.
2. Utilize features and techniques of a digital camera with proper use of lenses, settings, and flashes.
3. Create photo collections that represent proper use of technical skills.
4. Demonstrate proficiency in planning, lighting, capturing, and distributing photographic projects which show ability to create photographs artistically and to tell a story or express an idea.
5. Utilize appropriate software to create original projects.
6. Demonstrate knowledge in post-production of photos as to sizing, sampling, resolution, and exporting.
7. Produce original projects which respect intellectual property of others.
8. Create a digital portfolio of work completed during the course.

FDMA 1555. Introduction to the Creative Media Industry
3 Credits (3)

This class is an introductory course for students who are beginning their understanding of Media and how it affects them and our society. It offers a broad-stroked view of the entire industry including Marketing, Production, History, Jobs, Design, Architecture, New Media Literacy, and industry standards. Students will listen to experts in the field, get involved in open discussions about the industry and use new information to complete hands-on individual & group assignments.

Learning Outcomes

1. The basic philosophies and methods that guide people working in the Creative Media industry.
2. Knowledge of a wide variety of different jobs, qualifications and paradigms used in the industry.
3. Marketing, Production, Budgets, History, New Media, Inspiration and other aspects of the industry.
4. An accurate view of the Creative Media field.

FDMA 1630. Principles of Design
3 Credits (2+2P)

This course will explore how we see and use visuals to communicate information. Students will develop critical thinking skills in applying concepts of basic design principles. Students will apply the concepts with hands-on and analysis assignments. These concepts will then be applied to design for advertising, print, digital media, and web design. The business of design will also be covered with emphasis on client relations and networking Restricted to: Community Colleges only. Prerequisite(s): FDMA 1535

Learning Outcomes

1. Practice Creativity
2. Plan a Design project
3. Demonstrate the effective use of Emphasis Contrast
4. Demonstrate the effective use of Balance and Alignment
5. Demonstrate the effective use of Harmony and Repetition
6. Demonstrate the effective use of Flow, Movement, and Rhythm
7. Demonstrate the effective use of Simplicity and Economy
8. Effectively apply basic color theory
9. Demonstrate the effective use of Typography principles 1
10. Apply design principles to Screen Print Projects 1
11. Develop client relations

FDMA 1710. 2D Animation
3 Credits (2+2P)

Concepts and techniques in storyboarding and creating interactive 2D animations for web, multimedia and video.

Prerequisite(s): FDMA 1535.

Learning Outcomes

1. Be able to correctly storyboard an animation scene
2. Define and demonstrate basic animation terminology and principles.
3. Produce a complete hand drawn animation using industry standard software and processes.

FDMA 1715. 2-D Compositing & FX
3 Credits (3)

This course will familiarize students with the process of compositing and creating special effects for animation using industry standard software. Students will learn how to assemble an animated scene and use advanced 3D lighting, spacing, and digital effects to achieve a dynamic, professionally rendered look.

Prerequisite: FDMA 2710.

Learning Outcomes

1. The goal of this class is for students to learn how to use advanced compositing and effects tools in order to achieve a more dynamic and professional visual look for their animations or motion graphics.
2. By the end of the class, you should be proficient animation compositors that can assemble and synthesize a basic animation into a rendered, visually sophisticated piece.
3. Students who pass this class will have a basic to intermediate knowledge of Adobe After Effects

FDMA 1720. 3-D Character Design
3 Credits (2+4P)

Focus on designing a character and then taking that design and building it in 3D using intermediate modeling techniques. May be repeated for a maximum of 6 credits.

Prerequisite(s): FDMA 1510 or FDMA 2530.

Learning Outcomes

1. Translate concept art into a low and high resolution 3D model using proper modeling techniques
2. Use Polygon modeling techniques to create a 3D character
3. Layout UVs and utilize Adobe Photoshop to texture a model.

FDMA 1996. Selected Topics
1-4 Credits (1-4)

Specific titles to be announced in the Schedule of Classes. May be repeated for a maximum of 18 credits. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Varies

FDMA 2120. Film Crew I/ Introduction to Film and Media Workflow
9 Credits (9)

An introduction to the film industry. This class teaches film production processes, film crew hierarchy, film production set-safety and etiquette and provides hands-on training in industry standard film production equipment. Students complete the semester by participating as a below-the-line crew member on a short film. Restricted to: Community Colleges only.

Learning Outcomes

1. Explain film production processes; Interpret call sheets and deal memos, model basic on-set protocols and professional behavior
2. Assist producers and directors in completing a professional film project
3. Work effectively in production crew positions in a group environment.
4. Recognize and articulate specific film production structure, from original concept to final release

FDMA 2125. Film Crew II
9 Credits (9)
The second course designed to train students to become working members of film crews. It will be taught by working film professionals. Content will be lecture and hands-on. Students complete the semester by working as part of an actual film crew as below-the-line and above-the-line crew members. Restricted to: Community Colleges only.
Prerequisite(s): FDMA 2120.
Learning Outcomes

1. Understand film production processes used to produce a film
2. Manage craft area job functions
3. Model on-set protocols and professional behaviors
4. Assist producers and directors in completing a professional film project

FDMA 2144. Pre-production Management
3 Credits (2+2P)
Pre-production planning paperwork breakdowns, budgeting, and scheduling; taking a project from start to finish from a producers standpoint.
Prerequisite(s): FDMA 1210.
Learning Outcomes

1. Demonstrate proficiency in various areas of pre-production
2. Create a script breakdown, budget, production and post-production schedule, and management plan and timeline that are technically sound.
3. Use features of pre-production and project management software, to foresee and plan the pre-production, production, and post-production stages of a project
4. Demonstrate understanding of the processes of supporting and managing a project, through the pre-production, production, and post-production stages to completion
5. Work collaboratively and communicate effectively with the pre-production and management teams to produce the desired finished project.

FDMA 2150. Desktop Publishing II
3 Credits (2+2P)
This class will enhance and build upon student layout/design skills developed in the Introduction to Desktop Publishing course, incorporating intermediate to advanced concepts in typography and layout design. Upon completion of this course, students will be able to use page layout software to prepare a variety of documents for presentation and critique, including newsletters, instructional flyers, and other complex design/typographic pieces May be repeated up to 6 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): FDMA 1120.
Learning Outcomes

1. Build upon knowledge of design and design terminology.
2. Exhibit intermediate to advanced design principles using type, layout, and color.
3. Demonstrate skill in intermediate to advanced concepts and features of page layout software.
4. Exhibit knowledge of styles, tables, images and clipping paths and interactive documents as well as printing preparations and procedures.
5. Create layouts for print, web, and other media that demonstrate an intermediate to advanced knowledge in typography and layout design.
6. Format and produce newsletters and instructional flyers, as well as larger, complex projects such as packaging mechanicals, multiple master page documents, and books.
7. Assess works of graphic design for quality and effectiveness.
8. Utilize produced material to create or add to a design portfolio for future use.

FDMA 2210. Digital Video Production II
3 Credits (2+2P)
Advanced techniques of the tools and application of professional film making. May be repeated for a maximum of 6 credits.
Prerequisite: FDMA 1210.
Learning Outcomes

1. Demonstrate the ability to produce and manage a video project: Produce a script, storyboard, and production schedule for a video project designed for a specific audience.
2. Demonstrate proficiency in producing quality digital video footage and audio tracks: Shoot to the script and storyboard using a variety of camera and lighting techniques; Produce a finished complex sound track including narration, music, and sound effect.
3. Demonstrate ability to produce and edit a professional quality video project: Integrate all production aspects of the project including video, audio, graphics, titles, transitions, and effects. Guide the project through the final production stages.
4. Develop competency in digital video distribution using various formats and techniques: Distribute project in various formats which could include DVD and web posting.

FDMA 2241. Advanced Camera Techniques
3 Credits (2+2P)
Professional camera techniques and training for electronic news gathering and studio filmmaking. Utilizes high-end handheld shooting techniques, cranes, dollies, and steadicam training. May be repeated for a maximum of 6 credits.
Prerequisite(s): FDMA 1210.
Learning Outcomes

1. Students knowledge of high-end video camera operation and features.
2. Students must know all the working features of the video production equipment being used during the course in order to achieve the desired footage as required by the instructor.
3. Demonstrate proficiency in producing quality digital video footage.
4. Individuals must acquire the knowledge of different shooting styles in different productions situations and use those acquired skills to produce the appropriate video footage.
5. Using the proper lighting in different on location shooting styles.
6. Skill of each individual utilizing the usage of high-end camera equipment such as dollies, cranes and Steadicam.
7. Each individual must work as a team player to create professional style video footage.

FDMA 2285. Digital Video Production and Editing II
3 Credits (2+2P)
Advanced features of digital video, audio/music, and titling production software. Included are color correction, vector scopes, motion effects, and advanced editing techniques used by filmmakers. Restricted to Community Colleges campuses only. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): FDMA 1220.
Learning Outcomes
1. intermediate to advanced video editing create short films and training videos, create TV quality commercials, direct a news broadcast, and work as a mentor to students on digital media equipment

FDMA 2287. Digital Design Studio
1-3 Credits
A design studio environment in which students obtain real-world experience while providing service to college and non-profit associations with faculty supervision using a variety of media. Can be used with permission to fulfill cooperative requirement. May be repeated for a maximum of 6 credits.
Prerequisite(s): FDMA 1630 or ARTS 1712.
Learning Outcomes
1. Demonstrate competency in the use of InDesign software.
2. Create appropriate visual solutions based on target marketing information.
3. Demonstrate competency in the design and production of advertising and promotional materials.
4. Present ideas and concepts effectively and competently.
5. Visually demonstrate design solutions to be used in a portfolio.

FDMA 2310. History of Cinema I
3 Credits (3)
This course surveys the history of cinema - investigating the process by which the original “cinema of attractions” evolved into a globally dominant form of visual storytelling. We will explore the development of cinema both as an art form and as an industry, and consider the technological, economic, cultural factors, as well as many key international movements that helped shape it. Restricted to: G-CMI, DFM, ANVE majors.
Learning Outcomes
1. Gain a greater appreciation for the history of cinema
2. Develop knowledge of the key eras in the history of U.S. cinema
3. Learn the characteristics of major movements in international cinema
4. Understand the various elements that go into telling a story in cinema: screenplay, narrative devices, director, producer, talent, production design, cinematography, editing, sound design
5. Learn how major genres in U.S. cinema have evolved in the past 100+ years
6. Gain a basic understanding of the operations and organization of the Hollywood film industry, from the studio system until today
7. Gain an awareness of the shifts inthe film industry that present new opportunities for independent filmmakers
8. Understand the importance of learning about the history of cinema to the process of becoming a filmmaker
9. Strengthen public speaking skills

FDMA 2311. History of Animation
3 Credits (3)
Explores the history of Animation as an art form and industry through readings, screenings, lecture and periodic guest speakers. Restricted to: G-CMI, ANVE, DFM majors. Restricted to Las Cruces campus only.
Learning Outcomes
1. To expand your knowledge of the history of animation and its evolution to the modern day.
2. To expand your ability to view animation critically and to understand its early connections to cartooning as well as its ongoing cultural presence and relevance.
3. To expand your comfort with accessing information and completing assignments both online and independently. Canvas will be utilized for many of our readings and for some response assignments.

FDMA 2312. History of Media Design
3 Credits (3)
An introduction to the principles of design history and theory within a chronological framework of historical and emerging media.
Learning Outcomes
1. Introduction to visual communication: Defines design media; Discuss universal design principles and strengthen student basic design skills.
2. Historical technological development and design: Prehistoric communication; Beginnings of alphabet and written language; Movable type and the printing press; Industrial revolution; Digital Age; Designers and Trends; Personalities and their influence and contributions
3. Identify design styles and discuss the relevance of how design influences: Idea generation; Trend sources; Influences or appropriation; Propaganda and advertising.

FDMA 2325. Advanced Photoshop
3 Credits (2+2P)
This course expands on the Photoshop skill set to develop proficiency with selections, masking, channels, filters, color correction, painting tools, vector integration, video, special effects, and compositing techniques. The focus is on the core image-editing tools of Photoshop that can be universally applied to photography, print, film or the web. The material is covered in production-oriented projects and students develop work suitable for portfolios. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): FDMA 1515.
Learning Outcomes
1. Create effects using advanced blending techniques
2. Effectively utilize advanced masking techniques
3. Refine Selections with advanced techniques
4. Assess Adjust color in an image
5. Utilize advanced photo enhancement techniques
6. Alter images using Photoshop painting techniques
7. Create brush presets
8. Create vector elements with paths
9. Add manipulate type on a path 1
10. Create advanced special effects 1
11. Apply vanishing point warping 1
12. Create a video clip 1
13. Apply color adjustments to video

FDMA 2326. Digital Photography and Imaging II
3 Credits (2+2P)

Provide understanding and skills needed for advanced digital capture, editing, optimizing and manipulating photographic images for print, web and multimedia applications. The course will prepare students to make more advanced technical and more refined aesthetic decisions relative to specific photographic applications. Restricted to: Alamogordo campus, Carlsbad campus, Dona Ana campus.
Prerequisite(s): FDMA 1545.
Learning Outcomes

1. Apply proper exposure techniques.
2. Practice effective composition techniques.
3. Demonstrate knowledge of working with Camera RAW files.
4. Demonstrate proper image adjustment and correction techniques.
5. Successfully apply the basics of HDR digital photography.
6. Apply techniques for modifying light.

FDMA 2360. Web Design II
3 Credits (2+2P)
In this course, students will refine their skills in coding and web graphic design as well as be introduced to methods in constructing sites that adhere to the standards of responsive web design. Students will expand their knowledge of HTML and CSS using a code editor, and they will both analyze existing websites and also construct an interactive website. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): FDMA 1360.
Learning Outcomes

1. Plan and produce web design mockups.
2. Demonstrate a proficiency in HTML/CSS coding.
3. Utilize basic web scripts.
4. Integrate animation into web design.
5. Create fully functional websites using one or more web editors.
6. Make a website “live.”
7. Evaluate web designs for aesthetics and functionality.
8. Demonstrate the utilization of responsive design.

FDMA 2365. Web Design for Small Business
3 Credits (2+2P)
Technology and techniques for designing and building a web presence for small business. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): FDMA 1360.
Learning Outcomes

1. Learning advanced tools and techniques for creating and maintaining complex Business web sites. We will be using CSS, PHP, HTML, Photoshop, and Wordpress.
2. design a complete and fully functional online web business.
3. understand and develop a plan to better manage a web store/ business.
4. review basic design guidelines in preparing a variety of web applications for business.
5. develop technical skills in using various web based solutions.
6. reinforce your knowledge of web design software.
7. introduce alternate sources of data, communication and financial solutions.

FDMA 2381. Storyboarding
3 Credits (3)
Examines effective writing principles to create storyboards that communicate the overall picture of a project, timing, scene complexity, emotion and resource requirements. Further, the purpose of this course is to introduce students to the principles of visual storytelling—in film--through the use of the storyboard. In other words, to show how storyboards are critical "architectural component" of the filmmaking process, used as a blueprint (or guide) to communicate the complex elemnts of a film story. Crosslisted with: ENGL 2381. Restricted to: DFM,ANVE, G-CMI majors. Restricted to Las Cruces campus only.
Learning Outcomes

1. Learn to conceive and draw original images.
2. Learn to use images to tell a story.
3. Design, develop, and order images (shots) into storyboarded scenes.
4. Understand how storyboarded sequences are a tool in the process of filmmaking.
5. Understand how the storyboard image is translated from the written page.
6. Build scenes from the scripted sequences into a storyboard.

FDMA 2382. Principles of Story Across the Media
3 Credits (3)
The purpose of this course is to help students understand the basic elements of narrative structure (e.g. character, dramatic conflict, theme, etc.) and how these elements may be used effectively in media expression. Crosslisted with: ENGL 2382. Restricted to: G-CMI, DFM, ANVE majors. Restricted to Las Cruces campus only.
Learning Outcomes

1. Identify the elements of storytelling in scripted text or improvised performance
2. Understand how these elements work together across different media
3. Apply these elements of storytelling in original work
4. Appreciate and master these elements for independent or collaborative work

FDMA 2410. Audio Production II
3 Credits (2+2P)
Students will use skills developed in the Audio Production I course to produce audio projects utilizing a variety of analog and digital audio hardware and software, including continued use of multi-track, computer-based recording and editing systems, as well as exploring more advanced audio techniques and concepts. Restricted to: Community Colleges only. May be repeated up to 6 credits.
Prerequisite: FDMA 1410.
Learning Outcomes

1. Apply analog and digital audio hardware and software in audio recording.
2. Apply common professional set-up practices of audio production facilities.
3. Produce audio projects, sync sound recordings, and audio dialogue replacement (ADR) demonstrating technical expertise.
4. Perform an audio mix and master for a final professional product.
5. Analyze and compare existing audio productions for quality.

FDMA 2510. Introduction to Sound Design for Film
3 Credits (3)
This couse is an introduction to the principles, techniques and applications of sound design and film scoring. Students learn how sound affects storytelling in a film, examine the role of sound from the script to screen, and the professional process of creating a soundtrack. Students learn how to use sound equipment in a production environment and execute basic techniques used to develop a soundtrack. Crosslisted with: FDMA 1415.

Prerequisite(s)/Corequisite(s): FDMA 2382. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Compare the properties and propagation of sound and importance of sound to the storytelling aspect of filmmaking
2. Learn the process of designing a soundtrack for film and recording live audio dialogue for use in post-production editing.
3. Learn methods of capturing sound including live audio recording, dialogue recording, foley, orchestration and audio dialogue replacement
4. Design a soundtrack for motion media project.

FDMA 2520. Introduction to Cinematography

3 Credits (3)

The Director of Photography (or Cinematographer), in close collaboration with the Director and Production Designer, helps determine the look of a film. This course is designed to intorduce students to the technical and aesthetic fundamentals of creating, developing, and collaborating on the visual elements of storytelling, using camera framing, lensing, and lighting fundamentals such as shadows, light and color. May be repeated up to 6 credits. only. Prerequisite(s)/Corequisite(s): FDMA 2382 (Las Cruces Campus) or FDMA 1210 (Community College Campus(es)

Learning Outcomes

1. Define and explain the fundamental concepts of cinematography, such as exposure, lighting solutions, and color temperature.
2. Understand how cinematography brings the Director's vision to reality.
3. Demonstrate proficiency in plotting and executing interior and exterior lighting solutions.

FDMA 2530. Introduction to 3D Modeling

3 Credits (3)

This course will introduce 3D modeling methods and current practices. Students will learn preliminary and detailed modeling techniques using industry standard software. Methods will emphasize formal and functional aspects of modeling as they apply to mechanical, organic, and sculpted topology for application in animation, games, and information media. May be repeated for a maximum of 6 credits.

Learning Outcomes

1. Identify the role of a 3D modeler in a production pipeline within various fields of digital animation.
2. Apply techniques in modeling mechanical and organic objects.
3. Utilize tools available in professional 3D modeling software.
4. Create simple animations and renders.
5. Present original animations to instructor and classmates for critique.
6. Create a demo reel of work completed during the course.

FDMA 2535. Digital Illustration Techniques

3 Credits (3)

Introductory course examining traditional artistic expressions and translating visual art experiences into a digital art medium to enhance visual storytelling. Students acquire basic principles of drawing and painting through hands-on experience manipulating tonal value, composition, form development, light and shadow, color theory, rendering realism, and graphic design. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. Be familiar with the CMI computer system, facilities, equipment and policies.
2. Appropriately utilize the various media technologies available at CMI for digital illustration.
3. Understand the different roles and areas of digital illustration.
4. Understand and apply some basic techniques of digital illustration.
5. Understand and apply some basic processes of creating pleasing images based on knowledge of traditional art principles.
6. Begin to apply some basic strategies for developing and creating aesthetically pleasing images.

FDMA 2570. Creative Media Studio

3 Credits (2+2P)

A studio environment where students specialize in creating film-festival quality and portfolio-ready projects under the supervision of faculty. May be repeated for a maximum of 6 credits.

Prerequisite(s): FDMA 1210 and FDMA 1220 or FDMA 2530.

Learning Outcomes

1. Students will work together to create portfolio-quality work in a studio environment.
2. Through classroom discussion and reporting the students will collaborate to produce a professional quality "vertical slice" game concept within a defined timeline and financial budget

FDMA 2710. Beginning 2-D Animation

3 Credits (3)

Students will learn the basics of digital 2D animation by working through a variety of exercises, creating an original storyboard, and animating five or more shots utilizing industry standard software. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.

Learning Outcomes

1. The student will demonstrate an overall knowledge of computers as a tool of the animation artist and be able to produce simple animations using the techniques learned in class.
2. Use major software tools with ease
3. Manage time lines through key frames
4. Build storyboards
5. Demonstrate knowledge of 2-D and animation terminology
6. Produce actions, set environments and constraints for 2-D animation
7. Render full animation.

FDMA 2715. Special Effects

3 Credits (2+4P)

Creating advanced virtual special effects for both rigid and soft bodies. Using MEL, dynamic principles, mixing nodes, and advanced particle systems. How to drive particles over surfaces, add texture to flow, create surface tensions, and use collision events to drive texture. Study of integrating computer-generated images with real-life video and audio.

Prerequisite(s): FDMA 2530 or FDMA 2765.

FDMA 2720. 3D Animation

3 Credits (3)

Overview of the essentials and principles of 3D animation; creative methods for using industry standard tools to produce the illusion of movement for storytelling and creating 3D effects. Topics include, keyframe and curve animation, kinematics, cycle animation, camera animation, deformers, dynamics and constraints.

Prerequisite: FDMA 1510, FDMA 2710 or consent of instructor.

Learning Outcomes

1. Clearly describe the role of an animator in cinema, gaming and related fields.
2. Recognize leading animators and their methods.

3. Demonstrate knowledge of advances in contemporary animation.
4. Utilize current industry standard animation tools.
5. Apply fundamental animation processes and techniques

FDMA 2725. Rigging for 3D Animation
3 Credits (3)
This course will introduce principles and practices of current 3D animation rigging. Students will develop fundamental methods necessary to create character rigs. Students will learn aesthetic, technical, and optimization concepts as they apply to organic and mechanical designs. Topics will include: hierarchies, constraints, deformation rigging, skeleton creation, skinning, forward and inverse kinematics, controls, body and facial rigging. Restricted to: DFM, ANVE majors.
Prerequisite(s): FDMA 1510.
Learning Outcomes
1. Understand what Rigging is and the role it plays in the world of cinema and video games.
2. Be familiar with industry professionals and their techniques and approaches to rigging.
3. Understand and be able to apply the fundamentals of rigging to industry standard applications.
4. Demonstrate ability to rig basic to intermediate machines, bipeds and quadrapeds

FDMA 2730. Advanced Character Animation
3 Credits (2+2P)
Focus on complex rigging techniques as well as utilizing advanced animation functions to blend multiple animations into complex animations. May be repeated for a maximum of 6 credits. Restricted to: Community Colleges only.
Prerequisite(s): FDMA 2530.
Learning Outcomes
1. Create skeletal riggings for use with a 3D model
2. Attach riggings to a 3D model using Smooth and rigid binding and refine the bindings so that they are properly weighted
3. Animate a 3D model using skeletal and vertex animation techniques

FDMA 2745. Light, Shade, Render
3 Credits (3)
This course will explore the theory and practice of 3D lighting and rendering methodologies. Techniques covered will implement cameras, lighting sources, textures, surface-mapping and algorithmic rendering to produce stylized and photo realistic images. Topics covered will include direct and indirect lighting, shaders that simulate physical substances and effects, rendering multiple passes and simulating physical lens effects. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.
Prerequisite: FDMA 1510 OR FDMA 2530, or Consent of Instructor.
Learning Outcomes
1. Understand the role of lighting and surfacing to tell a story.
2. Be familiar with leading lighting artist and their approaches.
3. Utilize the software implemented in the entertainment industry.
4. Understand and apply fundamental lighting and rendering techniques.
5. Demonstrate ability to create successfully rendered scenes from concept through production.

FDMA 2750. Digital Sculpting
3 Credits (3)
Introduce students to the 3D Sculpting programs which are the industry standard sculpting programs. Students will learn how to create complex high polygon sculpts and normal maps and transfer the models into 3D studio Max and Autodesk Maya. May be repeated up to 6 credits. Restricted to: Community Colleges only.
Prerequisite(s): FDMA 2530.
Learning Outcomes
1. Demonstrate communication skills through written critiques and explanations
2. Students will demonstrate visual communication skills through critiques, written explanations, and storyboarding
3. Demonstrate a working knowledge of Zbrush's interface
4. Demonstrate a working knowledge of Zpheres and how they are best used to create sculpts
5. Demonstrate a working knowledge of painting a mesh using Spotlight
6. Demonstrate a working knowledge of retopologizing and exporting the mesh
7. Demonstrate a working knowledge of integrating the full Zbrush pipeline into Unity and Unreal

FDMA 2755. Drawing for Animation
3 Credits (3)
Introductory study of the human and animal form in relation to animation. Students learn fundamentals and exaggeration of the figure, as related to proportion, rhythm, mechanics, and motion. Areas of focus are: basic form, proportion, shape, contour, gesture, anatomy, portraiture, perspective, clothing effects and drawing from observation. Restricted to: CMT,DFM,ANVE majors.
Learning Outcomes
1. Students will have an opportunity to gain hands on experience using industry standard state of the art animation software.
2. Understand what the basics of drawing the human form.
3. Have a general understanding of human anatomy as needed for the artist.
4. Be able to design the human form from imagination.

FDMA 2770. Critical Game Studies
3 Credits (2+2P)
Focus on creating a complete design document utilizing techniques and standards used in the industry today. May be repeated up to 6 credits.
Learning Outcomes
1. Develop a comprehensive game design document that adheres to industry standards, incorporating elements such as gameplay mechanics, narrative structure, and user interface design.
2. Critically analyze existing game design documents to identify strengths, weaknesses, and areas for improvement.
3. Apply advanced game design techniques to create innovative and engaging game concepts.
4. Evaluate the ethical and cultural implications of game design choices and their impact on diverse audiences.
5. Collaborate effectively in a team setting to produce a cohesive and well-documented game design project.
6. Present and defend game design concepts and documents to peers and industry professionals, demonstrating clear communication and critical thinking skills.

FDMA 2775. Game Tools and Techniques
3 Credits (2+2P)
Focus on the different engines and gaming technologies that power the games of today. May be repeated for a maximum of 6 credits.

Prerequisite(s): FDMA 2770.

Learning Outcomes

1. Students will develop rapid prototyping techniques.
2. Through classroom exercises the students will gain competency in industry-standard game creation engines and tools, and learn to work together in groups to create rapid prototypes.
3. This includes creating art, sound and music, and creating basic scripts within an engine.

FDMA 2785. Level Design Concepts

3 Credits (2+2P)

Focus on the design and creation of video game levels. Dealing with the challenges and pitfalls of different video game genres. May be repeated for a maximum of 6 credits. Prerequisite(s): FDMA 2770

Learning Outcomes

1. Students will develop level design skills.
2. Through classroom exercises the students will gain a comfortable competency with designing levels both on paper and digitally.
3. This includes creating first person shooter levels, third person levels, multiplayer level design, and more.

FDMA 2993. Workshops (Advanced Photography)

1 Credit (1)

This is a series of 1-credit workshops offering specialized and intense advanced skill training and upgrading applications of photography for commercial purposes and training in photographic skills and styles presented by a variety of professional lecturers. May be repeated up to 7 credits. Restricted to Community Colleges only.

Prerequisite(s): FDMA 1545.

Learning Outcomes

1. Varies

FDMA 2994. Portfolio Design & Development

1-3 Credits

Personalized design and creation of the student's professional portfolio including hard-copy, demo reel, and online. May be repeated up to 6 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Varies

FDMA 2995. Film Crew Cooperative Experience

3-6 Credits (3-6)

Industry production experience in specific craft areas for film crew technicians who have successfully completed two semesters of FTTP. Restricted to: Dona Ana campus, Carlsbad campus.

Prerequisite(s): FDMA 2125.

Learning Outcomes

1. Varies

FDMA 2996. Special Topics

1-4 Credits

Specific topics to be announced in the Schedule of Classes. May be repeated for a maximum of 18 credits.

Learning Outcomes

1. Varies

FDMA 2997. Independent Study

1-3 Credits

Individual studies directed by consenting faculty with prior approval of department head. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

Prerequisite(s): Minimum GPA of 3.0 and sophomore standing.

Learning Outcomes

1. Varies

FDMA 2998. Internship

1-3 Credits

Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships may be paid or unpaid. Students are supervised/evaluated by both the employer and the instructor. May be repeated up to 9 credits. Consent of Instructor required. Graded: S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only. Consent of instructor required.

Learning Outcomes

1. Varies

FDMA 301. Sound Design II

3 Credits (3)

Mixing and balancing dialogue, sound effects and music in postproduction. Study the role of sound effects, foley, soundtrack choices, and music supervision. Restricted to: DFM, ANVE majors.

Prerequisite: FDMA 2510.

Learning Outcomes

1. Apply advanced techniques for cleaning and restoring dialogue audio to enhance clarity and quality in post-production.
2. Design complex sound mixes that creatively solve audio challenges and support the emotional tone of visual media.
3. Evaluate the narrative function of sound in documentary and fictional film through critical analysis and hands-on project work.

FDMA 303. Cinema Review and Critique

3 Credits (3)

This course develops students' skills in critically viewing and evaluating films across genres, periods, and cultural contexts. Through screenings of classic, independent, and contemporary world cinema, students will learn to identify and analyze key cinematic elements such as narrative, mise en scène, cinematography, and editing. Emphasis is placed on developing a precise critical vocabulary and applying theoretical and historical frameworks to both oral discussions and written critiques. By the end of the course, students will be able to craft persuasive film reviews and analytical essays that demonstrate sophisticated engagement with cinema as an art form and cultural product. Restricted to: DFM, ANVE majors.

Prerequisite: FDMA 2382.

Learning Outcomes

1. Analyze films using critical frameworks and cinematic terminology to evaluate narrative structure, thematic content, and stylistic choices.
2. Compose persuasive and well-organized film reviews and critical essays that demonstrate advanced film literacy and audience awareness.
3. Present informed analyses of key film scenes, connecting cinematic techniques to historical, cultural, and aesthetic contexts.

FDMA 304. Independent Filmmaking

3 Credits (3)

This course is designed to enhance student knowledge about independent film in the U.S. Through a series of screenings, readings and lectures, students will learn how to take an idea, obtain the script, create a budget, finance the project, direct the shoot, edit the film, attend festivals, secure an agent, and then market, sell and distribute around the world. Students will gain an appreciation of the history of American independent filmmaking. Students will apply this knowledge in their

written assignments, and a critical comparative essay. Restricted to ANVE, DFM Majors.

Learning Outcomes

1. Students will acquire greater proficiency in independent filmmaking and planning.
2. Students will gain an understanding of the history of independent filmmaking and where the industry stands today.
3. Students will improve their ability to write about film in an organized, articulate, and effective manner.
4. Students will hone critical thinking skills by engaging in comparative analysis of independent films.

FDMA 305. Business of Filmmaking/Animation
3 Credits (3)

This course provides an in-depth exploration of the film industry's economic, legal, and organizational frameworks, from development through distribution. Students will examine the roles of unions, guilds, and key industry stakeholders; learn fundamentals of financing models, tax incentives, and contract structures; and analyze how technological and market shifts—such as streaming and global distribution—continue to reshape the business of filmmaking. Through case studies and project-based work, students will gain practical insights into budgeting, producing, and pitching film projects, preparing them for professional participation in an evolving media landscape.

Prerequisite: FDMA 2382.

Learning Outcomes

1. Explain the roles of key stakeholders in the film industry—such as producers, investors, agents, and distributors—and how they contribute to the development, financing, and distribution of a film.
2. Analyze current trends, tax incentives, and financing strategies affecting the production and distribution of feature films in a changing media landscape.
3. Develop and deliver a compelling film pitch that demonstrates an understanding of industry expectations, project viability, and the economic and legal considerations of filmmaking.

FDMA 307. Writing for Television
3 Credits (3)

Students will examine and apply various strategies of storytelling, narrative structure and its principle components as they relate to a wide cross-section of television platforms, genres and formats. Restricted to ANVE, DFM Majors.

Prerequisite: FDMA 2382.

Learning Outcomes

1. By the end of this course, students should be able to identify the building blocks of storytelling, including conflict, structure, plot, theme, character, and point of view.
2. By the end of this course, students should be able to understand how these building clocks work together to effectively communicate in all types of scripted television, including streaming platforms such as Amazon and Netflix.
3. By the end of this course, students should be able to have a better understanding and mastery of writing mechanics.
4. By the end of this course, students should be able to present a verbal and written pitch for an original TV series and one cold open.

FDMA 308. Writing for Animation
3 Credits (3)

This class explores methods for, and approaches to, writing for animation. Students study and produce scripts for a range of animation outlets while engaging in writing exercises based on character and story development.

Prerequisite: FDMA 2382 or consent of instructor.

Learning Outcomes

1. Analyze scripts for animated content by applying principles of character design, world-building, and narrative structure.
2. Apply industry-standard formats and techniques to write and revise scripts suitable for various animation platforms and genres.
3. Construct and present an effective short, original work that communicates a compelling animated concept to potential collaborators or producers.

FDMA 309. Screenwriting I
3 Credits (3)

Writing intensive. Students learn the craft of screenwriting, honing skills in writing dialogue and visual narrative, crafting dynamic characters and dramatic action. Original student scripts will be performed and discussed in class. Crosslisted with: ENGL 309 and THEA 306.

Prerequisite: FDMA 2382 or consent of instructor.

Learning Outcomes

1. Apply the fundamentals of three-act structure, including inciting incident, major plot points, and climax, to develop original screenplays.
2. Construct compelling characters and scenes by integrating conflict, visual storytelling, character arcs, and thematic elements.
3. Demonstrate proficiency in industry-standard screenplay formatting and use of visual language in written scripts.

FDMA 310. Cinematography II
3 Credits (3)

Advanced tools of the cinematographer, lighting and composition techniques. Artistic and technological elements of cinematography. Restricted to: DFM,ANVE majors.

Prerequisite: FDMA 2520.

Learning Outcomes

1. Apply advanced cinematography techniques—including camera movement, lighting, and lens selection—to shape the visual style of a narrative or documentary film.
2. Design and execute lighting and composition plans that enhance story, tone, and character within a cinematic framework.
3. Evaluate visual and technical choices made during production in relation to artistic intent, storytelling goals, and professional standards of cinematography.

FDMA 311. Editing II
3 Credits (3)

Advanced techniques in digital films using professional non-linear editing systems. Restricted to: DFM,ANVE majors.

Prerequisite: FDMA 1220.

Learning Outcomes

1. Demonstrate advanced proficiency in editing tools, including software, workflow organization, basic color correction, compositing, and sound design.
2. Evaluate footage and performance to make editorial decisions that strengthen narrative coherence, pacing, and emotional impact.
3. Incorporate feedback and collaborate effectively with directors and peers to revise and polish edited scenes that align with the overall storytelling vision.

FDMA 312. Post Production Color Grading
3 Credits (3)

Color grading is an important part of the overall look of a film. It used to be a craft that only a small number of people knew how to do. However, due to advances in technology and business models, more and more people are diving into color grading. This class is an introductory look into the art and techniques of color grading. Restricted to: DFM, ANVE majors.

Prerequisite: FDMA 1220.

Learning Outcomes

1. Demonstrate proficiency in DaVinci Resolve by completing the official Beginner's Guide curriculum and passing the Blackmagic Design Certification Exam.
2. Analyze the digital image pipeline—including codecs, compression, and color workflows—to make informed technical and aesthetic decisions in postproduction.
3. Apply principles of color theory and visual storytelling to enhance mood, focus, and emotional tone through color grading and image manipulation.

FDMA 314. Acting for Film
3 Credits (3)

Techniques for film and television acting. In-depth analysis of film performance creation among actor, director, writer, cinematographer, and editor. Restricted to: THTR,DFM majors.

Prerequisite: FDMA 2382.

Learning Outcomes

1. Apply acting techniques, character research, and improvisational strategies to create authentic and emotionally resonant on-camera performances.
2. Analyze scenes and scripts to interpret character objectives, subtext, and emotional beats from the perspective of a screen actor.
3. Demonstrate an understanding of film acting vocabulary, camera awareness, and performance timing by crafting and performing roles suitable for inclusion in a professional acting reel.

FDMA 318. Documentary Production
3 Credits (3)

Survey of theory and history of documentary film making including viewings and discussions of notable films and directors. Class works with actual documentary project. May be repeated up to 6 credits. Restricted to: ANVE, DFM majors.

Prerequisite: FDMA 1220, FDMA 2520.

Learning Outcomes

1. Analyze documentary forms, storytelling strategies, and ethical considerations to inform the development of original nonfiction projects.
2. Produce short documentary films—individually and collaboratively—that demonstrate technical proficiency in shooting, sound, and editing.
3. Develop research-driven proposals and pitch presentations that effectively communicate concept, story, and social relevance to an intended audience.

FDMA 320. Race and Gender in Film
3 Credits (3)

In this course students will analyze film as an art form as well as be exposed to Race and Gender Feminist Film Theory. We will consider the role of ilm in our understandings of sex, gender and sexuality. Through discussions and writing we will work to discern relevant social, political, ideological, and aesthetic concepts in the media we examine. Crosslisted with: ENGL 399, GNDR 450 and GNDR 550.

FDMA 325. Film Festival Production
3 Credits (3)

A course for students interested in learning about the processes of orchestrating an independent film festival. Students will engage in a professional environment with other film students and filmmakers, as well as learn about film event administration and organization. May be repeated up to 6 credits.

Learning Outcomes

1. Analyze the role of film festivals within the independent film industry, including programming trends, audience engagement, and professional networking opportunities.
2. Develop programming proposals and event concepts—such as film selections, panels, and presentations—based on research into current festival practices and audience needs.
3. Organize and execute components of a live film festival, demonstrating proficiency in event logistics, collaboration, and professional communication with filmmakers and industry partners.

FDMA 327. 2D Rigging
3 Credits (3)

This course will introduce industry-standard 2D rigging principles and practices. Using node-based technology, students will learn aesthetic and technical concepts of 2D rigging to build a variety of fully functional, 360-degree 2D rigs of their own designs. Topics include: victor-based art, node structures and groups, articulation points, deformations, drawing substitutions, and master controllers for efficient animation. Restricted to ANVE Majors.

Prerequisite: FDMA 2710.

Prerequisite/Corequisite: FDMA 2755.

Learning Outcomes

1. Students will learn how to use drawing and rigging tools in Toon Boom Harmony Premium to create strong character designs and functional 2D rigs.
2. By the end of the class, students should be proficient rigging artists who can design a character and assemble a 2D rig for that character, as well as animate the character rig.

FDMA 328. Producing
3 Credits (3)

Examines the role of the Producer, essential to every film production. The course will revolve around the best practices in organizational design, the production process, the budgeting process, financial controls, scheduling, insurance and distribution.

Prerequisite/Corequisite: FDMA 2510, FDMA 1220, FDMA 2382.
Restricted to: ANVE,DFM majors.

Learning Outcomes

1. Plan and organize film productions by creating budgets, schedules, and logistical frameworks that ensure efficient project execution.
2. Manage collaborative workflows across multiple production teams, demonstrating leadership and effective communication throughout the filmmaking process.
3. Evaluate distribution strategies and financial considerations—including insurance and financial controls—to ensure professional standards and project viability.

FDMA 332. 3D Character Animation
3 Credits (3)

Essentials and principles of 3D character animation. Techniques and craft of breathing life into characters through movement, including dynamic poses, blocking action, run and walk cycles, lip synching and realism. Students will plan and produce original animation for review by

classmates and as part of of a CGI demo reel. THEA 1221, Acting and FDMA 2510, Sound Design are recommended. Restricted to: DFM,ANVE majors.
Prerequisite: THEA 1210 (or FDMA 314 or FDMA 348), FDMA 1510 and FDMA 2720 or consent of instructor.

Learning Outcomes

1. Understand the character animation pipeline.
2. Understand basic body mechanics and how to represent them with a 3D character
3. Understand the twelve principles of animation on a deeper level and be able to apply them in individual work
4. Developing a vocabulary and critical eye in order to critique each other's work.

FDMA 341. Visual Effects I
3 Credits (3)

This course will educate students on the fundamental principles, skills, and artistry needed to successfully integrate live action footage and computer generated imagery into technically correct and narrative engaging cinematic shots. Topics include: Cinematography for visual effects; Green screen setup/lighting/keying; Intermediate compositing techniques; Editing, color correction and grading. Restricted to ANVE, DFM Majors. May be repeated up to 3 credits.
Prerequisite: FDMA 1510, FDMA 2530, FDMA 2745 (or consent of instructor).

Learning Outcomes

1. At the end of this class, students will produce (alone or in a group), an engaging, well-thought out and professionally executed visual story from scratch - using a combination of live action plates, green screen elements and seamlessly integrated CGI elements.
2. Students will become fluent in setting up and operating a professional camera proper cinematography techniques.
3. Students will shoot green screen elements/plate using proper cinematography techniques.
4. Students will become fluent in editing software to edit an engaging narrative.
5. Students will become fluent in node-based compositing software to produce seamless, photoreal integrations of CGI elements and green screen mattes in live action plates.
6. Students will use color-correction and color grading techniques and use color as a narrative element.
7. Students will correctly adhere to established production standards and protocols.

FDMA 348. Acting for Animation
3 Credits (3)

This course explores performance techniques relevant to animators including 2D and 3D animation and motion capture. Students learn to create dynamic, dramatic performances and believable character interactions for animation based reference. Students learn to analyze scripts, sound, acting, action and performance for production. Topics include: acting theory, emotional/mental states, character movement and style, dynamic facial expression, scene construction, posing, layering and rhythm, simplification and exaggeration, and lip sync. Restricted to: ANVE,DFM majors. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the different roles and character mindsets of digital animation in cinema.
2. Understand and apply some basic acting skills into animation reference.
3. Understand and apply some basic processes of creating reference for a narrative.
4. Begin to apply some basic strategies for developing and creating a story visually.

FDMA 350. Intermediate 2D Animation
3 Credits (3)

Students will begin to refine their animation skills by animating more complex characters utilizing the Principles of Animation. They will practice these advanced drawing and motion techniques in a variety of exercises and projects using industry standard software. Areas of focus include: squash and stretch, cloth simulation, the successive breaking of joints, and biped walk cycles.
Prerequisite: FDMA 1510 and FDMA 2710.

Learning Outcomes

1. Students will refine foundational animation skills.
2. Students will learn and show proficiency in related industry-standard software.
3. Students will apply skills to more advanced projects than in previous 2D courses.

FDMA 360. Previsualization
3 Credits (3)

Implements 3D animation tools in preproduction shot and sequence design for motion picture and broadcast industries; including 3D storyboarding, technical planning and editing basics. LC Campus Only. Restricted to ANVE, DFM majors.
Prerequisite: FDMA 1510, FDMA 2530, and FDMA 2720 or consent of instructor.

Learning Outcomes

1. Apply 3D animation and storyboarding tools to design previsualized sequences that communicate camera movement, composition, and timing.
2. Integrate previsualization into the broader preproduction workflow to support technical planning for live-action and animated productions.
3. Evaluate previsualization sequences for clarity, feasibility, and effectiveness in communicating narrative and technical intent to production teams.

FDMA 362. Motion Graphics
3 Credits (3)

Students will learn the industry standard motion graphics techniques through a variety of exercises and projects that combine animation, text, visual effects, and sound. Restricted to: ANVE, DFM majors.
Prerequisite: FDMA 1715.

Learning Outcomes

1. Understand the context for and learn to create, combine, and animate text with graphics.
2. Explore various applications of creative techniques, including motion graphic design for commercials, logos, informative videos, UI design, and basic character rigging.
3. Learn to use industry-standard motion graphic softwares.

FDMA 365. Character Design and Development
3 Credits (3)

Digital character design for the entertainment industry. Provides insight into the process of creating iconic characters. Traditional and contemporary character designers are explored. Industry workflow is introduced and necessary skills are developed to design detailed 3D characters from concept through production. Restricted to ANVE, DFM majors. May be repeated up to 3 credits.

Prerequisite: FDMA 1510, FDMA 2530 and FDMA 2535, or consent of instructor.

Learning Outcomes

1. Understand the role of a character in cinema and gaming.
2. Become familiar with leading character designers and their approach.
3. Utilize current industry standard methods.
4. Understand and apply fundamental character design techniques.
5. Demonstrate a strong ability to design and create characters from concept through production.

FDMA 395. Directing I

3 Credits (3)

This introductory course in directing explores the essential skills required to bring a script to life on screen and stage. Students will learn the director's role in interpreting text, shaping visual and performance styles, and collaborating effectively with actors, designers, and production teams. Through practical scene work, students will develop foundational abilities in blocking, shot composition, rehearsal techniques, and storytelling, while building confidence as creative leaders in the filmmaking process. Restricted to: DFM,ANVE majors.

Prerequisite: FDMA 2510, AND FDMA 2520, AND FDMA 1220.

Learning Outcomes

1. Interpret scripts and translate narrative elements into visual and performance concepts for short scene work.
2. Demonstrate basic directing techniques—including blocking, shot composition, and rehearsal strategies—while working with actors and production collaborators.
3. Develop organizational and communication strategies to manage relationships between creative and technical team members during production.

FDMA 396. Directing II

3 Credits (3)

This advanced directing course deepens students' understanding of the director's role in preproduction and production planning. Students will learn to perform detailed script breakdowns, develop casting strategies, and design ground plans and shot coverage. The course emphasizes leadership in assembling and managing a creative team—including cinematographers, designers, and sound specialists—while introducing practical skills in budgeting and scheduling. Through hands-on projects, students will refine their ability to translate story concepts into fully realized production plans.

Prerequisite: FDMA 395.

Learning Outcomes

1. Break down scripts to identify technical, logistical, and creative requirements for casting, design, and shot planning.
2. Assemble and lead a creative team by selecting key collaborators and guiding artistic and technical decisions during preproduction.
3. Develop production plans—including ground plans, shot coverage, budgets, and schedules—that ensure an organized and efficient shoot.

FDMA 397. Practicum

1-3 Credits (1-3)

Practical application of the student's field of study in a project environment. May be repeated up to 9 credits.

Learning Outcomes

1. Varies.

FDMA 398. Special Topics

3 Credits (3)

This course addresses specific subjects and issues as identified by the department. Topics and credits to be announced in the Schedule of classes. May be repeated up to 12 credits.

Learning Outcomes

1. Varies depending on topic and instructor.

FDMA 400. Directed Studies

1-6 Credits (1-6)

Directed study course in CMI under the supervision of a CMI faculty member. May be repeated up to 9 credits.

Learning Outcomes

1. Varies depending on topic and instructor.

FDMA 401. Motion Capture Techniques

3 Credits (3)

Students will implement industry standard motion capture techniques and essential skills to capture and integrate performance for movie making, 3D animation and game production. Students will learn how to use the motion capture system, equipment and workflow, and polish performances using industry standard software. Concepts covered will consist of exploring motion capture setup, shooting, data tracking, and animation correction and enhancement. Restricted to ANVE, DFM majors. May be repeated up to 3 credits.

Prerequisite: FDMA 1510, FDMA 2720 and FDMA 2725 (or consent of instructor).

Learning Outcomes

1. Understand and demonstrate basic approaches to integrating live actors with computer generated imagery.
2. Understand the role of motion capture in cinema, advertising and related fields.
3. Build familiarity with leading motion capture companies and their approaches.
4. Become knowledgeable of the history of motion capture.
5. Become knowledgeable of current advances in motion capture.
6. Learn to utilize industry standard motion capture software.
7. Demonstrate a strong ability to produce believable imagery from concept through final production.

FDMA 410. Cinematography III

3 Credits (3)

This advanced cinematography course explores high-end digital workflows, from image acquisition to post-production color grading. Building on skills from earlier cinematography courses, students learn about the digital imaging pipeline, gaining expertise in camera operation, rig building, and data management. Emphasis is placed on integrating production and post-production processes, understanding the impact of color and image pipelines, and achieving cinematic quality that meets industry standards for high-end productions. Restricted to: DFM, ANVE majors.

Prerequisite: FDMA 310.

Learning Outcomes

1. Operate professional digital cinema cameras and configure camera rigs for high-end image acquisition.
2. Manage on-set and post-production workflows, including data handling, transcoding, and color grading, to ensure image integrity and efficiency.
3. Integrate cinematography and post-production techniques to create visually cohesive projects that meet artistic and technical objectives.

FDMA 422. Environmental Filmmaking

3 Credits (3)

As a documentary workshop in social-impact filmmaking, this course focuses on the transformative power of visual storytelling to address the pressing environmental issues of our times. Students will watch a variety of environmental films, and make their own short documentary and media projects, telling solutions-oriented stories about environmental issues. This course is designed to give students the opportunity to collaborate with environmental NGOs, foundations, and NMSU faculty and students in other departments working on environmental issues in the Southwest and Borderlands region. By harnessing the power of visual storytelling to address the pressing challenges of our times, students will be empowered to become content creators and change makers having impact in the world. Restricted to DFM majors. May be repeated up to 3 credits.
Prerequisite: FDMA 1220, FDMA 2510, FDMA 2520.
Learning Outcomes
1. To understand the basic elements of the climate crisis.
2. To explore the power of visual storytelling to address pressing environmental issues.
3. To learn basic strategies used by filmmakers to create social impact films, including calls to action.
4. To study effective case-studies of impact documentaries exploring climate issues, oceans/rivers, energy policy and the extinction crisis.
5. To give comparative presentations that connect films screened outside of the class with films watched in class.
6. To explore the ethics of documentary filmmaking.
7. To identify and build relationships with local non-profits and researchers working on environmental issues in the region.
8. To learn industry-standard documentary research and interview skills.
9. To produce, film and edit (in teams) a short impact documentary about selected subjects.

FDMA 433. Sets and Environments
3 Credits (3)
Digital environment design and creation for movies and games from concept to production; including illustration, modeling, matte painting, texturing, lighting, rendering, integration, and camera projection. Restricted to ANVE, DFM majors. May be repeated up to 3 credits.
Prerequisite: FDMA 1510, FDMA 2530, and FDMA 2535 or consent of instructor.
Learning Outcomes
1. Understand the role of digital production design in cinema.
2. Become familiar with the work of leading digital artists involved in production design for the entertainment and gaming industries.
3. Utilize the software implemented in the entertainment industry.
4. Understand and apply fundamental digital set design techniques.
5. Demonstrate a strong ability to design and create digital set and environments from concept through production.

FDMA 450. Advanced 2D Animation
3 Credits (3)
This course will cover the more advanced aspects of 2D Animation. Students will demonstrate their mastery of the principles of animation through a variety of exercises and projects focusing on: automated and manual lip sync, full motion character animation, acting, smears, and quadruped animation. Restricted to ANVE, DFM majors. May be repeated up to 3 credits.
Prerequisite: FDMA 350.
Learning Outcomes
1. Students will gain experience mastering Disney's Principles of animation.
2. Students will complete exercises to animate both humans and animals.
3. Students will gain proficiency in lip syncing and acting using industry standard software.

FDMA 451. Dynamics and Effects
3 Credits (3)
This course educates students in photoreal 3D simulation techniques focusing on particle simulations, rigid body dynamics and fluid simulations. Students will complete several professional grade VFX shots involving explosions, fire, destruction, dust and debris.
Prerequisite: FDMA 1510.
Learning Outcomes
1. Students will exhibit high level competency in critical thinking and independent problem solving.
2. Students will understand and apply procedural methodologies; and complete several professional quality, portfolio-ready simulation shots using industry-standard techniques.
3. Students will produce work at a pace to meet with the production schedule.
4. Students will implement critiques on their work-in-progress to iteratively improve production quality.

FDMA 480. Screenwriting II
3 Credits (3)
This advanced screenwriting course builds upon the foundational skills developed in Screenwriting I, focusing on rewriting, peer feedback, and deeper exploration of character and theme. Students will write two short scripts (10–15 pages each) and participate in intensive workshop sessions where scripts are read aloud, analyzed, and refined. Emphasis is placed on the revision process—incorporating feedback, strengthening dialogue and structure, and sharpening character arcs—to prepare students for more complex screenwriting projects and professional critique environments. May be repeated up to 6 credits. Restricted to ENGL, DFM, ANVE majors. Crosslisted with: ENGL 480.
Prerequisite: ENGL 309 or FDMA 309 or THEA 306 or consent of instructor.
Learning Outcomes
1. Revise original short screenplays by integrating peer and instructor feedback to improve structure, dialogue, and character development.
2. Critique peer screenplays constructively using narrative and character analysis frameworks to support collaborative workshop environments.
3. Refine storytelling techniques, including theme development and emotional resonance, to create polished scripts suitable for production or portfolio inclusion.

FDMA 490. Advanced Screenwriting
3 Credits (3)
Students will prepare a 30-60 page screenplay. Script analysis will be in an advanced workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialogue, character development, etc. This course is aimed at preparing writers for the professional market. Consent of instructor required. May be repeated up to 6 credits.

FDMA 491. 3D Production Studio I
6 Credits (6)
The course is the first semester of a year-long effort to complete a culminating project that is a story-driven short film, which can be either full CGI, or live action with visual effects. In Production Studio I the emphasis will be on the pre-production phase, including analysis and

critique, pipeline organization and project management. Pre-production consists of: Pitch, Script, Visual and sound references, Storyboards, 3D Previsualization, Scheduling/Project Management. Restricted to ANVE majors.
Prerequisite: FDMA 308 or FDMA 309, FDMA 341.
Prerequisite/Corequisite: FDMA 332, FDMA 360, FDMA 365, FDMA 433.
Learning Outcomes

1. Demonstrate an ability to create a transformational story.
2. Exhibit proficiency in visual storytelling, structure, and character development.
3. Develop a story appropriate to the chosen production approach.
4. Create storyboards/animatics to direct the cinematic aspects of the story.
5. Design the production visually in terms of characters and environment.
6. Learn to implement critiques of work to improve production quality.

FDMA 492. 2D Production Studio I
6 Credits (6)
Students will work through the pre-production process on short animated films. They will write a script, create a storyboard, and record voice over/dialogue to create an animatic. Additional exercises will then be assigned to augment the skill set of the student according to the needs of each student. Restricted to ANVE majors.
Prerequisite: FDMA 1715 and FDMA 450.
Learning Outcomes

1. Students will synthesize animation techniques to produce a completed animatic.
2. Students will show proficiency in storytelling towards the development of a short script for production.
3. Students will demonstrate proficiency in industry standard animation softwares and production practices.

FDMA 493. 3D Production Studio II
6 Credits (6)
The course is the final semester of a year-long concentration on a culminating project. Emphasis will be on the production, post-production, and distribution of the work created during 3D Production Studio I. Students will produce a professional quality and industry-standard visual story that will help them gain entry into professional employment. The overall objective is for students to execute their artistic vision with exceptional creative and technical proficiency - resulting in a story-driven and captivating cinematic experience. Restricted to ANVE majors.
Prerequisite: FDMA 491.
Learning Outcomes

1. Students will complete the process of transforming their story from script to screen.
2. Students will demonstrate mastery of craft as a digital artist.
3. Students will learn to direct the cinematic aspects of the story.
4. Students will show proficiency in the production workflow, and complete a deliverable short film by the end of the production schedule.

FDMA 494. 2D Production Studio II
6 Credits (6)
Students will produce the short animated films they developed in 2D Production Studio I. They will animate, composite, and edit their shorts into a final piece for presentation in a showcase. Restricted to ANVE majors.
Prerequisite: FDMA 492.
Learning Outcomes

1. To complete a final project (either short film or demo reel) that demonstrates synthesis of animation techniques taught in earlier classes.
2. To translate animatics from 2D Production Studio I into keyframes and then in-between their keyframes to get clean, smooth animations.

FDMA 495. Internship
1-12 Credits (1-12)
This internship course provides students the opportunity to gain supervised professional experience in media-related industries. Students apply and expand upon classroom learning in real-world environments. Through hands-on work and faculty-guided reflection, students will strengthen technical expertise, professional communication, and industry knowledge, preparing them for future careers in the evolving media landscape. May be repeated up to 18 credits.
Learning Outcomes

1. Apply technical and creative skills from coursework to professional tasks and responsibilities in media-related industries.
2. Demonstrate effective professional communication, teamwork, and problem-solving skills in real-world media related environments.
3. Reflect on internship experiences to analyze industry practices, assess personal growth, and identify future career goals within media fields.

FDMA 497. Portfolio Design and Development
3 Credits (3)
This advanced capstone course focuses on preparing students for professional careers in film and media by developing polished portfolios, resumes, and personal branding materials. Students conduct a deep dive into industry sectors and career pathways, identifying opportunities that align with their individual goals. Emphasis is placed on creating a personal website that showcases their best work, articulates their professional identity, and serves as a tool for securing employment or freelance opportunities after graduation. The course also integrates industry best practices for networking, marketing, and career planning.
Prerequisite: FDMA 2382.
Learning Outcomes

1. Assemble a professional portfolio and website that effectively showcase individual strengths, completed projects, and career objectives.
2. Analyze industry trends, roles, and personal career goals to design a targeted career plan and marketing strategy.
3. Refine professional materials—including resumes, personal statements, and digital presence—to meet industry standards and support job placement or freelance work.

FDMA 500. Graduate Problems in Creative Media
1-3 Credits (1-3)
Independent study in an area of Creative Media. The curriculum will be designed by the student taking the course with consultation from the assigned instructor. Consent of instructor required. May be repeated up to 9 credits.
Learning Outcomes

1. Student will outline an idea for a project or research study, including a timeline for various milestone completion.
2. Student will work with a faculty member to determine the final deliverable outcome, adjusting the timeline and finalized expectations as needed throughout the semester.

FDMA 501. Special Topics
3 Credits (3)
This course is a graduate-level course that addresses specific subjects and issues as identified by the department. Topics and credits to be announced in the Schedule of classes. This class may be cross listed with FDMA 398 Special Topics, or another FDMA course, and if so, graduate students will be expected to perform extra work or complete longer assignments. May be repeated up to 9 credits.
Learning Outcomes
1. The learning objectives will depend on the subject matter being covered in the special topics class, and may include completion of a creative work or research in an area of creative media.

FDMA 550. MFA Form & Technique
3 Credits (3)
Advanced study of issues in form and technique in creative writing, including point of view, scene and dialogue, and story structure. May be repeated up to 6 credits.
Learning Outcomes
1. By the end of this course, students will have completed advanced study of issues in form and technique in their major genre.
2. Students will finish the course with a greater understanding of point of view, scene and dialogue, and story structure, among other creative writing concerns.

FDMA 570. MFA Workshop
3 Credits (3)
Intensive practice in creative writing in a workshop environment with peer criticism. May be repeated up to 15 credits.
Learning Outcomes
1. Provide a workshop environment for graduate students taking creative writing classes as part of the MFA in Creative Writing.

FDMA 592. MFA Theory, Practice and Professionalism
1-2 Credits (1-2)
Students will study major poetics/narratology pieces in the field and other related professional topics such as literary citizenship, publishing, and job seeking skills. Students will also propose and develop a semester-long project in one of the categories, such as a community reading or workshop, a conference panel proposal, a paper presentation, a chapbook press launch, writing/placing literary book reviews, or work on an outreach project. Must be taken in one of the last two semesters of the MFA and currently with FDMA 594 MFA Thesis Workshop. Restricted to MFA-Creative Writing students, or by consent of instructor. May be repeated up to 4 credits.
Corequisite: FDMA 594.
Learning Outcomes
1. By the end of this course, students will understand, analyze, and effectively use the critical discourse of poetics/narratology/craft in the field of creative writing.
2. Design and execute an outreach or professional project that contributes to a creative writing community.
3. Explore applications of their training in professional contexts.
4. Analyze how students' own reading, writing, and research respond to existing leadership in professional creative writing communities, help provide new leadership, and answer community needs.

FDMA 594. MFA Thesis Workshop
3 Credits (3)
Students will submit a draft of their thesis project, in their major genre, for workshop critique. Revision of the thesis draft will be submitted to the instructor. Restricted to MFA Creative Writing students, or by consent of instructor. Must be taken in each of the last two semesters of the MFA, and concurrently with FDMA 592 MFA Theory, Practice and Profession). May be repeated up to 6 credits.
Corequisite: FDMA 592.
Learning Outcomes
1. Understand, analyze, and effectively use the critical discourse of the field of creative writing to discuss a thesis.
2. Examine how their thesis operates with the genre and within the context of contemporary literature.
3. Critically contextualize their thesis and those of their peers.
4. Apply various revision strategies across a thesis-length manuscript, responding to the critiques of the instructor and their peers.
5. Achieve the standards of publication of the University's thesis editor and learn those of the publishing environment in their genre.

FDMA 595. Master of Fine Arts Graduate Internship
1-12 Credits (1-12)
Internship credit is dependent upon placement in a supervised professional environment. Consent of instructor required. May be repeated up to 12 credits.
Learning Outcomes
1. Students will gain professional experiences that will add to their resumes and benefit their professional goals and development.

FDMA 599. MFA Thesis
3 Credits (3)
Students pursuing the MFA in Creative Writing are required to complete 6 credits of MFA Thesis. May be repeated up to 6 credits.
Learning Outcomes
1. Students will use these hours to work on a creative thesis as part of the MFA Creative Writing program.

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Animation and Visual Effects (2D Production Studio) - Bachelor of Creative Media

The Creative Media Institute's Bachelor of Creative Media with an emphasis in Animation & Visual Effects currently offers 2 different paths, determined by the kind of senior project students wish to produce.

Students must complete all university requirements and the Animation and Visual Effects curriculum outlined below. All Animation and Visual Effects Curriculum requirements must be completed with a grade of C- or higher.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1,2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits) [1]		
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Sciences Course or Social/ Behavioral Science Course (4 credits or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		
THEA 1210G	Acting for Non-Majors	3
General Education Elective [1]		*3-4*
Viewing a Wider World [3]		**6**
Departmental/College Requirements		
ANVE Core Courses		
FDMA 1510	Foundations of 3D Animation	3
FDMA 2311	History of Animation [4]	3
FDMA 2381	Storyboarding	3
or ENGL 2381	Storyboarding	
FDMA 2382	Principles of Story Across the Media [4]	3
or ENGL 2382	Narrative: Principles of Story Across the Media	
FDMA 2530	Introduction to 3D Modeling	3
FDMA 2535	Digital Illustration Techniques	3
FDMA 2710	Beginning 2D Animation	3
FDMA 308	Writing for Animation	3
or FDMA 309	Screenwriting I	
2D Production Studio Pathway Courses		
FDMA 1715	2-D Compositing & FX	3
FDMA 2755	Drawing for Animation	3
FDMA 327	2D Rigging	3
FDMA 348	Acting for Animation	3
FDMA 350	Intermediate 2D Animation	3
FDMA 362	Motion Graphics	3
FDMA 365	Character Design and Development	3
or FDMA 433	Sets and Environments	
FDMA 450	Advanced 2D Animation	3
FDMA 492	2D Production Studio I	6
FDMA 494	2D Production Studio II	6
Second Language Requirement: (not required)		**0**
Electives, to bring the total credits to 120 [5]		**19-22**
Total Credits		**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. A Mathematics General Education course is required but students may need to take any prerequisites needed to enter the course selected first.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. Required Pre-Application class for ANVE
5. Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Creative Media with a major in Animation and Visual Effects, there is no second language requirement for the degree.

A Suggested Plan of Study

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
English Composition - Level 1 Course [1,2]		4
ENGL 1110G or ENGL 1110H	Composition I (recommended) or Composition I Honors	
Area II: Mathematics [1,2]		3-4
MATH 1130G	Survey of Mathematics (recommended)	
FDMA 2311	History of Animation (C- or better) [3]	3
FDMA 2382 or ENGL 2382	Principles of Story Across the Media (B- or better) [3] or Narrative: Principles of Story Across the Media	3
Area III: Laboratory Sciences Course [2]		4
Area V: Humanities Course [2]		3
THEA 1210G	Acting for Non-Majors	3
FDMA 2381 or ENGL 2381	Storyboarding or Storyboarding	3
FDMA 2755	Drawing for Animation	3
Elective Course [4]		1
	Credits	**30-31**
Sophomore		
General Education Elective Course [2]		3-4
English Composition - Level 2 Course [2]		3

Choose one from the following:		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
FDMA 2535	Digital Illustration Techniques	3
FDMA 348	Acting for Animation	3
FDMA 2530	Introduction to 3D Modeling	3
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Science Course [2]		3-4
Oral Communications Course		3
Choose one from the following:		
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
FDMA 1510	Foundations of 3D Animation	3
FDMA 2710	Beginning 2D Animation	3
Elective Course [4]		3
	Credits	**30-32**
Junior		
Viewing A Wider World Courses [5]		6
FDMA 1715	2-D Compositing & FX	3
FDMA 350	Intermediate 2D Animation	3
FDMA 308 or FDMA 309	Writing for Animation or Screenwriting I	3
FDMA 365 or FDMA 433	Character Design and Development or Sets and Environments	3
Area IV: Social/Behavioral Sciences Course [2]		3
FDMA 362	Motion Graphics	3
FDMA 450	Advanced 2D Animation	3
Elective Course [4]		3
	Credits	**30**
Senior		
FDMA 492	2D Production Studio I	6
FDMA 494	2D Production Studio II	6
FDMA 327	2D Rigging	3
Elective Courses [4]		15
	Credits	**30**
	Total Credits	**120-123**

1 These courses must be taken with a C- of better

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 Required Pre-Application class for ANVE

4 Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

5 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Animation and Visual Effects (3D & VFX Production Studio) - Bachelor of Creative Media

The Creative Media Institute's Bachelor of Creative Media with an emphasis in Animation & Visual Effects currently offers 2 different paths, determined by the kind of senior project students wish to produce.

Students must complete all university requirements and the Animation and Visual Effects curriculum outlined below. All Animation and Visual Effects Curriculum requirements must be completed with a grade of C- or higher.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1,2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits) [1]		
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Science Course (4 credits or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		
THEA 1210G	Acting for Non-Majors	3
General Education Elective [1]		*3-4*
Viewing a Wider World [3]		**6**
Departmental/College Requirements		
ANVE Core Courses		
FDMA 1510	Foundations of 3D Animation	3
FDMA 2311	History of Animation [4]	3
FDMA 2381	Storyboarding	3
or ENGL 2381	Storyboarding	
FDMA 2382	Principles of Story Across the Media [4]	3
or ENGL 2382	Narrative: Principles of Story Across the Media	
FDMA 2530	Introduction to 3D Modeling	3
FDMA 2535	Digital Illustration Techniques	3
FDMA 2710	Beginning 2D Animation	3
FDMA 308	Writing for Animation	3
or FDMA 309	Screenwriting I	
3D & VFX Production Studio Pathway Courses		
FDMA 2720	3D Animation	3
FDMA 2725	Rigging for 3D Animation	3
FDMA 2745	Light, Shade, Render	3
FDMA 332	3D Character Animation	3
FDMA 341	Visual Effects I	3
FDMA 360	Previsualization	3

FDMA 365	Character Design and Development	3
FDMA 401	Motion Capture Techniques	3
FDMA 433	Sets and Environments	3
FDMA 491	3D Production Studio I	6
FDMA 493	3D Production Studio II	6
Second Language Requirement: (not required)		**0**
Electives, to bring the total credits to 120 [5]		**16-19**
Total Credits		**120**

1 See the General Education (p. 262) section of the catalog for a full list of courses.
2 A Mathematics General Education course is required but students may need to take any prerequisites needed to enter the course selected first.
3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4 Required Pre-Application class for ANVE
5 Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Creative Media with a major in Animation and Visual Effects, there is no second language requirement for the degree.

A Suggested Plan of Study

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		**Credits**
English Composition - Level 1 Course [1,2]		4
ENGL 1110G or ENGL 1110H	Composition I (recommended) or Composition I Honors	
Area II: Mathematics [1,2]		3-4
MATH 1130G	Survey of Mathematics (recommended)	
FDMA 2311	History of Animation (C- or better) [3]	3
FDMA 2382 or ENGL 2382	Principles of Story Across the Media (B- or better) [3] or Narrative: Principles of Story Across the Media	3
Area III: Laboratory Sciences Course [2]		4
Area V: Humanities Course [2]		3
THEA 1210G	Acting for Non-Majors	3
FDMA 2381 or ENGL 2381	Storyboarding or Storyboarding	3
FDMA 2530	Introduction to 3D Modeling	3
Elective Course [4]		1
	Credits	**30-31**
Sophomore		
General Education Elective Course [2]		3-4
English Composition - Level 2 Course [2]		3
Choose one from the following:		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
FDMA 1510	Foundations of 3D Animation	3
FDMA 2535	Digital Illustration Techniques	3
FDMA 2710	Beginning 2D Animation	3
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Science Course [2]		3-4
Oral Communications Course		3
Choose one from the following:		
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
FDMA 2745	Light, Shade, Render	3
FDMA 2720	3D Animation	3
FDMA 433	Sets and Environments	3
	Credits	**30-32**
Junior		
Viewing A Wider World Courses [5]		6
FDMA 2725	Rigging for 3D Animation	3
FDMA 332	3D Character Animation	3
FDMA 365 or FDMA 433	Character Design and Development or Sets and Environments	3
FDMA 341	Visual Effects I	3
FDMA 308 or FDMA 309	Writing for Animation or Screenwriting I	3
FDMA 360	Previsualization	3
FDMA 401	Motion Capture Techniques	3
Area IV: Social/Behavioral Sciences Course [2]		3
Viewing a Wider World Courses [5]		3
	Credits	**33**
Senior		
FDMA 491	3D Production Studio I	6
FDMA 493	3D Production Studio II	6
Elective Courses [4]		18
	Credits	**30**
	Total Credits	**123-126**

1 These courses must be taken with a C- of better
2 See the General Education (p. 262) section of the catalog for a full list of courses.
3 Required Pre-Application class for ANVE
4 Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
5 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Digital Film Making - Bachelor of Creative Media

Students must complete all university requirements and the Digital Film Making curriculum outlined below. All Digital Film Making Curriculum requirements must be completed with a grade of C- or higher.

Requirements

Prefix	Title	Credits
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1, 2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences [1]		*10-11*
Area III: Laboratory Sciences Course (4 credits)		
Area IV: Social/Behavioral Sciences Course (3 credits)		
Either an Area III/IV: Laboratory Science Course or Social/ Behavioral Sciences Course (4 credits or 3 credits)		
Area V: Humanitites [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing a Wider World [3]		**6**
Departmental/College Requirements		
Foundation Courses		
FDMA 1555	Introduction to the Creative Media Industry [4]	3
FDMA 2510	Introduction to Sound Design for Film	3
or FDMA 1415	Principles of Sound	
FDMA 2520	Introduction to Cinematography	3
or FDMA 1210	Digital Video Production I	
FDMA 1220	Introduction to Digital Video Editing [5]	3
FDMA 2382	Principles of Story Across the Media [4]	3
or ENGL 2382	Narrative: Principles of Story Across the Media	
FDMA 2310	History of Cinema I	3
FDMA 303	Cinema Review and Critique	3
or ENGL 303	Theory and Criticism: Film, Media and Culture	
FDMA 314	Acting for Film	3
or THEA 311	Acting for Film and Television	
or FDMA 309	Screenwriting I	
FDMA 328	Producing	3
or FDMA 305	Business of Filmmaking/Animation	
FDMA 497	Portfolio Design and Development	3
FDMA Elective Courses		
Select 27 credits from the following (21 credits must be 300 level and above): [6]		27
FDMA 2311	History of Animation	
FDMA 2381	Storyboarding	
or ENGL 2381	Storyboarding	
FDMA 2710	Beginning 2D Animation	
FDMA 1510	Foundations of 3D Animation	
FDMA 2120	Film Crew I/ Introduction to Film and Media Workflow [6]	
FDMA 2125	Film Crew II [6]	
FDMA 1210	Digital Video Production I [6]	
FDMA 2210	Digital Video Production II [6]	
FDMA 2144	Pre-production Management [6]	
FDMA 2285	Digital Video Production and Editing II [6]	
FDMA 301	Sound Design II	
FDMA 304	Independent Filmmaking	
FDMA 305	Business of Filmmaking/Animation	
FDMA 307	Writing for Television	
FDMA 308	Writing for Animation	
FDMA 309	Screenwriting I	
FDMA 310	Cinematography II	
FDMA 311	Editing II	
FDMA 312	Post Production Color Grading	
FDMA 314	Acting for Film	
FDMA 318	Documentary Production	
FDMA 320	Race and Gender in Film	
FDMA 325	Film Festival Production	
FDMA 341	Visual Effects I	
FDMA 348	Acting for Animation	
FDMA 395	Directing I	
FDMA 396	Directing II	
FDMA 397	Practicum	
FDMA 398	Special Topics	
FDMA 400	Directed Studies	
FDMA 410	Cinematography III	
FDMA 422	Environmental Filmmaking	
FDMA 480	Screenwriting II	
FDMA 490	Advanced Screenwriting	
FDMA 495	Internship	
JOUR 302	Television Videography & Editing	
JOUR 319	Introduction to Photography	
JOUR 320	Photojournalism	
Second Language Requirement: (not required)		
Electives: to bring the total to 120 credits [7]		**25**
Total Credits		**120-123**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course first.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. Required pre-application course for DFM
5. Course may be taken at an NMSU community college.
6. See course descriptions in the designated community college campuses.
7. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Creative Media with a major in Digital Film Making there is no second language requirement for the degree.

A Suggested Plan of Study

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and

order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
English Composition - Level 1 Course [1]		4
ENGL 1110G or ENGL 1110H	Composition I (recommended) or Composition I Honors	
Area II: Mathematics Course [1]		3-4
MATH 1130G	Survey of Mathematics (recommended)	
FDMA 1555	Introduction to the Creative Media Industry (B- or better)	3
FDMA 2382 or ENGL 2382	Principles of Story Across the Media (B- or better) or Narrative: Principles of Story Across the Media	3
Oral Communication Course		3
Select one from the following:		
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area III: Laboratory Sciences Course [3]		4
Area IV: Social/Behavioral Sciences Course [3]		3
Area V: Humanities Course [3]		3
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course [3]		3-4
Elective Course [2]		1
	Credits	**30-32**
Sophomore		
English Composition - Level 2		3
Choose one from the following:		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
General Education Elective Course [3]		3-4
FDMA 2510 or FDMA 1415	Introduction to Sound Design for Film or Principles of Sound	3
FDMA 2520 or FDMA 1210	Introduction to Cinematography or Digital Video Production I	3
FDMA 1220	Introduction to Digital Video Editing	3
Area VI: Creative and Fine Arts [3]		3
FDMA 2310	History of Cinema I	3
FDMA Elective Courses [4]		6
Elective Courses [2]		3
	Credits	**30-31**
Junior		
Viewing A Wider World Courses [5]		6
FDMA 314 or THEA 311	Acting for Film or Acting for Film and Television	3
Choose one from the following:		3
FDMA 303	Cinema Review and Critique	
ENGL 303	Theory and Criticism: Film, Media and Culture	
ENGL 326	Cultural Identity and Representation Across Media	
FDMA 328 or FDMA 305	Producing or Business of Filmmaking/Animation	3
FDMA Elective Course (Upper-Division) [4]		9
Elective Course [2]		6
	Credits	**30**
Senior		
FDMA 497	Portfolio Design and Development	3
FDMA Elective Courses (Upper-Division) [4]		12
Elective Courses [2]		15
	Credits	**30**
	Total Credits	**120-123**

1 These courses must be taken with a C- of better

2 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

3 See the General Education (p. 262) section of the catalog for a full list of courses.

4 **FDMA Elective Courses:**

Las Cruces Campus Courses

- FDMA 2311 History of Animation, FDMA 2381 Storyboarding, FDMA 2710 Beginning 2D Animation, FDMA 1510 Foundations of 3D Animation, FDMA 301 Sound Design II, FDMA 305 Business of Filmmaking/Animation, FDMA 308 Writing for Animation, FDMA 309 Screenwriting I, FDMA 310 Cinematography II, FDMA 311 Editing II, FDMA 318 Documentary Production, FDMA 320 Race and Gender in Film, FDMA 341 Visual Effects I, FDMA 395 Directing I, FDMA 396 Directing II, FDMA 397 Practicum, FDMA 398 Special Topics, FDMA 400 Directed Studies, FDMA 410 Cinematography III, FDMA 480 Screenwriting II, FDMA 490 Advanced Screenwriting, FDMA 495 Internship,
- ENGL 2381 Storyboarding

Community College Courses

- FDMA 2120 Film Crew I/ Introduction to Film and Media Workflow, FDMA 2125 Film Crew II, FDMA 1210 Digital Video Production I, FDMA 2210 Digital Video Production II, FDMA 2285 Digital Video Production and Editing II, FDMA 2144 Pre-production Management

5 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Animation and Visual Effects - Undergraduate Minor

Must be admitted to DFM

Take 18 credits of FDMA/ENGL, FDMA/THEA courses as listed in the Animation and Visual Effects major. A minimum of 9 credits must be upper division.

Creative Writing - Undergraduate Minor

Students not earning a bachelor's degree in English with an emphasis in Creative Writing are eligible to pursue a minor in Creative Writing. Students must earn 18 credits from the approved course lists below. At least 12 credits must be upper division. Students may request approval for other courses clearly related to the minor from the undergraduate advisor in the Department of English. Students earning a BA in English must earn at least 6 credits approved by the Department of English undergraduate advisor beyond those earned for the major in order to earn a minor in Creative Writing.

Prefix	Title	Credits
Requirements		
Select two from the following: [1]		6
ENGL 2310G	Introduction to Creative Writing	
ENGL 2521	The Bible as Literature	
ENGL 2610G	American Literature I	
ENGL 2620G	American Literature II	
ENGL 2280	History of Argument	
ENGL 2630G	British Literature I	
Select two from the following: [2]		6
ENGL 304	Creative Writing: Prose	
ENGL 306	Creative Writing: Poetry	
ENGL 307	Creative Writing: Creative Nonfiction	
ENGL 308	Creative Writing: Playwriting	
ENGL 413	Advanced Creative Writing: Prose Workshop	
ENGL 414	Advanced Creative Writing: Poetry Workshop	
ENGL 446	Advanced Creative Writing: Nonfiction Prose	
Select one from the following (446 may satisfy this requirement if repeated or not used to satisfy the above requirement)	[2]	3
ENGL 413	Advanced Creative Writing: Prose Workshop	
ENGL 414	Advanced Creative Writing: Poetry Workshop	
Select 3 credits from English literature courses numbered 300 and above.		3
Total Credits		**18**

[1] Students may make 1 or 2 of the following substitutions:

- HNRS 2160G New Testament as Literature for ENGL 2521 The Bible as Literature;
- HNRS 2171G The Worlds of Arthur, HNRS 2173G Middle Ages, or HNRS 2117G The World of the Renaissance: Discovering the Modern for ENGL 2630 British Literature I;

[2] All Creative Writing workshops may be taken more than once.

Digital Film Making - Undergraduate Minor

Must be admitted to ANVE

Take 18 credits from the FDMA/ENGL, FDMA/THTR courses as listed in the Digital Film Making major. A minimum of 9 credits must be upper division.

Criminal Justice

Undergraduate Program Information

The Department of Criminal Justice offers courses in the traditional setting as well as online.

The criminal justice degree plan is broadly interdisciplinary in nature embracing the study of the humanities, law, natural, behavioral and social sciences. The curriculum seeks to balance theoretical inquiry with applied knowledge.

Students become prepared for careers in law enforcement, corrections, probation and parole, work with juveniles, victim services, non- and not-for profit organizations connected with criminal and social justice, and the related field of forensics. Graduates have also been successful in law school and graduate programs in the social sciences. The undergraduate major consists of at least 33 credits in the major field, 27 of which must be numbered 300 or above (excluding CJUS 393 Internship in Criminal Justice).

The department offers an interdisciplinary minor in Forensic Sciences. Students interested in the minor should consult with the department head.

Graduate Program Information

The Department of Criminal Justice offers graduate study leading to the Master of Criminal Justice (MCJ) degree. Admission to the MCJ is competitive and prospective graduate students are expected to have at least a 3.0 undergraduate grade-point-average, coursework in research methods and statistics, and possess a bachelor's degree. Those not meeting these requirements may be admitted conditionally and required to make up deficiencies at the outset of their program of study. Applicants should review our graduate handbook (https://crimjust.nmsu.edu/graduate-programs/HANDBOOK-Revised-May-2019f.pdf) and provide a personal statement that includes a discussion of your interest in the field and reasons for wanting to pursue the degree (1-2 pages). If interested in a graduate assistantship, please complete the application form (https://crimjust.nmsu.edu/_assets/TA-Application-for-MCJ-in-CJ-.pdf) and provide three letters of recommendation. Students meeting the minimum GPA requirement (3.0 or better) do not need to submit letters of recommendation. Students not meeting the minimum GPA requirement may be asked for additional materials, including letters of recommendation. The GRE is NOT required for admission into the MCJ program. The MCJ Graduate Committee may require a student to complete additional English writing coursework. For more information, please visit the Criminal Justice Graduate Programs webpage (https://crimjust.nmsu.edu/graduate-programs/criminal-justice-grad.html).

Students must declare their intent to pursue one of the two degree options: the thesis option or the focused coursework option. The degree options are provided so that students may better match their education with career goals. The thesis option is often used by students interested in pursuing careers in basic and applied criminal justice research or a doctoral degree. The focused coursework option is often used by students pursuing administrative positions within criminal justice

agencies. The thesis option is typically only available for Campus-Based students.

All candidates, regardless of chosen degree option, must complete a final examination. Examination requirements vary by degree option. Please contact the director of the MCJ program or consult the Department of Criminal Justice Graduate Programs webpage (https://crimjust.nmsu.edu/graduate-programs/criminal-justice-grad.html).

Thesis students must submit a thesis proposal to their faculty committee at a proposal hearing for approval and subsequently complete the approved thesis project. An approved thesis proposal is one wherein the thesis committee determines the student demonstrates a comprehensive understanding of the nexus of theory, method, and policy as it applies to the proposed thesis project. At the discretion of the thesis committee the proposal may be considered inadequate and the student is required to revise and resubmit the thesis proposal until the committee determines the proposal is satisfactory. The final examination includes a defense of the completed thesis, but may also include a general examination based upon the candidate's program of study. The minimum coursework requirements are displayed below.

Focused coursework students must pass two written comprehensive examinations following completion of the required courses, no earlier than their third semester. Students not passing the examinations will be required to wait until the following semester to retake the examination. The minimum course requirements are displayed below.

Online M.C.J. Coursework

There is an online option for the MCJ degree. Online criminal justice courses are available only to those admitted to the MCJ program as online students, or with permission of the Director of the MCJ program. Students desiring to be admitted to the MCJ program as online students must declare that intent in writing to the MCJ director. For more information regarding the online MCJ degree option, consult the Department of Criminal Justice web page, http://crimjust.nmsu.edu, or contact the Director of the MCJ program.

Teaching Assistantships

Teaching assistantships are typically available for some traditional (on-campus) MCJ students on a competitive basis. The Director of the MCJ Program will contact admitted students to determine their interest, and the Graduate Committee will make recommendations to the Department Head for a final decision.

Degrees for the Department

Bachelor Degree(s) & Supplemental Major(s)

- Criminal Justice - Bachelor of Criminal Justice (p. 701)
- Criminal Justice - Bachelor of Criminal Justice (Online) (https://catalogs.nmsu.edu/global/nmsu-global/criminal-justice-bcj-online/)
- Law and Society - Undergraduate Supplemental Major (p. 705)

Master Degree(s) & Dual Degree(s)

- Criminal Justice - Master of Criminal Justice (p. 141)
- Criminal Justice - Master of Criminal Justice (Online) (https://catalogs.nmsu.edu/global/nmsu-global/criminal-justice-mcj-online/)
- MPA-MCJ Program - Dual Degree (p. 176)

Minors for the Department

- Forensic Science - Undergraduate Minor (p. 704)
- Human Rights - Undergraduate Minor (p. 705)

Professor, Carlos E. Posadas, Department Head

Professor Natividad; ***Associate Professors*** Baek, Cho, Keys; ***Assistant Professors*** Corey, Edwards, Spivey; ***College Associate Professor*** Dimitrijevic; ***College Assistant Professor****; Breckenridge, D'Antonio-Hangen, Garland;* ***Emeritus Professors*** Crowley, Gregware, Mays (Regents), Winfree.

H. Baek, Ph.D. (University of Louisville, Kentucky)--police administration, criminology; A. Cho, Ph.D. (Sam Houston State University)--corrections, gender as it relates to crime & justice; J. Corey, Ph.D. (University of Texas at Dallas) - corrections, mental health, program evaluation; M. Edwards, Ph.D. (Kansas State University) - criminology, community supervision, structural & social inequalities; D. Giever, Ph.D. (Indiana University of Pennsylvania)--criminology, research methods, evidence-based program evaluation; D. Keys, Ph.D. (Missouri-Columbia)– penology, narcotic policy; N. Natividad, Ph.D. (Arizona State)–borderland studies, race and identity studies, immigration; C. E. Posadas, Ph.D. (Arizona State)– immigration and justice, juvenile justice, research methods; E. Spivey (Texas State University)* - reentry, desistance, intersectionality, criminological theory, collateral consequences of exposure to the criminal justice system; *J. Breckenridge, MCJ (New Mexico State University) - law enforcement, criminal investigations, terrorism; M. Dimitrijevic, MCJ (New Mexico State University) - human trafficking, drugs, comparative CJ systems; I. D'Antonio-Hangen, MCJ (New Mexico State University) - criminal investigations, human trafficking, forensic law; S. Garland, M.A. (Indiana University of Pennsylvania) - corrections, administrative systems.*
**MCJ Program Director*

Criminal Justice Courses

CJUS 1110G. Introduction to Criminal Justice
3 Credits (3)
This course provides an overall exploration of the historical development and structure of the United States criminal justice system, with emphasis on how the varied components of the justice system intertwine to protect and preserve individual rights. The course covers critical analysis of criminal justice processes and the ethical, legal, and political factors affecting the exercise of discretion by criminal justice professionals.
Learning Outcomes

1. Describe the history, structure and function of the criminal justice system in the United States.
2. Discuss the role of law enforcement, court systems, corrections, and security in maintaining social order.
3. Identify and describe crime causation theories, various measures of crime and their reliability and victimization theories.
4. Relate fundamental principles, concepts and terminology used in criminal justice to current events.
5. Apply basic analytical and critical thinking skills in evaluating criminal justice issues, policies, trends and disparities.

CJUS 1120. Criminal Law
3 Credits (3)
This course covers basic principles of substantive criminal law including elements of crimes against persons, property, public order,public morality, defenses to crimes, and parties to crime. May be repeated up to 3 credits.

Learning Outcomes

1. Explain the concepts of substantive criminal liability in the United States, including actus reas, mens rea, causation, concurrence, and parties to crime.
2. Define the differences between criminal law and civil law in the United States.
3. Demonstrate basic knowledge of legal terminology as it relates to criminal law.
4. Identify the elements of crimes against persons, property, public order and the administration of justice, public morality, and the inchoate crimes.
5. Describe the various defenses to crimes.

CJUS 1996. Special Topics in Criminal Justice
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. May be repeated under different topics for a maximum of 6 credits.
Learning Outcomes

1. Varies

CJUS 2120. Criminal Courts and Procedure
3 Credits (3)
This course covers the structures and functions of American trial and appellate courts, including the roles of attorneys, judges, and other court personnel, the formal and informal process of applying constitutional law, rules of evidence, case law and an understanding of the logic used by the courts.
Learning Outcomes

1. Explain the application of the Constitutional Amendments that apply to criminal justice.
2. Explain and describe the dual court system in the U.S. and how courts enforce the rule of law.
3. Identify and list the duties and requirements of the courtroom workgroup.
4. Describe courtroom procedures, rules of the court, and due process of law.
5. Articulate basic knowledge of the U.S. criminal court system.
6. Define legal terms.
7. Explain the use of discretion in criminal procedure.
8. Differentiate the role of courts of limited jurisdiction, courts of general jurisdiction, and the appellate courts in the processing of criminal cases.

CJUS 2140. Criminal Investigations
3 Credits (3)
This course introduces criminal investigations with in the various local, state, and federal law enforcement agencies. Emphasis is given to the theory, techniques, aids, technology, collection, and preservation procedures which insure the evidentiary integrity. Courtroom evidentiary procedures and techniques will be introduced. Community Colleges only. (Note: students completing CJUS 2140 may not take CJUS 321.)
Learning Outcomes

1. Identify developments in investigation technology.
2. Identify common types of criminal investigations and their key components.
3. Apply proper crime scene investigative protocols.
4. Explain proper evidentiary gathering and handing procedures, and utilize various interviewing techniques.
5. Identify and compare different law enforcement agencies and the role they play in criminal investigations.
6. Describe proper collection, evidence preservation, documentation, and court presentation.
7. Develop effective search authorization.

CJUS 2150. Corrections System
3 Credits (3)
This course introduces the corrections system in the United States, including the processing of an offender in the system and the responsibilities and duties of correctional professionals. The course covers the historical development, theory, and practice, as well as the institutional and community-based alternatives available in the corrections process.
Learning Outcomes

1. Describe the purposes of the corrections system and the issues facing the corrections system.
2. Explain the components of the corrections system and describe their functions.
3. Compare and contrast the different forms of correction practices.
4. Explain the goals of corrections, the different factors affecting the sentencing process, the legal rights of prisoners, and the issues concerning prison violence.
5. Explain the impact of reentry into society.
6. Identify the issues concerning capital punishment.
7. Describe the effectiveness of various correction programs on offenders.

CJUS 2160. Field Experience in Criminal Justice
3-6 Credits
This course is designed to provide actual experience working for a criminal justice agency and the opportunity to apply criminal justice concepts and theory to a field situation. Students already working in an agency will complete an approved learning project while on the job.
Prerequisites: CJUS 1110G, prior arrangement and consent of instructor and a GPA of 2.0 or better in major.
Learning Outcomes

1. Obtain practical experience by observing, researching, and working in a criminal justice agency.
2. Apply the knowledge of principles, theories, and methods that were learned in the classroom to situation in which field experience will be devoted
3. Instill an understanding for general and specific problems that criminal justice agencies encounter on a daily basis.
4. Develop a professional work ethic and attitudes, including reliability, professional responsibility, and the ability to work cooperatively with others.

CJUS 2220. The American Law Enforcement System
3 Credits (3)
This course covers the historical and philosophical foundations of law and order, with an in-depth examination of the various local, state, ad federal law enforcement agencies and how they interact within the criminal justice system.
Learning Outcomes

1. Discuss, evaluate, and analyze the role of police in the democratic society today, and the historical development of modern day law enforcement
2. Define and explain the different types of community policing and the valid reasons behind their application within a community

3. List and discuss the ways to overcome the barriers to change within a police organization, good recruitment, screening, and retention of employees
4. Analyze and discuss the history of and the different types of police patrol, as well as the use of force and deadly force, and methods used for controlling police behavior
5. Describe and discuss the different types of police behavior, potential oversight, and remedy and their limitations
6. List and discuss the benefits of higher and continued education, along with the minimum educational requirements for police officers
7. Evaluate and discuss the reasons for police stress and the methods of dealing with stressors
8. Interpret current court cases, both state and federal, that affect police procedures

CJUS 300. Introduction to Criminal Justice Research
3 Credits (3)
Overview and evaluation of criminal justice research. Selection of research topics, methods of data selection and collection, analysis techniques, and presentation of findings.
Prerequisite: restricted to majors or consent of instructor.

CJUS 301. Advanced Research Methods
3 Credits (3)
Study of selected quantitative and qualitative skills and their application to criminal justice research.
Prerequisite: Restricted to majors or consent of instructor.

CJUS 302. Crime, Justice and Society
3 Credits (3)
Through critical analysis students build a rich understanding of the role of crime in our contemporary landscape and explore ideas and practices associated with justice, victimization, criminality, morality and righteousness. The course cultivates knowledge & awareness of the interactions between socially constructed phenomena (race, class, power, ethnicity, economic structures) and popular beliefs, policies, and practices associated with crime, punishment, and formal social control. It is recommended that you complete three of the following English courses before enrolling in this class: ENGL 1110G, ENGL 2210G, ENGL 2221G & ENGL 2130G. Restricted to: Criminal Justice majors.

CJUS 303. Introduction to Criminological Theory
3 Credits (3)
Defining and measuring crime, crime causation, and the criminal behavior system, and their linkage to criminal justice policies, procedures, and practices. Students must be enrolled or have completed third English writing class and completed two of the following: ENGL 1110G, ENGL 2210G, ENGL 2221G or ENGL 2130G. Restricted to: C J majors.
Prerequisite(s): CJUS 300.

CJUS 304. Historical Perspectives of Criminal Justice Systems
3 Credits (3)
Examines the precursors to and development of three distinct systems associated with crime and punishment in the United States: the Courts, the Police, & Corrections. By studying the historical context and socio-political backdrop in which theses institutions emerged and expanded students will come to a richer understanding of them and their attendant polices, practices, conventions, and assumptions.It is recommended that you complete three of the following English courses before enrolling in this class: ENGL 1110G, ENGL 2210G, ENGL 2221G or ENGL 2130G. Restricted to: Criminal Justice majors.
Prerequisite(s): CJUS 300.

CJUS 306. Criminal Procedural Law
3 Credits (3)
Legal analyses of the rights of criminal defendants; legal duties and responsibilities of criminal justice personnel in the processing of criminal defendants. May be repeated up to 3 credits. Restricted to: C J majors.
Prerequisite(s): Restricted to majors, Forensic Science minors, or consent of instructor.

CJUS 307. Law of Evidence
3 Credits (3)
Evidentiary rules and concepts and their application in a criminal trial. May be repeated up to 3 credits. Restricted to: C J majors.
Prerequisite(s): Restricted to majors, Forensic Science minors, or consent of instructor.

CJUS 321. Criminal Investigation and Intelligence
3 Credits (3)
Principles of criminal investigation and intelligence production; processing cases from complaint through crime scene search, identification and collection of evidence, interviewing and interrogation, and case preparation for courts. May be repeated up to 3 credits. Restricted to: C J majors.
Prerequisite(s): Restricted to majors, Forensic Science minors, or consent of instructor.

CJUS 331. American Correctional Institutions
3 Credits (3)
Structure, organization, and operations of United States jails and prisons. Overview of correctional standards and classification systems, emphasizing current theory and practice.
Prerequisite: restricted to majors or consent of instructor.

CJUS 332. Correctional Law
3 Credits (3)
Federal and state laws and rules of post-conviction procedures; rights of the convicted related to sentencing, appeals, clemency, and restoration of rights.
Prerequisite: restricted to majors or consent of instructor.

CJUS 333. Juvenile Corrections
3 Credits (3)
Development and implementation of juvenile facilities and community programs. Effectiveness of current corrections practices. Restricted to majors.

CJUS 345. Victimology
3 Credits (3)
Study of risk factors in crime victimization, the impact of crimes upon victims, and the role of the victim in the criminal justice system.
Prerequisite: restricted to majors or consent of instructor.

CJUS 347. Sex Crimes
3 Credits (3)
Dynamics of sex crimes for victims and offenders, plus consideration of the legal and correction systems' response to sex crimes. Restricted to majors.

CJUS 348. Serial Killers
3 Credits (3)
Overview and critical assessment of serial homicide and its relevance for contemporary U.S. society. Focus on factors influencing definitions and cultural understanding of serial homicide.
Prerequisite(s): 60 credit hours.

CJUS 360. The Juvenile Justice System
3 Credits (3)

History, development, and philosophy behind a separate juvenile justice system. Role of the juvenile court, evaluation of juvenile law and procedure, and the processing of juvenile offenders.
Prerequisite: restricted to majors or consent of instructor.

CJUS 380. Introduction to Terrorism
3 Credits (3)
Overview of the phenomenon of terrorism, psychological and sociological theories of terrorism, and various contemporary governmental policies.

CJUS 391. Special Readings in Criminal Justice
1-3 Credits
Individually chosen subject areas not readily available in other courses. May be repeated for a maximum of 6 credits under different subtitles. Restricted to majors.
Prerequisites: at least a 2.5 GPA and consent of instructor.

CJUS 393. Internship in Criminal Justice
1-12 Credits
Field experience in a local, state, or federal criminal justice or private security agency. Includes orientation, observation, conferences, and work experience. Credits limited to six if student has taken CJUS 2160. May be repeated for a maximum of 12 credits. Restricted to majors. Graded S/U.
Prerequisites: consent of instructor and GPA of 2.5 or better.

CJUS 399. New Mexico Law
3 Credits (3)
Examination of the history, development and implementation of law in New Mexico with an emphasis on legal issues unique to New Mexico. Crosslisted with: POLS 399. May be repeated up to 3 credits.
Learning Outcomes
1. To understant the unique legal issues of New Mexico through critical examination of the history, development and implementation of law in the state.
2. To develop skills to critically analze debates over legal issues in New Mexico.
3. To develop skills to effectively communicate analysis of legal issues in New Mexico in oral and written forms.

CJUS 405. Juvenile Courts and Law
3 Credits (3)
History, development, and current status of juvenile courts. Legal status of juveniles in court and constitutional protections afforded them. Restricted to majors.

CJUS 410. Criminal Justice Administrative Systems
3 Credits (3)
Administrative structures in criminal justice agencies and institutions; relationship of administrative structures to practical police, courts, and corrections problems.
Prerequisite: restricted to majors or consent of instructor.

CJUS 412. Introduction to Security Technology and Loss Prevention
3 Credits (3)
Private and public responses to security problems, including employee theft, perimeter security, and domestic or foreign terrorism; reviews related law and management practices.

CJUS 414. Race, Crime and Justice
3 Credits (3)
Historical and contemporary analysis of the relationship between race and crime in the United States with emphasis upon human equality and fairness. Overview of racial and ethnic social categorizations and how they impact law and order.

CJUS 416. Global Perspectives on Youth and Drug Use
3 Credits (3)
Overview of global drug use among young people, comparative legal structures, formal and informal responses. Restricted to C J, C EP, ANTH, GOVT, SOC, GNDR, S WK majors.
Learning Outcomes
1. Identify and analyze the history of drugs.
2. Compare different legal and illegal drugs of abuse in cultures around the world, with particular reference to children and youth.
3. Critique the different strategies in addressing illegal drugs and the use of medical marijuana.
4. Identify the various categories of drugs.
5. Collaborate with classmates in a group project to investigate designer drugs.
6. Examine how the local program focuses on substance use prevention and/or drug treatment operates and summarize recommendations for drug prevention programs and education.

CJUS 417. Drugs In Our World
3 Credits (3)
Comparative analysis of patterns and theories of drug use, terminology concerning drugs, associated behaviors, dangers, criminal relationships, class stratification, and the impact of drugs.
Learning Outcomes
1. Identify and analyze types of drugs their effects on society.
2. Compare major contributing factors responsible for addiction regulations of drugs in the criminal justice system.
3. Clearly communicate (orally or in writing) arguments regarding the adverse effects of drugs on social and economic costs in the U.S.
4. Examine the patterns of abuse among various groups of people.
5. Critique the current prevention programs for drug use and abuse offer suggestions for effective drug treatments.

CJUS 424. Forensic Law
3 Credits (3)
Overview of the rules and issues related to the use of scientific information in the legal process. May be repeated up to 3 credits. Restricted to: C J majors.
Prerequisite(s): C J major, Forensic Science minors, or consent of instructor.

CJUS 425. Issues in Ethics, Law, and Criminal Justice
3 Credits (3)
Examination of the key ethical and decision-making dilemmas facing professionals working in the field of law and criminal justice.
Prerequisite: restricted to majors or consent of instructor.

CJUS 427. Race and Crime in Film
3 Credits (3)
Critical analysis of film where messages relating race and crime are present, with emphasis on how this imagery informs problem definition, policies, and practice within the criminal justice system.
Prerequisite(s): 60 credit hours.

CJUS 428. Mexican-Americans and Issues of Social Justice
3 Credits (3)
In this course we will explore and discuss social issues related to the Mexican American community in the U.S., with special emphasis on their collective historical struggles and contributions to society. We will discuss the political, economic and cultural forces that exemplify their experience as a “whole.”
Prerequisite(s): Students must have completed CJUS 300 or research methods equivalent or consent from the instructor.

CJUS 429. Immigration & Justice
3 Credits (3)
This course is designed to introduce undergraduate students to the complexities of immigration in the United States through a social justice lens. Students will explore the intersections of race, ethnicity, gender, and class in immigration through different groups' historical and contemporary experiences, including immigrants' experience with the criminal justice system.
Prerequisite(s): Student must have completed CJUS 300 or Research Methods equivalent or consent of the instructor.

CJUS 432. Documentary Production
3 Credits (3)
Survey of theory and history of documentary film making including viewings and discussions of notable films and directors. Class works with actual documentary project. May be repeated up to 6 credits. Restricted to: ANVE, DFM majors.
Prerequisite: FDMA 1220, FDMA 2520.
Learning Outcomes
1. Analyze documentary forms, storytelling strategies, and ethical considerations to inform the development of original nonfiction projects.
2. Produce short documentary films—individually and collaboratively—that demonstrate technical proficiency in shooting, sound, and editing.
3. Develop research-driven proposals and pitch presentations that effectively communicate concept, story, and social relevance to an intended audience.

CJUS 434. Probation, Parole, and Community Corrections
3 Credits (3)
Structure, organization, and operation of probation, parole, and other community-based correctional programs in the U.S. Overview of historical and recent trends in the supervision of offenders in the community and in the development of alternatives to incarceration. Analysis of issues related to community correctional policies and practices. Restricted to majors.

CJUS 435. Political Penology
3 Credits (3)
Comparative analysis of incarceration and sanctions as punishment for crimes of conscience, religious intolerance, and dissidence.

CJUS 436. Courts and Sentencing
3 Credits (3)
This course will focus on the structure, organization, and operation of the state and federal court systems in the United States. It examines courtroom decision making and dynamics of courthouse justice—prosecutorial discretion, plea bargaining practices, jury and judicial decision making and sentencing. Additional topics will include racial, gender and class disparities in sentencing outcomes and the impact of recent reforms directed at the criminal court system. Restricted to: Criminal Justice majors.

CJUS 437. Wrongful Convictions
3 Credits (3)
This course will address causes (e.g. problems in witness identification, forensics, police and attorney conduct) as well as results of erroneous dispositions (e.g. compensation, media dynamics, possible reforms) in a critical analysis. Appropriate for prospective police, legal, and policy professionals. Restricted to: Criminal Justice majors.

CJUS 440V. Comparative Criminal Justice Systems
3 Credits (3)
Cross-national study of selected Western and non-Western legal systems. Comparison of structures and functions of police, court systems, and corrections in different systems.

CJUS 453. Women and Justice
3 Credits (3)
Critical analysis of the impact of the criminal justice system, race and class upon the lives of women. Restricted to majors.

CJUS 454. Human Trafficking
3 Credits (3)
Study of global human trafficking, its causes and costs, and mitigation strategies. Restricted to C J, GOVT, SOC, GNDR, S WK majors.

CJUS 456. Police and the Community
3 Credits (3)
This course is an advanced introduction to policing in the United States. The course will also cover current issues in policing, such as new technologies and the role of police in terrorism prevention.
Learning Outcomes
1. Describe the evolution of police community relations and community policing.
2. Compare and contrast traditional policing with community policing.
3. Examine discretion in police work and relate it to legal, operational, and ethical issues and problems.
4. Examine police misconduct and corruption.
5. Examine the importance of professionalism and ethics in police work.
6. Identify strategies for interacting with the physically and mentally disabled, the elderly, and crime victims.

CJUS 4750V. International Criminal Law, War Crimes, Genocide, & Crimes Against Humanity
3 Credits (3)
The course provides a basic introduction to international criminal law and current events and issues involving international criminal justice. It examines how the international criminal justice system addresses the gravest crimes and mass human rights violations. The course is broken up into three parts. First it explores the evolution and historical development of prosecution of international crimes and mass atrocities by international criminal courts and tribunals. Second, the course examines the main elements of international crimes including war crimes, genocide, crimes against humanity, and crimes of aggression. This section also explores the sources of international criminal law and jurisdiction over the investigation and prosecution of international crimes. The last section examines the growth of the International Criminal Court (ICC) and recent developments in international criminal justice including sentencing, reparations and victim participation. The course provides an understanding of the codification and application of international criminal law and international humanitarian law and challenges to addressing mass human rights violations during or after conflict.
Learning Outcomes
1. Explain the historical evolution of international criminal law.
2. Define the core crimes of war crimes, crimes against humanity and genocide.
3. Identify foundational texts of international criminal law.
4. Understand domestic and international judicial enforcement.
5. Describe the forms and modes of criminal responsibility.
6. Identify issues related to the prosecution and punishment of international crimes at the national and international level.
7. Explain the history of the International Criminal Court.

8. Understand the international criminal court structure, function and proceedings.
9. Critically examine efficacy of international criminal law and criminal courts. 1
10. Gain a better understanding of your own worldviews and opinions towards international criminal law and justice.

CJUS 484. Hate Crimes & Groups
3 Credits (3)
Explores the phenomenon of hate-motivated violence. Examines the hate crime laws, organized hate groups, and social theories attempting to explain violent hate.

CJUS 501. Research Methods in Criminal Justice
3 Credits (3)
Research design, methods of data collection and analysis, and preparation of research reports. Restricted to majors.
Prerequisite: C J major or consent of instructor.

CJUS 502. Statistics in Criminal Justice
3 Credits (3)
Intermediate level statistical techniques applied to criminal justice data.
Learning Outcomes
1. Understand the basic statistical procedures for criminal justice research.
2. Use statistical software to enter and edit data, and conduct basic analysis.
3. Allow students the opportunity to recognize the critical role of empirical research in informing, influencing, and evaluating criminal justice practices and policies.
4. Developing a basic understanding of the role of statistics in criminal justice research.
5. Interpret and evaluate research evidence and statistical operations.

CJUS 511. Nature of Crime
3 Credits (3)
Defining and measuring crime, crime causation, and criminal behavior systems. Restricted to majors.
Prerequisite: C J major or consent of instructor.

CJUS 514. Advanced Race, Crime, and Justice
3 Credits (3)
Advanced analysis of the historical and contemporary relationship between race and crime in the United States with emphasis upon human equality and fairness. Overview of racial and ethnic social categorizations and how they impact law and order.

CJUS 515. A Course on Punishment
3 Credits (3)
Exploration and analysis of the idea and practice of punishment through a variety of philosophical perspectives, seeking to understand its moral and practical viability as employed in contemporary society, including its application within the criminal justice system.

CJUS 520. Advanced Girls, Women & Crime
3 Credits (3)
Advanced critical social science analysis of concepts of violence and justice as experienced by women impacted by the criminal justice system. Restricted to C J, GNDR majors. Crosslisted with: GNDR 520

CJUS 525. Issues in Ethics, Law, and Criminal Justice
3 Credits (3)
Examination of the key ethical and decision-making dilemmas facing professionals working in the fields of law and criminal justice. Restricted to majors.

CJUS 527. Advanced Race & Crime in Film
3 Credits (3)
Advanced critical analysis of film where messages relating race and crime are present, with emphasis on how this imagery informs problem definition, policies, and practice within the criminal justice system.

CJUS 528. Advanced Mexican-Americans and Issues of Social Justice
3 Credits (3)
Advanced analysis of social issues related to the Mexican American community in the U.S., with special emphasis on their collective historical struggles and contributions to society. We will discuss the political, economic and cultural forces that exemplify their experience as a "whole."
Learning Outcomes
1. Explore and discuss social issues related to the Mexican American community in the U.S.
2. Gain a better understanding of the history of the Mexican American experience in the U.S.
3. Understand current social justice issues impacting the Mexican American community.
4. Explore the Mexican American community experience particularly in the southwest.
5. Critically engage the challenges faced by the Mexican American community on issues such racial discrimination, racial profiling, immigration, and crime.

CJUS 529. Advanced Immigration & Justice
3 Credits (3)
Advanced analysis of the complexities of immigration in the United States through a social justice lens. Students will explore the intersections of race, ethnicity, gender, and class in immigration through different groups' historical and contemporary experiences, including immigrants' experience with the criminal justice system.

CJUS 531. Advanced Family Violence and the Law
3 Credits (3)
This course will examine how practitioners are involved in the criminal justice system in areas of family violence including: child physical abuse; child sexual abuse; child neglect; child ritualistic abuse; child exploitation; sibling abuse; intimate partner abuse; stalking; sexual abuse and elder abuse. This course will be helpful for those who wish to go into law enforcement or victim's advocacy work. Restricted to: Criminal Justice majors.

CJUS 532. Advanced Issues in Criminal Justice (f, s, sum)
3 Credits (3)
Seminar on problems and conflicts encountered in major criminal justice issues. Topics announced in the Schedule of Classes. May be repeated under different subtitles for unlimited credit.

CJUS 537. Advanced Wrongful Convictions
3 Credits (3)
This course will address causes (e.g. problems in witness identification, forensics, police and attorney conduct) as well as results of erroneous dispositions (e.g. compensation, media dynamics, possible reforms) in a critical analysis. Appropriate for prospective police, legal, and policy professionals. Restricted to: Criminal Justice majors.

CJUS 541. Seminar in Criminal Justice Policy Analysis and Planning
3 Credits (3)
Seminar on policy development, planning and implementation processes in criminal justice. Links formal policy goals as they relate to theory and

outcomes. Topics announced in the Schedule of Classes. Restricted to majors.
Prerequisite: C J major or consent of instructor.

CJUS 545. Advanced Victimology
3 Credits (3)
Study of risk factors in crime victimization, the impact of crimes upon victims, and the role of the victim in the criminal justice system. Consideration of the impact of criminal justice policy on victim outcomes.

CJUS 560. Juvenile Justice Systems
3 Credits
Policy development and operations in police, court, and correctional agencies in response to juveniles. Analysis of programs designed to identify, prevent and treat juvenile offenders. CJUS 570. Probation and Parole 3 cr. Advanced analysis of goals, theories and practices of all forms of correction in the community, including probation, parole, plus other intermediate sanctions. Restricted to majors.

CJUS 581. Community Policing
3 Credits (3)
Overview and analysis of community policing issues from various perspectives. Analysis of strategies that facilitate police and community collaboration. Restricted to majors.

CJUS 591. Directed Readings in Criminal Justice
3 Credits (3)
Supervised review of literature in specialized areas of the nature of crime, law and social control, and criminal justice administration. Consent of instructor required.

CJUS 592. Independent Research
1-3 Credits
Design and execution of a criminal justice research project. Requires a written paper in standard format, including literature review, hypotheses, methodology, findings, and conclusions.

CJUS 593. Internship
3-6 Credits
Supervised placement in an applied or research setting in criminal justice. An in-depth written report of the project is required. Restricted to C J majors. May be repeated for a maximum of 6 credits. Graded S/U.
Prerequisites: introductory graduate course in the area of the internship and consent of the internship supervisor.

CJUS 599. Master's Thesis
1-15 Credits
Thesis.

Human Rights Courses

HMRT 2110G. Introduction to Human Rights
3 Credits (3)
The course provides a basic introduction to international human rights including conceptual foundations and key theoretical debates with attention paid to current events that are shaping justice and human rights. It provides a variety of disciplinary perspectives on human rights including philosophy, socio-legal studies, political science, law, and criminology. The combination of understanding the conceptual foundations, key theoretical debates, and thematic areas in human rights will enable students to understand the evolution of human rights regimes and their influence in society today. The course is broken into four parts. The first part provides an understanding of the historical underpinnings of international human rights and their evolution in society and law. It examines foundational texts on justice and human rights that have shaped our concepts of rights and justice today. The second part focuses on global and regional mechanisms within human rights. Examining these mechanisms helps us understand the legal application and enforcement of human rights globally. The third section focuses on thematic areas in human rights. These thematic areas include: environmental law, international criminal law, refugee, migrants and asylum seekers, international women's rights, economic, social & cultural rights, and transitional justice. The course concludes by focusing on critical perspectives and local issues on human rights.
Learning Outcomes
1. Understand key theoretical debates on human rights.
2. Describe historical underpinnings of international human rights.
3. Identify different foundational texts in the evolution of justice and human rights.
4. Understand how social and historical contexts have impacted beliefs on justice, rights, and human dignity.
5. Explain thematic areas in international human rights.
6. Understand regional and global multilateral mechanisms in human rights law.
7. Critically examine the efficacy of international human rights.
8. Understand the social, political, economic and other factors that have molded human rights.
9. Gain a better understanding of your own worldviews and opinions towards justice and human rights.

HMRT 2125. International Rights of Children
3 Credits (3)
This course examines the history, sources and role of international rights of children in the protection of children worldwide. It provides an understanding of the international legal regulatory framework implemented to address the rights of children. The course is broken into two parts. The first part covers the history and development of international rights of children and explores key concepts from children's rights theory. This section also covers current international legal mechanisms in place to protect children worldwide. The second section covers issues in the protection of children's rights. Issues covered include (but not limited to): child labor, child trafficking, armed conflict, war, the right to truth. Lastly the course covers the future of international rights of children.
Learning Outcomes
1. Understand the history and origins of child protection in international human rights law.
2. Identify key concepts of children's rights theory in international human rights law.
3. Describe major international human rights law established for the protection of children.
4. Understand how international rights of children addresses issues in child exploitation and abuse related to child labor and child trafficking.
5. Explain the rights of children during armed conflict and war.
6. Identify the rights of children to the right to truth.
7. Critically examine the what the future of international rights of children entails when incorporating an understanding of human rights law.
8. Gain a better understanding of your own worldviews and opinions towards the international rights of children.

HMRT 2175G. Border Justice & Human Rights
3 Credits (3)
This course examines the human rights implications of border practices, migration/refugee patterns, and environmental degradation set

amidst increasingly contentious territorial politics, complex population movements, and record-shattering climate change events. Additionally, the course provides context to justice along the U.S/Mexico border as seen through a human rights lens. It examines issues of border conflict around the world. It also explores the history of the U.S.-Mexico border and examines historical and contemporary human rights issues impacting the region. The course is broken into three parts. The first part provides an introduction to the history of the U.S.-Mexico border region. This includes exploring the history of border drawing and its impact on populations living along the border. The second section examines the long history of violence along borders. It examines how border identities develop over time in the midst of violence, community building, and the contested spaces of borders. It also explores how drugs, immigration, and free trade has impacted border regions. Lastly after understanding the history and issues of violence along borders, the last section explores human rights issues of border regions. This section examines how social movements and human rights advocacy have impacted the protection of rights of communities living along borders.

Learning Outcomes

1. Explain the historical evolution of border drawing along the U.S.-Mexico border and throughout the world.
2. Identify how colonization impacted the development of border regions.
3. Understand how identity is informed by migration and belonging in the U.S.-Mexico border region.
4. Describe how increased border enforcement and immigrant criminalization has impacted the U.S.-Mexico border region.
5. Understand how drug wars, human trafficking and gendered violence impacts the U.S.-Mexico border.
6. Describe past and current human rights violations taking place along the U.S.-Mexico border and at other borders throughout the world.
7. Understand how transnational advocacy groups and other social movements advocating for human rights have impacted border regions.
8. Gain a better understanding of your own worldviews and opinions towards the U.S.-Mexico border and human rights.

HMRT 3996. Issues in Human Rights
3 Credits (3)

The course provides an opportunity to discuss contemporary issues in international human rights, including current events that are shaping justice and human rights. It provides a variety of disciplinary perspectives on human rights including philosophy, socio-legal studies, political science, law, and criminology. The combination of understanding the conceptual foundations, key theoretical debates, and thematic areas in human rights will enable students to understand the evolution of human rights regimes and their influence in society today. It will be taught as a Seminar on problems and conflicts encountered in major human rights issues.

Learning Outcomes

1. Understand key theoretical debates on human rights.
2. Describe historical underpinnings of international human rights.
3. Identify different foundational texts in the evolution of justice and human rights.
4. Understand how social and historical contexts have impacted beliefs on justice, rights, and human dignity.
5. Explain thematic areas in international human rights.
6. Understand regional and global multilateral mechanisms in human rights law.
7. Explain issues and approaches in human rights enforcement and policy.
8. Critically examine the efficacy of international human rights.
9. Understand the social, political, economic and other factors that have molded human rights. 1
10. Gain a better understanding of your own worldviews and opinions towards justice and human rights.

HMRT 4550V. Skills & Ethics for Human Rights Work
3 Credits (3)

Course topics will vary, but each will cover a specific skill that is important for doing contemporary human rights work. Topics might include: grant writing and fundraising, specific statistical techniques or research methods, forensics and human rights, interviewing of marginalized communities, creating documentary media, or the optimum use of social media. The course is broken into three parts. The first part provides an introduction to the topic of human rights and examines current issues faced by people working in the human rights field. The second section focuses on development of practical human rights skills. The last section explores ethical dilemmas faced when conducting human rights work

Learning Outcomes

1. Explain the practice of human rights work.
2. Identify differences between human rights activism and advocacy.
3. Explain differences between human right and other rights.
4. Understand the nature and practice of human rights data collection.
5. Describe the different research methods used in human rights work.
6. Understand grant writing and fundraising strategies for human rights work.
7. Identify the impact journalism, documentaries, and social media has on human rights work.
8. Understand how decolonizing human rights practices impact human rights work along the U.S.-Mexico border.
9. Critically examine the role human rights work has globally. 1
10. Gain a better understanding of your own worldviews and opinions towards the skills and ethics of human rights work.

HMRT 4580V. International Environmental Law and Justice
3 Credits (3)

This course will provide a general introduction to the basic concepts and mechanisms of international environmental law. The course is aimed at providing a foundation of the current international legal framework and principles that govern and regulate environmental law. It explores the root causes of environmental problems and investigates the ways society manages environmental issues via the law that transcend international boundaries and resultantly fall beyond the authority of a single nation. The course is broken into four parts. The first part provides an introduction to the topic and examines current issues impacting environmental law and justice. The section also examines the history and evolution of international environmental law. The second section analyzes the causes associated with environmental problems and describes current norms and policies. The third section explores the roles of governmental and intergovernmental actors and actors beyond the state that participate in international environmental law. The course concludes by examining environmental justice and questions whether environmental law is effective and what are the shortcomings and areas needed for improvement to protect the environment. This section also examines how social movements impact the protection and implementation of environmental law.

Learning Outcomes

1. Explain the historical evolution of international environmental law.
2. Identify root causes of environmental problems.
3. Understand the nature and practice of environmental law.
4. Describe the different types of environmental norms.
5. Identify the legal structure of courts and regulators for environmental law.
6. Understand the different jurisdictional spaces and actors for environmental law.
7. Explain the complexities of international environmental governance and regulation.
8. Describe the interconnections of environmental law with other areas of international law, including human rights, humanitarian law, trade and foreign investment.
9. Critically examine the influence of politics on the protection of the environment and establishment of international environmental law. 1
10. Gain a better understanding of your own worldviews and opinions towards the environmental protection and the law.

HMRT 4720V. Space Law & Human Rights
3 Credits (3)
This course examines the history, sources and role of space law shaping contemporary governance of space activities including weapons in space, freedom of exploration, militarization, surveillance, and corporate accountability. It provides an understanding of international resolutions, principles, regulations and private international and national space laws and policies. The course is broken into two parts. The first part provides an introduction the space law and human rights and examines the evolution of space law. This section also provides understanding on current space law treaties and principles. The second section covers substantive legal issues in outer space law and how human rights intersects with these issues. Issues covered include: weapons in space, corporate responsibility, national security, militarization, and environmental issues.

Learning Outcomes

1. Understand the history and development of space law.
2. Identify main tenets of space law.
3. Explain key space law treaties and principles.
4. Describe how space law intersects with human rights law.
5. Understand contemporary legal issues in space law and the protection of human rights and the environment.
6. Critically examine the what the future of space law entails when incorporating an understanding of human rights law.
7. Gain a better understanding of your own worldviews and opinions towards the outer space law and human rights.

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Criminal Justice - Bachelor of Criminal Justice

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Select one from the following: [1]		3
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
Choose one from the following: [2]		3
MATH 1220G	College Algebra [3]	
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits) [3]		
Area IV: Social Behavioral Sciences Course		
CJUS 1110G	Introduction to Criminal Justice	
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [3]		
Area V: Humanities		
Choose one from the following: [4]		3
PHIL 1145G	Philosophy, Law, and Ethics	
PHIL 2230G	Philosophical Thought	
PHIL 1120G	Logic, Reasoning, & Critical Thinking	
PHIL 2110G	Introduction to Ethics	
Area VI: Creative and Fine Arts [3]		*3*
General Education Elective [3]		*3-4*
Viewing a Wider World [5]		**6**
Departmental/College Requirements		
CJUS Core Courses [6]		
The department requires CJUS 1110G and this course will count towards both the General Education and Departmental/College Requirements		
CJUS 1120	Criminal Law	3
CJUS 301	Advanced Research Methods	3
CJUS 302	Crime, Justice and Society	3

CJUS 425	Issues in Ethics, Law, and Criminal Justice	3
Select 3-4 credits from the following:		3-4
CJUS 300	Introduction to Criminal Justice Research	
POLS 300	Political Research Skills	
PSYC 3110	Experimental Methods	
SOCI 3150	Social Research: Methods	
CJUS Theory Courses		
One course from the following:		3
CJUS 303	Introduction to Criminological Theory	
CJUS 304	Historical Perspectives of Criminal Justice Systems	
CJUS 414	Race, Crime and Justice	
Criminal Justice Electives		
Select 12 credits from upper division Criminal Justice Electives [7]		12
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Choose one additional English Composition - Level 2 course, must be a different course that previously selected:		3
ENGL 1120	Composition II	
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Second Language Requirement: (required- see below)		**3-14**
Electives, to bring the total credits to 120 [8]		**32-46**
15 credits must be Upper Division [9]		
Total Credits		**120**

1 The department requires 6 credits of English Composition - Level 2 coursework, 3 credits will count towards the General Education requirement, the other 3 credits will count as Non-Departmental requirements. ENGL 112 will only be accepted to fulfill one of the English Composition Level 2 requirements and is only allowed for transfer students.

2 MATH 1220G, MATH 1350G or MATH 2350G are preferred but any Mathematics course that is higher level than MATH 121G, excluding MATH 1130G Survey of Mathematics, or higher than STAT 251G is also accepted.
**students may need to take any prerequisites needed to enter of the allowable Mathematics course(s) first.*

3 See the General Education (p. 262) section of the catalog for a full list of courses.

4 Students can take an Upper-Division PHIL course to meet departmental requirements, however, if this option is chosen, the student will have to take another general education humanities course to fulfill the general education humanities requirement.

5 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

6 Prior to enrolling in upper division courses, lower division courses must be completed or final courses must be in progress.

7 Not to include CJUS 393 Internship in Criminal Justice, or any criminal justice required course. Courses that fall under multiple content areas may only be counted once. Please visit our website for specific courses in each of these content areas http://crimjust.nmsu.edu.

8 Elective credit may vary based on General Education course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

9 For transfer students only.

*A student must earn a C- or better to receive credit for any departmental and nondepartmental requirement for the BC J degrees.

Second Language Requirement

For the Bachelor of Criminal Justice with a major in Criminal Justice there is a two year second language requirement (or the completion of MATH 1511G), the student must do one of the following:there is a two year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120 & FREN 2110 & FREN 2120	French I and French II and French III and French IV	3-14
GRMN 1110 & GRMN 1120 & GRMN 2110 & GRMN 2120	German I and German II and German III and German IV	3-14
JAPN 1110 & JAPN 1120 & JAPN 2110 & JAPN 2120	Japanese I and Japanese II and Japanese III and Japanese IV	3-14
SPAN 1110 & SPAN 1120 & SPAN 2110 & SPAN 2120	Spanish I and Spanish II and Spanish III and Spanish IV	3-14
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220 & SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	3-9

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
SIGN 2110	American Sign Language III	3

Option 3:

Prefix	Title	Credits
Challenge the 2120 level for the following courses:		
FREN 2120	French IV	3
or GRMN 2120	German IV	
or JAPN 2120	Japanese IV	
or SPAN 2120	Spanish IV	
OR		
Challenge the 1120/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:
Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:
Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:
By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:
By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:
In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G , or MATH 1350G or MATH 2350G and ENGL 1110G. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G or ENGL 1110H	Composition I (C- or better) or Composition I Honors	4
Choose one from the following: [1]		3
MATH 1220G	College Algebra (C- or better)	
MATH 1350G	Introduction to Statistics (C- or better)	
MATH 2350G	Statistical Methods (C- or better)	
CJUS 1110G	Introduction to Criminal Justice (C- or better and counts towards Area IV Requirement)	3
Choose one Area V: Humanities and Fine Arts Course from the following: [2]		3
PHIL 1145G	Philosophy, Law, and Ethics (C- or better)	
PHIL 2230G	Philosophical Thought (C- or better)	
PHIL 1120G	Logic, Reasoning, & Critical Thinking (C- or better)	
PHIL 2110G	Introduction to Ethics (C- or better)	
FYEX 1112 or Elective		3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area III: Laboratory Science Course [3]		4
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course [3]		3-4
CJUS 1120	Criminal Law (C- or better)	3
Elective Course		1
	Credits	**30-31**
Sophomore		
Choose one from the following: (C- or better)		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
General Education Elective Course [3]		3-4
Area V: Creative and Fine Arts Course [2]		3
Second Language Requirement: 1110- level (C- or better) [4]		4
Second Language Requirement: 1120- level (C- or better) [4]		4
CJUS 300	Introduction to Criminal Justice Research (C- or better)	3
Elective Courses [5]		10
	Credits	**30-31**
Junior		
Second Language Requirement: 2110- level (C- or better) [4]		3
Second Language Requirement: 2120- level (C- or better) [4]		3
VWW - Viewing a Wider World Courses [9]		6
CJUS 301	Advanced Research Methods (C- or better) [7]	3
CJUS - Upper Division Elective Course (C- or better)		3
CJUS 302	Crime, Justice and Society (C- or better)	3
CJUS 425	Issues in Ethics, Law, and Criminal Justice (C- or better)	3
Elective Course - Upper Division [5]		3
Elective Courses [5]		3
	Credits	**30**
Senior		
Choose one from the following:		3
CJUS 303	Introduction to Criminological Theory (C- or better)	
CJUS 304	Historical Perspectives of Criminal Justice Systems (C- or better)	
CJUS 414	Race, Crime and Justice (C- or better)	
CJUS - Upper Division Elective Course (C- or better)		9
Elective Course - Upper Division [5]		12
Elective Course [5]		6
	Credits	**30**
	Total Credits	**120-122**

1. Math Placement:MATH 1220G College Algebra or MATH 1350G Introduction to Statistics orMATH 2350G Statistical Methods is the starting Math course for the degree, however, students may need to complete any prerequisites prior to enrolling into one of these courses.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. One of the following is required for the major: PHIL 1145G Philosophy, Law, and Ethics, PHIL 2230G Philosophical Thought, PHIL 1120G Logic, Reasoning, & Critical Thinking, and PHIL 2110G Introduction to Ethics
4. Second Language: options for completing the second language requirement can be located on the Requirements (p. 701) tab for this degree.
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-

case basis and students should discuss elective requirements with their advisor.

[6] CJUS 300 Introduction to Criminal Justice Research can be taken in either the Fall or Spring semesters of Year Two.
The following courses may substitute for CJUS 300: POLS 300 Political Research Skills, PSYC 3110 Experimental Methods, SOCI 3150 Social Research: Methods

[7] CJUS 300 Introduction to Criminal Justice Research and CJUS 301 Advanced Research Methods should ideally be taken in separate semesters

[8] Recommended: 1 credit of PHED, LSAT Prep or FYEX coursework

[9] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

Forensic Science - Undergraduate Minor

Forensic Science is the application of principles and techniques of scientific analysis in a legal context. Forensic scientists study physical evidence to resolve issues involving criminal investigations, environment analyses and similar areas of research.

A student must pass 18 credits with a grade of C- or higher from the following curriculum to earn the Forensic Science minor. No courses may be taken S/U. Students must take at least 6 credits from departments outside their major(s). At least 9 credits in any minor must be upper division. Students must register in the minor before enrolling in any upper division Criminal Justice courses.

The following curriculum represents minimum requirements for a minor. Students interested in a career in Forensic Science are encouraged to take additional courses from those listed below.

The Forensic Minor requires courses from three sections: (1) 6 credits from the list of Core Courses; (2) 3 credits from an additional course not already completed; and (3) 9 credits from one of the four tracks listed below.

Prefix	Title	Credits
Core Courses		
Select 6 credits from the following:		6
CJUS 306	Criminal Procedural Law	
CJUS 307	Law of Evidence	
CJUS 321	Criminal Investigation and Intelligence	
CJUS 424	Forensic Law	
PHYS 304	Forensic Physics	
Additional Course		
Select 3 credits from areas I or II above not already completed.		3
Track Courses		
9 credits from one of the four tracks (see below)		9
Total Credits		**18**

Track A: Laboratory Analysis

Students should check the catalog to ensure that they have taken prerequisites before enrolling in these courses.

Prefix	Title	Credits
Select one from the following:		4-5
BIOL 2310 & 2310L	Microbiology and Microbiology Lab	
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory	
Select 4-5 credits from the following:		4-5
BIOL 354 & 354 L	Physiology of Humans and Laboratory of Human Physiology	
BCHE 395	Biochemistry I	
BCHE 396	Biochemistry II, Lecture and Laboratory	
CHEM 371	Analytical Chemistry	
TOX 361	Basic Toxicology	
TOX 461	Toxicology I	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
Total Credits		**8-10**

Track B: Human Forensic Analysis

Honors, Special Topics, or Independent Studies courses if approved by Academic Head, Department of Criminal Justice.

Prefix	Title	Credits
Select 9 credits from the following: [1]		9
ANTH 1135G & ANTH 1135L	Introduction to Biological Anthropology and Introduction to Biological Anthropology Lab	
ANTH 315	Archaeological Method and Theory	
ANTH 355	Biological Anthropology	
ANTH 356	Forensic Anthropology	
ANTH 357V	Medical Anthropology	
ANTH 388	Archaelogical Field School	
ANTH 474	Human Osteology [2]	
ANTH 477	Zooarchaeology	
Total Credits		**9**

[1] Recommended sequence ANTH 1135G Introduction to Biological Anthropology/ANTH 1135L Introduction to Biological Anthropology Lab, ANTH 355 Biological Anthropology or ANTH 315 Archaeological Method and Theory, and then ANTH 474 Human Osteology.

[2] Courses have prerequisites, and students should check the catalog to ensure that they have taken prerequisites before enrolling in these courses.

Track C: Forensic Psychology

Students should check the catalog to ensure that they have taken prerequisites before enrolling in these courses.

Prefix	Title	Credits
Required Courses		
Select three from the following:		9
Principles of Behavior		
PSYC 2110	Social Psychology	
PSYC 3320	Psychology of Personality	
PSYC 3330	Sexual Behavior	
PSYC 3510	Psychology and the Law	
PSYC 3520	Evolutionary Psychology	
Psychological Treatment		
PSYC 2210	Abnormal Psychology	
Total Credits		**9**

Track D: General

Prefix	Title	Credits
Select 9 credits from the following:		9
ANTH 474	Human Osteology [1]	
CJUS 306	Criminal Procedural Law	
CJUS 307	Law of Evidence	
CJUS 321	Criminal Investigation and Intelligence	
CJUS 424	Forensic Law	
PSYC 3510	Psychology and the Law	
PHYS 304	Forensic Physics	
Total Credits		**9**

[1] Courses have prerequisites, and students should check the catalog to ensure that they have taken prerequisites before enrolling in these courses.

Human Rights - Undergraduate Minor

Prefix	Title	Credits
Required Coursework		3
HMRT 2110G	Introduction to Human Rights	
Elective-Human Rights		3
HMRT 2125G	International Rights of Children	
HMRT 2175G	Border Justice & Human Rights	
HMRT 3996	Issues in Human Rights	
HMRT 4550V	Skills & Ethics for Human Rights Work	
HMRT 4580V	International Environmental Law and Justice	
HMRT 4720V	Space Law & Human Rights	
Elective-Law		3
CJUS 4750V	International Criminal Law, War Crimes, Genocide, & Crimes Against Humanity	
HMRT 4580V	International Environmental Law and Justice	
HMRT 4720V	Space Law & Human Rights	
POLS 396	International Law	
Electives-General		9
CJUS 429	Immigration & Justice	
CJUS 453	Women and Justice	
CJUS 454	Human Trafficking	
CJUS 4750V	International Criminal Law, War Crimes, Genocide, & Crimes Against Humanity	
ECON 324V	Developing Nations	
GNDR 402	Transnational Feminisms	
HMRT 2125G	International Rights of Children	
HMRT 2175G	Border Justice & Human Rights	
HMRT 3996	Issues in Human Rights	
HMRT 4550V	Skills & Ethics for Human Rights Work	
HMRT 4580V	International Environmental Law and Justice	
HMRT 4580V	International Environmental Law and Justice	
HMRT 4720V	Space Law & Human Rights	
HNRS 400	Honors Capstone	
HNRS 410	Honors Internship	
PHIL 1145G	Philosophy, Law, and Ethics	
or PHLS 1110H	Personal Health and Wellness Honors	
PHLS 1110G	Personal Health & Wellness	
PHLS 3130V	Global Environmental Health Issues	
PHLS 4660	U.S.-Mexico Border Health Issues	
POLS 396	International Law	
SOCI 3340V	Social Change	
SOCI 4320	Social Movements and Activism	
SOCI 4325	Digital Media and Activism	
SOCI 4335V	Advanced Environmental Sociology	
SOCI 4430	International Migration	
Total Credits		**18**

Fall Start Roadmap

First Year		
Fall		**Credits**
HMRT 2110G	Introduction to Human Rights	3
Law Elective		3
	Credits	**6**
Spring		
Human Rights Elective		3
General Elective		3
	Credits	**6**
Summer		
General Elective		3
General Elective		3
	Credits	**6**
	Total Credits	**18**

Spring Start

First Year		
Fall		**Credits**
HMRT 2110G	Introduction to Human Rights	3
Law Elective		3
	Credits	**6**
Spring		
Human Rights Elective		3
General Elective		3
	Credits	**6**
Summer		
General Elective		3
General Elective		3
	Credits	**6**
	Total Credits	**18**

Law and Society - Undergraduate Supplemental Major

The Law and Society Program (https://catalogs.nmsu.edu/nmsu/arts-sciences/government/law-society-supplemental-major/) is administered by the Department of Government and offers an interdisciplinary major for students interested in pursuing law school or careers that incorporate a strong legal element, such as government, law enforcement, business and social work. As a supplementary major, it must be taken in conjunction with a regular major. Some courses may double-count toward a student's regular major or General Education requirements. Students should check with academic advisors in their primary major. To declare this supplemental major please contact the College of Arts & Sciences Student Records Office. For more information please visit: https://deptofgov.nmsu.edu/academic-programs/law-society.html.

Economics, Applied Statistics, and International Business

Undergraduate Program Information

The Department of Economics, Applied Statistics and International Business in the College of Business offers an economics major to Bachelor of Arts candidates in the College of Arts and Sciences. (Additional information may be found under the Economics and International Business (p. 988) section in the College of Business chapter).

Degrees for the Department

- Economics - Bachelor of Arts (p. 709)

Minors for the Department

- Economics - Undergraduate Minor (p. 711)

Economics Courses

ECON 1110G. Survey of Economics
3 Credits (3)
This course will develop students' economics literacy and teaches students how economics relates to the everyday life of individuals, businesses and society in general. The course will also introduce students to the roles different levels of governments play in influencing the economy. At the conclusion of the course, students will be able to identify economic causes for various political and social problems at national and international levels, and have a better understanding of everyday economic issues that are reported in media and public forums.
Learning Outcomes
1. Gain and demonstrate a contextual understanding of economic terms and concepts.
2. Recognize and analyze common economic issues which relate to individual markets and the aggregate economy.
3. Learn basic economic principles that influence global trading and challenges relating to globalization.
4. Outline the implications of various economic policies on individuals and on economies.
5. Demonstrate ability to use diagrams and graphs to explain economic principles, policies and their applications.
6. Appreciate and understand how individual decisions and actions, as a member of society, affect economies locally, nationally and internationally.
7. Explain the roles of governments in influencing buyer and seller behavior in the market and how government failure occurs when intervention fails to improve or actually worsens economic outcomes.
8. Be able to apply course concepts to interpret, evaluate and think critically about economic events and policies, especially as regularly reported in the media and other public forums.

ECON 2110G. Macroeconomic Principles
3 Credits (3)
Macroeconomics is the study of national and global economies. Topics include output, unemployment and inflation; and how they are affected by financial systems, fiscal and monetary policies.
Learning Outcomes
1. Explain the concepts of opportunity cost, comparative advantage and exchange.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium and use supply and demand curves to analyze responses of markets to external events.
3. Explain the circular flow model and use the concepts of aggregate demand and aggregate supply to analyze the response of the economy to disturbances.
4. Explain the concepts of gross domestic product, inflation and unemployment and how they are measured.
5. Describe the determinants of the demand for money, the supply of money and interest rates and the role of financial institutions in the economy.
6. Define fiscal policy and monetary policies and how these affect the economy.
7. Students will be able to identify the causes of prosperity, growth, and economic change over time and explain the mechanisms through which these causes operate in the economy.

ECON 2120G. Microeconomics Principles
3 Credits (3)
This course will provide a broad overview of microeconomics. Microeconomics is the study of issues specific to households, firms, or industries with an emphasis on the role of markets. Topics discussed will include household and firm behavior, demand and supply,government intervention, market structures, and the efficient allocation of resources.
Learning Outcomes
1. Explain the concept of opportunity cost.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium.
3. Use supply and demand curves to analyze responses of markets to external events.
4. Use supply and demand analysis to examine the impact of government intervention.
5. Explain and calculate price elasticity of demand and other elasticities.
6. Demonstrate an understanding of producer choice, including cost and break-even analysis.
7. Compare and contrast the following market structures: perfect competition, monopoly, monopolistic competition, and oligopoly.

ECON 2120H. Principles of Microeconomics Honors
3 Credits (3)
Microeconomic theory and public policy: supply and demand, theory of the firm, market allocation of resources, income distribution, competition and monopoly, governmental regulation of businesses and unions. Must be a Crimson Scholar.
Learning Outcomes
1. Explain the concept of opportunity cost.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium.
3. Use supply and demand curves to analyze responses of markets to external events.
4. Use supply and demand analysis to examine the impact of government intervention.
5. Explain and calculate price elasticity of demand and other elasticities.
6. Demonstrate an understanding of producer choice, including cost and break-even analysis.

7. Compare and contrast the following market structures: perfect competition, monopoly, monopolistic competition, and oligopoly.

ECON 304. Money and Banking
3 Credits (3)
Income measurement and determination, monetary and fiscal policies. May be repeated up to 3 credits.
Prerequisite: ECON 2110G or ECON 2110H or equivalent.
Learning Outcomes
1. Understand the role of the financial system in the economy.
2. Identify the components of the financial system.
3. Understand the related concepts of net present value and yield to maturity.
4. Understand the structure and role of the federal reserve system.
5. Understand the role of monetary policy in determining economic activity.

ECON 311. Intermediate Macroeconomic Theory
3 Credits (3)
Analysis of gross domestic product, the Classical, Keynesian, and Neo-Keynesian theories of income, employment, inflation and growth.
Prerequisite: ECON 2110G or ECON 2110H.
Learning Outcomes
1. Learn the uses and abuses of macroeconomic data
2. Learn the role of economic theory in understanding economic issues and forecasting economic behavior
3. Learn the causes and consequences of short-run economic fluctuations and long-run economic growth
4. Learn the role of government in the macroeconomy
5. By the end of the class, you should be able to describe the state of the macroeconomy and analyze the consequences of economic policy actions from several perspectives

ECON 312. Intermediate Microeconomic Theory
3 Credits (3)
Contemporary economic theory with emphasis upon value and distribution.
Prerequisite: ECON 2120G or ECON 2120H or equivalent.
Learning Outcomes
1. Gain an understanding of the language of Intermediate Microeconomics.
2. Know the underlying structure of economic models such as supply and demand, consumer theory, producer theory and market structure.
3. Understand the assumptions of economic models.
4. Be able to solve a supply and demand model.
5. Demonstrate critical thinking skills by applying economic models to a wide variety of policy questions.

ECON 324V. Developing Nations
3 Credits (3)
Economic analysis of problems related to development of developing nations. Issues such as growth, industrialization, poverty, population, international trade, foreign debt, and international economic relations.

ECON 325V. Economic Development of Latin America
3 Credits (3)
Economic analysis of problems related to development in Latin America, including the agrarian problem, debt and austerity programs, industrialization, inflation and unemployment, the drug trade, U.S.-Latin American relations, development strategies. Also individual countries problems. May be repeated up to 3 credits.
Learning Outcomes
1. Identify the basic components of economic growth and development
2. Understand how Latin America fell behind other regions in terms of economic development
3. Compare various policies implemented to support economic development in Latin America, as well as the successes and failures of these policies
4. Gain a basic understanding of how to conduct independent research to be demonstrated by the completion of a term paper addressing an issue related to economic development in a nation or region of Latin America

ECON 332. Public Finance
3 Credits (3)
This course will examine the roles of government in modern, market-oriented, mixed economies. It will examine justifications for government participation in resource allocation, income distribution, and economic stabilization focusing primarily on the fiscal functions of government, taxation and public expenditure. Students will apply basic microeconomic analysis to analyze the impacts of public taxation and expenditures on economic decisions made elsewhere in the economy. In this course the emphasis will be on understanding the workings of public finance in fiscal federalist systems like the United States, but the principles taught will be applicable across other economic systems. Prerequisites: ECON 2120G or ECON 2120H

ECON 335V. Business and Government
3 Credits (3)
Relation of government to business through regulation; political, legal, and social implications. Crosslisted with: MGMT 335G

ECON 337V. Natural Resource Economics
3 Credits (3)
Gain insight into important natural resource problems of our time. Apply economic principles to problems in the preservation, use, and development of agricultural, range, mineral, water, forestry, fishery, and environmental resources. Understand the use of cost-benefit analysis for government natural-resource projects, policies, and programs. Same as AEEC 337V.
Prerequisite: ECON 1110G or ECON 2120G or ECON 2120H.

ECON 345. Energy Economics
3 Credits (3)
Examines the economics of energy production including oil, coal, natural gas, renewables, and conservation as a substitute for energy production. Emphasis is on federal and state regulatory framework, and resulting public policy issues from a regional and national perspective.
Prerequisite(s): (ECON 2110G or ECON 2110H), (ECON 2120G or ECON 2120H).

ECON 384V. Water Resource Economics
3 Credits (3)
Use of economic principles to evaluate current and emerging issues in water resources. Applications focus on use of economic methods of analysis to current policy decisions surrounding agricultural, municipal, industrial, and environmental uses of water. Same as AEEC 384V.
Prerequisite: AEEC 1110 or ECON 2120G or ECON 2120H.

ECON 405. Introductory Econometrics
3 Credits (3)
Multiple regression and correlation applied to economics and business; inference techniques; significance tests; simultaneous equations, estimation, and problems.
Prerequisite: MATH 1350G or A ST 311 (or equivalent).

Learning Outcomes

1. Demonstrate knowledge of probability and statistics and basic expected value theory.
2. Define the relationship between population statistics and sample statistics.
3. Explain the method of ordinary least squares.
4. Understand multiple regression, correlation, inference techniques, and significance tests.
5. Interpret basic econometric results.

ECON 445. Oil and Natural Gas Economics
3 Credits (3)
Examines the economics of oil and gas production. Topics covered include transportation, refining, federal and state regulatory framework, and resulting public policy issues from a regional and national perspective.
Prerequisite: (ECON 2110G or ECON 2110H), (ECON 2120G or ECON 2120H).
Learning Outcomes

1. Oil and Natural Gas Production
2. Oil and Natural Gas Transportation and Storage
3. Advanced oil and gas market analysis
4. Economic analysis of government energy policy and regulation

ECON 449. Open Economy Macroeconomics
3 Credits (3)
This course studies theoretical and empirical macroeconomics in international dimension. It covers from the fundamental concepts of national income and growth, monetary/fiscal and exchange rate policies, foreign exchange markets, international trade and finance, and regionalization/economic integration to the impact analysis of these macroeconomic fundamentals in the open economy. Crosslisted with: I B 449.
Prerequisite(s): BFIN 341 OR ECON 311.

ECON 450. International Economics
3 Credits (3)
Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations. Crosslisted with: I B 450
Prerequisite(s): ECON 2110G or ECON 2110H and ECON 2120G or ECON 2120H.

ECON 457. Mathematical Economics
3 Credits (3)
Application of mathematical tools, especially the calculus, to economic theory.
Prerequisite(s): MATH 1430G or equivalent.

ECON 461. Environmental Economics
3 Credits (3)
Economic foundations for public decision-making about environmental resources utilizing tools from intermediate microeconomic theory. Emphasis on the welfare economic approach for the provision of public goods with specific emphasis on market failure, externalities, benefit-cost analysis, and methods for valuing environmental resources and human health.
Prerequisite: ECON 2120G Principles of Microeconomics.
Learning Outcomes

1. Students will develop an understanding of environmental economics and interactions between the natural environment, markets, and politics and regulation.
2. Students will develop familiarity with the tools of economic analysis and will develop marketable skills in benefit-cost analysis, non-market valuation, natural resource management and valuation, program evaluation, survey research and applied data analysis.

ECON 471. Electricity Economics
3 Credits (3)
Regulatory policy and economic analysis related to the Electric Industry. Topics include characteristics of a utility and legal justification for regulation; characteristics and functions of a regulatory commission; history and structure of the industry; technology and network design; revenue requirements; cost allocation; and basic retail rate design. Crosslisted with: ECON 571.
Prerequisite(s): ECON 345.

ECON 490. Selected Topics
1-3 Credits
Current topics in economics. Subject matter to be designated for each semester.

ECON 498. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated for a maximum of 3 credits.
Prerequisite: junior or above standing and consent of instructor.

ECON 503. Managerial Economics
3 Credits (3)
Theory and application of microeconomics to the management of organizations. May be repeated up to 3 credits.
Prerequisite: Graduate students only.
Learning Outcomes

1. Apply and explain economic and business concepts and terminology.
2. Develop critical thinking skill to solve economic- and business-related problems.
3. Solve economic- and business-related problems using quantitative information.
4. Apply and relate ethical implication in economic and business contexts.
5. Analyze economic and business case studies.
6. Demonstrate critical and efficient course engagement between/among peers in the traditional/online environment.

ECON 511. The Economics of Imperfect Markets
3 Credits (3)
A rigorous course in microeconomics covering uncertainty and information, game theory, general equilibrium, market power and market failures.
Learning Outcomes

1. Students should be able to demonstrate an understanding of the microeconomic underpinnings of general equilibrium theory, as well as welfare economics.
2. Students should be able to examine externalities, and be able to examine decision making under cases of risk and uncertainty.
3. Further, students will have a good understanding of the theory behind economic impact analysis, and a grasp of modern economic impact analysis software.

ECON 545. Econometrics II
3 Credits (3)
Application of statistical techniques to estimation of economic relationships: demand functions, production and cost functions, and macroeconomic equations.

Prerequisite: AEEC 5240.

Learning Outcomes

1. To learn and use statistical techniques to estimate economic relationships: demand functions, production and cost functions, and macroeconomic equations.

ECON 550. Special Topics
1-3 Credits
Seminars in selected current topics in the various areas of economics. Prerequisites vary according to the topic being offered.

ECON 571. Regulatory Policy and Industry Analysis: Electricity I
3 Credits (3)
Regulatory policy and economic analysis related to the Electric Industry. Topics include: characteristics of a utility and legal justification for regulation; characteristics and functions of a regulatory commission; history and structure of the industry; technology and network design; revenue requirements; cost allocation; and basic retail rate design.

ECON 572. Regulatory Policy and Industrial Analysis: Water and Natural Gas
3 Credits (3)
Regulatory policy and economic analysis related to the Natural Gas and Water industries. Topics include: history and structure of the industry; technology and network design; revenue requirements; cost allocation; and retail rate design.

ECON 573. Regulatory Policy and Industry Analysis: Electricity II
3 Credits (3)
Regulatory policy and economic analysis related to the Electric industry. Topics include: optimal generation mix; ancillary services; environmental policies; rate case procedures and strategies for effective testimony; advanced retail rate design; wholesale exchanges; unbundled transmission tariffs; market institutions and how different markets function; state and federal deregulation policies; Federal Energy Regulatory Commission orders and policies; demand-side management; and regulatory treatment of non-traditional retail services. Consent of instructor required.
Prerequisite(s): ECON 571 or consent of instructor.

ECON 574. Advanced Seminar Regulatory Policy and Industry Analysis
3 Credits (3)
Advanced seminar and writing course specializing in regulatory policy and regulatory casework. Topics Include: special policy & regulatory issues in telecommunications, electricity, natural gas, and water; preparation of written testimony; expert witness effectiveness including cross-examination; and contested case management. This course involves extensive reading and writing assignments. Consent of instructor required.
Prerequisite(s): ECON 571 or consent of instructor.

ECON 596. Independent Study
3 Credits (3)
Individual study program. Each offering will cover a subtitle. Maximum of 3 credits in a semester and 6 credits in a program. Consent of instructor required.

Phone: (575) 646-2113

Website: https://business.nmsu.edu/academic-departments/easib/index.html (https://business.nmsu.edu/academic-departments/easib/)

Economics - Bachelor of Arts

The Bachelor of Arts major in Economics is the only bachelor of arts degree offered through the College of Business. It has the advantage of including a large number of general electives. This feature provides great flexibility to the student who, in addition to completing the courses for a major in economics, may wish to take a double major or take courses from a wide variety of other subjects of his or her own choosing. This program is suitable for, among others, students who plan to go to graduate school in economics, law, business, the social sciences or other areas.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses.		
Area I: Communications		
English Composition - Level 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
English Composition - Level 2		
Choose one from the following:		3
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra (Foundation Requirement) [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
ECON 2110G	Macroeconomic Principles (Credits are counted in Business Core)	
ECON 2120G	Principles of Microeconomics Honors (Credits are counted in Business Core)	
Area III: Laboratory Sciences Course (4 credits) [2]		
Area V: Humanitites [2]		*3*
Area V: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1430G	Applications of Calculus I (must earn a grade of at least C-) [1]	3
Viewing A Wider World Courses [3]		**6**
Departmental/College Requirements		
Foundation Requirements [4]		

A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)	3
ACCT 2110	Principles of Accounting I	3
Major Courses [5]		
ECON 304	Money and Banking	3
ECON 311	Intermediate Macroeconomic Theory	3
ECON 312	Intermediate Microeconomic Theory	3
ECON 405	Introductory Econometrics	3
ECON 457	Mathematical Economics	3
At least two electives must be from the following:		*6*
ECON 332	Public Finance	
ECON 449	Open Economy Macroeconomics	
ECON 450	International Economics	
Additional ECON Upper Division Electives		*6*
Second Language: (not required)		
Electives, to bring the total credits to 120 [6]		**49**
Total Credits		**120**

1 Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses and how to fulfill this requirement.

4 All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G, MATH 1430G and A ST 311 must be completed.

5 Economics majors must earn a minimum cumulative GPA of 2.5 in the 27 credits of departmental requirements.

6 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
MATH 1220G	College Algebra (C- or better) [1]	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) [1]	
ENGL 1110H	Composition I Honors (C- or better) [1]	
ENGL 1110M	Composition I (C- or better) [1]	
Area V: Humanities Course [2]		3
Elective course [3]		3
Elective Course [3]		3
	Credits	**16**
Spring		
MATH 1430G	Applications of Calculus I (C- or better) [1]	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors (C- or better)	
Area III: Laboratory Science Course [2]		4
Area VI: Creative Fine Arts Course [2]		3
Elective Course [3]		3
	Credits	**16**
Second Year		
Fall		
A ST 311	Statistical Applications (C- or better)	3
ECON 2110G	Macroeconomic Principles ((C- or better, counts towards Area IV Gen.Ed))	3
ACCT 2110	Principles of Accounting I (C- or better)	3
Choose one from the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication (C- or better) or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science (C- or better)	
Elective Course [3]		3
	Credits	**15**
Spring		
ECON 2120G	Principles of Microeconomics Honors ((C- or better, counts towards Area IV Gen.Ed)) [1]	3
Viewing a Wider World Course [4]		3
Elective Course [3]		4
Elective Course [3]		3
Elective Course [3]		3
	Credits	**16**
Third Year		
Fall		
ECON 304	Money and Banking [1]	3
ECON 311	Intermediate Macroeconomic Theory [1]	3
Elective Course [3]		3
Elective Course [3]		3
Elective Course [3]		3
	Credits	**15**
Spring		
ECON 312	Intermediate Microeconomic Theory [1]	3
ECON 405	Introductory Econometrics [1]	3
Viewing a Wider World Course [4]		3
Elective Course [3]		3
Elective Course [3]		3
	Credits	**15**
Fourth Year		
Fall		
ECON 457	Mathematical Economics	3
Choose one Upper-Division Elective in ECON from the following: [5]		3
ECON 332	Public Finance [1]	

ECON 449	Open Economy Macroeconomics [1]	
ECON 450	International Economics	
Elective Course [3]		3
Elective Course [3]		3
Elective Course [3]		3
	Credits	**15**
Spring		
Choose one Upper-Division Elective in ECON from the following (it must differ from the Fall semester): [5]		3
ECON 332	Public Finance [1]	
ECON 449	Open Economy Macroeconomics [1]	
ECON 450	International Economics	
ECON Upper-Division Elective Course [5]		3
ECON Upper-Division Elective Course [5]		3
Elective Course [3]		3
	Credits	**12**
	Total Credits	**120**

1 Prerequisites are required, students are responsible for checking and fulfilling course prerequisites listed in the catalog.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

4 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

5 Upper Division ECON electives are typically only offered during certain semesters, so students must plan accordingly.
Fall: ECON 337V Natural Resource Economics, ECON 449 Open Economy Macroeconomics
Fall/Summer: ECON 457 Mathematical Economics
Spring: ECON 384V Water Resource Economics

6 **International Business Double Majors:** Students may not receive credit for I B 489 Senior Seminar in International Business For this reason, students majoring in both Economics and International Business must consult with the Department Head to arrange a suitable substitution.

Economics - Undergraduate Minor

The undergraduate minor in economics is appropriate for those who seek a better understanding of how micro- and macro-economic forces influence individuals, business and government decision making. Students thinking of a career in banking and finance, government service, or law will find the minor helpful.

A minor in economics consists of 18 or more credit hours of approved course work in economics (ECON), of which at least 12 are numbered 300 or higher, all completed with a grade of C- or higher. At least 12 credits must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

Prefix	Title	Credits
Required Courses		
ECON 2110G	Macroeconomic Principles [1]	3
ECON 2120G	Principles of Microeconomics [1]	3
ECON 304	Money and Banking	3
or ECON 311	Intermediate Macroeconomic Theory	
ECON 312	Intermediate Microeconomic Theory	3
Upper-division courses (300 or higher) in economics		6
Total Credits		**18**

1 ECON 1110G Survey of Economics may be substituted for one of Econ 251G Principals of Macroeconomics or Econ 252G Principals of Microeconomics with the approval of the Head of the Department of Economics, Applied Statistics, and International Business.

English

Undergraduate Program Information

The Department of English offers the Bachelor of Arts in English and the Bachelor of Arts in Gender and Sexuality Studies.

The **BA in English** is the cornerstone of studies in the humanities. The English major provides students with personal and cultural enrichment as well as verbal, analytical and cultural skills that are readily adaptable to a variety of careers. The English curriculum includes courses in literature, language, creative writing, technical and professional communication, rhetoric, cultural studies, digital media, and film. Our majors go on to succeed in a wide range of professions, including secondary and post-secondary education, business, government, publishing, and law. We offer four different major concentrations that students can tailor to their individual needs:

1. English
2. Creative Writing
3. Literature, Language and Culture
4. Rhetoric, Digital Media and Professional Communication

Students who wish to pursue English as a double major may eliminate one elective from the departmental requirements. Students are required to fulfill a second language requirement (one year of college-level instruction, or the equivalent).

The **BA in Gender and Sexuality Studies** is offered both on the Main campus and as a fully online, asynchronous program through NMSU-Global. Gender and Sexuality Studies is a combined field of study that encompasses women's, gender, LGBTQIA+, and feminist studies. It is a discipline dedicated to reshaping society through interdisciplinary approaches, knowledge production, creative expression, and community-engagement. G&SS at NMSU offers students the knowledge and tools to advocate for social justice and make a meaningful impact in various professional fields, such as social work, policy analysis, research, education, and community development. G&SS majors may choose to pursue a concentration in Media Arts and Cultural Studies (MACS). This inclusive curriculum invites students to delve into the rich intersections of media arts (both digital and material), film, cultural studies, and women's, gender, and sexuality studies. All G&SS courses are available to all NMSU students regardless of major.

The department also offers five undergraduate **minors**:

- English
- Literature
- Medieval and Early Modern Studies

- Rhetoric and Professional Communication
- Gender and Sexuality Studies

The English department provides strong and personalized advising designed to help students reach their full academic potential and future career goals.

Further information about career opportunities, concentrations, and minors is available from the Department of English.

Graduate Program Information

Graduate coursework in the Department of English spans a diverse field of studies in culture, rhetoric, literature, digital media, composition pedagogy, professional communication, and writing as well as a range of interdisciplinary work in women's, gender, and sexuality studies.

The department offers two graduate degrees in English: the **Master of Arts in English** and the **Doctor of Philosophy in Rhetoric and Professional Communication**. Students pursuing the MA in English may specialize in any of three areas: Literature; Rhetoric and Professional Communication; or English Studies for Teachers. Through NMSU-Global, the department also offers a fully online (asynchronous) **MA in Technical and Professional Communication**. These graduate degrees prepare students to succeed in a variety of careers, including writing, editing, publishing, secondary and post-secondary education, business and industry, media, web design, government, nonprofits, and law. Students work closely with faculty advisors to develop programs of study that fit their individual needs and goals.

> Students wishing to apply to the MA or PhD should consult application information on the English Department website at http://english.nmsu.edu/apply/ (https://english.nmsu.edu/_assets/apply.html). Applications are due by February 1st for Fall admission to the MA or the PhD program. MA applications are also accepted for Spring admission; review of MA applications for Spring admission begins on October 1.
>
> Support in the form of a Graduate Assistantships is awarded through a competitive selection process; this application is folded into the application for admission and should be submitted by the February 1st deadline. Students in the PhD and in the MA emphases in Literature and Rhetoric and Professional Communication are eligible to apply for a Graduate Assistantship. All Graduate Assistantships in English begin in the Fall semester.

The department offers a graduate **Minor in Gender and Sexuality Studies**. This interdisciplinary minor enables students to enrich their academic experience, broaden their career prospects, and contribute meaningfully to their fields of study in ways that challenge societal biases and promote understanding, acceptance, and equality for all individuals.

Degrees for the Department

Bachelor Degree(s)

- English (Creative Writing) - Bachelor of Arts (p. 730)
- English (Literature, Language and Culture) - Bachelor of Arts (p. 734)
- English (Rhetoric, Digital Media and Professional Communication) - Bachelor of Arts (p. 736)
- English - Bachelor of Arts (p. 732)
- Gender and Sexuality Studies - Bachelor of Arts (p. 738)
- Gender and Sexuality Studies - Bachelor of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/gender-sexuality-studies-ba-online/)

Master Degree(s)

- English (Technical and Professional Communication) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/english-technical-professional-communication-ma-online/)
- English - Master of Arts (p. 156)

Doctoral Degree(s)

- Rhetoric and Professional Communication - Doctor of Philosophy (p. 234)

Minors for the Department

- English - Undergraduate Minor (p. 740)
- Gender & Sexuality Studies - Undergraduate Minor (p. 740)
- Gender and Sexuality Studies - Graduate Minor (p. 256)
- Literature - Undergraduate Minor (p. 741)
- Medieval and Early Modern Studies - Undergraduate Minor (p. 741)
- Rhetoric and Professional Communication - Undergraduate Minor (p. 742)

Professor Elizabeth Schirmer, Department Head

Regents Professor Bejarano; ***Professors*** Schirmer, Sharp-Hoskins, Stolte, Thatcher; ***Associate Professors*** Banazek, Cull, House, Jonet, Lanier, Miller-Tomlinson, Rourke, Wells, Williams; ***Assistant Professors*** Blackston, Weisse; ***College Professor*** Brown; ***College Associate Professors*** Anatska, Conley, Lawrence, Retzinger ***College Assistant Professors*** Granger, Lavender-Smith, Tafoya

E. Schirmer, Department Head, Ph.D. (California-Berkeley) — medieval literature, gender theory; B. Rourke, Associate Department Head, Ph.D. (Stanford) -- modern British literature, critical theory; K. Sharp-Hoskins, Writing Program Administrator, Ph.D. (Illinois State) -- rhetoric, composition, culture, pedagogy; D. Blackston, Program Director, Gender and Sexuality Studies, Ph.D (Arizona) -- gender and sexuality studies, trans studies; T. Miller-Tomlinson, Director of Graduate Studies, Ph.D. (Yale) — Shakespeare, early modern literature and culture; T. Stolte, Director of Undergraduate Studies, Ph.D. (British Columbia) — 19th-century British literature and culture; K. Weisse, Director, Writing Center, Ph.D.(Wisconsin-Madison) -- rhetoric and writing studies, critical data studies; K. Banazek, Director, Creative Research Center, Ph.D. (Pittsburgh) -- rhetoric, writing studies, cultural studies, philosophy of media; T. Anatska, Ph.D (New Mexico State) -- multilingual education, TESOL; C. Bejarano, Ph.D. (Arizona State) -- gender and sexuality studies, justice studies; M. Brown, M.A. (New Mexico State) -- multilingual writing; R. Conley, M.A. (New Mexico State) -- composition, women's literature, film studies; R. Cull, Ph.D. (Illinois) — modern and contemporary American literature; M. Granger, M.A. (New Mexico State) -- rhetoric and professional communication; E. House, Ph.D. (Arizona) -- critical composition and writing studies; M. C. Jonet, Ph.D. (Purdue) -- gender and sexuality studies, media and cultural studies; C. Lanier, Ph.D. (New Mexico State) -- technical and professional communication; J. Lavender-Smith, Ph.D. (CUNY), rhetoric and composition, literary and film studies; G. Lawrence, Ph.D. (UTEP) -- composition, professional communication, gender studies; D. Retzinger, Ph.D. (New Mexico State) -- technical and professional communication; C. Tafoya, M.F.A. (New Mexico State) -- rhetoric and composition, professional communication, creative writing-

poetry; B. Thatcher, Ph.D. (Purdue) – professional communication, intercultural rhetoric; J. Wells, Ph.D. (South Carolina) – rhetorical theory and history, environmental rhetoric; A. Williams, Ph.D (Purdue) – gender and sexuality studies, media and cultural studies.

English Courses

ENGL 1105M. Introduction to Academic Writing for Multilingual Students
3 Credits (3)
This course is offered to international and domestic multilingual students. The purpose of this course is to provide students with review and practice opportunities to develop writing fluency and coherence, grammar awareness, and academic vocabulary necessary to be successful in ENGL 1110M and/or ENGL 471M.
Prerequisite: Placement in ENGL 1105M through NMSU's English Language Placement Test (ELPT), or an ACT score of 13-15, or#placement with an academic advisor using the English Self-Placement Canvas#Course, or#consent of instructor.
Learning Outcomes
1. Create well-organized, coherent paragraphs alone or in essay format.
2. Integrate a variety of sentence structures in connected discourse.
3. Portray, with general mastery, basic grammatical forms with very few errors.
4. Summarize or paraphrase information from source readings correctly.
5. Analyze readings for meaning and main ideas through annotation.
6. Integrate APA style format for in-text citations and references into their writing.

ENGL 1110G. Composition I
4 Credits (4)
In this course, students will read, write, and think about a variety of issues and texts.They will develop reading and writing skills that will help with the writing required in their fields of study and other personal and professional contexts. Students will learn to analyze rhetorical situations in terms of audience, contexts, purpose, mediums, and technologies and apply this knowledge to their reading and writing. They will also gain an understanding of how writing and other modes of communication work together for rhetorical purposes. Students will learn to analyze the rhetorical context of any writing task and compose with purpose, audience, and genre in mind. Students will reflect on their own writing processes, learn to workshop drafts with other writers,and practice techniques for writing, revising, and editing. May be repeated up to 4 credits.
Prerequisite: ACT standard score in English of 16 or higher, or an Accuplacer score 250 or higher, or an SAT score of 400 or higher or a C- or higher in either CCDE 110N or CCDS 119N.
Learning Outcomes
1. Analyze communication through reading and writing skills.
2. Employ writing processes such as planning, organizing, composing, and revising.
3. Express a primary purpose and organize supporting points logically.
4. Use and document research evidence appropriate for college-level writing.
5. Employ academic writing styles appropriate for different genres and audiences.
6. Identify and correct grammatical and mechanical errors in their writing.

ENGL 1110H. Composition I Honors
4 Credits (4)
In this course, students will read, write, and think about a variety of issues and texts.They will develop reading and writing skills that will help with the writing required in their fields of study and other personal and professional contexts. Students will learn to analyze rhetorical situations in terms of audience, contexts, purpose, mediums, and technologies and apply this knowledge to their reading and writing. They will also gain an understanding of how writing and other modes of communication work together for rhetorical purposes. Students will learn to analyze the rhetorical context of any writing task and compose with purpose, audience, and genre in mind. Students will reflect on their own writing processes, learn to workshop drafts with other writers,and practice techniques for writing, revising, and editing.
Learning Outcomes
1. Analyze communication through reading and writing skills.
2. Employ writing processes such as planning, organizing, composing, and revising.
3. Express a primary purpose and organize supporting points logically.
4. Use and document research evidence appropriate for college-level writing.
5. Employ academic writing styles appropriate for different genres and audiences.
6. Identify and correct grammatical and mechanical errors in their writing.

ENGL 1110M. Composition I Multilingual
4 Credits (4)
In this course, students will read, write, and think about a variety of issues and texts.They will develop reading and writing skills that will help with the writing required in their fields of study and other personal and professional contexts. Students will learn to analyze rhetorical situations in terms of audience, contexts, purpose, mediums, and technologies and apply this knowledge to their reading and writing. They will also gain an understanding of how writing and other modes of communication work together for rhetorical purposes. Students will learn to analyze the rhetorical context of any writing task and compose with purpose, audience, and genre in mind. Students will reflect on their own writing processes, learn to workshop drafts with other writers,and practice techniques for writing, revising, and editing. May be repeated up to 4 credits.
Prerequisite: ACT standard score in English of 16 or higher, or an Accuplacer score 250 or higher, or an SAT score of 400 or higher or CCDE 1110 N.
Learning Outcomes
1. Analyze communication through reading and writing skills.
2. Employ writing processes such as planning, organizing, composing, and revising.
3. Express a primary purpose and organize supporting points logically.
4. Use and document research evidence appropriate for college-level writing.
5. Employ academic writing styles appropriate for different genres and audiences.
6. Identify and correct grammatical and mechanical errors in their writing.

ENGL 1120. Composition II
2 Credits (2)
In this course, students will explore argument in multiple genres. Research and writing practices emphasize summary, analysis, evaluation, and integration of secondary sources. Students will analyze rhetorical situations in terms of audience, contexts, purpose, mediums, and

technologies and apply this knowledge to their reading, writing, and research. Students will sharpen their understanding of how writing and other modes of communication work together for rhetorical purposes. The emphasis of this course will be on research methods.
Prerequisite: successful completion of ENGL 1110G or ENGL 1110H or ENGL 1110M.
Learning Outcomes
1. Analyze the rhetorical situation for purpose, main ideas, support, audience, and organizational strategies in a variety of genres.
2. Employ writing processes such as planning, organizing, composing, and revising.
3. Use a variety of research methods to gather appropriate, credible information.
4. Evaluate sources, claims, and evidence for their relevance, credibility, and purpose.
5. Quote, paraphrase, and summarize sources ethically, citing and documenting them appropriately.
6. Integrate information from sources to effectively support claims as well as other purposes (to provide background information, evidence/examples, illustrate an alternative view, etc.).
7. Use an appropriate voice (including syntax and word choice).

ENGL 1410G. Introduction to Literature
3 Credits (3)
In this course, students will examine a variety of literary genres, including fiction, poetry, and drama. Students will identify common literary elements in each genre, understanding how specific elements influence meaning.
Learning Outcomes
1. Identify, define, and understand basic literary conventions and themes in fiction, poetry and drama.
2. Write reasonable, well-supported analyses of literature that ethically integrate evidence from texts

ENGL 2130G. Advanced Composition
3 Credits (3)
This course is for students who are striving for fluency, maturity, clarity and significance in their writing. It is an intermediate writing course that builds on and refines writing skills acquired in previous courses. It focuses on non-fiction writing for the professions, business, science, technical fields, academe and/or the popular press. Short works of master writers are studied for ideas, styleand structure.
Learning Outcomes
1. Students will examine and apply different writing styles and modes used by masters of personal essay and keep a reading response journal of assigned readings as demonstrated by scoring a 70% in faculty designed assignments.
2. Students will develop a sense of audience by discussing their papers with each other in small groups during class or by reading each other's papers and participating in positive, helpful peer reviews as demonstrated by scoring a 70% in faculty designed assignments.

ENGL 2210G. Professional and Technical Communication
3 Credits (3)
Professional and Technical Communication will introduce students to the different types of documents and correspondence that they will create in their professional careers. This course emphasizes the importance of audience, document design, and the use of technology in designing, developing, and delivering documents. This course will provide students with experience in professional correspondence and communicating technical information to a non-technical audience.
Prerequisite(s): Grade of C- or better in ENGL 1110G or the equivalent.
Learning Outcomes
1. Choose professional communication appropriate for audiences and situations.
2. Write in different genres of professional communication.
3. Identify the purpose of a work-related communication and assess the audiences' informational needs and organizational constraints.
4. Employ appropriate design/visuals to support and enhance various texts.
5. Demonstrate effective collaboration and presentation skills.
6. Integrate research and information from credible sources into professional communication.

ENGL 2210H. Professional and Technical Communication Honors
3 Credits (3)
Professional and Technical Communication writing for Crimson Scholars/Honors students will introduce students to the different types of documents and correspondence that they will create in their professional careers. This course emphasizes the importance of audience, document design, and the use of technology in designing, developing, and delivering documents. This course will provide students with experience in professional correspondence and communicating technical information to a non-technical audience. 3.5 GPA is also required. Restricted to Las Cruces campus only.
Prerequisite(s): grade of C- or better in ENGL 1110G or the equivalent; approval of the honors college.
Learning Outcomes
1. Choose professional communication appropriate for audiences and situations.
2. Write in different genres of professional communication.
3. Identify the purpose of a work-related communication and assess the audiences' informational needs and organizational constraints.
4. Employ appropriate design/visuals to support and enhance various texts.
5. Demonstrate effective collaboration and presentation skills.
6. Integrate research and information from credible sources into professional communication.

ENGL 2210M. Professional and Technical Communication for Multilingual Students
3 Credits (3)
Professional and Technical Communication will introduce students to the different types of documents and correspondence that they will create in their professional careers. This course emphasizes the importance of audience, document design, and the use of technology in designing, developing, and delivering documents. This course will provide students with experience in professional correspondence and communicating technical information to a non-technical audience. NMSU specific description: In this course, students will explore the unique advantages and challenges of being multilingual writers. This course is designed for international and domestic multilingual students.
Prerequisite: Grade of C- or better in ENGL 1110G or ENGL 1110H or ENGL 1110M.
Learning Outcomes
1. Choose professional communication appropriate for audiences and situations.
2. Write in different genres of professional communication.
3. Identify the purpose of a work-related communication and assess the audiences' informational needs and organizational constraints.

4. Employ appropriate design/visuals to support and enhance various texts.
5. Demonstrate effective collaboration and presentation skills.
6. Integrate research and information from credible sources into professional communication.

ENGL 2215G. Advanced Technical and Professional Communication
3 Credits (3)
Theory and practice of writing in technical and professional fields, individualized to each student s field. Emphasizes efficient writing processes and effective written products. May be repeated up to 3 credits. Restricted to Las Cruces campus only.
Prerequisite(s): Junior or above standing, or consent of instructor.
Learning Outcomes
1. To complicate the definition of "technical and scientific communication" and its relationship(s) to studying and practicing "rhetoric."
2. To complicate our relationship to concepts like "science", "knowledge, "objectivity," neutrality, "clarity," etc.
3. To use a community-based approach to study and practice technical and scientific documents within various discourse communities.
4. To study and practice different genres (i.e. memos, letters, e-mails, reports, proposals, and instruction sets) attending to issues of audience and purpose within discourse communities.
5. To practice some mindful reading strategies that allow you to attend to the use of language and its material and discursive effects in different situations.
6. To examine the material effects of producing, circulating, and consuming technical and scientific texts on the bodies of people within different contexts.
7. To complicate our understanding of "ethics," "responsibility," and "accountability" toward ourselves and others.
8. To work collaboratively and individually to research, to analyze, and to write about public debates regarding the conduct of science and technology.
9. To understand and use basic principles of document design attending to issues of usability and accessibility. 1
10. To articulate the relationship between technical and scientific communication and issues of inclusion and social justice in the world.

ENGL 2221G. Writing in the Humanities and Social Science
3 Credits (3)
Theory and practice in interpreting texts from various disciplines in the humanities and social sciences. Strategies for researching, evaluating, constructing, and writing researched arguments. Course subtitled in the Schedule of Classes. May be repeated up to 3 credits.
Prerequisite(s): Grade of C- or better in ENGL 1110G or ENGL 1110H, or ENGL 1110M.
Learning Outcomes
1. Develop the ability to interpret and respond to humanities and social sciences texts
2. Analyze and evaluate cultural artifacts such as texts, images, and practices as a means of academic inquiry
3. Critique arguments offered in the readings to determine the underlying methodology as well as underlying values
4. Construct a rhetorical argument with evidence appropriate for an explicit audience and purpose
5. Use written, visual, or oral strategies to persuade, inform, or engage, considering situation, audience, purpose, aesthetics, and diverse points of view
6. Practice effective research strategies, and integrate research correctly and ethically from credible sources
7. Understand and apply components of the writing process such as planning, collaborating, organizing, composing, revising, and editing

ENGL 2280. History of Argument
3 Credits (3)
Investigates the major figures and movements in rhetoric from the classical period to modern rhetorical theory, examining relations between rhetorical teaching and practice, culture, epistemology, and ideology. Main campus only. Prerequisite(s): ENGL 1110G, or ENGL 1110GH, or ENGL 1110M
Learning Outcomes
1. Understand how rhetoric, argument, and persuasion work. Become familiar with the key terms and various contexts in which rhetoric, argument, and persuasion function and the contingencies that influence their use and effectiveness;
2. be familiar with the broad history and major figures of western rhetoric;
3. apply a number of approaches used to analyze and construct/deconstruct rhetorical arguments, including (but not limited to) Aristotelian appeals and commonplaces, stasis theory, toulmin analysis, pentadic/dramatistic analysis, fallacy analysis, and rogerian analysis;
4. complete an analysis as well as design and present a project regarding a contemporary issue or concern about which you feel deep passion and commitment; and
5. Improve general critical thinking and communication skills, both oral and written.

ENGL 2310G. Introduction to Creative Writing
3 Credits (3)
This course will introduce students to the basic elements of creative writing, including short fiction, poetry, and creative nonfiction. Students will read and study published works as models, but the focus of this "workshop" course is on students revising and reflecting on their own writing. Throughout this course, students will be expected to read poetry, fiction, and nonfiction closely, and analyze the craft features employed. They will be expected to write frequently in each of these genres. May be repeated up to 3 credits.
Prerequisite: C- or better in ENGL 1110G or ENGL 1110H or ENGL 1110M.
Learning Outcomes
1. Participate in a constructive conversation and community about creative writing.
2. Read and critically engage with a variety of texts.
3. Compose creative works in various genres of creative writing.
4. Provide respectful, honest, and critical feedback to peers about their work.
5. Revise creative work based on peer feedback and critique.
6. Develop thoughtful workshop reflection on students' own writing and writing process.
7. Evaluate and engage with publication process.

ENGL 2381. Script Development and Storyboarding
3 Credits (3)

Examines effective writing principles for creating storyboards that communicate the overall picture of a project, timing, scene complexity, emotion and resource requirements. Crosslisted with: FDMA 2381.

Learning Outcomes

1. develop a story idea into a complete storyboard
2. describe and visualize the creative aspects of a media project from conception to completion
3. write a scene in the professional script format
4. deliver a professional verbal and visual presentation of a story idea to an audience
5. the ability to conceive, illustrate and plan a visual project
6. proficiency in oral, written, and visual communication via storyboarding, script writing and verbal presentations

ENGL 2382. Narrative: Principles of Story Across the Media
3 Credits (3)

Examines the various strategies of written and visual storytelling, narrative structure and its principal components (plot, theme, character, imagery, symbolism, point of view) with an attempt to connect them to elements of contemporary forms of media expression, including screenwriting, playwriting, writing for documentaries and animation, etc. Crosslisted with: FDMA 2382

Learning Outcomes

1. Identify use the building blocks of storytelling: plot, theme, character, imagery,
2. Symbolism and point of view
3. Develop these building blocks into a cohesive narrative within a written document
4. Effectively communicate in different written formats
5. Create design documents for varied genres of media: narrative short, documentary, 6 Animation, commercial/industrial video, computer game
6. Describe how a written narrative can be translated into a visual medium

ENGL 2520G. Film as Literature
3 Credits (3+3P)

The purpose of this course is to teach students how to analyze film as a visual text. Students will learn to analyze films, film techniques, eras, and genres. Students will also identify significant trends and developments in film-making, examining the ways in which film reflects and creates cultural trends and values.

Prerequisites: C- or better in ENGL 1110G or ENGL 1110H or ENGL 1110M.

Learning Outcomes

1. Develop an understanding of the cultural, historical, and technical contexts for various films.
2. Identify, define, and analyze basic film techniques used in different genres and time periods.
3. Analyze how film uses literature by studying different sources of adaptation.
4. Demonstrate an understanding of film in its various aspects by writing film analysis, reviews, and/or other projects.

ENGL 2521. The Bible as Literature
3 Credits (3)

Develops informed readings of Hebrew and Christian scriptures. Emphasizes understanding Biblical literary forms, techniques, themes; historical, cultural contexts for interpretation; authorship, composition, audience for individual books; development of Biblical canon.

Learning Outcomes

1. Develop and articulate historically informed and textually supported arguments regarding the form and meaning of biblical texts
2. Express arguments and explication in clear, organized,
3. Understand the Jewish and Christian scriptures as cultural artifacts, using some fundamental techniques of literary analysis and interpretation, especially: thematic interpretation, stylistic analysis, narrative analysis, poetics, and the rhetorical analysis of figurative language.
4. Use socio-historically informed interpretive methods focused on these fundamental contextual questions : 1) who probably wrote and edited these texts, 2) why and how they most likely did so, 3) how their earliest audiences probably responded to them, and 4) why and how they were later combined to form the canonical Jewish and Christian bibles read today.
5. Know in detail substantial selections of representative, influential, and historically informative biblical texts
6. Distinguish literary critical and historical analysis of the Bible from those based on faith, tradition, authority, and theology
7. Recognize, understand, and analyze the forms, genres, and techniques used by biblical authors
8. Become familiar with and be able to use essential knowledge of the historical, cultural, and geographical contexts of Biblical writing
9. Learn how evaluate texts as historical documents, as well as how doing so relates to and differs from literary critical analysis and interpretation 1
10. Become familiar with common and influential scholarly, critical, and aesthetic ways of reading Biblical texts from a contemporary perspective 1
11. Understand the cultural influence of the Bible and its relevance for other areas of scholarly and artistic work

ENGL 2610G. American Literature I
3 Credits (3)

This course surveys American literature from the colonial period to the mid-nineteenth century. This course provides students with the contexts and documents necessary to understand the origins of American Literature and the aesthetic, cultural, and ideological debates central to early American culture.

Learning Outcomes

1. Recognize the traditions of American literature and their connection to issues of culture, race, class, and gender.
2. Demonstrate familiarity with a variety of major works by American authors.
3. Explore the various influences and sources of American literature.
4. Apply effective analytic and interpretive strategies to American literary works using academic conventions of citation and style.

ENGL 2620G. American Literature II
3 Credits (3)

This course surveys American literature from the mid-nineteenth-century to the contemporary period. This course provides students with the contexts and documents necessary to understand American literature and the aesthetic, cultural, and ideological debates central to American culture.

Learning Outcomes

1. Recognize the traditions of American literature and their connection to issues of culture, race, class, and gender.

2. Demonstrate familiarity with a variety of major works by American authors.
3. Explore the various influences and sources of American literature.
4. Apply effective analytic and interpretive strategies to American literary works using academic conventions of citation and style.

ENGL 2630G. British Literature I
3 Credits (3)
This course offers a study of British literature from its origins in Old English to the 18th century. This survey covers specific literary works--essays, short stories, novels, poems, and plays--as well as the social, cultural, and intellectual currents that influenced the literature.
Learning Outcomes
1. Read and discuss representative works of British writers from its origins in Old English to the 18th century to understand cultural and historical movements which influenced those writers and their works.
2. Identify the characteristics of various British literary genres, such as the essay, novel, short story, poetry, and dramatic literature.
3. Apply effective analytic and interpretive strategies to British literary works using academic conventions of citation and style.

ENGL 2640G. British Literature II
3 Credits (3)
This course offers a study of British literature from the 18th century to the present. This survey covers specific literary works--essays, short stories, novels, poems, and plays--as well as the social, cultural, and intellectual currents that influenced the literature.
Learning Outcomes
1. Read and discuss representative works of British writers from the 18th century to the present to understand cultural and historical movements, which influenced those writers,and their works.
2. Identify the characteristics of various British literary genres, such as the essay, novel, short story, poetry, and dramatic literature.
3. Apply effective analytic and interpretive strategies to British literary works using academic conventions of citation and style.

ENGL 2650G. World Literature I
3 Credits (3)
In this course, students will read representative world masterpieces from ancient, medieval and Renaissance literature. Students will broaden their understanding of literature and their knowledge of other cultures through exploration of how literature represents individuals, ideas and customs of the world cultures. The course focuses strongly on examining the ways literature and culture intersect and define each other.
Learning Outcomes
1. Identify and comprehend key authors and literary works from ancient periods to the Enlightenment.
2. Understand each text's historical and cultural context.
3. Identify and analyze a variety of literary forms, including poetry, plays, and philosophical and religious texts.
4. Compare works from different cultures and historical periods examining genre, style, and content or theme.
5. Analyze how literary works reflect historical, national, cultural, and ethnic differences.

ENGL 2675. Transatlantic Literatures
3 Credits (3)
This course tracks the production, circulation, and reception of literary works in transatlantic contexts over at least 150 years. Students examine a variety of documents to map transformations in form, genre, and medium across historical and geographic contexts. Students consider how colonization, exile, displacement, and migration have track the production, circulation, and reception of literary works in transatlantic contexts over at least 150 years reinforced or contested national literary traditions.
Learning Outcomes
1. Track the production, circulation, and reception of literary works in transatlantic contexts over at least 150 years
2. Identify and analyze a variety of documents to map transformations in form, genre, and medium across historical and geographic contexts
3. Explain how colonization, exile, displacement, and migration have reinforced or contested national literary traditions.

ENGL 2996. Special Topics
1-3 Credits
Emphasis on a literary and/or writing subject chosen for the semester. Repeatable for a unlimited credit under different subtitles.
Learning Outcomes
1. Varies

ENGL 301. Theory and Criticism: Rhetoric and Culture
3 Credits (3)
Introduction to rhetorical criticism with an emphasis on understanding the theoretical and cultural underpinnings for the rhetorical analyses of texts.

ENGL 302. Theory and Criticism: Literature and Culture
3 Credits (3)
Introduction to literary criticism, from its classical beginnings through contemporary critical approaches.

ENGL 303. Theory and Criticism: Film, Media and Culture
3 Credits (3)
Surveys classical and contemporary film theory. Explores the relationship of theory to textual analysis and filmmaking practices. Includes auteurism semiotics, psychoanalysis, and other theories, as well as theories of other media.

ENGL 304. Creative Writing: Prose
3 Credits (3)
Imaginative writing, chiefly prose narrative. Repeatable for a maximum of 9 credits.

ENGL 306. Creative Writing: Poetry
3 Credits (3)
Introduction to the writing of poetry. Repeatable for a total of 9 credits.

ENGL 307. Creative Writing: Creative Nonfiction
3 Credits (3)
Introduction to creative nonfiction. Skills emphasized will include the personal voice, powers of observation and reflection, advocacy, argument, and a creative, powerful use of language. Repeatable for a maximum of 9 credits.

ENGL 308. Creative Writing: Playwriting
3 Credits (3)
Technique of one-act playwriting, and analysis of dramatic structure. Crosslisted with: THEA 308

ENGL 309. Screenwriting I
3 Credits (3)
Writing intensive. Students learn the craft of screenwriting, honing skills in writing dialogue and visual narrative, crafting dynamic characters and dramatic action. Original student scripts will be performed and discussed in class. Consent of instructor required. Crosslisted with: CMI 309 and THTR 306
Prerequisite(s): ENGL 235 or CMI 235.

ENGL 310. Critical Writing
3 Credits (3)
A course in critical reading, writing, and research designed to prepare English majors for upper-division courses.

ENGL 312. Digital & Visual Rhetoric
3 Credits (3)
Includes discussion of how digital and visual media shape our everyday lives. Prepares students to analyze media ecologies - moving from messages embedded in individual photographs to the physical infrastructures that make the internet work - and engage with media ethics.

Learning Outcomes
1. Conceptualize and articulate roles digital and visual media play in production of culture.
2. Describe media representation of individuals and communities in multiple, complex ways.
3. Demonstrate familiarity with public and academic conversations surrounding media ethics.
4. Discuss how technical limitations and media histories shape representational practices.
5. Use terms and ideas from course reading to engage media objects in day-to-day life.

ENGL 313. Media Literacy & Social Justice
3 Credits (3)
Examines how information and misinformation spread through the media, while considering how this affects current social justice movements.

Learning Outcomes
1. Develop the ability to interpret and respond to current media texts as well as humanities and social sciences texts.
2. Analyze and evaluate cultural artifacts such as texts, images, and practices as a means of academic inquiry.
3. Critique arguments offered in the readings to determine the underlying methodology as well as underlying values.
4. Construct rhetorical arguments with evidence appropriate for an explicit audience and purpose.
5. Use written, visual, or oral strategies to persuade, inform, or engage, considering situation, audience, purpose, aesthetics, and diverse points of view.
6. Practice effective research strategies, and integrate research correctly and ethically from credible sources.
7. Understand and apply components of the writing process such as planning, collaborating, organizing, composing, revising, and editing.

ENGL 314. Public Writing and Rhetorics
3 Credits (3)
Invites students to study and practice writing for public audiences, considering its ethical, political, and technological contexts and consequences.

Learning Outcomes
1. Conceptualize and articulate the complex relationship(s) between writing and publics.
2. Propose, develop, and produce a defined, purpose-based and public-facing text.
3. Identify and integrate research in support of writing project.
4. Use relevant genre, media, and technological conventions in support of writing project.

ENGL 315. Writing for the Web
3 Credits (3)
Introduction to writing for the World Wide Web through practical application and analysis on both theory and research. Allows hands-on learning in a computer classroom.

ENGL 323. American Drama
3 Credits (3)
Masterworks of American drama by noted American playwrights. Crosslisted with: THEA 323

ENGL 326. Cultural Identity and Representation Across the Media
3 Credits (3)
Considers complex relationships between representation and culture including how images and language shape racial, ethnic, gender, sexual, and class identities. Examines theories from several disciplines. Includes lecture, discussion and production exercises.

ENGL 327V. Shakespeare around the Globe
3 Credits (3)
Introduction to multicultural issues in Shakespeare's plays and to adaptations of Shakespeare's plays in other cultures.

ENGL 328V. Literature of Science Fiction and Fantasy
3 Credits (3)
Survey and critical examination of the development of science fiction and fantasy as literature genres through selected authors and texts.

ENGL 339V. Chicana/o Literature
3 Credits (3)
Introduction to Chicano novels, short stories and selected creative nonfiction.

ENGL 354. Form and Technique in Fiction
3 Credits (3)
Literature course designed for fiction writers, especially those English majors in the Creative Writing emphasis. The course combines the study of published fiction with the study of craft. Some of the assignments will require the student to write original fiction based on exercises provided by the instructor. Repeatable for up to 9 credits.

ENGL 356. Form and Technique in Poetry
3 Credits (3)
Literature course designed for poets, especially those English majors in the Creative Writing emphasis. The course combines the study of published poetry with the study of craft. Some of the assignments will require the student to write original poems based on exercises provided by the instructor. Repeatable for up to 9 credits.

ENGL 363. Literature for Children and Young Adults
3 Credits (3)
A comparative, historical survey of literature for young (K to 12th grade) readers. Emphasis on critical evaluation.
Prerequisite: junior or above standing.

ENGL 380V. Women Writers
3 Credits (3)
Introduction to multicultural women's traditions through intensive study of works by women writers. Crosslisted with: GNDR 380V.

ENGL 392V. Mythology
3 Credits (3)
Greek and Roman mythology and its impact on European and English literature. Readings in myths, classical plays, and other literature with mythological interest, including nonclassical myths.

ENGL 394V. Southwestern Literature
3 Credits (3)

Introduction to multicultural literature of the Southwest: oral folk literature, literary fiction (classic and contemporary), nonfiction and poetry.

ENGL 399. Special Topics
3 Credits (3)
Emphasis on a theme, genre, figure, or technique chosen for study during the semester. Repeatable under different subtitles.

ENGL 400. Independent Study: Upper Division
1-3 Credits
For students with demonstrated aptitude for independent work. Approval of instructor required before registration. Repeatable under different subtitles.

ENGL 403. Web Design and Development
3 Credits (3)
Combines study and practice of web design and development as rhetoric, technical, processual, and collaborative.
Learning Outcomes
1. Read and write HTML without the use of an editor
2. Design and format web pages via CSS
3. Understand what JavaScript is and how it's used
4. Understand the methods for accessibility
5. Create usable, aesthetically pleasing, and functional websites

ENGL 404. User Experience and Assistance
3 Credits (3)
Includes theories and discussions of users, usability, accessibility, disability, design, embodiment, and ethics to prepare students to understand, write for, and collaborate with users and audiences in technical and professional communication contexts.
Learning Outcomes
1. Understand histories and politics that inform contemporary best practices and ethics conversations associated with the development of user-oriented documentation
2. Develop a robust vocabulary that permits engagement in both academic and industry-based conversations about users, access, and documentation
3. Discuss pros, cons, and nuances of multiple user-centered research methods
4. Produce professional user-assistance documents and discuss the ethics of design decisions.

ENGL 405. Chaucer
3 Credits (3)
Principal works, with emphasis on The Canterbury Tales.

ENGL 407. Milton
3 Credits (3)
Studies in Milton's works, including Paradise Lost.
Learning Outcomes
1. Analyze Milton’s poetry using the methods of close reading;
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Milton’s poetry and prose;
3. Demonstrate ability to locate Milton’s writings in historical and cultural context;
4. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a Working Bibliography and Research Paper on a topic related to our course material.

ENGL 408. Shakespeare I
3 Credits (3)
Study in Shakespeare’s early poems and plays. Repeatable for up to six credits under different subtitles.
Learning Outcomes
1. Analyze Shakespeare’s poetry using the methods of close reading
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Shakespeare’s poems and plays;
3. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance

ENGL 409. Shakespeare II
3 Credits (3)
Study in Shakespeare's later plays. ENGL 408 is not a prerequisite. Repeatable for up to six credits under different subtitles. Crosslisted with THEA 409.
Learning Outcomes
1. Analyze Shakespeare’s poetry using the methods of close reading;
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Shakespeare’s poems and plays;
3. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance.

ENGL 412. Writing in the Workplace
3 Credits (3)
Study of workplace writing practices, including a focus on research-based, theoretical, and pedagogical approaches to professional communication.

ENGL 413. Advanced Creative Writing: Prose Workshop
3 Credits (3)
Imaginative writing, chiefly the narrative. May be repeated up to 12 credits.
Prerequisite(s): ENGL 304 or consent of instructor.

ENGL 414. Advanced Creative Writing: Poetry Workshop
3 Credits (3)
For advanced writers of poetry. Repeatable for a total of 12 credits.
Prerequisite(s): ENGL 306 or consent of instructor.

ENGL 416. Approaches to Literature
3 Credits (3)
Understanding, appreciation, techniques of instruction in the high school.
Prerequisite: at least 6 credits in upper-division English courses.

ENGL 417. Advanced Study in Critical Theory
3 Credits (3)
Advanced study of one or more major trends in theoretical inquiry within English studies. Some prior study of theory, such as English 301-303, strongly recommended. Repeatable under different subtitles.

ENGL 419. Modern Rhetorical Theory
3 Credits (3)
Major figures in rhetorical theory, with particular emphasis on developments in rhetorical theory in the twentieth century.

ENGL 422. Advanced Study in a Literary Form or Genre
3 Credits (3)

Close study of a topic in a particular literary form or genre. May be repeated under different subtitles.

ENGL 423. Advanced Study in a Major Author
3 Credits (3)
Close study of selected works by a major author. May be repeated under different subtitles.

ENGL 430. Online Publishing
3 Credits (3)
This three-credit course provides a theoretical background for online publishing and design as well as hands on experience publishing an online arts magazine.

ENGL 431. Technical Editing
3 Credits (3)
Uses workshops, readings, hands-on projects, and discussion to improve skills in gathering, writing, designing, and editing technical information. For students interested in technical communication as well as students interested in developing strengths in communicating in scientific and technical fields.

ENGL 433. Victorian Literature
3 Credits (3)
Intensive study of major writers and critical topics from the Victorian period. Repeatable under different subtitles.

ENGL 442. Modern and Contemporary American Poetry
3 Credits (3)
Studies the development of American poetry from World War I to the present. Repeatable under a different subtitle. May be repeated up to 6 credits.

ENGL 445. Postmodern Fiction
3 Credits (3)
Study of the various forms of formally innovative experimental fiction produced since 1945, with a focus on the relationship between literary history and its sociohistorical contexts. Some texts will be read in translation. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 446. Advanced Creative Writing: Nonfiction Prose
3 Credits (3)
This workshop-format class for advanced writers will examine the many varieties of Creative Nonfiction. Students should be prepared for a rigorous reading load of published nonfiction and student submissions. Because of the workshop format, every student is expected to contribute extensively to every class, both in printed form and oral comments. Taught with ENGL 546. May be repeated up to 12 credits.
Prerequisite(s): ENGL 307 or consent of instructor.

ENGL 449. Advanced Study in Writing
3 Credits (3)
Close study of a topic in composition, rhetoric and/or technical and professional communication. Repeatable for a maximum of 6 credits with permission of department.

ENGL 453. World Literatures
3 Credits (3)
Study of one or more literary traditions exclusive of those originating in Europe and the United States. Readings will include texts in translation. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 458. Latino/a Literature and Culture
3 Credits (3)
Focuses on established and emergent Latino/a literary and cultural production. Incorporates both literary and sociocultural readings of texts. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 460. Proposal Writing
3 Credits (3)
Developing proposals and grants in a workshop setting.

ENGL 469. Advanced Study in American Literature
3 Credits (3)
Covers selected works for a particular period of American literary history. Repeatable under different subtitles.

ENGL 470. Approaches to Composition
3 Credits (3)
Theory and practice of teaching writing. Discussion and application of classroom practices, definition of standards, and evaluation of student writing.

ENGL 471 M. Scholarly Writing for International Graduate Students
3 Credits (3)
This course is designed for international graduate students with an emphasis on strengthening academic writing skills, analyzing scholarly articles, writing research papers and reports, reviewing English grammar, and citing in APA style. Graded: S/U grading. May be repeated up to 3 credits. Graded: S/U grading.
Prerequisite: Placement in ENGL 471 M through NMSU's English Language Placement Test (ELPT), or#successful completion of#ENGL 1105M, or consent of instructor.
Learning Outcomes

1. Differentiate between genres in the discourses of their chosen disciplines.
2. Write part-genres (problem-solutions and Methods and Discussion sections) and genres (book/article reviews and research papers).
3. Analyze writing conventions in peer-reviewed, scholarly articles in their chosen disciplines.
4. Develop academic research abilities.
5. Apply analytical skills to the discourses of their chosen disciplines to explore how effective academic writing is achieved.
6. Incorporate APA style format for in-text citations and references into their writing.

ENGL 478. Document Design
3 Credits (3)
Advanced study in writing, with an emphasis on the computer as a tool for designing visually informative text. Includes theory and research in document design and the use of page composition and graphics software.

ENGL 479. Computers and Writing
3 Credits (3)
This course will trace the history of computers and composition as a field by looking at the work of important scholars including Selfe, Hawisher, Johnson-Eilola, and Wysocki. We will then focus on specific ways new media might be integrated into composition classrooms. The course will include discussions, student facilitations, and experimentation with technologies.

ENGL 481. Women's Literature
3 Credits (3)
Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles.

ENGL 485 M. International Teaching Assistant Development
1-3 Credits (1-3)
Prepares international graduate students for teaching assignments in their field of study and work at NMSU. Assists international/multilingual graduate students in developing communication and teaching studies necessary to fulfill duties their duties as teaching assistants at NMSU.

Learning Outcomes

1. Demonstrate effective communication strategies as an instructor.
2. Apply a variety of teaching strategies to present and explain content in your academic field.
3. Demonstrate understanding of different aspects of undergraduate education in the United States.
4. Demonstrate understanding of diverse student populations at NMSU.

ENGL 489. Cultural Studies: Literature and Theory
3 Credits (3)
Examines the theory and practice of cultural studies in relation to the variety of discourse describable as literary, including autobiography, avant-garde writing, nonfiction prose, the essay, online writing, folklore, and popular genre fiction (such as mystery, romance, thriller, or horror). Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 497. Internship
3-6 Credits (3-6)
Supervised technical and professional communication internship in business, industry, government, or the university. Repeatable for a total of 6 credits. Consent of instructor required.

ENGL 500. Supervised Study
1-3 Credits
To prepare the student for the master s degree examinations by special studies in fields not covered in routine course work.
Prerequisite: consent of instructor.

ENGL 501. Online Publishing
3 Credits (3)
This three-credit course provides a theoretical background for online publishing and design as well as hands-on experience publishing an online arts magazine. Taught with ENGL 430.

ENGL 502. Critical Conversations in Technical and Professional Communication
3 Credits (3)
Introduces students to critical histories, theories, and key concepts in technical and professional communication across academic and industry boundaries.

Learning Outcomes

1. Understand the histories and politics of emergence of technical and professional communication as a field of study and expertise;
2. Identify and track key concepts, terms, and conversations that give shape to technical and professional communication;
3. Draw on a range of theories and methodologies to articulate and critique the function and effects of technical and professional communication;
4. Participate in disciplinary conversations through research and writing.

ENGL 503. Web Design and Development
3 Credits (3)
Combines study and practice of web design and development as rhetorical, technical, processual, and collaborative.

Learning Outcomes

1. Read and write HTML without the use of an editor
2. Design and format web pages via CSS
3. Understand what JavaScript is and how it's used
4. Understand the methods for accessibility

ENGL 504. User Experience and Assistance
3 Credits (3)
Includes theories and discussions of users, usability, accessibility, disability, design, embodiment, and ethics to prepare students to understand, write for, and collaborate with users and audiences in technical and professional communication contexts.

Learning Outcomes

1. Understand histories and politics that inform contemporary best practices and ethics conversations associated with the development of user-oriented documentation
2. Develop a robust vocabulary that permits engagement in both academic and industry-based conversations about users, access, and documentation
3. Discuss pros, cons, and nuances of multiple user-centered research methods
4. Produce professional user-assistance documents and discuss the ethics of design decisions

ENGL 505. Graduate Study in Chaucer
3 Credits (3)
Principal works, with emphasis on the Canterbury Tales. Requirements include independent directed research. May be repeated up to 3 credits.

ENGL 507. Special Topics in Rhetoric and Technical and Professional Communication
3 Credits (3)
Seminar course centered on contemporary issues in rhetoric and technical and professional communication. Repeatable under different subtitles, for up to 6 credits.

Learning Outcomes

1. Use rhetoric inquiry and theory to contextualize and study technical and professional communication.
2. Understand the disciplinary overlaps, tensions, and possibilities among rhetoric and technical and professional communication.
3. Track a contemporary thematic trend, issue, or question through rhetoric and technical and professional communication.

ENGL 508. Graduate Study in Shakespeare I
3 Credits (3)
Graduate study in Shakespeare's early poems and plays. Requirements include independent directed research. Repeatable for up to six credits under different subtitles.

Learning Outcomes

1. Analyze Shakespeare’s poetry using the methods of close reading
2. Demonstrate graduate-level ability to read and develop persuasive literary-critical interpretations of Shakespeare’s poems and plays
3. Demonstrate graduate-level skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance

ENGL 509. Graduate Study in Shakespeare II
3 Credits (3)
Study in Shakespeare’s late poems and plays. Requirements include independent directed research. Repeatable for up to six credits under different subtitles.

Learning Outcomes

1. Analyze Shakespeare’s poetry using the methods of close reading
2. Demonstrate graduate-level ability to read and develop persuasive literary-critical interpretations of Shakespeare’s poems and plays;

3. Demonstrate graduate-level skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance

ENGL 510. Proseminar in Rhetoric and Professional Communication
3 Credits (3)
Introduction to research in rhetoric and professional communication. Taught with ENGL 610.

ENGL 512. Graduate Study in Writing in the Workplace
3 Credits (3)
Study of workplace writing practices, including a focus on research-based, theoretical, and pedagogical approaches to professional communication.

ENGL 513. Creative Writing Workshop: Fiction
3 Credits (3)
Advanced creative writing prose workshop. Imaginative writing, chiefly the narrative. Graduate level workshop for students who are not in the English Department MFA program. May be repeated for a maximum of 12 credits. Taught with ENGL 413 with additional work required at the graduate level.

ENGL 514. Creative Writing Workshop: Poetry
3 Credits (3)
Creative writing poetry workshop for advanced writers of poetry. Graduate level works for students who are not in the English Department MFA program. Repeatable for a maximum of 12 credits. Taught with ENGL 414 with additional work required at the graduate level.

ENGL 516. Graduate Study in Approaches to Literature
3 Credits (3)
Understanding, appreciation, techniques of instruction in the high school. Requirements include independent directed research.
Prerequisite: at least 6 credits in upper-division English courses.

ENGL 517. Graduate Study in Critical Theory
3 Credits (3)
Advanced study of one or more major trends in theoretical inquiry within English studies. Some prior study of theory, such as English 301, 302, or 303, strongly recommended. Repeatable under different subtitles.

ENGL 518. History of Rhetoric
3 Credits (3)
An investigation of the crucial writings that have shaped Western attitudes towards and practice of rhetoric. Course will examine key texts from the Greeks through the Enlightenment, especially as they have influenced contemporary rhetorical theory.

ENGL 519. Graduate Study in Modern Rhetorical Theory
3 Credits (3)
Major figures in rhetorical theory, with particular emphasis on developments in rhetorical theory in the 20th century. Students will be responsible for all requirements of ENGL 419 and will in addition undertake independent directed research.

ENGL 521. Graduate Study in a Literary Period or Movement
3 Credits (3)
Close study of a topic in a particular literary period or movement. Requirements include independent directed research. Repeatable under different subtitles.

ENGL 522. Graduate Study in a Literary Form or Genre
3 Credits (3)
Close study of a topic in a particular literary form or genre. Requirements include independent directed research. Repeatable under different subtitles.

ENGL 523. Graduate Study of a Major Author
3 Credits (3)
Close study of selected works of a major author. Requirements include independent directed research. Repeatable under different subtitles.

ENGL 524. Graduate Study in a Major Text
3 Credits (3)
Close study of a major text. Requirements include independent directed research. Repeatable under different subtitles.

ENGL 525. Graduate Study in Comparative Literature
3 Credits (3)
Close study of a selection on non-English literary works read in translation. English-language works from a similar literary period or genre may also be read. Requirements include independent directed research. Repeatable under different subtitles.
Prerequisite: graduate standing or consent of instructor.

ENGL 526. Special Topics in Critical Theory
3 Credits (3)
Study of a specific historical or theoretical topic, trend, or movement in Critical Theory. Repeatable under different subtitles.

ENGL 527. Graduate Study in Film and Digital Media
3 Credits (3)
Offers close graduate study of a form or genre, a major figure or style, a historical period or movement, or a major theme or text. Topics vary from semester to semester.

ENGL 531. Technical Editing
3 Credits (3)
Uses workshops, readings, hands-on projects, and discussion to improve skills in gathering, writing, designing, and editing technical information. For students interested in technical communication as well as students interested in developing strengths in communicating in scientific and technical fields.

ENGL 533. Victorian Literature
3 Credits (3)
Intensive study of major writers and critical topics from the Victorian period. Repeatable under different subtitles.

ENGL 534. Graduate Study: Form and Technique in Fiction
3 Credits (3)
Advanced study of issues in form and technique in fiction, including point of view, scene and dialogue, and story structure. Repeatable for a maximum of 6 credits.

ENGL 535. Graduate Study: Form and Technique in Poetry
3 Credits (3)
Advanced study of issues in form and technique in poetry, including voice, tone, syntax, and structure. Repeatable for a maximum of 12 credits.

ENGL 536. The Borderlands Writing Project
3-6 Credits (3-6)
Intensive month-long seminar for practicing teachers and educators designed to improve the teaching of writing and the writing process and literacy and reading in schools and other educational contexts. Reading, discussing, and writing about current professional literature; completing teacher inquiry; and planning action research. Participants complete personal and professional writing, as well as additional professional development activities. By invitation only. Affiliated with the National Writing Project. Consent of instructor required. Crosslisted with: RDG 536

ENGL 542. Modern and Contemporary American Poetry
3 Credits (3)
Studies the development of American poetry from World War I to the present. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 543. Multimedia Theory and Production
3 Credits (3)
Issues, theories, and production practices underlying design of multimedia, including rhetorical choices, aesthetic approaches, usability concerns, and diverse academic and popular discourses contributing to continued development of digital texts. Taught with ENGL 643.

ENGL 544. Modern British Fiction
3 Credits (3)
Study of the fiction produced in the British Isles in the 20th and 21st centuries. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 545. Postmodern Fiction
3 Credits (3)
Study of the various forms of formally innovative experimental fiction produced since 1945, with a focus on the relationship between literary history and its sociohistorical contexts. Some texts will be read in translation. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 546. Advanced Creative Writing: Nonfiction Prose
3 Credits (3)
This graduate-level workshop will examine the many varieties of Creative Nonfiction. Students should be prepared for a rigorous reading load of published nonfiction and student submissions. Because of the workshop format, every student is expected to contribute extensively to every class, both in printed form and oral comments. Taught with ENGL 446 with additional work required at the graduate level. Consent of Instructor required. Crosslisted with: ENGL 446.

ENGL 548. Graduate Study in Empirical Research
3 Credits (3)
Introduction to empirical research methods in composition, professional communication, and rhetoric.

ENGL 549. Graduate Study in Writing
3 Credits (3)
Close study of a topic in composition, rhetoric, and/or technical and professional communication. Topics vary. Repeatable for a maximum of 6 credits.

ENGL 550. Graduate Study in Literacy
3 Credits (3)
Studies in literacy theory and literacy research. Topics may vary. Taught with ENGL 650.

ENGL 552. Graduate Study in History of the English Language
3 Credits (3)
This course examines the history of the English language from its Indo-European origins through its development into an international language. The aim is to describe the English language formally and to trace linguistic change over time. Samples of written English will illustrate various stages in the development of English. Also considered are contemporary social and political issues related to language, including the problem of 'standard English' and the uses of language in advertising, the media, and politics.

ENGL 553. World Literatures
3 Credits (3)
Study of one or more literary traditions exclusive of those originating in Europe and the United States. Readings will include texts in translation. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 555. Graduate Study in Rhetoric of Scientific Literature
3 Credits (3)
Intensive study of the rhetoric of selected works of scientific literature.

ENGL 558. Latino/a Literature and Culture
3 Credits (3)
Focuses on established and emergent Latino/a literary and cultural production. Incorporates both literary and sociocultural readings of texts. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 560. Proposal and Grant Writing
3 Credits (3)
Developing proposals and grants in a workshop setting.

ENGL 561. Topics in Writing Program Administration
3 Credits (3)
Explores issues, theories, and research underlying the design of writing programs and the administration of writing centers. Repeatable for a maximum of 6 credits. Taught with ENGL 661.

ENGL 563. Graduate Study in English Literature
3 Credits (3)
Covers selected works for a particular period of English literary history. Repeatable under different subtitles.

ENGL 564. History and Theory of Composition Studies
3 Credits (3)
Studies in the history and theory of composition as a discipline. Taught with ENGL 664.

ENGL 565. Intercultural Rhetoric and Professional Communication
3 Credits (3)
Examines rhetorical traditions in intercultural professional, technical, academic, and governmental contexts. Taught with ENGL 665.

ENGL 567. Documentary Film Theory and Criticism
3 Credits (3+3P)
Course offers critical survey of documentary film theory and criticism including considerations of the epistemological assumptions, rhetorical choices, aesthetic approaches, political circumstances of historical and contemporary documentary film.

ENGL 568. Rhetoric and Cultural Studies
3 Credits (3)
Explores intersections between rhetoric and cultural studies. Examines theories and practices of texts and discourses in political and cultural contexts. Taught with ENGL 668.

ENGL 569. Graduate in American Literature
3 Credits (3)
A group of works from a particular period of American literary history. Repeatable under different subtitles.

ENGL 570. Graduate Study in Approaches to Composition
3 Credits (3)
Theory and practice of teaching writing, including classroom practices, definition of standards, and evaluation of student writing. Requirements include independent directed research.

ENGL 571. Composition Pedagogy and Practicum
3 Credits (3)
Examines the pedagogical implications of contemporary composition theory and research. Focuses on teaching composition at the college level. Consent of instructor required.

ENGL 572. Technical-Professional Communication Pedagogies
3 Credits (3)
Combines theoretical and practical attention to the pedagogies that underwrite the teaching of technical and professional communication; culminates in the development of a TPC course proposal, syllabus, and rationale. For Graduate students only.

Learning Outcomes

1. Engage with research and scholarship that reflects a range of approaches to conceptualize the purposes and goals of technical and professional communication courses;
2. Articulate a range of possibilities for and responsibilities of technical and professional communication pedagogy;
3. Compose and substantiate a teaching philosophy and course plan for teaching technical and professional communication.

ENGL 574. Workshop: Advanced Writing Prose
3 Credits (3)
Intensive practice in prose writing, primarily fiction, in a workshop environment with peer criticism. Repeatable for a total of 15 credits. Consent of instructor required.

ENGL 575. Workshop: Advanced Writing Poetry
3 Credits (3)
Intensive practice in poetry writing in a workshop environment with peer criticism. Repeatable for a total of 15 credits. Consent of instructor required.

ENGL 576. Workshop: Advanced Writing Playwriting
3 Credits (3)
Intensive practice in dramatic writing in a workshop environment with peer criticism. Repeatable for a total of 9 credits. Consent of instructor required.

ENGL 577. Workshop: Advanced Technical and Professional Writing
3 Credits (3)
Intensive practice in technical and professional writing and editing in a workshop environment. May be repeated for a total of 6 credits. Consent of instructor required.

ENGL 578. Topics in Rhetoric and Technology
3 Credits (3)
Explores intersections between rhetoric and technology, approaches may highlight theory, media production, and/or research. Repeatable for a maximum of 6 credits. Taught with ENGL 678.

ENGL 579. Computers and Writing
3 Credits (3)
This course will trace the history of computers and composition as a field by looking at the work of important scholars including Selfe, Hawisher, Johnson-Eilola, and Wysocki. We will then focus on specific ways new media might be integrated into composition classrooms. The course will include discussions, student facilitations, and experimentation with technologies.

ENGL 580. Graduate Problems in Creative Writing
3 Credits (3)
Independent study in creative writing. Consent of instructor required. Repeatable for a total of 9 credits.

ENGL 581. Women's Literature
3 Credits (3)
Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles.

ENGL 582. Gender and Popular Culture
3 Credits (3)
Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 583. Critical Writing Studies
3 Credits (3)
Overview of current and historical approaches to the critical study of gender and language: how gender theoretically manifests in linguistic, social, cultural, academic, and professional contexts.

ENGL 584. Workshop: Advanced Academic Writing for International Students
3 Credits (3)
This workshop-based course is for graduate-level multilingual writers from all disciplines who want to improve their English academic writing in an intensive and collaborative environment. Students will propose a major writing project to workshop throughout the semester, such as dissertation, thesis, comprehensive exams, etc. Some of the topics covered will be academic language, cohesion/coherence, organization, and supporting academic arguments. Other topics to be determined by needs of the class.) 4.Consent of instructor.
Prerequisite(s): 1.Be classified as a graduate student by the Graduate School 2.Be classified as an international student whose first language is not English 3.Have a major writing project in progress (comprehensive exams, thesis, dissertation, conference paper, etc.

ENGL 585. Advanced Writing Workshop: RPC Capstone
3 Credits (3)
Students work to develop and revise their chosen Master's program Capstone Project (a portfolio, thesis or master essay) in consultation with instructor and classmates. Students provide and receive feedback on their work-in-progress. Consent of Instructor required.

ENGL 589. Cultural Studies: Literature and Theory
3 Credits (3)
Examines the theory and practice of cultural studies in relation to the variety of discourse describable as literary, including autobiography, avant-garde writing, nonfiction prose, the essay, online writing, folklore, and popular genre fiction (such as mystery, romance, thriller, or horror). Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 590. Master's Seminar in Rhetoric
3 Credits (3)
Studies in theories of and issues in rhetoric. Topics may vary from year to year. Repeatable for a total of 9 credits.

ENGL 592. Master's Theory, Practice, and Profession
3 Credits (3)
Students will study major poetics/narratology pieces in the field and other related professional topics such as literary citizenship, publishing, and job seeking skills. Students will also propose and develop a year-long project in one of the above categories, such as a community reading or workshop, a conference panel proposal, a paper presentation, a chapbook press launch, writing/placing literary book reviews, or work on an outreach project. Must be taken in each of the last two semesters of the MFA and currently with ENGL 594 (Master's Workshop). Restricted to MFA-Creative Writing students, or by consent of instructor.

Learning Outcomes

1. Understand, analyze, and effectively use the critical discourse of poetics/narratology/craft in the field of creative writing
2. Design and execute an outreach or professional project that contributes to a creative writing community
3. Explore applications of their training in professional contexts.

4. Analyze how students' own reading, writing, and research respond to existing leadership in professional creative writing communities, help provide new leadership, and answer community needs.

ENGL 594. Master's Workshop
3 Credits (3)
Students will submit a draft of their thesis project, in their major genre, for workshop critique. Revision of the thesis draft will be submitted to the instructor. Restricted to MFA Creative Writing students, or by consent of instructor. Must be taken in each of the last two semesters of the MFA, and concurrently with ENGL 592 (Master's Theory, Practice, and Profession).

Learning Outcomes

1. Understand, analyze, and effectively use the critical discourse of the field of creative writing to discuss a thesis.
2. Examine how their thesis operates with the genre and within the context of contemporary literature.
3. Critically contextualize their thesis and those of their peers
4. Apply various revision strategies across a thesis-length manuscript, responding to the critiques of the instructor and their peers
5. Achieve the standards of publication of the University's thesis editor and learn those of the publishing environment in their genre.

ENGL 595. Master's Workshop: Poetry
3-6 Credits (3-6)
Students will submit a draft of thesis project for workshop critique. Revision of the thesis draft submitted to the instructor. Restricted to MFA CW majors.
Prerequisite(s): Enrolled in MFA penultimate semester.

ENGL 596. Master's Workshop: Fiction
3-6 Credits (3)
Students will submit a draft of thesis project for workshop critique. Revision of the thesis draft submitted to the instructor. Restricted to MFA CW majors.
Prerequisite(s): Enrolled in MFA penultimate semester.

ENGL 597. Internship in Technical and Professional Communication
3-6 Credits (3-6)
Supervised technical and professional communication in business, industry, government, or the university. May be repeated for a total of 6 credits. Consent of instructor required.

ENGL 598. Master's Essay
3 Credits (3)
Students electing the master essay option complete revision of a scholarly essay of 25-30 pages, the approximate length of a journal article, and reformulation of this essay to the 7-8 pages appropriate for presentation at a conference. This option also requires research of appropriate publication venues and a final oral defense of the project. A supervising faculty member will approve the selected essay, guide revision, and help students form an examining committee, which consists of at least two members of the graduate English faculty and one member of the graduate faculty from outside the department. Students are encouraged to undertake the Master Essay process in the first half of their third semester of full time graduate work, or soon after completing 18 hours of course work. This option is the preferred exam option, particularly for those students who intend to pursue Ph.D. study. Consent of instructor required.

ENGL 599. Master's Thesis
1-15 Credits
Thesis.

ENGL 600. Doctoral Research
1-15 Credits
Assigns credit for research performed prior to the doctoral comprehensive examination.

ENGL 601. Qualitative Research
3 Credits (3)
Theory and practice of designing research studies and of collecting and analyzing data. Emphasis on qualitative methods of research in composition, professional communication, and rhetoric.

ENGL 604. Digital Research Methods
3 Credits (3)
This course will serve as one of the core methods courses in the RPC PhD program, focusing on “digital” methods in rhetorical studies. As such, the aim of this class is to help you begin to gain confidence in conducting research in rhetoric, professional communication, and composition using digital methods. In this course we will assume that digital methods in rhetoric take broadly two forms: first, digital methods of acquisition, processing, and presentation of research data. And second, digital methods of production and circulation of rhetorical objects. The former closely resembles the methods of “digital humanities” while the latter will be closer to media archaeology and “critical making” practices. In all cases, we will relate these tools and methods to key questions and theories in our field, asking how and why we might apply digital methods in rhetorical scholarship.
Prerequisite(s): graduate standing.

ENGL 610. Proseminar in Rhetoric and Professional Communication
3 Credits (3)
Introduction to research in rhetoric and professional communication. Required of and limited to students enrolled in the Ph.D. program in Rhetoric and Professional Communication.

ENGL 643. Multimedia Theory and Production
3 Credits (3)
Issues, theories, and production practices underlying design of multimedia, including rhetorical choices, aesthetic approaches, usability concerns, and diverse academic and popular discourses contributing to continued development of digital texts. Taught with ENGL 543.

ENGL 649. Graduate Study in Writing
3 Credits (3)
Close study of a topic in composition, rhetoric, and/or technical and profession communication. Repeatable for a total of 6 credits.

ENGL 650. Graduate Study in Literacy
3 Credits (3)
Studies in literacy theory and literacy research. Topics may vary. Taught with ENGL 550.

ENGL 661. Topics in Writing Program Administration
3 Credits (3)
Explores issues, theories, and research underlying writing programs and the administration of writing centers. Repeatable for a maximum of 6 credits. Taught with ENGL 561.

ENGL 664. History and Theory of Composition Studies
3 Credits (3)
Studies in the history and theory of composition as a discipline. Taught with ENGL 564.

ENGL 665. Intercultural Rhetoric and Professional Communication
3 Credits (3)
Examines rhetorical traditions in intercultural professional, technical, academic, and governmental contexts. Taught with ENGL 565.

ENGL 668. Rhetoric and Cultural Studies
3 Credits (3)
Explores intersections between rhetoric and cultural studies. Examines theories and practices of texts and discourses in political and cultural contexts. Taught with ENGL 568.

ENGL 678. Topics in Rhetoric and Technology
3 Credits (3)
Explores intersections between rhetoric and technology, approaches may highlight theory, media production, and/or research. Repeatable for a maximum of 6 credits. Taught with ENGL 578.

ENGL 683. Critical Writing Studies
3 Credits (3)
This course investigates the field of Writing Studies as a distinct field of study, related to but not synonymous with Composition Studies. While debates surrounding the relationships among Writing Studies and Composition Studies flourish, this course centers on the former—investigating writing as a practice, process, and object that merits attention in its own right. Such attention will be grounded in contemporary critical and cultural theory that contests writing as a positive or neutral sign (i.e. activity theory, posthumanism, ecocriticism, new materialism, new media studies; feminist, queer, critical race or decolonial theory). Crosslisted with: ENGL 583.
Prerequisite(s): graduate standing.

ENGL 690. Doctoral Seminar in Rhetoric
3 Credits (3)
Studies in theories of and issues in rhetoric. Topics may vary from year to year. Repeatable for a maximum of 9 credits.

ENGL 700. Doctoral Dissertation
1-15 Credits
Dissertation.

Gender and Sexuality Studies Courses

GNDR 2110G. Introduction to Women, Gender, and Sexuality Studies
3 Credits (3)
This course introduces students to key concepts, debates, and analytical tools informing Women's, Gender, and Sexuality Studies. As an interdisciplinary field of study, Women's, Gender, and Sexuality Studies employs academic perspectives from a range of disciplines and theoretical approaches. It also incorporates lived experience and social location into its object of analysis. Though content will vary according to the expertise and focus of the instructor, this course will develop tools through readings and assignments that critically analyze how gender and sexuality are shaped by different networks of power and social relations and demonstrate how the intersections of race, class, disability, national status, and other categories identity and difference are central to their understanding and deployment. In addition to feminist thought, areas of focus might include gender and sexuality in relation to social, cultural, political, creative, economic, or scientific discourses. This class is recommended for those with a general interest in the topic area as well as for those seeking a foundational course for further study. May be repeated up to 3 credits.
Learning Outcomes
1. Understand foundational concepts, theories, and approaches to gender and sexuality in conjunction with contemporary social justice movements such as feminism.
2. Describe the range of social and political forces that shape and are shaped by gender, sexuality, race/ethnicity, and other intersecting categories of identity.
3. Demonstrate the ability to conduct intersectional analysis.
4. Develop and improve skills in reading, critical thinking, academic writing, and public speaking.

GNDR 2120G. Representing Women Across Cultures
3 Credits (3)
Historical and critical examination of women's contributions to the humanities, with emphasis on the issues of representation that have contributed to exclusion and marginalization of women and their achievements.
Learning Outcomes
1. To think critically about contemporary discourses on gender, race, sexuality, and class.
2. To understand how forms of identity intersect with one another
3. To explore the ways power and privilege operate in contemporary society
4. To understand some of the ways social inequalities develop, function, and change
5. To further students' interest in developing their own ideas and research in issues of women and gender, sexuality, race, class, and nation

GNDR 350. Special Topics
3 Credits (3)
The topic of course will vary and will be indicated by subtitle. May be cross-listed with relevant courses at the 300-level from any specific department. May be repeated up to 99 credits.
Learning Outcomes
1. Varies

GNDR 352. Women's & Mass Media
3 Credits (3)
Portrayal and participation of women in mass media from colonial to contemporary times. Taught with JOUR 380.

GNDR 357. Gender and Society
3 Credits (3)
Overview of issues related to gender, including how gender is constructed and reproduced in our society. Gender is examined from social psychological and institutional perspectives.
Learning Outcomes
1. To develop a working knowledge of sociological concepts and theoretical approaches common in gender studies, as well as the research methodologies employed to understand gender as an organizing principle in 21st century societies.
2. To develop a solid understanding of how dominant ideologies affect the structures and meanings of gender and gender inequality in the United States and on how gender shapes one's own life chances and choices.
3. To develop a decolonial "sociological imagination" and the analytical tools to understand how gender intersects with other systems of inequality (such as nation, race, ethnicity, sexuality, physical abilities, economic class, and citizenship status).
4. To develop a working knowledge of past and present collective social movements to eradicate gender inequality and gender oppression in all our homes, communities, institutions, and world.

GNDR 359. Psychology of Gender
3 Credits (3)
Examines theories and research on the psychological functioning of women and men in North American society, including influential theories of gender in psychology and current controversies in the psychological literature. Topics include those unique to women and unique to men

in development across the lifespan, work, physical and mental health, sexuality, victimization, gender stereotypes, gender comparisons in abilities and personality, and biological, social, and cultural influences on behavior. Crosslisted with: PSYC 359.
Prerequisite: PSYC 1110G.

GNDR 360. Masculinities Studies
3 Credits (3)
Explores how contemporary American culture constructs manhood and masculinity. Interrogates ideas and enactments of masculinity, especially as they intersect with race/ethnicity, class, and sexuality. The class asks how sexuality, gender construction, and sex roles inform our understanding of masculinity, as well as how masculinity relates to social power.

GNDR 371. Introduction to LGBTQ Studies
3 Credits (3)
Multidisciplinary introduction to Lesbian, Gay, Bisexual, Transgender, and Queer Studies. Students will learn about LGBTQ identities, social movements, civil rights, and media representation.
Learning Outcomes
1. To broaden students' knowledge, cultural competencies, and research skills regarding LGBTQ+ Studies.
2. To develop a critical understanding of LGBTQ+ peoples and communities in relation to issues of power and inequality.
3. To expand understanding and learning approaches involving the study of cultural texts and arts forms created by or about LGBTQ+ experiences.
4. To develop the necessary analytical tools for further and more specialized study in the field of LGBTQ+ Studies.

GNDR 380V. Women Writers
3 Credits (3)
Introduction to multicultural women's traditions through intensive study of works by women writers. Taught with ENGL 380V. May be repeated up to 3 credits.

GNDR 381V. Women's Health Issues
3 Credits (3)
A focus on the unique issues and problems that confront women today and how they affect the health of women. Crosslisted with: PHLS 3120V. May be repeated up to 3 credits.

GNDR 401. Women & Immigration
3 Credits (3)
Explores historical and contemporary immigration processes in/to the U.S. that are shaped by gendered dynamics, societal structures, and the socio-economic conditions that impact immigrant women. Examines how immigrant women use their agency and resistance to overcome exploitative circumstances, and the restraints of immigration laws and policies that impact individual, communal and societal change.

GNDR 402. Transnational Feminisms
3 Credits (3)
Explores dimensions of gender, race, class, and sexuality in conjunction with nationalisms, anti-capitalist struggles, religious fundamentalism, militarism, globalization, eco-critique, and the politics of resistance and social movements.

GNDR 403. Gender & Horror
3 Credits (3)
Explores cultural anxieties and crises through the genre of horror as they relate to issues of gender, sexuality, feminism, and race. Traces ways horror films represent and reconfigure notions of sexuality and gender and ways they reinforce and/or challenge social norms.

GNDR 405. Alternative Genders and Sexualities
3 Credits (3)
Examination of queer, transgender, non-binary, and intersex gender identities and queer/non-heterosexual sexualities through literature, film, and critical theory

GNDR 406. Women and Human Rights
3 Credits (3)
Analysis of human rights violations and injustices as they relate to the lives of girls and women. Examines international political, legal, economic and socio-cultural implications of violence that target women and girls. Focusing on different countries, discusses social, political, economic, and human rights.
Learning Outcomes
1. Students will evaluate socio-culturally sanctioned practices that often lead to widespread victimization of girls/ women/ womxn
2. Students will better understand the application of Human Rights discourse and Human Rights remedies to women's, womxn's, and girls' rights

GNDR 407. Gender and Graphic Narrative
3 Credits (3)
Examines graphic novels that disrupt stereotypical ideas about genre, gender, race, class sexuality, as well as common notions about comics. Considers texts that address underrepresented experiences.

GNDR 408. Feminist Food Studies
3 Credits (3)
Examines contemporary food writing as a way to study identity, social structures, and notions of acceptability. Explores how constructions of food shape bodies, desires, and notions of belonging.
Learning Outcomes
1. Apply critical thinking and critical writing competencies about race ethnicity, gender sexuality, and class, as well as food and culture.
2. Analyze representations of food and culinary practices in literature, film, and other cultural production as a reflection of larger social forces.
3. Develop a scholarly vocabulary for discussing themes of race and ethnicity, gender and sexuality, class, citizenship and belonging, dislocation and exile, labor and consumption.

GNDR 411. Gender and Migration
3 Credits (3)
Explores multiple experiences of forced migration and displacement. Examines violence, structural dislocation, neoliberalism, globalization, economic collapse and civil war. Discusses local, regional and global responses to creating meaningful change in communities most affected by migration.

GNDR 412. Gender and Film Studies
3 Credits (3)
Examines how movies have created, reflected, and shaped ideas about gender, sexuality, race, and other dimensions of identity. This class analyzes these representations, how they create meaning, how they function within the filmic medium, and how some filmmakers create alternative visions.
Learning Outcomes
1. To develop skills to critically analyze films.
2. To gain a grounding in the analysis of social identity categories, with an emphasis on race and gender.
3. To analyze how race and gender are represented in popular culture and why media representation matters.

4. To learn critical tools to think through contemporary discourses on gender, race, and sexuality as well as categories of difference and identity.

GNDR 433V. Sex, Gender and Culture
3 Credits (3)
This seminar course introduces students to the anthropological study of gender. We take an integrated approach to the subject, considering the ways that that different kinds of anthropological research, including archaeology, biological anthropology, ethnography, etc.,expand our understanding of the various ways gender is defined across space and time, how it is lived, and what it means to us and others. Students will review the historical context and development of this subject within the field, and will explore such topics as sex versus gender, embodiment and gendered performance, gender hierarchies, the politics of reproduction, and globalization. May be repeated up to 3 credits.
Learning Outcomes
1. Identify and evaluate different anthropological approaches to the study of gender
2. Develop and employ analytical and critical thinking skills
3. Demonstrate proficiency in oral and written communication
4. Integrate and synthesize knowledge of gender-related topics in a research paper

GNDR 450. Special Topics
3 Credits (3)
The topic of course will vary and will be indicated by subtitle. May be cross-listed with relevant courses at the 400-level from any specific department. May be repeated up to 99 credits.
Learning Outcomes
1. Varies

GNDR 451. Practicum in Gender and Sexuality Studies
3 Credits (3)
Supervised field work in community setting relating to women. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

GNDR 454. Women Crossing Borders
3 Credits (3)
Experiences of women who cross class, race, cultural, national, or sexual borders including theories regarding women's Interactions across borders. Emphasis will vary with professor and discipline.

GNDR 455. Feminist Research Methodologies
3 Credits (3)
Study of feminist modes of research inquiry, feminist ethics in research, and critiques of traditional disciplinary approaches to research.
Learning Outcomes
1. Students will recognize how theories and research methods influence the subjects and outcomes of studies.
2. Students will understand feminist practices associated with evolving epistemologies, research strategies, and calls for social change.
3. Students will develop and practice skills in designing, conducting, and analyzing narratives in ways that utilize feminist theory and research methods.

GNDR 461. Independent Study in Gender and Sexuality Studies
3 Credits (3)
Individual study of selected topic and writing of research paper. May be repeated up to 6 credits.
Learning Outcomes
1. Varies.

GNDR 465. Sex, Gender and the Body
3 Credits (3)
Examines forces at work in defining and differentiating gender, race, sexuality. How ideas about what is 'natural' and 'normal' for men and women shifted over time. Considers different discourses shaping embodied experiences and categories of identity.

GNDR 471. Seminar in Feminist and Queer Theories
3 Credits (3)
Seminar in contemporary feminist and queer theorizing that explores knowledge production, key debates, and transformation. Course examines interconnectedness of feminist and queer theories as well as critical concepts for social change and worldmaking.
Learning Outcomes
1. Demonstrate through discussion, research, and writing knowledge of shifts, differences, and debates in feminist and queer theoretical discourses.
2. Analyze a range of contemporary feminist and queer critical theories in discussions, essay assignments, and exams.
3. Formulate theories and forge connections between feminist and queer discourses through written and other assignments

GNDR 474. Gender in East Asian History
3 Credits (3)
Examines the position of women and the social roles of both sexes in traditional China and Japan, and traces the changes taking place in those societies in the course of modernization in the last century and a half. Scholarly literature and works of Chinese and Japanese literature in translation and cinema used. Taught with HIST 474.

GNDR 482. Gender and Popular Culture
3 Credits (3)
Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. May be repeated up to 6 credits.

GNDR 501. Advanced Women & Immigration
3 Credits (3)
Advanced exploration of historical and contemporary immigration processes in/to the U.S. that are shaped by gendered dynamics, societal structures, and the socio-economic conditions that impact immigrant women. Examines how immigrant women use their agency and resistance to overcome exploitative circumstances, and the restraints of immigration laws and policies that impact individual, communal and societal change.

GNDR 502. Advanced Transnational Feminisms
3 Credits (3)
Advanced analysis of dimensions of gender, race, class, and sexuality in conjunction with nationalisms, anti-capitalist struggles, religious fundamentalism, militarism, globalization, eco-critique, and the politics of resistance and social movements.

GNDR 505. Advanced Alternative Genders and Sexualities
3 Credits (3)
Intensive exploration of queer, transgender, non-binary, and intersex gender identities and queer/non-heterosexual sexualities through literature, film, and critical theory.

GNDR 506. Advanced Women and Human Rights
3 Credits (3)

Advanced analysis of human rights violations and injustices as they relate to the lives of girls and women. Intensive examination of international political, legal, economic and socio-cultural implications of violence that target women and girls. Focusing on different countries, explores social, political, economic, and human rights.

Learning Outcomes

1. Students will evaluate socio-culturally sanctioned practices that often lead to widespread victimization of girls/ women/womxn
2. Students will better understand the application of Human Rights discourse and Human Rights remedies to women's,womxn's, and girls' rights

GNDR 507. Advanced Gender and Graphic Narrative
3 Credits (3)

Advanced examination of graphic novels that disrupt stereotypical ideas about genre, gender, race, class sexuality, as well as common notions about comics. Considers texts that address underrepresented experiences.

GNDR 508. Advanced Feminist Food Studies
3 Credits (3)

Advanced examination of contemporary food writing as a way to study identity, social structures, and notions of acceptability. Intensive exploration of how constructions of food shape bodies, desires, and notions of belonging.

Learning Outcomes

1. Apply critical thinking and critical writing competencies about race ethnicity, gender sexuality, and class, as well as food and culture.
2. Analyze representations of food and culinary practices in literature, film, and other cultural production as a reflection of larger social forces.
3. Develop a scholarly vocabulary for discussing themes of race and ethnicity, gender and sexuality, class, citizenship and belonging, dislocation and exile, labor and consumption.

GNDR 511. Advanced Gender and Migration
3 Credits (3)

Advanced exploration of multiple experiences of forced migration and displacement. Intensive examination of violence, structural dislocation, neoliberalism, globalization, economic collapse and civil war. Discusses local, regional and global responses to creating meaningful change in communities most affected by migration.

GNDR 512. Advanced Gender and Film Studies
3 Credits (3)

Advanced study of how movies have created, reflected, and shaped ideas about gender, sexuality, race, and other dimensions of identity. This class analyzes these representations, how they create meaning, how they function within the filmic medium, and how some filmmakers create alternative visions.

Learning Outcomes

1. To develop skills to critically analyze films
2. To gain a grounding in the analysis of social identity categories, with an emphasis on race and gender
3. To analyze how race and gender are represented in popular culture and why media representation matters
4. To learn critical tools to think through contemporary discourses on gender, race, and sexuality as well as categories of difference and identity

GNDR 533. Advanced Issues in Sex, Gender, and Culture
3 Credits (3)

Survey of the history of anthropological ideas about gender and women, and a comparison of gender roles, relations, and ideologies across a range of cultures. Same as ANTH 533.

Learning Outcomes

1. Explain to others how you understand the concepts of sex, women, gender, and culture.
2. Critically analyze the uses of these concepts across a range of different contexts including media, politics, cultural performance, and everyday interactions.
3. Apply theoretical concepts introduced in this class to a current anthropological research problem/topic.

GNDR 550. Special Topics
3 Credits (3)

The topic of course will vary and will be indicated by subtitle. May be cross-listed with relevant courses at the 500-level from any specific department. May be repeated up to 99 credits.

Learning Outcomes

1. Varies

GNDR 554. Advanced Issues in Women Crossing Borders
3 Credits (3)

Experiences of women who cross class, race, cultural, national, or sexual borders including theories regarding women's interactions across borders. Consent of Instructor required.

GNDR 555. Advanced Feminist Research Methodologies
3 Credits (3)

Study of feminist modes of research inquiry, feminist ethics in research, and critiques of traditional disciplinary approaches to research.

Learning Outcomes

1. Students will recognize how theories and research methods influence the subjects and outcomes of studies.
2. Students will understand feminist practices associated with evolving epistemologies, research strategies, and calls for social change.
3. Students will develop and practice skills in designing, conducting, and analyzing narratives in ways that utilize feminist theory and research methods.

GNDR 561. Independent Graduate Research in Gender & Sexuality Studies
3 Credits (3)

Individual study of selected topics and writing of a research paper. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

GNDR 565. Advanced Sex, Gender & the Body
3 Credits (3)

Advanced examination of forces at work in defining and differentiating gender, race, sexuality. How ideas about what is 'natural' and 'normal' for men and women shifted over time. Considers different discourses shaping embodied experiences and categories of identity.

GNDR 571. Advanced Seminar in Feminist and Queer Theories
3 Credits (3)

Seminar in contemporary feminist and queer theorizing that explores knowledge production, key debates, and transformation. Course examines interconnectedness of feminist and queer theories as well as critical concepts for social change and worldmaking.

Learning Outcomes

1. Students will be able to demonstrate through discussion, research, and writing knowledge of shifts, differences, and debates in feminist and queer theoretical discourses.
2. Students will be able to analyze a range of contemporary feminist and queer critical theory in discussions, essay assignments, and exams.
3. Students will be able to formulate theories and forge connections between feminist and queer discourses through written and other assignments.

GNDR 582. Gender and Popular Culture
3 Credits (3)
Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. May be repeated up to 6 credits.

Phone: (575) 646-3931

Websites: https://english.nmsu.edu/

https://genders.nmsu.edu/ (https://english.nmsu.edu/)

NOTE: The MFA in Creative Writing, with its faculty, have moved to the Creative Media Institute as of Fall 2022:

CMI phone: (575) 646-5671

https://cmi.nmsu.edu/

English (Creative Writing) - Bachelor of Arts

In addition to meeting the English basic skills requirement, the student majoring in Creative Writing must complete 42 credits in English beyond ENGL 1110G Composition I satisfying the following requirements.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1,2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits) [1]		
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
ENGL 310	Critical Writing [4]	3
Select three from the following: [4,5]		9
ENGL 2521	The Bible as Literature	
ENGL 2610G	American Literature I	
ENGL 2620G	American Literature II	
ENGL 2630G	British Literature I	
ENGL 2280	History of Argument	
ENGL 2640G	British Literature II	
Select one from the following: [4]		3
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 302	Theory and Criticism: Literature and Culture	
ENGL 303	Theory and Criticism: Film, Media and Culture	
Select a minimum of two different Creative Writing workshops from the following:		6
ENGL 304	Creative Writing: Prose	
ENGL 306	Creative Writing: Poetry	
ENGL 307	Creative Writing: Creative Nonfiction	
ENGL 308	Creative Writing: Playwriting	
ENGL 309	Screenwriting I	
Select two advanced Creative Writing Workshops from the following (300-level workshops are prerequisites for 400-level workshops in the same genre):		6
ENGL 413	Advanced Creative Writing: Prose Workshop	
ENGL 414	Advanced Creative Writing: Poetry Workshop	
ENGL 446	Advanced Creative Writing: Nonfiction Prose	
Select two from the following:		6
ENGL 354	Form and Technique in Fiction	
ENGL 356	Form and Technique in Poetry	
Select 9 additional credits from English courses numbered 400-499.		9
Second Language Requirement: (required- see the section at the bottom of the page)		**0-8**
Electives, to bring the total credits to 120 [6]		**29-40**
Total Credits		**120**

1 See the General Education (p. 262) section of the catalog for a full list of courses

2 A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course first.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 Students may make 1 or 2 of the following substitutions:

- HNRS 2160G New Testament as Literature for ENGL 2521 The Bible as Literature;
- HNRS 2117G The World of the Renaissance: Discovering the Modern for ENGL 2630 British Literature I;

5 These 18 credits should be completed before the student enrolls in 400 level courses.

6 Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up

needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in the English, with a Concentration in Creative Writing, there is a one year second language requirement; the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II	3-6
or SPAN 2210	Spanish for Heritage Learners III	

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
FREN 1120	French II	4
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
OR		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1130G	Survey of Mathematics	3
FYEX 1112	The Freshman Year Experience	3
Area IV: Social and Behavioral Science Course [2]		3
Area VI: Creative and Fine Arts Course [2]		3
ENGL 2310G	Introduction to Creative Writing	3
Area III: Laboratory Science Course [2]		4
Choose from one of the following:		3
COMM 1115G	Introduction to Communication	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
HNRS 2175G	Introduction to Communication Honors	
Elective Course(s)		4
	Credits	**30**
Sophomore		
Choose from one of the following: [1]		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
ENGL 2130G	Advanced Composition	
Area III: Laboratory Science Course OR Area IV: Social And Behavioral Science Course [2]		3-4
2000-level ENGL requirement [1]		9
First in Second Language Series of Courses		3-4
Next Course in Second Language Series [1]		3-4
ENGL Creative Writing Workshop Course [1,3]		3
General Education Elective Course [2]		3-4
Elective Course(s)		3
	Credits	**30-34**
Junior		
ENGL 310	Critical Writing	3
Choose from one of the following:		3
ENGL 354	Form and Technique in Fiction	

ENGL 356	Form and Technique in Poetry	
ENGL Creative Writing Workshop Course [3]		3
ENGL Advanced Creative Writing Workshop Course		3
Choose from one of the following:		3
ENGL 354	Form and Technique in Fiction	
ENGL 356	Form and Technique in Poetry	
Choose from one of the following:		3
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 302	Theory and Criticism: Literature and Culture	
ENGL 303	Theory and Criticism: Film, Media and Culture	
VWW: Viewing a Wider World Course [4]		6
Elective Course		3
Upper-Division Elective Course		3
	Credits	**30**
Senior		
ENGL Advanced Creative Writing Workshop Course [1,5]		3
ENGL Elective Course (400-499 level) [1]		3
ENGL Elective Course (400-499 level) [1]		6
Upper-Division Elective Courses [1]		9
Elective Course(s)		9
	Credits	**30**
	Total Credits	**120-124**

1 These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 **Creative Writing Workshop Courses:**

- ENGL 304 Creative Writing: Prose
- ENGL 306 Creative Writing: Poetry
- ENGL 307 Creative Writing: Creative Nonfiction
- ENGL 308 Creative Writing: Playwriting
- ENGL 309 Screenwriting I

4 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

5 **Advanced Creative Writing Workshop Courses:**

- ENGL 413 Advanced Creative Writing: Prose Workshop
- ENGL 414 Advanced Creative Writing: Poetry Workshop
- ENGL 446 Advanced Creative Writing: Nonfiction Prose

English - Bachelor of Arts

In addition to meeting the English basic skills requirement, the student majoring in English must complete 42 credits in English beyond ENGL 1110G Composition I satisfying the following requirements.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1, 2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits) [1]		
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
ENGL 310	Critical Writing [4]	3
Select four from the following: [4,5]		12
ENGL 2310G	Introduction to Creative Writing	
ENGL 2521	The Bible as Literature	
ENGL 2610G	American Literature I	
ENGL 2620G	American Literature II	
ENGL 2280	History of Argument	
ENGL 2630G	British Literature I	
ENGL 2650G	World Literature I	
ENGL 2640G	British Literature II	
Select one from the following: [4]		3
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 302	Theory and Criticism: Literature and Culture	
ENGL 303	Theory and Criticism: Film, Media and Culture	
Select 6 additional credits from English courses numbered 2996-399.		6
Students may count 1 or 2 of the following Honors courses towards the requirement of 6 hours of 300-level electives:		
HNRS 348V	Comparative Mythology: Myth, Ritual, and the Life Cycle [6]	
Students may count the following Honors course towards the requirement of 6 hours of 300-level electives		
Select oe from the following (The following courses may fulfill this requirement at the discretion of the Director of Undergraduate Studies, if their content is primarily American literature: ENGL 422, 423, 445, 481, 489, 500):		3
ENGL 442	Modern and Contemporary American Poetry	
ENGL 458	Latino/a Literature and Culture	
ENGL 469	Advanced Study in American Literature	
ENGL 405	Chaucer	3
or ENGL 407	Milton	
ENGL 408	Shakespeare I	3
or ENGL 409	Shakespeare II	
Select 9 additional credits from English courses numbered 400-499.		9
Second Language Requirement: (required- see the section at the bottom of the page)		**0-8**
Electives, to bring the total credits to 120 [7]		**29-40**
Total Credits		**120**

1 See the General Education (p. 262) section of the catalog for a full list of courses

[2] A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course first.

[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

[4] Students may make 1 or 2 of the following substitutions:

- HNRS 2160G New Testament as Literature for ENGL 2521 The Bible as Literature;
- HNRS 2117G The World of the Renaissance: Discovering the Modern for ENGL 2630 British Literature I;

[5] These 15 credits should be completed before the student enrolls in 400-level courses.

[6] Students may not take both ENGL 392V Mythology and HNRS 348V Comparative Mythology: Myth, Ritual, and the Life Cycle.

[7] Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in the English, with a Concentration in English, there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II	3-6
or SPAN 2210	Spanish for Heritage Learners III	

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
FREN 1120	French II	4
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
OR		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1130G	Survey of Mathematics [1]	3
FYEX 1112	The Freshman Year Experience	3
Area IV: Social and Behavioral Science Course [2]		3
Area VI: Creative and Fine Arts Course [2]		3
Choose from one of the following:		3
COMM 1115G	Introduction to Communication	
HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
2000-level ENGL Course		3
Area III: Laboratory Science Course [2]		4
Area V: Humanities Course [2]		3
Elective Course		1
	Credits	**30**
Sophomore		
Choose from one of the following:		3

ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication [1]	
ENGL 2221G	Writing in the Humanities and Social Science [1]	
Area III: Laboratory Science Course OR Area IV: Social and Behavioral Science Course		3-4
First Course in Second Language Series		3-4
Next Course in Second Language Series		3-4
2000-level ENGL Courses		9
General Education Elective Course [2]		3-4
Elective Courses		6
	Credits	**30-34**
Junior		
ENGL 310	Critical Writing	3
ENGL Courses (2996 - 399 level)		6
VWW: Viewing a Wider World Course [3]		6
Choose from one of the following:		3
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 302	Theory and Criticism: Literature and Culture	
ENGL 303	Theory and Criticism: Film, Media and Culture	
Upper-Division Elective Course		6
Elective Course		6
	Credits	**30**
Senior		
Choose from one of the following:		3
ENGL 405	Chaucer (offered Spring only)	
ENGL 407	Milton (offered fall only)	
ENGL Upper-Division Course (400-499 level)		9
ENGL American Literature Course		3
Choose from one of the following:		3
ENGL 408	Shakespeare I (offered Fall only)	
ENGL 409	Shakespeare II (offered Spring only)	
Upper-Division Elective Course		9
Elective Course		3
	Credits	**30**
	Total Credits	**120-124**

1 These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

English (Literature, Language and Culture) - Bachelor of Arts

In addition to meeting the English basic skills requirement, the student majoring in English must complete 42 credits in English beyond ENGL 1110G Composition I satisfying the following requirements.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1, 2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits) [1]		
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
ENGL 310	Critical Writing [4]	3
Select four from the following, of which three must be taken from courses numbered 2610-2640 [4,5]		12
ENGL 2610G	American Literature I	
ENGL 2620G	American Literature II	
ENGL 2630G	British Literature I	
ENGL 2640G	British Literature II	
ENGL 2650G	World Literature I	
ENGL 2675	Transatlantic Literatures	
ENGL 2310G	Introduction to Creative Writing	
ENGL 2521	The Bible as Literature	
ENGL 2280	History of Argument	
Select one from the following: [4]		3
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 302	Theory and Criticism: Literature and Culture	
ENGL 303	Theory and Criticism: Film, Media and Culture	
Select one English Literature course from the following:		3
ENGL 323	American Drama	
ENGL 327V	Shakespeare around the Globe	
ENGL 328V	Literature of Science Fiction and Fantasy	
ENGL 339V	Chicana/o Literature	
ENGL 363	Literature for Children and Young Adults	
ENGL 380V	Women Writers	
ENGL 392V	Mythology	
ENGL 394V	Southwestern Literature	
Select 3 additional credits from English courses numbered 2996-399		3
Students may count the following Honors course towards the requirement of 6 hours of 300-level electives:		
HNRS 348V	Comparative Mythology: Myth, Ritual, and the Life Cycle [6]	
Select one from the following (The following courses may fulfill this requirement at the discretion of the Director of Undergraduate Studies, if their content is primarily American literature: ENGL 422, 423, 445, 481, 489, 500):		3
ENGL 469	Advanced Study in American Literature	
ENGL 442	Modern and Contemporary American Poetry	
ENGL 458	Latino/a Literature and Culture	

Select one from the following:		3
ENGL 405	Chaucer	
ENGL 407	Milton	
Select one from the following:		3
ENGL 408	Shakespeare I	
ENGL 409	Shakespeare II	
Select two additional English Literature courses from the following (405 and 407 may count towards this requirement once the above 405/407 requirement has been fulfilled. 408 and 409 may count towards this requirement once the above 408/409 requirement has been fulfilled. 442, 458, and 469 may count towards this requirement once the above 469/442/458 requirement has been met.):		3
ENGL 417	Advanced Study in Critical Theory	
ENGL 422	Advanced Study in a Literary Form or Genre	
ENGL 423	Advanced Study in a Major Author	
ENGL 433	Victorian Literature	
ENGL 445	Postmodern Fiction	
ENGL 453	World Literatures	
ENGL 481	Women's Literature	
ENGL 489	Cultural Studies: Literature and Theory	
Select 3 additional credits from English courses numbered 400-499.		3
Second Language Requirement: (required- see the section at the bottom of the page)		**0-8**
Electives, to bring the total credits to 120 [7]		**32-43**
Total Credits		**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course first.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. Students may make 1 or 2 of the following substitutions:
   - HNRS 2160G New Testament as Literature for ENGL 2521 The Bible as Literature;
   - HNRS 2171G The Worlds of Arthur, HNRS 2173G Middle Ages, or HNRS 2117G The World of the Renaissance: Discovering the Modern for ENGL 2630G British Literature I;
5. These 15 credits should be completed before the student enrolls in 400-level courses.
6. Students may not take both ENGL 392V Mythology and HNRS 348V Comparative Mythology: Myth, Ritual, and the Life Cycle.
7. Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in the English, with a Concentration in Literature, Language and Culture,there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II	3-6
or SPAN 2210	Spanish for Heritage Learners III	

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
FREN 1120	French II	4
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
OR		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1130G	Survey of Mathematics [1]	3
FYEX 1112	The Freshman Year Experience	3
Area IV: Social and Behavioral Science Course [2]		3
Area VI: Creative and Fine Arts Course [2]		3
Choose from one of the following:		3
COMM 1115G	Introduction to Communication	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
HNRS 2175G	Introduction to Communication Honors	
Area III: Laboratory Science Course [2]		4
Area III: Laboratory Science Course [2]		3
2000-level ENGL requirement		3
Elective Course		1
	Credits	**30**
Sophomore		
Choose from one of the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science [1]	
ENGL 2215G	Advanced Technical and Professional Communication [1]	
Area III: Laboratory Science Course OR Area IV: Social and Behavioral Science Course [2]		3-4
General Education Elective Course [2]		3
First Course in Second Language Series		3-4
Next Course in Second Language Series [1]		3-4
2000-level ENGL requirement		3
2000-level ENGL Courses		6
Elective Courses		6
	Credits	**30-33**
Junior		
ENGL 310	Critical Writing	3
VWW: Viewing a Wider World Coursed [3]		6
One ENGL Literature Course		3
Choose from one of the following:		3
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 302	Theory and Criticism: Literature and Culture	
ENGL 303	Theory and Criticism: Film, Media and Culture	
ENGL Course (2996 - 399 level)		3
Upper-Division Elective Course		3
Elective Courses		9
	Credits	**30**
Senior		
Choose from one of the following:		3
ENGL 405	Chaucer (offered Spring only)	
ENGL 407	Milton (offered Fall only)	
ENGL American Literature Course		3
ENGL Course (400-499 level)		3
Choose from one of the following:		3
ENGL 408	Shakespeare I (offered Fall only)	
ENGL 409	Shakespeare II (offered Spring only)	
ENGL Literature Courses (400-level)		6
Upper-Division Elective Courses		9
Elective Courses		3
	Credits	**30**
	Total Credits	**120-123**

1. These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

English (Rhetoric, Digital Media and Professional Communication) - Bachelor of Arts

In addition to meeting the English basic skills requirement, the student pursuing a concentration in Rhetoric, Digital Media, and Professional Communication must complete 42 credits in English beyond ENGL 1110G Composition I satisfying the following requirements.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1, 2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits) [1]		
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Social/Behavioral Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
ENGL 310	Critical Writing [4]	3
Select four from the following: [4,5]		12
ENGL 2310G	Introduction to Creative Writing	

ENGL 2521	The Bible as Literature	
ENGL 2610G	American Literature I	
ENGL 2620G	American Literature II	
ENGL 2630G	British Literature I	
ENGL 2640G	British Literature II	
ENGL 2675	Transatlantic Literatures	
ENGL 2280	History of Argument ((recommended))	
Select one from the following: [4]		3
ENGL 301	Theory and Criticism: Rhetoric and Culture (recommended)	
ENGL 302	Theory and Criticism: Literature and Culture	
ENGL 303	Theory and Criticism: Film, Media and Culture (recommended)	
Rhetoric and Composition		
Select two from the following: [5]		6
ENGL 313	Media Literacy & Social Justice	
ENGL 314	Public Writing and Rhetorics	
ENGL 419	Modern Rhetorical Theory	
ENGL 449	Advanced Study in Writing	
ENGL 470	Approaches to Composition	
Professional Communication		
Select two from the following: [5]		6
ENGL 403	Web Design and Development	
ENGL 412	Writing in the Workplace	
ENGL 431	Technical Editing	
ENGL 449	Advanced Study in Writing	
ENGL 460	Proposal Writing	
ENGL 497	Internship	
Digital Rhetoric and Design		
Select two from the following: [5]		6
ENGL 312	Digital & Visual Rhetoric	
ENGL 315	Writing for the Web	
ENGL 326	Cultural Identity and Representation Across Media	
ENGL 404	User Experience and Assistance	
ENGL 430	Online Publishing	
ENGL 449	Advanced Study in Writing	
ENGL 478	Document Design	
Additional Courses		
Select 6 credits of upper division level, advisor-approved English courses relevant to program of study. [6]		6
Second Language Requirement: (required- see the section at the bottom of the page)		**0-8**
Electives, to bring the total credits to 120 [7]		**29-40**
Total Credits		**120**

1 See the General Education (p. 262) section of the catalog for a full list of courses

2 A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course first.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 Students may make 1 or 2 of the following substitutions:

- HNRS 2160G New Testament as Literature for ENGL 2521 The Bible as Literature;
- HNRS 2171G The Worlds of Arthur or HNRS 2117G The World of the Renaissance: Discovering the Modern for ENGL 2630 British Literature I.

5 These 18 credits should be completed before the student enrolls in 400 level courses.

6 Students must take a total of 12 credit hours at the 400 level or above.

7 Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in the English, with a Concentration in Rhetoric, Digital Media and Professional Communication, there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II	3-6
or SPAN 2210	Spanish for Heritage Learners III	

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
FREN 1120	French II	4
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
OR		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:
Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:
Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:
By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:
By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:
In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1130G	Survey of Mathematics [1]	3
FYEX 1112	The Freshman Year Experience	3
Area IV: Social and Behavioral Science Course [2]		3
Area VI: Creative and Fine Arts Course [2]		3
Choose from one of the following:		3
COMM 1115G	Introduction to Communication	
HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
Area III: Laboratory Science Course [2]		4
Area III: Humanities Course [2]		3
2000-level ENGL requirement		3
Elective Course		1
	Credits	**30**
Sophomore		
Choose from one of the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
ENGL 2130G	Advanced Composition	
Area III: Laboratory Science Course OR Area IV: Human and Behavioral Science Course [2]		3
2000-level ENGL requirement courses		9
First Course in Second Language Series		3-4
Next Course in Second Language Series [1]		3-4
General Education Elective Course [2]		3-4
Elective Courses		6
	Credits	**30-33**
Junior		
ENGL 310	Critical Writing	3
Choose from one of the following:		3
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 302	Theory and Criticism: Literature and Culture	
ENGL 303	Theory and Criticism: Film, Media and Culture	
VWW: Viewing a Wider World Course [3]		6
ENGL Rhetoric and Composition Elective Course		6
ENGL Professional Communication Elective Course		3
Elective Courses		9
	Credits	**30**
Senior		
ENGL Professional Communication Elective Course		3
ENGL Digital Rhetoric and Design Elective Course		6
ENGL Course (300 - 499 level)		6
Upper-Division Elective Courses		12
Elective Course		3
	Credits	**30**
	Total Credits	**120-123**

1. These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Gender and Sexuality Studies - Bachelor of Arts

The undergraduate major in Gender and Sexuality Studies specializes in the examination of gender; gender identity; queer and transgender studies; feminisms; and social justice from interdisciplinary perspectives. Students develop a strong understanding of how interconnected social formations such as race, class, age, nation, citizenship, ability, and other categories of difference are constructed and intersect with gender and sexuality. Our courses equip students with analytical skills and knowledge to engage power structures critically and transform lives and communities.

Gender and Sexuality Studies readies students for further study in the field at the graduate level as well as advanced study in a variety of disciplines. We offer a plan of study that integrates humanities and social sciences methods and objects of study, including areas of concentration such as human rights and transnational migration; socially engaged literature, film, and other creative media; and transnational and decolonial methodologies.

Gender and Sexuality Studies students prepare for careers in such fields as advocacy and social organizing, community development, creative writing, criminal justice, education, filmmaking and video production,

health care, human resources, journalism, law, music production, social services, and visual arts. Many students declare a double major in Gender and Sexuality Studies with another discipline to enhance career opportunities and learning.

Courses are offered both online and on campus. In addition to the Bachelor of Arts with a major in Gender and Sexuality Studies offers an undergraduate minor and graduate minor.

Degree requirements for the major include

- 9 credit hours of required Gender & Sexuality Studies courses;
- 18 credit hours of Gender & Sexuality Studies electives; and
- 9 credit hours from a number of cross-listed courses offered both by Gender & Sexuality Studies and by other programs/departments.
- The total credit hour requirement for the major is 36 credit hours with 21 hours at the upper division level. All requirements must be completed with a grade of C- or higher.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Choose one from the following:		3
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		*3*
MATH 1130G	Survey of Mathematics (Recommended) [1]	
Area III/IV: Laboratory Science and Social/Behavioral Sciences		*10-11*
GNDR 2110G	Introduction to Women, Gender, and Sexuality Studies	
or GNDR 2120G	Representing Women Across Cultures	
Area III: Laboratory Sciences Course (4 credits) [2]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective [2]		*3-4*
Viewing a Wider World [3]		**6**
Departmental/College Requirements		
Core Courses		
GNDR 455	Feminist Research Methodologies	3
or GNDR 465	Sex, Gender and the Body	
GNDR 471	Seminar in Feminist and Queer Theories	3
Select nine credits from the following:		*9*
GNDR 401	Women & Immigration	
GNDR 402	Transnational Feminisms	
GNDR 403	Gender & Horror	
GNDR 450	Race and Gender in Film	
GNDR 454	Women Crossing Borders	
GNDR or Cross-Listed Electives		*18*
6 credits must be upper division		
GNDR 360	Masculinities Studies	
GNDR 405	Alternative Genders and Sexualities	
GNDR 407	Gender and Graphic Narrative	
GNDR 411	Gender and Migration	
GNDR 412	Gender and Film Studies	
GNDR 451	Practicum in Gender and Sexuality Studies	
GNDR 482	Gender and Popular Culture	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 [4]		**47-49**
12 credits must be Upper - Division		
Total Credits		**120**

1. MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts with a major in Gender & Sexuality Studies, there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		Credits
ENGL 1110G	Composition I (C- or better)	4
or ENGL 1110H	or Composition I Honors	
MATH 1130G	Survey of Mathematics (C- or better) [1]	3
Area V: Humanities Course [2]		3
Elective Course(s) [3]		9
Choose one from the following:		3

ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area III: Laboratory Science Course [2]		4
GNDR 2110G or GNDR 2120G	Introduction to Women, Gender, and Sexuality Studies (C- or beter) [4] or Representing Women Across Cultures	3
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**32**
Second Year		
ENGL 2210G or ENGL 2221G or ENGL 2210H	Professional and Technical Communication or Writing in the Humanities and Social Science or Professional and Technical Communication	3
Select either an Area III/IV: Laboratory Sciences or Social/Behavioral Sciences Course [2]		3-4
GNDR or Cross-listed Elective Course (any level) (C- or better) [5]		6
Elective Course(s) [3]		12
General Education Elective Course [2]		3-4
Choose one from the following: [6]		3
GNDR 401	Women & Immigration	
GNDR 402	Transnational Feminisms	
GNDR 403	Gender & Horror	
GNDR 450	Race and Gender in Film	
GNDR 454	Women Crossing Borders	
	Credits	**30-32**
Third Year		
VWW - Viewing a Wider World Course(s) [7]		6
GNDR 455 or GNDR 465	Feminist Research Methodologies (C- or better in either) or Sex, Gender and the Body	3
Choose two from the following: [5]		6
GNDR 401	Women & Immigration	
GNDR 402	Transnational Feminisms	
GNDR 403	Gender & Horror	
GNDR 450	Race and Gender in Film	
GNDR 454	Women Crossing Borders	
Elective Course(s)		12
GNDR or Cross-listed Elective Course (any level) (C- or better) [5]		3
	Credits	**30**
Fourth Year		
GNDR 471	Seminar in Feminist and Queer Theories	3
GNDR or Cross-listed Elective Course (Upper-Division)(C- or better) [5]		6
GNDR or Cross-listed Elective Course (any level) (C- or better) [5]		3
Elective Course(s) [3]		3
Elective Course(s) - Upper Division [3]		13
	Credits	**28**
	Total Credits	**120-122**

1 MATH 1130G Survey of Mathematics is recommended for the degree but students may need to take any prerequisites needed to enter MATH 1130G (or an alternative relevant Area II MATH course) first.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 Elective credit may vary based on General Education course selections, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

4 GNDR 2110G Introduction to Women, Gender, and Sexuality Studies and GNDR 2120G Representing Women Across Cultures count towards Area V.

5 Students must take 6 credits of Upper-Division W S Cross-listed Elective coursework

6 Students cannot take the same course multiple times to fulfill this requirement.

7 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

English - Undergraduate Minor

Students not earning a bachelor's degree in English are eligible to pursue a minor in English. Students must earn 18 credits from the approved course lists below. Students may request approval for other courses clearly related to the minor from the undergraduate advisor in the Department of English.

Prefix	Title	Credits
Requirements		
Select 6 credits from the following: [1]		6
ENGL 2310G	Introduction to Creative Writing	
ENGL 2521	The Bible as Literature	
ENGL 2610G	American Literature I	
ENGL 2620G	American Literature II	
ENGL 2280	History of Argument	
ENGL 2630G	British Literature I	
ENGL 2640G	British Literature II	
Select one from the following:		3
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 302	Theory and Criticism: Literature and Culture	
ENGL 303	Theory and Criticism: Film, Media and Culture	
ENGL 310	Critical Writing	
Select 6 credits from English courses numbered 300-499.		6
Select three additional credits from English courses numbered 400-499.		3
Total Credits		**18**

1 Students may make 1 or 2 of the following substitutions:

- HNRS 2160G New Testament as Literature for ENGL 2521 The Bible as Literature;
- HNRS 2171G The Worlds of Arthur, HNRS 2173G Middle Ages, or HNRS 2117G The World of the Renaissance: Discovering the Modern for ENGL 2630 British Literature I;

Gender & Sexuality Studies - Undergraduate Minor

A minor in Gender & Sexuality Studies consists of 18 credit hours of approved course work in Gender & Sexuality Studies of which at least 12 are upper division (300 level or above).

Prefix	Title	Credits
Required Core Courses		
GNDR 2110G	Introduction to Women, Gender, and Sexuality Studies	3
or GNDR 2120G	Representing Women Across Cultures	
Select one from the following:		3
GNDR 471	Seminar in Feminist and Queer Theories	
GNDR 402	Transnational Feminisms	
GNDR 455	Feminist Research Methodologies	
GNDR 465	Sex, Gender and the Body	
Select 12 credits from the following:		12
GNDR 360	Masculinities Studies	
GNDR 401	Women & Immigration	
GNDR 403	Gender & Horror	
GNDR 405	Alternative Genders and Sexualities	
GNDR 407	Gender and Graphic Narrative	
GNDR 411	Gender and Migration	
GNDR 412	Gender and Film Studies	
GNDR 450	Special Topics	
GNDR 451	Practicum in Gender and Sexuality Studies	
GNDR 454	Women Crossing Borders	
Total Credits		**18**

Note: A student may not earn a bachelor's degree in Gender & Sexuality Studies and also earn a minor in Gender & Sexuality Studies.

Literature - Undergraduate Minor

Students not earning a bachelor's degree in English with a concentration in Literature, Language and Culture are eligible to pursue a minor in Literature. Students must earn 18 credits from the approved course lists below. At least 12 credits must be upper division. Students may request approval for other courses clearly related to the minor from the undergraduate advisor in the Department of English. Students earning a Bachelor of Arts in English must earn at least 6 credits approved by the Department of English undergraduate advisor beyond those earned for the major in order to earn a minor in Literature.

Prefix	Title	Credits
Requirements		
Select two from the following: [1]		6
ENGL 2521	The Bible as Literature	
ENGL 2610G	American Literature I	
ENGL 2620G	American Literature II	
ENGL 2280	History of Argument	
ENGL 2630G	British Literature I	
ENGL 2640G	British Literature II	
Select one from the following:		3
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 302	Theory and Criticism: Literature and Culture (recommended)	
ENGL 303	Theory and Criticism: Film, Media and Culture	
ENGL 310	Critical Writing	
Select one from the following:		3
ENGL 323	American Drama	
ENGL 326	Cultural Identity and Representation Across Media	
ENGL 328V	Literature of Science Fiction and Fantasy	
ENGL 339V	Chicana/o Literature	
ENGL 363	Literature for Children and Young Adults	
ENGL 380V	Women Writers	
ENGL 392V	Mythology	
ENGL 394V	Southwestern Literature	
ENGL 399	Race and Gender in Film (with advisor approval)	
Substitutions Allowed		
HNRS 348V	Comparative Mythology: Myth, Ritual, and the Life Cycle	
Select two from the following:		6
ENGL 405	Chaucer	
ENGL 407	Milton	
ENGL 408	Shakespeare I	
ENGL 409	Shakespeare II	
ENGL 417	Advanced Study in Critical Theory	
ENGL 422	Advanced Study in a Literary Form or Genre	
ENGL 423	Advanced Study in a Major Author	
ENGL 433	Victorian Literature	
ENGL 442	Modern and Contemporary American Poetry	
ENGL 445	Postmodern Fiction	
ENGL 453	World Literatures	
ENGL 458	Latino/a Literature and Culture	
ENGL 469	Advanced Study in American Literature	
ENGL 481	Women's Literature	
ENGL 489	Cultural Studies: Literature and Theory	
Total Credits		**18**

[1] Students may make 1 or 2 of the following substitutions:

- HNRS 2160G New Testament as Literature for ENGL 2521 The Bible as Literature;
- HNRS 2171G The Worlds of Arthur, HNRS 2173G Middle Ages, or HNRS 2117G The World of the Renaissance: Discovering the Modern for ENGL 2630 British Literature I;

Medieval and Early Modern Studies - Undergraduate Minor

Students must earn 18 credits from the approved course lists below. At least 9 credits must be upper division. No more than 9 credits may be taken under faculty in any department. Students may request approval for other courses clearly related to Medieval and/or Early Modern Studies from the undergraduate advisor in the Department of English in consultation with faculty in medieval and early modern studies.

Prefix	Title	Credits
Requirements		
Select three from the following:		9
ARTH 2110G	History of Art I	
ENGL 2521	The Bible as Literature	
ENGL 2630	British Literature I	
ENGL 2650G	World Literature I	
HIST 1150G	Western Civilization I	
HIST 2250G	East Asia to 1600	
HIST 2245G	Islamic Civilizations to 1800	
HNRS 2160G	New Testament as Literature	
HNRS 2175G	Introduction to Communication Honors	

Select 9 credits from the following:		9
ARTH 300	Special Topics in Art History [1]	
ARTH 477	Independent Research in Art History [1]	
ARTH 478	Seminar in Art History [1]	
ENGL 380V	Women Writers [1]	
ENGL 392V	Mythology	
ENGL 405	Chaucer	
ENGL 407	Milton	
ENGL 408	Shakespeare I	
ENGL 409	Shakespeare II	
ENGL 422	Advanced Study in a Literary Form or Genre [1]	
ENGL 423	Advanced Study in a Major Author [1]	
ENGL 481	Women's Literature [1]	
GNDR 484	Women's Literature	
FREN 381	Survey of French Literature I	
FREN 451	Special Topics in French [1]	
HIST 323	Cultural History of Later Imperial China	
HIST 372	The Roman World	
HIST 387	Spain in the New World: Conquest, Conflict, and Cultural Exchange	
HIST 400	Special Topics [1]	
HIST 434	Urban History	
HIST 471	China through the Ming Dynasty	
HNRS 326V	Art and Mythology	
HNRS 400	Honors Capstone [1]	
MUSC 302	Music History and Literature: Classic through Romantic	
MUSC 421	Music of the Baroque Era	
PHIL 344	Modern Philosophy	
PHIL 363	Independent Studies [1]	
PHIL 463	Independent Studies [1]	
SPAN 306	Special Topics [1]	
Total Credits		**18**

[1] Courses are approved for the minor only when their topics are appropriate. Students must seek approval to count these courses for the minor from the undergraduate advisor in the Department of English.

Rhetoric and Professional Communication - Undergraduate Minor

Students not earning a bachelor's degree in English with a concentration in Rhetoric, Digital Media, and Professional Communication are eligible to pursue a minor in Rhetoric and Professional Communication. Students must earn 18 credits from the approved course lists below. Students may request approval for other courses clearly related to the minor from the undergraduate advisor in the Department of English. Students earning a Bachelor of Arts in English must earn at least 6 credits approved by the Department of English undergraduate advisor beyond those earned for the major in order to earn a minor in Rhetoric and Professional Communication.

Prefix	Title	Credits
Requirements		
Select one from the following: [1]		3
ENGL 2310G	Introduction to Creative Writing	
ENGL 2521	The Bible as Literature	
ENGL 2610G	American Literature I	
ENGL 2620G	American Literature II	
ENGL 2280	History of Argument	
ENGL 2630G	British Literature I	
ENGL 2640G	British Literature II	
Select one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Select 12 credits from the following:		12
ENGL 301	Theory and Criticism: Rhetoric and Culture	
ENGL 315	Writing for the Web	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 326	Cultural Identity and Representation Across Media	
ENGL 412	Writing in the Workplace	
ENGL 431	Technical Editing	
ENGL 449	Advanced Study in Writing	
ENGL 460	Proposal Writing	
ENGL 470	Approaches to Composition	
ENGL 478	Document Design	
ENGL 497	Internship	
Total Credits		**18**

[1] Students may make 1 or 2 of the following substitutions:

- HNRS 2160G New Testament as Literature for ENGL 2521 The Bible as Literature;
- HNRS 2171G The Worlds of Arthur, HNRS 2173G Middle Ages, or HNRS 2117G The World of the Renaissance: Discovering the Modern for ENGL 2630 British Literature I;

Geography & Environmental Studies

Academic Programs

The Department of Geography & Environmental Studies offers several undergraduate, master's, and doctoral degrees as well as minors in Geography, Environmental Studies, and Geographic Information Science and Technology (GIS&T):

Bachelor Degrees

- Bachelor of Science in Geography (Environmental Studies) (p. 757)
- Bachelor of Science in Geography (Geographic Information Science and Technology) (p. 760)

Master Degrees

- Master of Applied Geography (p. 163)
- Master of Science in Geographic Information Science and Technology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/geographic-information-science-technology-ms-online/)

Doctoral Degree

- Doctor of Philosophy in Geography (p. 226)

Undergraduate Minors

- Undergraduate Minor in Geography (p. 763)
- Undergraduate Minor in Geographic Information Science and Technology (p. 763)

Graduate Minor

- Graduate Minor in Geographic Information Science and Technology (p. 257)

For more information about these degrees and minors, follow the links above or explore the Degrees and Minors tabs on this webpage.

Interdisciplinary Learning & Career Pathways

Students in the Department of Geography and Environmental Studies have the flexibility to tailor their studies to their interests. While some specialize in one particular area, many integrate concepts and methods from Geography, Environmental Studies, and GIS&T to develop interdisciplinary solutions to complex challenges.

Geography
As a broad and integrative field, geography examines how human activities, natural processes, and their interactions shape the world across space and time. Through critical and spatial thinking and qualitative, quantitative, and mixed-methods approaches, students develop the expertise to address pressing challenges such as environmental degradation, climate change, natural disasters, public health crises, and economic and social inequality. Graduates pursue careers in government, academia, private industry, and non-profit organizations in fields related to Environmental Studies, GIS&T, and beyond.

Environmental Studies
This concentration integrates insights from the natural sciences, social sciences, and humanities to address environmental challenges. Students develop expertise in critical, qualitative, and creative research methods, preparing for careers in fields such as environmental consulting, policy, education, outreach, advocacy, conservation, and sustainability.

GIS&T
This concentration focuses on the collection, analysis, and visualization of geospatial data using cutting-edge technologies. Students learn to apply GIS, remote sensing, and spatial analysis and modeling to tackle human and environmental challenges, preparing for careers in fields such as urban and regional planning, cultural and natural resources management, emergency management, data and information management, and public health.

Course Offerings Across Subfields

Students in the Department of Geography & Environmental Studies can choose from a wide range of courses in physical geography, human geography, regional geography, environmental studies, and GIS&T, tailoring their educational journey to align with their individual interests and career goals.

Physical Geography
This field examines Earth's natural processes—such as plate tectonics, weather patterns, and ecological interactions—and how they shape landscapes and influence life on Earth. Students explore diverse topics through courses like Geomorphology, Weather & Climate, and Biogeography, which focus on landforms and surface processes, atmospheric dynamics, the distribution of plants and animals, and more.

Human Geography
This field examines how people shape—and are shaped—by the world around them. Students explore diverse topics through courses like The City, Cultural Geography, and Challenges and Opportunities of Globalization, which focus on urban life and development, concepts of place and landscape, cultural exchange and regional disparities, and other key societal dynamics.

Regional Geography
This field bridges human and physical geography by examining the unique characteristics of places and regions. It explores how landscapes, cultural identities, economies, and political systems interact across geographic areas, helping to understand human-environment relationships at multiple spatial and temporal scales. Students can engage with these concepts through courses focusing on regions such as Latin America, Europe, and New Mexico and the American West.

Environmental Studies
This field focuses on the complex relationships between humans and the environment, emphasizing topics like environmental change, conservation, and sustainability. Students examine how natural and social systems interact, exploring issues such as land use, environmental policy, and ecosystem management. Courses like Planning a Sustainable World, Field Explorations, and U.S. National Parks provide applied learning opportunities to analyze real-world environmental challenges, study conservation strategies, and engage with landscapes ranging from urban green spaces to protected wilderness areas.

GIS&T
This field focuses on the collection, analysis, modeling, and visualization of spatial data to solve complex human and environmental challenges. Students gain expertise in geospatial data, methods, and technologies applicable across disciplines. In courses such as Cartography & GIS, Fundamentals of GIS, Remote Sensing, Programming, and Spatial Analysis and Modeling, students develop theoretical and technical proficiency through lab exercises and independent research projects tailored to their interests—whether in the natural sciences, social sciences, engineering, or beyond.

For more information about course offerings, visit the Courses tab on this webpage.

Research & Applied Learning Resources

To support students' educational and research needs, the Department of Geography & Environmental Studies maintains a computer teaching laboratory and the Spatial Applications Research Center (SpARC), a grants and contracts research lab. Both are equipped with state-of-the-art workstations running a wide array of specialized software packages. The Department also provides access to unoccupied aerial systems (drones), a field spectroradiometer, survey-grade GPS units, and other advanced equipment to support research and applied learning. Additionally, strong collaborations with campus units such as the Water Resources Research Institute and Jornada Experimental Range offer students valuable opportunities for inter-, multi-, and transdisciplinary research.

A Supportive & Engaging Community

The Department of Geography & Environmental Studies is more than just a place to learn—it's a community. Through student organizations, departmental events, and close faculty mentorship, we foster an

environment where students feel supported both academically and personally. Whether participating in research symposiums, networking with professionals, or joining student groups, students have opportunities to connect, collaborate, and grow. We are committed to providing an inclusive and welcoming space where students from all backgrounds can find their place, pursue their passions, and thrive.

Mission, Vision, & Core Values

Mission

The Department of Geography & Environmental Studies applies holistic and integrative approaches in geography, environmental studies, and geographic information science and technology to advance human and environmental well-being in our local community, state, and beyond. We embrace student-centered, inclusive, collaborative, ethical, and positively impactful scholarship and creative activities, teaching and mentoring, service, and outreach.

Vision

We envision a future where human and environmental well-being thrives in our local community, state, and beyond.

Core Values

We are guided by a commitment to fostering an inclusive and impactful learning environment that supports both human and environmental well-being. Our core values are student-centered learning, human and environmental well-being, collaboration and teamwork, belonging and inclusion, and integrity and ethical practice.

More Information

For more information about programs, faculty, funding opportunities, scholarships, student organizations, and more in the Department of Geography and Environmental Studies, please visit the departmental website (https://geography.nmsu.edu/).

Bachelor Degree(s)

- Geography (Environmental Studies) - Bachelor of Science (p. 757)
- Geography (Geographic Information Science and Technology) - Bachelor of Science (p. 760)

Master Degree(s)

- Geographic Information Science and Technology - Master of Science (Online) (https://catalogs.nmsu.edu/global/nmsu-global/geographic-information-science-technology-ms-online/)
- Geography - Master of Applied Geography (p. 163)

Doctoral Degree(s)

- Geography - Doctor of Philosophy (p. 226)

Minor(s)

- Geographic Information Science and Technology - Graduate Minor (p. 257)
- Geographic Information Science and Technology - Undergraduate Minor (p. 763)
- Geography - Undergraduate Minor (p. 763)

Department Faculty

Academic Department Head Dr. Michaela Buenemann, Professor

Professors *Brown, Buenemann;* ***Associate Professors*** Campbell, Magrane; ***Assistant Professors*** Dugas, Fan; ***Visiting Assistant Professors*** Standen; ***Professors Emeriti*** Czerniak, DeMers, Wright

C. P. Brown, Ph.D. (University of California, Santa Barbara / San Diego State University) – US-Mexico and US-Canada border environment and water resources research, GIS, comparative environmental analysis*; M. Buenemann, Department Head, Ph.D. (University of Oklahoma)* – remote sensing, GIS, spatial modeling, human-environment geography, land system science, landscape ecology, drylands*; C. L. Campbell, Ph.D. (University of California, Los Angeles)* – biogeography, ecology, avian ecology, GIS, sustainability, national parks, human-environment relationships*; D. Dugas, Ph.D. (University of Oregon)* – geomorphology, landscape ecology, paleoclimate and climate change, geographic education*; Chao Fan, Ph.D. (Arizona State University)* – GIScience, spatial analysis and modeling, remote sensing, climate change, land cover land use change; *E. Magrane, Ph.D. (University of Arizona)* – climate & culture, art & environment, human-environment geography, geopoetics, geohumanities, critical methodologies.*; A Standen, Ph.D. (University of Colorado Boulder)* - environmental history, hurricanes and disaster events, history of energy, agriculture, political ecology, environmental justice, social movements.

Professors Emeriti: R. J. Czerniak, Ph.D. (University of Colorado, Boulder) – land use and transportation planning, Europe, urban geography; *M. N. DeMers, Ph.D. (University of Kansas)* – geographic information science, landscape ecology, geographic education*; J. B. Wright, Ph.D. (University of California, Berkeley)* – environmental conservation, cultural geography, American West.

Geography Courses

GEOG 1110G. Physical Geography
4 Credits (3+3P)

This course introduces the physical elements of world geography through the study of climate and weather, vegetation, soils, plate tectonics, and the various types of landforms as well as the environmental cycles and the distributions of these components and their significance to humans.

Learning Outcomes

1. Define, describe, illustrate, distinguish among or explain the use of maps, map scale, globes, map projections, and remote sensing.
2. Define, describe, illustrate, distinguish among or explain the various elements of the earth's atmosphere, earth's relation to the sun, incoming solar radiation, the ozone layer, the primary temperature controls, and the unequal heating of land and water.
3. Define, describe, illustrate, distinguish among or explain the weather makers (air temperature, air pressure, humidity, clouds, precipitation, visibility, and wind [including pressure gradient, the Coriolis force, and friction]).
4. Define, describe, illustrate, distinguish among or explain air masses, pressure systems, the various fronts and associated types of storms, weather symbols, monsoons, the various forms of precipitation, along with causes and effects of lightning.
5. Define, describe, illustrate or explain the hydrologic cycle, the characteristics and influences of the oceans and continents on the weather, the Southern Oscillation (i.e., El Nino), the effects of land/water distribution, and climates and their global distribution.
6. Define, describe, illustrate or explain the biosphere, including organisms (flora and fauna), food chains, ecosystems and relationships. Define, describe, illustrate or explain soils in terms of soil-forming processes, components, properties, and classification.

7. Define, describe, illustrate or explain the structure of the earth, the internal processes, weathering and mass wasting, fluvial processes, characteristics and processes of arid regions, processes of coastal and Karst topographical regions, the processes and characteristics of glaciation (mountainous and continental).
8. Define, describe, illustrate, distinguish among or explain specific impacts by humans on weather, climate, and on the ecosystem at large.
9. Perform tests and collect data to analyze and classify weather, climate and landforms characteristics, processes, and impacts both quantitatively and quantitatively. This includes reading and extracting basic information from maps, diagrams, remote sensing devices, graphs, and tables. 1
10. Apply critical thinking skills such as inductive, deductive, and mathematical reasoning to solve problems using the scientific method. This includes interpreting maps, graphs and photos. 1
11. Recognize and discuss the effect of human activity on climate, climate change, the greenhouse effect, and on landforms at large. 1
12. Synthesize information from external, current sources and personal observations and discuss their relationships to class material.

GEOG 1115G. Maps and GIScience
3 Credits (3+3P)
Explore the principles of Geographic Information Science (GIScience) and its applications in solving human, natural, and socio-environmental challenges. Learn to evaluate geospatial data and technologies; analyze their significance, implications, and applications; and communicate insights effectively. Topics include map use, spatial data analysis, Geographic Information Systems (GIS), remote sensing, and Global Navigation Satellite Systems (GNSS).
Corequisite: GEOG 1115L.
Learning Outcomes
1. Explain key concepts and methods of geographic information science (GIScience).
2. Articulate the significance of geographic information in decision-making processes that address human, natural, and socio-environmental challenges.
3. Evaluate the ethical, socio-environmental, and legal implications of geospatial data, technologies, and applications.
4. Evaluate spatial and aspatial data to assess human, natural, and socio-environmental problems, as well as potential solutions.
5. Communicate effectively in written and oral formats.

GEOG 1115L. Maps and GIScience Laboratory
1 Credit (1P)
Gain hands-on field and laboratory experience with geospatial tools, including Geographic Information Systems (GIS), remote sensing, and Global Navigation Satellite Systems (GNSS). Manage, collect, analyze, interpret, and visualize spatial data to solve real-world problem, and develop your own GIScience research report.
Corequisite: GEOG 1115G.
Learning Outcomes
1. Collect spatial and aspatial data using various web and mobile apps.
2. Apply spatial and aspatial quantitative methods for data management, visualization, analysis, interpretation, and spatial problem-solving.
3. Create functional and aesthetically pleasing maps.
4. Develop a GIScience research report.
5. Communicate effectively in written and oral formats.

GEOG 1120G. World Regional Geography
3 Credits (3)
Overview of the physical geography, natural resources, cultural landscapes, and current problems of the world's major regions. Students will also examine current events at a variety of geographic scales.
Learning Outcomes
1. Identify, describe, illustrate, distinguish among or explain the basic concepts of geography, the major world regions, areal differences and similarities, the processes that shape geography natural and human, the use of maps, and the key topics of geographical interpretation (e.g., location, world importance, population, political status, resources, etc.).
2. Identify, describe, illustrate, distinguish among or explain the regional groups of Europe, its historical background, its languages and religions, major features, the diversified economy, political structures, and impact on globalization.
3. Identify, describe, illustrate, distinguish among or explain the regional groups of Russia and its satellite nations, its historical background, their languages and religions, major features, their diversified economies, political structures, current problems, and impact on globalization.
4. Identify, describe, illustrate or explain the regional nations of Middle East, their historical background, their languages and religions, the major features, the diversified economies and political structures, the current problems.
5. Identify, describe, illustrate, distinguish among or explain the regional groups of Asia, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization.
6. Identify, describe, illustrate, distinguish among or explain the regional groups of the Pacific World, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization.
7. Identify, describe, illustrate, distinguish among or explain the regional groups of Africa, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization.
8. Identify, describe, illustrate, distinguish among or explain the regional groups of Latin America, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization.
9. Identify, describe, illustrate, distinguish among or explain the regional groups of Anglo-America, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization. 1
10. Collect data to analyze or classify the region various historical developments and trends relating to globalization 1
11. Apply critical thinking skills in predicting future developments and impacts in economics, cultural diversity, and political stability globally. 1
12. Recognize and discuss current political “hot-spots,” their causes, and potential results with regards to globalization. 1
13. Synthesize information the data into a comprehensive world-view.

GEOG 1130G. Human Geography
3 Credits (3)
This course serves as an introduction to the study of human geography. Human geography examines the dynamic and often complex relationships that exist between people as members of particular cultural

groups and the geographical "spaces" and "places" in which they exist over time and the world today.

Learning Outcomes

1. Locate on maps, globes, and other technologies various geo-political spaces and places around the world, including in the United States.
2. Describe the primary concepts, theories, methods and terms prevalent in the field of human geography.
3. Apply core geographic concepts to the spatial patterns demonstrated in real-world scenarios.
4. Identify the relationships that influence human-environmentinteraction in a specific location at a specific time.
5. Define and utilize key concepts to explain human social and cultural change over time and across geographical space.
6. Explain the geographic context of a current event or conflict.
7. Identify a current event that illustrates a core cultural geographic concept.
8. Think critically, discuss, and write about the relationships of the natural world to human geography.

GEOG 1150G. Introduction to Environmental Studies
3 Credits

This course provides an introduction to core environmental issues and how these have been debated over time. In the process, it is intended to help you read critically, write effectively, and to reflect on your own environmental concerns in relation to the analytical as well as the cultural, social, and political perspectives that have been brought to bear on environmental issues over time. Through extensive exposure to environmental issues, solutions, and institutions, the course will help prepare you for a professional career relating to environmental management and policy.

Learning Outcomes

1. Survey the major environmental issues facing humankind.
2. Assess the conflicts or perceived conflicts between society and the environment.
3. Evaluate the relationships between the environment and the economy.
4. Analyze potential solutions.
5. Develop clear and effective communicators skills.

GEOG 2130. Map Use and Analysis
3 Credits (2+3P)

Exploration of the cartographic medium. Development of critical map analysis and interpretation skills, and map literacy. Comprised of traditional lecture, labs, and map use projects.

GEOG 2996. Special Topics
1-3 Credits

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Learning Outcomes

1. Varies

GEOG 315V. World Agriculture and Food Problems
3 Credits (3)

This course examines key concepts and issues relevant to the world's food production systems. Topical highlights include the causes and consequences of hunger, agriculture's economic and environmental significance, sustainable development, biotechnology, and globalization of agricultural markets. As students learn about these issues from both local and global perspectives, they are engaged in the development of both their literacy of economic concepts and their core research and communication skills. We do this through a combination of relevant course readings, in class discussion exercises, and focused writing assignments on current issues of relevance. May be repeated up to 3 credits.

Learning Outcomes

1. Integrate conceptual and systems thinking and design.
2. Assess the nutrition and healthfulness of food choices.
3. Describe structure and function of food and agricultural systems.
4. Analyze roles of and relationships between food producers, consumers, and policy makers.
5. Apply basic economic concepts to describe and interpret food and agricultural issues.

GEOG 325V. New Mexico and the American West
3 Credits (3)

Discover the diverse landscapes, histories, and human-environment interactions that define New Mexico and the American West. In this course, we examine the historical, cultural, political, economic, and environmental forces that have shaped the region, from Indigenous histories and colonial legacies to contemporary land use, sustainability challenges, and climate impacts. Through critical discussions, landscape interpretation, and geographic inquiry, we will explore how people and the environment have co-evolved in the West, how narratives and representations influence conceptions of the region, and how modern challenges continue to shape its present and future. By the end of the course, you will develop a deeper understanding of the complex and contested landscapes of the West and the forces that shape this iconic region.

Learning Outcomes

1. Discuss the human and physical geography of New Mexico and the American West.
2. Critically examine definitions and narratives of the American West.
3. Evaluate contemporary environmental and cultural challenges in the West.
4. Critically interpret the landscapes of the West.

GEOG 326. U.S. National Parks
3 Credits (3)

Explore the U.S. public lands system, where conservation, history, and public access intersect. We will examine the evolution, purpose, and management of national parks, investigating how they preserve geological, ecological, and cultural resources while addressing complex environmental and social challenges. Through discussions and case studies, we will analyze the cultural, social, political, economic, and environmental forces that shape national parks today. The course culminates in an independent research or creative project, allowing you to dive deep into a parks-related topic of your choice and share your findings in a compelling and meaningful way.

Learning Outcomes

1. Discuss the history and current structure of the U.S. public lands system.
2. Describe the diverse physical landscapes represented in U.S. National Parks and their value to human and environmental well-being.
3. Explain the social, cultural, political, and economic role and function of national parks and protected places.
4. Evaluate current challenges related to parks and conservation and how critical spatial and place-based perspectives and methods might help meet those challenges.

5. Communicate an independent research or creative project on a parks-related topic through written, verbal, visual, digital, or multimedia formats.

GEOG 328V. Environment and Society of Latin America
3 Credits (3)
This course takes you on an exciting journey through Latin America, examining how geography shapes the environment, culture, and society of the region. You'll dive into the dynamic interplay between natural landscapes and human development, exploring everything from environmental issues to socioeconomic challenges. Through case studies and real-world examples, we'll tackle pressing topics like urban growth, resource management, climate change, and political conflict. Whether you're interested in sustainability, culture, or global economics, this course will provide a deeper understanding of Latin America's unique challenges and its role in the world today.
Learning Outcomes
1. Analyze how societal and environmental patterns vary across Latin American countries and regions.
2. Evaluate how globalization, development, and other factors shape societies and environments of Latin America.
3. Discuss strategies for addressing contemporary societal and environmental challenges in Latin America.
4. Critically evaluate diverse perspectives on environmental and societal challenges in Latin America using evidence-based reasoning.
5. Communicate challenges and opportunities in human-environment dynamics across Latin America's through clear, structured writing and discussion.

GEOG 331V. Environment and Society of Europe
3 Credits (3)
Join us on an in-depth exploration of Europe as both a physical place and a cultural idea. This course examines the interplay between physical landscapes, environmental dynamics, economic systems, social structures, and political institutions that shape the region. We will critically assess what defines Europe as a region, its historical and contemporary transformations, and the role of the European Union (EU) in addressing key challenges. Through critical discussions, geographic analysis, and hands-on assignments, you will engage with current regional and international issues, including migration, climate change, economic disparities, and political shifts. By the end of the course, you will not only develop a strong understanding of Europe's geography but also gain the skills to analyze its evolving identity and global significance.
Learning Outcomes
1. Critically evaluate conceptions of Europe as both a physical place and a cultural idea.
2. Explain the importance of the major countries, cities, and physical features of Europe.
3. Analyze major regional and international issues facing Europe today.
4. Evaluate the European Union (EU) and current challenges to its stability and influence.
5. Apply knowledge of Europe through a variety of forms, including critical discussions on contemporary issues, a writing assignment, and a plan for a detailed European trip.

GEOG 351. Biogeography
3 Credits (3)
Unravel the mysteries of life's distribution across the planet! In this course, you will explore how species and ecosystems are shaped by time, space, and environmental forces. From deserts to rainforests, you'll investigate the factors driving biodiversity patterns, species dispersal, and ecosystem dynamics. Along the way, you'll examine how evolution, climate, and human influences shape life on Earth. Expect hands-on learning, interactive discussions, and an independent research project culminating in a presentation of your findings. By the end of the course, you'll have a deeper appreciation for the forces that shape life on Earth—and the tools to start exploring them yourself!
Learning Outcomes
1. Analyze how species move, adapt, and survive across diverse environments, from islands to mountaintops.
2. Explain how Earth's history—plate tectonics, climate shifts, and extinctions—has shaped global biodiversity.
3. Evaluate why some places are bursting with life while others have extreme or limited biodiversity, using key biogeographic principles.
4. Apply real-world data and tools, including satellite imagery, geographic information systems, and field data, to study species distributions.
5. Conduct independent research on a biogeographic topic of your choice, culminating in a written and verbal presentation.

GEOG 353. Geomorphology
3 Credits (2+3P)
This course examines the principal theories and concepts of landform creation through an exploration of the roles of structure, processes, climate, and time.
Learning Outcomes
1. Outline the basic history of geomorphic theory and research methods.
2. Describe the trends and probable causes of Cenozoic climate change and its links to basic landform processes.
3. Describe the main landform processes including weathering, soil formation, hillslope evolution and associated natural hazards, fluvial processes, arid land processes, glacial/interglacial climates and processes.
4. Integrate field observations into basic landscape evolution reconstructions.
5. Conduct a fluvial system experiment, incorporating experimental design, implementation, and data analysis.

GEOG 357. Weather & Climate: Earth's Dynamic Atmosphere
3 Credits (3)
From basic atmospheric processes to paleoclimate analysis and modern forecast modeling, from local-to-global, we will investigate climate's influences on natural environments, cultures, economics, politics, the characteristics of regional climates, and issues of global climate change.
Learning Outcomes
1. Explain fundamental atmospheric processes that drive weather patterns and climate systems.
2. Evaluate the evidence for climate change, including historical climate data and modern forecasting models.
3. Integrate perspectives from the natural sciences, social sciences, and humanities to assess the influences of climate on nature and society from local to global scales.
4. Apply knowledge of climate dynamics to current global issues, including environmental policies, sustainability practices, and climate adaptation strategies.

GEOG 361V. Challenges and Opportunities of Globalization
3 Credits (3)
This course takes a deep dive into how globalization shapes our world—creating both exciting opportunities and serious challenges. From

booming cities to struggling communities, we'll uncover why some places thrive while others get left behind. But globalization isn't just about uneven development—it's also about innovation, cultural exchange, and creative solutions to pressing global issues. Through engaging discussions, thought-provoking readings, and short writing assignments, we'll connect economic geography to real-world events, giving you new ways to understand and navigate our interconnected world.

Learning Outcomes

1. Analyze the economic, political, and cultural forces driving globalization.
2. Evaluate how globalization contributes to both uneven development and regional disparities.
3. Discuss how globalization fosters regional opportunities, innovation, and cultural exchange in response to global challenges.
4. Assess the impacts of competing economic models and trade approaches on sustainability, equity, and human and environmental well-being.
5. Communicate well-reasoned perspectives on globalization's challenges and opportunities through writing and discussion.

GEOG 363V. Culture, Nature, and the Environment
3 Credits (3)

In this course, we will explore the interactions between geography and culture, and dive into key cultural geographic concepts such as landscape, place, nature, and environment. We will consider multiple ways of doing cultural geography, focusing on cultural geography as both a critical and creative practice. We will especially emphasize the cultural geography tradition, critical cultural geographies, and cultural geography and creativity.

Learning Outcomes

1. Describe critical approaches to the cultural geographic concepts of landscape, place, space, nature, and environment
2. Analyze contemporary cultural geographic approaches to topics such as place and capitalism, place and nature, environmental narratives, and the Anthropocene
3. Articulate the connections between geography and artistic/literary practices.
4. Develop essays, discussions, story maps, and/or visual essays to apply their own practice of cultural geography through multiple forms of output.

GEOG 365V. The City
3 Credits (3)

This course takes you on a fascinating journey through the past, present, and future of urban life, exploring how cities grow, change, and adapt in an increasingly globalized world. We'll uncover the history of urban development and compare cities across North America, South American Europe, Asia, and Africa, highlighting both their unique identities and shared transformations. You'll discover how cities are shaped—not just in their layout and design, but in how people live, work, and innovate within them. From bustling markets to cutting-edge smart cities, we'll explore the economic, social, and political forces that drive urbanization while also showcasing creative solutions to urban challenges. Whether you're curious about skyscrapers, sustainable city planning, or how neighborhoods evolve, this course will change the way you see the world's cities!

Learning Outcomes

1. Define cities from statistical, historical, cultural, economic, and political perspectives
2. Analyze how historical urban development shapes modern city form and function.
3. Evaluate how globalization, migration, transportation, technology, governance, and environmental change transform urban spaces.
4. Examine how cultural, economic, social, political, and environmental factors influence urban life and well-being.
5. Apply research and critical thinking to propose solutions for contemporary urban challenges.

GEOG 373. Introduction to Remote Sensing
4 Credits (3+3P)

Discover the exciting world of remote sensing! This course introduces the theory, methods, and real-world applications of capturing Earth from above. Explore how energy and light are used to generate stunning images of our planet from aerial and satellite platforms and learn to analyze them to uncover insights about the biosphere, hydrosphere, atmosphere, lithosphere, and cultural landscapes. Hands-on labs and engaging lectures will guide you through the basics of analyzing and interpreting remote sensing products. Dive into the science of seeing our world in a whole new way.

Learning Outcomes

1. Explain basic remote sensing concepts, data, and methods.
2. Evaluate remotely sensed products.
3. Map built and natural environments using remote sensing data and methods.
4. Execute an original remote sensing investigation.
5. Communicate an original remote sensing investigation in written and oral formats.

GEOG 381. Cartography and GIS
4 Credits (3+3P)

Unleash your inner mapmaker! This course introduces the essential concepts and techniques of cartography and geographic information systems (GIS) through dynamic lectures and hands-on labs. Explore topics like map scale, projections, and symbolization in class, and then apply these principles to design maps that are both functional and aesthetically appealing. By the end of the semester, you'll master the science and art of creating and presenting your very own GIS mapping project—a unique blend of data, design, and storytelling that's ready to impress.

Learning Outcomes

1. Explain key cartographic concepts and methods.
2. Evaluate the content, implications, and functionality of maps.
3. Create functional and aesthetically pleasing maps.
4. Execute an original GIS mapping project.
5. Communicate an original GIS mapping project in written and oral formats.

GEOG 401. Internship/Co-op
1-3 Credits

This course provides students with hands-on experience in applied geographic work through an internship or cooperative education placement. Students will work with a local, regional, or federal agency, private-sector firm, or nonprofit organization under the supervision of both an on-site professional and a geography faculty mentor. This course allows students to apply geographic knowledge and skills in professional settings while gaining valuable career experience, networking opportunities, and practical insights into the field of geography. May be repeated up to 3 credits.

Learning Outcomes

1. Apply geographic concepts, skills, and methods to real-world challenges in a professional setting.

2. Develop professional competencies, including communication, problem-solving, and project management, in an applied geographic context.
3. Reflect on internship experiences to evaluate career interests, professional growth, and the role of geography in the workplace.

GEOG 412. Geohumanities
3 Credits (3)
In recent years, artists, writers, and humanities scholars have increasingly engaged with geographic concerns, and geographers have incorporated humanities-based approaches to their work. Broadly known as the geohumanities, these interdisciplinary endeavors offer exciting ways to engage with key geographic concepts such as place, landscape, and nature. This graduate level seminar will examine both critical and creative approaches to the geohumanities.
Learning Outcomes
1. Articulate an understanding of the geohumanities as an interdisciplinary field, including its practices and its histories that draw on geography's intersection with multiple humanities fields.
2. Identify key texts, thinkers, and practices in the geohumanities, as well as spaces (such as both scholarly and public-facing journals and digital spaces) where geohumanities work is currently being advanced and developed.
3. Engage with current debates and directions within the geohumanities.
4. Develop a creative and/or critical project that uses geohumanities approaches and advances your research/scholarly/creative interests.

GEOG 435. Planning a Sustainable World
3 Credits (3)
This course tackles the big challenges we face when imagining and building the places where we live. In addition to exploring today's most pressing issues through engaging readings, we jump into solving real-world problems. You'll explore topics like how to make sustainable development fair for everyone, how to create affordable housing, and how to design land use and transportation systems that actually work together. Plus, we'll examine ways to grow local economies and build cities that are not just livable, but truly sustainable, drawing on ideas like new urbanism and neo-traditional planning.
Learning Outcomes
1. Describe key urban planning principles and how they are applied in practice.
2. Analyze the multiple dimensions of sustainable development and their role in environmental planning.
3. Evaluate strategies for addressing contemporary urban and environmental planning challenges.
4. Critically evaluate scholarly literature on planning themes and a self-selected research topic in written and oral formats.
5. Collaborate on an applied research project to develop solutions for real-world planning scenarios.

GEOG 442. Programming for GIS
3 Credits
Unlock the power of Geographic Information Systems (GIS) with the art of programming! In this dynamic course, you'll dive into the fundamentals of GIS programming through interactive lectures and hands-on lab assignments. Discover the essentials of Python, a versatile and in-demand programming language, as you learn to process, analyze, and develop geospatial applications. Explore key tools and techniques for manipulating and analyzing geographic data while building practical skills. By the end of the semester, you'll confidently harness Python to tackle real-world geospatial challenges and take your GIS expertise to the next level.
Learning Outcomes
1. Explain fundamental rules and syntax in Python including variables, data types, flow of execution, and functions.
2. Articulate key concepts and principles in geospatial data models, processing, and analysis.
3. Use classes, functions, and modules in ArcPy to perform geospatial data processing and analysis.

GEOG 452. Landscape Ecology
3 Credits (3+3P)
This course explores the dynamic patterns and processes that shape landscapes across spatial and temporal scales. Students will investigate how natural forces and human activities interact to influence biodiversity, habitat connectivity, ecosystem services, landscape resilience, and other environmental characteristics. Through the application of geospatial tools—including GIS, remote sensing, and spatial modeling—students will assess landscape change and evaluate conservation strategies. The course culminates in an independent research project, allowing students to apply landscape ecology principles to real-world challenges and communicate their findings in engaging and impactful ways.
Learning Outcomes
1. Analyze spatial patterns and processes in landscapes using core principles of landscape ecology.
2. Evaluate how natural and human-induced processes interact to shape landscape structure and function across space and time.
3. Interpret ecological concepts that influence species distributions, ecosystem processes, and other environmental dynamics across multiple spatial and temporal scales.
4. Apply geospatial tools such as GIS, remote sensing, and spatial modeling to assess rates and patterns of landscape change and evaluate potential conservation strategies.
5. Communicate an independent applied landscape ecology research project in written, verbal, visual, digital, or multimedia formats.

GEOG 453. Geomorphology
3 Credits (2+3P)
Examination of the principal theories and concepts of landform creation; exploration of the roles of structure, processes, climate, and time in the formation of various types of landforms. Cross-listed with GEOG 553 and GEOL 353.
Learning Outcomes
1. Outline the basic history of geomorphic theory and research methods.
2. Describe the trends and probable causes of Cenozoic climate change and its links to basic landform processes.
3. Describe the main landform processes including weathering, soil formation, hillslope evolution and associated natural hazards, fluvial processes, arid land processes, glacial/interglacial climates and processes.
4. Integrate field observations into basic landscape evolution reconstructions.
5. Design and implement a fluvial system experiment and analyze the data.

GEOG 455. Southwest Environments
3 Credits (3)
This course introduces the U.S. Southwest, including its physical and human geography, coupled human-environment interactions, causes and

consequences of environmental issues, and implications for sustainable development.

Learning Outcomes

1. Describe physical and human geographic patterns of the U.S. Southwest.
2. Discuss coupled human-environment interactions in the U.S. Southwest.
3. Explain how these interactions have produced a series of societal and/or ecological problems in the U.S. Southwest.
4. Assess critically the challenges and potentials of sustainability in the U.S. Southwest.

GEOG 473. Advanced Remote Sensing
4 Credits (3+3P)

Take your remote sensing skills to the next level! This course explores advanced concepts, methods, and applications in digital image processing, analysis, and visualization. Learn how to acquire, correct, enhance, transform, classify, evaluate, and interpret remotely sensed imagery to reveal insights about Earth's dynamic landscapes. Engaging lectures will introduce cutting-edge techniques, while hands-on labs provide opportunities to apply advanced image processing workflows to real-world data. The course culminates in an independent research project, allowing you to explore a remote sensing topic of your choice and present your findings in a compelling format.

Learning Outcomes

1. Explain advanced remote sensing concepts, data, and methods.
2. Employ several approaches for acquiring and preprocessing remotely sensed data.
3. Apply spectral and spatial analysis techniques to enhance and transform remotely sensed imagery.
4. Implement traditional pixel-based, object-based, spectral unmixing, AI-driven, and hybrid classification and change detection techniques for remote sensing applications.
5. Communicate an independent remote sensing research project in written, verbal, visual, digital, or multimedia formats.

GEOG 481. Fundamentals of GIS
4 Credits (3+3P)

Discover the potential of Geographic Information Systems (GIS) in this dynamic and hands-on introductory course! Whether you're passionate about mapping, solving real-world problems, or analyzing geographic data, this course will teach you how to harness the power of GIS to make an impact. You'll learn to manage, integrate, analyze, and visualize geospatial data to uncover patterns, relationships, and solutions to pressing challenges in fields like urban planning, environmental management, public health, and beyond. Using the industry-leading ArcGIS Pro software, you'll gain practical experience through engaging activities that blend theory with cutting-edge technology. Whether you're a curious beginner or looking to add GIS skills to your toolkit, this course is your gateway to mastering one of today's most versatile and in-demand technologies. Join us and see the world through a whole new lens.

Learning Outcomes

1. Describe fundamental principles, concepts, and methods underlying geographic information science.
2. Discuss map projections, datums, coordinate systems, and grid systems.
3. Use a geographic information system for management and analysis of spatial data.
4. Utilize GIS concepts, tools, and techniques to answer geographic questions.
5. Communicate the results of spatial data analysis through data visualization.

GEOG 483. Field Explorations in Geography
3 Credits (6P)

This hands-on, field-based course immerses you in the natural and cultural landscapes of the U.S. Southwest. Using geographic field methods and tools, you will document, collect, and analyze data to interpret these diverse environments. Depending on the instructor and schedule, the course may be structured as a two-week immersive field experience with camping or as a series of weekend field excursions. The course culminates in a field research project, allowing you to investigate a topic of your choice and communicate your findings in a compelling and meaningful way. A lab fee is required to cover transportation and field expenses.

Learning Outcomes

1. Apply geographic field methods and tools to document, collect, and analyze human and environmental data.
2. Interpret physical and cultural landscapes using field observations, geospatial technologies, and geographic reasoning.
3. Communicate geographic field research findings in written, verbal, visual, digital, or multimedia formats.

GEOG 484. Qualitative, Critical, and Creative Methodologies
3 Credits (3)

This course explores qualitative, critical, and creative methodologies within human geography and related fields. We will examine epistemology, methodology, ethics, and critical reflexivity in research, as well as particular methods such as interviews, oral histories, questionnaires, participant observation, focus groups, archival research, visual methodologies, textual and discourse analysis, and arts-based approaches.

Learning Outcomes

1. Discuss the relationship between epistemology, methodology, and methods.
2. Develop a nuanced understanding of multiple critical, qualitative, and/or creative methods within human geography and related fields.
3. Demonstrate knowledge of research ethics and the role of NMSU's Institutional Review Board (IRB) in human subjects research, including through the completion of the CITI Human Subjects training.

GEOG 485. Spatial Analysis and Modeling
3 Credits (3)

Leverage the power of spatial data in this hands-on course on spatial analysis and modeling. Building on fundamental statistical concepts, you will explore a range of geospatial techniques to analyze geographic patterns, relationships, and processes. Through lectures and applied labs, you will gain experience with methods such as spatial pattern analysis, spatial interpolation, geographically weighted regression, and ecological niche modeling. Emphasis is placed on critical thinking, real-world applications, and the integration of geospatial approaches to problem-solving. The course culminates in an independent spatial investigation, in which you apply advanced analytical techniques to a topic of your choice and effectively communicate your findings in a compelling format.

Learning Outcomes

1. Explain key concepts and methods in spatial analysis and modeling.
2. Apply diverse techniques to analyze spatial data, model human and environmental processes, and predict spatial distributions.

3. Communicate findings from an original spatial analysis and/or modeling investigation in written, verbal, visual, digital, or multimedia formats.

GEOG 488. GIS for Water Resources
3 Credits (3)
This course explores the application of Geographic Information Systems (GIS) in water resource research and management. Students will work with geospatial data, methods, and technologies to address challenges such as watershed characterization, water quality and availability assessment, flood risk analysis, groundwater-surface water interactions, and hydrological modeling. Through a combination of lectures and hands-on labs, students will gain practical experience applying GIS to real-world water resource issues. The course culminates in an independent or collaborative project tailored to students' interests.
Learning Outcomes
1. Apply GIS techniques to analyze and model water resources and hydrological processes.
2. Evaluate geospatial data and methods for decision-making in water resource planning and management.
3. Communicate an independent or collaborative GIS-based research project on water resources using written, verbal, visual, digital, or multimedia formats.

GEOG 491. Special Topics
1-3 Credits (1-3)
This course provides an in-depth exploration of selected geographic topics that vary by semester and instructor. Course content may include readings, discussions, lectures, hands-on applications, and/or research projects that examine contemporary challenges, emerging trends, and specialized themes in geography. Specific topics will be announced in the Course Schedule.
Learning Outcomes
1. Critically engage with geographic concepts, methods, and applications relevant to the selected topic.
2. Apply geographic reasoning and analytical skills to address topic-related problems.
3. Communicate ideas and findings effectively in written, verbal, visual, digital, or multimedia formats.

GEOG 493. Special Problem Research
1-3 Credits
This course provides advanced undergraduate students with the opportunity to conduct independent research on a specialized geographic topic under the mentorship of a faculty member. Students will formulate a research question, engage in independent inquiry, analyze geographic data, and produce a scholarly paper. Designed for highly motivated students seeking research experience beyond standard coursework, the course emphasizes original research, critical analysis, and effective communication of findings. May be repeated up to 6 credits.
Learning Outcomes
1. Develop a research approach for investigating a geographic problem.
2. Conduct independent research using appropriate geographic concepts and methods.
3. Communicate research findings in a well-structured scholarly paper.

GEOG 495. Independent Study
1-3 Credits
This independent study course allows undergraduate students to engage in focused learning under the guidance of a faculty mentor. Students will explore specialized topics aligned with their academic and professional interests, developing deeper knowledge through self-directed study. The course fosters critical thinking, independent inquiry, and the application of geographic concepts and methods to real-world questions and challenges. May be repeated up to 6 credits.
Learning Outcomes
1. Develop specialized knowledge and skills in a chosen geographic topic through independent study and faculty mentorship.
2. Apply geographic concepts and methods to a research or applied project.
3. Communicate findings effectively in a format appropriate to the project's scope and objectives.

GEOG 501. Geographic Theory and Application
3 Credits (3)
This graduate seminar provides an overview of geographic philosophies, methodologies, and the relationship between theory and practice. Students will explore key ontological, epistemological, and methodological debates that shape contemporary geographic research across human geography, physical geography, human-environment geography, and GIScience. Through critical discussions, written assignments, and a literature review in their area of interest, students will gain a broad understanding of how geographers approach research and engage with different intellectual traditions. Emphasizing intra- and interdisciplinary synthesis and collaboration, this course prepares students to articulate their research perspectives and work effectively across subfields.
Learning Outcomes
1. Evaluate contemporary philosophies and methodologies in major areas of geographical research.
2. Discuss diverse contemporary applications of geographic research.
3. Communicate effectively in written and oral formats.

GEOG 502. Integrative Research Design
3 Credits (3)
This graduate seminar guides students through the process of designing rigorous and impactful research projects. Students will explore quantitative, qualitative, critical, creative, and mixed-methods approaches, along with research frameworks, ethical considerations, proposal writing, and project management. Designed for students in geography and related fields, this hands-on course fosters critical thinking, collaboration, and effective communication, culminating in the development of a polished research proposal tailored to their goals.
Prerequisite: GEOG 501.
Learning Outcomes
1. Design a significant and feasible research project.
2. Evaluate strategies for successful project management and assessment.
3. Communicate effectively in written and oral formats.

GEOG 505. GIS&T Capstone I - Geospatial Research Design
3 Credits
This course is designed to support the professional development of students with an interest in conducting research using Geographic Information Science and Technology (GIS&T). More specifically, the course asks you to dig into the literature in an area of geospatial research of interest to you and to develop a plan for a research project that aligns with your interests and/or professional work.

Learning Outcomes

1. Conceptualize an independent geospatial research project.
2. Plan an independent geospatial research project.
3. Propose an independent geospatial research project.

GEOG 506. GIS&T Capstone II - Geospatial Research Implementation
3 Credits

This course is designed to support the professional development of students with an interest in conducting research using Geographic Information Science and Technology (GIS&T). The course provides you an opportunity to implement the geospatial work you proposed in Capstone I. You will then then share the results of this research through oral presentations and a written document that supports your professional portfolio and work.

Prerequisite: GEOG 505.

Learning Outcomes

1. Implement an independent geospatial research project.
2. Present orally the rationale, data, methods, results, and implications of this independent geospatial research project.
3. Present in writing the rationale, data, methods, results, and implications of this independent geospatial research project.

GEOG 512. Geohumanities
3 Credits (3)

In recent years, artists, writers, and humanities scholars have increasingly engaged with geographic concerns, and geographers have incorporated humanities-based approaches to their work. Broadly known as the geohumanities, these interdisciplinary endeavors offer exciting ways to engage with key geographic concepts such as place, landscape, and nature. This graduate level seminar will examine both critical and creative approaches to the geohumanities.

Learning Outcomes

1. Articulate an understanding of the geohumanities as an interdisciplinary field, including its practices and its histories that draw on geography's intersection with multiple humanities fields.
2. Identify key texts, thinkers, and practices in the geohumanities, as well as spaces (such as both scholarly and public-facing journals and digital spaces) where geohumanities work is currently being advanced and developed.
3. Engage with current debates and directions within the geohumanities.
4. Develop a creative and/or critical project that uses geohumanities approaches and advances your research/scholarly/creative interests.

GEOG 526. U.S. National Parks
3 Credits (3)

Explore the U.S. public lands system, where conservation, history, and public access intersect. We will examine the evolution, purpose, and management of national parks, investigating how they preserve geological, ecological, and cultural resources while addressing complex environmental and social challenges. Through discussions and case studies, we will analyze the cultural, social, political, economic, and environmental forces that shape national parks today. The course culminates in an independent research or creative project, allowing you to dive deep into a parks-related topic of your choice and share your findings in a compelling and meaningful way.

Learning Outcomes

1. Discuss the history and current structure of the U.S. public lands system.
2. Describe the diverse physical landscapes represented in U.S. National Parks and their value to human and environmental well-being.
3. Explain the social, cultural, political, and economic role and function of national parks and protected places.
4. Evaluate current challenges related to parks and conservation and how critical spatial and place-based perspectives and methods might help meet those challenges.
5. Communicate an independent research or creative project on a parks-related topic through written, verbal, visual, digital, or multimedia formats.

GEOG 535. Planning a Sustainable World
3 Credits (3)

This course tackles the big challenges we face when imagining and building the places where we live. In addition to exploring today's most pressing issues through engaging readings, we jump into solving real-world problems. You'll explore topics like how to make sustainable development fair for everyone, how to create affordable housing, and how to design land use and transportation systems that actually work together. Plus, we'll examine ways to grow local economies and build cities that are not just livable, but truly sustainable, drawing on ideas like new urbanism and neo-traditional planning.

Learning Outcomes

1. Describe key urban planning principles and how they are applied in practice.
2. Analyze the multiple dimensions of sustainable development and their role in environmental planning.
3. Evaluate strategies for addressing contemporary urban and environmental planning challenges.
4. Critically evaluate scholarly literature on planning themes and a self-selected research topic in written and oral formats.
5. Collaborate on an applied research project to develop solutions for real-world planning scenarios.

GEOG 542. Programming for GIS
3 Credits

Unlock the power of Geographic Information Systems (GIS) with the art of programming! In this dynamic course, you'll dive into the fundamentals of GIS programming through interactive lectures and hands-on lab assignments. Discover the essentials of Python, a versatile and in-demand programming language, as you learn to process, analyze, and develop geospatial applications. Explore key tools and techniques for manipulating and analyzing geographic data while building practical skills. By the end of the semester, you'll confidently harness Python to tackle real-world geospatial challenges and take your GIS expertise to the next level.

Learning Outcomes

1. Explain fundamental rules and syntax in Python including variables, data types, flow of execution, and functions.
2. Articulate key concepts and principles in geospatial data models, processing, and analysis.
3. Use classes, functions, and modules in ArcPy to perform geospatial data processing and analysis.

GEOG 544. GIS&T Professional Portfolio
1 Credit

This course provides students with the opportunity to develop their GIS&T professional portfolio and disseminate it via multiple platforms. The portfolio will showcase students' experience, knowledge and skills, and potential for professional development and employment in the geospatial workforce.

Learning Outcomes

1. Identify content for a GIST professional portfolio.
2. Visualize the portfolio content.
3. Describe the portfolio content.
4. Reflect on the portfolio content.
5. Create a compelling static document and interactive web versions of the portfolio.

GEOG 545. Geospatial Professionalism
2 Credits

Geospatial data, technologies, and applications are influenced by and shape our social, political, and legal environments in numerous ways. This course introduces you to these environments and provides opportunities to explore them through a series of readings, writing exercises, and class discussions. We also examine in detail the moral and ethical implications of geospatial data, technologies, and applications. With this grounding in place, we develop skills to communicate the results of our geospatial work in a professional, effective, and morally and ethically responsible manner.

Learning Outcomes

1. Discuss the moral and ethical implications of geospatial data, technologies, and applications.
2. Examine the social, political, and legal implications of geospatial data, technologies, and applications.
3. Communicate geospatial work in a professional, effective, and morally and ethically responsible manner.

GEOG 551. Biogeography
3 Credits (3)

Unravel the mysteries of life's distribution across the planet! In this course, you will explore how species and ecosystems are shaped by time, space, and environmental forces. From deserts to rainforests, you'll investigate the factors driving biodiversity patterns, species dispersal, and ecosystem dynamics. Along the way, you'll examine how evolution, climate, and human influences shape life on Earth. Expect hands-on learning, interactive discussions, and an independent research project culminating in a presentation of your findings. By the end of the course, you'll have a deeper appreciation for the forces that shape life on Earth—and the tools to start exploring them yourself!

Learning Outcomes

1. Analyze how species move, adapt, and survive across diverse environments, from islands to mountaintops.
2. Explain how Earth's history plate tectonics, climate shifts, and extinctions has shaped global biodiversity.
3. Evaluate why some places are bursting with life while others have extreme or limited biodiversity, using key biogeographic principles.
4. Apply real-world data and tools, including satellite imagery, geographic information systems, and field data, to study species distributions.
5. Conduct independent research on a biogeographic topic of your choice, culminating in a written and verbal presentation.

GEOG 552. Landscape Ecology
4 Credits (3+3P)

Analysis of the structure, function, and change of natural and anthropogenic landscapes. Patches, corridors, matrix and network, spatial organization, landscape dynamics, and role of disturbance in overall functioning of landscapes. Role of landscape heterogeneity in landscape management.

Learning Outcomes

1. Apply a vocabulary of terms and phrases employed by landscape ecologists.
2. Demonstrate familiarity with articles and researchers in landscape ecology.
3. Identify influences of scale and spatial configuration on ecosystem processes.
4. Discuss approaches, tools, and techniques to describe, quantify, and analyze landscape characteristics.
5. Demonstrate knowledge of various landscape ecology approaches by accurately applying landscape ecology terms and concepts in answers to a select group of the end-of-chapter questions as well as in discussion posts.

GEOG 553. Geomorphology
3 Credits (2+3P)

This course examines the principal theories and concepts of landform creation through an exploration of the roles of structure, processes, climate, and time.

Learning Outcomes

1. Outline the basic history of geomorphic theory and research methods.
2. Describe the trends and probable causes of Cenozoic climate change and its links to basic landform processes.
3. Describe the main landform processes including weathering, soil formation, hillslope evolution and associated natural hazards, fluvial processes, arid land processes, glacial/interglacial climates and processes.
4. Integrate field observations into basic landscape evolution reconstructions.
5. Conduct a fluvial system experiment, incorporating experimental design, implementation, and data analysis.

GEOG 555. Southwest Environments
3 Credits (3)

This course introduces the U.S. Southwest, including its physical and human geography, coupled human-environment interactions, causes and consequences of environmental issues, and implications for sustainable development. Taught with GEOG 455.

Learning Outcomes

1. Describe physical and human geographic patterns of the U.S. Southwest.
2. Discuss coupled human-environment interactions in the U.S. Southwest.
3. Explain how these interactions have produced a series of societal and/or ecological problems in the U.S. Southwest.
4. Assess critically the challenges and potentials of sustainability in the U.S. Southwest.

GEOG 556. Weather & Climate: Earth's Dynamic Atmosphere
3 Credits (3)

From basic atmospheric processes to paleoclimate analysis and modern forecast modeling, from local-to-global, we will investigate climate's influences on natural environments, cultures, economics, politics, the characteristics of regional climates, and issues of global climate change.

Learning Outcomes

1. Explain the fundamental atmospheric processes that drive weather patterns and create climate systems.
2. Evaluate the evidence for climate change, including historical climate data and modern forecasting models.

3. Integrate perspectives from the natural sciences, social sciences, and humanities to assess the influences of climate on nature and society from local to global scales.
4. Apply knowledge of climate dynamics to current global issues, including environmental policies, sustainability practices, and climate adaptation strategies.

GEOG 571. Cartography and GIS
4 Credits (3+3P)
Unleash your inner mapmaker! This course introduces the essential concepts and techniques of cartography and geographic information systems (GIS) through dynamic lectures and hands-on labs. Explore topics like map scale, projections, and symbolization in class, and then apply these principles to design maps that are both functional and aesthetically appealing. By the end of the semester, you'll master the science and art of creating and presenting your very own GIS mapping project—a unique blend of data, design, and storytelling that's ready to impress.

Learning Outcomes
1. Explain key cartographic concepts and methods.
2. Evaluate the content, implications, and functionality of maps.
3. Create functional and aesthetically pleasing maps.
4. Execute an original GIS mapping project.
5. Communicate an original GIS mapping project in written and oral formats.

GEOG 573. Introduction to Remote Sensing
4 Credits (3+3P)
Discover the exciting world of remote sensing! This course introduces the theory, methods, and real-world applications of capturing Earth from above. Explore how energy and light are used to generate stunning images of our planet from aerial and satellite platforms and learn to analyze them to uncover insights about the biosphere, hydrosphere, atmosphere, lithosphere, and cultural landscapes. Hands-on labs and engaging lectures will guide you through the basics of analyzing and interpreting remote sensing products. Dive into the science of seeing our world in a whole new way.

Learning Outcomes
1. Explain basic remote sensing concepts, data, and methods.
2. Evaluate remotely sensed products.
3. Map built and natural environments using remote sensing data and methods.
4. Execute an original remote sensing investigation.
5. Communicate an original remote sensing investigation in written and oral formats.

GEOG 578. Fundamentals of GIS
4 Credits (3+3P)
Discover the potential of Geographic Information Systems (GIS) in this dynamic and hands-on introductory course! Whether you're passionate about mapping, solving real-world problems, or analyzing geographic data, this course will teach you how to harness the power of GIS to make an impact. You'll learn to manage, integrate, analyze, and visualize geospatial data to uncover patterns, relationships, and solutions to pressing challenges in fields like urban planning, environmental management, public health, and beyond. Using the industry-leading ArcGIS Pro software, you'll gain practical experience through engaging activities that blend theory with cutting-edge technology. Whether you're a curious beginner or looking to add GIS skills to your toolkit, this course is your gateway to mastering one of today's most versatile and in-demand technologies. Join us and see the world through a whole new lens.

Learning Outcomes
1. Describe fundamental principles, concepts, and methods underlying geographic information science.
2. Discuss map projections, datums, coordinate systems, and grid systems.
3. Use a geographic information system for management and analysis of spatial data.
4. Utilize GIS concepts, tools, and techniques to answer geographic questions.
5. Communicate the results of spatial data analysis through data visualization.

GEOG 582. Advanced Remote Sensing
4 Credits (3+3P)
Take your remote sensing skills to the next level! This course explores advanced concepts, methods, and applications in digital image processing, analysis, and visualization. Learn how to acquire, correct, enhance, transform, classify, evaluate, and interpret remotely sensed imagery to reveal insights about Earth's dynamic landscapes. Engaging lectures will introduce cutting-edge techniques, while hands-on labs provide opportunities to apply advanced image processing workflows to real-world data. The course culminates in an independent research project, allowing you to explore a remote sensing topic of your choice and present your findings in a compelling format.

Learning Outcomes
1. Explain advanced remote sensing concepts, data, and methods.
2. Employ several approaches for acquiring and preprocessing remotely sensed data.
3. Apply spectral and spatial analysis techniques to enhance and transform remotely sensed imagery.
4. Implement traditional pixel-based, object-based, spectral unmixing, AI-driven, and hybrid classification and change detection techniques for remote sensing applications.
5. Communicate an independent remote sensing research project in written, verbal, visual, digital, or multimedia formats.

GEOG 583. Field Explorations in Geography
3 Credits (6P)
This hands-on, field-based course immerses you in the natural and cultural landscapes of the U.S. Southwest. Using geographic field methods and tools, you will document, collect, and analyze data to interpret these diverse environments. Depending on the instructor and schedule, the course may be structured as a two-week immersive field experience with camping or as a series of weekend field excursions. The course culminates in a field research project, allowing you to investigate a topic of your choice and communicate your findings in a compelling and meaningful way. A lab fee is required to cover transportation and field expenses.

Learning Outcomes
1. Apply geographic field methods and tools to document, collect, and analyze human and environmental data.
2. Interpret physical and cultural landscapes using field observations, geospatial technologies, and geographic reasoning.
3. Communicate geographic field research findings in written, verbal, visual, digital, or multimedia formats.

GEOG 584. Qualitative, Critical, and Creative Methodologies
3 Credits (3)
This course explores qualitative, critical, and creative methodologies within human geography and related fields. We will examine

epistemology, methodology, ethics, and critical reflexivity in research, as well as particular methods such as interviews, oral histories, questionnaires, participant observation, focus groups, archival research, visual methodologies, textual and discourse analysis, and arts-based approaches.

Learning Outcomes

1. Discuss the relationship between epistemology, methodology, and methods.
2. Develop a nuanced understanding of multiple critical, qualitative, and/or creative methods within human geography and related fields.
3. Demonstrate knowledge of research ethics and the role of NMSU's Institutional Review Board (IRB) in human subjects research, including through the completion of the CITI Human Subjects training.

GEOG 585. Spatial Analysis and Modeling
3 Credits (3)

Leverage the power of spatial data in this hands-on course on spatial analysis and modeling. Building on fundamental statistical concepts, you will explore a range of geospatial techniques to analyze geographic patterns, relationships, and processes. Through lectures and applied labs, you will gain experience with methods such as spatial pattern analysis, spatial interpolation, geographically weighted regression, and ecological niche modeling. Emphasis is placed on critical thinking, real-world applications, and the integration of geospatial approaches to problem-solving. The course culminates in an independent spatial investigation, in which you apply advanced analytical techniques to a topic of your choice and effectively communicate your findings in a compelling format.

Learning Outcomes

1. Explain key concepts and methods in spatial analysis and modeling.
2. Apply diverse techniques to analyze spatial data, model human and environmental processes, and predict spatial distributions.
3. Communicate findings from an original spatial analysis and/or modeling investigation in written, verbal, visual, digital, or multimedia formats.

GEOG 588. GIS for Water Resources
3 Credits (3)

This course explores the application of Geographic Information Systems (GIS) in water resource research and management. Students will work with geospatial data, methods, and technologies to address challenges such as watershed characterization, water quality and availability assessment, flood risk analysis, groundwater-surface water interactions, and hydrological modeling. Through a combination of lectures and hands-on labs, students will gain practical experience applying GIS to real-world water resource issues. The course culminates in an independent or collaborative project tailored to students' interests.

Learning Outcomes

1. Apply GIS techniques to analyze and model water resources and hydrological processes.
2. Evaluate geospatial data and methods for decision-making in water resource planning and management.
3. Communicate an independent or collaborative GIS-based research project on water resources using written, verbal, visual, digital, or multimedia formats.

GEOG 595. Independent Study
1-3 Credits

This independent study course provides master's students with the opportunity to engage in focused learning under the guidance of a faculty mentor. Students will explore specialized topics relevant to their academic and professional interests, gaining deeper expertise through self-directed study. The course fosters critical inquiry, independent scholarship, and the application of geographic concepts, theories, and methods to research and practical applications. May be repeated up to 6 credits.

Learning Outcomes

1. Develop specialized knowledge and skills in a chosen geographic topic through independent study and faculty mentorship.
2. Apply geographic concepts, theories, and methods to an independent research or applied project.
3. Communicate findings effectively in a format appropriate to the project's scope and objectives.

GEOG 596. Residency
1-12 Credits

This course provides graduate students with a structured, contractual learning experience in the public or private sector. Under the supervision of a field supervisor and faculty member, students apply geographic knowledge and skills to real-world projects, gaining professional experience in research, analysis, and decision-making. The residency allows students to integrate academic learning with applied practice, preparing them for careers in government agencies, private industry, nonprofit organizations, and other professional settings. May be repeated up to 12 credits.

Learning Outcomes

1. Apply geographic concepts, methods, and analytical tools in a professional setting.
2. Demonstrate problem-solving and decision-making skills in an applied geographic project.
3. Communicate professional experiences and research findings effectively in written, verbal, or digital formats.
4. Evaluate the role of geographic expertise in public, private, and nonprofit sector work.

GEOG 598. Special Topics
1-3 Credits

This course provides an in-depth exploration of selected geographic topics that vary by semester and instructor. Course content may include readings, discussions, lectures, hands-on applications, and/or research projects that examine contemporary challenges, emerging trends, and specialized themes in geography. Specific topics will be announced in the Course Schedule. May be repeated up to 12 credits.

Learning Outcomes

1. Critically engage with geographic concepts, methods, and applications relevant to the selected topic.
2. Apply geographic reasoning and analytical skills to address topic-related problems.
3. Communicate ideas and findings effectively in written, verbal, visual, digital, or multimedia formats.
4. Conduct independent or collaborative research to develop deeper insights into the selected theme.

GEOG 599. Master's Thesis
1-12 Credits

This course supports master's students in conducting independent research for their thesis under the guidance of a faculty advisor and thesis committee. Students engage in all phases of the research process, including conceptualization, planning, implementation, management, and communication through written and verbal research reports. The course provides a structured framework for developing original geographic

research with intellectual merit and broader impacts. May be repeated up to 99 credits.

Learning Outcomes

1. Develop a rigorous and well-structured research design.
2. Accurately implement appropriate methods for data collection and analysis.
3. Correctly evaluate their research findings.
4. Effectively communicate the study's research design, findings, and significance in written and verbal formats.

GEOG 601. Geographic Theory and Application
3 Credits (3)

This graduate seminar provides an overview of geographic philosophies, methodologies, and the relationship between theory and practice. Students will explore key ontological, epistemological, and methodological debates that shape contemporary geographic research across human geography, physical geography, human-environment geography, and GIScience. Through critical discussions, written assignments, and a literature review in their area of interest, students will gain a broad understanding of how geographers approach research and engage with different intellectual traditions. Emphasizing intra- and interdisciplinary synthesis and collaboration, this course prepares students to articulate their research perspectives and work effectively across subfields.

Learning Outcomes

1. Evaluate contemporary philosophies and methodologies in major areas of geographical research.
2. Discuss diverse contemporary applications of geographic research.
3. Communicate effectively in written and oral formats.

GEOG 602. Integrative Research Design
3 Credits (3)

This graduate seminar guides students through the process of designing rigorous and impactful research projects. Students will explore quantitative, qualitative, critical, creative, and mixed-methods approaches, along with research frameworks, ethical considerations, proposal writing, and project management. Designed for students in geography and related fields, this hands-on course fosters critical thinking, collaboration, and effective communication, culminating in the development of a polished research proposal tailored to their goals.

Prerequisite: GEOG 601.

Learning Outcomes

1. Design a significant and feasible research project.
2. Evaluate strategies for successful project management and assessment.
3. Communicate effectively in written and oral formats.

GEOG 603. Professional Geographic Practice
3 Credits (3)

This core course equips students with essential professional skills for careers in academia, government, private industry, and nonprofit organizations. It covers professional communication, ethics, and grant proposal writing while also providing tailored training aligned with students' career goals. Depending on their focus, students may develop expertise in academic teaching, applied policy work, community engagement, or scientific communication. As all students in the doctoral geography program are expected to incorporate applied projects into their research, this course provides a foundation for integrating geographic expertise into real-world problem-solving.

Learning Outcomes

1. Explain the ways in which geographers contribute to research, policy development, and decision-making in professional contexts.
2. Communicate effectively with diverse audiences in academic, government, private sector, and nonprofit settings.
3. Evaluate ethical considerations in geographic research and practice.
4. Develop a competitive grant proposal that aligns with funding priorities and research goals.
5. Apply geographic expertise in a professional setting through a practical exercise in teaching, policy work, community engagement, or scientific communication.

GEOG 695. Independent Study
1-3 Credits (1-3)

This independent study course provides doctoral students with the opportunity to engage in focused learning under the guidance of a faculty mentor. Students will explore specialized topics aligned with their academic and professional interests, deepening their expertise through self-directed study. The course fosters critical inquiry, independent scholarship, and the application of geographic theories and methods to advanced research. May be repeated up to 6 credits.

Learning Outcomes

1. Develop specialized knowledge and skills in a chosen geographic topic through independent study and faculty mentorship.
2. Apply appropriate geographic theories, data, and methods to a self-directed research project.
3. Apply appropriate geographic theories, data, and methods to a self-directed research project.

GEOG 696. Supervised Research
3-9 Credits (3-9)

This supervised research course provides doctoral students with structured guidance as they prepare for key doctoral candidacy requirements, including comprehensive exams, dissertation proposal defenses, and funding applications. Under the mentorship of a faculty advisor, students will engage in independent study and research activities tailored to their dissertation focus. The course emphasizes critical engagement with scholarly literature, research design, and professional communication, equipping students with the skills needed for the next stage of their doctoral journey. May be repeated up to 18 credits.

Learning Outcomes

1. Explain key geographic theories and methodologies in both broad disciplinary contexts and in relation to their specific research focus.
2. Develop a well-structured and persuasive research proposal, including both a written document and an oral presentation.
3. Pursue funding opportunities through grant applications or other funding mechanisms.

GEOG 700. Doctoral Dissertation
1-18 Credits

This highly individualized research course is designed for doctoral students who have completed their comprehensive exams and are actively working on their dissertation. Under the guidance of a faculty advisor and dissertation committee, students refine their research design, conduct independent research, and produce a significant contribution to the field of geography. The course emphasizes advanced research skills, scholarly writing, and professional dissemination of findings. May be repeated up to 99 credits.

Learning Outcomes

1. Expand expertise in a specialized area of geographic research through independent study.

2. Execute a rigorous, original research project that contributes to the field.
3. Apply advanced methods of data collection, analysis, and synthesis in geographic research.
4. Communicate research findings effectively through scholarly writing and presentations.
5. Demonstrate project management skills in organizing, executing, and completing a doctoral dissertation.

Contact Info

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- Master of Applied Geography & Ph.D. in Geography: Dr. Eric Magrane, Breland Hall 145, (575) 646-1819, magrane@nmsu.edu
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Department Website: https://geography.nmsu.edu

Geography (Environmental Studies) - Bachelor of Science

Overview

The Department of Geography and Environmental Studies offers a Bachelor of Science in Geography with a concentration in Environmental Studies. This major provides students with a strong foundation in geography, the study of how people and the environment interact across space and time, and introduces key methods such as mapping.

Unlike the concentration in Geographic Information Science and Technology, the Environmental Studies concentration emphasizes integrating insights from the natural sciences, social sciences, and humanities to tackle environmental challenges using qualitative methods.

Graduates pursue careers in fields such as environmental consulting, policy, education, outreach, advocacy, conservation, natural resource management, renewable energy, environmental health, and sustainability.

Program Learning Outcomes

Upon completion of the B.S. in Geography with a concentration in Environmental Studies, students will be able to:

1. Apply geographic concepts and methods to critically evaluate human and/or environmental problems.
2. Articulate potential ethical solutions to human and/or environmental problems using critical thinking.
3. Communicate effectively in verbal, written, and/or visual formats with diverse audiences.

More Information

See the Requirements tab for details on course and credit expectations for earning the B.S. in Geography with a concentration in Environmental Studies, and the Roadmap tab for a suggested course sequence.

Course and Credit Requirements

The Department of Geography and Environmental Studies offers a Bachelor of Science in Geography with a concentration in Environmental Studies. This major provides students with a strong foundation in geography, the study of how people and the environment interact across space and time, and introduces key methods such as mapping. Unlike the concentration in Geographic Information Science and Technology, the Environmental Studies concentration emphasizes integrating insights from the natural sciences, social sciences, and humanities to tackle environmental challenges using qualitative methods. Career paths for graduates include environmental consulting, policy, education, outreach, advocacy, conservation, natural resource management, renewable energy, environmental health, and sustainability.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. A grade of "C-" or better is required for all courses taken for the major. Students may not take any of these courses S/U.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
or ENGL 2215G	Advanced Technical and Professional Communication	
or ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
COMM 1115G	Introduction to Communication	3
or COMM 1130G	Public Speaking	
or HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra	3
or MATH 1250G	Trigonometry & Pre-Calculus	
or MATH 1350G	Introduction to Statistics	
or MATH 2350G	Statistical Methods	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
GEOG 1110G	Physical Geography (Departmental Requirement)	4
GEOG 1120G	World Regional Geography (Departmental Requirement)	3
GEOG 1130G	Human Geography (Departmental Requirement)	3
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		

MATH 1350G	Introduction to Statistics	3
or MATH 2350G	Statistical Methods	
Viewing a Wider World [2]		**6**
Departmental/College Requirements		
Foundational Mapping Courses		
GEOG 2130	Map Analysis & Interpretation	3
GEOG 381	Cartography and GIS	4
Human Geography, Physical Geography, and Environmental Studies Courses		*24-25*
Select 24-25 credits from the following, choosing at least two courses from each of these three areas: Physical Geography, Human Geography, and Environmental Studies.		
Physical Geography		
GEOG 351	Biogeography	
GEOG 353	Geomorphology	
GEOG 357	Weather & Climate: Earth's Dynamic Atmosphere	
GEOG 452	Landscape Ecology	
Human Geography		
GEOG 361V	Challenges and Opportunities of Globalization	
GEOG 363V	Culture, Nature, and the Environment	
GEOG 365V	The City	
Environmental Studies [5]		
GEOG 325V	New Mexico and the American West	
GEOG 326	U.S. National Parks	
GEOG 328V	Environment and Society of Latin America	
GEOG 331V	Environment and Society of Europe	
GEOG 435	Planning a Sustainable World	
GEOG 455	Southwest Environments	
GEOG 483	Field Explorations in Geography	
Second Language Requirement (required - see below)		*6-8*
Electives, to bring the total credits to 120 [3]		**42-45**
15 credits must be Upper Division		
Total Credits		**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. See the Viewing a Wider World (p. 266) (VWW) section of the catalog for a full list of courses. Geography students are required to complete two VWW courses, totaling 6 credits. One VWW course must be selected from outside the College of Arts and Sciences, and the other must be from outside the Department of Geography and Environmental Studies. Students may substitute three credits earned through a Study Abroad Experience for one of the VWW course requirements.
3. Elective credits may vary depending on factors such as General Education course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount listed in the requirements is what's needed to reach the total of 120 credits but may vary based on the specific degree. However, students may need to complete more or fewer credits on a case-by-case basis, so it's important to discuss elective requirements with an advisor.

Second Language Requirement

For the Bachelor of Science in Geography with a concentration in Environmental Studies, all majors must demonstrate one-year proficiency in a foreign language (through the 1120 level, completed with a C- or better) or equivalent/placement. The options to fulfill this requirement are listed below. The number of credits required may vary depending on the student's existing language proficiency. Consult an advisor for more information on the courses needed to fulfill the second language requirement for this degree. Please note that language immersion courses are available through the Office of Experiential Learning and Education Abroad.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II	3-6
or SPAN 2210	Spanish for Heritage Learners III	

Option 2:

Prefix	Title	Credits
Complete 6 additional upper-division Geography credits beyond the major requirements.		**6**

Option 3:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 4:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
FREN 1120	French II	4
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
OR		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 5:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 6:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 7:
By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 8:
By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 9:
In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra (or an alternative "Area II: Mathematics" course listed under the Requirements tab in the catalog) and in ENGL 1110G Composition I (or in an alternative "English Composition - Level I" course listed under the Requirements tab in the catalog) . The contents and order of this roadmap may vary depending on initial student placement in Mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. A grade of "C-" or better is required for all courses taken for the major. Students may not take any of these courses S/U.

First Year		Credits
GEOG 1110G	Physical Geography	4
GEOG 1120G	World Regional Geography	3
GEOG 1130G	Human Geography	3
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
MATH 1220G or MATH 1250G or MATH 1350G or MATH 2350G	College Algebra or Trigonometry & Pre-Calculus or Introduction to Statistics or Statistical Methods	3
Area V: Humanities Course [1]		3
Area VI: Creative and Fine Arts Course [1]		3
Elective Course(s) or FYEX 1112 [2]		7
	Credits	**30**
Second Year		
GEOG 2130	Map Analysis & Interpretation	3
Choose one of the following Physical Geography courses		3-4
GEOG 351	Biogeography	
GEOG 353	Geomorphology	
GEOG 357	Weather & Climate: Earth's Dynamic Atmosphere	
GEOG 452	Landscape Ecology	
Choose one of the following Human Geography courses		3
GEOG 361V	Challenges and Opportunities of Globalization	
GEOG 363V	Culture, Nature, and the Environment	
GEOG 365V	The City	
ENGL 2210G or ENGL 2210H or ENGL 2215G or ENGL 2221G	Professional and Technical Communication or Professional and Technical Communication or Advanced Technical and Professional Communication or Writing in the Humanities and Social Science	3
COMM 1115G or COMM 1130G or HNRS 2175G	Introduction to Communication or Public Speaking or Introduction to Communication Honors	3
MATH 1350G or MATH 2350G	Introduction to Statistics or Statistical Methods	3
Second Language [3]		3-4
Second Language [3]		3-4
Elective Course [2]		6
	Credits	**30-33**
Third Year		
GEOG 381	Cartography and GIS	4
Choose two of the following Environmental Studies courses:		6
GEOG 325V	New Mexico and the American West	
GEOG 326	U.S. National Parks	
GEOG 328V	Environment and Society of Latin America	
GEOG 331V	Environment and Society of Europe	
GEOG 361V	Challenges and Opportunities of Globalization	
GEOG 435	Planning a Sustainable World	
GEOG 455	Southwest Environments	
GEOG 483	Field Explorations in Geography	
Choose one Physical Geography course [4]		3-4
Choose one Human Geography course [4]		3
VWW - Viewing a Wider World Course(s) [5]		6
Elective Course(s) [2]		9
	Credits	**31-32**
Fourth Year		
Choose two courses from the available Physical Geography, Human Geography, and Environmental Studies course options [4]		6-7
Elective Course(s) - Upper Division [2]		15
Consider taking one or more of GIS&T courses or more Physical Geography, Human Geography, and Environmental Studies courses [4,6]		
Elective Courses(s) [2]		8
	Credits	**29-30**
	Total Credits	**120-125**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. Elective credits may vary depending on factors such as General Education course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount listed in the requirements is what's needed to reach the total of 120 credits but may vary based on the specific degree. However, students may need to complete more or fewer credits on a case-by-case basis, so it's important to discuss elective requirements with an advisor.
3. The Second Language requirement can be fulfilled using one of nine available options detailed under the Requirements tab in the catalog. The Department of Geography and Environmental Studies recommends Option 1 (language courses numbered 1110 and 1120) or Option 2 (two upper-division GEOG courses totaling 6-8 credits). Additionally, immersion courses abroad, available through Study Abroad, may substitute for courses in the Second Language sequence.
4. Physical Geography course options: GEOG 351 Biogeography, GEOG 353 Geomorphology, GEOG 357 Weather & Climate: Earth's Dynamic Atmosphere, GEOG 452 Landscape Ecology Human Geography course options: GEOG 361V Challenges and Opportunities of Globalization, GEOG 363V Culture, Nature, and the Environment, GEOG 365V The City

Environmental Studies course options: GEOG 325V New Mexico and the American West, GEOG 326 U.S. National Parks, GEOG 328V Environment and Society of Latin America, GEOG 331V Environment and Society of Europe, GEOG 435 Planning a Sustainable World, GEOG 455 Southwest Environments, GEOG 483 Field Explorations in Geography

[5] See the Viewing a Wider World (p. 266) (VWW) section of the catalog for a full list of courses. Geography students are required to complete two VWW courses, totaling 6 credits. One VWW course must be selected from outside the College of Arts and Sciences, and the other must be from outside the Department of Geography and Environmental Studies. Students may substitute three credits earned through a Study Abroad Experience for one of the VWW course requirements.

[6] Introductory GIS&T course options: GEOG 373 Introduction to Remote Sensing, GEOG 481 Fundamentals of GIS
Advanced GIS&T course options: GEOG 473 Advanced Remote Sensing, GEOG 442 Programming for GIS, GEOG 485 Spatial Analysis and Modeling

Geography (Geographic Information Science and Technology) - Bachelor of Science

Overview

The Department of Geography and Environmental Studies offers a Bachelor of Science in Geography with a concentration in Geographic Information Science and Technology (GIS&T). This major provides students with a strong foundation in geography, the study of how people and the environment interact across space and time, and introduces diverse concepts and methods from the natural sciences, social sciences, and humanities.

Unlike the concentration in Environmental Studies, the GIS&T concentration focuses on the collection, analysis, and visualization of geospatial data using various technologies for tackling human and/or environmental challenges.

Graduates pursue careers in fields such as data and information management, urban and regional planning, cultural and natural resources management, emergency management, and public health.

Program Learning Outcomes

Upon completion of the B.S. in Geography with a concentration in Geographic Information Science & Technology, students will be able to:

1. Apply geographic concepts and methods to critically evaluate human and/or environmental problems.
2. Articulate potential ethical solutions to human and/or environmental problems using critical thinking.
3. Communicate effectively in verbal, written, and/or visual formats with diverse audiences.

More Information

See the Requirements tab for details on course and credit expectations for earning the B.S. in Geography with a concentration in Environmental Studies, and the Roadmap tab for a suggested course sequence.

Course and Credit Requirements

The Department of Geography and Environmental Studies offers a Bachelor of Science in Geography with a concentration in Geographic Information Science and Technology (GIS&T). This major provides students with a strong foundation in geography, the study of how people and the environment interact across space and time, and introduces diverse concepts and methods from the natural sciences, social sciences, and humanities. Unlike the concentration in Environmental Studies, the GIS&T concentration focuses on the collection, analysis, and visualization of geospatial data using various technologies for tackling human and/or environmental challenges. Career opportunities for students pursuing this major span diverse fields, including data and information management, urban and regional planning, cultural and natural resources management, emergency management, and public health.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. A grade of "C-" or better is required for all courses taken for the major. Students may not take any of these courses S/U.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
or ENGL 2215G	Advanced Technical and Professional Communication	
or ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
COMM 1115G	Introduction to Communication	3
or COMM 1130G	Public Speaking	
or HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra	3
or MATH 1250G	Trigonometry & Pre-Calculus	
or MATH 1350G	Introduction to Statistics	
or MATH 2350G	Statistical Methods	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
GEOG 1110G	Physical Geography (Departmental Requirement)	
GEOG 1120G	World Regional Geography (Departmental Requirement)	
or GEOG 1130G	Human Geography	
Either an Area III/IV Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1350G	Introduction to Statistics	3
or MATH 2350G	Statistical Methods	
Viewing a Wider World [2]		**6**

Departmental/College Requirements		
Introductory GIS&T Courses		
GEOG 2130	Map Analysis & Interpretation	3
GEOG 373	Introduction to Remote Sensing	4
GEOG 381	Cartography and GIS	4
GEOG 481	Fundamentals of GIS	4
Advanced GIS&T Courses		
GEOG 473	Advanced Remote Sensing	4
GEOG 442	Programming for GIS	3
GEOG 485	Spatial Analysis and Modeling	3
Human Geography, Physical Geography, and Environmental Studies Courses		*12-13*
Select 12-13 credits from the following, choosing at least one course from each of these three areas: Physical Geography, Human Geography, and Environmental Studies.		
Physical Geography		
GEOG 351	Biogeography	
GEOG 353	Geomorphology	
GEOG 357	Weather & Climate: Earth's Dynamic Atmosphere	
GEOG 452	Landscape Ecology	
Human Geography		
GEOG 361V	Challenges and Opportunities of Globalization	
GEOG 363V	Culture, Nature, and the Environment	
GEOG 365V	The City	
Environmental Studies		
GEOG 325V	New Mexico and the American West	
GEOG 326	U.S. National Parks	
GEOG 328V	Environment and Society of Latin America	
GEOG 331V	Environment and Society of Europe	
GEOG 435	Planning a Sustainable World	
GEOG 455	Southwest Environments	
GEOG 483	Field Explorations in Geography	
Second Language Requirement (required - see below)		*6-8*
Electives, to bring the total credits to 120 [3]		**35-39**
9 credits must be upper-division		
Total Credits		**120**

1 See the General Education (p. 262) section of the catalog for a full list of courses.

2 See the Viewing a Wider World (p. 266) (VWW) section of the catalog for a full list of courses. Geography students are required to complete two VWW courses, totaling 6 credits. One VWW course must be selected from outside the College of Arts and Sciences, and the other must be from outside the Department of Geography and Environmental Studies. Students may substitute three credits earned through a Study Abroad Experience for one of the VWW course requirements.

3 Elective credits may vary depending on factors such as General Education course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount listed in the requirements is what's needed to reach the total of 120 credits but may vary based on the specific degree. However, students may need to complete more or fewer credits on a case-by-case basis, so it's important to discuss elective requirements with an advisor.

Second Language Requirement

For the Bachelor of Science in Geography with a concentration in Environmental Studies, all majors must demonstrate one-year proficiency in a foreign language (through the 1120 level, completed with a C- or better) or equivalent/placement. The options to fulfill this requirement are listed below. The number of credits required may vary depending on the student's existing language proficiency. Consult an advisor for more information on the courses needed to fulfill the second language requirement for this degree. Please note that language immersion courses are available through the Office of Experiential Learning and Education Abroad.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120	French I and French II	8
GRMN 1110 & GRMN 1120	German I and German II	8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II	3-6
or SPAN 2210	Spanish for Heritage Learners III	

Option 2:

Prefix	Title	Credits
Complete 6 additional upper-division Geography credits beyond the major requirements.		**6**

Option 3:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 4:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
FREN 1120	French II	4
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
OR		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 5:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 6:
Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 7:
By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 8:
By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 9:
In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra (or an alternative "Area II: Mathematics" course listed under the Requirements tab in the catalog) and in ENGL 1110G Composition I (or in an alternative "English Composition - Level I" course listed under the Requirements tab in the catalog) . The contents and order of this roadmap may vary depending on initial student placement in Mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. A grade of "C-" or better is required for all courses taken for the major. Students may not take any of these courses S/U.

First Year		Credits
GEOG 1110G	Physical Geography	4
GEOG 1120G or GEOG 1130G	World Regional Geography or Human Geography	3
GEOG 2130	Map Analysis & Interpretation	3
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
MATH 1220G or MATH 1250G or MATH 1350G or MATH 2350G	College Algebra or Trigonometry & Pre-Calculus or Introduction to Statistics or Statistical Methods	3
Area VI: Creative and Fine Arts Course [1]		3
Area V: Humanities Course [1]		3
Elective Course(s) or FYEX 1112 [2]		6
	Credits	**29**
Second Year		
GEOG 381	Cartography and GIS	4
GEOG 481	Fundamentals of GIS	4
ENGL 2210G or ENGL 2210H or ENGL 2215G or ENGL 2221G	Professional and Technical Communication or Professional and Technical Communication or Advanced Technical and Professional Communication or Writing in the Humanities and Social Science	3
COMM 1115G or COMM 1130G or HNRS 2175G	Introduction to Communication or Public Speaking or Introduction to Communication Honors	3
MATH 1350G or MATH 2350G	Introduction to Statistics or Statistical Methods	3
Area III: Laboratory Science or Area IV: Social/Behavioral Science Course [1]		3-4
Second Language [3]		3-4
Second Language [3]		3-4
Elective Courses(s) [2]		6
	Credits	**32-35**
Third Year		
GEOG 373	Introduction to Remote Sensing	4
GEOG 442	Programming for GIS	3
Select one of the following Physical Geography courses		3-4
GEOG 351	Biogeography	
GEOG 353	Geomorphology	
GEOG 357	Weather & Climate: Earth's Dynamic Atmosphere	
GEOG 452	Landscape Ecology	
Select one of the following Human Geography courses		3
GEOG 361V	Challenges and Opportunities of Globalization	
GEOG 363V	Culture, Nature, and the Environment	
GEOG 365V	The City	
Select one of the following Environmental Studies courses		3
GEOG 325V	New Mexico and the American West (C- or better)	
GEOG 326	U.S. National Parks (C- or better)	
GEOG 328V	Environment and Society of Latin America (C- or better)	
GEOG 331V	Environment and Society of Europe (C- or better)	
GEOG 435	Planning a Sustainable World	
GEOG 483	Field Explorations in Geography (C- or better)	
VWW- Viewing a Wider World Course [4]		6
Elective Course(s) [2]		9
	Credits	**31-32**
Fourth Year		
GEOG 473	Advanced Remote Sensing (C- or better)	4
GEOG 485	Spatial Analysis and Modeling	3
Select a Human Geography, Physical Geography, or Environmental Studies course [5]		3-4
Elective Course - Upper Division [2]		6
Consider taking more of Physical Geography, Human Geography, and Environmental Studies courses [5]		
Elective Course(s) [2]		12
	Credits	**28-29**
	Total Credits	**120-125**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. Elective credits may vary depending on factors such as General Education course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount listed in the requirements is what's needed to reach the total of 120 credits but may vary based on the specific degree. However, students may need to complete more or fewer credits on a case-by-case basis, so it's important to discuss elective requirements with an advisor.
3. The Second Language requirement can be fulfilled using one of nine available options detailed under the Requirements tab in the catalog. The Department of Geography and Environmental Studies recommends Option 1 (language courses numbered 1110 and 1120) or Option 2 (two upper-division GEOG courses totaling 6-8 credits). Additionally,

immersion courses abroad, available through Study Abroad, may substitute for courses in the Second Language sequence.

[4] See the Viewing a Wider World (p. 266) (VWW) section of the catalog for a full list of courses. Geography students are required to complete two VWW courses, totaling 6 credits. One VWW course must be selected from outside the College of Arts and Sciences, and the other must be from outside the Department of Geography and Environmental Studies. Students may substitute three credits earned through a Study Abroad Experience for one of the VWW course requirements.

[5] Physical Geography course options: GEOG 351 Biogeography, GEOG 353 Geomorphology, GEOG 357 Weather & Climate: Earth's Dynamic Atmosphere, GEOG 452 Landscape Ecology
Human Geography course options: GEOG 361V Challenges and Opportunities of Globalization, GEOG 363V Culture, Nature, and the Environment, GEOG 365V The City
Environmental Studies course options: GEOG 325V New Mexico and the American West, GEOG 326 U.S. National Parks, GEOG 328V Environment and Society of Latin America, GEOG 331V Environment and Society of Europe, GEOG 435 Planning a Sustainable World, GEOG 455 Southwest Environments, GEOG 483 Field Explorations in Geography

Geographic Information Science and Technology - Undergraduate Minor

Overview

The Department of Geography and Environmental Studies offers an Undergraduate Minor in Geographic Information Science and Technology (GIS&T). This minor is available to all undergraduate students, except Geography majors, and provides a valuable concentration for those seeking jobs that involve spatial data collection and analysis.

Career opportunities span diverse fields, including data and information management, urban and regional planning, water resource management, ecology, cultural resource management, emergency management, and public health.

Program Learning Outcomes

Upon completion of the Undergraduate Minor in Geographic Information Science & Technology, students will be able to:

1. Think spatially, geographically, and geospatially.
2. Explain basic and advanced concepts, methods, and applications in geographic information science and technology, including geographic information systems and remote sensing.
3. Solve real-world problems by acquiring, analyzing, interpreting, evaluating, and visualizing spatial data.

More Information

See the Requirements tab for details on course and credit expectations for earning the Undergraduate Minor in GIS&T.

Course and Credit Requirements

The Department of Geography and Environmental Studies offers an undergraduate minor in Geographic Information Science and Technology (GIS&T). This minor is available to all undergraduate students, except Geography majors, and provides a valuable concentration for those pursuing professional careers that involve spatial data collection and analysis. Career opportunities span diverse fields, including data and information management, urban and regional planning, water resource management, ecology, cultural resource management, emergency management, and public health.

To earn the undergraduate minor in GIS&T, students must complete the following required courses, totaling 18-19 credits. All courses must be taken for a letter grade, with a minimum grade of C- required in each course.

Prefix	Title	Credits
Departmental Requirements		
GEOG 373	Introduction to Remote Sensing	4
GEOG 381	Cartography and GIS	4
GEOG 481	Fundamentals of GIS	4
Select 6-7 credits from the following:		6-7
GEOG 442	Programming for GIS	
GEOG 473	Advanced Remote Sensing	
GEOG 485	Spatial Analysis and Modeling	
GEOG 488	GIS and Water Resources	
Total Credits		**18-19**

Geography - Undergraduate Minor

Overview

The Department of Geography and Environmental Studies offers an Undergraduate Minor in Geography. This minor is available to all undergraduate students, except Geography majors, and provides a valuable concentration for those seeking jobs that require an understanding of the complex interactions between humans and the environment.

Graduates find career opportunities in diverse fields such as environmental consulting, policy, education, outreach, and advocacy; conservation and natural resource management; renewable energy and environmental health; and sustainability and corporate social responsibility.

Program Learning Outcomes

Upon completion of the Undergraduate Minor in Geography, students will be able to:

1. Apply geographic concepts and methods to critically evaluate human and/or environmental problems.
2. Articulate potential ethical solutions to human and/or environmental problems using critical thinking.
3. Communicate effectively in verbal, written, and/or visual formats with diverse audiences,

More Information

See the Requirements tab for details on course and credit expectations for earning the Undergraduate Minor in Geography.

Course and Credit Requirements

The Department of Geography and Environmental Studies offers an undergraduate minor in Geography. This minor is available to all undergraduate students, except Geography majors, and provides a valuable concentration for those pursuing professional careers that require an understanding of the complex interactions between humans

and the environment. Career opportunities span diverse fields, including environmental consulting, policy, education, outreach, and advocacy; conservation and natural resource management; renewable energy and environmental health; and sustainability and corporate social responsibility.

To earn the undergraduate minor in Geography, students must complete the following required courses, totaling 18-20 credits. All courses must be taken for a letter grade, with a minimum grade of C- required in each course.

Prefix	Title	Credits
Departmental Requirements		
GEOG 1110G	Physical Geography	4
GEOG 1120G	World Regional Geography	3
or GEOG 1130G	Human Geography	
Select 3-4 credits from the following:		3-4
GEOG 2130	Map Use and Analysis	
GEOG 373	Introduction to Remote Sensing	
GEOG 381	Cartography and GIS	
GEOG 481	Fundamentals of GIS	
Select 9-10 credits from the following, choosing courses from at least two of these three areas: Physical Geography, Human Geography, and Environmental Studies.		9-10
Physical Geography		
GEOG 351	Biogeography	
GEOG 353	Geomorphology	
GEOG 357	Weather & Climate: Earth's Dynamic Atmosphere Explored	
GEOG 452	Landscape Ecology	
Human Geography		
GEOG 361V	Challenges of Globalization	
GEOG 363V	Cultural Geography	
GEOG 365V	The City	
Environmental Studies		
GEOG 325V	New Mexico and the American West	
GEOG 326	U.S. National Parks	
GEOG 328V	Environment and Society of Latin America	
GEOG 331V	Europe	
GEOG 435	Planning a Sustainable World	
GEOG 455	Southwest Environments	
GEOG 483	Field Explorations in Geography	
Total Credits		**19-21**

Geological Sciences

Undergraduate Program Information

A degree in geology leads to a wide variety of career choices. Students can access careers in the geosciences through one of three concentrations in the BS Geology degree. The first concentration is Geological Sciences. This is a traditional geology curriculum, in which students take geology classes, augmented with calculus, physics, and chemistry; this concentration leads to graduate study in the geosciences and careers in industry, academia, government, and policy. The second concentration is Earth and Environmental Systems. Students take geology classes, augmented with a variety of environmental, economic, and political classes; this concentration leads to careers in the environmental industry. The third concentration is Earth Science Education. Students take geology and education classes, and are certified to teach science at New Mexico middle and high schools after completing the BS and one year of graduate work in the College of Education.

Students earning the BS in Geology, in any concentration, may also earn the Undergraduate Research Certificate in the Department of Geological Sciences. Completion of the Undergraduate Research Certificate includes completion of an undergraduate research project, participation in the department's undergraduate research meetings and one of the following:

1. a senior thesis;
2. a manuscript submitted for a publication; or
3. an oral or poster presentation at a national or regional meeting.

Undergraduate Research Certificates are presented at the department's annual awards ceremony.

Graduate Program Information

The Department of Geological Sciences offers graduate study leading to the Master of Science degree in geology. The department offers excellent laboratory facilities for research in mineralogy, igneous petrology, geochemistry, stratigraphy, geochronology, rock magnetism, paleomagnetism, and sedimentology. Available are a large, fully equipped rock preparation laboratory, mineral separation laboratory, plus computer, geochemical and petrographic labs. Major equipment includes a Gemini heavy mineral separation table, a class 1000 clean lab, Thermal Ionization Mass Spectrometry (TIMS) and Laser-Ablation Multi-Collector Inductively Coupled Plasma Mass Spectrometry (LA-MC-ICP-MS). The department maintains its own fleet of field vehicles. Also available are computing facilities that include an HP color plotter and GIS system. Financial support is available to graduate students in geology through teaching and research assistantships and scholarships. Inquiries regarding financial aid should be directed to the graduate advisor. Admission to the program is in accord with the general regulations of the Graduate School.

Degrees for the Department

Bachelor Degree(s)

- Geology (Earth and Environmental Sciences) - Bachelor of Science (p. 768)
- Geology (Earth Science Education) - Bachelor of Science (p. 771)
- Geology (Geological Sciences) - Bachelor of Science (p. 773)

Master Degree(s)

- Geology - Master of Science (p. 166)

Minors for the Department

- Geology - Undergraduate Minor (p. 776)

Professor, Eric C. Ferré, Department Head

Professors Amato, Ferré, Ramos; ***Associate Professor*** Hampton; **Assistant Professor** Flynn, Thines ***Adjunct Professors*** A. Peslier, A. Brandon; ***Emeritus Faculty*** Lawton, Mack, McMillan

E.C. Ferré, Department Head, Ph.D. (Paul Sabatier, Toulouse, France)– structural petrology; J. M. Amato, Ph.D. (Stanford)– structural geology, tectonics; A. G. Flynn Ph.D. (Baylor)- paleoclimatology; F. C. Ramos, Ph.D. (California- Los Angeles)– isotope geochemistry, petrology; B.A. Hampton, Ph.D. (Purdue)- sedimentology, tectonics; J. Thines, Ph.D. (U. Iowa)- volcanology, mineralogy, petrology; T.F. Lawton, Ph.D. (Emeritus)

(Arizona)- stratigraphy, basin analysis; G.H. Mack, Ph.D. (Emeritus) (Indiana-Bloomington)- sedimentary petrology, sedimentology; N. McMIllan, Ph.D. (Emerita) (Southern Methodist University)- petrology, geochemistry.

Geology Courses

GEOL 1110G. Physical Geology
4 Credits (3+3P)
Physical Geology is an introduction to our dynamic Earth introducing students to the materials that make up Earth (rocks and minerals) and the processes that create and modify the features of our planet. The course will help students learn how mountains are formed, how volcanoes erupt, where earthquakes occur, and how water, wind, and ice can shape landscapes. Students will also develop a basic understanding of the ways humans have altered the planet including our impact on natural resources and global climate change.
Learning Outcomes
1. Recall, describe or explain geologic vocabulary.
2. Identify or explain aspects of the geologic time scale and compare the uses and limitations of relative and absolute dating.
3. Recognize or explain the evidence used to support the theory of plate tectonics. Describe or identify how plate tectonics is related to the structure and features of the Earth.
4. Describe the formation of, and describe, compare, and classify minerals.
5. Identify or describe the three main rock types, how each forms in the context of the rock cycle and what each indicates about its environment of formation.
6. Recognize or explain the fundamentals of surface and groundwater hydrology and discuss the impact of human activities on water quality and quantity.
7. Describe or discuss the processes that are responsible for specific geologic hazards (e.g., earthquakes, volcanic eruptions, mass movement, flooding, etc.).
8. Recognize or describe the geologic processes involved in the formation and concentration of geologic resources.

GEOL 1150. Introduction to Rocks and Minerals
3 Credits (2+3P)
This course is an introduction to the characteristics and the formation of the three main types of rocks, the rock-forming minerals, and important ore minerals. An outline of Plate Tectonics will give students the basis to understand how many of these rocks and minerals form. In laboratory exercises, students will gain practice in describing and identifying hand-specimens of the main types of rocks and minerals.
Prerequisite(s)/Corequisite(s): GEOL 1110G.
Learning Outcomes
1. The student Identify the main rock-forming minerals from each mineral group as demonstrated by scoring a total of 70% or more on the relevant laboratory exercise component. Studying minerals, the student will: Identify the main minerals in hand specimens; Describe the environments in which these minerals form; Identify the rock types in which these minerals are found.
2. The student will understand the structure, composition, and genesis of rocks by identifying the principal igneous, sedimentary, and metamorphic rocks, as demonstrated by scoring a total of 70% or more on the relevant laboratory exercise components.
3. Studying rocks, the student will: Define the principal igneous processes and features, identify the most common igneous rocks and their constituting minerals in hand specimens, and discuss their origin and interpretation; Describe the principles of sedimentary processes and features, identify the most common sedimentary rocks in hand specimens, and discuss their origin and interpretation; Describe the principles of metamorphic processes and features, identify the most common metamorphic rocks and constituting minerals in hand specimens, and discuss their origin and interpretation.

GEOL 2996. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. Community Colleges only. May be repeated for a maximum of 12 credits.
Learning Outcomes
1. Varies

GEOL 305V. Fossils and the Evolution of Life
3 Credits (3)
Examination of the fossil record within the context of geologic time. Special emphasis on critical evaluation of possible terrestrial and extra-terrestrial causes for the evolution of plants and animals and for periods of mass extinction.

GEOL 312. Mineralogy and Optics
3 Credits (2+3P)
Principles of crystallography, optical mineralogy, and mineral chemistry as applied to the identification and characterization of rock-forming minerals. May be repeated up to 3 credits.
Prerequisite(s): GEOL 1110G and GEOL 1150.
Learning Outcomes
1. Students will understand how polarized light interacts with isotropic, uniaxial, and biaxial crystals.
2. Students will be able to recognize optical phenomena resulting from the interaction of polarized light with minerals.
3. Students will become proficient in the recognition of the major rock-forming minerals in thin section.
4. Students will recognize crystal faces according to the Miller Indices.
5. Students will be able to calculate the structural formula of any mineral.

GEOL 320. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

GEOL 335V. Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present
3 Credits (3)
This class willl provide an introduction to geologic hazards and natural disasters, their effects on society and the attempts at preparation and mitigation for these events. Hazards to be covered include earthquakes, volcanic eruptions, floods, landslides, hurricanes, tsunamis and others.

GEOL 353. Geomorphology
3 Credits (2+3P)
Examination of the principal theories and concepts of landform creation; exploration of the roles of structure, processes, climate, and time in the formation of various types of landforms. Cross-listed with GEOG 553 and GEOL 353.
Learning Outcomes
1. Outline the basic history of geomorphic theory and research methods.
2. Describe the trends and probable causes of Cenozoic climate change and its links to basic landform processes.

3. Describe the main landform processes including weathering, soil formation, hillslope evolution and associated natural hazards, fluvial processes, arid land processes, glacial/interglacial climates and processes.
4. Integrate field observations into basic landscape evolution reconstructions.
5. Design and implement a fluvial system experiment and analyze the data.

GEOL 360. General Geochemistry
3 Credits (3)
The chemistry of the earth and its parts, with emphasis on geochemical systems and cycles, distribution of the elements, and mineral equilibria. Crosslisted with: CHEM 360
Prerequisite(s): CHEM 1215G or CHEM 1120G.

GEOL 399. Igneous and Metamorphic Petrology
3 Credits (2+3P)
Mineralogical composition, classification, and genesis of igneous and metamorphic rocks. May be repeated up to 3 credits.
Prerequisite: GEOL 312 for geology majors, GEOL 1150 for majors other than geology.
Learning Outcomes
1. Students will learn to identify minerals and rocks in hand sample and using the petrographic microscope. Students will be expected to score above 70%on a set of eight laboratory exercises and a laboratory final exam.
2. Students will learn to understand the environments, sources, and processes involved in generating igneous rocks and metamorphic rocks I a range of geologic/tectonic environments.
3. Students will learn to write within the field of geology using Geological Society of America format. A 6-10 page paper will be required and will be graded using the Ramos writing rubric. Revisions will also be required.
4. Students will learn to present in standard GSA format (12 minute oral presentations using Powerpoint). Presentation will be graded using a rubric that evaluates presentation materials, presentation effectiveness, and presenter skills/behaviors related to their presentations.

GEOL 401. Geology Colloquium
1 Credit (1)
Presentations by visiting speakers and students. May be repeated up to 6 credits.

GEOL 420. Stratigraphy and Sedimentology
3 Credits (2+3P)
Identification and interpretation of sedimentary rocks with emphasis on classification, deposition, and stratal geometry. May be repeated up to 3 credits.
Prerequisite: GEOL 1150.
Learning Outcomes
1. Recognize patterns associated with physical and chemical weathering and erosion.
2. Identify and classify siliciclastic and chemical sedimentary rock and sediment.
3. Compare and contrast sedimentologic processes recorded in depositional, erosional, deformational, and biogenic sedimentary structures (i.e., facies).
4. Identify specific sedimentary facies associated with specific depositional environments.
5. Delineate between nonmarine, marginal marine, and deep marine environments.
6. Correlate stratigraphic successions and environments along strike and place in a tectonic and basin-scale context.

GEOL 424. Soil Chemistry
3 Credits (3)
Same as SOIL 424, CHEM 424.

GEOL 441. Tutorial Geology
2 Credits (1+3P)
Participation in teaching lower-division laboratories and conducting tutorial sessions. May be repeated for a total of 4 credits.
Prerequisite: junior or above standing and nomination by faculty.

GEOL 442. Zuhl Collection Internship
1-3 Credits (3-9P)
Applied experience with the NMSU Zuhl Collection, under supervision of the Zuhl Collection Director. Possible activities include developing displays, giving tours, developing outreach materials, etc. May be repeated up to 6 credits. Consent of Instructor required.

GEOL 444. GIS for Geology
3 Credits (3)
Tools-based introduction to using GIS software for solving problems in geology. Emphasis on effectively portraying and analyzing geologic maps. One required field trip. Crosslisted with: GEOG 544.
Prerequisite(s): GEOL 470.

GEOL 449. The Geological Profession
1 Credit (1)
Outcomes assessment exit exams. For graduating seniors only. May be repeated up to 1 credits.
Prerequisite(s): Graduating seniors only.

GEOL 452. Geohydrology
4 Credits (3+2P)
Origin, occurrence, and movement of fluids in porous media assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. May be repeated up to 4 credits. Crosslisted with: ENVS 452 and C E 452.

GEOL 455. Undergraduate Research
1-3 Credits
Geological research and field projects for the advanced student. May be repeated for a total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.
Prerequisite(s): Consent of instructor.

GEOL 465. Isotope Geochemistry
3 Credits (3)
Geochemistry of stable and radiogenic isotopes and its application to a wide range of problems in the earth and planetary sciences.
Prerequisite(s): CHEM 1225G, GEOL 360, GEOL 399.

GEOL 470. Structural Geology
3 Credits (2+3P)
Deformation of rocks of the earth. May be repeated up to 3 credits.
Prerequisite: GEOL 1150.
Learning Outcomes
1. Describe and analyze features in rocks produced by deformation, such as folds and faults.
2. Describe regional phases of structural geology and their relationship to plate tectonic processes.
3. Describe how understanding of deformational features informs plate tectonic models.

4. Describe how practical knowledge of structural geology is related to all fields of geology.

GEOL 471. Volcanology
3 Credits (3)
Identification and interpretation of volcanic deposits (including air fall, ash flow tuffs, surges, lava flows), with focus on how the characteristics of these deposits can reveal eruption styles and eruption dyanmics. Other topics covered include: magma migration and storage, volcanic hazards, volcano monitoring and volcanoes and climate. Crosslisted with: GEOL 571.
Prerequisite(s): GEOL 399.

GEOL 477. Special Problems
1-3 Credits
Selected advanced topics of current interest or importance. May be repeated for a total of 6 credits.
Prerequisite: consent of instructor.

GEOL 478. Petroleum Systems and Stratigraphy
3 Credits (2+3P)
Sedimentation, stratigraphy, depositional environments, and tectonics in relation to the occurrences and exploration of hydrocarbons. Course includes two off-campus field trips. May be repeated up to 3 credits.
Prerequisite(s): GEOL 420.

GEOL 480. Seminar
1-3 Credits
Supervised study of a subject not covered by regular courses. For organized group meetings treating selected advanced topics. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

GEOL 482. Zuhl Collection Internship
1-3 Credits (1-3)
Applied experience working with the Zuhl Collection of rocks, minerals, fossils, and petrified wood, supervised by the Director of the Zuhl Collection. Activities include tours, display development, research on aspects of the collection, and other work in the museum. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: GEOL majors.

GEOL 490. Field Geology
3 Credits (9P)
Mapping, instrumentation, and interpretation of geology in the field.
Prerequisites: either GEOL 420 and GEOL 470.

GEOL 491. Tectonic Evolution of North America
3 Credits (3)
Current ideas regarding the plate-tectonic evolution of North America from Archean through Holocene time, emphasizing the use of regional stratigraphy and structural geology to interpret mountain building, magmatism, and basin development.
Prerequisites: GEOL 1110G, GEOL 399, GEOL 420 and GEOL 470.

GEOL 495. Geology Field Camp
4 Credits (12P)
Three week intensive summer course. Geologic mapping in a site-based setting, emphasizing spatial relations, cross-section construction, and preparation of geologic reports. Prerequisite: GEOL 490

GEOL 499. Senior Thesis
1-3 Credits
Writing a formal paper describing original geologic research conducted under supervision of a faculty advisor. Restricted to majors.
Prerequisite: consent of instructor.

GEOL 501. Geology Colloquium
1 Credit (1)
Presentations by visiting speakers and graduate students.

GEOL 520. Selected Topics
1-3 Credits (1-3)
Selected topics in geology. Students must be in graduate standing to enroll. Consent of instructor requied. May be repeated up to 99 credits.
Learning Outcomes
1. Varies

GEOL 534. Tectonics of Sedimentary Basins
3 Credits (3)
Origin of sedimentary basins with emphasis on subsidence mechanisms, geometry of basin fill, depositional systems and tectonic setting. Course includes two off-campus field trips. Restricted to: GEOL majors May be repeated up to 3 credits. Prerequisite: .
Learning Outcomes
1. To be able to recognize sedimentary basin types in geologic and geomorphic environments.
2. To understand these aspects of sedimentary basins: plate tectonic setting/context, basement to basins (continental vs. oceanic/transitional lithosphere), structure and structural vergence, sedimentologic and stratigraphic signatures in the rock record, depositional systems, and basin-scale provenance.

GEOL 537. Topics in Volcanology
3 Credits (3)
A seminar-style class exploring volcanic processes. Course topics vary by semester and include: magmatism and volcanism at different tectonic settings (subduction zones, intraplate) and plumbing systems and eruptions of volcanoes (calderas, monogenetic volcanoes).

GEOL 544. GIS for Geology
3 Credits (3)
Tools-based introduction to using GIS software for solving problems in geology. Emphasis on effectively portraying and alayzing geologic maps. One required field trip. Taught with: GEOL 444. May be repeated up to 3 credits.
Learning Outcomes
1. A tools-based introduction to Geographic Information Systems software, specifically the ArcGIS package developed by ESRI.
2. Hands-on use of GIS software to make maps and analyze datasets that are commonly used by geoscientists.
3. Compiling and analyzing geologic mapping datasets collected from the field and from published literature.
4. Development of an awareness of how to find publicly accessible datasets and solutions to problems beyond the sample exercises presented in class.
5. Application of GIS to solve a problem.

GEOL 558. Neotectonics
3 Credits (3)
Recognition, measurement, and dating of deformation related to earthquakes in the Quaternary geologic record.

GEOL 562. Analytical Geochemistry
3 Credits (3)
Techniques used to determine the major element, trace element and isotopic composition of rocks and minerals and the determination of mineral structure.

GEOL 565. Isotope Geochemistry
3 Credits (3)

Trace element partitioning and isotope systematics applied to problems in petrology and ore genesis.

GEOL 571. Volcanology
3 Credits (3)
Identification and interpretation of volcanic deposits (including air fall, ash flow tuffs, surges, lava flows), with focus on how the characteristics of these deposits can reveal eruption styles and eruptions dynamics. Other topics covered include: magma migration and storage, volcanic hazards, volcano monitoring and volcanoes and climate. Crosslisted with: GEOL 471.

GEOL 578. Petroleum Systems and Stratigraphy
3 Credits (2+3P)
Sedimentation, stratigraphy, depositional environments and tectonics in relation to the occurences and exploration of hydrocarbons. Course includes two off-campus field trips.

GEOL 580. Tectonic Evolution of the Southwest USA
3 Credits (3)
Geologic history and tectonic evolution of the Western U.S. Cordillera from the Precambrian assembly of the craton to the recent history of rifting in the Rio Grande valley. Focus on the geology of the Southwest, particularly southern New Mexico, but also topics such as evolution of San Andreas fault system.
Learning Outcomes
1. Learn about the tectonic history of the Southwest United States across the time scale.
2. Learn how to communicate the results of others' work in speaking and writing.
3. Learn how to engage in a discussion of scientific results.
4. Learn details of subdisciplines other than your own interests.
5. Learn about geophysical methods.
6. Learn to improve reading comprehension.
7. Learn about geochronology.
8. Learn how different disciplines in the earth sciences are used to understand tectonics.

GEOL 582. Plate Tectonics
3 Credits (3)
Plate tectonics as a fundamental model for geological activity on a dynamic earth. Focuses on plate tectonic theory development and mechanisms, plus modern analogs of ancient processes.

GEOL 585. Geochronology
3 Credits (3)
The principles, analytical methods, and interpretation of the most common geochronologic methods.

GEOL 598. Special Research Programs
1-3 Credits
Investigations into contemporary geological problems. May be repeated for unlimited credit.
Prerequisites: graduate standing and consent of instructor.

GEOL 599. Master's Thesis
15 Credits
Thesis research. May be repeated up to 88 credits.

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Geology (Earth and Environmental Sciences) - Bachelor of Science

The concentration in geological sciences provides students with scientific insight as a foundation for careers in environmental earth science, environmental policy and resource management. Qualified students are also prepared for graduate study in these areas. This concentration does not prepare students for graduate study in the geological sciences; these students should follow the curriculum in the Geological Sciences Concentration.

Students must complete all University degree requirements, which include: **General Education requirements**, **Viewing a Wider World requirements**, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students must receive a C- or better in courses.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1,2]		*3-4*
MATH 1220G	College Algebra (or higher)	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
GEOL 1110G	Physical Geology	
or HNRS 2116G	Earth, Time and Life	
ECON 2120G	Principles of Microeconomics Honors	
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
Viewing A Wider World [3]		**6**
Departmental/College Requirements [4]		
GEOL 1150	Introduction to Rocks and Minerals	3
GEOL 305V	Fossils and the Evolution of Life	3
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	3
GEOL 353	Geomorphology	3
GEOL 360	General Geochemistry	3
GEOL 420	Stratigraphy and Sedimentology	3
GEOL 449	The Geological Profession	1
GEOL 452	Geohydrology	4
GEOL 470	Structural Geology	3

Departmental Elective Requirements (select 9 credits from the following) [4]		**9**
GEOL 312	Mineralogy and Optics	
GEOL 399	Igneous and Metamorphic Petrology	
GEOL 465	Isotope Geochemistry	
GEOL 478	Petroleum Systems and Stratigraphy	
GEOL 480	Seminar	
GEOL 490	Field Geology	
GEOL 491	Tectonic Evolution of North America	
GEOL 495	Geology Field Camp	
Non-Departmental Requirements (in addition to Gen.Ed/VWW) [4]		
Choose one from the following:		3
A ST 311	Statistical Applications	
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
AEEC 3120V	Natural Resource Economics	3
or AEEC 3130V	Water Resource Economics	
GEOG 381	Cartography and GIS	4
PHYS 1230G	Algebra-Based Physics I	3
or PHYS 2230G	General Physics for Life Science I	
PHYS 1230L	Algebra-Based Physics I Lab	1
or PHYS 2230L	Laboratory to General Physics for Life Science I	
Second Language Requirement: (required- see below)		
Select 8 credits from two semesters of a second language (see the section at the bottom of the page)		8
Non-Departmental Electives (choose 12-14 credits from the following) [4]		**12-14**
SOIL 2110 & 2110L	Introduction to Soil Science and Introduction to Soil Science Laboratory	
SOIL 370	Environmental Soil Science	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
or CHEM 2115	Survey of Organic Chemistry and Laboratory	
POLS 320	Making Public Policy	
GEOG 373	Introduction to Remote Sensing	
GEOG 473	Advanced Remote Sensing	
EPWS 380V	Science & Society	
RGSC 2110	Introduction to Rangeland Management	
RGSC 302V	Forestry and Society	
GEOL courses: 300-400 level GEOL courses other than those used to satisfy the departmental requirements and electives		
Electives, to bring the total credits to 120 [5]		**8-11**
Total Credits		**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. For any Mathematics course selection students may need to take any prerequisites needed to enter the class(es) first.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4. May not be taken S/U and a grade of C- or better must be earned.
5. Elective credit may vary based on Math course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Students must work closely with their advisors in order to plan programs that allow them to meet all requirements and earn sufficient upper-division credit.

Second Language Requirement

For the Bachelor of Science in the Geology there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120	French I and French II	8
GRMN 1110 & GRMN 1120	German I and German II	8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II	3-6
or SPAN 2210	Spanish for Heritage Learners III	

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
FREN 1120	French II	4
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
OR		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300/3000 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:
Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:
By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:
By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:
In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in ENGL 1110G Composition I and MATH 1220G College Algebra . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
GEOL 1110G or HNRS 2116G	Physical Geology or Earth, Time and Life	4
MATH 1220G	College Algebra (or higher)	3
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
HNRS 2175G	Introduction to Communication Honors	
Area V: Humanities Course [1]		3
Area VI:Creative and Fine Arts Course [1]		3
	Credits	**16**
Semester 2		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
Elective		1
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
ECON 2120G	Principles of Microeconomics Honors	3
	Credits	**16**
Second Year		
Semester 1		
GEOL 1150	Introduction to Rocks and Minerals	3
GEOL 305V	Fossils and the Evolution of Life	3
PHYS 1230G or PHYS 2230G	Algebra-Based Physics I or General Physics for Life Science I	3
PHYS 1230L or PHYS 2230L	Algebra-Based Physics I Lab or Laboratory to General Physics for Life Science I	1
PHYS 2231	Supplemental Instruction to General Physics for Life Sciences I	1
Second Language, first course in sequence [2]		4
	Credits	**15**
Semester 2		
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	3
GEOL 420	Stratigraphy and Sedimentology	3
Second language, second course in sequence [2]		4
Non-Departmental Elective Course [3]		3
Elective Course [4]		3
	Credits	**16**
Third Year		
Semester 1		
GEOL 353	Geomorphology	3
GEOL 360	General Geochemistry	3
Geology Departmental Elective Course [5]		3
English Composition Level 2 [1]		3
Viewing the Wider World [6]		3
	Credits	**15**
Semester 2		
Geology Departmental Elective Course [5]		3
GEOG 381	Cartography and GIS	4
AEEC 3120V or AEEC 3130V	Natural Resource Economics or Water Resource Economics	3
Non-Departmental Elective Course [3]		3
Elective Course [4]		3
	Credits	**16**
Fourth Year		
Semester 1		
GEOL 470	Structural Geology	3
GEOL 452	Geohydrology	4
A ST 311 or MATH 1350G or MATH 2350G	Statistical Applications or Introduction to Statistics or Statistical Methods	3
Viewing the Wider World [6]		3
Non-Departmental Elective Course [3]		3
	Credits	**16**
Semester 2		
GEOL 449	The Geological Profession	1
Geology Departmental Elective course [5]		3
Non-Departmental Elective Course [3]		3
Elective Course [4]		3
	Credits	**10**
	Total Credits	**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. See the Second Language section of the Requirements Tab (p. 768) for this degree for more information.
3. **Non-Departmental Elective Courses:**

- SOIL 2110 Introduction to Soil Science/SOIL 2110L Introduction to Soil Science Laboratory
- SOIL 370 Environmental Soil Science
- CHEM 1225G General Chemistry II Lecture and Laboratory for STEM Majors
- CHEM 2115 Survey of Organic Chemistry and Laboratory
- POLS 320 Making Public Policy
- GEOG 373 Introduction to Remote Sensing
- GEOG 473 Advanced Remote Sensing
- EPWS 380V Science & Society
- RGSC 2110 Introduction to Rangeland Management
- RGSC 302V Forestry and Society
- GEOL courses: 300-400 level courses other than those used to satisfy the Departmental Requirements and Departmental Electives

[4] Elective credit may vary depending on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credit in the requirement list is the amount needed to bring the total to 120 credits and may vary based on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss this with their advisor.

[5] **Departmental Electives:**

- GEOL 312 Mineralogy and Optics
- GEOL 399 Igneous and Metamorphic Petrology
- GEOL 465 Isotope Geochemistry
- GEOL 478 Petroleum Systems and Stratigraphy
- GEOL 480 Seminar
- GEOL 490 Field Geology
- GEOL 491 Tectonic Evolution of North America
- GEOL 495 Geology Field Camp

[6] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Geology (Earth Science Education) - Bachelor of Science

The concentration in earth science education is a collaboration between the Department of Geological Sciences and the Department of Curriculum and Instruction in the College of Education. In this option, students earn a Secondary Licensure as well as a Bachelor of Science in Geology, and become qualified to teach the Broad Sciences at the middle and high school levels. Students take one year of graduate classes in the College of Education to complete the Secondary Licensure.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
	English Composition - Level 1 [1]	
	English Composition - Level 2 [1]	
	Oral Communication [1]	
Area II: Mathematics [1,2]		*3*
MATH 1220G	College Algebra (or higher)	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
GEOL 1110G	Physical Geology	
or HNRS 2116G	Earth, Time and Life	
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
or ASTR 1120G	The Planets Lecture & Laboratory	
CEPY 1120G	Human Growth and Behavior	
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
Viewing A Wider World [3]		**6**
Departmental/College Requirements [4]		
GEOL 1150	Introduction to Rocks and Minerals	3
GEOL 305V	Fossils and the Evolution of Life	3
GEOL 420	Stratigraphy and Sedimentology	3
GEOL 449	The Geological Profession	1
Geology Departmental Electives (choose four of these courses)		**12**
GEOL 312	Mineralogy and Optics	
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	
GEOL 360	General Geochemistry	
GEOL 399	Igneous and Metamorphic Petrology	
GEOL 444	GIS for Geology	
GEOL 470	Structural Geology	
GEOL 491	Tectonic Evolution of North America	
Non-Departmental Requirements (in addition to Gen.Ed/VWW) [4]		
BIOL 313	Structure and Function of Plants	3
or BIOL 322	Zoology	
CEPY 2110	Learning in the Classroom	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [5]	4
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [5]	4
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
EDUC 3120	Multicultural Education	3
EDUC 3997	Secondary Field Experience	3
EDUC 4410	Teaching Science at the Middle and High School Level	3
EDUC 4820	Secondary Student Teaching	9
EDUC 4821	Middle and High School Student Teaching Seminar	3
PHYS 1230G	Algebra-Based Physics I	3
or PHYS 2230G	General Physics for Life Science I	
PHYS 1230L	Algebra-Based Physics I Lab	1
or PHYS 2230L	Laboratory to General Physics for Life Science I	
PHYS 1240G	Algebra-Based Physics II	3
or PHYS 2240G	General Physics for Life Science II	
PHYS 1240L	Algebra-Based Physics II Lab	1

or PHYS 2240L	Laboratory to General Physics for Life Science II	
SPED 3105	Introduction to Special Education in a Diverse Society	3
READ 4330	Content Area Literacy	3
Second Language Requirement: (required- see below)		
Select 8 credits from two semesters of a second language (see section at the bottom of the page)		8
Electives, to bring the total credits to 120 [6]		**1**
Total Credits		**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. For any Mathematics course selection students may need to take any prerequisites needed to enter the class(es) first.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4. May not be taken S/U and a grade of C- or better must be earned.
5. CHEM 1215G General Chemistry I Lecture and Laboratory for STEM Majors and CHEM 1225G General Chemistry II Lecture and Laboratory for STEM Majors: Preferred
6. Elective credit may vary based on Math course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Students must work closely with their advisors in order to plan programs that allow them to meet all requirements and earn sufficient upper-division credit.

After completing the BS in Geology, Concentration Earth Science Education, students should apply and be admitted to the Graduate School in the Department of Curriculum and Instruction, and be admitted to the Teacher Education Program (TEP). For additional details, see the School of Teacher Preparation, Administration and Leadership (p. 1363) portion of the NMSU Catalog.

Second Language Requirement

For the Bachelor of Science in the Geology there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120	French I and French II	8
GRMN 1110 & GRMN 1120	German I and German II	8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II	6
or SPAN 2210	Spanish for Heritage Learners III	

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
FREN 1120	French II	4
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
OR		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
English Composition - Level 1 Course [1]		4
GEOL 1110G or HNRS 2116G	Physical Geology or Earth, Time and Life	4
CEPY 1120G	Human Growth and Behavior	3
MATH 1220G	College Algebra	3
Elective Course [2]		1
	Credits	**15**
Semester 2		
Oral Communication Course [1]		3
CEPY 2110	Learning in the Classroom	3
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
Area V: Humanities Course [1]		3
Area VI: Creative and Fine Arts course [1]		3
	Credits	**16**
Second Year		
Semester 1		
GEOL 1150	Introduction to Rocks and Minerals	3
GEOL 305V	Fossils and the Evolution of Life	3
CHEM 1215G or CHEM 1216	General Chemistry I Lecture and Laboratory for STEM Majors or General Chemistry I Lecture and Laboratory for CHEM Majors	4
EDUC 3120	Multicultural Education	3
Second Language first course in sequence [3]		4
	Credits	**17**
Semester 2		
GEOL 420	Stratigraphy and Sedimentology	3
Geology Departmental Elective Course [4]		3
CHEM 1225G or CHEM 1226	General Chemistry II Lecture and Laboratory for STEM Majors or General Chemistry II Lecture and Laboratory for CHEM Majors	4
SPED 3105	Introduction to Special Education in a Diverse Society	3
Second Language second course in sequence [3]		4
	Credits	**17**
Third Year		
Semester 1		
Geology Departmental Elective Course [4]		3
PHYS 1230G or PHYS 2230G	Algebra-Based Physics I or General Physics for Life Science I	3
PHYS 1230L or PHYS 2230L	Algebra-Based Physics I Lab or Laboratory to General Physics for Life Science I	1
Viewing a Wider World course [5]		3
EDUC 3997	Secondary Field Experience	3
Student who need to enroll in 15 credits for Financial Aid purposes will need to take additional elective credits		
	Credits	**13**
Semester 2		
Geology Departmental Elective [4]		3
PHYS 1240G or PHYS 2240G	Algebra-Based Physics II or General Physics for Life Science II	3
PHYS 1240L or PHYS 2240L	Algebra-Based Physics II Lab or Laboratory to General Physics for Life Science II	1
BIOL 313 or BIOL 322	Structure and Function of Plants or Zoology	3
READ 4330	Content Area Literacy	3
Viewing a Wider World Course [5]		3
	Credits	**16**
Fourth Year		
Semester 1		
Geology Departmental Elective Course [4]		3
GEOL 449	The Geological Profession	1
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
ASTR 1120G	The Planets Lecture & Laboratory	4
EDUC 4410	Teaching Science at the Middle and High School Level	3
Student who need to enroll in 15 credits for Financial Aid purposes will need to take additional elective credits		
	Credits	**14**
Semester 2		
EDUC 4820	Secondary Student Teaching	9
EDUC 4821	Middle and High School Student Teaching Seminar	3
	Credits	**12**
	Total Credits	**120**

[1] See the General Education (p. 262) section of the catalog for a full list of courses.

[2] Elective credit may vary depending on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The elective credit in the requirement list is the amount needed to bring the total to 120 credits and may vary based on the degree. Students may need to complete more or less courses on a case-by-case basis and each student should discuss this with their advisor.

[3] See the Second Language section of the Requirements Tab (p. 768) for this degree for more information.

[4] **Departmental Electives:**

- GEOL 312 Mineralogy and Optics
- GEOL 335V Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present
- GEOL 360 General Geochemistry
- GEOL 399 Igneous and Metamorphic Petrology
- GEOL 444 GIS for Geology
- GEOL 470 Structural Geology
- GEOL 491 Tectonic Evolution of North America

[5] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Geology (Geological Sciences) - Bachelor of Science

The concentration in geological sciences is a broad field of study that prepares students for employment by energy and mineral industries, environmental and water resource companies, federal, state and local governments, as well as service companies that utilize earth resources.

Qualified students are also prepared for graduate study in the geological sciences.

Students must complete all University degree requirements, which include: **General Education requirements**, **Viewing a Wider World requirements**, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students must receive a C- or better in courses.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
GEOL 1110G	Physical Geology	
or HNRS 2116G	Earth, Time and Life	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
Viewing A Wider World [3]		**6**
Departmental/College Requirements [4]		
GEOL 1150	Introduction to Rocks and Minerals	3
GEOL 305V	Fossils and the Evolution of Life	3
GEOL 312	Mineralogy and Optics	3
GEOL 360	General Geochemistry	3
GEOL 399	Igneous and Metamorphic Petrology	3
GEOL 420	Stratigraphy and Sedimentology	3
GEOL 449	The Geological Profession	1
GEOL 470	Structural Geology	3
GEOL 490	Field Geology	3
GEOL 491	Tectonic Evolution of North America	3
GEOL 495	Geology Field Camp	4
Departmental Elective Requirements [4]		
Select 12 credits from the following:		12
C E 357	Soil Mechanics	
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	
GEOL 353	Geomorphology	
GEOL 424	Soil Chemistry	
GEOL 444	GIS for Geology	
GEOL 452	Geohydrology	
GEOL 465	Isotope Geochemistry	
GEOL 478	Petroleum Systems and Stratigraphy	
GEOL 480	Seminar	
SOIL 2110	Introduction to Soil Science	
Non-Departmental Requirements (in addition to Gen.Ed/VWW) [4]		
MATH 1511G/1511H	Calculus and Analytic Geometry I	4
or MATH 1430G	Applications of Calculus I	
MATH 1521G	Calculus and Analytic Geometry II (Choose one sequence from the following (4 credits):) [2]	3-4
or MATH 1440	Applications of Calculus II	
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Choose one sequence from the following (4 credits):		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
Choose one sequence from the following (4 credits):		4
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
Select 3-4 credits from the following:		3-4
CSCI 1240	C++ Programming I	
CSCI 1210	Computer Programming Fundamentals	
CSCI 1220	Computer Programming Fundamentals: Python	
CSCI 1235	R Programming I	
C E 151	Introduction to Civil Engineering	
GEOG 381	Cartography and GIS	
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
Second Language Requirement: (required- see below)		
Select 8 credits from two semesters of a second language (see the section at the bottom of the page)		8
Electives, to bring to the total credits 120 [5]		**7-11**
Total Credits		**121-120**

1 See the General Education (p. 262) section of the catalog for a full list of courses

2 *For either Mathematics course selection students may need to take any prerequisites needed to enter the class(es) first.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

4 May not be taken S/U and a grade of C- or better must be earned.

5 Elective credit may vary based on Math course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Students must work closely with their advisors in order to plan programs that allow them to meet all requirements and earn sufficient upper-division credit.

Second Language Requirement

For the Bachelor of Science in the Geology there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120	French I and French II	8
GRMN 1110 & GRMN 1120	German I and German II	8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220 or SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II Spanish for Heritage Learners III	6

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
FREN 1120 or GRMN 1120 or JAPN 1120 or SPAN 1120	French II German II Japanese II Spanish II	4
OR		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120 or SPAN 1220 or SPAN 2210	Portuguese II Spanish for Heritage Learners II Spanish for Heritage Learners III	3

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1250G Trigonometry & Pre-Calculus and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
Area I: Communications - Level 1 Course		4
ENGL 1110G or ENGL 1110H	Composition I (Recommended) [1] or Composition I Honors	
Area II: Mathematics Course [1]		3-4
MATH 1250G	Trigonometry & Pre-Calculus (Recommended) [2]	
GEOL 1110G or HNRS 2116G	Physical Geology or Earth, Time and Life	4
Area IV: Social and Behavioral Science Course [1]		3
	Credits	**14-15**
Semester 2		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [2]	4
MATH 1430G or MATH 1511G or MATH 1511H	Applications of Calculus I [2] or Calculus and Analytic Geometry I or Calculus and Analytic Geometry I Honors	3-4
Area I: Communications - Oral Communication Course		3
COMM 1115G or HNRS 2175G	Introduction to Communication (Recommended) or Introduction to Communication Honors	
Area VI: Creative and Fine Arts Course [1]		3
Elective Course [3]		1
	Credits	**14-15**
Second Year		
Semester 1		
GEOL 1150	Introduction to Rocks and Minerals	3
GEOL 305V	Fossils and the Evolution of Life	3
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [2]	4
MATH 1440 or MATH 1521G or MATH 1521H	Applications of Calculus II [2] or Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	3-4
Area I: Communications - Level 2 Course		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication (Recommended) [1] or Professional and Technical Communication	
	Credits	**16-17**

Semester 2		
GEOL 312	Mineralogy and Optics (Spring Only) [2]	3
GEOL 420	Stratigraphy and Sedimentology	3
Choose one from the following:		3-4
GEOG 381	Cartography and GIS (Recommended to meet the 3-4 credit non-departmental requirement)	
CSCI 1210	Computer Programming Fundamentals	
CSCI 1210	Computer Programming Fundamentals	
CSCI 1220	Computer Programming Fundamentals: Python	
CSCI 1235	R Programming I	
C E 151	Introduction to Civil Engineering	
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
Area V: Humanities Course [1]		3
Elective Course [3]		2
	Credits	**14-15**
Third Year		
Semester 1		
GEOL 470	Structural Geology [2]	3
GEOL 360	General Geochemistry	3
Choose one sequence from the following:		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab [2]	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab [2]	
Geology Upper-Division Elective Course (refer to degree requirements list)		3
Elective course		2
	Credits	**15**
Semester 2		
GEOL 399	Igneous and Metamorphic Petrology	3
Choose one sequence from the following:		4
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab [2]	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab [2]	
Geology Upper-Division Elective Course (refer to degree requirements list)		3
VWW: Viewing a Wider World Course [4]		3
Elective course		2
	Credits	**15**
Fourth Year		
Summer		
GEOL 495	Geology Field Camp [5]	4
	Credits	**4**
Semester 1		
VWW: Viewing a Wider World Course [4]		3
Geology Upper-Division Elective Course (refer to degree requirements list)		3
Geology Upper-Division Elective Course (refer to degree requirements list)		3
Elective Course		2
First Course in Second Language Series		4
	Credits	**15**
Semester 2		
GEOL 490	Field Geology [1,5]	3
GEOL 491	Tectonic Evolution of North America [1]	3
GEOL 449	The Geological Profession [1]	1
Second Course in Second Language Series		4
Elective course [3]		2
	Credits	**13**
	Total Credits	**120-124**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
3. Students whose Financial Aid requires enrollment in at least 15 credits each semester, may need to take additional elective credit than what is listed. Students should discuss their electives with their advisor. *Elective credit may vary based on Math course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. GEOL 495 Geology Field Camp, is only taught in the summer of odd-numbered years. Students should take GEOL 490 Field Geology, during the spring semester before taking GEOL 495.
   GEOL 495 Geology Field Camp should be taken the summer after the third or fourth year. In cases where it is impossible to fit this class into a schedule, students may take a field camp at another university and transfer the credits. It is the student's responsibility to have the department head verify that the field camp is acceptable before taking the course.

Geology - Undergraduate Minor

A student cannot earn a BS in Geology and also earn a minor in Geology.

Prefix	Title	Credits
Required Courses		
GEOL 1110G	Physical Geology	4
or HNRS 2116G	Earth, Time and Life	
GEOL 305V	Fossils and the Evolution of Life	3
Select 12 credits from the following:		12
GEOL 310	Mineralogy	
GEOL 312	Mineralogy and Optics [1]	
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	
GEOL 353	Geomorphology	
GEOL 360	General Geochemistry	
GEOL 399	Igneous and Metamorphic Petrology [1]	
GEOL 420	Stratigraphy and Sedimentology [1]	
GEOL 444	GIS for Geology	
GEOL 465	Isotope Geochemistry [1]	
GEOL 470	Structural Geology [1]	
GEOL 477	Special Problems (variable credit) [1]	
GEOL 478	Petroleum Systems and Stratigraphy [1]	
GEOL 480	Seminar (variable credit) [1]	
GEOL 490	Field Geology [1]	
GEOL 491	Tectonic Evolution of North America [1]	

GEOL 495	Geology Field Camp [1]	
Total Credits		**19**

[1] Courses with Geology prerequisites other than GEOL 1110G Physical Geology or HNRS 2116G Earth, Time and Life.

History

Undergraduate Program Information

An undergraduate degree in history prepares students for careers in: teaching; law; public service; management; journalism; education; communications; travel counseling; and library, museum and archival staff work. Students master skills including the ability to read critically, to formulate arguments, to conduct historical research, and to synthesize arguments and create novel interpretations.

Graduate Program Information

The Department of History offers graduate work leading to the Master of Arts degree. In addition to fulfilling the basic requirements for admission to the Graduate School, applicants must present undergraduate passage of at least 12 credits in history with grades of B or higher, including 6 upper division history credits. Those lacking this preparation must normally make up deficiencies before beginning graduate course work. Candidates who choose a course of study requiring a foreign language will be responsible for their own language preparation.

Students applying for admission to the graduate program in history are required to submit an application form and a transcript to the Graduate School and a strong writing sample, three letters of recommendation ideally from History faculty members at NMSU or other institutions, and a two-to-three page statement of purpose to the Department of History, approximately four months in advance of the desired enrollment date. Applicants for graduate assistantships and fellowships must submit a letter of application, a transcript, and three letters of recommendation to the department by February 15 for the fall semester, and by October 15 for the spring semester. Students who are not applying for graduate assistantships and fellowships may apply at any time for acceptance into the graduate program.

Degrees for the Department

Bachelor Degree(s)

- History - Bachelor of Arts (p. 790)

Master Degree(s) & Dual Degree(s)

- History (Public History) - Master of Arts (p. 167)
- History - Master of Arts (p. 166)
- Public History and Public Administration - Dual M.A. Degree (p. 185)

Minors for the Department

- History - Graduate Minor (p. 257)
- History - Undergraduate Minor (p. 792)

Elizabeth Horodowich, Department Head

Professors Bronstein, Cioc-Ortega, Garcia-Bryce, Hammond, Horodowich; ***Assistant Professors*** De Armond, Hooton, Wallace; ***College Professors*** Masson

J. L. Bronstein, Ph.D. (Stanford)– U.S., Britain; M. Cioc-Ortega, Ph.D. (California-Berkeley)- Europe, U.S., public history; I. Garcia-Bryce, Ph.D. (Stanford)– Latin America, Peru; K. J. Hammond, Ph.D. (Harvard)– China, East Asia; E. Horodowich, Ph.D. (Michigan-Ann Arbor)– early modern Europe, Mediterranean; T. De Armond, Ph.D. (Stanford) - classics, archaeology, history of incarceration; L Hooton, Ph.D. (California - Santa Barbara) - borderlands, African American, immigration; J. D. Wallace, Ph.D. (University of New Mexico)– U.S., public history.

History Courses

HIST 1110G. United States History I
3 Credits (3)
The primary objective of this course is to serve as an introduction to the history of the United States from the pre-colonial period to the immediate aftermath of the Civil War. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of the United States within the context of world societies.
Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of the United States from the pre-colonial period to the immediate aftermath of the Civil War. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply 8
6. Students will APPLY historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze 9

HIST 1120G. United States History II
3 Credits (3)
The primary objective of this course is to serve as an introduction to the history of the United States from reconstruction to the present. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of the United States within the context of world societies.
Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of the United States from the reconstruction to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distingusih between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create

3. Students will summarize and appriase different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will apply historical knowledge and historical thinking "inorder to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze 10 11

HIST 1130G. World History I
3 Credits (3)
The primary objective of this course is to serve as an introduction to global history from ancient times to the 16th century. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of world societies. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for global history from ancient times to the 16th century. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze

HIST 1140G. World History II
3 Credits (3)
The primary objective of this course is to serve as an introduction to global history from the 16th century to the present. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of world societies. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of global history from the 16th century to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will Apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze

HIST 1150G. Western Civilization I
3 Credits (3)
This course is a chronological treatment of the history of the western world from ancient times to the early modern era. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of western civilization within the context of world societies. Selective attention will be given to "non-western" civilizations which impact and influence the development of "western" civilization.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of the western world from ancient times to the early modern era. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. BloomTaxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze 14

HIST 1160G. Western Civilization II
3 Credits (3)
This course is a chronological treatment of the history of the western world from the early modern era to the present. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of western

civilization within the context of world societies. Selective attention will be given to "non-western" civilizations which impact and influence the development of "western" civilization.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of the western world from the early modern era to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze

HIST 1170G. Survey of Early Latin America

3 Credits (3)

The primary objective of this course is to serve as a survey of the history of Latin America from pre-Columbian times through independence. This course will explore the contributions of Indigenous peoples, Africans, and Europeans to the creation of Latin America's diverse societies. The elements of this course are designed to inform students on the major events and trends that are essential to the understanding of the history of Latin America within the context of world societies.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of Latin America from independence to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand.
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: analyze, remember, evaluate, create.
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: understand, evaluate, apply.
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: remember, understand, evaluate.
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: create, apply.
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: apply, analyze.

HIST 1180. MODERN LATIN AMERICA

3 Credits (3)

The primary objective of this course is to serve as a survey of the history of Latin America from independence to the present. This course will explore the contributions of Indigenous peoples, Africans, and Europeans to the creation of Latin America's diverse societies. The elements of this course are designed to inform students on the major events and trends that are essential to the understanding of the history of Latin America within the context of world societies.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of Latin America from independence to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: analyze, remember, evaluate, create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: understand, evaluate, apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: remember, understand, evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: create. apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present."Bloom Taxonomy's Cognitive Process: apply, analyze

HIST 1180G. Survey of Modern Latin America

3 Credits (3)

The primary objective of this course is to serve as a survey of the history of Latin America from independence to the present. This course will explore the contributions of Indigenous peoples, Africans, and Europeans to the creation of Latin America's diverse societies. The elements of this course are designed to inform students on the major events and trends that are essential to the understanding of the history of Latin America within the context of world societies.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of Latin America from independence to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand.
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: analyze, remember, evaluate, create.
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: understand, evaluate, apply.

4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: remember, understand, evaluate.
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: create and apply.
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present."Bloom Taxonomy's Cognitive Process: apply, analyze.

HIST 2245G. Islamic Civilizations to 1800
3 Credits (3)
History of Islamic civilizations to 1800.
Learning Outcomes
1. By the conclusion of the course, the student will be able to demonstrate a knowledge of the history of cultural encounters, exchanges, and conflicts between the Islamic world and the West from the seventh to the sixteenth century;
2. Be able to evaluate the major themes of cultural contact, conflict, and interchange between the Islamic world and the West;
3. Critically read and evaluate historical evidence with the goal of forming an argument about historical evidence
4. Communicate a historical argument logically, clearly, and effectively in writing.

HIST 2250G. East Asia to 1600
3 Credits (3)
History of China, Korea, Vietnam, and Japan from earliest times through the sixteenth century. Emphasis on cultural and political developments and their social and economic contexts, and the interaction between East Asian societies.
Learning Outcomes
1. Students will learn the analytic skills of interpreting historical changes and continuity.
2. They will assess and use historical documents, and learn how to evaluate varying historical interpretations.
3. Students will understand the chronological and geographic context of important historical events,and will understand the social, technological, economic, cultural and political components of the society under study in this course.
4. Students will understand how people shape their culture and its beliefs, and the way in which prevailing cultures and beliefs shape them.
5. They will understand the historical origins of present-day societies, to learn about their own historical roots.
6. They will learn about the development of structures of power, the production of and distribution of goods, and the relationship between science and technology and human values and behavior.

HIST 2251G. East Asia since 1600
3 Credits (3)
History of China, Korea, Vietnam, and Japan from the sixteenth through the twentieth centuries. Emphasis on internal development of each country, as well as the social and political impact of Western Imperialism, and the emergence of each country's unique version of modern society.
Learning Outcomes
1. Students will learn the analytical skills of interpreting historical changes and continuity.
2. They will assess and use historical documents, and learn how to evaluate varying historical interpretations.
3. Students will understand the chronological and geographic context of important historical events, and will understand the social, technological, economic, cultural and political components of the society under study in this course.
4. Students will understand how people shape their culture and its beliefs, and the way in which prevailing cultures and beliefs shape them.
5. They will understand the historical origins of present-day societies, to learn about their own historical roots.
6. They will learn about the development of structures of power, the production of and distribution of goods, and the relationship between science and technology and human values and behavior.

HIST 2996. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. Community Colleges only. May be repeated for a maximum of 12 credits.
Learning Outcomes
1. Varies

HIST 300. Special Topics
1-9 Credits (1-9)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 18 credits.
Learning Outcomes
1. Students will analyze and interpret key themes, events and figures related to the chosen topic of this class, evaluating their historical significance and impact.
2. Students will assess both primary and secondary historical sources related to the chosen topic of this class, developing skills in historical inquiry and evidence-based argumentation in both discussion and written work.
3. Students will construct well-supported historical arguments related to the chosen subject matter of this class in both written and oral formats.

HIST 302V. Science in Modern Society
3 Credits (3)
The social impact of scientific activity and thought from Newton to the present. The growth of modern scientific institutions; the political and social context of modern science. ENGL 1110G recommended.
Learning Outcomes
1. Analyze the historical development of science and scientific ideas since the Scientific Revolution.
2. Evaluate the main factors comprising the institutions of modern science.
3. Assess the development of science and scientific ideas through brief biographies of scientists.
4. Evaluate relevant primary and secondary sources on a selected topic for a research paper related to the course.

HIST 308V. The History of Food
3 Credits (3)
From the earliest uses of fire for cooking up through our modern age of fast food and organic gardening, human culinary traditions have long shaped and been shaped by the forces of history. This course offers a general overview of the history of food production and consumption in the West from prehistoric times through the 21st century, with a special focus on the various ways in which social and political history have

impacted dining, taste, and cooking. Among a great variety of topics, we will focus on the origins of cooked food; ancient Hebrew dietary laws; the "spice revolution" and the great influence of Arabic cuisine on the kitchens of medieval Europe; emerging ideas about etiquette and table manners including the use of the fork; the advent of print and the first printed cookbooks; the Columbian Exchange and the arrival of foods from the New World; the rise of French cuisine; food and immigration; the global dominance of fast food; and sustainable food production and consumption in the modern era. We will pay a special emphasis throughout the course to the myriad ways in which food production and consumption in history have always been gendered, as well as influenced by ideas about social class.

Learning Outcomes

1. Master a general master narrative about the history of food in the Western World, including a variety of European countries;
2. Analyze the relationship between food and culture in a variety of countries and traditions;
3. Critically read and learn to evaluate secondary historical literature, grasping the strengths and weaknesses of historical monographs; and
4. Communicate a historical argument logically and effectively in a 20-page original research paper.

HIST 313. Making the American West
3 Credits (3)

Development of the American West from 1803 to 1900 with emphasis on conquest, federal and corporate roles in western development, environmental change, and the Mythic West. Includes meetings outside regular class time to view feature-length films.

Learning Outcomes

1. Students will analyze primary and secondary sources to assess their biases and the quality of their evidence for historical argument.
2. Students will assess different interpretations of the West as described in the historiography of this field.
3. Students will evaluate the processes that created the West as region in both written and oral formats.

HIST 320. American History Through Film
3 Credits (3)

This course uses feature films as texts to examine the depiction of major themes and events in American history and society. It considers both the accuracy of these depictions, and the way in which the historical viewpoint of feature films is influenced by factors including directorial point of view and popular memory. It also examines the influence of feature films on popular understandings of the American past. May be repeated up to 3 credits.

Learning Outcomes

1. Students will critically analyze and evaluate the accuracy and truthfulness of cinematic representations of episodes in U.S. history, and convey these analyses and evaluations orally and in writing.
2. Students will evaluate contemporary claims made concerning the value of films for historical understanding, and convey these analyses and evaluations orally and in writing.
3. Students will assess the ways in which films serve as historical documents that illuminate the cultural, social, and political history of the eras in which they were produced, and convey these analyses and evaluations orally and in writing.

HIST 321V. History of Korea
3 Credits (3)

Social, political, and cultural history of Korea from earliest times through twentieth century. Emphasis on the interaction between Korean traditions and influences from China and the West. May be repeated up to 3 credits.

Learning Outcomes

1. Students will learn the analytical skills of interpreting historical changes and continuity.
2. They will assess and use historical documents, and learn how to evaluate varying historical interpretations.
3. Students will also understand the chronological and geographic context of important historical events, and will understand the social, technological, economic, cultural and political components of the society under study in this course.
4. Students will examine how people shape their culture and beliefs, and the way in which prevailing cultures and beliefs shape them.
5. They will understand the historical origins of present-day societies, to learn about their own historical roots.
6. They will learn about the development of structures of power, the production of and distribution of goods, and the relationships between science and technology and human values and behavior.

HIST 323. Cultural History of Later Imperial China
3 Credits (3)

Covers art and literature of China from the Tang Dynasty (618-907) through the eighteenth century. Developments in cultural theory and practice are traced in the context of the social and economic changes fostering an understanding of Chinese cultural history and its legacy in East Asia today.

Learning Outcomes

1. Analyze and interpret historical changes and continuity.
2. Assess and debate historical documents and practice evaluating varying historical interpretations.
3. Distinguish the chronological and geographic context of important historical events, in order to understand the social, technological, economic, cultural and political components of Chinese society.
4. Examine how people shape their culture and beliefs, and the ways in which prevailing cultures and beliefs shape them.
5. Identify the development of structures of power, the production of and distribution of goods, and the relationships between science and technology and human values and behavior.

HIST 329. History of Egypt
3 Credits (3)

History of Egypt from ancient times to the present.

Learning Outcomes

1. Outline the history of Egypt, from the pharaonic period to the present.
2. Identify key themes in Egyptian history and society and evaluate their significance to the contemporary world.
3. Analyze a variety of primary sources for their biases, as well as the quality of their evidence for historical argument.
4. Create well-supported, well-written historical arguments.

HIST 331. Rebels, Guerrillas, and Terrorists in Modern Latin America
3 Credits (3)

Explores history of rebels in Latin America. Examines guerilla struggles attaining national dimension. Focus on modern events, including Peru's Shining Path, Colombia's FARC, and Mexico's Zapatistas. Taught with POLS 468.

Learning Outcomes

1. Analyze primary sources by placing them into historical context.
2. Relate historical events to current-day issues in Latin America.

3. Improve writing skills using Chicago style of writing.
4. Explain the historical significance of a particular person or set of events.
5. Identify common patterns and differences in the history of Latin American nations.

HIST 333. Renaissance Europe
3 Credits (3)
This course explores the cultural, social, and political developments of early modern Europe between 1350-1650. This period witnessed a dramatic transformation between the medieval and modern worlds: a transition marked by new historical and artistic visions, the invention of the printing press, the discovery of the New World, the permanent fracturing of Christianity during the Protestant Reformation, the scientific revolution, and the rise of capitalism as a world system. We will consider these and other transformations in this time period both as they were understood by elite society as well as the impact of these innovations upon the daily lives of everyday people and women in particular.
Learning Outcomes
1. Identify the key historical facts, values, and ideas that shaped the history of Europe between 1400--1650;
2. Analyze the causes and effects of the Renaissance, the Age of Encounters, the Reformation, and the Scientific Revolution;
3. Identify the major artistic, literary, and technological contributions of individuals during this time period;
4. Describe how cultural exchanges reveal the global context of events in early modern Europe; and
5. Create well-supported historical arguments based on primary and secondary source evidence.

HIST 334. Art and Life in Renaissance Italy
3 Credits (3)
Examines how Italian Renaissance textual and visual culture offered Europe new ways of seeing and portraying itself, 1350-1550. Topics include: Florence, Venice, Rome, Leonardo, Michelangelo, Titian, humanism, the Medici, and republican and courtly culture. Same as ARTH 444.

HIST 338. World War I
3 Credits (3)
Cultural, social, and intellectual background and impact of World War I. Military and diplomatic events of the war. Consequences of the war.
Learning Outcomes
1. Analyze the events from 1890-1914 that led to the outbreak of WWI.
2. Describe events and factors that led to military stalemates on the western and eastern front from 1914-1916 years.
3. Assess the importance of the southern front in Italy and southeastern Europe, including the Ottoman Empire.
4. Analyze the domestic front in France, Germany, and Russia that led to breakthroughs in the military stalemate.
5. Analyze the collapse of Russia and the renewal of the German offensive on the western front.
6. Explore the long-term impact of the Paris Peace Conference and the Treaty of Versailles.

HIST 339. World War II
3 Credits (3)
Social, cultural and political aspects of World War II, in addition to traditional military events. Emphasis on U.S. involvement.
Learning Outcomes
1. Analyze the situation in Europe from 1919-1939 that led to the outbreak of WWII.
2. Describe the events that led to the triumph of fascism in Italy and Germany.
3. Explore the impact of the Russian Revolution and Soviet Union on eastern European affairs.
4. Describe the impact of the Great Depression on European affairs.
5. Analyze Hitler's political and military strategy during the 1930 year.
6. Explain the events that led to German domination of Europe from 1939 to 1942 years.
7. Understand the connection between WWII and the Holocaust.
8. Analyze the events that led to Hitler's downfall in 1945 year.

HIST 361. African American History to 1877
3 Credits (3)
African background, slave trade, slavery; Civil War and Reconstruction; free blacks in a white society to about 1900. May be repeated up to 3 credits.
Learning Outcomes
1. Students will evaluate and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze and compare political, economic, social and intellectual institutions, structures and processes over the period from the great African Empires (circa 900CE) to the end of the period of Reconstruction (1877), with particular focus on the experiences of African Americans.
3. Students will strengthen their argumentative skills through online class discussions and written assignments.
4. Students will demonstrate an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
5. Students will demonstrate an ability to think about the interaction between present and past issues presented in the class.

HIST 362. African American History, 1865-present
3 Credits (3)
Black Americans in the United States in the twentieth century; segregation; black leaders, organizations, methods and goals; white reaction; the struggle for equality. May be repeated up to 3 credits.
Learning Outcomes
1. Students will evaluate and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze and compare political, economic, social and intellectual institutions, structures and processes over the period of the Civil Rights Movement through readings, interaction with primary source documents, essays, and discussions.
3. Students will strengthen their argumentative skills through online class discussions and written assignments.
4. Students will demonstrate an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
5. Students will demonstrate an ability to think about the interaction between present and past issues presented in the class.

HIST 366V. British Imperialism
3 Credits (3)
Survey of the activities of the British empire from the 16th century through the 20th century, with emphasis on Ireland, North America and India. Assesses the impact of imperial activities on British domestic

politics, culture and social history, and the process and impact of decolonization.

Learning Outcomes

1. Students will study the chronologies of colonization and decolonization within the British Empire between 1066 and 1999 years.
2. Students will analyze primary sources to understand their content, context, sourcing, and the degree to which they corroborate a historical interpretation.
3. Students will evaluate narratives from a wide variety of cultural and historical perspectives.

HIST 371. Ancient Greece
3 Credits (3)

This course provides a survey of Greek history from the Trojan War through the conquests of Alexander the Great. Topics include the formation of the Greek city-states with a focus on Sparta and Athens and the wars between them, the invention of democracy in Athens, the birth of the discipline of history, the development of philosophy, the trial and death of Socrates, and the spread of Greek culture to the borders of India because of the conquests of Alexander the Great. We will explore most aspects of Greek society, using Greek authors and artists to introduce much of the material. Attention is paid to the everyday life of ancient Greeks not just power politics.

Learning Outcomes

1. Students will define, explain, and analyze the major political, social and cultural transformations of Greek history through a variety of primary sources, including works of literature and art.
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context.
3. Students will critically read and evaluate historical evidence with the goal of forming an historical argument.
4. Students will communicate a historical argument logically, clearly, and effectively in writing.

HIST 372. The Roman World
3 Credits (3)

In this course we will explore the growth of Rome from a village in the Italian peninsula to a global empire stretching from Spain to Syria and Britain to the sands of the Sahara. We will focus on the development of political, social, and cultural institutions in the construction of the Roman Republic and the enormous military conquests of that period. We then examine the transformation of the Republic into an empire, governed by an emperor. Finally, we analyze the rise of Christianity in the Roman world and the Roman empire's decline in the 5th century C.E. Attention is paid to the everyday life of ancient Romans not just power politics.

Learning Outcomes

1. Students will define, explain, and analyze the major political, social and cultural transformations of Roman history through a variety of primary sources.
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context.
3. Students will critically read and evaluate historical evidence with the goal of forming an historical argument.
4. Students will communicate a historical argument logically, clearly, and effectively in writing.

HIST 379V. The History of Italy from the Etruscans to the Mafia
3 Credits (3)

Italy is beloved by many, for its food, language, and art; however, we often understand it only superficially, and often fail to grasp the darker elements of its history. This class will consider the history of the Italian peninsula from the time of its earliest inhabitants, the Etruscans, up through the twenty-first century. We will consider topics such as the Roman world and its legacy, the rise of Christianity, the growth of medieval towns and their economies, Renaissance, the Risorgimento or the formation of the modern nation of Italy, Italian fascism, the wars of the twentieth century, Italian film, the history of Italian food including pizza and pasta, Italian communism, and the growth of organized crime and the mafia. Special attention will be paid throughout to the relationship between Northern and Southern Italy, as well as the special city of Venice and its relationship to the rest of the peninsula.

Learning Outcomes

1. Master a general master narrative about the history of Italy from its earliest inhabitants through the twenty-first century
2. Identify a variety of developments in the history of Italian culture, including art, literature, food, and film;
3. Critically read and evaluate primary and secondary historical sources and
4. Communicate a historical argument logically and effectively in a 15-page original research paper.

HIST 382V. Modern Russia
3 Credits (3)

Domestic policies and foreign relations from mid-nineteenth century to the present with emphasis on the Soviet period.

Learning Outcomes

1. Evaluate the political, social, and cultural development of Russia/Soviet Union from the 1917 Revolutions to 1953 at Stalin's death.
2. Evaluate the political, social, and cultural developments in the Soviet Union in the post-Stalin Era (1953-91) and the post-Soviet era until the present (1991-2024).
3. Analyze primary source materials relating to the Soviet and post-Soviet periods.
4. Assess differing historical interpretations (historiography) of important periods of the Soviet and post-Soviet eras.

HIST 386. New Mexico History
3 Credits (3)

Economic, political and social development of New Mexico from exploration to modern times.

Learning Outcomes

1. Students will examine the scholarship of New Mexico history since 1,000 ADE.
2. Students will describe New Mexico's place on the edges of empires over its 500-year history and how this shaped a unique identity.
3. Students will create new ways of applying New Mexico history to contemporary issues and debates.
4. Students will analyze New Mexico history through secondary and primary source scholarship.
5. Students will create well-supported, well-written historical arguments about New Mexico history in the twentieth century.

HIST 387. Spain in the New World: Conquest, Conflict, and Cultural Exchange
3 Credits (3)

The history of Spain, with a focus on Spain's interaction with the New World. May be repeated up to 3 credits.

Learning Outcomes

1. The student will be able to demonstrate a knowledge of the history of Spanish contacts, conquests, and influences in the New World from the late fifteenth century until the early twenty first century;
2. Be able to evaluate the major themes of cultural contact, conflict, and interchange between the Spain and the New World; Critically read and evaluate historical evidence in order to construct past events;
3. Communicate a historical argument logically, clearly, and effectively in writing.

HIST 390V. The Holocaust
3 Credits (3)
The attack upon European Jews by Adolf Hitler and the National Socialist Party in Germany and occupied Europe from his accession to chancellor in 1933 until the end of the Third Reich in 1945.

Learning Outcomes

1. Analyze the historical context and events leading up to the Holocaust, including the rise of antisemitism and the Nazi party in Germany.
2. Examine the policies and actions taken by the Nazi regime that led to the systematic extermination of Jewish people and other minority groups.
3. Analyze the experiences of Jews and other victims of the Holocaust, including their persecution, enslavement, and murder by various methods.
4. Evaluate the role of collaborators, bystanders, victims, and resistance fighters during the Holocaust and the impact of their actions on the course of events.

HIST 397. Introduction to Public History
3 Credits (3)
Surveys how historians do history in museums, archives, government agencies, and in communities. Hands-on experience provides students a better understanding of history and how historians work outside of the classroom. Seminar project required.

Learning Outcomes

1. Students will discuss the history and theories of public history in the United States.
2. Students will examine the different debates and methods in the field.
3. Students will analyze a variety of primary and secondary sources and identify how they apply to a general audience.

HIST 398. Historians and History
3 Credits (3)
General historiography and philosophy of history; historical methodology, research, and writing; bibliographical aids and their uses.

Learning Outcomes

1. Understand the philosophy of history and historiographical changes.
2. Demonstrate proper use of historical methodology.
3. Formulate a research plan, conduct independent research, synthesize findings, and construct a historical argument based on the research.
4. Articulate the importance of historical research to the growth of knowledge and understanding of present-day issues and challenges.

HIST 400. Special Topics
1-9 Credits (1-9)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 18 credits.

Learning Outcomes

1. Students will analyze and interpret key themes, events and figures related to the chosen topic of this class, evaluating their historical significance and impact.
2. Students will engage with and critically assess both primary and secondary historical sources related to the chosen topic of this class, developing skills in historical inquiry and evidence-based argumentation in both discussion and written work.
3. Students will construct well-supported historical arguments related to the chosen subject matter of this class in both written and oral formats.

HIST 402. Special Topics in European History
3 Credits (3)
Special topics in European history to be announced in the Schedule of Classes. May be repeated up to 12 credits.

Learning Outcomes

1. Students will analyze and interpret key themes, events and figures related to a topic in European history, evaluating their historical significance and impact.
2. Students will engage with and critically assess both primary and secondary historical sources related to the chosen topic of this class, developing skills in historical inquiry and evidence-based argumentation in both discussion and written work.
3. Students will construct well-supported historical arguments related to the chosen subject matter of this class in both written and oral formats.

HIST 404. Special Topics in Asian History
3 Credits (3)
Special topics in Asian history to be announced in the Schedule of Classes. May be repeated up to 12 credits.

Learning Outcomes

1. Students will analyze and interpret key themes, events and figures related to a topic in Asian history, evaluating their historical significance and impact.
2. Students will engage with and critically assess both primary and secondary historical sources related to the chosen topic of this class, developing skills in historical inquiry and evidence-based argumentation in both discussion and written work.
3. Students will construct well-supported historical arguments related to the chosen subject matter of this class in both written and oral formats.

HIST 406. Special Topics in United States History
3 Credits (3)
Special topics in United States history to be announced in the Schedule of Classes. May be repeated up to 12 credits.

Learning Outcomes

1. Students will analyze and interpret key themes, events and figures related to a topic in US history, evaluating their historical significance and impact.
2. Students will engage with and critically assess both primary and secondary historical sources related to the chosen topic of this class, developing skills in historical inquiry and evidence-based argumentation in both discussion and written work.
3. Students will construct well-supported historical arguments related to the chosen subject matter of this class in both written and oral formats.

HIST 413. Native American History
3 Credits (3)
Seminar explores the history of Native Americans, including tribal conflicts, interactions with Europeans and Euro-Americans, land loss, degradation of natural resources, federal Indian policy, pan-Indian

movements, cultural resistance and revitalization, and modern tribal economies.

HIST 414. The Constitution and U.S. History
3 Credits (3)
This seminar examines the history and political context of the ideas that coalesced in the U.S. Constitution, from 1603 to the writing of the Constitution and into the Early Republic.
Learning Outcomes
1. Students will evaluate and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze the relationship between historical events in the Atlantic world and the development of key political concepts including divine right monarchy, constitutional monarchy, individual representation, the social contract theory, checks and balances, and the theoretical and practical processes of constitution-writing and ratification.
3. Students will strengthen their critical thinking argumentative skills through class discussions.
4. Students will demonstrate public speaking and class leadership skills by preparing and leading class discussions.
5. Students will demonstrate an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
6. Students will demonstrate an ability to think about the interaction between present and past issues presented in the class.
7. Students will undertake a major project of historical synthesis at the end of the semester.

HIST 431. History of Race and Ethnicity
3 Credits (3)
Seminar explores the historical social construction of race and ethnicity, and their relationship to other systems of social difference such as class and gender. Course will examine popular and academic theories of race and ethnicity as well as historical concrete effects of racial and ethnic differences in society.
Learning Outcomes
1. Summarize the importance of race, ethnicity, and indigeneity in the history of the United States.
2. Analyze and critique academic sources in groups.
3. Identify the historical precedents for varied rights across racial, ethnic, and indigenous groups.
4. Analyze the ways social, political, and economic systems and ideas in the United States have been impacted by ideas around race, ethnicity, and indigeneity.

HIST 433. United States Labor History Since 1877
3 Credits (3)
Seminar discussions explore United States labor and working-class history since 1877, including such topics as industrial labor, debt peonage, and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state.
Learning Outcomes
1. Students will evaluate, synthesize, and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze and compare the economic structures, workplace experiences, and cultural impacts presented by different types of industries in New Mexico from the late 19th century to the present.
3. Students will apply their argumentative skills through online class discussions and written assignments.
4. Students will express an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
5. Students will demonstrate an ability to think about the interaction between present and past issues presented in the class.

HIST 434. Urban History
3 Credits (3)
Seminar discusses cities as complex catalysts for cultural, political, and scientific development, both within cities themselves and more broadly for their nations and regions. Course deals with such topics as the relationship between social organization and physical space; city development, morphology and dynamics; and the cultural and intellectual history of cities.
Learning Outcomes
1. Students will analyze current debates about city planning and development in a historical context.
2. Students will identify major events that have shaped city planning and urban development since World World I.
3. Students will analyze primary sources and construct short argumentative papers on how gender, race, or class has shaped urban centers in the United States.

HIST 435. History of War and Revolution
3 Credits (3)
Seminar covers historical dynamics of violent social, political, and economic transitions. May focus upon a particular war or upheaval, such as World War II or the French Revolution, or may examine more generic characteristics of conflict and radical change across many historical examples. Extensive readings in scholarly literature. Research projects relating to specific course contents.

HIST 443. The Cold War in Latin America
3 Credits (3)
Seminar discusses Latin American political history during the Cold War. Course focuses on how Latin Americans (individuals, parties, militaries, states) acted in an increasingly politicized arena defined by growing United States concerns over Cuban and Soviet influence in the area.
Learning Outcomes
1. Analyze primary sources by placing them into the historical context of the Cold War.
2. Compare Cold War themes and historical events to current-day issues in Latin America.
3. Acquire writing skills using Chicago style of writing.
4. Explain the historical significance of a particular person or set of events.
5. Analyze the impact of the Cold War in different Latin American countries.

HIST 449. Readings
1-3 Credits
Individual study of selected readings and problems. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

HIST 469. Cultural Resource Management I
3 Credits (3)
This course will introduce students to the field of cultural resource management (CRM) and the federal and state laws and regulations that

govern most archaeology and historic preservation projects conducted today. Course lectures, readings, and written assignments will cover major US federal laws (NHPA, NEPA, ARPA, NAGPRA); New Mexico state cultural resource laws, regulations, and permitting practices; and major international heritage laws. Particular emphasis will be placed on the evaluation and nomination processes of cultural resources to the National Register of Historic Places (NRHP). Strong oral and communication skills are key for success in CRM, so you will be given many opportunities to develop these skills in class.

Learning Outcomes

1. Explain the goals of cultural resource management (CRM).
2. Describe the major laws and regulations that govern CRM in the United States, New Mexico, and abroad.
3. Identify common challenges with implementing these laws and regulations.
4. Determine the eligibility of cultural resources for listing on the NRHP and justify that determination.

HIST 471. China through the Ming Dynasty
3 Credits (3)
History of China from origins to Ming dynasty, (1368-1644). Cultural and political development with emphasis on social and economic contexts and long term trends.

HIST 472. China in the Modern World
3 Credits (3)
History of China from seventeenth through twentieth centuries. Rise and fall of the Manchu Qing dynasty, internal dynamics of social and political change in nineteenth and twentieth centuries, impact of Western Imperialism, and development of the Peoples Republic since 1949.

Learning Outcomes

1. Students will learn the basic narrative of modern Chinese history.
2. Students will learn to understand and evaluate historical arguments and interpretations.
3. Students will learn to work with primary sources and to analyze and interpret their contents.
4. Students will complete a research paper combining primary and secondary sources and making a sustained historical argument.

HIST 473. History of Japan
3 Credits (3)
History of Japan through twentieth century. Political and cultural developments and their social and economic contexts. Chinese influence on early Japan, rise of Samurai and Shogunate, impact of Western Imperialism, and emergence of modern Japan.

HIST 474. Gender in East Asian History
3 Credits (3)
Examines the position of women and the social roles of both sexes in traditional China and Japan, and traces the changes taking place in those societies in the course of modernization in the last century and a half. Scholarly literature and works of Chinese and Japanese literature in translation and cinema used. Same as GNDR 474.

Learning Outcomes

1. Students will analyze historical change and continuity, with particular attention to female-centered lenses through time.
2. Students will interpret historical documents, and learn how to evaluate varying historical interpretations.
3. Students will summarize the chronological and geographic context of important historical events and will understand the social, technological, economic, cultural, and political components of Chinese society.
4. Students will describe how people shape their culture and its beliefs, and the way in which prevailing cultures and beliefs shape them.
5. Students will understand the development of structures of power, the production and distribution of goods, and the relationship between science and technology and human values and behavior.

HIST 475. History of the Global Political Economy
3 Credits (3)
Traces development of global systems of economic interaction and the rise of European military and political dominance in the 18th and 19th centuries. Emphasis on East and South Asian roles in early modern history, and on challenges to European dominance in the 20th and 21st centuries.

HIST 478. History of Transportation: Planes, Trains and Automobiles
3 Credits (3)
The course examines the impact of changes in transportation technology on society from the 19th century to the present, with a focus on the Americas, both the United States and Latin America. Revolutionary changes such as the railroad, the steamship, and later the automobile and the airplane changed the way that people lived, worked and interacted with others.

Learning Outcomes

1. Analyze primary sources by placing them into historical context.
2. Improve writing skills using Chicago style of writing.
3. Explain the nature of technological change in history and its impact in society.
4. Relate historical events to current-day debates about transportation.
5. Practice team-work through Team Based Learning method.

HIST 479. Oral History
3 Credits (3)
Oral history through readings, discussions, and interviews. Semester project required that includes an interview and transcript.

Learning Outcomes

1. Demonstrate an understanding of methodology, importance, and challenges for oral history research and scholarship.
2. Attain experience developing materials for and conducting oral history interviews.
3. Apply oral history research to a historical research paper.
4. Construct a historical argument using oral histories in conjunction with other historical sources and secondary materials.

HIST 483. Historic Preservation
3 Credits (3)
Study of community development, the historic preservation movement, and the built environment. Field project.

Learning Outcomes

1. Students will study the fundamental practices of historic preservation.
2. Students will examine the different debates and methods in the field and how they apply to the nomination process.
3. Students will assess the Secretary of Interior's standards of site interpretation.

HIST 486. Interpreting Historic Places for the Public
3 Credits (3)
Explores historic site interpretation, the scholarship and philosophy of historic interpretation, and the nature of heritage interpretation for historic places.

Learning Outcomes

1. Students will interpret primary and secondary sources to understand how they apply to a general audience.
2. Students will examine the different debates and methods in the field and how they apply to the nomination process.
3. Students will assess the basic history and theories of historic site interpretation.

HIST 500. Special Topics
1-9 Credits (1-9)
Specific subjects to be announced in the Schedule of Classes. Graduate research paper required. May be repeated up to 12 credits.
Learning Outcomes

1. Students will analyze and interpret key themes, events and figures related to the chosen topic of this class on an advanced level, evaluating their historical significance and impact.
2. Students will engage with and critically assess both primary and secondary historical sources related to the chosen topic of this class on an advanced level, developing skills in historical inquiry and evidence-based argumentation in both discussion and written work.
3. Students will construct well-supported historical arguments related to the chosen subject matter of this class in both written and oral formats.

HIST 511. Making the American West
3 Credits (3)
Development of the American West from 1803 to 1900, with emphasis on conquest, federal and corporate roles in western development, environmental change, and the mythic West. Includes extra class meetings to view feature-length films. Graduate research paper required.
Learning Outcomes

1. Students will analyze primary and secondary sources about the history of the US West.
2. Students will examine and debate different interpretations of the West and the controversies by writing a short historiographical essay.
3. Students will create their own history assignment.
4. Students will construct arguments in written essays and in class discussions.

HIST 514. The Constitution and U.S. History
3 Credits (3)
This seminar examines the history and political context of the ideas that coalesced in the U.S. Constitution, from 1603 to the writing of the Constitution and into the Early Republic.
Learning Outcomes

1. Students will evaluate and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze the relationship between historical events in the Atlantic world and the development of key political concepts including divine right monarchy, constitutional monarchy, individual representation, the social contract theory, checks and balances, and the theoretical and practical processes of constitution-writing and ratification.
3. Students will strengthen their critical thinking argumentative skills through class discussions.
4. Students will demonstrate public speaking and class leadership skills by preparing and leading class discussions.
5. Students will demonstrate an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
6. Students will demonstrate an ability to think about the interaction between present and past issues presented in the class.
7. Students will undertake a 10-12 page research paper in which they will integrate and extend learned material.

HIST 527. Labor History
3 Credits (3)
Seminar discussions explore labor and working-class history, including such topics as pre-industrial labor, slavery, debt peonage, indentured servitude, and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state.
Learning Outcomes

1. Students will evaluate, synthesize, and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze and compare the economic structures, workplace experiences, and cultural impacts presented by different types of industries in New Mexico from the late 19th century to the present.
3. Students will apply their argumentative skills through online class discussions and written assignments.
4. Students will express an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
5. Students will attain an ability to think about the interaction between present and past issues presented in the class.

HIST 535. War and Revolution
3 Credits (3)
Seminar covers historical dynamics of violent social, political and economic transitions. May focus upon a particular war or upheaval, such as World War II or the French Revolution, or may examine more generic characteristics of conflict and radical change across many historical examples. Extensive readings in scholarly literature. Research projects relating to specific course contents.

HIST 538. Special Topics in European History
3 Credits (3)
Advanced special topics in European history to be announced in the schedule of classes. May be repeated up to 12 credits.
Learning Outcomes

1. Students will analyze and interpret key themes, events and figures related to the chosen topic of this class on an advanced level, evaluating their historical significance and impact.
2. Students will engage with and critically assess both primary and secondary historical sources related to the chosen topic of this class on an advanced level, developing skills in historical inquiry and evidence-based argumentation in both discussion and written work.
3. Students will construct well-supported historical arguments related to the chosen subject matter of this class in both written and oral formats.

HIST 543. Special Topics in Asian History
3 Credits (3)
Advanced special topics in Asian history to be announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes

1. Students will analyze and interpret key themes, events and figures related to a topic in Asian history on an advanced level, evaluating their historical significance and impact.

2. Students will engage with and critically assess both primary and secondary historical sources related to the chosen topic of this class on an advanced level, developing skills in historical inquiry and evidence-based argumentation in both discussion and written work.
3. Students will construct well-supported historical arguments related to the chosen subject matter of this class in both written and oral formats.

HIST 545. Special Topics in United States History
3 Credits (3)
Advanced special topics in United States history to be announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes
1. Students will analyze and interpret key themes, events and figures related to a topic in US history on an advanced level, evaluating their historical significance and impact.
2. Students will engage with and critically assess both primary and secondary historical sources related to a topic in US history on an advanced level, developing skills in historical inquiry and evidence-based argumentation in both discussion and written work.
3. Students will construct well-supported historical arguments related to the chosen subject matter of this class in both written and oral formats.

HIST 549. Graduate Readings
1-3 Credits
Individual study of selected readings and problems. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

HIST 568. Urban History
3 Credits (3)
Seminar discusses cities as complex catalysts for cultural, political, and scientific development, both within cities themselves and more broadly for their nations and regions. Course deals with such topics as the relationship between social organization and physical space; city development, morphology and dynamics; and the cultural and intellectual history of cities.
Learning Outcomes
1. Students will examine the best practices of urban planning and development and write short argumentative papers on how these theories have changed over time.
2. Students will create a presentation that examines urban development in the American West since 1880 using primary and secondary sources.
3. Students will identify the major turning points in urban development in the United States in class discussions and short response papers.

HIST 569. Cultural Resource Management I
3 Credits (3)
This course will introduce you to the field of cultural resource management (CRM) and the federal and state laws and regulations that govern most archaeology and historic preservation projects conducted today. Course lectures, readings, and written assignments will cover major US federal laws (NHPA, NEPA, ARPA, NAGPRA); New Mexico state cultural resource laws, regulations, and permitting practices; and major international heritage laws. Particular emphasis will be placed on the evaluation and nomination processes of cultural resources to the National Register of Historic Places (NRHP). Strong oral and communication skills are key for success in CRM, so you will be given many opportunities to develop these skills in class.
Learning Outcomes
1. Explain the goals of cultural resource management (CRM).
2. Describe the major laws and regulations that govern CRM in the United States, New Mexico, and abroad.
3. Identify common challenges with implementing these laws and regulations.
4. Determine the eligibility of cultural resources for listing on the NRHP and justify that determination.

HIST 570. The Cold War in Latin America
3 Credits (3)
Seminar discusses Latin American political history during the Cold War. Course focuses on how Latin Americans (individuals, parties, militaries, states) acted in an increasingly politicized arena defined by growing United States concerns over Cuban and Soviet influence in the area.
Learning Outcomes
1. Analyze primary sources by placing them into the historical context of the Cold War.
2. Compare Cold War themes and historical events to current-day issues in Latin America.
3. Attain writing skills using Chicago style of writing.
4. Explain the historical significance of a particular person or set of events.
5. Analyze the impact of the Cold War in different Latin American countries.

HIST 571. China through the Ming Dynasty
3 Credits (3)
History of China from origins to Ming Dynasty, 1368-1644. Cultural and political development with emphasis on social and economic contexts and long term trends. Research paper required.

HIST 572. China in the Modern World
3 Credits (3)
Covers the history of China from 17th through 20th centuries. Rise and fall of the Manchu Qing dynasty, internal dynamics of social and political change in the 19th and 20th centuries, impact of Western imperialism, and development of the Peoples Republic since 1949. Research paper required. May be repeated up to 3 credits.
Learning Outcomes
1. Students will learn the basic narrative of modern Chinese history.
2. Students will learn to understand and evaluate historical arguments and interpretations
3. Students will learn to work with primary sources and to analyze and interpret their contents.
4. Students will complete a research paper combining primary and secondary sources and making a sustained historical argument.

HIST 573. History of Japan
3 Credits (3)
Covers the history of Japan through the 20th century. Political and cultural developments and their social and economic contexts. Chinese influence on early Japan, rise of Samurai and Shogunate, impact of Western imperialism, and the emergence of modern Japan. Research paper required.

HIST 575. History of the Global Political Economy
3 Credits (3)
Traces development of global systems of economic interaction and the rise of European dominance in the 18th and 19th centuries. Emphasis on

East and South Asian roles in early modern history, and on challenges to European dominance in the 20th and 21st centuries.

HIST 577. Cultural Resource Management II
3 Credits (3)
This course will introduce students to the practice of working in cultural resource management (CRM). It includes readings, lectures, field sessions, and laboratory sessions aimed at providing students with the research design, archaeological survey, site mapping and documentation, and technical writing skills necessary to pursue employment in CRM. Students are strongly encouraged to take CRM I before taking this class.
Learning Outcomes
1. Map and record an archaeological site.
2. Document an archaeological site (using a Laboratory of Anthropology site form).
3. Analyze and present archaeological data using relevant software.
4. Critically evaluate an inventory, testing, or data recovery report.
5. Prepare sections of a technical report—either a research proposal or survey report.
6. Conduct archaeological fieldwork safely and ethically.

HIST 579. Oral History
3 Credits (3)
Oral history through readings, discussion, and interviews. Course project required that includes an interview and transcription.
Learning Outcomes
1. Articulate an understanding of methodology, importance, and challenges for oral history research and scholarship.
2. Practice developing materials for and conducting oral history interviews.
3. Apply oral history research to a historical research paper.
4. Construct a historical argument using oral histories in conjunction with other historical sources and secondary materials.

HIST 583. Advanced Historic Preservation
3 Credits (3)
Covers the community development, the historic preservation movement, and the built environment. Field project and additional graduate work.
Learning Outcomes
1. Students will examine the best practices in the field of historic preservation and construct short response papers based on course readings.
2. Students will examine the different debates and methods in the field and how they apply to the nomination process.
3. Students will prepare a group nomination project and write a paper justifying how their work aligns with the Secretary of Interior's standards as a way of gaining field experience.

HIST 585. Public History Internship
3 Credits (3)
Individual project in an area of public history, including a final written report. Research project required. May be repeated for a maximum of 9 credits.
Prerequisite: consent of instructor.

HIST 586. Interpreting Historic Places for the Public
3 Credits (3)
Advanced study of historic site interpretation, the scholarship and philosophy of historic interpretation, and the nature of heritage interpretation for historic places.
Learning Outcomes
1. Students will complete historical marker nomination forms and align them with the NM SHPO standards as a way of gaining field experience.
2. Students will examine the different debates and methods in the field through short writing assignments and construct historical arguments backed with secondary and primary sources.
3. Students will analyze different theories of interpretation and visit a historic site or museum to see how other professionals apply these concepts.

HIST 590. Reading Seminar: Borders, Boundaries and Frontiers
3 Credits (3)
Explores questions and issues concerning different kinds of borders, boundaries and frontiers. Introduces relevant theoretical literature and considers specific places and times through case studies, including U.S.-Mexico border. Restricted to students in HIST program. May be repeated up to 6 credits.
Learning Outcomes
1. Summarize historiographical debates around borders, boundaries, and frontiers.
2. Analyze academic sources in group discussions.
3. Evaluate the impacts of borders, boundaries, and frontiers on other areas of historical inquiry.
4. Formulate a research plan, conduct independent research, synthesize findings, and construct a historical argument based on the research.

HIST 591. Reading Seminar: Modernity and its Discontents
3 Credits (3)
Examines the problem of modernization and the meaning of becoming and being modern, including positive and negative effects on individuals, cultures, environments and societies.
Learning Outcomes
1. Students will evaluate the complex concept of modernity by engaging in group discussion based on close readings of academic sources on the topic.
2. Students will analyze how different cultures have incorporated the concept of modernity to understand their own historical development.
3. Students will summarize recent historiography that challenges the notion of modernity as a Western-centered historical process.

HIST 592. Reading Seminar: Nature and Society
3 Credits (3)
Considers how humans and nature have reshaped each other, how people have perceived nature, how different cultures have understood their relationships to nature, and how social groups and nations have struggled over natural resources. Takes a comparative, transnational approach.
Learning Outcomes
1. Students will analyze the complex interactions between people and environments across a wide range of geographies and temporalities.
2. Students will compare how different cultures, in different historical moments, have shaped, been shaped by, and thought about the environments around them.
3. Students will summarize the major texts, themes, concepts, and approaches in the field of environmental history.
4. Students will evaluate sources, evidence, historical interpretations, and arguments with a critical eye.

5. Students will craft evidence-based historical arguments that reflect an awareness of audience, purpose, ethics, and historiography.

HIST 594. Public History Seminar
3 Credits (3)
Introduction to the discipline of public history, including its methodology and literature. Fieldwork is required.
Learning Outcomes
1. Students will examine the history and theories of public history in the United States and write short argumentative papers about the field's best practices.
2. Students will compare the different debates and methods in the field and write short response papers that engage a general audience.
3. Students will create an original public history project from one of the subfields and compile a proposal, budget, and CV as a way of gaining grant writing experience.

HIST 596. Research Seminar
3 Credits (3)
Research seminar teaches students the process of conducting original historical research with primary source documents. Students will then use these research skills to produce a polished chapter or article-length manuscript. Restricted to HIST majors.
Learning Outcomes
1. Make an original and substantial historical contribution based on research in primary sources available in an archive or in digital form.
2. Explain how their scholarship makes a contribution to the field by summarizing relevant historiography.
3. Articulate their research findings effectively in written and oral presentations.
4. Demonstrate an understanding of professional and ethical standards in the discipline.

HIST 597. Public History Article
1-9 Credits (1-9)
Researching and writing an article suitable for publication about a student's public history internship or other topic of interest within the field of public history.

HIST 598. Craft of History: Historical Theories, Methods, and Criticism (f)
3 Credits (3)
Introduction to historical theories, methodologies, criticism, and skills essential to graduate study in history. Required for all history graduate students; restricted to history majors.
Learning Outcomes
1. Analyze exemplary historical writing and a variety of methodologies around a single topic.
2. Explain historical epistemic practices.
3. Craft a precis that summarizes and analyzes historical scholarship.
4. Situate new works within a relevant historiographic tradition.
5. Produce an academic book review suitable for publication in a scholarly journal.
6. Devise an engaging class discussion about shared readings.

HIST 599. Master's Thesis
1-15 Credits (1-15)
Thesis.

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Website: http://history.nmsu.edu/ (http://history.nmsu.edu)

History - Bachelor of Arts

The undergraduate history major consists of at least 36 credits in the major field, 21 credits of which must be numbered 300/3000 or above. All courses must be passed with grades of C- or higher, and none may be taken on an S/U basis. Electives must be carefully selected by the student and approved by a Department of History advisor so that the student's program is well tailored to individual goals. All majors must be advised prior to registration.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1,2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences (4 credits) [1]		
Area IV: Social/Behavioral Sciences Course [1]		
Either an Area III/IV: Laboratory Sciences or Social/Behavioral Sciences Course (4 credits or 3 credits) [1]		
Area V: Humanities		
Choose one HIST course from the following to satisfy the Area V requirement and another one to satisfy the General Education elective requirement:		3
HIST 1130G	World History I	
HIST 1140G	World History II	
HIST 1150G	Western Civilization I	
HIST 1160G	Western Civilization II	
HIST 1110G	United States History I	
HIST 1120G	United States History II	
HIST 2245G	Islamic Civilizations to 1800	
HIST 2250G	East Asia to 1600	
HIST 2251G	East Asia since 1600	
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		*3*
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
A total of 15 credits of lower-division HIST courses are required.		15
HIST 1150G	Western Civilization I	
HIST 1160G	Western Civilization II	
HIST 1130G	World History I	
HIST 1140G	World History II	
HIST 1110G	United States History I	
HIST 1120G	United States History II	
HIST 2250G	East Asia to 1600	
HIST 2251G	East Asia since 1600	

HIST 2245G	Islamic Civilizations to 1800	
Required Course		
Students should take HIST 398 in their Junior year, if possible. HIST 398 is only offered in spring semesters.		
HIST 398	Historians and History [5]	3
Select at least 18 credits of upper-division courses, excluding HIST 398. At least 6 credits of upper-division courses must be at the 400/4000 or above level. [5]		18
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120		
Select sufficient electives to bring total credits to 120, including 48 upper-division credits. [6]		44-46
Total Credits		**120**

1 See the General Education (p. 262) section of the catalog for a full list of courses.

2 A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course first.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 Students who complete their Humanities General Education requirements with courses outside of the HIST prefix will need to take an additional 6 credits of lower-division HIST, in order to complete the requirement with a total of 12 credits

5 **Majors must pass a total of 21 upper division History credits** (including HIST 398 Historians and History) with at least 6 at the 400 level.

6 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in History there is no second language requirement for the degree.

Secondary Licensure

History majors who are planning on pursuing certification as public school teachers should take the following six courses in preparation. These six courses will complete approximately half of the course work necessary for students to earn teaching licensure in New Mexico. After completing the undergraduate degree in History with a grade point average of 2.5 or above, the student should apply to the Graduate School for admission to the Department of Curriculum and Instruction and the Teacher Education Program in the College of Education to pursue the remaining courses needed to complete secondary licensure.

Prefix	Title	Credits
Required Courses		
EDUC 3120	Multicultural Education	3
EDLT 3110	Integrating Technology with Teaching	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
EDUC 3997	Secondary Field Experience	0,3
EDUC 5110	Exploration in Education [1]	3
Total Credits		**12-15**

1 Recommended for senior year or as a graduate student.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1130G	Survey of Mathematics [1]	3
FYEX 1112	The Freshman Year Experience	3
General Education HIST Elective Course		3
Area IV: Social and Behavioral Science Course [2]		3
Choose from one of the following:		3
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
General Education HIST Elective Course [2]		3
HIST Elective Course		3
Area VI: Creative and Fine Arts Course [2]		3
Minor (or Elective) Course		3
	Credits	**31**
Sophomore		
ENGL 2221G	Writing in the Humanities and Social Science [1]	3
Area III: Laboratory Science Course [2]		4
Area III: Laboratory Science Course OR Area IV: Social and Behavioral Science Course [2]		3-4
HIST Elective Courses		9
Minor (or Elective) Course		6
Elective Course(s)		6
	Credits	**31-32**
Junior		
HIST 398	Historians and History (HIST 398 is only offered in spring semesters.)	3
HIST Upper-Division Elective Course		9
VWW: Viewing a Wider World Course [3]		3
Upper-Division Minor (or Elective) Course		6
Upper-Division Elective Course		6
Elective Course(s)		3
	Credits	**30**
Senior		
VWW: Viewing a Wider World Course [3]		3
HIST 400-Level or Above Elective Course		6
HIST Upper-Division Elective Course		6
Upper-Division Elective Course		6
Elective Course(s)		7
	Credits	**28**
	Total Credits	**120-121**

[1] These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
[2] See the General Education (p. 262) section of the catalog for a full list of courses.
[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

History - Undergraduate Minor

A student may not earn both a bachelor's degree in the Department of History and a minor in History.

Prefix	Title	Credits
Requirements		
Select two from the following:		6
HIST 1150G	Western Civilization I	
HIST 1160G	Western Civilization II	
HIST 1130G	World History I	
HIST 1140G	World History II	
HIST 1110G	United States History I	
HIST 1120G	United States History II	
HIST 2250G	East Asia to 1600	
HIST 2251G	East Asia since 1600	
HIST 2245G	Islamic Civilizations to 1800	
Select 12 additional credits in History (at least 9 credits must be numbered 300 and above)		12
Total Credits		**18**

Note: All courses must be passed with grades of C- or above. No courses may be taken S/U.

Individualized Studies - Bachelor of Individualized Studies

The Bachelor of Individualized Studies (BIS) prepares students for 21st century challenges. This degree serves students desiring an academic degree not already offered at NMSU. Students served by the BIS are those with extensive, comprehensive or eclectic academic and career interests. Self-motivated and self-directed students work closely with an advisor to select classes each semester with the intent of graduating in a timely manner, ideally with at least one minor. Recommended and chosen courses should be organized to meet the unique educational needs of the student, be it professional advancement within an existing career, academic preparation for graduate or professional programs, a strategy for career change, or a plan for efficiently utilizing prior university credits to complete a Bachelor Degree.

A well-designed individualized curriculum emphasizes the value of approaching complex issues from multiple perspectives, equipping students with the requisite critical and analytical skills to become effective problem solvers in their chosen fields of study or career. Each student should select courses designed to integrate academic and career goals into a cohesive degree program.

Extensive flexibility in program design implies increased individual responsibility for the BIS student. BIS students must be active participants in their academic experience, simultaneously pursuing a skill-set demonstrating:

- Coherent expression of ideas in writing;
- Capacity to conduct systematic and objective inquiry within their program of study;
- Ability to tolerate ambiguity within the design and implementation of a program of study;
- Proactive communication with the academic advisor;
- Commitment to effective follow-through on tasks related to program of study design and implementation.

To Declare a BIS

Students entering the BIS degree program work in consultation with a BIS advisor and complete a series of courses building on the applicant's existing coursework and complementing the applicant's education or career goals.

Deadline for Declaring BIS Major: Students must declare the BIS degree by the last date to drop with a "W" in a student's final semester of study (*see NMSU Academic Calendar for date*).

Degree Requirements

To graduate with the Bachelor of Individualized Studies degree, you must complete a minimum 120 credit hours (or more, as determined in consultation with your academic advisor). (*Note: The NMSU College of Business allows a maximum of 30 business credit hours to count towards the BIS degree. Also, the only College of Business minor allowed is the Business Administration Minor.)*

BIS students must also

- Complete a minimum of 48 credit hours of upper-division courses (300-499 level), including six credits of Viewing a Wider World (VWW) (p. 266) from courses in two separate colleges at NMSU. You may substitute three credits of VWW with credits taken in study abroad. A minimum of 36 of the 48 required upper-division credits must have a grade of C- or better.
- Complete the University's General Education Core Requirements (*minimum of 32 credit hours of approved New Mexico* General Education courses *(p. 262)*).
- Not have completed the requirements, or be a candidate, for another baccalaureate degree.

In addition, it is strongly recommended that students take one or more of the Interdisciplinary Studies courses designed specifically for the Bachelor of Applied Studies and the Bachelor of Individualized Studies degrees: INTR 300 Foundations of Interdisciplinary Studies and/or INTR 301 Interdisciplinary Research: Theory & Practice. These courses prepare BAS and BIS students to better plan and conceptualize their degree as they prepare to move into their professional careers or graduate school.

Second Language Requirement

For the Bachelor of Individualized Studies there is no second language requirement for the degree.

Individualized Studies (Pre-Pharmacy) - Bachelor of Individualized Studies

The Bachelor of Individualized Studies (BIS) Pre-Pharmacy concentration is a mechanism for students in the NMSU — University of New Mexico (UNM) Pre-Pharmacy Early Assurance Program (EAP) to earn a Bachelor's degree from NMSU that will show up on their NMSU transcript. The NMSU part of the program takes approximately three years (six academic terms) to complete. Students who subsequently successfully complete the first year of study in the UNM PharmD program can readily apply for readmission to NMSU, transfer the PharmD credits back to NMSU, then apply for the BIS degree.

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Up to 36 upper division credits earned through the UNM PharmD program can be transferred back to NMSU and counted towards meeting these requirements. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirement		
Area I: Communications [1]		*9-10*
English Composition - Level 1		
English Composition - Level 2		
ENGL 2221G	Writing in the Humanities and Social Science	
or ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
or ENGL 2210M	Professional and Technical Communication for Multilingual Students	
Oral Communication [2]		
COMM 1115G	Introduction to Communication	
or HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics [3]		*3-4*
Choose either MATH 1220G and MATH 1221, or MATH 1430G		
MATH 1220G & MATH 1221	College Algebra and General Supplemental Instruction II [4]	
MATH 1430G	Applications of Calculus I	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11-13*
Area III: Laboratory Sciences		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [4]	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [4]	
Area IV: Social/Behavioral Sciences (3 credits)		
ECON 2110G	Macroeconomic Principles	
or ECON 2120G	Principles of Microeconomics Honors	
Area V: Humanities		*3*
Choose one of the following		
PHIL 1115G	Introduction to Philosophy (preferred)	
PHIL 1120G	Logic, Reasoning, & Critical Thinking	
PHIL 1145G	Philosophy, Law, and Ethics	
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective: fulfilled by nondepartmental requirements		*3-4*
Viewing a Wider World courses from two different colleges [5]		**6**
Concentration Requirements (in addition to Gen.Ed/VWW) specific to the concentration		**32-34**
ARSC 2996	Interdisciplinary Topics (Intro. to Pharmacy.) [6]	
BCHE 140	Explorations in Chemistry and Biochemistry	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
BIOL 305	Principles of Genetics	
BIOL 311	General Microbiology	
or BIOL 2320	Public Health Microbiology	
BIOL 311 L	General Microbiology Laboratory	
BIOL 353	Pre-Professional Human Anatomy	
or SPMD 2210	Anatomy and Physiology I	
BIOL 353 L	Pre-Professional Human Anatomy Laboratory	
BIOL 354	Physiology of Humans	
or SPMD 2225	Anatomy and Physiology II	
CHEM 313	Organic Chemistry I [4]	
CHEM 314	Organic Chemistry II [4]	
CHEM 315	Organic Chemistry Laboratory	
MATH 1350G	Introduction to Statistics	
or A ST 311	Statistical Applications	
Second Language: not required		
Selective A: Communication [7]		**3**
Selective B: Critical Thinking [8]		**3**
Elective [9,10]		**19-7**
BCHE 395	Biochemistry I	
Non-professional support courses to bring the total credits to 120		
Credits transferred from UNM College of Pharmacy [10]		**25-36**
ARSC 4550	Topics in Pharmacy	
ARSC 4555	Advanced Topics in Pharmacy	
Total Credits		**120-126**

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. Any course listed under *Oral Communication* the General Education (p. 262) section of the catalog may be used
3. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I are required for the degree but students may need to take any prerequisites needed to enter MATH 1220G or MATH 1430G first.
4. Supplemental instruction (SI) is strongly recommended but credits may be waived in cases in which the student has prior knowledge of the subject or in cases where SI would lead to a scheduling conflict.
5. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses and
6. ARSC 1115 or ARSC 2511 or another approved course may substitute for ARSC 2996 if the latter is not offered in the semester indicated on the degree roadmap
7. One course from the following, COMM 3120, COMM 3710, COMM 3530, COMM 3610, COMM 4520, COMM 4640, COMM 4530, COMM 4750, or an approved alternative.
8. Choose one from the following:
   A ST 465, HORT 310, PHIL 316, PHIL 328, PHIL 351 or one of the PHIL general education courses not already used to fulfill the Area V requirement, SPMD 1120, TOX 361, any upper division BIOL course not listed among the concentration requirements, or an approved upper division alternative.

[9] In addition to the Selective A and B courses, the UNM/NMSU Early Assurance Program for pre-pharmacy students requires as preparation for the UNM PharmD program a total of 21 credits outside of math and core sciences, designated as non-professional support (NPS) credits. Fourteen of these credits are accounted by ARSC 2996 Interdisciplinary Topics (2 cr), General Education Areas IV and VI (6 cr), and VWW (6 cr), leaving seven elective NPS credits to be selected in consultation with an academic advisor. If BCHE 395 Biochemistry I is not completed then ten remaining NPS credits must be taken, with at least three of those credits in an area of health promotion, such as courses under the NUTR or PHLS prefixes.

[10] Upon successful completion of at least one full year of study in the UNM PharmD program students may transfer back to NMSU up to 36 credits of designated UNM PharmD classwork under the NMSU course numbers ARSC 4550 (up to 18 credits) and ARSC 4555 (up to 18 additional credits). The number of elective credits needed to fulfill the NMSU requirement of 120 total credits will depend on the number of Pharm-D credits transferred back from UNM, the number of credits of supplemental instruction accumulated, and other factors.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I . This plan only includes those credits earned while in residence at NMSU, not the credits to be earned subsequently in the UNM PharmD program and transferred back to NMSU. The contents and order of this roadmap may vary depending on initial math and English placement and other factors. While students need to satisfy prerequisites to enroll in math and science courses, there is some flexibility in when other degree requirements are satisfied. Many courses are offered only once per year. Students are strongly encouraged to consider this when planning for the year ahead.

Freshman		
Fall		**Credits**
MATH 1220G & MATH 1221 or MATH 1430G	College Algebra [1] or Applications of Calculus I	4
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
PHIL 1115G	Introduction to Philosophy (or other Philosophy General Education course)	3
ECON 2110G or ECON 2120G	Macroeconomic Principles or Principles of Microeconomics Honors	3
FYEX 1110	First-year Seminar (or other elective credit if needed) [4]	1-3
	Credits	**14-16**
Spring		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	5
ENGL 1110G or ENGL 1110H or ENGL 1110M	Composition I or Composition I Honors or Composition I	4
ARSC 2996	Interdisciplinary Topics (Intro to Pharmacy)	2
ARTH 2110G	History of Art I (or other Area VI General Education course) [2]	3
PHED 1230	Individual Sport: (or other elective credit if needed) [4]	1
	Credits	**15**
Sophomore		
Fall		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
ENGL 2221G or ENGL 2210G	Writing in the Humanities and Social Science or Professional and Technical Communication	3
BCHE 140	Explorations in Chemistry and Biochemistry	1
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	5
Selective A or B		3
	Credits	**16**
Spring		
BIOL 353 or SPMD 2210	Pre-Professional Human Anatomy or Anatomy and Physiology I	4
BIOL 305	Principles of Genetics	3
CHEM 313	Organic Chemistry I	4
CHME 395V	Brewing Science and Society (or other VWW course outside Arts and Sciences) [3]	3
Non-professional elective		3
	Credits	**17**
Junior		
Fall		
CHEM 314	Organic Chemistry II	4
BIOL 354 or SPMD 2225	Physiology of Humans or Anatomy and Physiology II	3
CHEM 315	Organic Chemistry Laboratory	2
ANTH 357V	Medical Anthropology (or other VWW course) [3]	3
Selective B or A		3
	Credits	**15**
Spring		
BIOL 311 L	General Microbiology Laboratory	2
BIOL 311 or BIOL 2320	General Microbiology or Public Health Microbiology	3
MATH 1350G or A ST 311	Introduction to Statistics or Statistical Applications	3
BCHE 395	Biochemistry I (or Non-professional elective)	3
Non-professional electives totalling at least 4 credits		4
	Credits	**15**
	Total Credits	**92-94**

[1] MATH 1220G or MATH 1430G is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.

[2] See the General Education (p. 262) section of the catalog for a full list of courses

[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

[4] Elective credits may be added if student needs to enroll in at last 15 credits to be eligible for certain types of financial aid. Suitable coursework includes FYEX, PHED and other flexible courses that can be taken for one or two credits.

Students interested in other activities related to pre-pharmacy studies should consider joining the NMSU Pre-Pharmacy society. Please see https://cpp.nmsu.edu/ for contact information.

Journalism and Media Studies

Undergraduate Program Information

Studies in Journalism and Media Studies prepare students for careers in mass media, including broadcast news, multimedia journalism, advertising, public relations and photojournalism. Students study these disciplines and learn about industry trends and changes, such as how they converge on the internet. The curriculum emphasizes the skills of gathering, evaluating, writing, and disseminating information and related skills. Students are also instructed in the theory, law, history, and professional guidelines of mass media.

Thanks to the generosity of donors who invest in the next generation of storytellers, all Journalism and Media Studies majors who remain eligible receive scholarship support (https://journalism.nmsu.edu/students/scholarships.html). Apply, declare your major, and start your degree with real financial backing behind your media future.

Degrees for the Department

- Journalism and Media Studies - Bachelor of Arts (p. 801)

Minors for the Department

- Journalism and Media Studies - Undergraduate Minor (p. 805)
- Social Media Management - Undergraduate Minor (p. 805)
- Strategic Communications - Undergraduate Minor (p. 805)

Interim Department Head: Lanasa

Professor Lamonica; ***Associate Professor*** Berman; ***Assistant Professor*** Hunter; ***College Full Professor*** Miller; ***College Associate Professor*** Perez; ***College Assistant Professor*** Coltharp; ***Professor Emeritus*** McCleneghan, Mellen, Thayer; ***News22 Director*** Miller; ***Spanish News22 Director*** Perez

Journalism and Media Studies Courses

JOUR 105G. Media and Society
3 Credits (3)
Functions and organization of the mass media system in the United States; power of the mass media to affect knowledge, opinions, and social values; and the impact of new technologies.
Learning Outcomes
1. Describe the structure and functions of major US media institutions and their roles in shaping public knowledge and opinion.
2. Analyze the social, political, and cultural impacts of mass media on audiences and communities, with attention to issues of power and representation.
3. Evaluate the influence of emerging technologies on media practices, audience behavior, and the future of journalism.

JOUR 110. Media Writing I
3 Credits (2+2P)
Introduction to media writing basics including news writing for print and web, feature writing, sports writing and writing for public relations. Course emphasizes fundamental news values, journalism ethics and Associated Press style. Restricted to all Campuses. May be repeated up to 3 credits.
Learning Outcomes
1. Know and put into practice news writing basics including the five W's, inverted pyramid, basic news leads, quotations, interviews, attributions and cutlines.
2. Know how to cover scheduled and breaking news events, and put knowledge into practice.
3. Know how to write for different media, including print, web and broadcast, and put knowledge into practice.
4. Know fundamentals of writing news stories, features, editorials, obituaries, and press releases, and put knowledge of each into practice.
5. Develop and practice basic copy editing skills.

JOUR 201. Introduction to Multimedia Journalism
3 Credits (2+2P)
Introduction to journalistic storytelling using text, photos, audio, video and infographics. Students produce their own multimedia stories in intensive, hands-on environment using digital cameras and audio recorders, mobile phones, external microphones and digital editing software applications including Adobe Premiere Pro, Audition and Photoshop. May be repeated up to 3 credits.
Learning Outcomes
1. Learn how to recognize and accurately define multimedia journalism.
2. Improve visual literacy by viewing and analyzing a variety of work produced by professional multimedia journalists.
3. Know the basic requirements and parts of a story, and know how to map and structure a story.
4. Know and put into practice news writing basics including the five W's.
5. Know what makes a good image, and put into practice composing and framing photographs and videos.
6. Understand and put into practice still photography, video and audio capture and editing fundamentals using a variety of tools.
7. Know how to combine different media to create a logical and effective story.

JOUR 210. Copyediting
3 Credits (2+2P)
Introduction to various aspects of copyediting with an emphasis on accuracy and style. Includes hands-on, directed practice in editing for Associated Press style, punctuation and grammar. Includes headline and cutline writing. May be repeated up to 3 credits.
Prerequisite: JOUR 110.
Learning Outcomes
1. Know and put into practice news writing basics including the five W's, inverted pyramid, basic news leads, quotations, interviews and attributions.
2. Know fundamentals of writing news stories, sports stories, features and editorials, and put knowledge of each into practice.
3. Know how to write for different media, including print, web and social media, and put knowledge into practice.
4. Develop and practice basic copy editing skills.
5. Understand fundamentals of media law and ethics, and know basic press rights.
6. Understand basic math principles used by reporters.
7. Practice and understand the importance of meeting deadlines.
8. Develop a habit of consuming news and monitoring daily headlines.

JOUR 300. Introduction to Advertising
3 Credits (3)
This course introduces students to the principles and practices of integrated marketing communications (IMC) and their role in promoting goods, services, and organizations. Students explore the creative and strategic processes behind advertising campaigns, including media

planning, message design, and consumer behavior analysis. The course also addresses social and ethical issues in advertising, providing a foundation for further study in media strategy, creative development, and campaign evaluation.

Learning Outcomes

1. Explain the role of integrated marketing communications in the promotion of goods, services, and organizations within the broader marketing landscape.
2. Analyze consumer behavior and media trends to inform strategic planning and message development for advertising campaigns.
3. Apply creative and ethical principles to design basic advertising concepts or campaign strategies that address specific communication objectives.

JOUR 302. Television Videography & Editing
3 Credits (3)

Classroom instruction on basic studio and single camera video productions. The focus is placed on introductory practical aspects of news and videography, reporting and storytelling. Lab experience in camera basics, studio functions and digital video editing. Includes practical experience through crew assignments on the live student - produced newscast, News22, which airs on KRWG-TV, a PBS affiliate station. May be repeated up to 3 credits.

Learning Outcomes

1. The students will be able to have a broader introductory understanding of video production for broadcasting media
2. The students will be able to edit video and digital production
3. The students will be able to create media reporting for News and Sports

JOUR 305. Visual Communication in Media
3 Credits (3)

How one sees, perceives, interprets, creates and applies visual language. Explores the history, techniques, application and practice of the various visual media. May be repeated up to 3 credits.

Learning Outcomes

1. Give students an understanding of the historical, critical, theoretical and practical aspects of visual culture in digital media era.
2. Sharpen students' visual acuity
3. Enhance students' understanding of point of view
4. Help students to broaden their perspective of visual communication from the storytelling perspective in social and digital media
5. Enlarge students appreciation of visual culture

JOUR 306. Sports Writing and Reporting
3 Credits (3)

Fundamental principles of sports writing and reporting with an emphasis on accuracy and style. Includes a mix of classroom instruction and hands-on, directed practice in game coverage sports feature writing, sports commentary and sports statistics. Students have the opportunity to produce sports content for Kokopelli online news outlet. May be repeated up to 6 credits.

Prerequisite: JOUR 210 or consent of instructor.

Learning Outcomes

1. Know how to recognize and accurately define sports journalism and different sports story types
2. Improve sports journalism literacy by reading, viewing and analyzing a variety of work produced by professional sports writers and reporters
3. Know the basic parts of a sports story, and know how to structure and package various types of sports stories
4. Know and put into practice sports writing basics including the five W's, leads, interviews, quotations and attributions
5. Know how to write sports stories for different media, including print, web and social media, and put knowledge into practice
6. Know basic sports terminology, and know how to compile, compute and interpret a wide variety of sports statistics

JOUR 310. Media Writing II
3 Credits (3)

Field reporting and writing for web and print publication. Includes a mix of classroom instruction and hands-on, directed practice in local news and sports reporting, feature writing, opinion writing and social media content creation. Students produce written and visual content for Kokopelli online news outlet. Course emphasizes accuracy, news values and ethics in fast-paced, deadline-oriented environment. May be repeated up to 3 credits. May be repeated up to 3 credits.

Prerequisite: JOUR 210.

Learning Outcomes

1. Write an inverted pyramid on deadline.
2. Use AP style in all written assignments.
3. Incorporate news writing conventions in all stories.
4. Identify the differences between hard news stories and features.
5. Conduct interviews using best journalistic practices and professionalism.
6. Demonstrate news judgment in pitching, reporting, and writing stories.
7. Build a personal website and use digital media to report, publish and promote stories.
8. Understand basic libel law and journalistic ethics.

JOUR 312. Advertising/Copywriting
3 Credits (3)

This course explores the creative and strategic processes involved in developing effective advertising messages. Students will learn the principles of persuasive copywriting, visual storytelling, and layout design, applying these skills to create integrated advertising materials for clients. Emphasis is placed on aligning creative executions with brand strategy and audience insights while adhering to ethical and professional standards.

Prerequisite: JOUR 110 or consent.

Learning Outcomes

1. Apply principles of persuasive writing and strategic thinking to develop advertising copy that aligns with client objectives and target audiences.
2. Design storyboards and layouts that integrate copy and visuals to communicate cohesive advertising messages across multiple media platforms.
3. Evaluate advertising concepts for effectiveness, creativity, and alignment with ethical and professional standards in the industry.

JOUR 314. Broadcast Reporting
3 Credits (3)

Students learn the techniques of reporting and writing news stories for broadcast, including how to incorporate video and natural sound so all elements work together for good storytelling. May be repeated up to 3 credits.

Prerequisite: JOUR 302.

Learning Outcomes

1. Students will learn the basics of television reporting.
2. Students will learn and practice the skills of broadcast news reporting, especially, broadcast writing, reporting, interviewing, videography and audio recording, editing, and how to tell stories with video and audio.

JOUR 315. News 22
1-3 Credits (1-3)
Students will report news stories for live, student-produced television newscast that airs on KRWG-TV, public television for Southern New Mexico. May be repeated up to 3 credits.
Prerequisite: JOUR 314 or JOUR 330.
Learning Outcomes

1. Students will learn to report professional news stories for News twenty-two
2. Students will learn the fundamentals of live broadcast news production.

JOUR 319. Intro Photography
3 Credits (3)
Introduction to photography emphasizing composition, camera techniques, post-production skills in Photoshop, Lightroom, and InDesign and storytelling skills. History of photography overview. This class is the starting point for students interested in a photojournalism emphasis. May be repeated up to 3 credits.
Learning Outcomes

1. Students will be able to use "visual language" for use across multiple platforms including print, video and web.
2. Students will acquire post-production skills used in various industries.
3. Students will be able to produce powerful and effective communication through image-making.

JOUR 320. Photojournalism
3 Credits (3)
Communication photography on multiple platforms for sports, news, advertising/public relations and other editorial and commercial needs. Photography lighting techniques, photo-editing software, and website skills will be expanded and further developed. May be repeated up to 3 credits.
Prerequisite: JOUR 319 or Consent of instructor.
Learning Outcomes

1. Students will be able to use specialty techniques, especially sports photography and studio/portraiture/product photography.
2. Students will expand skills needed in editorial, advertising and other communication industries.

JOUR 321. Media Graphic Design
3 Credits (3)
Introduction to graphic design fundamentals for print and web publication including page layout, typography, color theory and photo editing. Students produce their own print and web-based design pieces using Adobe InDesign and Photoshop. May be repeated up to 3 credits.
Learning Outcomes

1. Know and put into practice fundamental design principles including proximity, alignment, repetition and contrast.
2. Know fundamentals of color theory and typography, and apply this knowledge to a variety of media design projects.
3. Know fundamental rules of photography composition and cropping.
4. Know fundamental rules and principles of printed newspaper and magazine design and put knowledge into practice.
5. Know fundamental rules and principles of printed newsletter and brochure design and put knowledge into practice.

JOUR 330. TV News Shooting & Editing
3 Credits (2+4P)
Advanced technical and aesthetic skills and journalism basics needed for videography and editing on-location news stories. Single camera videography and nonlinear/digital editing. May be repeated up to 3 credits.
Prerequisite: JOUR 314 or permission of instructor.
Learning Outcomes

1. Learn or continue exploring and mastering the concept of video sequencing in the field, gathering great natural sound, opening and closing shots and improve your overall storytelling process in the field and during the edit process.
2. Learn or continue exploring the fundamentals of non-linear digital editing, using Adobe Premier.
3. Expand knowledge of field sound recording.
4. Learn and distinguish the difference between uncontrolled action and controlled action.

JOUR 350V. Media History
3 Credits (3)
Historical overview of media including newspapers, magazines, radio, television, photography, entertainment media, advertising, public relations, and digital media. The history of American media development is directly intertwined with American history. Newspapers, magazines, television, and radio have not just reported on news and events; by virtue of what facts and sources editors and reporters have chosen to use, journalists have framed how the public should think about events. Editorials also provided further framing guidance on issues to readers and viewers. Students will study media history from social, intellectual, and cultural history perspectives. Students will examine the historical relationship of the media to American social, political, economic, and cultural patterns and developments. And, conversely, students will examine how these same forces impacted and changed all forms of media through a multi-cultural approach. May be repeated up to 3 credits.
Learning Outcomes

1. Survey the development of various forms of media and the changes in the media as they relate to the larger social, economic, and political sphere
2. Learn the methods and processes of historical research and engage in historical research.
3. Learn that the development of all fields of communication are interrelated
4. Discover how American media have attempted to influence how Americans perceive the world around them (including perceptions of other nations) via their coverage and portrayal of global events.
5. Learn that America's historical events played out through the media. As such, students will gain a deeper understanding of how media personnel helped "frame" the discussion and debate about news and information from the 1600s to present day
6. Discover that the ethical and professional foundations of media industries have adjusted and changed over time due to external and internal forces, including the rise of the professionalism movement across the nation in the late nineteenth century, the internal response to public demands for licensing of news media following World War I,

and modern pressures caused by digitization of the industry and the parallel fragmentation of audiences

7. Learn how to determine how various groups outside the mainstream contributed to overall press development. This includes an examination of how women and ethnic minorities influenced how and why the press became a force for social, cultural, political, and economic change in society.
8. Discover and appreciate that history is NOT just the study of names, dates, and places, but of people
9. Discover that the history of media is not the province of any one individual, corporation, or entity. Instead, a variety of factors: social, economic, political, legal, ethical, and cultural, helped shape the media's development

JOUR 360. Media Literacy
3 Credits (3)
This course is designed to help students develop an informed, critical, and practical understanding of media including analysis of online and social media and to help students develop their media literacy and analytical skills.
Learning Outcomes
1. Write clearly, precisely, and in a well-organized manner.
2. Demonstrate critical thinking, reading, and viewing skills.
3. Research, develop, evaluate, and present arguments grounded in research-based knowledge.
4. Apply analytical, precise, and elaborated terms and concepts for talking and writing about media and the ways in which they communicate meaning.
5. Demonstrate how images are constructed via specific formal and technical elements and how those images construct meaning about national and global communities.
6. Interpret media texts (film, television, etc.) to expand experience and understanding of the self and society.

JOUR 374. Introduction to Public Relations
3 Credits (3)
This course is designed to familiarize students with the basic concepts, principles, practices, and professions of public relations (PR). It is the foundation course for other PR courses in Journalism and a supplemental course for students majoring in other fields.
Learning Outcomes
1. The role and functions of public relations in contemporary society.
2. The contingency views of public relations practice in the worlds of managing competition and conflict.
3. The historical evolution of public relations, career opportunities in the field, and professional/ethical/legal responsibilities.
4. The basic process of public relations—research, planning, communication, evaluation—and the use of communications strategies and tactics to achieve organizational goals and objectives.
5. The persuasion of public opinion and audience analyses and how to reach diverse audiences.
6. Practical guidelines for utilizing written, spoken, and visual techniques to reach selected audiences.
7. An understanding of how public relations is a global phenomenon.
8. How the Internet and social media are changing the way public relations professionals build and sustain relationships between an organization and its constituents.
9. An understanding of public relations activities in business, sports, tourism, entertainment, nonprofit, education, and government organizations.

JOUR 377V. Mass Media Ethics
3 Credits (3)
Philosophical and moral examination of problems relating to mass media. Use of case study method to analyze media situations; development of framework for media professionalism.
Learning Outcomes
1. Analyze ethical dilemmas in mass media using established philosophical theories and ethical frameworks.
2. Evaluate media case studies to determine the ethical responsibilities and professional standards applicable to journalists and media practitioners.
3. Construct a personal code of media ethics informed by moral reasoning, professional guidelines, and critical reflection on case studies.

JOUR 380. Women and the Media
3 Credits (3)
Portrayal and participation of women in mass media from colonial to contemporary times. Same as GNDR 450.
Learning Outcomes
1. Examine the historical evolution of women's roles and representations in mass media from colonial America to the present.
2. Critique media portrayals of women across different time periods and platforms, using feminist theory and media analysis frameworks.
3. Develop original media content, presentations, or arguments that reflect an informed understanding of gender dynamics in media industries.

JOUR 384. Public Relations Storytelling
3 Credits (3)
This course will help students understand the concept of using storytelling as a tool for public relations, branding, and social change. Students will learn how to use storytelling on traditional and social media platforms. Upon completion of this course, students should have attained knowledge of essential elements of storytelling, audience-led narratives, transmedia storytelling, etc.
Learning Outcomes
1. Students will attain knowledge and understanding of the essential elements of branding through storytelling.
2. Students will attain knowledge and understanding of the assessment of brand stories and customer-led narratives.
3. Students will attain knowledge and understanding of integrating brand storytelling into the marketing mix.
4. Students will attain knowledge and understanding of data-driven storytelling.
5. Students will attain knowledge and understanding of personal branding of leaders and brand storytelling success.
6. Students will attain knowledge and understanding of research skills for brand storytelling.
7. Students will attain knowledge and understanding of the future of brand storytelling.

JOUR 407. Media Internship
1-3 Credits (1-3)
Supervised work with a media organization. 1-3 credits. May be repeated up to 3 credits. Restricted to: JOUR majors.
Prerequisite: Consent of internship coordinator.

Learning Outcomes
1. Varies.

JOUR 408. Media Practicum
1-3 Credits
Advanced supervised work with a media organization. May be repeated up to 3 credits.
Prerequisite: Consent of internship coordinator.
Learning Outcomes
1. Varies.

JOUR 412. Documentary Photojournalism
3 Credits (3)
Production of documentary photography for web, print, broadcasting and exhibition emphasizing deep visual storytelling. Multimedia, social media distribution and website techniques including WordPress website design and maintenance. Discussion of notable photographers. Multiple Field Trips to produce material for the Small Village New Mexico term project (SVNM). Students produce an individual Term Project book and multimedia show. May be repeated up to 3 credits.
Prerequisite: JOUR 319.
Learning Outcomes
1. Students will learn "slow photojournalism," and be able to produce visual stories done with deep immersion in whatever community or subject they work in.
2. Students will be able to use photography for communication, giving deeper meaning to subjects than transitory "news" type photography allows.

JOUR 414. Broadcast Reporting Portfolio
3 Credits (3)
This is course is designed to help students who are preparing for a career in broadcasting. Students will refine reporting, shooting and editing skills and build a professional website containing a reporter reel, resume and proof of other skills needed for success in broadcasting. The class also features guest speakers throughout the semester who work in the broadcast and digital world of media. May be repeated up to 3 credits.
Prerequisite: JOUR 314.
Learning Outcomes
1. To practice, hone, and improve scriptwriting skills, especially news writing.
2. To practice and improve audio announcing skills and on-camera announcing skills.
3. To practice and improve overall videography and digital editing skills.
4. To learn more and prepare for related careers.

JOUR 425. Media Planning and Buying
3 Credits (3)
Covers the principles of media planning for an IMC campaign and procedures for purchasing ad time or space.
Prerequisite: JOUR 300 or consent of instructor.
Learning Outcomes
1. Analyze audience demographics, psychographics, and media consumption data to determine optimal media channels for journalistic content placement.
2. Design comprehensive media plans that align with campaign objectives, budget constraints, and ethical journalism practices.
3. Evaluate the effectiveness of media buys using key performance indicators (KPIs) and adjust strategies based on data-driven insights.

JOUR 427. Media Writing III
3 Credits (3)
Advanced field reporting and writing for web and print publication. Includes hands-on, directed practice in local news and sports reporting, feature writing, opinion writing, social media content creation and web publishing. Students produce written and visual content for Kokopelli online news outlet, and prepare final portfolio. Course emphasizes accuracy news values and ethics in fast-paced, deadline-oriented environment. May be repeated up to 3 credits.
Prerequisite: JOUR 310.
Learning Outcomes
1. Sharpen and expand advanced reporting, interviewing, writing, and editing skills for print and online publication.
2. Sharpen multimedia reporting and storytelling skills including photography skills.
3. Improve and expand professional portfolio through online publication of original work.
4. Demonstrate effective use of social media platforms.
5. Demonstrate understanding of fundamentals of journalism ethics.
6. Learn to work effectively under deadline pressure.
7. Produce a final portfolio or "string book" of published work.

JOUR 457. Social Media Management and Analytics
3 Credits (3)
This course is designed to help students to understand how marketing has (and has not) changed due to the rise of social media and changes in various underlying contextual factors, such as dramatically increased speed of information dissemination across consumers and brands. The overarching goal is to obtain a clear perspective on what's really going on in digital/social/mobile marketing so that you can begin to appreciate its true value to consumers, to managers, and to other corporate stakeholders. It will equip students with the relevant knowledge, perspectives, and practical skills required to develop marketing strategies that leverage the opportunities inherent in social media and consumer-to-consumer social interactions for achieving business and marketing goals.
Prerequisite: JOUR 374.
Learning Outcomes
1. Understand what social media is and how this new type of media and communications technology influences how business and marketing is done
2. Develop skill in using the predominant social media tools currently available for business/marketing communication
3. Understand how to use various social media channels to publish and disseminate relevant branded content in order to engage consumers and to increase social impact, influence, and value
4. Develop a strategic plan for identifying opportunities for using social media in a company

JOUR 460V. Sports & Entertainment P.R.
3 Credits (3)
This course aims to provide a basic understanding of sports and entertainment PR and its industry trends, theories, techniques, case studies, global trends, and future directions. Upon completion of this course, students will be able to use the theories and techniques to plan, implement, and evaluate sports and entertainment PR campaigns and activities. May be repeated up to 3 credits.
Learning Outcomes
1. Describe the nature of public relations practice in sports
2. Practice the primary research methods employed in sports public relations.
3. Recognize the major steps involved in planning a public relations campaign and the key considerations at each step in the process.

4. Identify the various types of paid/earned/shared/owned media commonly utilized in the profession
5. Comprehend the different tactics used to generate publicity.
6. Become proficient in writing news releases.
7. Distinguish among the various response strategies sports managers may employ in a crisis.
8. Describe unique aspects of social responsibility in the sports and entertainment industry
9. Identify legal issues in sports PR, anticipate emerging ethical issues, evaluate ethical dilemmas present in sports PR, and recognize the need for ethical decision-making in sports PR. 1
10. Describe current global trends and multicultural issues, which have impacted the global sports and entertainment industry.

JOUR 463. Public Relations for Social Impact
3 Credits (3)
This course aims to provide a basic understanding of the role of PR in influencing public behavior and creating positive social impact. This course offers different approaches to solving a range of social problems in the areas of health, safety, environmental protection, and community involvement.
Learning Outcomes
1. Apply social marketing theories for developing, implementing, and evaluating social marketing campaigns
2. Utilize nudge techniques to improve decisions about health, wealth, and happiness in both personal and societal levels
3. Prepare a prosocial campaign plan using social media and public relations strategies
4. Identify examples of successful social marketing campaigns

JOUR 470. Environmental, Social, & Governance Public Relations
3 Credits (3)
This course will explore how organizations create values by investigating the concept of environmental, social, and governance (ESG) and social responsibility campaigns in the light of public relations. Students will learn about philanthropy, sustainability, reputation building, and ESG for the media and entertainment industry.
Learning Outcomes
1. Understand the basic concepts and elements of Strategic Corporate Social Responsibility (Strategic CSR).
2. Understand company's value-creating activities through strategic CSR.
3. Understand company's CSR strategy under the context of economical and social exchanges
4. Understand the process of creating comprehensive strategic CSR communications plan

JOUR 476. Advertising & Public Relations Campaigns
3 Credits (3)
In this capstone course, students will utilize the principles and techniques of advertising and public relations to research and develop a comprehensive campaign plan. Students will develop a portfolio to demonstrate their skills to prospective employers. Restricted to Journalism and Media Studies Majors. May be repeated up to 3 credits.
Prerequisite: JOUR 374.
Learning Outcomes
1. Students will independently work on two projects to practice how to promote themselves and develop a professional point of view.
2. Students will create a portfolio at the end of the course that can be used to help demonstrate their skills to prospective employers.
3. Students' projects will demonstrate that they understand how to utilize the principles and techniques of advertising and PR to research and develop a comprehensive campaign plan.

JOUR 489. Media Research
3 Credits (3)
This course introduces students to the methods and applications of empirical research in mass communication. Students explore survey design, field studies, content analysis, and basic data analysis to address real-world media problems. Emphasis is placed on understanding research ethics, interpreting quantitative and qualitative data, and applying research findings to inform media strategies and evaluate communication effectiveness.
Learning Outcomes
1. Explain key research methodologies used in mass communication, including surveys, content analysis, and field studies.
2. Conduct basic empirical research by designing instruments, collecting data, and applying appropriate analytical techniques.
3. Interpret and evaluate research findings to address communication problems and inform media strategies or journalistic practices.

JOUR 490. IMC Campaign
3 Credits (3)
Capstone course utilizing all previous instruction to create and develop plans for a long-term national or local IMC (Integrated Marketing Communications) campaign. May be repeated up to 3 credits. Consent of Instructor required.
Prerequisite(s): JOUR 300 and 312 or consent of instructor.
Learning Outcomes
1. Students will learn how to create IMC campaign for client or for brands, and will be able to apply this for the real world when they apply for job.

JOUR 493. Media Law
3 Credits (3)
Examination of legal issues relating to mass media in the United States. Invasion of privacy, libel, sedition, copyright, and advertising regulation. Same as COMM 493, POLS 493.
Learning Outcomes
1. Identify and explain major legal principles, statutes, and court decisions governing mass media in the United States.
2. Analyze legal issues such as privacy, libel, copyright, and advertising regulation in the context of real or hypothetical media scenarios.
3. Evaluate the legal and ethical implications of media practices to ensure compliance with professional and constitutional standards.

JOUR 494. Special Topics
3 Credits (3)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 9 credits.
Learning Outcomes
1. Varies.

JOUR 495. Media Theory
3 Credits (3)
Theoretical approaches to media communications. Examination of media effects, audiences, and media socialization. May be repeated up to 3 credits.
Learning Outcomes
1. Trace the historical development of major media theories and explain their relevance to contemporary media landscapes.

2. Apply theoretical frameworks to analyze media content, audience behavior, and the role of media institutions in society.
3. Evaluate scholarly research and communication practices using media theory to support critical thinking and effective written communication.

JOUR 499. Independent Study in Media
1-3 Credits
Individual study directed by consenting instructor with prior approval of department head. May be repeated up to 6 credits.
Prerequisite: 2.5 GPA and consent of instructor.
Learning Outcomes
1. Varies.

JOUR 501. Global Strategic Communications: Cultural Perspective
3 Credits (3)
This course is set up to combine both theory and practice, regarding global communications, especially from cultural perspectives. Also, this course is designed for students to understand persuasive strategic communications in different nations. Markets are no longer bound with their physical locations because of the communication technologies. To successfully address the strategic communications in global market, marketers and advertisers need to fully understand "local" challenges coming "deep" from cultural, economic, regulatory and competitive differences. Based on theoretical and practical understanding of the dynamic interplay between global and local forces, students will acquire theoretical as well as practical understandings of how to accomplish the goals of strategic communications in global markets. Thus, the core objective of this class is to develop an ability to analyze and map out persuasive communication strategies that are effective in global markets.
Learning Outcomes
1. Know how to analyze cultural norms and recognize strategic communications practices that are congruent to such cultural norms.
2. Identify similarities and differences in different consumer segments according to dimensions of culture.
3. Develop a deeper understanding of cultural dimensions.
4. Implement effective market research applications in different regions of the world.
5. Conceptualize and operationalize theoretical frameworks.

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Journalism and Media Studies - Bachelor of Arts

Below are the requirements for completing the Bachelor of Arts with a major in Journalism and Media Studies without a specific area of focus. For information on how to complete the program with an emphasis in Broadcasting, or Multimedia, Photojournalism or Advertising and Public Relations, please see the roadmaps tab. (p. 803)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above.

To graduate with the Bachelor of Arts with a major in Journalism and Media Studies, students must complete a minimum of 45 credits in journalism, and at least 33 of those credits must be in upper-division courses numbered 300/3000 or above.

Developmental coursework will not count toward the degree requirements, but may be needed in order to take the required English and mathematics courses.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Choose one from the following:		3
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics [1]		
MATH 1130G	Survey of Mathematics (Recommended)	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
JOUR 105G	Media and Society (Core Requirement)	
Area III: Laboratory Science Course (4 credits) [1]		
Choose One More Class from Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3*
Viewing a Wider World Courses [3]		**6**
Journalism and Media Studies		
Introductory/Core Requirements		*30*
JOUR 110	Media Writing I	
JOUR 201	Introduction to Multimedia Journalism	
JOUR 210	Copyediting	
Upper-Division:		
JOUR 300	Introduction to Advertising	
JOUR 302	Television Videography & Editing	
JOUR 319	Intro Photography	
JOUR 321	Media Graphic Design	
JOUR 374	Introduction to Public Relations	
JOUR 493	Media Law	
Journalism and Media Studies Non-Core Requirements		*15*
Intermediate Courses (Complete at least one):		*3*
JOUR 306	Sports Writing and Reporting	
JOUR 312	Advertising/Copywriting	

JOUR 314	Broadcast Reporting	
JOUR 320	Photojournalism	
JOUR 384	Public Relations Storytelling	
Advanced Courses (Complete at least one):		*3*
JOUR 310	Media Writing II	
JOUR 315	News 22	
JOUR 330	TV News Shooting & Editing	
JOUR 407	Media Internship	
JOUR 408	Media Practicum	
JOUR 425	Media Planning and Buying	
Capstone Courses (Complete at least one)		*3*
JOUR 412	Documentary Photojournalism	
JOUR 414	Broadcast Reporting Portfolio	
JOUR 427	Media Writing III	
JOUR 476	Advertising & Public Relations Campaigns	
JOUR 490	IMC Campaign	
Media Studies Courses (Complete at least one)		*3*
JOUR 350	Media History	
JOUR 377V	Mass Media Ethics	
JOUR 380	Women and the Media	
JOUR 457	Social Media Management and Analytics	
JOUR 460V	Sports & Entertainment P.R.	
JOUR 463	Public Relations for Social Impact	
JOUR 470	Environmental, Social, & Governance Public Relations	
JOUR 489	Media Research	
JOUR 494	Special Topics	
JOUR 495	Media Theory	
JOUR 499	Independent Study in Media	
Second Language Requirement: (required- see below)		**4-8**
Electives, to bring the total credits to 120 [5]		**31-36**

15 credits must be Upper Division

1 See the General Education (p. 262) section of the catalog for a full list of course options.

2 See the Viewing a Wider World (p. 266) section of the catalog for a full list of course options.

3 Every Journalism and Media Studies major is required to complete all ten introductory/core courses (30 credits), including JOUR 105G, which also counts as an Area IV Social/Behavioral Science Gen Ed requirement.
Students must complete JOUR 110 Media Writing I before they may enroll in either JOUR 310 Copy Editing or JOUR 374 Introduction to Public Relations.
There are no prerequisites for any of the other introductory/core courses.
Students are advised to wait until their junior or senior year to enroll in JOUR 493 Media Law.

4 Students must complete at least five non-core Journalism and Media Studies courses (15 credits) including at least one course from each of the following categories: Intermediate, Advanced, Capstone, and Media Studies. Entry into courses is subject to successful completion of appropriate prerequisites.

5 Elective courses will include courses taken inside and outside the Journalism and Media studies major. Many students elect to complete an 18-credit minor to help them reach the 120-credit minimum.

Second Language Requirement

For the Bachelor of Arts in Journalism and Media Studies there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220 or SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II Spanish for Heritage Learners III	3-6

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
FREN 1120	French II	4
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
OR		
Challenge the 1120/1220/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. Course selection and sequencing may vary depending on a student's initial entry point and areas of interest. This is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

The department offers the following four degree focus areas: broadcasting, multimedia, photojournalism, and strategic communications (advertising/public relations). ***These are not considered official concentrations and will not appear on a student's transcript or within their student record.***

General Focus

Freshman		Credits
ENGL 1110G or ENGL 1110H	Composition I (C- or better) or Composition I Honors	4
Area II: Mathematics Course [1]		3-4
MATH 1130G	Survey of Mathematics (Recommended (C- or better))	
JOUR 105G	Media and Society (C- or better - will count for Gen. Ed requirement)	3
Area V: Humanities Course [1]		3
JOUR 110	Media Writing I	3
Choose one from the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Area III: Laboratory Science Course [1]		4
Area IV: Social/Behavioral Sciences Course [1]		3
JOUR 210	Copyediting	3
JOUR 201	Introduction to Multimedia Journalism	3
	Credits	**32-33**
Sophomore		
JOUR Introduction/Core and Intermediate Courses (C- or better)		12
Choose from one of the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
General Education Elective Course [1]		3
Second Language Requirement: 1110- level [2]		4
Second Language Requirement: 1120- level [2]		4
Elective Course [4]		3
	Credits	**29**
Junior		
JOUR Introductory/Core Course (C- or better)		6
JOUR - Media Studies Course (C- or better)		3
JOUR - Upper Division Elective (C- or better)		6
JOUR Advanced Course		3
VWW - Viewing a Wider World Courses [2]		6
Elective - Upper Division Course [1]		6
	Credits	**30**
Senior		
JOUR 493	Media Law (C- or better)	3
JOUR - Upper Division Elective Course (C- or better)		9
Elective - Upper Division Courses [1]		12
JOUR Advanced Professional Course		3
Elective Course [1]		3
	Credits	**30**
	Total Credits	**121-122**

1. See the General Education (p. 262) section of the catalog for a full list of course options.
2. Second Language: options for completing the second language requirement can be located on the Requirements (p. 801) tab for this degree.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Strategic Communications (Ad/PR) Focus

Freshman		Credits
ENGL 1110G	Composition I (C- or better)	4
Area II: Mathematics Course [1]		3-4
MATH 1130G	Survey of Mathematics (Recommended (C- or better))	
JOUR 105G	Media and Society (C- or better - will count for Gen Ed requirement)	3
JOUR 110	Media Writing I	3
JOUR 201	Introduction to Multimedia Journalism	3
JOUR 210	Copyediting	3
Choose one from the following:		3
ENGL 2210G	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Area III: Laboratory Science Course [1]		4
Area IV: Social/Behavioral Sciences Course [1]		3
	Credits	**29-30**
Sophomore		
JOUR 300	Introduction to Advertising	3
JOUR 319	Intro Photography	3
JOUR 374	Introduction to Public Relations	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1130G	Public Speaking	
COMM 1115G	Introduction to Communication	
HNRS 2175G	Introduction to Communication Honors	
Area III Laboratory Science or Area IV: Social/Behavioral Science Course [1]		3-4
Area V: Humanities Course: POLS 1110G Recommended [1]		3
Area VI: Creative and Fine Arts Course [1]		3
Second Language Requirement: 1110- level [2]		4

Second Language Requirement: 1120-level [2]		4
Elective Courses: ECON 2110G Recommended		3
	Credits	**32-33**
Junior		
JOUR 302	Television Videography & Editing	3
JOUR 312	Advertising/Copywriting (C- or better)	3
JOUR 321	Media Graphic Design	3
JOUR 384	Public Relations Storytelling (C- or better)	3
JOUR 425	Media Planning and Buying (C- or better)	3
JOUR 470	Environmental, Social, & Governance Public Relations	3
VWW - Viewing a Wider World Course [3]		6
Elective Courses		6
	Credits	**30**
Senior		
JOUR 457	Social Media Management and Analytics	3
JOUR 460V	Sports & Entertainment P.R.	3
JOUR 493	Media Law (C- or better)	3
Choose one of the following:		3
JOUR 476	Advertising & Public Relations Campaigns	3
JOUR 490	IMC Campaign	3
Elective Courses		9
	Credits	**27**
	Total Credits	**118-120**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. Second Language: options for completing the second language requirement can be located on the Requirements (p. 801) tab for this degree.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Broadcasting Focus

Freshman		**Credits**
ENGL 1110G	Composition I (C- or better)	4
Area II: Mathematics Course [1]		3-4
MATH 1130G	Survey of Mathematics (Recommended (C- or better))	
JOUR 105G	Media and Society (C- or better, will count for Gen Ed requirement)	3
JOUR 110	Media Writing I	3
JOUR 210	Copyediting	3
JOUR 201	Introduction to Multimedia Journalism	3
Choose one from the following:		3
ENGL 2210G	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Area III: Laboratory Science Course [1]		4
Area IV: Social/Behavioral Sciences Course [1]		3
	Credits	**29-30**
Sophomore		
JOUR 302	Television Videography & Editing	3
JOUR 319	Intro Photography	3
JOUR 321	Media Graphic Design	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area III: Laboratory Sciences OR Area IV: Social/Behavioral Sciences Course		3-4
Area V: Humanities Course, C- or better [1]		3
Area VI: Creative and Fine Arts Course [1]		3
Second Language Requirement: 1110- level [2]		4
Second Language Requirement: 1120-level [2]		4
Elective Course ECON 2110G Recommended [4]		3
	Credits	**32-33**
Junior		
JOUR 314	Broadcast Reporting (C- or better)	3
JOUR 315	News 22 (C- or better)	3
JOUR 493	Media Law	3
Choose one from the following:		3
JOUR 300	Introduction to Advertising	
JOUR 374	Introduction to Public Relations	
VWW - Viewing a Wider World Courses [6]		6
JOUR - Media Studies Course		3
Elective Courses		9
	Credits	**30**
Senior		
JOUR 330	TV News Shooting & Editing	0-3
JOUR 414	Broadcast Reporting Portfolio (C- or better)	3
Choose one from the following:		3
JOUR 300	Introduction to Advertising	
JOUR 374	Introduction to Public Relations	
Elective Course		18
	Credits	**24-27**
	Total Credits	**115-120**

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. Second Language: options for completing the second language requirement can be located on the Requirements (p. 801) tab for this degree.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Multimedia and Photojournalism Focus

Freshman		**Credits**
ENGL 1110G	Composition I (C- or better)	4
Area II: Mathematics Course [1]		3-4
MATH 1130G	Survey of Mathematics (Recommended (C- or better))	
JOUR 105G	Media and Society (C- or better, will count for Gen Ed requirement)	3
Area V: Humanities Course [1]		3
JOUR 110	Media Writing I	3
JOUR 210	Copyediting	3
JOUR 201	Introduction to Multimedia Journalism	3
Choose one from the following:		3
ENGL 2210G	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Area III: Laboratory Science Course [1]		4

Area IV: Social/Behavioral Science Course [1]		3
	Credits	**32-33**
Sophomore		
JOUR 310	Media Writing II	3
JOUR 319	Intro Photography	3
JOUR 321	Media Graphic Design	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area III: Laboratory Science OR Area IV: Scial/Behavioral Sciences Course [1]		3-4
Second Language Requirement: 1110- level [2]		4
Second Language Requirement: 1120-level [2]		4
Area VI: Creative and Fine Arts Course [1]		3
Elective Course: ECON 2110G Recommended		3
	Credits	**29-30**
Junior		
JOUR 302	Television Videography & Editing	3
JOUR 306	Sports Writing and Reporting	3
JOUR 320	Photojournalism	3
JOUR 300	Introduction to Advertising	3
JOUR 374	Introduction to Public Relations	3
VWW - Viewing a Wider World Courses [5]		6
JOUR Media Studies Course		3
Elective Course - Upper Divison [3]		9
	Credits	**33**
Senior		
JOUR 427	Media Writing III	3
JOUR 457	Social Media Management and Analytics	3
JOUR 493	Media Law (C- or better)	3
JOUR Elective Course [6]		3
Elective Course [3]		12
	Credits	**24**
	Total Credits	**118-120**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. Second Language: options for completing the second language requirement can be located on the Requirements (p. 801) tab for this degree.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Journalism and Media Studies - Undergraduate Minor

Students may not earn both a Bachelor of Arts in Journalism and Media Studies and minor in Journalism and Media Studies.

Prefix	Title	Credits
Required Courses		
JOUR 105G	Media and Society	3
JOUR 110	Media Writing I	3
JOUR 210	Copyediting	3
Upper- Division JOUR courses		9
Total Credits		**18**

Social Media Management - Undergraduate Minor

A student must take the following classes to get a minor in social media management.

Prefix	Title	Credits
Requirements: [1]		
Take all three classes		9
JOUR 110	Media Writing I	
JOUR 374	Introduction to Public Relations	
JOUR 457	Social Media Management and Analytics	
Choose two from the following:		6
JOUR 384	Public Relations Storytelling	
JOUR 460	Sports & Entertainment P.R.	
JOUR 470	Environmental, Social, & Governance Public Relations	
JOUR 476	Advertising & Public Relations Campaigns	
Choose one from the following:		3
JOUR 321	Media Graphic Design	
JOUR 319	Intro Photography	
Total Credits		**18**

1. Total of 18 credits with the grade of C- or better, are required to get a minor of Social Media Management

Strategic Communications - Undergraduate Minor

A student must take the following classes to get a minor in strategic communications.

Prefix	Title	Credits
Requirements [1]		
JOUR 110	Media Writing I	3
JOUR 300	Introduction to Advertising	3
JOUR 374	Introduction to Public Relations	3
Choose three courses from the following:		9
JOUR 384	Public Relations Storytelling	
JOUR 425	Media Planning and Buying	
JOUR 470	Environmental, Social, & Governance Public Relations	
JOUR 476	Advertising & Public Relations Campaigns	
JOUR 490	IMC Campaign	
Total Credits		**18**

1. Total of 18 credits with the grade of C- or better are required to get a minor of Strategic Communications.

Languages and Linguistics

Undergraduate Program Information

Programs of study in the Department of Languages and Linguistics prepare students for a diverse number of professions and provide them with critical skills that compliment many careers in an increasingly interdependent and global marketplace. Students also increase their awareness of the important role language plays in human interaction on individual and global levels.

Major curriculum plans in each language include balanced groups of courses in language, linguistics, literature and culture. Students may choose to major, double major or minor in French, German or Spanish.

For the undergraduate program in Spanish, students may earn credit by receiving the following scores on the AP exams: More specifically, for the AP Spanish Language and Culture Exam, with a score of 3, students receive 3 credits for either SPAN 316 or 318. With scores of 4 or 5, students receive 6 credits (SPAN 316 or 318) and SPAN 325. For the AP Spanish Literature and Culture Exam, with a score of 3, students receive 3 credits (SPAN 380) and for scores of 4 or 5, they receive 6 credits (SPAN 380 and SPAN 305).

Graduate Program Information

The Department of Languages and Linguistics offers a Master of Arts in Spanish, which may be completed through our program on the main campus or completely online. Students are asked to indicate an area of interest in either linguistics or literature. The degree requires a total of 36 credit hours. It is recommended that students focus at least 27 credit hours of that total in their selected area of interest. Main campus students may select either a thesis or a non-thesis option. Students selecting to follow the thesis option, may count up to 6 credit hours towards their degree total. Online students are limited to the non-thesis option only at this time.

Admission Requirements

Admission requirements include a BA in Spanish. An undergraduate Grade Point Average (GPA) of 3.0 or above, which includes at least 12 semester hours of upper-division undergraduate courses in Spanish with a GPA of at least 3.0. Students must also satisfy general requirements of the Graduate School and submit the proper electronic online application and transcripts at the Graduate School website. Students must also complete a secondary admission packet (also submitted online through the Graduate School electronic application portal), which should include:

- A current resume (C.V.) in Spanish
- Three (3) letters of recommendation from qualified professionals (written within the last six months), preferably from past professors, that address the applicant's academic record.
- A writing sample in Spanish (critical or creative writing texts). If you do not have a six-page paper, you may submit multiple shorter works totaling six pages.
- A Language Evaluation Form (available for download at the departmental website) completed and signed by a qualified language evaluator. If you have an official ACTFL OPI rating certificate, this may be submitted in lieu of the Language Evaluation Form.
- An introductory letter in Spanish to include:
  - A brief biography of one or two paragraphs along with your goals and objectives for obtaining a Master's degree in Spanish
  - A statement of interest in either the residential (on-campus) program or the online program
  - A statement of your prospective area of interest (Linguistics or Literature), and
  - Your declaration of interest in being considered for a Graduate Teaching Assistantship (this option is only available for the residential [on-campus] program).

Only completed applications will be reviewed. Again, all materials should be submitted via the Graduate School electronic application portal. No materials should be sent directly to the department. Applying to the program does not guarantee admission to the program. It is the applicant's responsibility to ensure that all materials have been submitted correctly.

Application deadlines: September 15 for admission for the following Spring semester (which begins in January), and January 15 for admission for the following Fall semester (which begins in August). Students will be advised upon their formal acceptance into the program.

Degrees for the Department

Bachelor Degree(s) & Supplemental Major(s)

- Chicano Studies - Supplemental Major (p. 839)
- Languages (French) - Bachelor of Arts (p. 826)
- Languages (German) - Bachelor of Arts (p. 828)
- Languages (Spanish) - Bachelor of Arts (p. 831)
- Latin American Studies - Supplemental Major (p. 838)
- Linguistics - Bachelor of Arts (p. 833)
- Linguistics - Supplemental Major (p. 839)

Master Degree(s)

- Spanish - Master of Arts (p. 191)
- Spanish - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/spanish-ma-online/)

Minors for the Department

- East Asian Studies - Undergraduate Minor (p. 836)
- French - Undergraduate Minor (p. 836)
- German - Undergraduate Minor (p. 837)
- International Studies - Undergraduate Minor (p. 837)
- Linguistics - Undergraduate Minor (p. 837)
- Spanish - Undergraduate Minor (p. 838)

Graduate Certificates

- Teaching Spanish for Heritage Language Learners - Graduate Certificate (p. 253)
- Teaching Spanish for Heritage Language Learners - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/teaching-spanish-heritage-language-learners-gr-certificate-online/)

Professor, Glenn W. Fetzer, Department Head

Professors Herrera, MacGregor-Mendoza, Waltermire ***Associate Professors*** Bove, Moreno ***Assistant Professors*** Figueroa Obregon, Iglesias Pascual ***College Professors*** Longwell; Pedersen ***College Associate Professor*** Zollner

K. Bove, Ph.D. (Georgia); G. Fetzer, Department Head Ph.D. (CUNY); R. Figueroa Obregon, Ph.D. (Oklahoma); S. Herrera, Ph.D. (New Mexico); I.

Iglesias Pascual, Ph.D. (Ohio); J. Longwell, Graduate Director, Ph.D. (New Mexico State University); P. MacGregor-Mendoza, Ph.D. (Illinois- Urbana-Champaign); G. Moreno, Ph.D. (Arizona); M. Waltermire, Ph.D. (New Mexico);

Chinese Courses

CHIN 311. Advanced Chinese Language I
3 Credits (3)
This course emphasizes the development of advanced oral, aural, reading and writing skills in Mandarin Chinese. Expanding of vocabulary and development of reading comprehension will be through different genres of authentic texts. Students will be trained to write short essays on a variety of topics.

CHIN 312. Advanced Chinese Language II
3 Credits (3)
This course emphasizes the development of advanced oral, aural, reading and writing skills in Mandarin Chinese. Expanding of vocabulary and development of reading comprehension will be through different genres of authentic texts. Students will be trained to write short essays on a variety of topics.
Prerequisite(s): Grade of C or better in CHIN 311.

French Courses

FREN 1110. French I
4 Credits (4)
Intended for students with no previous exposure to French, this course develops basic listening, speaking, reading, and writing skills aiming toward the ACTFL novice-high level. This is an introductory course designed to teach the student to communicate in French in everyday situations and to develop an understanding of French and Francophone cultures through the identification of cultural products and practices, of cultural perspectives, and the ability to function at a survival level in an authentic cultural content. This course will also develop the student's sense of personal and social responsibility through the identification of social issues.
Learning Outcomes
1. Students can communicate and exchange information about familiar topics using phrases and simple sentences, sometimes supported by memorized language.
2. Students can usually handle short social interactions in everyday situations by asking and answering simple questions
3. Students can write short messages and notes on familiar topics related to everyday life.
4. Students can often understand words, phrases, and simple sentences related to everyday life.
5. Students can recognize pieces of information and sometimes understand the main topic of what is being said.
6. Students can understand familiar words, phrases, and sentences within short and simple texts related to everyday life.
7. Students can sometimes understand the main idea of what they have read.
8. Students can identify beliefs, behaviors and cultural artifactsof the French-speaking world.
9. In English, students will engage with social issues confronting the French-speaking world to develop their sense of personal and social responsibility.

FREN 1120. French II
4 Credits (4)
A continuation of French 1,students will develop a broader foundation in skills gained during the first semester, including understanding, speaking, reading and writing French aiming toward the ACTFL intermediate-low level. This course is designed to increase student fluency in French as applied to everyday situations. Students will also learn to recognize and understand various French and Francophone products,practices, and perspectives, identifying common cultural patterns, describing basic cultural viewpoints, and further developing their sense of personal and social responsibility through the investigation of cultural issues. May be repeated up to 4 credits.
Learning Outcomes
1. Students can participate in conversations on a number of familiar topics using simple sentences.
2. Students can handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can write briefly about most familiar topics and present information using a series of simple sentences.
4. Students can understand the main idea in short, simple messages and presentations on familiar topics.
5. Students can understand the main idea of simple conversations that they overhear.
6. Students can understand the main idea of short and simple texts when the topic is familiar.
7. Students can describe and make comparisons between decisions about beliefs, behaviors and cultural artifacts of the French-speaking world.
8. Students will engage with social issues confronting the French-speaking world to continue to develop their sense of personal and social responsibility

FREN 2110. French III
3 Credits (3)
In this third semester course, students will continue to develop a broader foundation in skills gained during the first year, including understanding, speaking, reading and writing French aiming toward the ACTFL intermediate-mid level.This course is designed to teach the student to communicate in a more sustained way in areas of personal interest and in everyday situations. Students will engage in and analyze various French and Francophone products, practices, and perspectives, as well as continue to develop their sense of personal and social responsibility through comparison and contrast of cultural perspectives. May be repeated up to 3 credits.
Learning Outcomes
1. Students can participate in conversations on familiar topics using sentences and series of sentences.
2. Students can engage in short social interactions in everyday situations by asking and answering a variety of questions. Students can usually say what they want to say about themselves and their everyday life.
3. Students can write on a wide variety of familiar topics using connected sentences.
4. Students can understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies.
5. Students can understand the main idea of conversations that they overhear.
6. Students can understand the main idea of texts related to everyday life and personal interests or studies.
7. Students can analyze beliefs, behaviors and cultural artifacts of the French-speaking world, and discuss the nature and value of French and Francophone products, practices, and perspectives.

8. Students will engage with social issues confronting the French-speaking world to continue to develop their sense of personal and social responsibility

FREN 2120G. French IV
3 Credits (3)
In this fourth semester course, students will continue to broaden and refine skills gained during previous semesters, including understanding, speaking, reading and writing French aiming at the ACTFL intermediate-high level. This course is designed to teach the student to communicate in a more sustained way in situations that go beyond the everyday. Students will evaluate various French and Francophone products,practices, and create ways to demonstrate their sense of personal and social responsibility through participation in cultural interaction. May be repeated up to 3 credits.
Learning Outcomes
1. Students can participate with ease and confidence in conversations on familiar topics. They can usually describe people, places, and things. They can usually talk about events and experiences in various time frames.
2. Students can handle social interactions in everyday situations, sometimes even when there is an unexpected complication.
3. Students can write about topics related to school, work, and community in a generally organized way. They can write some simple paragraphs about events and experiences in various time frames.
4. Students can easily understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies.
5. Students can usually understand a few details of what I overhear in conversations, even when something unexpected is expressed. The student can sometimes follow what they hear about events and experiences in various time frames.
6. Students can understand the main idea of texts with topics related to everyday life, personal interests, and studies, as well as sometimes follow stories and descriptions about events and experiences in various time frames.
7. Students can analyze beliefs, behaviors and cultural artifacts of the French-speaking world, and recognize and discuss the representations and controversies of French and Francophone products, practices, and perspectives.
8. Students demonstrate the essential skills of Critical Thinking, Personal and Social Responsibility, and Information and Digital Literacy, as per the New Mexico General Education Curriculum

FREN 2135G. Frontiers and Border Crossings in the French-Speaking World
3 Credits (3)
An exploration of frontiers and borders in the French-speaking world: geographical, linguistic, cultural, and symbolic
Learning Outcomes
1. Articulate the diversity of boundaries (geographical, literal, gender, cultural, symbolic) and the role they play in negotiating cultural identities in the Francophone world.
2. Critically analyze and communicate orally and in writing the nuances of frontiers, border crossings, and their expressions in the course texts.
3. Describe, through the study of French and Francophone borders and frontiers, how cultural contexts and human practices influence individuals and societies.
4. Apply the knowledge and skills gained though the study of boundaries in the francophone world to analogous settings and to students' personal academic goals.
5. Demonstrate information literacy and technological skills in researching and presenting themes related to the readings and to the films screened
6. Reflect on the effects of geographical, social, linguistic, and symbolic boundaries and crossings as expressed in the course content on individuals.

FREN 306. Topics in French Culture and Civilization
1-3 Credits (1-3)
Selected topics focusing on French culture and civilization. This course is linked to FLIP (Faculty-Led International Programs) when applicable. May be repeated up to 4 credits.
Learning Outcomes
1. Recognize the arrondissements of Paris and describe their identifying characteristics.
2. Navigate through Paris effectively and knowingly.
3. Communicate effectively with native speakers of the language.
4. Exemplify qualities of a good guest in a francophone culture.
5. Talk knowledgeably about a topic related to Paris and Parisians.

FREN 315. French Grammar
3 Credits (3)
A thorough review of French grammar through the study of grammatical elements and the use of grammatical exercises. May be repeated up to 3 credits.
Learning Outcomes
1. By the end of the course, students should be familiar with a review of grammar for all tenses, pronouns, adverbs, adjectives.
2. Students should attain the intermediate high level in all areas (Listening, Speaking, Reading, Writing, Attitudinal / Cultural) on the American Council on the Teaching of Foreign Languages (ACTFL) scale.
3. By the end of the course, students should be familiar with spoken speech at paragraph level.
4. By the end of the course, students should be familiar with writing a narrative in the past and future tenses.

FREN 316. Writing for Expression and Communication
3 Credits (3)
Examination of writing in French for various purposes and development of interpersonal, presentational, and interpretative skills of written communication. May be repeated up to 6 credits.
Prerequisite: FREN 2120G or permission of the instructor.
Learning Outcomes
1. To assimilate strategies to develop the discipline of writing.
2. To develop critical thinking to self-correct and to refine one's skills.
3. To develop familiarity with tools (dictionaries, style manuals, grammars) needed to improve one's writing.
4. To develop awareness of grammatical and syntactical accuracy.
5. To develop confidence in one's writing so to acquire professional skills.

FREN 325. Intermediate Conversation
3 Credits (3)
French conversation through intensive oral practice with emphasis on vocabulary acquisition and pronunciation. May be repeated up to 3 credits.

Learning Outcomes

1. To enhance active vocabulary acquisition.
2. To provide opportunities for the learner's speech to progress from short utterances to more connected, sustained speech.
3. To address pronunciation issues.
4. To enhance presentation skills.
5. To improve auditory proficiency.
6. Based on the scale established by the American Council on the Teaching of Foreign Languages (ACTFL), the performance goals for the course are: (A) Listening Intermediate High, (B) Speaking Intermediate High, (C) Reading Advanced Low, (D) Writing Intermediate High.

FREN 330. Business French
3 Credits (3)
An introduction to standard language within the corporate world in French-speaking countries. Students practice reading, writing, listening, speaking and expanding their vocabulary in professional fields related to business.

Learning Outcomes

1. Use business and legal vocabulary.
2. Demonstrate basic competency in French corporate etiquette.
3. Interact in a culturally appropriate manner in common business situations, including meetings, sales calls, business letters, and e-mails.
4. Demonstrate familiarity in using French in business-related situations.

FREN 352. French Phonetics
3 Credits (3)
Systematic description of modern French pronunciation. Corrective exercises for foreign learners. Formal study of spelling/pronunciation relationships. May be repeated up to 6 credits.

Learning Outcomes

1. By the end of the semester, students will have acquired a systematic, comprehensive review and enhancement of French pronunciation, and an elevated aural comprehension. Non-native speakers of French will be able to participate more easily in verbal communication; and the intermediate high level in all areas (Listening, Speaking, Reading, Writing, Attitudinal / Cultural) on the American Council on the Teaching of Foreign Languages (ACTFL) scale.
2. Students will be able to pronounce words, using the International Phonetic alphabet.
3. Students will be able to read short texts and be understood by non-sympathetic speakers of French.
4. Students will sharpen their aural skills in language recognition.

FREN 362. Contemporary French Culture
3 Credits (3)
Institutions, lifestyles and popular attitudes in modern France.

Learning Outcomes

1. Learning what is particular to various cities and towns in France.
2. Learning what are some characteristics of everyday life in France.
3. Learning what are some cultural traditions, art forms, or artifacts of France.
4. Learning what are some current events impacting France.

FREN 365V. Perspectives in French Culture
3 Credits (3)
Examines components of French culture through literature, films and other sources. Taught in English. Does not satisfy Arts and Sciences second language requirement. Does not satisfy French major or minor requirements.

FREN 378. Studies in Francophone Cultures
3 Credits (3)
Studies of representative Francophone cultures through their history, literature, music and films.
Prerequisite: FREN 2120 or consent of instructor.

FREN 380. Readings in French Literature
3 Credits (3)
Selected readings in the literature of France, from the Middle Ages to the twentieth century. May be repeated up to 6 credits.

Learning Outcomes

1. To introduce students to readings from a variety of genres, from the Middle Ages to the twentieth century.
2. To teach students to make the transition from intermediate language courses to upper-level literature courses, not only by historical overview, but by offering reading strategies, including pre-reading and post-reading exercises.
3. To afford students plenty of opportunity to improve reading skills.
4. To enhance speaking and listening skills necessary for more in-depth study of literature.
5. To increase general literary, culture and attitudinal expertise for those intending to major/minor in French.

FREN 381. Survey of French Literature I
3 Credits (3)
Literary movements, authors and selected texts of the Middle Ages through the eighteenth century.
Prerequisite: FREN 2120 or consent of instructor.

FREN 382. Survey of French Literature II
3 Credits (3)
Literary movements, authors and selected texts of the nineteenth and twentieth centuries.
Prerequisite: FREN 2120 or consent of instructor.

FREN 386. Contemporary Women Writers in French
3 Credits (3)
Exploration of literary texts by contemporary women writers in France and the Francophone world; emphasizes the cultural contexts that have defined women's relationship to writing. Selections will vary from year to year.
Prerequisite: FREN 2120 or consent of instructor.

FREN 410. Paris: History and Cultures
3 Credits (3)
An in-depth look at history and culture of Paris from its origins to the present.
Prerequisite(s): FREN 212 or consent of instructor.

FREN 425. Advanced French Conversation
3 Credits (3)
Mastery of spoken French language through discussion of personal readings and group work to develop vocabulary, syntactical and conversational skills. The class is conducted entirely in French.
Prerequisite(s): FREN 325 or consent of instructor.

FREN 449. French for Specific Purposes
3 Credits (3)
Directed reading for students to satisfy language requirement for master's or doctoral programs. May be repeated up to 6 credits.

FREN 451. Special Topics in French
1-3 Credits
Selected topics relating to the cultures or literatures of the countries where French is spoken will be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.
Prerequisite: consent of instructor.

FREN 453. Independent Studies in French
1-3 Credits
Individualized, self-paced projects for advanced students. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

FREN 478. Studies in Francophone Cultures Around the World
3 Credits (3)
Advanced studies of representative Francophone cultures through their history, literature, music and films.
Prerequisite: FREN 2120 or consent of instructor.

FREN 486. Advanced Contemporary Women Writers in French
3 Credits (3)
Advanced study of literary texts by contemporary women writers in France and the Francophone world; emphasizes the cultural contexts that have defined women's relationship to writing. Selections will vary from year to year.
Prerequisite: FREN 2120 or consent of instructor.

FREN 649. Readings in Transborder and Global Human Dynamics
3 Credits (3)
Individualized study of selected readings and topics in French and francophone transborder and global human dynamics. Admission to the PhD program in Transborder and Global Human Dynamics required for enrollment. May be repeated up to 9 credits.
Learning Outcomes
1. Identification of a topic for further study, involving French or francophone-related transborder issues.
2. Compilation of a biography to comprise the readings.
3. Demonstration of knowledge of contexts and issues raised by the readings.
4. Articulation of pertinence of readings to course of study.

German Courses

GRMN 1110. German I
4 Credits (4)
Intended for students with no previous exposure to German, this course develops basic listening, speaking, reading, and writing skills aiming toward the ACTFL novice-mid level. This is an introductory course designed to teach the student to communicate in German in everyday situations and to develop an understanding of German cultures through the identification of cultural products and practices, of cultural perspectives, and the ability to function at a survival level in an authentic cultural content. This course will also develop the student's sense of personal and social responsibility through the identification of social issues.
Learning Outcomes
1. Students can communicate on very familiar topics using a variety of words and phrases that they have practiced and memorized.
2. Students can write lists and memorized phrases on familiar topics.
3. Students can recognize some familiar words and phrases when they hear them spoken.
4. Students can recognize some letters or characters.
5. Students can understand some learned or memorized words and phrases when they read.
6. Students can identify beliefs, behaviors and cultural artifacts of the German-speaking world.
7. In English, students will engage with social issues confronting the German-speaking world to develop their sense of personal and social responsibility

GRMN 1120. German II
4 Credits (4)
A continuation of German 1, students will develop a broader foundation in skills gained during the first semester, including understanding, speaking, reading and writing German aiming toward the ACTFL novice-high level. This course is designed to increase student fluency in German as applied to everyday situations. Students will also learn to recognize and understand various German products, practices, and perspectives, identifying common cultural patterns, describing basic cultural viewpoints, and further developing their sense of personal and social responsibility through the investigation of cultural issues.
Prerequisite(s): C or better in GRMN 1110.
Learning Outcomes
1. Students can communicate and exchange information about familiar topics using phrases and simple sentences, sometimes supported by memorized language.
2. Students can usually handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can write short messages and notes on familiar topics related to everyday life.
4. Students can often understand words, phrases, and simple sentences related to everyday life.
5. Students can recognize pieces of information and sometimes understand the main topic of what is being said.
6. Students can understand familiar words, phrases, and sentences within short and simple texts related to everyday life.
7. Students can sometimes understand the main idea of what they have read.
8. Students can describe and make comparisons between decisions about beliefs, behaviors and cultural artifacts ofthe German-speaking world.
9. Students will engage with social issues confronting the German-speaking world to continue to develop their sense of personal and social responsibility.

GRMN 2110. German III
3 Credits (3)
In this third semester course, students will continue to develop a broader foundation in skills gained during the first two semesters, including understanding, speaking, reading and writing German aiming toward the ACTFL intermediate-low level. This course is designed to teach the student to communicate in a more sustained way in areas of personal interest and in everyday situations. Students will engage in and analyze various German products, practices, and perspectives, as well as continue to develop their sense of personal and social responsibility through comparison and contrast of cultural perspectives.
Prerequisite(s): C or better in GRMN 1120.
Learning Outcomes
1. Students can participate in conversations on a number of familiar topics using simple sentences.
2. Students can handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can write briefly about most familiar topics and present information using a series of simple sentences.

4. Students can understand the main idea in short, simple messages and presentations on familiar topics.
5. Students can understand the main idea of simple conversations that they overhear.
6. Students can understand the main idea of short and simple texts when the topic is familiar.
7. Students can analyze beliefs, behaviors and cultural artifacts of the German-speaking world, and discuss the nature and value of German products, practices, and perspectives.
8. Students will engage with social issues confronting the German-speaking world to continue to develop their sense of personal and social responsibility.

GRMN 2120. German IV
3 Credits (3)
In this fourth semester course, students will continue to broaden and refine skills gained during previous semesters, including understanding, speaking, reading and writing German aiming at the ACTFL intermediate-mid level. This course is designed to teach the student to communicate in a more sustained way in situations that go beyond the everyday. Students will evaluate various German products, practices, and create ways to demonstrate their sense of personal and social responsibility through participation in cultural interaction.
Prerequisite(s): C or better in GRMN 2110.
Learning Outcomes
1. Students can participate in conversations on familiar topics using sentences and series of sentences.
2. Students can engage in short social interactions in everyday situations by asking and answering a variety of questions. Students can usually say what they want to say about themselves and their everyday life.
3. Students can write on a wide variety of familiar topics using connected sentences.
4. Students can understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies.
5. Students can understand the main idea of conversations that they overhear.
6. Students can understand the main idea of texts related to everyday life and personal interests or studies.
7. Students can analyze beliefs, behaviors and cultural artifacts of the German-speaking world, and recognize and discuss the representations and controversies of German products, practices, and perspectives.
8. Students will engage with social issues confronting the German-speaking world to create ways to demonstrate their sense of personal and social responsibility.

GRMN 305. Topics in German Culture
3 Credits (3)
Group study of selected topics focusing on German culture and civilization. This course is linked to FLiP courses (Faculty-Led international Programs) when applicable. Topics identified by subtitle in the Schedule of Classes. GRMN 2120 or equivalent is recommended. May be repeated for up to 6 credits with different topics.
Learning Outcomes
1. (Language) Students will show more confidence in their German speaking, listening and writing abilities.
2. (Culture): Students will demonstrate knowledge of the culture of German institutions, of Berlin (through reflection and discussion sessions) after visits to historical, architectural and cultural sites as well as direct interaction with the locals.
3. (Culture): Students will demonstrate competence at navigating a culture different from their own.
4. (Culture): Students will demonstrate (through reflection and discussion sessions) a greater appreciation for the diversity of German identity.

GRMN 313. Intermediate Composition and Grammar
3 Credits (3)
A review of the rules of German grammar. Development of written German skills. GRMN 2120 or equivalent is recommended. May be repeated up to 3 credits.
Learning Outcomes
1. Students will show their improvement in writing skills in German through the application of accurate grammar rules practiced in the course.
2. Students will show their improvement in vocabulary usage in German by using more varied and appropriate vocabulary in their writing.
3. Students will show their improvement in writing organization.

GRMN 326V. Transnational German Film
3 Credits (3)
The film industry has kept abreast of globality, glocality, cultural, and linguistic diversity. In this course we will cover examples of German film from its impressionist beginnings to the current globally influenced, and technologically advancing style and will look at palpable transnational aspects, including Turkish-German cinema and refugees on- and off-screen. We will focus on how the turn towards a transnational understanding of film provides a space for a more globally connected and inclusive cinema and world
Learning Outcomes
1. Students analyze how ideas are represented, interpreted, or valued in various expressions of human culture.
2. Students examine relevant primary source materials as understood by the humanities area under study and interpret the material in writing assignments (or alternatives that require equally coherent and sustained analysis).
3. Students examine the messages embedded in images and relate them to their own culture(s).
4. Students will be conversant in film techniques, film genres, film history, politics, and culture of the time in which the film was made.
5. Students will practice and express aesthetic judgement in the form of analysis and assessment of film as an art form, both through discussion and through writing.
6. Students will be expected to identify and interpret key themes and topics related to Transnational 'German' Cinema.

GRMN 340. Introduction to Translation
3 Credits (3)
General aspects of Translation from German to English and English to German. GRMN 2120 or equivalent is recommended. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate understanding of the concept of translation by reading translation theory.
2. Demonstrate an enhanced knowledge of German as related to translation practices.
3. Demonstrate the ability to use specialized vocabulary and concepts in various professional areas.

4. Demonstrate knowledge of the translator's place as a professional.
5. Develop and enhance their linguistic competence and cultural awareness.

GRMN 341. German Folklore and Culture
3 Credits (3)
Customs, traditions, mythology, folk literature and art. Special focus on Grimms' fairy tales. GRMN 2120 or equivalent is recommended. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate improvement in reading skills in German by one ACTFL level by augmenting vocabulary, grammatical accuracy, and reading comprehension skills.
2. Describe the 5 basic motifs in folktales (FT) and where they supposedly come from.
3. List and define the 9 types of FT (Teverson) according to their functions.
4. Discuss the impact of the enlightenment in the structure of FT, Evaluate the influence of the industrial revolution and the development of a bourgeois society in FT.
5. Critique the position of the present-day, pop-cult media in its recently created versions of FT.

GRMN 350. Introduction to German Literature
3 Credits (3)
Basic literary genres and major figures in German language literature from its beginnings to the 19th century. GRMN 2120 or equivalent is recommended. To be followed by GRMN 471 - Studies in German Literature. May be repeated up to 3 credits. Consent of Instructor required.
Learning Outcomes
1. Demonstrate an improvement on reading skills in German by one ACTFL level by augmenting active vocabulary, grammatical accuracy and reading comprehension skills.
2. Describe the authors, styles and basic discourses of 3 periods of German-language literature (old and middle high German from early the medieval literature, the protestant reformation; High German and literature academies: the fifteenth to seventeenth Centuries; and the Eighteenth Century.

GRMN 399. Intermediate Independent Study in German
1-3 Credits (1-3)
Tutorial in reading, writing and oral expression for intermediate-level students of German. Topics identified in the Schedule of Classes. GRMN 2120 or equivalent is recommended. May be repeated for up to 6 credits with different topics. May be repeated up to 6 credits. Consent of Instructor required.
Learning Outcomes
1. Objectives for independent study courses will depend on the study/research interests of the student; they will always vary.

GRMN 410. Practicum in Conversational German
1-3 Credits
Intensive oral communication practice for students with a strong German language foundation. May be repeated up to 6 credits.
Prerequisite(s): GRMN 325 or consent of instructor.
Learning Outcomes
1. Objectives for independent study courses will depend on the study/research interests of the student; they will always vary.

GRMN 413. Advanced Composition and Grammar
3 Credits (3)
Exercises in written German with emphasis on stylistic features.
Prerequisite: GRMN 313 or consent of instructor.

GRMN 451. Special Topics in German
1-3 Credits
Selected topics to be identified by subtitle in the Schedule of Classes. May be repeated for up to 6 credits with different topic. May be repeated up to 12 credits.
Learning Outcomes
1. Objectives for independent study courses will depend on the study/research interests of the student; they will always vary.

GRMN 453. Independent Studies in German
1-3 Credits (1-3)
Individualized, self-paced research projects for advanced-level students of German. Topics identified by subtitle in the Schedule of Classes. GRMN 2120 or equivalent is recommended. May be repeated up to 12 credits.
Learning Outcomes
1. Objectives for independent study courses will depend on the study/research interests of the student; they will always vary.

Language Courses

LANG 111. Beginning Language I
4 Credits (4)
Developing language skills through study abroad for languages not offered at NMSU main campus. Specific languages to be identified with course subtitles. Main campus only.
Prerequisite: Language placement exam or consent of the instructor.

LANG 451. Special Topics
1-3 Credits
Selected topics relating to cultures or literatures of a specific country. Credit can be applied only towards fulfilling second language requirement. Credit is not accepted towards any graduate level major or minor. May be repeated for a maximum of 12 credits. Consent of instructor required.

LANG 453. Independent Studies
1-3 Credits
Individualized, self-paced projects for advanced students. May be repeated under different subtitles for a maximum of 6 credits.
Prerequisite: consent of instructor.

Linguistics Courses

LING 2110G. Introduction to the Study of Language and Linguistics
3 Credits (3)
This course presents an introduction to the study of language through the basic aspects of linguistic analysis: the sound system (phonetics and phonology), the structure of words and sentences (morphology and syntax), and the ways in which language is used to convey meaning (semantics and pragmatics). In addition, the course will investigate how language is acquired and stored in the brain, and how differences in speech styles and dialects reflect different social and cultural backgrounds of individual speakers.
Learning Outcomes
1. Understand the basic concepts and terminology associated with phonetics, phonology, morphology, syntax, semantics, and pragmatics.
2. Comprehend how language evolves over history and over an individual's lifespan.

3. Describe some common, but mistaken, beliefs about language and to distinguish between descriptive and prescriptive approaches to language.
4. Describe the social, psychological, geographic and historical influences that lead to language dominance or language endangerment.
5. Be aware of the relations among various languages in the world, between dialects and slang, and between human and non-human languages.
6. Apply methods of linguistic analysis as introduced in the course.
7. Critically engage with the works of linguistic researchers.
8. Stimulate curiosity about language and what it reveals about the human mind.

LING 302V. Language and Society
3 Credits (3)
Study of how social identity including such factors as ethnicity, age, sex, education, power and socio-economic class is expressed in language systems and how misunderstandings arise between groups. Research skills are emphasized.

LING 303. Exploring Language Systems
3 Credits (3)
Forms of linguistic semantic, syntactic and phonological organization.
Prerequisite(s): LING 2110G.

LING 405. Topics in Linguistics
3 Credits (3)
Selected linguistics topics subtitled in the Schedule of Classes. May be repeated for a maximum of 6 credits under different subtitles.
Prerequisite: consent of instructor.

LING 425. Language and the Mind: Introduction to Psycholinguistics
3 Credits (3)
This course is an introduction to psycholinguistics; the study of how humans learn, represent, comprehend and produce language. Throughout this course, we address a variety of questions on the psychology of language most of which are still being answered. These include: What does it mean to know a language? What are the cognitive processes involved in language use? How do we produce and recognize speech? How can we improve texts and make them easier to read? How can we control speech in special situations to avoid errors?
Prerequisite(s): LING 2110G or consent of instructor.

LING 451. Independent Studies in Linguistics
1-3 Credits
Individual or group study of selected topics to be identified by subtitle. May be repeated for a maximum of 6 credits.
Prerequisites: LING 2110G and prior arrangement with faculty supervisor.

LING 455. Research in Linguistics
3 Credits (3)
This course will provide a capstone experience for students who have progressed through the program in linguistics and provide the foundation for further study at the post-graduate level in a linguistics-related field. Students will apply their foundation of knowledge and skills in linguistics through the realization of an individualized, inquiry-based project. Consent of instructor may enroll student only in case of elective credit shortfall with concurrent enrollment.
Prerequisite(s): LING 2110G, LING 301, LING 302V, LING 303, plus 9 credit hours of related electives.

LING 500. Introduction to Linguistics
3 Credits (3)
Survey of the main branches of linguistics: phonology, morphology, syntax, semantics, language acquisition, sociolinguistics, historical linguistics and some of the theoretical issues in the field.

LING 502. Graduate Study in Sociolinguistics
3 Credits (3)
Study of how social identity including factors such as ethnicity, age, gender education and socio-economic class is expressed in language systems.
Prerequisites: LING 2110G or LING 500 recommended.

LING 503. Exploring Language Systems- Grad
3 Credits (3)
Students will be responsible for all requirements of LING 303 and will undertake independent,directed research.
Prerequisite(s): LING 2110G or LING 500.

LING 505. Selected Topics
3 Credits (3)
Studies, varying from year to year, in linguistics.

Portuguese Courses

PORT 1110. Portuguese I
3 Credits (3)
Designed for students with no previous exposure to Portuguese, this course develops basic listening, speaking, reading, and writing skills. This is an introductory course aimed at teaching the student to communicate in Portuguese in everyday situations.
Learning Outcomes
1. Students can communicate and exchange information about familiar topics using phrases and simple sentences, sometimes supported by memorized language.
2. Students can handle most short social interactions in everyday situations by asking and answering simple questions.
3. Students can write short messages and notes on familiar topics related to everyday life.
4. Students can often understand words, phrases, and simple sentences related to everyday life.
5. Students can recognize pieces of information and sometimes understand the main topic of what is being said.
6. Students can understand familiar words, phrases, and sentences within short and simple texts related to everyday life.
7. Students can sometimes understand the main idea of what they have read.
8. Students can make connections between beliefs, behaviors and cultural artifactsof the Portuguese-speaking world, and make informed cross-cultural comparisons.

PORT 1120. Portuguese II
3 Credits (3)
A continuation of Portuguese I, students will develop a broader foundation in skills gained during the first semester, including understanding, speaking, reading and writing Portuguese. Students will also gain more in- depth knowledge of Portuguese-speaking cultures.
Prerequisite: C or better in PORT 1110 or consent of instructor.
Learning Outcomes
1. Students can participate in conversations on a number of familiar topics using simple sentences.
2. Students can handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can write about familiar topics and present information using a series of simple sentences.

4. Students can understand the main idea in short, simple messages and presentations on familiar topics.
5. Students can understand the main idea of simple conversations that they overhear.
6. Students can understand the main idea of short and simple texts when the topic is familiar.
7. Students can begin to narrate and describe simple events in the past.
8. Students can make broader connections between beliefs, behaviors and cultural artifacts of the Portuguese-speaking world, and make informed cross-cultural comparisons.

PORT 364V. Brazilian Culture Through Popular Music
3 Credits
This course will present students with an overview of Brazilian popular music, from the late nineteenth century to the present day, concentrating on the 60s, 70s, 80s of the 20th Century. It aims to discuss topics about cultural aspects and current issues in Brazil. It is designed to give students some introductory experience in Portuguese language and emphasizes skill development and refinement in the area of critical reading and writing.
Learning Outcomes
1. Be able to identify and distinguish the Brazilian musical styles including in the course.
2. Informatively discuss the main historical events in Brazil from the XVI to the XXI Century.
3. Be able to link the different musical styles to specific periods and events in Brazilian history.
4. Evaluate Brazil's the triple heritage (Indigenous, European, and African) and how it reflects on the notion of being Brazilian.
5. Demonstrate insight of how globalization has influenced Brazilian music, as well as of the transnational aspects of Brazilian music.
6. Be able to use the previous knowledge to discuss current notions of Brazilian identity, as well as recent developments in Brazilian music and society.
7. Be able to informatively relate Brazilian culture to their own.

PORT 453. Independent Luso-Brazilian Studies
1-3 Credits (1-3)
Individualized, self-paced projects for advanced students in Luso-Brazilian studies. May be repeated up to 12 credits. Consent of Instructor required.

PORT 513. Graduate Portuguese for Romance Language Students I
3 Credits (3)
Portuguese for beginners at the graduate level. May be completed on campus or via Study Abroad. Credit can be applied towards fulfilling the second language requirement. Credit is not accepted towards any graduate level major or minor.

PORT 514. Graduate Portuguese for Romance Language Students II
3 Credits (3)
Portuguese for beginners at the graduate level. May be completed on campus or via Study Abroad. Credit can be applied towards fulfilling the second language requirement. Credit is not accepted towards any graduate level major or minor.
Prerequisite(s): Language placement exam or C or better in PORT 513, or consent of instructor.

Spanish Courses

SPAN 1110. Spanish I
4 Credits (4)
Designed for students with little exposure to Spanish, this course develops basic listening, speaking, reading, and writing skills and basic intercultural competence in interpretive, interpersonal and presentational modes of communication at the Novice Level of proficiency based on ACTFL guidelines. During this course, students perform better and stronger in the Novice Mid level while some abilities emerge in the Novice High range. This is an introductory course aimed at helping the student to communicate in Spanish in everyday familiar situations via recognition and production of practiced or memorized words, phrases, and simple sentences.
Prerequisite(s): language placement and/or assessment by departmental examination.
Learning Outcomes
1. Students can communicate on very familiar topics using a variety of words and phrases that they have practiced and memorized.
2. Students can present information about myself and some other very familiar topics using a variety of words, phrases, and memorized expressions.
3. Students can write short messages and notes on familiar topics related to everyday life.
4. Students can often understand words, phrases, and simple sentences related to everyday life.
5. Students can recognize pieces of information and some-times understand the main topic of what is being said.
6. Students can understand familiar words, phrases, and sentences within short and simple texts related to everyday life.
7. Students can sometimes understand the main idea of what they have read.

SPAN 1120. Spanish II
4 Credits (4)
Designed for students with some degree of exposure to Spanish in high school and/or at home, this course continues to develop basic listening, speaking, reading, and writing skills and basic intercultural competence in interpretive, interpersonal and presentational modes of communication based at the Novice High Level of proficiency based on ACTFL guidelines, although a few abilities may emerge in the Intermediate Low Level. Students in this course communicate in Spanish in familiar topics using a variety of words, phrases, simple sentences and questions that have been highly practiced and memorized.
Prerequisite: language placement and/or assessment by departmental examination or a C- or better in SPAN 1110.
Learning Outcomes
1. Students can participate in conversations on a number of familiar topics using simple sentences.
2. Students can handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can present basic information on familiar topics using language they have practiced using phrases and simple sentences.
4. Students can write briefly about most familiar topics and present information using a series of simple sentences.
5. Students can understand the main idea in short, simple messages and presentations on familiar topics.
6. Students can understand the main idea of simple conversations that they overhear.
7. Students can understand the main idea of short and simple texts when the topic is familiar.

SPAN 1210. Elementary Spanish for Heritage Learners I
3 Credits (3)

This is a beginning-level Spanish course designed for students who have a cultural connection to the Spanish language. Some students have had very little exposure to the language and enter the class to develop beginning-level skills. Other students may have grown up hearing the heritage language in the community and may understand some Spanish and speak at a basic level as a result. The objective is to draw upon the connection to the heritage language as a source of motivation and engagement for our learning communities. At the same time, we build upon the language base that students may already have as a result of their heritage learner experience in order to develop new proficiencies in Spanish and reactivate the Spanish that students have learned previously. By the end of this course, students will be able to describe their home, campus surroundings and common activities including cultural traditions. At the same time, students gain cultural competency and develop a critical understanding of their linguistic and cultural background. Students who have previously earned a C or better in SPAN 1110 or SPAN 1120 may not recieve credit for this course.

Learning Outcomes

1. Interpersonal Communication: Students can engage in exchanges in culturally appropriate ways using understandable pronunciation on familiar topics using contextualized words, phrases, common idiomatic expressions, and simple sentences.
2. Written expression: Students can write an essay/poem/story/creative sketch/lyric in the target language that describes a past/present/future (fictional) event to the reader.
3. Interpretive listening: Students can understand familiar questions and statements from simple sentences in conversations.
4. Interpretive reading: Students can identify the topic and some isolated facts from simple sentences in informational and fictional texts.
5. Critical cultural awareness: Students can recognize and explain some of the issues facing bilingual communities in accordance to the instructor expertise and articulation with subsequent courses.

SPAN 1220. Spanish for Heritage Learners II
3 Credits (3)

Spanish as a Heritage Language II is a second semester class designed for students who have developed some basic Spanish proficiency from previous classes and/or from community experiences. This course provides students with the opportunity to develop their proficiency in the four language skills (speaking, listening, reading, and writing). Class activities are designed to strengthen oral communication skills (speaking and listening) through a variety of group activities. By the end of the course students will be able to understand and produce narrations of past events in oral and written Spanish. In order to foster a desire to revitalize and maintain the Spanish language in the US context we attempt to raise students' critical awareness of what it means to be part of a specific speech community.

Learning Outcomes

1. Interpersonal Communication: Students can engage in basic but authentic conversations through providing and obtaining information, expressing likes and dislikes, describing their daily lives, and narrating simple events in the past.
2. Written expression: Students can write an essay/poem/story/creative sketch/lyric in the target language, and that describes a past (fictional) event to the reader.
3. Interpretive listening: can identify the main idea in short conversations.
4. Interpretive reading: Students can identify the topic and related information from simple sentences in short informational and fictional texts.
5. Critical cultural awareness: Students can recognize and explain some of the issues facing bilingual communities in accordance to the instructor expertise and articulation with previous and subsequent courses.

SPAN 1410. Spanish for Health Care Professions
3 Credits (3)

This course is designed to develop the student's ability to understand, speak, read and write the Spanish language within a health profession framework because linguistic and cultural knowledge are essential for communication with patients. Restricted to Community Colleges campuses.

Prerequisite: SPAN 1511.

Learning Outcomes

1. Demonstrate acquisition of intermedia communicative skills in the area of listening, speaking, reading, and writing.
2. Comprehend and participate in conversations in Spanish.
3. Have a working vocabulary which enables to recognize and exchange information in Spanish.
4. Be able to apply some basic and intermediate grammar rules in Spanish.

SPAN 1511. Spanish for Human Services
3 Credits (3)

An introductory Spanish course for professionals in the human services. The course focuses on pertinent vocabulary for situations commonly encountered by professionals in areas such as social work, counseling, case management, Social Security, Medicare, health services, food stamps, child support, vocational rehabilitation, senior citizen issues and other areas. Basic Spanish pronunciation and grammar are introduced in the context of practical social-services situations.

Learning Outcomes

1. Augment basic vocabulary pertinent to professional roles (Vocabulary Journal).
2. Display increased confidence about pronunciation of Spanish and Spanish sentence structure (Role Play Interview).
3. Identify cultural norms working with Hispanic individuals and families (interview of Hispanic Professional).
4. Translate and explain agency forms and documents (Translation of Agency Form).
5. Display listening comprehension of typical dialogues which take place in a variety of human services agencies (Final Exam).

SPAN 2110. Spanish III
3 Credits (3)

This course is based on the integration of learning outcomes across Interpersonal, Interpretive, and Presentational Modes of Communication at the Intermediate Low Level of proficiency based on ACTFL guidelines. Students accomplish real-world communicative tasks in culturally appropriate ways as they gain familiarity with the target culture(s). This is an intermediate course aimed at helping the student to communicate in Spanish on familiar topics about self, others and everyday life at the same time that they recognize and handle short social interactions in interactions in everyday situations by asking and answering a variety of questions.

Prerequisite: language placement and assessment by departmental examination or C or better in SPAN 1120.

Learning Outcomes

1. Students can participate in conversations on familiar topics using sentences and series of sentences.

2. Students can handle short social interactions in everyday situations by asking and answering a variety of questions.
3. Students can usually say what they want to say about themselves and their everyday life.
4. Students can make presentations on a wide variety of familiar topics using connected sentences
5. Students can write on a wide variety of familiar topics using connected sentences.
6. Students can understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies.
7. Students can under-stand the main idea in conversations that they overhear.
8. Students can understand the main idea of texts related to everyday life and personal interests or studies.

SPAN 2120. Spanish IV
3 Credits (3)
This course is based on the integration of learning outcomes across Interpersonal, Interpretive, and Presentational Modes of Communication at the Intermediate Low Level of proficiency based on ACTFL guidelines. Students accomplish real-world communicative tasks in culturally appropriate ways as they gain familiarity with the target culture(s). This is an intermediate course aimed at helping the student to communicate in Spanish on familiar topics about self, others and everyday life at the same time that they recognize and handle short social interactions in interactions in everyday situations by asking and answering a variety of questions.
Prerequisite: language placement and assessment by departmental examination or C or better in SPAN 2110.
Learning Outcomes
1. Students can participate with ease and confidence in conversations on familiar topics.
2. Students can usually talk about events and experiences in various time frames.
3. Students can usually describe people, places, and things.
4. Students can handle social interactions in everyday situations, sometimes even when there is an unexpected complication.
5. Students can make presentations in a generally organized way on school, work, and community topics, and on topics they have researched.
6. Students can make presentations on some events and experiences in various time frames.
7. Students can write on topics related to school, work, and community in a generally organized way.
8. Students can write some simple paragraphs about events and experiences in various time frames.
9. Students can easily understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies. 1
10. Students can usually understand a few details of what they overhear in conversations, even when something unexpected is expressed. 1
11. Students can sometimes follow what they hear about events and experiences in various time frames. 1
12. Students can easily understand the main idea of texts related to everyday life, personal interests, and studies. 1
13. Students can sometimes follow stories and descriptions about events and experiences in various time frames.

SPAN 2210. Spanish for Heritage Learners III
3 Credits (3)
Intermediate Spanish for Heritage Speakers I is a third semester course designed for students who have been raised in a Spanish-speaking environment and speak, or understand, some Spanish as a result of hearing it in the home, and in the community by family, friends, and neighbors. Students in this course will continue to develop their ability to narrate events in the past and will be able to describe hypothetical situations. Students will also develop their ability to express wishes, desires, and necessities. This course will help the student build confidence in their Spanish abilities and expand the language use in the areas of writing, reading, oral production and listening comprehension. In order to foster a desire to revitalize and maintain the Spanish language we attempt to raise students' critical awareness of wider issues facing Spanish speakers in the US context. May be repeated up to 3 credits.
Learning Outcomes
1. Interpersonal Communication: Students can exchange information on a wide variety of familiar topics in which the students use appropriate vocabulary to describe their daily lives and narrate events in the past with some degree of ease and confidence.
2. Written expression: Students can write an essay/poem/story/creative sketch/lyric in the target language, and that effectively conveys a series of past (fictional) events to the reader that may include recent and distant past.
3. Interpretive listening: Students can identify the main idea and key information in short straightforward conversations.
4. Interpretive reading: Students can understand the main idea and key information in short straightforward informational and fictional texts.
5. Critical cultural awareness: Students can recognize and explain some of the issues facing bilingual communities in accordance to the instructor expertise and articulation with previous and subsequent courses.

SPAN 305. Topics in Hispanic Civilization
3 Credits (3)
Group study of selected topics focusing on Hispanic culture and civilization. Topics announced in the Schedule of Classes. May be repeated for a maximum of 6 credits.
Prerequisite: SPAN 2120 or SPAN 2210 or consent of instructor.

SPAN 306. Special Topics
3 Credits (3)
Group study of Spanish for specialized purposes (e.g. court interpreting, professional language for bilingual teachers, technical writing for the business community). Course subtitled in the Schedule of Classes. May be repeated for a maximum of 12 credits.
Prerequisite: SPAN 2120 or SPAN 2210 or consent of instructor.

SPAN 316. Grammar for Non-Native Speakers of Spanish
3 Credits (3)
For students who did not grow up speaking Spanish. A review of the rules of Spanish grammar. Students cannot receive credit for both SPAN 316 and SPAN 318.
Prerequisite(s): SPAN 2120 or SPAN 2210 or consent of instructor.
Learning Outcomes
1. Students will be better equipped academically to continue into upper-division Spanish courses.
2. Students will be better equipped to communicate in Spanish by becoming more adept at using a variety of grammatical structures.
3. Students will gain an appreciation for diverse languages and cultures that exist in the borderlands and will be able to contribute to the diversity.

4. Students will gain critical thinking skills as they develop their bilingual abilities.
5. Students will be encouraged after becoming bilingual and will desire to make language learning life-long goal.

SPAN 317. Composition for Non-Native Speakers of Spanish
3 Credits (3)
For students who did not grow up speaking Spanish. Development of professional and academic writing skills in Spanish. Students cannot receive credit for both SPAN 317 and SPAN 319.
Prerequisite(s): SPAN 2120 or SPAN 2210 or consent of instructor.
Learning Outcomes
1. Students will be better equipped academically to continue into upper-division Spanish courses.
2. Students will be better equipped to communicate in written Spanishby employing a more clear and structured writing style.
3. Students will gain an appreciation for diverse languages and cultures that exist in the borderlands and will be able to contribute to the diversity.
4. Students will gain critical thinking skills as they develop their bilingual abilities.
5. Students will be encouraged after becoming bilingual and will desire to make language learning life-long goal.

SPAN 318. Grammar for Heritage/Native Speakers of Spanish
3 Credits (3)
For students who speak or have been exposed to Spanish at home or in the community. A review of grammatical concepts and analysis of both spoken and written Spanish. Students cannot receive credit for both SPAN 316 and SPAN 318.
Prerequisite(s): SPAN 2120 or SPAN 2210 or consent of instructor.
Learning Outcomes
1. Students will be better equipped academically to continue into upper division Spanish courses.
2. Students will be better equipped to communicate in written and spoken Spanish by using a variety of grammatical structures.
3. Students will sharpen their Spanish communication skills, which will assist them in securing employment as bilingual speakers.
4. Students will develop a stronger appreciation for the Spanish communication skills and cultural awareness which will assist them in contributing to their communities in meaningful ways.
5. Students will gain critical thinking skills as they sharpen their bilingual abilities.

SPAN 319. Composition for Heritage/Native Speakers of Spanish
3 Credits (3)
For students who speak or have been exposed to Spanish at home or in the community. Development of writing strategies, styles and techniques in the Spanish language. Students cannot receive credit for both SPAN 317 and SPAN 319.
Prerequisite(s): SPAN 2120 or SPAN 2210 or consent of instructor.
Learning Outcomes
1. Students will be better equipped academically to continue into upper-division Spanish courses.
2. Students will be better equipped to communicate in written Spanish by employing a more clear and structured writing style.
3. Students will gain an appreciation for diverse languages and cultures that exist in the borderlands and will be able to contribute to the diversity.
4. Students will gain critical thinking skills as they develop their bilingual abilities.
5. Students will be encouraged after becoming bilingual and will desire to make language learning life-long goal.

SPAN 325. Advanced Conversation
3 Credits (3)
Intensive oral practice. Not open to heritage/native speakers of Spanish.
Prerequisite(s): SPAN 2120 or consent of instructor.

SPAN 327. Spanish in the Community
3 Credits (3)
Emphasis on use of Spanish outside the classroom in the local communities. Activities include but are not limited to oral histories, language mentoring in schools, assisting with cultural activities and language research.
Prerequisite: SPAN 2120 or SPAN 2210 or consent of instructor.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn how to apply bilingual and bicultural skills to serve the community.

SPAN 330. Variations in Spanish
3 Credits (3)
The study of social variation within the Spanish language, examining both social and linguistic factors that affect language change.
Prerequisite: SPAN 316 or SPAN 318 or consent of instructor.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the terms and concepts related to linguistic variations.
5. Students will learn about variations in the Spanish language and how to apply these ideas to a greater linguistics body of knowledge.

SPAN 340. Introduction to Spanish Linguistics
3 Credits (3)
General aspects of Spanish linguistics: traditional, descriptive, historical and dialectal.
Prerequisite: SPAN 316 or SPAN 318 or consent of instructor.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.

3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the terms and concepts related to Spanish linguistics.
5. Students will learn about a wide range of linguistics topics and how to apply these ideas to a greater linguistics body of knowledge.

SPAN 350. Introduction to Chicano Studies
3 Credits (3)
Covers Mexican-American life including language, history, education, politics and literature.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of Chicano Studies.
5. Students will learn about various Chicano cultural and historical themes and how they affect the Chicano community today.

SPAN 361. US-Mexico Border Culture & Literature
3 Credits (3)
Study of major authors and/or cultural trends in the U.S.-Mexico border. Selected subject to be identified by subtitle in the Schedule of Classes. May be repeated up to 6 credits.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of border literature and culture.
5. Students will learn about the value of US-Mexico border culture and literature and how they help form unique border communities.

SPAN 364V. Culture and Civilization of Mexico
3 Credits (3)
Familiarization with culture, civilization and regions of Mexico. History, geography, art, literature, folklore, customs, economics and politics of each region. Impact of Mexican culture and civilization on the Southwest United States. Taught in English. Does not satisfy Arts and Sciences second language requirement.

SPAN 365V. Culture and Civilization of Spanish America
3 Credits (3)
Familiarization with culture, civilization and regions of Spanish America. Study of history, geography, art, literature, folklore, customs, economics and politics of each region. Impact of Spanish American culture and civilization on the Southwest United States. Taught in English. Does not satisfy College of Arts and Sciences second language requirement.

SPAN 380. Introduction to Hispanic Literature
3 Credits (3)
Works in Spanish, all genres and periods. How to read literature in all forms.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of Hispanic literature..
5. Students will read foundational Hispanic texts of various genres and periods and learn how they create and inform Hispanic histories, identities, and nations.

SPAN 385. Introduction to Chicano/US-Mexican Literature
3 Credits (3)
Introduction to the study of major works by Chicano/US-Mexican authors.
Prerequisite: SPAN 380 or consent of instructor.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of Chicano literature.
5. Students will read foundational Chicano texts of various genres and learn how they create and sustain a national Chicano consciousness.

SPAN 388. Contemporary Hispanic Literature
3 Credits (3)
Study of Peninsular and Spanish-American literature from the 20th century to the present.
Prerequisite: SPAN 380 or consent of instructor.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of Hispanic literature.
5. Students will read foundational Hispanic texts of various genres from the 20th and 21st centuries and learn how they create and inform Hispanic histories, identities, and nations.

SPAN 393. Introduction to Translation and Interpretation
3 Credits (3)

General aspects of translation and interpretation from English to Spanish and Spanish to English. Selected subject to be identified by subtitle in the Schedule of Classes.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms, concepts, and strategies related to translation and interpretation.
5. Students will learn how to translate written texts and/or interpret live communication between the Spanish and English languages. However, other languages may be included at instructor's discretion.

SPAN 399. Independent Studies in Literature, Language, or Culture
1-3 Credits

Individualized, self-paced projects for advanced students. Students must present formal proposal of study.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn how to connect the value between literature, language, and culture and how to apply this knowledge to serve their community.

SPAN 411. Creative Writing
3 Credits (3)

Creative writing in Spanish.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of creative writing and the publication process.
5. Students will read and learn about the process and types of creative writing and publication, how to create original texts, and how to edit and publish creating works.

SPAN 412. Spanish-American Poetry
3 Credits (3)

Study of major works by Spanish-American poets.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of the poetry genre.
5. Students will read foundational Hispanic poetry from different periods and learn how poets and poetry create and inform Hispanic histories, identities, and nations.

SPAN 414. Coyolxauhqui: La literatura chicana femenil
3 Credits (3)

This course is designed to introduce students to Chicano Studies through the exploration of literature and cultural representations. Students will examine the history of Chican@s and discuss contemporary issues affecting their life, work, and expressions. The study of cultural representations such as Coyolxauhqui, La Malinche, La Virgen de Guadalupe, La Llorona, La Maqui-Loca, and La Chican@ Queer through a feminist perspective will allow a closer look at the work done by Chicana writers, poets, and artists who share a locus of enunciation. Most importantly, this course helps situating the individual experiences in relationship and connection to other Chican@s in the world.

Learning Outcomes

1. Become familiar with the main theoretical and pedagogical aspects of Chican@ Studies through a feminist perspective.
2. Reflect on the diversity of Chican@ scholars.
3. Observe the uniqueness in Chican@ Studies as compared to other fields.
4. Critically examine current research areas involving the interdisciplinary field.
5. Explore innovative theoretical research in history, politics and cultural topics.

SPAN 418. Spanish-American Short Story
3 Credits (3)

Study of major short stories by Spanish-American authors.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of the short story genre.
5. Students will read foundational Hispanic short stories from various periods and learn how this genre creates and informs Hispanic histories, identities, and nations.

SPAN 419. Spanish American Drama
3 Credits (3)

Study of major works by Spanish-American dramatists.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of the drama genre.
5. Students will read foundational Hispanic short stories from various periods and learn how this genre creates and informs Hispanic histories, identities, and nations.

SPAN 420. The Art of Storytelling

3 Credits (3)

The study of the genesis of storytelling and its structure, learning how and why to apply oral storytelling in our personal and professional lives, and practicing the art of storytelling in front of an audience.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of oral storytelling and the significance of this skill in creating personal and national narratives.
5. Students will learn how to write and present original oral stories, myths, and other forms of oral storytelling for a public audience.

SPAN 421. New Mexico Culture and Literature

3 Credits (3)

The study of the development and flourishing of New Mexican culture and literature.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn about key cultural, literary, and historical elements of New Mexico.
5. Students will learn how to apply knowledge about New Mexico to serve their communities.

SPAN 422. Cultural Production of Hispanic Revolutions and Wars

3 Credits (3)

The study of Hispanic literature, art, and film dealing with revolutionary movements and wars.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of revolutions and wars as they relate to literary production and other modes of cultural expression.
5. Students will learn about various revolutions and wars throughout Spain and Latin America and how they have helped form our regional and national identities, especially through a cultural production lens.

SPAN 423. Colonial Legacy: Representations in Chican@ Literature & Culture

3 Credits (3)

The course offers an overview of the research surrounding the legacy of colonial practices. Presents key concepts in colonial studies (colonialism, colonies, colonization, enclosures, exploitation, settlements), along with the ideologies of colonialism, to build the theoretical framework that will help analyze our colonial legacy through the exploration of Chican@ literature and cultural representations of writers, poets, and artists. Students will reflect on their own colonial/postcolonial ideologies and practices. The course helps situate the individual experiences in relationship and connection to others in the world.

Learning Outcomes

1. Become familiar with the main theoretical and pedagogical aspects of colonial studies.
2. Reflect, observe and explore the colonial practices and approaches.
3. Critically examine current research areas involving the interdisciplinary field.
4. Explore innovative theoretical research in history, politics, literature and culture.

SPAN 424. Post-Modern Hispanic Literature

3 Credits (3)

The study of Post-Modern experimental literary genres, from Post-boom to the present.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of post-modernism, especially in relation to Hispanic literary production.
5. Students will read a variety of post-modern Hispanic texts from various genres and learn how they help develop regional and national identities.

SPAN 426. Spanish-American Novel
3 Credits (3)
Study of major works by Spanish-American novelists.
Prerequisite: SPAN 380 or consent of instructor.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of the novel genre.
5. Students will read foundational Hispanic novels from various periods and learn how this genre creates and informs Hispanic histories, identities, and nations.

SPAN 427. Chicano Literature
3 Credits (3)
Study of Chicano/US-Mexican authors.
Prerequisite: SPAN 380 or consent of instructor.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop advanced comprehension of the terms and concepts of Chicano literature.
5. Students will read foundational Chicano texts of various genres, but with a focus on narratives, and learn how they create and sustain a national Chicano consciousness.

SPAN 439. Topics in Applied Spanish Linguistics
3 Credits (3)
Group study of selected topics to be identified by subtitle in the Schedule of Classes. May be repeated once under different subtitle for a maximum of 6 credits.
Prerequisite: SPAN 340.

SPAN 442. Formation of Hispanic National Identities
3 Credits (3)
Study of seminal texts on the formation of Hispanic national identities and counternarratives against homogenous notions of nationhood.
Prerequisite: SPAN 380 or consent of instructor.
Learning Outcomes
1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how Hispanic identities were formed through various narrative practices and how that informs media representations of Hispanic people and culture.
4. Analyze how Hispanic identities were formed and with what motivations.
5. Assess national narratives and counter-narratives to understand their political-social worlds better.

SPAN 444. Body Studies
3 Credits (3)
Interdisciplinary study of the body in Hispanic societies and others and its associated political meaning.
Prerequisite: SPAN 380 or consent of instructor.
Learning Outcomes
1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how the Hispanic body became a cultural and political object and how it is changing by the means of new media.
4. Analyze how the understanding of the Hispanic body has changed throughout history and how local politics affect it.
5. Learn how the body has served as the locus of culture and the principle of social interaction and politics.

SPAN 446. Speculative Fiction
3 Credits (3)
Study of Hispanic speculative fiction and its related utopian/dystopian societies.
Prerequisite: SPAN 380 or consent of instructor.
Learning Outcomes
1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how social anxieties produced a Hispanic literary corpus to deal with the past, the present, and the future.
4. Analyze and compare how genre fiction challenges or supports hegemonic national discourses.
5. Learn how speculative fiction serves as an expression of social desires.

SPAN 447. Hispanic Film
3 Credits (3)
Study of major films from Spain and Spanish-America. Restricted to: Main campus only.

SPAN 448. U.S.-Hispanic Film
3 Credits (3)
Study of major films about and/or by Hispanics of the U.S. Restricted to: Main campus only.

SPAN 449. Special Problems
1-3 Credits
Directed reading for graduate students in their specific fields to satisfy language requirement for master's or doctoral programs. May be repeated for a maximum of 6 credits.

SPAN 451. Hispanic Cultures
3 Credits (3)
Issues in Hispanic cultures of the U.S., Spanish-America and Spain. Also focuses on U.S.-Mexico border culture. Selected topics to be identified by subtitle in the Schedule of Classes.
Prerequisite: SPAN 380 or consent of instructor.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.

2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn about various modes of Hispanic cultural production and how they create regional and national Hispanic identifies.

SPAN 461. Introduction to Spanish Phonetics
3 Credits (3)
An introduction to Spanish phonetics including basic dialectal variation and comparison with English.
Prerequisite: SPAN 340.

SPAN 474. Pragmatics
3 Credits (3)
The study of theory and pragmatic notions such as implicatures, presuppositions, deixis, speech acts, and politeness.
Prerequisite(s): SPAN 340.

SPAN 476. Semantics
3 Credits (3)
The investigation of language from a semantic-pragmatic perspective and the use of formal logic to communicate meaning.
Prerequisite(s): SPAN 340.

SPAN 483. Literature and Law
3 Credits (3)
The advanced study of Latin American and Latino literature and its historical and cultural connections to the development of laws and the influence of both on modern society.
Prerequisite: SPAN 380 or consent of instructor.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of legal themes as found in literature.
5. Students will read foundational Hispanic texts of various genres and learn how they create a narrative that embodies or implies legal issues that affect the Hispanic community.

SPAN 485. Literature and Mental Health
3 Credits (3)
The advanced study of Latin American and Latino literature and how storytelling, through various literary genres, can inform our understanding of mental health issues and propose possible solutions to improve our quality of mental health.
Prerequisite: SPAN 380 or consent of instructor.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of mental health themes as found in literature.
5. Students will read foundational Hispanic texts of various genres and learn how they create a narrative that embodies or implies mental health issues that affect the Hispanic community.

SPAN 490. Special Topics
3 Credits (3)
Selected topic to be identified by subtitle in the Schedule of Classes.
Prerequisite: SPAN 316 or SPAN 318 or consent of instructor.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn about various topics of Hispanic literature or linguistics that can be applied to advanced research projects.

SPAN 491. History of the Spanish Language
3 Credits (3)
The development of Spanish from its origins.
Prerequisite(s): SPAN 340.

SPAN 492. Structure of Spanish
3 Credits (3)
Topics in Spanish linguistics including phonology, morphology, syntax and semantics.
Prerequisite: SPAN 316 or SPAN 318 or SPAN 340.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the terms and concepts related to the structure of Spanish.
5. Students will learn about the formation of the structure of Spanish and how to apply these ideas to a greater linguistics body of knowledge.

SPAN 493. Espanol de los Estados Unidos
3 Credits (3)
Linguistic issues and studies of U.S. Spanish-speaking communities. Taught with SPAN 593. May be repeated up to 3 credits.
Prerequisite(s): SPAN 340.

SPAN 500. Methods of Research and Literary Criticism
3 Credits (3)
Advanced methods of research and literary criticism.

SPAN 502. Sentipensar Pedagogy: Anzaldúa and Other Theorists
3 Credits (3)

The course offers an overview of the theory, research and practice concerning Sentipensar pedagogy. Through the exploration of literature and cultural representations, students will interpret the works of theorist that promote the connections between the body, mind, and heart in their academic research and curriculum. The course will also discuss contemporary issues affecting our life, work, and expressions. The study of Gloria Anzaldúa's Coatlicue state, linguistic terrorism, Nepantla and Consciencia Mestiza, are only some of the approaches to academia that will be discussed in this course. We will also have a closer look at the work done by writers, poets, and artists who share a locus of enunciation. Most importantly, this course helps situating the individual experiences in relationship and connection to others in the world. This course focuses on strategies and techniques in curriculum development appropriate for teaching students at different levels. The materials and resources for the class are mostly written in English because the field research is done in this language. However, all work turned in for this class (discussions, quizzes, homework, presentations, etc.) must be written and developed in Spanish.

Learning Outcomes

1. Become familiar with the main theoretical and pedagogical aspects of Sentipensar pedagogy.
2. Reflect and explore on the diversity in the approaches and methodologies in Sentipensar pedagogy.
3. Observe the uniqueness in the field as compared to others.
4. Critically examine current research areas involving the interdisciplinary field.
5. Explore innovative theoretical research in history, politics and culture.

SPAN 503. Critical Language Awareness in Teaching SHL
3 Credits (3)

This course is designed to introduce students to the theory, research, and practice of Critical Language Awareness. Students will read about the theoretical framework established when teaching heritage language learners. The study of Critical Language Awareness will allow educators to take a closer look at their own sociocultural concerns and influences in their education. Most importantly, this course will help us understand how our individual experiences connect in relationship to other heritage and native language users in the world. The materials and resources for the class are mostly written in English because the field research is done in this language. However, all work turned in for this class (discussions, quizzes, homework, presentations, etc.) must be written and developed in Spanish.

Learning Outcomes

1. Become familiar with the main theoretical and pedagogical aspects of Critical Language Awareness.
2. Reflect on the diversity in the writings of scholars in the field.
3. Observe the uniqueness of Critical Language Awareness in heritage language pedagogy.
4. Critically examine current research areas involving the interdisciplinary field.
5. Explore innovative theoretical research in history, politics, and cultural topics.

SPAN 504. Culturally Sensitive Teaching in SHL: Teaching Spanish as a Heritage Language in the United States
3 Credits (3)

This course focuses on presenting the theories, strategies and techniques in curriculum development appropriate for teaching Spanish for Native Speakers (SNS/EHN) and Heritage Language Speakers (HLS/EHH) in a culturally and linguistically sensitive environment. Students will conduct classroom observations and prepare presentations on aspects of CLR and SHL instruction in addition to preparing a research project to illustrate all their preparation towards creating a more sensitive and responsive curriculum.

Learning Outcomes

1. Become familiar with the main theoretical and pedagogical aspects of culturally and linguistically responsive teaching of SHL.
2. Reflect on the linguistic diversity of SHL speakers.
3. Observe the uniqueness in the use of SHL as compared to the Spanish in other parts of the world.
4. Critically examine current research areas involving U.S. Spanish, family and community settings, policies, programs and curriculum.
5. Explore innovative techniques, materials and activities in culturally and linguistically responsive SHL instruction.
6. Design new evaluation practices in all four skills.

SPAN 507. Technology Enhanced Language Learning
3 Credits (3)

Strategies for enhancing language learning with emerging technologies. Course is taught in Spanish.

SPAN 508. Teaching Literature with Technology
3 Credits (3)

Strategies and techniques for enhancing the teaching of all literature genres using emerging technologies. Course is taught in Spanish. Co/**Prerequisite(s):** SPAN 507, and/or consent of instructor.

SPAN 509. Teaching Culture with Technology
3 Credits (3)

Strategies and techniques for enhancing the teaching of culture using emerging technologies. Course is taught in Spanish. Co/**Prerequisite(s):** SPAN 507, and/or consent of instructor.

SPAN 510. Assessing the National Standards
3 Credits (3)

Analysis of the National Standards for Foreign Language Learning (the 5 Cs) in the 21st Century. Course will also cover the Integrated Performance Assessment as applied to the national standards. Other assessments will be reviewed to evaluate effectiveness in all levels of Spanish language classrooms.

SPAN 512. Contemporary Spanish-American Poetry
3 Credits (3)

Readings and interpretation of Spanish-American poetry from the 20th century to the present.

SPAN 514. Coyolxauhqui: La literatura chicana femenil
3 Credits (3)

This course is designed to introduce students to Chicano Studies through the exploration of literature and cultural representations. Students will examine the history of Chican@s and discuss contemporary issues affecting their life, work, and expressions. The study of cultural representations such as Coyolxauhqui, La Malinche, La Virgen de Guadalupe, La Llorona, La Maqui-Loca, and La Chican@ Queer through a feminist perspective will allow a closer look at the work done by Chicana writers, poets, and artists who share a locus of enunciation. Most importantly, this course helps situating the individual experiences in relationship and connection to other Chican@s in the world.

Learning Outcomes

1. Become familiar with the main theoretical and pedagogical aspects of Chican@ Studies through a feminist perspective.
2. Reflect on the diversity of Chican@ scholars.
3. Observe the uniqueness in Chican@ Studies as compared to other fields.

4. Critically examine current research areas involving the interdisciplinary field.
5. Explore innovative theoretical research in history, politics and cultural topics.

SPAN 520. Adv. The Art of Storytelling
3 Credits (3)
The study of the genesis of storytelling and its structure, learning how and why to apply oral storytelling in our personal and professional lives, and practicing the art of storytelling in front of an audience.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the terms and concepts of storytelling and the significance of this skill in creating personal and national narratives.
5. Students will learn how to write and present original oral stories, myths, and other forms of oral storytelling for a public audience.

SPAN 521. Advanced Culture and Literature of New Mexico
3 Credits (3)
The advanced study of the development and flourishing of New Mexican culture and literature.

SPAN 522. Adv. Cultural Production of Hispanic Revolutions and Wars
3 Credits (3)
The study of Hispanic literature, art, and film dealing with revolutionary movements and wars.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of revolutions and wars as they relate to literary production and other modes of cultural expression.
5. Students will learn about various revolutions and wars throughout Spain and Latin America and how they have helped form regional and national identities, especially through a cultural production lens

SPAN 523. Colonial Legacy: Representations in Chican@ Literature & Culture
3 Credits (3)
The course offers an overview of the research surrounding the legacy of colonial practices. Presents key concepts in colonial studies (colonialism, colonies, colonization, enclosures, exploitation, settlements), along with the ideologies of colonialism, to build the theoretical framework that will help analyze our colonial legacy through the exploration of Chican@ literature and cultural representations of writers, poets, and artists. Students will reflect on their own colonial/postcolonial ideologies and practices. The course helps situate the individual experiences in relationship and connection to others in the world.
Learning Outcomes
1. Become familiar with the main theoretical and pedagogical aspects of colonial studies.
2. Reflect, observe and explore the colonial practices and approaches.
3. Critically examine current research areas involving the interdisciplinary field.
4. Explore innovative theoretical research in history, politics, literature and culture.

SPAN 528. Advanced U.S. Latino Culture and Literature
3 Credits (3)
The advanced study of major works by Latino writers in the U.S.

SPAN 540. Introduccion a la Linguistica
3 Credits (3)
Introduces students to the foundational topics of linguistic study with particular reference given to the Spanish language: properties of language and communication, morphology, syntax, phonetics, phonology, language variation and change.
Prerequisite(s): Eligibility to take graduate level courses.

SPAN 542. Adv. Formation of Hispanic National Identities
3 Credits (3)
Study of seminal texts on the formation of Hispanic national identities and counternarratives against homogenous notions of nationhood.
Learning Outcomes
1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how Hispanic identities were formed through various narrative practices and how that informs media representations of Hispanic people and culture.
4. Analyze how Hispanic identities were formed and with what motivations.
5. Assess national narratives and counter-narratives to understand their political-social worlds better.

SPAN 544. Adv. Body Studies
3 Credits (3)
Interdisciplinary study of the body in Hispanic societies and others and its associated political meaning.
Learning Outcomes
1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how the Hispanic body became a cultural and political object and how it is changing by the means of new media.
4. Analyze how the understanding of the Hispanic body has changed throughout history and how local politics affect it.
5. Learn how the body has served as the locus of culture and the principle of social interaction and politics.

SPAN 545. Advanced Dialectos del Espanol
3 Credits (3)
Advanced research of Spanish dialects including their formal characteristics, historical formation and regional variation.

SPAN 546. Adv. Speculative Fiction
3 Credits (3)
Study of Hispanic speculative fiction and its related utopian/dystopian societies.
Learning Outcomes
1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how social anxieties produced a Hispanic literary corpus to deal with the past, the present, and the future.
4. Analyze and compare how genre fiction challenges or supports hegemonic national discourses.
5. Learn how speculative fiction serves as an expression of social desires.

SPAN 547. Advanced Hispanic Film
3 Credits (3)
Advanced study of major films from Spain and Spanish-America. Restricted to: Main campus only.

SPAN 548. Advanced U.S.-Hispanic Film
3 Credits (3)
Advanced study of major films about and/or by Hispanics of the U.S. Restricted to: Main campus only.

SPAN 550. Advanced Chicana and Chicano Studies
3 Credits (3)
Multidisciplinary examination of issues that have historically affected/influenced the Chicana/o community regionally, in the borderlands, and beyond borders.
Learning Outcomes
1. Students will become better equipped to teach this material at the high school or community college levels.
2. Students will become better equipped to attend a PhD program in a related field.
3. Students will gain access to a more diverse curriculum which broaden their educational and cultural perspectives.
4. Students will be able to develop their scholarship on a more creative level.
5. Students will strengthen their academic writing, which will help in their graduate studies and/or post-graduate careers.

SPAN 551. Advanced Hispanic Cultures
3 Credits (3)
Advanced study on Hispanic cultures of the U.S., Spanish-America and/or Spain. Selected topic to be identified by subtitle. Taught with SPAN 451. May be repeated up to 6 credits.

SPAN 558. Bilinguismo
3 Credits (3)
Examines the topics of bilingualism from a psycholinguistic perspective including the development of the bilingual brain, lexical acquisition, retrieval and storage, and experimental techniques in measuring language competence.
Prerequisite(s): SPAN 540 or consent of instructor.

SPAN 561. Advanced Spanish Phonetics
3 Credits (3)
Advanced study of Spanish phonetics, including basic dialectal variation and comparisons with English.

SPAN 562. Advanced Spanish Phonology
3 Credits (3)
An advanced formal examination of the sound system of Spanish including formal characterizations, dialectal variation and laboratory data. May be repeated up to 3 credits.
Prerequisite(s): SPAN 561 or consent of instructor.

SPAN 563. Advanced Study in Mexican Literature
3 Credits (3)
Mexican literature from the Pre-Columbian period to the present.

SPAN 564. Advanced Post-Modern Hispanic Literature
3 Credits (3)
The advanced study of Post-Modern experimental literary genres, from Post-boom to the present.

SPAN 566. Contemporary Spanish-American Novel
3 Credits (3)
The Spanish-American novel from the 20th century to the present.

SPAN 567. Advanced Study in Chicano Literature
3 Credits (3)
Study of all genres of Chicano literature.

SPAN 570. Advanced Study in Technical Translation
3 Credits (3)
Translation of a variety of non-literary texts from English to Spanish and from Spanish to English. Course is taught in Spanish.

SPAN 573. Advanced Study in Creative Writing
3 Credits (3)
Advanced creative writing in Spanish.

SPAN 574. Advanced Pragmatics
3 Credits (3)
The study of theory and pragmatic notions such as implicatures, presuppositions, deixis, speech acts, and politeness.
Prerequisite(s): SPAN 540 or consent of instructor.

SPAN 576. Advanced Semantics
3 Credits (3)
The investigation of language from a semantic-pragmatic perspective and the use of formal logic to communicate meaning.
Prerequisite(s): SPAN 540 or consent of instructor.

SPAN 580. Research Methodology in Spanish Linguistics
3 Credits (3)
Study and practical application of techniques in linguistic research.

SPAN 583. Advanced Study in Spanish-American Women Writers
3 Credits (3)
All genres of Spanish-American literature written by women. Research paper required.

SPAN 584. Spanish Morphosyntax
3 Credits (3)
Examination of the morphological and syntactic structure of the Spanish language as well as their interaction. Practical applications are also explored.

SPAN 586. Contemporary Spanish-American Essay
3 Credits (3)
Main currents in the Spanish-American thought from the 20th century to the present.

SPAN 587. Contemporary Spanish-American Short Story
3 Credits (3)
The Spanish-American short story from the 20th century to the present.

SPAN 588. Contemporary Spanish-American Drama
3 Credits (3)
The Spanish-American drama from the 20th century to the present.

SPAN 589. Spanish Sociolinguistics
3 Credits (3)
Relationship between language and society in the Spanish-speaking world.

SPAN 590. Advanced Special Topics
3 Credits (3)
Specific subject to be announced in the Schedule of Classes. May be repeated up to 6 credits.

SPAN 591. Advanced Study in History of the Spanish Language
3 Credits (3)
The development of Spanish from its origins.

SPAN 592. Advanced Structure of Spanish
3 Credits (3)
Advanced study of Spanish linguistics topics such as phonology, morphology, syntax and semantics.

SPAN 594. Theory and Methodology of Spanish Pedagogy
3 Credits (3)
Advanced studies in current theories and methodologies of Spanish language pedagogy. Taught as a practicum.

SPAN 595. Advanced Topics in Applied Spanish Linguistics
3 Credits (3)
Selected topics to be identified by subtitle in the Schedule of Classes. May be repeated for a total of 9 credits under a different subtitle.

SPAN 597. Advanced Strategies for Teaching Spanish for Heritage/Native Speakers
3 Credits (3)
Advanced overview of the main theories, research, pedagogical approaches, assessment and practice concerning the teaching of Spanish to heritage learners and native speakers.

SPAN 598. Independent Reading, Research, and/or Creative Writing
1-3 Credits
Individual study of selected readings and problems; or individual research, either analytical or experimental, or creative writing.

SPAN 599. Master's Thesis
15 Credits
Thesis.

Phone: (575) 646-4541

Website: http://www.nmsu.edu/~langling/ (http://langling.nmsu.edu)

Languages (French) - Bachelor of Arts

Departmental Requirements

Single Major in Languages with a Concentration in French

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students who are pursuing only a major in Languages with a Concentration in French are considered single major students. Single major students are required to complete:

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Select one from the following:		3
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1130G	Survey of Mathematics [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
LING 2110G	Introduction to the Study of Language and Linguistics	
Area III: Laboratory Sciences Course (4 credits) [2]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective [2]		*3-4*
Viewing a Wider World [3]		**6**
These courses do not satisfy this requirement: (FREN 365V, SPAN 364V, SPAN 365V)		
Departmental/College Requirements		
Linguistics Requirement		
The Linguisitics requirement is completed with LING 2110G which also counts towards Area IV of the General Education requirements		
Select 24 additional credits from FREN courses (300-level or higher) selected with the help of an advisor from the department [4]		*24*
Second Language Requirement (see below) [6]		**0-14**
Electives, to bring the total credits to 120 [5]		**58**
Total Credits		**120-136**

1. MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G Survey of Mathematics first.
2. See the General Education (p. 262) Section of the catalog to view the full list of courses that can be selected to complete this requirement.
3. See the Viewing a Wider World (p. 266) Section of the catalog to view the full list of courses that can be selected to complete this requirement.
4. Entrance into the French sequence is determined by placement. Additional FREN courses may be needed to meet prerequisites of 300+ level GRMN courses.
5. Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor

coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

6 The number of credits needed to complete the Second Language Requirement may vary depending on language placement. As well, this requirement may be waived via conditions further described below.

Second Language Requirement

For the Bachelor of Arts in Languages with a concentration in French there is a two year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
GRMN 1110 & GRMN 1120 & GRMN 2110 & GRMN 2120	German I and German II and German III and German IV	3-14
JAPN 1110 & JAPN 1120 & JAPN 2110 & JAPN 2120	Japanese I and Japanese II and Japanese III and Japanese IV	3-14
SPAN 1110 & SPAN 1120 & SPAN 2110 & SPAN 2120	Spanish I and Spanish II and Spanish III and Spanish IV	3-14
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220 & SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	3-9

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
SIGN 2110	American Sign Language III	3

Option 3:

Prefix	Title	Credits
Challenge the 2120 level for the following courses:		
GRMN 2120	German IV	3
or JAPN 2120	Japanese IV	
or SPAN 2120	Spanish IV	
OR		
Challenge the 1120/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

Double Major in Languages with a Concentration in French

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students who are completing a different major in a different department can double major in Languages with a concentration in French. Double major students are required to complete:

Prefix	Title	Credits
General Education (from other major): [1]		**32-35**
Viewing a Wider World (from other major): [1]		**6**
These courses do not satisfy this requirement: (FREN 365V, SPAN 364V, SPAN 365V)		
Deparmental/College Requirements		
Select 24 credits from FREN courses (300-level or higher) selected with the help of an advisor from the department		*24*
Electives, to bring the total credits to 120 [3]		**58**
Total Credits		**120-123**

1 General Education and Viewing a Wider World requirements are solidified by completing the requirements for the other major in a different department, as part of the double major program.

2 Entrance into the French sequence is determined by placement and some courses may not be needed if a student is placed into a higher level.

3 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-

case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Intermediate Algebra and ENGL 1110G Rhetoric and Composition . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G or ENGL 1110H	Composition I (C- or better) or Composition I Honors	4
MATH 1130G	Survey of Mathematics (C- or better)	3
Elective Course [2]		3
FREN 1110	French I (For students who need to complete the lower-division sequence for prereqs.)	
Elective Course [2]		3-4
Recommended continuation of the FREN 1110, 1120, 2110, 2120 for students needing placement adjustments		
Select from one of the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area V: Humanities Course [3]		3
LING 2110G	Introduction to the Study of Language and Linguistics (C- or better) [4]	3
Elective Courses [2]		8
	Credits	**30-31**
Sophomore		
Select one from the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Area III: Laboratory Science Course [3]		4
Area VI: Creative and Fine Arts Course [3]		3
Second Language: Placement Level or HS Waiver (C- or better) [4]		3-4
Elective Courses [2]		6
Recommended continuation of the FREN 1110, 1120, 2110, 2120 for students needing placement adjustments		
General Education Elective Course [3]		3
Select either an Area III/IV: Laboratory Sciences or Social/Behavioral Sciences Course [3]		3-4
Second Language: Continued Sequence if no HS Waiver (C- or better) [4]		3-4
Elective Course [2]		2
	Credits	**30-33**
Junior		
VWW- Viewing a Wider World Courses [5]		6
Second Language: Continued Sequence if no HS Waiver (C- or better) [4]		6
French Upper Division Electives (FREN Courses, C- or better) [6]		12
Elective Course [2]		3
Elective Course (Upper Division) [2]		3
	Credits	**30**
Senior		
French Upper Division Electives (FREN Courses, C- or better) [6]		12
Elective Course (Upper Division) [2,7]		15
Elective Course [2]		3
	Credits	**30**
	Total Credits	**120-124**

1. MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.
2. Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
3. See the General Education (p. 262) section of the catalog for a full list of courses
4. Students who double major in Languages with a concentration in French are not required to take LING 2110G or fulfill a second language requirement.
5. See the Viewing a Wider World (p. 266) section of the catalog to see a full list of courses, please note that FREN 365V, SPAN 364V and SPAN 365V do not fulfill this requirement.
6. Upper- Division FREN Credits: 24 credits (300-level or higher) are to be selected with the aid of an academic advisor, please note that FREN 365V does not count towards a FREN Upper-Division Elective course.
7. FREN 306 may be taken for a maximum of 6 credits towards the degree, but only 3 credits will be accepted from study abroad.

Languages (German) - Bachelor of Arts

Departmental Requirements

Single Major in Languages with a Concentration in German

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students who are only pursuing a major in Languages with a Concentration in German are considered single major students. Single major students are required to complete:

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
English Composition - Level 2		
Select one from the following:		3
ENGL 2210G	Professional and Technical Communication	

ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1130G	Survey of Mathematics [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
LING 2110G	Introduction to the Study of Language and Linguistics	
Area III: Laboratory Sciences Course (4 credits) [2]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective [2]		*3-4*
Viewing a Wider World [3]		**6**
These courses do not satisfy this requirement: (FREN 365V, SPAN 364V, SPAN 365V)		
Departmental/College Requirements		
Linguistics Requirement		
The Linguisitics requirement is completed with LING 2110G which also counts towards Area IV of the General Education requirements		
Select 24 additional credits from GRMN courses (300-level or higher) selected with the help of an advisor from the department [4]		*24*
Second Language Requirement (see below) [6]		**0-14**
Electives, to bring the total credits to 120 [5]		**58**
18 credits must be upper division		
Total Credits		**120-136**

1. MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.
2. See the General Education (p. 262) Section of the catalog to view the full list of courses that can be selected to complete this requirement.
3. See the Viewing a Wider World (p. 266) Section of the catalog to view the full list of courses that can be selected to complete this requirement.
4. Entrance into the German sequence is determined by placement. Additional GRMN courses may be needed to meet prerequisites of 300+ level GRMN courses.
5. Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
6. The number of credits needed to complete the Second Language Requirement may vary depending on language placement. As well, this requirement may be waived via conditions further described below.

Second Language Requirement

For the Bachelor of Arts in Languages with a concentration in German there is a two year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120 & FREN 2110 & FREN 2120	French I and French II and French III and French IV	3-14
JAPN 1110 & JAPN 1120 & JAPN 2110 & JAPN 2120	Japanese I and Japanese II and Japanese III and Japanese IV	3-14
SPAN 1110 & SPAN 1120 & SPAN 2110 & SPAN 2120	Spanish I and Spanish II and Spanish III and Spanish IV	3-14
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220 & SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	3-9

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
SIGN 2110	American Sign Language III	3

Option 3:

Prefix	Title	Credits
Challenge the 2120 level for the following courses:		
FREN 2120	French IV	3
or JAPN 2120	Japanese IV	
or SPAN 2120	Spanish IV	
OR		
Challenge the 1120/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

Double Major in Languages with a Concentration in German

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students who are completing a different major in a different department can double major in Languages with a concentration in German. Double major students are required to complete:

Prefix	Title	Credits
General Education (from other major): [1]		**32-35**
Viewing a Wider World (from other major): [1]		**6**
These courses do not satisfy this requirement: (FREN 365V, SPAN 364V, SPAN 365V)		
Departmental/College Requirements		
Select 24 additional credits from GRMN courses (300-level or higher) selected with the help of an advisor from the department		*24*
Second Language: (not required)		
Electives, to bring the total credits to 120 [3]		**58**
Total Credits		**120-123**

1. General Education and Viewing a Wider World requirements are solidified by completing the requirements for the other major in a different department, as part of the double major program.
2. Entrance into the German sequence is determined by placement and some courses may not be needed if a student is placed into a higher level.
3. Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I (C- or better)	4
MATH 1130G	Survey of Mathematics (C- or better) [1]	3
Elective Course		3
GRMN 1110	German I (For students who need to complete the lower-division sequence for prereqs.)	
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
LING 2110G	Introduction to the Study of Language and Linguistics (C- or better) [4]	3
Area V: Humanities Course [3]		3
Recommended continuation of the GRMN 1110, 1120, 2110, 2120 for students needing placement adjustments.		
Elective Courses [2]		11
	Credits	**30**
Sophomore		
Select one from the following:		3
ENGL 2210G	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Area III: Laboratory Science Course [3]		4
Area VI: Creative and Fine Arts Course [3]		3
Select either an Area III/IV: Laboratory Sciences or Social/Behavioral Sciences [3]		3-4
General Education Elective Course [3]		3
Second Language: Placement Level or HS Waiver (C- or better) [4]		3-4
Second Language: Continued Sequence if no HS Waiver (C- or better) [4]		3-4
Elective Courses		6
Recommended continuation of the GRMN 1110, 1120, 2110, 2120 for students needing placement adjustments.		
Elective Courses [2]		2
	Credits	**30-33**
Junior		
VWW- Viewing a Wider World Course [5]		6
Second Language: Continued Sequence if no HS Waiver (C- or better) [4]		6
German Upper Division ElectiveS (GRMN Courses, C- or better) [6]		12
Elective Courses [2]		3
Elective Course (Upper Division) [2]		3
	Credits	**30**
Senior		
German Upper Division Electives (GRMN Courses, C- or better) [6]		12
Elective Courses (Upper Division) [2]		15
Elective Course [2]		3
	Credits	**30**
	Total Credits	**120-123**

1. MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.
2. Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up

needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

3 See the General Education (p. 262) section of the catalog for a full list of courses

4 Students who double major in Languages with a concentration in German are not required to take LING 2110G or fulfill a second language requirement.

5 See the Viewing a Wider World (p. 266) section of the catalog to see a full list of courses, please note that FREN 365V, SPAN 364V and SPAN 365V do not fulfill this requirement.

6 Upper- Division GER Credits: 24 credits (300-level or higher) are to be selected with the aid of an academic advisor.

Languages (Spanish) - Bachelor of Arts

Departmental Requirements

Single Major in Languages with a Concentration in Spanish

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students who are only pursuing a major in Languages with a concentration in Spanish are considered single major students. Single major students are required to complete:

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
English Composition - Level 2		
Select one from the following:		3
ENGL 2210G	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1130G	Survey of Mathematics [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
LING 2110G	Introduction to the Study of Language and Linguistics (linguistics requirement for major)	
Area III: Laboratory Sciences Course (4 credits) [2]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective [2]		*3*
Viewing a Wider World [3]		**6**
These courses do not satisfy this requirement: (FREN 365V, LING 302V, SPAN 364V, SPAN 365V)		
Departmental/College Requirements		
Linguistics Requirement		*3*
The Linguisitics requirement is completed with LING 2110G which also counts towards Area IV of the General Education requirements		
Departmental Requirements		
SPAN 316	Grammar for Non-Native Speakers of Spanish [4]	3
or SPAN 318	Grammar for Heritage/Native Speakers of Spanish	
SPAN 317	Composition for Non-Native Speakers of Spanish [4]	3
or SPAN 319	Composition for Heritage/Native Speakers of Spanish	
SPAN 340	Introduction to Spanish Linguistics [4]	3
SPAN 380	Introduction to Hispanic Literature [4]	3
SPAN Upper-Division Electives [4, 5]		12
Second Language Requirement (see below) [8]		**0-14**
Electives (to bring the total credits to 120) [6]		**55**
Total Credits		**120-135**

1 MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.

2 See the General Education (p. 262) Section of the catalog to view the full list of courses that can be selected to complete this requirement.

3 See the Viewing a Wider World (p. 266) Section of the catalog to view the full list of courses that can be selected to complete this requirement.

4 Entrance into the Spanish sequence is determined by placement. Additional SPAN courses may be needed to meet prerequisites of 300+ level SPAN courses.

5 SPAN 364V and SPAN 365V will not count toward the major. Neither SPAN 2110 or SPAN 2120 will count towards a major.

6 Both SPAN 340 Introduction to Spanish Linguistics and SPAN 380 Introduction to Hispanic Literature must be taken.

7 Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

8 The number of credits needed to complete the Second Language Requirement may vary depending on language placement. As well, this requirement may be waived via conditions further described below.

Second Language Requirement

For the Bachelor of Arts in Languages with a concentration in Spanish there is a two year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120 & FREN 2110 & FREN 2120	French I and French II and French III and French IV	3-14
GRMN 1110 & GRMN 1120 & GRMN 2110 & GRMN 2120	German I and German II and German III and German IV	3-14
JAPN 1110 & JAPN 1120 & JAPN 2110 & JAPN 2120	Japanese I and Japanese II and Japanese III and Japanese IV	3-14
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
SIGN 2110	American Sign Language III	3

Option 3:

Prefix	Title	Credits
Challenge the 1120/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

Double Major in Languages with a Concentration in Spanish

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students who are completing a different major in a different department can double major in Languages with a concentration in Spanish. Double major students are required to complete:

Prefix	Title	Credits
General Education (from other major): [1]		**36**
Viewing a Wider World (from other major): [1]		**6**
These courses do not satisfy this requirement: (FREN 365V, LING 302V, SPAN 364V, SPAN 365V)		
Departmental/College Requirements		
SPAN 316	Grammar for Non-Native Speakers of Spanish	3
or SPAN 318	Grammar for Heritage/Native Speakers of Spanish	
SPAN 317	Composition for Non-Native Speakers of Spanish	3
or SPAN 319	Composition for Heritage/Native Speakers of Spanish	
SPAN 340	Introduction to Spanish Linguistics	3
SPAN 380	Introduction to Hispanic Literature	3
SPAN Upper-Division Electives [3]		12
Electives (to bring the total credits to 120) [4]		**54**
Total Credits		**120**

1 General Education and Viewing a Wider World requirements are solidified by completing the requirements for the other major in a different department, as part of the double major program.

2 Entrance into the Spanish sequence is determined by placement; some courses may not be needed if a student is placed into a higher level.

3 SPAN 364V Culture and Civilization of Mexico and **SPAN 365V Culture and Civilization of Spanish America** will not count toward the double major.

4 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I (C- or better)	4
MATH 1130G	Survey of Mathematics (C- or better) [1]	3
SPAN 1110	Spanish I (For students who need to complete the lower-division sequence for prereqs.)	
Elective Courses or UNIV 150 [2]		6
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	

HNRS 2175G	Introduction to Communication Honors	
Area V: Humanities Course [3]		3
LING 2110G	Introduction to the Study of Language and Linguistics (C- or better) [4]	3
Recommended continuation of the SPAN 1110, 1120, 2110, 2120 for students needing placement adjustments		
Elective Courses [2]		8
	Credits	**30**
Sophomore		
Select one from the following:		3
ENGL 2210G	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Area III: Laboratory Science Course [3]		4
Area VI: Creative and Fine Arts Course [3]		3
Second Language: Placement Level or HS Waiver (C- or better) [4]		3-4
Recommended continuation of the SPAN 1110, 1120, 2110, 2120 for students needing placement adjustments		
Second Language: Continued Sequence if no HS Waiver (C- or better) [4]		3-4
General Education Elective Course [3]		3
Select either an Area III/IV: Laboratory Sciences or Social/Behavioral Sciences Course [3]		3-4
Elective Course [2]		8
	Credits	**30-33**
Junior		
Second Language: Continued Sequence if no HS Waiver (C- or better) [4]		6
SPAN 316 or SPAN 318	Grammar for Non-Native Speakers of Spanish [6,8] or Grammar for Heritage/Native Speakers of Spanish	3
SPAN 317 or SPAN 319	Composition for Non-Native Speakers of Spanish [7,8] or Composition for Heritage/Native Speakers of Spanish	3
SPAN 340 or SPAN 380	Introduction to Spanish Linguistics (C- or better) [8,9] or Introduction to Hispanic Literature	3
SPAN 380 or SPAN 340	Introduction to Hispanic Literature (C- or better) [8,9] or Introduction to Spanish Linguistics	3
VWW- Viewing a Wider World Courses [5]		6
Elective Course (Upper Division) [2]		3
Elective Courses [2]		3
	Credits	**30**
Senior		
Upper-Division Spanish Electives		6
SPAN Electives - SPAN 300-level or higher (C- or better) [8]		6
Elective Courses (Upper Division) [2]		15
Elective Courses [2]		3
	Credits	**30**
	Total Credits	**120-123**

1 MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.

2 Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

3 See the General Education (p. 262) section of the catalog for a full list of courses

4 Students who double major in Languages with a concentration in French are not required to take LING 2110G or fulfill a second language requirement.

5 See the Viewing a Wider World (p. 266) section of the catalog to see a full list of courses, please note that FREN 365V, SPAN 364V and SPAN 365V do not fulfill this requirement.

6 Credit will not be given for both SPAN 316 and SPAN 318

7 Credit will not be given for both SPAN 317 and SPAN 319

8 A total of 24 credits of Upper-Division Spanish is required

9 Both SPAN 340 and SPAN 380 must be taken

Linguistics - Bachelor of Arts

Departmental Requirements

Single Major in Linguistics

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

The strong interdisciplinary nature of the major in Linguistics lends itself to combining with other programs. Students fulfilling the requirements for the major in Linguistics are encouraged to complete either a minor or an additional major to enhance their academic pursuits.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
English Composition - Level 2		
Select one from the following:		3
ENGL 2130G	Advanced Composition	3
ENGL 2210H	Professional and Technical Communication	3
ENGL 2210M	Professional and Technical Communication for Multilingual Students	3
ENGL 2215G	Advanced Technical and Professional Communication	3
ENGL 2210G	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1130G	Survey of Mathematics [1]	3
MATH 1220G	College Algebra	3

MATH 1250G	Trigonometry & Pre-Calculus	0,4
MATH 1350G	Introduction to Statistics	3
MATH 1430G	Applications of Calculus I	0,3
MATH 1511G	Calculus and Analytic Geometry I	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
MATH 2134G	Fundamentals of Elementary Math II	3
MATH 2350G	Statistical Methods	3
MATH 2530G	Calculus III	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
LING 2110G	Introduction to the Study of Language and Linguistics (requirement for major)	
Area III: Laboratory Sciences Course (4 credits) [2]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI. Creative and Fine Arts [2]		*3*
General Education Elective [2]		*3-4*
Viewing a Wider World [3]		**6**
These courses do not satisfy this requirement:		
(GRMN 333V, FREN 365V, LING 302V, SPAN 364V, SPAN 365V)		
Departmental/College Requirements		
Linguistics Sequence		
LING 302V	Language and Society	3
LING 303	Exploring Language Systems	3
Select from one of the following:		3
LING 405	Topics in Linguistics	
LING 425	Language and the Mind: Introduction to Psycholinguistics	
LING 451	Independent Studies in Linguistics	
LING 455	Research in Linguistics (Required for single majors)	3
Electives		
Select 12 credits from the following:		12
ANTH 320	Anthropological Linguistics	
BLED 4110	Second Language Acquisition	
CSCI 3730	Compilers and Automata Theory	
CSCI 3997	Independent Study	
CSCI 4580	Compilers and Automata Transition	
CSCI 4105	Programming Language Structure I	
CSCI 4996	Special Topics	
COMM 3120	Persuasion Theory and Practice	
COMM 3510	Organizational Communication	
COMM 3710	Communication and Culture	
COMM 3530	Conflict Management	
COMM 3610	Interpersonal Communication	
COMM 4520	Small Group Communication	
COMM 4210	Political Communication	
COMM 4220	Communication Technologies	
COMM 4230	Strategic Communication	
COMM 4620	Deception and Communication	
COMM 4630	Family Communication	
COMM 4640	Nonverbal Communication	
COMM 4530	Leadership Communication	
COMM 4310	Sports Communication	
COMM 4720	International Communication	
COMM 4730	Environmental Communication	
COMM 4750	Health Communication	
COMM 4997	Independent Study	
COMM 4996	Selected Topics	
COMM 4998	Communication Internship	
FREN 352	French Phonetics	
FREN 451	Special Topics in French	
GRMN 451	Special Topics in German	
GRMN 453	Independent Studies in German	
LING 405	Topics in Linguistics	
LING 451	Independent Studies in Linguistics	
PHIL 312	Formal Logic	
PHIL 315	Philosophy of Language	
PHIL 346	Philosophy of Mind	
PORT 453	Independent Luso-Brazilian Studies	
PSYC 401	Directed Readings	
SPAN 330	Variations in Spanish	
SPAN 340	Introduction to Spanish Linguistics	
SPAN 393	Introduction to Translation and Interpretation	
SPAN 399	Independent Studies in Literature, Language, or Culture	
SPAN 439	Topics in Applied Spanish Linguistics	
SPAN 461	Introduction to Spanish Phonetics	
SPAN 474	Pragmatics	
SPAN 476	Semantics	
SPAN 490	Special Topics	
SPAN 491	History of the Spanish Language	
SPAN 492	Structure of Spanish	
SPAN 493	Espanol de los Estados Unidos	
SPED 4340	Communication and Autism	
SPHS 4720	Anatomy and Physiology of Speech Mechanisms	
SPHS 4510	Phonetics	
SPHS 4620	Speech and Hearing Science	
SPHS 4710	Speech Disorders Across the Lifespan	
SPHS 4520	Audiology	
SPHS 4820	Neural Bases of Communication Disorders	
Second Language Requirement (required - see below)		**0-14**
Electives (to bring the total credits to 120) [4]		**43-58**
Total Credits		**155-163**

1. MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.
2. See the **General Education** Section of the catalog to view the full list of courses that can be selected to complete this requirement.
3. See the **Viewing a Wider World** Section of the catalog to view the full list of courses that can be selected to complete this requirement.
4. Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in Linguistics, there is a two-year second language requirement. The options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
French		
FREN 1110	French I	
& FREN 1120	and French II	
& FREN 2110	and French III	
& FREN 2120	and French IV	
German		
GRMN 1110	German I	
& GRMN 1120	and German II	
& GRMN 2110	and German III	
& GRMN 2120	and German IV	
Japanese		
JAPN 1110	Japanese I	
& JAPN 1120	and Japanese II	
& JAPN 2110	and Japanese III	
& JAPN 2120	and Japanese IV	
Portuguese		
PORT 1110	Portuguese I	
& PORT 1120	and Portuguese II	
Spanish		
For Non-heritage Speakers		
SPAN 1110	Spanish I	
& SPAN 1120	and Spanish II	
& SPAN 2110	and Spanish III	
& SPAN 2120	and Spanish IV	
For Heritage Speakers		
SPAN 1210	Elementary Spanish for Heritage Learners I	
& SPAN 1220	and Spanish for Heritage Learners II	
& SPAN 2210	and Spanish for Heritage Learners III	

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
SIGN 2110	American Sign Language III	3
Completing SIGN 2110 fulfills second language requirement (with a C- or better).		

Option 3:

Prefix	Title	Credits
Challenge one of the following courses:		
FREN 2120	French IV	3
or GRMN 2120	German IV	
or JAPN 2120	Japanese IV	
or PORT 1120	Portuguese II	
or SPAN 2120	Spanish IV	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native-American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

Double Major in Linguistics

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students who are completing a different major in a separate field of study can double major in Linguistics and this program may be serve students by completing this program as a double major. Double major students are required to complete the same course sequence as single majors in Linguistics except that there is no requirement to take LING 455 Research in Linguistics or similar Linguistics course with a research component, rather this is an option for double majors in Linguistics. At least 3 elective credits must be at the 400 level. No more than 6 credits may be from the department where the student is obtaining his/her major.

A Suggested Plan of Study for Students

This roadmap assumes student placement in ENGL 1110G Composition I and MATH 1130G Survey of Mathematics. The contents and order of this roadmap may vary depending on initial student placement in English and Mathematics. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G	Composition I	4
or ENGL 1110H	or Composition I Honors	
MATH 1130G	Survey of Mathematics [1]	3

Second Language: Placement Level or HS Waiver (C- or better) [4]		3-4
Area 1: Communications		3
Select one from the following:		
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
LING 2110G	Introduction to the Study of Language and Linguistics [4]	3
Continued Language Sequence (C- or better)		3-4
Area V: Humanitites Course [3]		3
Elective Courses [2]		8
	Credits	**30-32**
Sophomore		
Select one from the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Area III: Laboratory Science Course [3]		4
Area VI: Creative and Fine Arts Course [3]		3
Continued Language sequence (or al elective if the sequence is completed (C- or better)		6
Select one from the following:		3
LING 405	Topics in Linguistics	
LING 425	Language and the Mind: Introduction to Psycholinguistics	
LING 451	Independent Studies in Linguistics	
General Education Elective Course [3]		3
Select either an Area III/IV: Laboratory Sciences or Social/Behavioral Sciences Course [3]		3-4
LING 302V	Language and Society	3
Elective Courses [2]		2
	Credits	**30-31**
Junior		
Viewing a Wider World Courses [3]		6
LING 303	Exploring Language Systems	3
Linguistics Elective Courses (select from list)		9
Elective Course (Upper Division) [2]		6
Elective Courses [2]		6
	Credits	**30**
Senior		
Linguistics Elective Courses (select from list)		6
LING 455	Research in Linguistics	3
Elective Course (Upper-Division) [2]		18
Elective Courses [2]		3
	Credits	**30**
	Total Credits	**120-123**

1 MATH 1130G Survey of Mathematics is required for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.

2 Elective credit may vary based on second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

3 See the General Education section of the catalog for a full list of courses.

4 See the Viewing a Wider World section of the catalog to see a full list of courses. Please note that FREN 365V, SPAN 364V and SPAN 365V do not fulfill this requirement.

East Asian Studies - Undergraduate Minor

Prefix	Title	Credits
Language Proficiency		**6**
All Students must reach a second-year proficiency in Japanese or Chinese. completion of JAPN 2120 or higher will satisfy that requirement. The minimum of 6 credits in language is taken from the below-listed coures:		
CHIN 311	Advanced Chinese Language I	
CHIN 312	Advanced Chinese Language II	
JAPN 2110	Japanese III	
JAPN 2120	Japanese IV	
JPNS 320	Oral Practicum in Japanese	
JPNS 453	Independent Studies in Japanese	
Cultural, Professional Courses		**12**
The remaining 12 credits can be completed in at least two of the following departments.		
At least 9 credits of those credits from the following and no more than 3 credits from the Non-Asian Studies courses.		
ANTH 307V	Japanese Culture and Society: Anthropological Perspectives	
ARTH 311	Art of China I: Neolithic to Song Dynasty	
ARTH 312	Art of China II: Song Dynasty to Today	
GNDR 474	Gender in East Asian History	
HIST 2250G	East Asia to 1600	
HIST 2251G	East Asia since 1600	
HIST 321V	History of Korea	
HIST 323	Cultural History of Later Imperial China	
HIST 404	Special Topics in Asian History	
HIST 471	China through the Ming Dynasty	
HIST 472	China in the Modern World	
HIST 473	History of Japan	
HIST 474	Gender in East Asian History	
HNRS 2141G	Bamboo and Silk: The Fabric of Chinese Literature	
HNRS 390V	Worlds of Buddhism	
Non-Asian Studies courses		
COMM 3710	Communication and Culture	
COMM 4720	International Communication	
I B 398	International Business and Economic Environments	
POLS 360	International Relations Theory	
Total Credits		**18**

French - Undergraduate Minor

Students must pass at least 18 credits of FREN courses of which at least 12 credits are upper division. Students may not count FREN 1110 French I or FREN 1120 French II, but may count FREN 2110 French III and/or

FREN 2120 French IV. A student whose primary language for a Bachelor of Arts in Languages is French may not also earn a minor in French.

Prefix	Title	Credits
Required Courses		
Select at least 18 credits of FREN courses of which at least 12 credits are upper division		18
Total Credits		**18**

German - Undergraduate Minor

Students must pass at least 18 credits of German (GRMN) courses of which at least 12 credits are upper division. Students may not count GRMN 1110 German I or GRMN 1120 German II, but may count GRMN 2110 German III and/or GRMN 2120 German IV. A student whose primary language for a Bachelor of Arts in Languages is German may not also earn a minor in German.

Prefix	Title	Credits
Required Courses		
Select at least 18 credits of GRMN courses of which at least 12 credits are upper division		18
Total Credits		**18**

International Studies - Undergraduate Minor

A minor in International Studies consists of 18 credit hours of approved interdisciplinary course work of which at least 12 are upper division (300/3000 level or above). No more than 3 credits of Independent Study may be applied to the minor and only 2 courses (6 credits) may be double counted with the course of the student's major(s). Students must maintain a minimum 2.5 GPA.

Prefix	Title	Credits
Required Coursework		
Other courses, than those listed below, may be substituted if approved by advisor and Dept of Languages and Linguistics.		
Introductory Course:		
ANTH 1140G	Introduction to Cultural Anthropology	3
or HNRS 2165G	Introduction to Humanities in the 21st Century	
International Experience:		
Faculty led programs or semester abroad.		
ARSC 3130	Faculty Led International Travel	3
Culture/Arts/Humanities:		
Choose one from the following:		3
ANTH 330V	Magic Witchcraft and Religion	
ANTH 360V	Food and Culture Around the World	
COMM 3710	Communication and Culture	
COMM 4720	International Communication	
ENGL 2650G	World Literature I	
FREN 378	Studies in Francophone Cultures	
FREN 478	Studies in Francophone Cultures Around the World	
GNDR 2120G	Representing Women Across Cultures	
GRMN 350	Introduction to German Literature	
PHIL 332	Ethics and Global Poverty	
SOCI 4240V	Comparative Global Family Systems	
SOCI 4460	Globalization	
SPAN 380	Introduction to Hispanic Literature	
SPAN 451	Hispanic Cultures	
GNDR 401	Women & Immigration	
GNDR 402	Transnational Feminisms	
GNDR 454	Women Crossing Borders	
History/Geography:		
Choose one from the following:		3
GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
GEOG 363V	Culture, Nature, and the Environment	
HIST 1130G	World History I	
HIST 1140G	World History II	
HIST 2250G	East Asia to 1600	
or HIST 2251G	East Asia since 1600	
HIST 2245G	Islamic Civilizations to 1800	
HIST 474	Gender in East Asian History	
Government/Politics/Economics:		
Choose one from the following:		3
ECON 324V	Developing Nations	
FREN 330	Business French	
I B 317	International Marketing	
I B 398	International Business and Economic Environments	
I B 450	International Economics	
I B 475	International Managerial Finance	
MGMT 458	International Business Management	
MKTG 317	International Marketing	
POLS 2120G	International Relations	
POLS 313	Model United Nations	
POLS 335	Management of Nonprofit Organizations	
POLS 360	World Politics	
POLS 361	World Politics	
POLS 362	International Political Economy	
POLS 366	American Foreign Policy	
POLS 396	International Law	
POLS 469	Globalization	
Health/Education/Environment:		
Choose one from the following:		3
AEEC 3110V	World Agriculture and Food Problems	
ANSC 351V	Agricultural Animals of the World	
ANTH 360V	Food and Culture Around the World	
AXED 4110	Management of Change, Diffusion, and Adoption of Innovations	
ECON 337V	Natural Resource Economics	
EDUC 3120	Multicultural Education	
FWCE 1110G	Introduction to Natural Resources Management	
POLS 335	Management of Nonprofit Organizations	
PHLS 3130V	Global Environmental Health Issues	
PHLS 3210	Foundations of Community Health Education	
PHLS 4630	International Health Problems	
SOCI 4240V	Comparative Global Family Systems	
Total Credits		**18**

Linguistics - Undergraduate Minor

The department offers a minor in linguisitics.

Prefix	Title	Credits
Required Courses		
LING 2110G	Introduction to the Study of Language and Linguistics	3
Select two from the following:		6
LING 302V	Language and Society	
LING 303	Exploring Language Systems	
LING 405	Topics in Linguistics	
LING 425	Language and the Mind: Introduction to Psycholinguistics	
LING 451	Independent Studies in Linguistics	
LING 455	Research in Linguistics	
Select 9 credits with the help of an advisor from related fields [1]		9
Total Credits		**18**

[1] See list of electives for the supplementary major in Linguistics.

Spanish - Undergraduate Minor

Students must pass at least 18 credits of Spanish (SPAN) courses of which at least 12 credits are at either the 300 or 400 level. Students may not count SPAN 1110 Spanish I, SPAN 1120 Spanish II and SPAN 1210 Elementary Spanish for Heritage Learners I, but may count SPAN 2110 Spanish III and/or SPAN 2120 Spanish IV or SPAN 1220 Spanish for Heritage Learners II and/or SPAN 2210 Spanish for Heritage Learners III. A student whose primary language for a Bachelor of Arts in Languages is Spanish may not also earn a minor in Spanish.

Prefix	Title	Credits
Required Courses		
SPAN 316	Grammar for Non-Native Speakers of Spanish	3
or SPAN 318	Grammar for Heritage/Native Speakers of Spanish	
SPAN 317	Composition for Non-Native Speakers of Spanish	3
or SPAN 319	Composition for Heritage/Native Speakers of Spanish	
Electives		
Additional 12 SPAN credits of which at least 6-credits are upper-division [1]		12
Total Credits		**18**

[1] SPAN 364V Culture and Civilization of Mexico and SPAN 365V Culture and Civilization of Spanish America do not count for a minor in Spanish as they are taught in English.

Latin American Studies - Supplemental Major

This program consists of 24 credits drawn from the lists below of which 18 credits must be numbered 300 or above. In addition, students must satisfy the College of Arts and Sciences Second Language Requirement.

Options

There are two options based on the section chosen by the student:

Option 1

Concentration in Latin American Language, Culture and Literature (Spanish or Portuguese):

- 12 credits from Section 1
- 12 credits from Section 2, *(Note: No more than 6 credits may be taken in a single department)*

Option 2

Concentration in one major (e.g., history, government, economics, health science, anthropology, sociology) included in Latin American Social Sciences and Art:

- 12 credits in the chosen area of Section 2
- 6 credits from another area (or areas) of Section 2
- 6 credits from Section 1

Both options require that the student take at least two Spanish or Portuguese courses above 300-level.

Section 1: Latin American Language, Culture and Literature

Only 3 credits will count.

Prefix	Title	Credits
Spanish/Portuguese Language		
Select one from the following:		3
SPAN 325	Advanced Conversation	
SPAN 327	Spanish in the Community	
PHLS 4610	Health Disparities: Determinants and Interventions	
Culture		
SPAN 305	Topics in Hispanic Civilization	3
SPAN 306	Special Topics	3
SPAN 491	History of the Spanish Language	3
Literature		
SPAN 388	Contemporary Hispanic Literature	3

Section 2: Latin American Social Sciences and Art

Prefix	Title	Credits
Course List		
ANTH 306V	Peoples of Latin America	3
ANTH 312	The Ancient Maya	3
ANTH 313V	Ancient Mexico	3
ARTH 344	Gender, Sexuality, and Art in the Americas	3
ECON 324V	Developing Nations	3
GEOG 328V	Environment and Society of Latin America	3
POLS 371	Latin American Politics	3
POLS 378	U.S.-Mexico Border Politics	3
POLS 379	Mexican Politics	3
HIST 331	Rebels, Guerrillas, and Terrorists in Modern Latin America	3
HIST 387	Spain in the New World: Conquest, Conflict, and Cultural Exchange	3
PHLS 4630	International Health Problems	3
PHLS 4660	U.S.-Mexico Border Health Issues	3
PORT 453	Independent Luso-Brazilian Studies	1-3
SOCI 3310V	Social Issues in the Rural Americas	3
SPAN 364V	Culture and Civilization of Mexico	3
SPAN 365V	Culture and Civilization of Spanish America	3

SPAN 412	Spanish-American Poetry	3
SPAN 418	Spanish-American Short Story	3
SPAN 419	Spanish American Drama	3
SPAN 421	New Mexico Culture and Literature	3
SPAN 422	Cultural Production of Hispanic Revolutions and Wars	3
SPAN 424	Post-Modern Hispanic Literature	3
SPAN 426	Spanish-American Novel	3
SPAN 447	Hispanic Film	3

In both sections, independent studies, honors or special topics courses may be chosen with the approval of the Supplementary Major in Latin American Studies advisor, the head of the Department of Languages and Linguistics, and the College of Arts and Sciences. As departments add new courses they may be included in the program.

Chicano Studies - Supplemental Major

This program consists of 24 credits from the lists below.

Prefix	Title	Credits
Core Requirements		
Select three from the following:		9
SPAN 327	Spanish in the Community	
SPAN 448	U.S.-Hispanic Film	
SOCI 4420	Sociology of Latinos/as in the United States	
SPAN 350	Introduction to Chicano Studies	
Culture and Literature		
Select two from the following:		6
ENGL 339V	Chicana/o Literature	
ENGL 394V	Southwestern Literature	
ENGL 458	Latino/a Literature and Culture	
SPAN 361	US-Mexico Border Culture & Literature	
SPAN 385	Introduction to Chicano/US-Mexican Literature	
SPAN 427	Chicano Literature	
SPAN 451	Hispanic Cultures	
Applicable upper-division honors courses		
Applicable upper-division “special topics” courses		
Social Studies		
Select 6 credits from the following:		6
CJUS 414	Race, Crime and Justice	
POLS 378	U.S.-Mexico Border Politics	
POLS 399	New Mexico Law	
HIST 400	Special Topics	
SOCI 3410	Race and Ethnic Relations	
SPAN 361	US-Mexico Border Culture & Literature	
SPAN 493	Espanol de los Estados Unidos	
Applicable upper-division honors courses		
Applicable upper-division “special topics” courses		
Electives		
Select one from the following:		3
ANTH 313V	Ancient Mexico	
CEPY 5130	Multicultural Counseling	
EDUC 3120	Multicultural Education	
ENGL 394V	Southwestern Literature	
GEOG 325V	New Mexico and the American West	
POLS 399	New Mexico Law	
HIST 483	Historic Preservation	
PHLS 4660	U.S.-Mexico Border Health Issues	
GNDR 454	Women Crossing Borders	
Total Credits		**24**

[1] Only with prior written permission of instructor, department head and course dean.

Independent study, honors or special topics courses may be chosen with the approval of the advisor for Supplementary Majors in Chicano Studies, the head of the Department of Languages and Linguistics, and the College of Arts and Sciences. As departments add new courses they may be included in the program.

Linguistics - Supplemental Major

This program consists of 24 credits drawn from the lists below. In addition, students must satisfy the College of Arts and Sciences Second Language Requirement.

Prefix	Title	Credits
Core Requirements		
LING 2110G	Introduction to the Study of Language and Linguistics	3
LING 302V	Language and Society	3
LING 303	Exploring Language Systems	3
One additional LING course to be selected from the following:		**3**
LING 405	Topics in Linguistics	
LING 425	Language and the Mind: Introduction to Psycholinguistics	
LING 455	Research in Linguistics	
Electives		
Select 12 credits from the following: [1]		12
ANTH 320	Anthropological Linguistics	
BLED 4110	Second Language Acquisition	
CSCI 3730	Compilers and Automata Theory	
CSCI 3997	Independent Study [2]	
CSCI 4580	Compilers and Automata Transition	
CSCI 4105	Programming Language Structure I	
CSCI 4996	Special Topics [2]	
COMM 3110	Communication Theory and Discovery	
COMM 3120	Persuasion Theory and Practice	
COMM 3510	Organizational Communication	
COMM 3710	Communication and Culture	
COMM 3530	Conflict Management	
COMM 3610	Interpersonal Communication	
COMM 4520	Small Group Communication	
COMM 4210	Political Communication	
COMM 4220	Communication Technologies	
COMM 4230	Strategic Communication	
COMM 4620	Deception and Communication	
COMM 4630	Family Communication	
COMM 4640	Nonverbal Communication	
COMM 4310	Sports Communication	
COMM 4730	Environmental Communication	
COMM 4998	Communication Internship	
COMM 4720	International Communication	
COMM 4750	Health Communication	

COMM 4996	Selected Topics
COMM 4997	Independent Study
FREN 352	French Phonetics
FREN 451	Special Topics in French
GRMN 451	Special Topics in German
GRMN 453	Independent Studies in German
LING 451	Independent Studies in Linguistics [2]
PHIL 312	Formal Logic
PHIL 315	Philosophy of Language
PHIL 346	Philosophy of Mind
PORT 453	Independent Luso-Brazilian Studies [2]
PSYC 401	Directed Readings
SPAN 340	Introduction to Spanish Linguistics
SPAN 439	Topics in Applied Spanish Linguistics
SPAN 461	Introduction to Spanish Phonetics
SPAN 491	History of the Spanish Language
SPAN 492	Structure of Spanish
SPAN 493	Espanol de los Estados Unidos
SPED 4340	Communication and Autism
SPHS 4510	Phonetics
SPHS 4520	Audiology
SPHS 4610	Language Acquisition
SPHS 4620	Speech and Hearing Science
SPHS 4710	Speech Disorders Across the Lifespan
SPHS 4720	Anatomy and Physiology of Speech Mechanisms
SPHS 4820	Neural Bases of Communication Disorders
Total Credits	**24**

[1] At least 3 hours must be at the 400/4000 level. No more than 6 hours may be from the department where the student is obtaining his/her major.

[2] All Independent Study, Special topic, or Directed Reading courses must be approved by the Department of Languages and Linguistics to count toward Supplementary Major.

Mathematical Sciences

Undergraduate Program Information

In addition to meeting University and College requirements, students earning a Bachelor of Science in Mathematics must fulfill the core departmental requirements and choose from one of six concentrations:

- General,
- Applied Mathematics,
- Actuarial Science and Insurance,
- Foundations,
- Secondary Mathematics Education or
- Probability and Statistics.

Students must earn a grade of C- or better in all departmental and nondepartmental courses for any degree in the Department of Mathematical Sciences.

Math Sequence Information and Recommendations

Some students may be able to bypass one or more courses in the calculus sequence MATH 1511G Calculus and Analytic Geometry I - MATH 1521G Calculus and Analytic Geometry II - MATH 2530G Calculus III. The calculus sequence, MATH 1531 Introduction to Higher Mathematics, and MATH 2415 Introduction to Linear Algebra provide knowledge that is basic to further work, and students are advised to complete them or their equivalent as early as possible.

Students planning to enter a graduate program in Mathematics should select the General Emphasis. In any case, such students are strongly advised to take both MATH 3110 Introduction to Modern Algebra and MATH 3120 Introduction to Analysis, since these courses are required by most programs, and should take as many as possible of the following courses

Prefix	Title	Credits
MATH 4340	Abstract Algebra I: Groups and Rings	3
MATH 4350	Advanced Linear Algebra	3
MATH 4360	Introduction to Real Analysis I	3
MATH 4365	Introduction to Real Analysis II	3

Graduate Program Information

The Department of Mathematical Sciences offers graduate instruction leading to the Master of Science degree, and Doctor of Philosophy degree. Possible areas of study are various topics in pure mathematics and applied mathematics, statistics and mathematics education. Students may also pursue an interdisciplinary program of study. Most graduate students in Mathematical Sciences are supported either through teaching assistantships, research assistantships, fellowships, or job opportunities at nearby teaching or research units.

For more information on our programs and facilities, and to learn more about the research interests of the faculty, please see our web site at https://math.nmsu.edu/, phone us at (575) 646-3901, or write to:

Graduate Secretary
Department of Mathematical Sciences
NMSU
Las Cruces, NM 88003-8001
Email: gradcomm@nmsu.edu

Students applying for regular admission to graduate study in mathematics are expected to have 24 credits of upper-division courses in mathematics and statistics, including three-credit proof based courses in modern analysis and in modern algebra. Students who do not meet these requirements may be admitted with deficiencies and allowed to complete the requirements at New Mexico State University.

Applications must be submitted online, see http://prospective.nmsu.edu/graduate/apply/ (http://admissions.nmsu.edu/apply/). The minimum application to be admitted as a regular graduate student in mathematics includes:

1. a completed Graduate School admission application
2. complete transcripts of all undergraduate and graduate work
3. application fee
4. three letters of recommendation from professors, employers, or others who are qualified to judge potential for graduate work in mathematics
5. a one-page statement of educational objectives

Although GRE subject test scores are not required for admission, applicants are encouraged to submit them, if available. The test scores

may be used to help allocate available teaching assistantships among entering students.

To ensure full consideration for admission, candidates should submit their applications by the following deadlines.

Application Deadlines-Domestic Applicants

Semester	Admission Only	Admission/Financial Aid
Fall	July 1	February 1
Spring/Summer	October 1	October 1

Application Deadlines-International Applicants

Semester	Admission Only	Admission/Financial Aid
Fall	February 1	February 1
Spring/Summer	October 1	October 1

Degrees for the Department

Bachelor Degree(s) & Supplemental Major(s)

- Applied Mathematics - Supplemental Major (p. 871)
- Mathematics (Actuarial Science and Insurance) - Bachelor of Science (p. 857)
- Mathematics (Applied Mathematics) - Bachelor of Science (p. 859)
- Mathematics (Computational Mathematics) - Bachelor of Science (p. 861)
- Mathematics (Foundations) - Bachelor of Science (p. 863)
- Mathematics (General Mathematics) - Bachelor of Science (p. 864)
- Mathematics (Physics) - Bachelor of Science (p. 866)
- Mathematics (Probability and Statistics) - Bachelor of Science (p. 867)
- Mathematics (Secondary Mathematics Education) - Bachelor of Science (p. 869)

Master Degree(s)

- Mathematics - Master of Science (p. 172)

Doctoral Degree(s)

- Mathematics - Doctor of Philosophy (p. 230)

Minors for the Department

- Mathematics - Undergraduate Minor (p. 871)
- Mathematics -Graduate Minor (p. 259)

Professor, John Harding, Department Head

Professors Ballyk, Bezhanishvili, DeBlassie, Fouli, Harding, Lakey, Olberding; ***Associate Professors*** Contreras, Tian; ***Assistant Professors*** Bhattacharya, Boyle, De Chenne, DiPasquale, Li, Oprisan, Shapirovskiy; ***College Associate Professors*** O'Rourke, Villaverde; ***College Assistant Professors*** Archuleta, Cruz Quinones, Hoang, Letterhos, Rocks; ***College Instructors*** Reece.

J. Harding Department Head, Ph.D. Ph.D. (McMaster)– applications of topological methods to ordered structures; M. Ballyk, Ph.D. (McMaster)– mathematical biology and ecology; G. Bezhanishvili, Ph.D. (Tokyo Institute of Technology)– topology, algebra, and categories in logic; P. Bhattacharya, Ph.D. (Indiana)– algebraic topology; K. Boyle, Ph.D. (Oregon)– topology; A. Contreras, Ph.D. (Indiana)– analysis and applied mathematics; D. DeBlassie, Ph.D. (MIT)– probability; A. De Chenne, Ph.D. (Oregon State)– mathematics education, combinatorial reasoning, computation education in mathematics; M. DiPasquale, Ph.D. (Illinois)– computational commutative algebra and algebraic geometry; L. Fouli, Ph.D. (Purdue)– commutative algebra; J. Lakey, Ph.D. (Maryland)– applied harmonic analysis; B. Li, Ph.D. (Waterloo)– functional analysis, operator theory and operator algebras; B. Olberding, Ph.D. (Wesleyan)– commutative algebra, valuation theory and module theory; A. Oprisan, Ph.D. (Texas–Arlington)– statistics, probability, and data science; I. Shapirovskiy*, Ph.D.* (IITP, Moscow, Russia) *– foundations; J. Tian, Ph.D. (California–Riverside)– applied mathematics, mathematical biology, and biostatistics.*

Mathematics Courses

MATH 1130G. Survey of Mathematics
3 Credits (3)
This course will develop students' ability to work with and interpret numerical data, to apply logical and symbolic analysis to a variety of problems, and/or to model phenomena with mathematical or logical reasoning. Topics include financial mathematics used in everyday life situations, statistics, and optional topics from a wide array of authentic contexts.
Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in CCDM 113 N or CCDM 114 N.
Learning Outcomes

1. Construct and analyze graphs and/or data sets: Gather and organize information; Understand the purpose and use of various graphical representations such as tables, line graphs, tilings, networks, bar graphs, etc.; Interpret results through graphs, lists, tables, sequences, etc.; Draw conclusions from data or various graphical representations.
2. Use and solve various kinds of equations: Understand the purpose of and use appropriate formulas within a mathematical application; Solve equations within a mathematical application; Check answers to problems and determine the reasonableness of results.
3. Understand and write mathematical explanations using appropriate definitions and symbols: Translate mathematical information into symbolic form; Define mathematical concepts in the student's own words; Use basic mathematical skills to solve problems.
4. Demonstrate problem solving skills within the context of mathematical applications; Show an understanding of a mathematical application both orally and in writing; Choose an effective strategy to solve a problem; Gather and organize relevant information for a given application.

MATH 1134. Fundamentals of Elementary Mathematics I
3 Credits (3)
Numbers and the four operations of arithmetic. Understanding and comparing multiple representations of numbers and operations, in particular how these representations build from whole numbers to integers to fractions and decimals. Applying properties of numbers and operations in contextual situations. Reasoning, communicating, and problem solving with numbers and operations. Applications to ratio, and connections with algebra. Taught primarily through student activities and investigations. Restricted to: EDUC,EPAR,E ED,ECED majors.
Prerequisite: C- or better in ENGL 1110G; adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1215.

Learning Outcomes

1. As future elementary teachers you will be teaching mathematics to children.
2. In order to teach a subject well you need not only to know the material that you will teach, but you need to know more than what you will teach, and know it well,in order to be able to answer questions, understand student reasoning, give alternate explanations when your students do not understand something, and be able to adjust to changes in the mathematical curriculum.
3. Furthermore, even if you hope to teach a given grade, you should be prepared to teach a variety of grades since what a person ends up teaching is often not what they planned to do.
4. We will explore ideas of arithmetic in a way to help you improve your mathematical ability, gain confidence in your ability, introduce to you different ideas and models, and to see a variety of mathematical activities that are appropriate for people of all ages.
5. Everything we study will be done with the aim of developing your ability to relate to the mathematics of elementary school and to help children develop mathematical understanding.

MATH 1215. Intermediate Algebra
3 Credits (3)
A study of linear and quadratic functions, and an introduction to polynomial, absolute value, rational, radical, exponential, and logarithmic functions. A development of strategies for solving single-variable equations and contextual problems.
Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in CCDM 113 N or CCDM 114 N.
Learning Outcomes

1. Students will build on their knowledge of linear and quadratic functions and will begin to build an understanding of absolute value, polynomial, rational, power, radical, exponential and logarithmic functions in the following contexts: Demonstrate appropriate use of basic function language and notation; Convert between equivalent forms of algebraic expressions; Solve single-variable equations of the types listed above; Interpret and communicate algebraic solutions graphically and numerically; Demonstrate contextual problem-solving skills that include setting up and solving problems, and interpreting solutions in context; Apply appropriate problem solving methods from among algebraic, graphical, and numerical.

MATH 1217. General Supplemental Instruction I
1 Credit (2P)
Collaborative workshop for students enrolled in Intermediate Algebra.
Corequisite: MATH 1215.
Learning Outcomes

1. Intermediate Algebra Workshop provides time for students to work on problems from Intermediate Algebra under the guidance of their instructor.

MATH 1220G. College Algebra
3 Credits (3)
The study of equations, functions and graphs, reviewing linear and quadratic functions, and concentrating on polynomial, rational, exponential and logarithmic functions. Emphasizes algebraic problem solving skills and graphical representation of functions.
Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1215.
Learning Outcomes

1. Use function notation; perform function arithmetic, including composition; find inverse functions.
2. Identify functions and their transformations given in algebraic, graphical, numerical, and verbal representations, and explain the connections between these representations.
3. Graph and interpret key feature of functions, e.g., intercepts, leading term, end behavior, asymptotes.
4. Solve equations algebraically to answer questions about graphs, and use graphs to estimate solutions to equations.
5. Solve contextual problems by identifying the appropriate type of function given the context and creating a formula based on the information given.
6. Communicate mathematical information using proper notation and verbal explanations.

MATH 1221. General Supplemental Instruction II
1 Credit (1+2P)
Collaborative workshop for students enrolled in College Algebra.
Corequisite: MATH 1220G.
Learning Outcomes

1. College Algebra Workshop provides time for students to work on problems from College Algebra under the guidance of their instructor.

MATH 1250G. Trigonometry & Pre-Calculus
4 Credits (3+2P)
Trigonometry & Pre-Calculus includes the study of functions in general with emphasis on the elementary functions: algebraic, exponential, logarithmic, trigonometric and inverse trigonometric functions. Topics include rates of change, limits, systems of equations, conic sections, sequences and series, trigonometric equations and identities, complex number, vectors, and applications.
Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1220G.
Learning Outcomes

1. (Trigonometry) Students will be able to define and evaluate the trigonometric functions as functions of angle in both degree and radian measure using the definitions in terms of x, y, and r; as the ratio of sides of a right triangle; using the unit circle; using reference angles, commonly used (0 o, 30 o, 45 o, 60 o, 90o) angles and using a calculator.
2. (Trigonometry) Students will be able to solve right triangles. They will be able to draw a sketch in an applied problem when necessary.
3. (Trigonometry) Students will be able to solve non-right triangles using the law of sines and the law of cosines.
4. (Trigonometry) Students will be able to prove trigonometric identities and apply addition and subtraction, doubleangle, half-angle and power reduction formulas.
5. (Trigonometry) Students will be able to graph the six trigonometric functions, their transformations and their inverses.
6. (Trigonometry) Students will be able to use algebraic methods, including the use of identities and inverses, to solve trigonometric equations and demonstrate connections to graphical and numerical representations of the solutions.
7. (Trigonometry) Students will be able to add and subtract vectors in two dimensions. They will be able to use the dot product to project one vector onto another and to determine the angle between two vectors. They will be able to solve a variety of word problems using vectors.

8. (Trigonometry) Students will be able to work with polar coordinates; this includes graphing in polar coordinates and transforming an equation with polar coordinates into one with rectangular coordinates, and vice versa.
9. (Trigonometry) Students will be to work with the trigonometric form of complex numbers, including using De Moivre's formula. 1
10. (Pre-Calculus) Functions: Reinforce recognizing a function from its graph and from its algebraic expression; Reinforce identification of a one-to-one function graphically and from its algebraic expression; Reinforce identification of inverse functions graphically and algebraically; Reinforce combining functions arithmetically and compositionally; Be able to calculate the average rate of change of a function using the difference quotient and depict it graphically; Be able to find a limiting value of a function and be able to identify and use the notation that describes this. 1
11. (Pre-Calculus) Graphing: Reinforce using key characteristics of functions to graph them; Be able to graph conic sections from their key characteristics such as foci, eccentricity and asymptotes; Be able to identify all functions mentioned from their graphs, describing their key aspects. 1
12. (Pre-Calculus) Solving: Exponential/Logarithmic equations using the rules of exponents and logarithms; Systems of linear equations by elimination; Non-linear systems algebraically and graphically. 1
13. (Pre-Calculus) Applications: Modeling with functions with an emphasis on exponential and logarithmic functions, growth and decay. 1
14. (Pre-Calculus) Sequences and series: Understand the concept and notation of a sequence; Understand the concept and notation of a series; Be able to find limits of basic sequences; Be able to find sums of basic series.

MATH 1350G. Introduction to Statistics
3 Credits (3)
This course discusses the fundamentals of descriptive and inferential statistics. Students will gain introductions to topics such as descriptive statistics, probability and basic probability models used in statistics, sampling and statistical inference, and techniques for the visual presentation of numerical data. These concepts will be illustrated by examples from a variety of fields.
Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1215 or higher.
Learning Outcomes
1. Explain the general concepts of statistics: Explain and evaluate statistics used in the real world (from a news article, research project, etc.); Use statistical vocabulary appropriately; Distinguish between descriptive and inferential statistics; Distinguish between qualitative and quantitative data; Distinguish between populations and samples, and parameters and statistics; Give examples of independent and dependent variables.
2. Presentation and description of data: Present data graphically using histograms, frequency curves and other statistical graphs; Interpret graphs of data, including histograms and shapes of distributions.
3. Summarize data using measures of central tendency and variation: Calculate and interpret the mean, median, and mode to describe data; Calculate and interpret range, variance, and standard deviation to describe data.
4. Present the concepts of probability: Interpret basic probabilities; Calculate probabilities using compound probability rules and the binomial distribution; Calculate probabilities using the standard normal distribution and relate them to areas under the curve; Determine if the binomial distribution can be approximated with the normal distribution; Describe the relationship between the sampling distribution and the population distribution; Use the central limit theorem to approximate the probability distribution and calculate probabilities.
5. Compute point and interval estimates: Determine the confidence interval for a parameter; Interpret the confidence level and margin of error; Determine whether a statistical technique is appropriate under stated conditions.
6. Perform hypothesis tests: Determine whether a statistical test is appropriate under stated conditions; Identify null and alternative hypothesis; Perform and interpret statistical tests (e.g. z-test, t-test, one-tailed and two-tailed, one-sample, two-sample) and determine whether data is statistically significant; State the conclusion of a hypothesis test; Interpret a p-value as compared to a significance level; Explain why a test can lead us to reject a null hypothesis, not accept one; Distinguish between Type I and Type II errors.
7. Analyze data using regression and correlation: Explain the difference between correlation and causation; Construct and interpret scatter plots; Calculate and interpret the linear correlation coefficient; Determine and use the equation of a least-squares regression line between two variables to make predictions; Interpret the meaning of the coefficient of determination.
8. Optional topics: Inter-quartile range, box-plots, stem-and-leaf plots; Combinations and permutations; The Poisson distribution; Statistical power; Chi-square; Analysis of variance.

MATH 1430G. Applications of Calculus I
3 Credits (2+2P)
An algebraic and graphical study of derivatives and integrals, with an emphasis on applications to business, social science, economics and the sciences.
Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1220G or higher.
Learning Outcomes
1. Find limits algebraically and graphically, and use limits to analyze continuity.
2. Find the derivative of a function by applying appropriate techniques (limit of the difference quotient, general derivative rules, product rule, quotient rule, chain rule, and higher order derivatives).
3. Perform implicit differentiation. Use implicit differentiation to solve related rate application problems.
4. Use the derivative to describe the rate of change and slope of a curve in general and at particular points. Compare and contrast average rates of change to instantaneous rates of change.
5. Find the maxima, minima, points of inflections, and determine concavity of a function by applying the first and second derivatives. Use these results to sketch graphs of functions and to solve optimization problems in context.
6. Find the antiderivative and indefinite integral functions to include integration by substitution. Apply the Fundamental Theorem of Calculus in computing definite integrals of functions.
7. Approximate the area under the curve using Riemann sums.
8. Use the integral to determine the area under a curve and to find the accumulated value of a function in context.
9. Solve contextual problems by identifying the appropriate type of function given the context, creating a formula based on the

information given, applying knowledge of algebra and calculus, and interpreting the results in context. 1
10. Communicate mathematical information using proper notation and verbal explanations.

MATH 1435. Applications of Calculus I
3 Credits (3)
Intuitive differential calculus with applications to engineering.
Prerequisite(s): C- or better in MATH 1250G.
Learning Outcomes
1. Find limits algebraically and graphically, and use limits to analyze continuity.
2. Find the derivative of a function by applying appropriate techniques (limit of the difference quotient, general derivative rules, product rule, quotient rule, chain rule, and higher order derivatives).
3. Learn derivative rules for polynomial, exponential, logarithmic, trigonometric and inverse trigonometric functions.
4. Perform implicit differentiation. Use implicit differentiation to solve related rate application problems.
5. Find the maxima, minima, points of inflections, and determine concavity of a function by applying the first and second derivatives. Use these results to sketch graphs of functions and to solve optimization problems in context.
6. Find partial derivatives and find maxima, minima in three dimensions.
7. Find the linear approximation of a function.
8. Find Maclaurin and Taylor series.
9. Find limits via L'Hospital's rule. 1
10. Communicate mathematical information using proper notation and verbal explanations.

MATH 1440. Applications of Calculus II
3 Credits (3)
Topics in this second course of Applications of Calculus include functions of several variables, techniques of integration, an introduction to basic differential equations, and other applications.
Prerequisites: C or better in MATH 1435 or in MATH 1521G, or in MATH 1521H.
Learning Outcomes
1. Find definite and indefinite integrals using integration by parts, integral tables, and numerical integration.
2. Analyze multivariable functions using partial derivatives and double integrals, and apply these techniques to applications such as optimization, least squares, and volumes.
3. Solve differential equations graphically, numerically, and algebraically using separation of variables, and apply differential equations in context.
4. Apply differentiation and integration to other areas, for example to Taylor polynomials and Taylor series, probability, trigonometric functions, etc.

MATH 1511G. Calculus and Analytic Geometry I
4 Credits (4)
Limits and continuity, theory and computation of derivatives, applications of derivatives, extreme values, critical points, derivative tests, L'Hopital's Rule.
Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1250G.
Learning Outcomes
1. The goals are to present the concepts of calculus, stressing techniques, applications, and problem solving, and emphasizing numerical aspects such as approximations and order of magnitude.
2. Overall, the goals are to illustrate the power of calculus as a tool for modeling situations arising in physics, science, engineering and other fields.
3. In fulfillment of these goals, this and later courses will stress topics such as polynomial approximation, setting up integrals, as well as the use of appropriate technology.

MATH 1511H. Calculus and Analytic Geometry I Honors
4 Credits (4)
Limits and continuity, theory and computation of derivatives, applications of derivatives, extreme values, critical points, derivative tests, L'Hopital's Rule. This is an Honors version of MATH 1511G. It is taught with MATH 1511G with differentiated assignments.
Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1250G or higher.
Learning Outcomes
1. The goals are to present the concepts of calculus, stressing techniques, applications, and problem solving, and emphasizing numerical aspects such as approximations and order of magnitude.
2. Overall, the goals are to illustrate the power of calculus as a tool for modeling situations arising in physics, science, engineering and other fields.
3. In fulfillment of these goals, this and later courses will stress topics such as polynomial approximation, setting up integrals, as well as the use of appropriate technology.
4. Gain a deeper understanding of the mathematics behind Limits and Derivatives and be able to use mathematical ideas (such as the Intermediate Value Theorem, the Mean Value Theorem, and the Extreme Value Theorem) in applied contexts.

MATH 1521G. Calculus and Analytic Geometry II
4 Credits (4)
Riemann sums, the definite integral, antiderivatives, fundamental theorems, techniques of integration, applications of integrals, improper integrals, Taylor polynomials, sequences and series, power series and Taylor series.
Prerequisite: C- or better in MATH 1511G.
Learning Outcomes
1. Recognize the interplay between Riemann sums and definite integrals.
2. Use the Fundamental Theorem of Calculus to compute definite and indefinite integrals.
3. Demonstrate an understand of the relationship between the derivative and the definite integral.
4. Evaluate integrals numerically using standard rules (midpoint, trapezoid, Simpson's).
5. Evaluate integrals analytically using standard methods (substitution, integration by parts, trigonometric substitution and identities, inverse functions and partial fractions.
6. Use integration to solve problems in geometry, physics, science, engineering and other fields.
7. Use appropriate methods such as L'Hopital's Rule to evaluate improper integrals.
8. Approximate functions using Taylor polynomials.

9. Apply standard tests to determine convergence or divergence of sequences and series. 1
10. Find a power series representation for a function and determine where it converges. 1
11. Identify and evaluate first order differential equations.

MATH 1521H. Calculus and Analytic Geometry II Honors
4 Credits (4)
A more advanced treatment of the material of MATH 1521G with additional topics. Consent of Instructor required. Restricted to Las Cruces campus only.
Learning Outcomes
1. Recognize the interplay between Riemann sums and definite integrals.
2. Use the Fundamental Theorem of Calculus to compute definite and indefinite integrals.
3. Demonstrate an understand of the relationship between the derivative and the definite integral.
4. Evaluate integrals numerically using standard rules (midpoint, trapezoid, Simpson's).
5. Evaluate integrals analytically using standard methods (substitution, integration by parts, trigonometric substitution and identities, inverse functions and partial fractions.
6. Use integration to solve problems in geometry, physics, science, engineering and other fields.
7. Use appropriate methods such as L'Hopital's Rule to evaluate improper integrals.
8. Approximate functions using Taylor polynomials.
9. Apply standard tests to determine convergence or divergence of sequences and series. 1
10. Find a power series representation for a function and determine where it converges. 1
11. Identify and evaluate first order differential equations.

MATH 1531. Introduction to Higher Mathematics
3 Credits (3)
Logic; sets, relations, and functions; introduction to mathematical proofs.
Prerequisite(s): C- or better in MATH 1521G or MATH 1521H.
Learning Outcomes
1. The primary objective of this course is to serve as a bridge between the calculus courses you have taken, where the focus is on computations and solving problems, to more abstract mathematics courses.
2. In particular, we will discuss logical reasoning, definitions, proofs, and certain basic building blocks such as sets, functions, and relations.
3. By the end of the course, you should be able to understand and construct well-written proofs of basic mathematical arguments involving simple properties of the real numbers, integers, sets, functions, and relations using universal and existential quantifiers, absolute values and inequalities, modular arithmetic, and proof by induction.

MATH 1531H. Introduction to Higher Mathematics Honors
3 Credits (3)
Logic; sets, relations, and functions; introduction to mathematical proofs. A more advanced treatment of the material of MATH 1531 with additional topics and/or assignments. Consent of Instructor required. Restricted to Las Cruces campus only.
Prerequisite: C- or better in MATH 1521G or MATH 1521H.
Learning Outcomes
1. The primary objective of this course is to serve as a bridge between the calculus courses you have taken, where the focus is on computations and solving problems, to more abstract mathematics courses.
2. In particular, we will discuss logical reasoning, definitions, proofs, and certain basic building blocks such as sets, functions, and relations.
3. By the end of the course, you should be able to understand and construct well-written proofs of basic mathematical arguments involving simple properties of the real numbers, integers, sets, functions, and relations using universal and existential quantifiers, absolute values and inequalities, modular arithmetic, and proof by induction.
4. Since this is an honors course, you should be able to understand higher-level properties of the mathematical objects and ideas arising in the class. You should also be able to write, edit, revise, and ultimately construct well-written proofs and mathematical arguments.

MATH 1996. Topics in Mathematics
1-3 Credits
Topics to be announced in the Schedule of Classes. Maximum of 3 credits per semester. Total credit not to exceed 6 credits. Community Colleges only.
Prerequisite: consent of instructor.
Learning Outcomes
1. Varies

MATH 2134G. Fundamentals of Elementary Math II
3 Credits (3)
Geometry and measurement. Multiple approaches to solving problems and understanding concepts in geometry. Analyzing and constructing two- and three-dimensional shapes. Measurable attributes, including angle, length, area, and volume. Understanding and applying units and unit conversions. Transformations, congruence, and symmetry. Scale factor and similarity. Coordinate geometry and connections with algebra. Reasoning and communicating about geometric concepts. Taught primarily through student activities and investigations.
Prerequisite: C- or better in MATH 1134.
Learning Outcomes
1. The primary objectives are mathematical: to understand some of the basic concepts of geometry, and measurement with an appropriate level of rigor; to appreciate the historical, cultural and educational contributions and potential applications in real life situations; and to gain problem solving skills using these concepts.
2. The secondary goal is to appreciate the importance of this material in the elementary school curriculum.

MATH 2350G. Statistical Methods
3 Credits (3)
Exploratory data analysis. Introduction to probability, random variables and probability distributions. Concepts of Central Limit Theorem and Sampling Distributions such as sample mean and sample proportion. Estimation and hypothesis testing single population parameter for means and proportions and difference of two population parameters for means and proportions. Analysis categorical data for goodness of fit. Fitting simple linear regression model and inference for regression parameters. Analysis of variance for several population means. Techniques in data analysis using statistical packages.
Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1215 or higher.

Learning Outcomes

1. Summarize Data through graphs and Descriptive statistics: Define qualitative and quantitative data; Provide examples of a population, a sample, independent and dependent variables, parameters and statistics; Construct and interpret histograms, stem plots, bar charts, and boxplot; Summarize distributions with numerical measures such as mean, median, standard deviation, percentiles, interquartile range.
2. Present the concepts of probability: Explain related to probability axioms (e.g. mutually exclusive events and independent events); Apply applications of probability rules; Apply Conditional probability and Bayes Rule.
3. Distinguish between discrete and continuous random variables: Calculate probabilities using Binomial and Poisson distributions; Calculate probabilities using the standard normal distribution by finding the area underneath the curve.
4. Explain the Central Limit Theorem: Introduce the concept of a sampling distribution; Discuss the distribution of the sample mean and sample proportion under repeated sampling; Generate and interpret a sampling distribution using repeated sampling; Determine if the Binomial and Poisson distribution can be approximated with the normal distribution.
5. Estimate a population parameter: Determine confidence interval for population mean, proportion, difference of means, and difference of proportions; Interpret the confidence interval and margin of error; Explain the dependence of margin of error on sample size and confidence level.
6. Perform hypothesis tests for population parameters (population mean, proportion, difference of means, and difference of proportions); Describe the logic and framework of the inference of hypothesis testing; Make a decision using a p-value and draw an appropriate conclusion; Distinguish between Type I and Type II errors; Explain power of the test.
7. Perform Hypothesis Tests for Categorical data: Determine and analyze Chi-square test for Independence; Determine and analyze Chi-square test for Goodness of fit.
8. Analyze data using regression and correlation: Construct scatterplots and analyze the scatter plots; Calculate the linear correlation coefficient and determine whether a linear relationship exists between two variables; Fit the least-squares regression line between two variables; Predict the response variable from the regression line; Apply statistical inference to regression parameters.
9. Perform analysis of variance: State hypotheses for the test of several population means; Construct the AVOVA Table; Explain the significance of multiple comparisons. 1
10. Demonstrate the appropriate use of technology (e.g., Excel, an appropriate graphing calculator or other software (Minitab, SAS)

MATH 2415. Introduction to Linear Algebra
3 Credits (3)

Systems of equations, matrices, vector spaces and linear transformations. Applications to computer science.
Prerequisite(s): Grade of C- or better in MATH 1521G or MATH 1521H.
Learning Outcomes

1. Use row reduction and echelon forms of a matrix to solve linear systems of equations.
2. Use matrix operations, inverse matrices, and matrix factorizations to solve matrix equations.
3. Study the properties of vector spaces and subspaces (e.g., the null and column spaces of a matrix); linear transformations, isomorphisms and kernels; linear independence, bases, and dimension.
4. Apply appropriate matrix manipulations to perform a change of basis.
5. Understand determinants and their properties.
6. Find eigenvalues and eigenvectors and use them to diagonalize matrices.
7. Understand inner product spaces and apply them to real-world problems.

MATH 2530G. Calculus III
3 Credits (3)

Continuation of Calculus II including multivariate and vector calculus, level curves and surfaces, partial derivatives, gradient, directional derivatives, tangent planes, optimization, multiple integrals in Cartesian, cylindrical and spherical coordinate systems.
Prerequisite: Grade of C- or better in MATH 1521G or MATH 1521H.
Learning Outcomes

1. Use vector notation correctly.
2. Perform vector operations, including dot product, cross product, differentiation and integration, and demonstrate their geometric interpretations.
3. Perform operations on vector valued functions and functions of a parameter.
4. Identify and graph the equations of cylinders and quadratic surfaces in 3-dimensional space.
5. Determine the domain of continuity of a vector valued function and of a function of multiple variables.
6. Compute partial derivatives, generally and at a point, and sketch their graphical representation on a surface in space.
7. Recognize when the chain rule is needed when differentiating functions of multiple variables, parametric equations and vector valued functions, and be able to use the chain rule in these situations.
8. Compute curvature of a parameterized vector representation of a curve in 2- and 3-dimensional space and be able to explain its meaning.
9. Compute the unit tangent and unit normal vectors to a curve and be able to sketch them with the curve. 1
10. Computationally move among position vector, velocity vector, speed, and acceleration vectors; recognize and demonstrate their use as applied to motion in space. 1
11. Determine the equation of the tangent plane to a surface at a point. 1
12. Use the tangent plane to a surface to approximate values on the surface and estimate error in approximation using differentials 1
13. Compute directional derivatives and represent them graphically relative to the inherent surface. 1
14. Compute the gradient vector; represent it graphically relative to the inherent surface and use it to maximize or minimize rate of change of the function. 1
15. Locate local and global maxima and minima of a function. 1
16. Use Lagrange multipliers to maximize output with one or two constraints. 1
17. Compute arc length and be able to explain its derivation as a limit. 1
18. Calculate double and triple integrals independently and with their geometric representations as surfaces, areas and volumes. 1
19. Calculate iterated integrals in polar, cylindrical and spherical coordinate systems.

MATH 2992. Directed Study
1-3 Credits
May be repeated for a maximum of 6 credits. Graded S/U.
Prerequisite: consent of the instructor.
Learning Outcomes
1. Varies

MATH 3110. Introduction to Modern Algebra
3 Credits (3)
Elements of abstract algebra, including groups, rings and fields.
Prerequisite: C or better in MATH 1531 and MATH 2415.
Learning Outcomes
1. Varies.

MATH 3120. Introduction to Analysis
3 Credits (3)
Development of the real numbers, a rigorous treatment of sequences, limits, continuity, differentiation, and integration.
Prerequisite: C- or better in MATH 1531 or MATH 1531H.
Learning Outcomes
1. Understand the Axiom of Completeness and be able to work with suprema and infima.
2. Know the basic definitions of sequences and be able to understand and construct rigorous epsilon-N proofs.
3. Understand the properties of convergent sequences and be able to construct related proofs.
4. Know the basic definitions of limits and be able to understand and construct epsilon-delta proofs.
5. Be familiar with the basic properties and topology of the reals.

MATH 3130. Introduction to Geometry
3 Credits (3)
Building on ideas from high school geometry, an introduction to the axiomatic method, transformation groups, and non-Euclidean geometry.
Prerequisite: C- or better in MATH 1531 (or MATH 1531H) and MATH 2415.
Learning Outcomes
1. Demonstrate the ability to make conjectures in geometry, refine conjectures, and prove or refute conjectures.
2. Understand how transformations of the plane can be used to define and apply the concepts of congruence and similarity in Euclidean geometry.
3. Solve problems in geometry using different approaches (axioms, coordinates, transformations), and explain how the different approaches are related.
4. Compare the definitions and theorems of Euclidean geometry with the corresponding definitions and theorems in non-Euclidean geometry.

MATH 3140. Introduction to Numerical Methods
3 Credits (3)
Basic numerical methods for interpolation, approximation, locating zeros of functions and integration; numerical linear algebra. Computer-oriented methods will be emphasized. Student must also have some programming experience in order to enroll.
Prerequisite: C- or better in one of MATH 2415, M E 228, or E E 200.
Learning Outcomes
1. Understand the limitations, advantages, and disadvantages of common numerical methods and how they are used to obtain approximate solutions.
2. Apply numerical methods to obtain approximate solutions to mathematical problems.
3. Analyze and evaluate the accuracy of common numerical methods.
4. Write efficient, well-documented code to implement numerical methods.

MATH 3160. Introduction to Ordinary Differential Equations
3 Credits (3)
Introduction to differential equations and dynamical systems with emphasis on modeling and applications. Basic analytic, qualitative and numerical methods. Equilibria and bifurcations. Linear systems with matrix methods, real and complex solutions.
Prerequisite: C or better in MATH 1521G or MATH 1521H or B or better in MATH 1440.
Learning Outcomes
1. Solve basic linear and nonlinear linear first order equations using appropriate methods (both explicit and qualitative).
2. Model both linear and nonlinear physical entities such as population, income growth, mixing and cooling, as well as systems of physical entities such as predator/prey models and electric circuits.
3. Classify higher order equations as homogeneous/nonhomogeneous and linear/nonlinear.
4. Solve second order homogeneous and nonhomogeneous linear equations using appropriate techniques.
5. Solve differential equations using Laplace Transforms.
6. Solve systems of linear equations using basic matrix methods.

MATH 3997. Directed Readings
1-3 Credits
A selection of readings and reports in the mathematical sciences, the breadth and depth of which is deemed to fit the needs of the student. May be repeated up to 3 credits.
Prerequisite: consent of instructor.

MATH 400. Undergraduate Research
1-3 Credits
May be repeated for a maximum of 6 credits. Graded S/U.
Prerequisite: consent of faculty member.

MATH 4110V. Great Theorems in Mathematics
3 Credits (3)
This course examines some significant mathematical achievements from antiquity to the modern era. Evolution of notions and methods in geometry, number theory, algebra, and calculus will be supplemented by cultural and biographical history, placing mathematics in a broad human context.
Prerequisite: Grade of C- or higher in MATH 1531, or grade of B or higher in any upper-division math or stat course, or consent of instructor.
Learning Outcomes
1. At the end of this course, students will be able to: Describe the history of the development of some key mathematical concepts.
2. Describe the connections between mathematical ideas in different historical periods and places.
3. Recognize the role of abstraction and logic in the progress of mathematics.
4. Describe the contribution of mathematics to culture and science in different historical eras.
5. Determine if a mathematical conjecture is correct and provide rigorous written mathematical justification.

6. Provide sound, complete and clear mathematical arguments involving simple calculations, geometric constructions, and/or written mathematical proofs.
7. Communicate mathematical ideas, both written and orally.

MATH 4210. Complex Variables
3 Credits (3)
A first course in complex function theory, with emphasis on applications.
Prerequisite: C- or better in both MATH 3160 and MATH 2530G.
Learning Outcomes
1. Define analytic function, the Cauchy-Riemann equations, and harmonic functions.
2. Recognize elementary analytic functions such as the exponential function, trigonometric functions, and branches of the logarithmic function and their properties.
3. Understand mapping by elementary functions, linear fractional transformations, and powers.
4. Compute line integrals, making appropriate use of the Cauchy-Goursat Theorem, the Cauchy Integral Formula, and Morera's Theorem.
5. Relate complex power series (including Laurent series) to their singularities (removable singularities, poles, and essential singularities).
6. Evaluate improper integrals using the Residue Theorem.

MATH 4220. Fourier Series and Boundary Value Problems
3 Credits (3)
Fourier series and methods of solution of the boundary value problems of applied mathematics.
Prerequisite: C- or better in MATH 3160.
Learning Outcomes
1. Learn the standard boundary/initial value problems for the partial differential equations of mathematical physics: wave equation, heat equation, Laplace's equation and Poisson's equation.
2. Be able to use the method of separation of variables to solve the boundary/initial value problems.
3. In learning the method, understand orthogonal sets of functions, eigenvalues, eigenfunctions, Fourier series, generalized Fourier series.
4. Understand Fourier integrals, Fourier transforms and their applications.

MATH 4230. Applied Linear Algebra
3 Credits (3)
An application-driven course, whose topics may include the four fundamental subspaces, inner products, orthogonality, diagonalization, and complex matrices. Applications may include factorization, least squares, data compression, singular value decomposition, and discrete Fourier transform.
Prerequisite: C- or better in one of MATH 2415, E E 200, or M E 228.
Learning Outcomes
1. Understand higher-level linear algebra concepts for which matrix linear algebra is the basic tool.
2. Understand how to apply higher-level linear algebra concepts to problems that arise in real-world applications.

MATH 4310. Introduction to Topology
3 Credits (3)
Topological spaces: general spaces and specific examples such as metric spaces, Hausdorff spaces and/or normed vector spaces; separation axioms; continuity, compactness, connectedness; related theorems. Crosslisted with: MATH 5310.
Prerequisite: MATH 3120.

MATH 4320. Logic and Set Theory
3 Credits (3)
Propositional and first order logic; axioms, proofs, models. Semantic and syntactic consequence. Soundness, completeness, compactness, and Loewenheim –Skolem theorems. The Zermelo-Fraenkel axioms for set theory. Well orderings, ordinals, cardinals, the axiom of choice, and the von Neumann hierarchy.
Learning Outcomes
1. Define the fundamental notions of set theory (ordinals, cardinals) and apply transfinite induction/recursion to construct proofs.
2. Explain the Axiom of Choice and relate set-theoretic and logical techniques to topics in algebra and analysis.
3. Construct formal proofs in first-order logic and distinguish between semantic and syntactic consequence.
4. Prove the Completeness and Compactness theorems of first-order logic and apply metatheorems (Löwenheim–Skolem) to analyze formal theories and their models.

MATH 4330. Elementary Number Theory
3 Credits (3)
Covers primes, congruences and related topics.
Prerequisite: Grade of C or better in MATH 3110 or consent of instructor.

MATH 4340. Abstract Algebra I: Groups and Rings
3 Credits (3)
Group theory, including cyclic groups, homomorphisms, cosets, quotient groups and Lagrange's theorem. Introduction to rings: ring homomorphisms, ideals, quotient rings, polynomial rings, and principal ideal domains. Taught with MATH 5340.
Prerequisite(s): MATH 3110 or consent of instructor.

MATH 4350. Advanced Linear Algebra
3 Credits (3)
Rigorous treatment of vector spaces and linear transformations including canonical forms, spectral theory, inner product spaces and related topics.
Prerequisite: Grade of C or better in MATH 3110.
Learning Outcomes
1. Apply the fundamental properties of abstract vector spaces to solve algebraic problems.
2. Define and evaluate linear independence, bases, and dimension within abstract vector spaces.
3. Construct matrix representations for linear transformations between vector spaces.
4. Compute determinants, eigenvalues, and eigenvectors of linear operators.
5. Prove theorems regarding direct sums, kernels (null spaces), and ranges of linear transformations.
6. Apply the properties of adjoint operators to solve problems in inner product spaces.

MATH 4360. Introduction to Real Analysis I
3 Credits (3)
Rigorous discussion of the real numbers for topics introduced in calculus: limits and continuity, followed by differentiation, integration, and series of functions.
Prerequisite: Grade of C- or better in MATH 3120 or consent of instructor.
Learning Outcomes
1. Understand two-sided limits, one-sided limits, limits at infinity, continuity and uniform continuity for functions on the real line.

2. Understand derivatives, differentiability theorems, the Mean Value Theorem, Taylor's Theorem, L'hospital's Rule and the Inverse Function Theorem for functions on the real line.
3. Understand integration on the real line: the Riemann integral, Riemann sums, the Fundamental Theorem of Calculus and improper Riemann integrals.
4. Understand sequences and infinite series of functions, including uniform convergence, limit supremum, limit infimum, power series and analytic functions.

MATH 4365. Introduction to Real Analysis II
3 Credits (3)
Extension of the ideas of Math 4360 to higher dimensions and more general contexts (metric spaces, differentiability on higher dimensional Euclidean space, integration on higher dimensional Euclidean space).
Prerequisite: C- or better in MATH 4360 or consent of instructor.
Learning Outcomes
1. Understand the algebraic structure, including planes and linear transformations, of Euclidean spaces.
2. Understand the fundamental notions of metric spaces: limits of functions, interior/closure/boundary of sets, compact sets, connected sets, continuous functions and the Stone-Weierstrass Theorem.
3. Understand derivatives, differentials, tangent planes, the Chain Rule, the Mean Value Theorem, Taylor's Formula and the Inverse Function Theorem for functions on n-dimensional Euclidean space.
4. Apply the Ascoli Theorem for relative compactness of sets of continuous functions on a compact metric space.

MATH 454. Logic and Set Theory
3 Credits (3)
Propositional and first order logic; axioms, proofs, models. Semantic and syntactic consequence. Soundness, completeness, compactness, and Loewenheim –Skolem theorems. The Zermelo-Fraenkel axioms for set theory. Well orderings, ordinals, cardinals, the axiom of choice, and the von Neumann hierarchy. Crosslisted with: MATH 524.
Prerequisite(s): C- or better in MATH 331 or MATH 332, or consent of instructor.

MATH 455. Elementary Number Theory
3 Credits (3)
Covers primes, congruences and related topics.
Prerequisite: grade of C or better in MATH 331 or consent of instructor.

MATH 456. Abstract Algebra I: Groups and Rings
3 Credits (3)
Group theory, including cyclic groups, homomorphisms, cosets, quotient groups and Lagrange's theorem. Introduction to rings: ring homomorphisms, ideals, quotient rings, polynomial rings, and principal ideal domains. Crosslisted with: MATH 526.
Prerequisite(s): MATH 331 or consent of instructor.

MATH 491. Introduction to Real Analysis I
3 Credits (3)
Rigorous discussion of the real numbers for topics introduced in calculus: limits and continuity, followed by differentiation, integration, and series of functions.
Prerequisite: Grade of C- or better in MATH 332 or consent of instructor.
Learning Outcomes
1. Understand two-sided limits, one-sided limits, limits at infinity, continuity and uniform continuity for functions on the real line.
2. Understand derivatives, differentiability theorems, the Mean Value Theorem, Taylor's Theorem, L'hospital's Rule and the Inverse Function Theorem for functions on the real line.
3. Understand integration on the real line: the Riemann integral, Riemann sums, the Fundamental Theorem of Calculus and improper Riemann integrals.
4. Understand sequences and infinite series of functions, including uniform convergence, limit supremum, limit infimum, power series and analytic functions.

MATH 492. Introduction to Real Analysis II
3 Credits (3)
Extension of the ideas of Math 491 to higher dimensions and more general contexts (metric spaces, differentiability on higher dimensional Euclidean space, integration on higher dimensional Euclidean space).
Prerequisite: C- or better in MATH 491 or consent of instructor.
Learning Outcomes
1. Understand the algebraic structure, including planes and linear transformations, of Euclidean spaces.
2. Understand the fundamental notions of metric spaces: limits of functions, interior/closure/boundary of sets, compact sets, connected sets, continuous functions and the Stone-Weierstrass Theorem.
3. Understand derivatives, differentials, tangent planes, the Chain Rule, the Mean Value Theorem, Taylor's Formula and the Inverse Function Theorem for functions on n-dimensional Euclidean space.
4. Understand integration on n-dimensional Euclidean space: Jordan regions, Riemann integration on Jordan Regions, iterated integrals and change of variables.

MATH 498. Directed Reading
1-6 Credits
May be repeated for a maximum of 6 credits. Graded S/U.

MATH 4991. Undergraduate Research
1-3 Credits
May be repeated for a maximum of 6 credits. Graded S/U.

MATH 4996. Special Topics
1-3 Credits (1-3)
Specific subjects to be announced in the Schedule of Classes. May be used to fulfill a course requirement for the mathematics major. May be repeated up to 99 credits.
Learning Outcomes
1. Analyze concepts in the selected topic area.
2. Apply mathematical methods to solve complex problems within the topic area.
3. Communicate findings from the topic area in written and oral formats.

MATH 4997. Directed Reading
1-6 Credits
May be repeated for a maximum of 6 credits. Graded S/U.

MATH 5110. Fundamentals of Elementary Mathematics I
3 Credits (3+1P)
Topics from real numbers, geometry, measurement, and algorithms, incorporating calculator technology. Intended for K-8 teachers. As part of course students mentor MATH 1134 undergraduates. Does not fulfill degree requirements for M.S. in mathematics.

MATH 512. Fundamentals of Elementary Mathematics II
3 Credits (3+1P)

Real numbers, geometry, and statistics, incorporating calculator technology. Intended for K-8 teachers. Students serve as mentors to MATH 2134G undergraduates. Does not fulfill degree requirements for M.S. in mathematics.

MATH 5120. History and Theories of Mathematics Education
3 Credits (3)
A study of the history of the mathematics taught in American schools, including an examination of authentic original textbooks and the changes in their content and the approach to the subject over time, together with writings of people who have influenced the development and changes of mathematics education. Theories of learning mathematics, and current issues in mathematics education.
Prerequisite(s): Restricted to graduate students.

MATH 5130. Algebra with Connections
3 Credits (3)
Connections between Algebra and other K-12 curriculum strands, especially Geometry and Probability / Data Analysis. Apply algebraic modeling and reasoning to a variety of mathematical problem solving situations. Does not fulfill requirements for degrees in mathematics.
Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 5140. From Number to Algebra
3 Credits (3)
The progression from Number to Algebra in the K-12 curriculum as a concrete-to-abstract progression. Key concepts considered across the grade levels include the different uses of variables, equivalence in different contexts, patterns, and ratios. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.
Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 5150. Data Analysis with Applications
3 Credits (3)
Statistical concepts and terminology in professional uses of data by teachers, such as standardized test score reports and educational research; visual displays of data; measures of variation and central tendency; consideration of how K-12 topics in Data Analysis are developed from one grade level to the next. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.
Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 5160. From Measurement to Geometry
3 Credits (3)
The progression from Measurement to Geometry in the K-12 curriculum as a concrete-to abstract progression. Important concepts such as angle, length, and area progress from concrete, measurable situations to more abstract problems which require reasoning and proof. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.
Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 517. Complex Variables
3 Credits (3)
Same as MATH 471 with additional work for graduate students.

MATH 5170. Using Number Throughout the Curriculum
3 Credits (3)
Understand number concepts more deeply by seeing many examples of those concepts applied in other content strands. Develop mathematical knowledge and understanding to build a repertoire of ways for students to practice and review basic number skills and concepts as part of later, more advanced courses. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.
Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 518. Fourier Series and Boundary Value Problems
3 Credits (3)
Same as MATH 472 with additional work for graduate students.

MATH 5180. Geometry with Connections
3 Credits (3)
Connections between Geometry and other K-12 curriculum strands, especially Algebra and Probability / Data Analysis. Address key attributes of geometric concepts by considering their connections within and across grade levels. Does not fulfill requirements for degrees in mathematics.
Prerequisite: Admittance into the MC2-LIFT program.

MATH 5210. Complex Variables
3 Credits (3)
Same as MATH 4210 with additional work for graduate students.
Learning Outcomes
1. Define analytic function, the Cauchy-Riemann equations, and harmonic functions.
2. Recognize elementary analytic functions such as the exponential function, trigonometric functions, and branches of the logarithmic function and their properties.
3. Understand mapping by elementary functions, linear fractional transformations, and powers.
4. Compute line integrals, making appropriate use of the Cauchy-Goursat Theorem, the Cauchy Integral Formula, and Morera's Theorem.
5. Relate complex power series (including Laurent series) to their singularities (removable singularities, poles, and essential singularities).
6. Evaluate improper integrals using the Residue Theorem.

MATH 5220. Fourier Series and Boundary Value Problems
3 Credits (3)
Same as MATH 4220 with additional work for graduate students.
Learning Outcomes
1. Derive the partial differential equations of physics: wave equation, heat equation, Laplace's equation, and Poisson's equation, including boundary/initial values.
2. Use the method of separation of variables to solve the boundary/initial value problems.
3. Recognize the role of orthogonal sets of functions, eigenvalues, eigenfunctions, Fourier series, generalized Fourier series in the method of separation of variables.
4. Compute Fourier integrals and Fourier transforms, and apply them to physical problems.

MATH 527. Introduction to Real Analysis I
3 Credits (3)
Same as MATH 491 with additional work for graduate students.
Learning Outcomes
1. Understand two-sided limits, one-sided limits, limits at infinity, continuity and uniform continuity for functions on the real line.
2. Understand derivatives, differentiability theorems, the Mean Value Theorem, Taylor's Theorem, L'hospital's Rule and the Inverse Function Theorem for functions on the real line.
3. Understand integration on the real line: the Riemann integral, Riemann sums, the Fundamental Theorem of Calculus and improper Riemann integrals.
4. Understand sequences and infinite series of functions, including uniform convergence, limit supremum, limit infimum, power series and analytic functions.

MATH 528. Introduction to Real Analysis II
3 Credits (3)
Same as MATH 492 with additional work for graduate students.
Learning Outcomes
1. Understand the algebraic structure, including planes and linear transformations, of Euclidean spaces.
2. Understand the fundamental notions of metric spaces: limits of functions, interior/closure/boundary of sets, compact sets, connected sets, continuous functions and the Stone-Weierstrass Theorem.
3. Understand derivatives, differentials, tangent planes, the Chain Rule, the Mean Value Theorem, Taylor's Formula and the Inverse Function Theorem for functions on n-dimensional Euclidean space.
4. Understand integration on n-dimensional Euclidean space: Jordan regions, Riemann integration on Jordan Regions, iterated integrals and change of variables.

MATH 5310. Introduction to Topology
3 Credits (3)
Topological spaces: general spaces and specific examples such as metric spaces, Hausdorff spaces and/or normed vector spaces; separation axioms; continuity, compactness, connectedness; related theorems. Crosslisted with: MATH 4310.
Learning Outcomes
1. Define the topology induced from a total ordering or metric.
2. Construct new topological spaces by taking subspaces, products, and quotients.
3. Compare different topologies on the same set to determine which is finer.
4. Determine whether a function is continuous with respect to a particular topology.
5. Classify topological spaces based on fundamental properties (connectedness, compactness, Hausdorff).
6. Construct examples and counter-examples of topological spaces satisfying a given set of properties.

MATH 5320. Logic and Set Theory
3 Credits (3)
Same as MATH 4320 with additional assignments for graduate students.

MATH 5330. Elementary Number Theory
3 Credits (3)
Same as MATH 4330 with additional assignments for graduate students.
Learning Outcomes
1. Apply various properties of the integers to solve number theory problems.
2. Analyze the properties of number theoretic functions.
3. Construct proofs using the concept of a congruence.
4. Solve certain types of Diophantine equations using number theoretic methods.
5. Explain how number theory is related to and used in modern cryptography.

MATH 5340. Abstract Algebra I: Groups and Rings
3 Credits (3)
Same as MATH 4340 with additional work for graduate students. Taught with MATH 4340.
Prerequisite: MATH 5350 or consent of instructor.
Learning Outcomes
1. Apply the fundamental properties of groups to solve abstract algebra problems and analyze the structure of rings.
2. Construct subgroups and factor groups of given groups.
3. Prove key theorems related to cyclic groups, Sylow groups, and permutation groups.
4. Prove that certain algebraic structures are isomorphic using homomorphism properties.
5. Determine group structures based on analyzing information about their subgroups.

MATH 5350. Advanced Linear Algebra
3 Credits (3)
Same as MATH 4350 with additional work for graduate students.
Learning Outcomes
1. Apply the fundamental properties of abstract vector spaces to solve algebraic problems.
2. Define and evaluate linear independence, bases, and dimension within abstract vector spaces.
3. Construct matrix representations for linear transformations between vector spaces.
4. Compute determinants, eigenvalues, and eigenvectors of linear operators.
5. Prove theorems regarding direct sums, kernels (null spaces), and ranges of linear transformations.
6. Apply the properties of adjoint operators to solve problems in inner product spaces.

MATH 5360. Introduction to Real Analysis I
3 Credits (3)
Same as MATH 4360 with additional work for graduate students.
Learning Outcomes
1. Understand two-sided limits, one-sided limits, limits at infinity, continuity and uniform continuity for functions on the real line.
2. Understand derivatives, differentiability theorems, the Mean Value Theorem, Taylor's Theorem, L'hospital's Rule and the Inverse Function Theorem for functions on the real line.
3. Understand integration on the real line: the Riemann integral, Riemann sums, the Fundamental Theorem of Calculus and improper Riemann integrals.
4. Understand sequences and infinite series of functions, including uniform convergence, limit supremum, limit infimum, power series and analytic functions.

MATH 5365. Introduction to Real Analysis II
3 Credits (3)
Same as MATH 4365 with additional work for graduate students.
Learning Outcomes
1. Understand the algebraic structure, including planes and linear transformations, of Euclidean spaces.
2. Understand the fundamental notions of metric spaces: limits of functions, interior/closure/boundary of sets, compact sets, connected sets, continuous functions and the Stone-Weierstrass Theorem.
3. Understand derivatives, differentials, tangent planes, the Chain Rule, the Mean Value Theorem, Taylor's Formula and the Inverse Function Theorem for functions on n-dimensional Euclidean space.
4. Apply the Ascoli Theorem for relative compactness of sets of continuous functions on a compact metric space.

MATH 5410. Complex Analysis
3 Credits (3)

Rigorous treatment of complex differentiation and integration, properties of analytic functions, series and Cauchy's integral representations.
Prerequisite: MATH 3120.
Learning Outcomes
1. Analyze the definitions and properties of analytic functions (the Cauchy-Riemann equations, harmonic functions).
2. Explain and apply Cauchy's Integral Theorem/Formula, primitive functions, Liouville's Theorem and the Maximum Modulus Principle.
3. Construct Taylor/Laurent series, analyze their convergence, and (where applicable) classify isolated singularities (poles, essential).
4. Prove the Residue Theorem and use it to compute line integrals and improper real integrals.
5. Analyze such concepts as the Argument Principle, Rouche's Theorem, Jordan's Lemma, the Schwarz Lemma, and Montel's Theorem.

MATH 5420. Topology I
3 Credits (3)
Connectedness and compactness of topological spaces, introduction to the quotient topology, elementary homotopy theory, the fundamental group, the Seifert-van Kampen theorem.
Prerequisite(s): MATH 5350 and MATH 5365, or consent of instructor.
Learning Outcomes
1. Formulate explicit homotopies between functions and construct homotopy equivalences between topological spaces.
2. Construct standard examples of manifolds and CW-complexes.
3. Prove basic properties of the fundamental groups of topological spaces.
4. Calculate fundamental groups of topological spaces using the Van Kampen Theorem.
5. Construct the covering space corresponding to a particular subgroup.
6. Determine when a group action on a space is a deck transformation action and compute the corresponding base space.

MATH 5425. Topology II
3 Credits (3)
Covering spaces and their classification, singular homology, degree theory, Brouwer's fixed point theorem, CW-complexes and cellular homology, and other applications.
Prerequisite(s): MATH 5420 or consent of instructor.
Learning Outcomes
1. Define singular chain complexes and singular homology.
2. Prove basic properties such as functoriality and homotopy invariance of singular homology groups.
3. Define and calculate cellular homology groups of CW-complexes using degree theory.
4. Prove geometric theorems (Brouwer's Fixed-point Theorem) using properties of homology groups.
5. Calculate singular homology groups of CW-Complexes using the singular/cellular equivalence.

MATH 5428. Topics in Topology
3 Credits
Topics in modern topology. The material covered will reflect current research topics in the field and may vary each time the course is offered. To be taken up to 3 times. May be repeated up to 9 credits.
Learning Outcomes
1. Gain knowledge of advanced methods in the area of topology.
2. Develop potential to explore literature in the area of topology.
3. Develop potential to conduct supervised research in the area of topology.

MATH 5430. Mathematical Structures in Logic
3 Credits (3)
Lattices, distributive lattices, Boolean algebras, Heyting algebras. Lindenbaum-Tarski algebras of classical and intuitionistic logics. Representation theorems. Modal logics and their algebraic counterparts. Kripke semantics. Goedel translation.
Prerequisite: MATH 5320.
Learning Outcomes
1. Explain the basic theory of posets and lattices and apply closure operators, ideals, and completions to solve related problems.
2. Analyze the basic theory of distributive lattices, Boolean algebras, and Heyting algebras, and construct related algebraic structures (homomorphisms, subalgebras).
3. Illustrate the connections between various algebraic systems and the propositional logics they model, and translate statements between an algebraic structure and its dual space.
4. Explain the theoretical motivation for various modal logics and relate properties of modal algebras with their corresponding dual frames.

MATH 5435. Universal Algebra and Model Theory
3 Credits (3)
Universal algebra, homomorphisms, subalgebras, products, congruences. Varieties and class operators. Free algebras and Birkhoff's theorem. Ultraproducts and Los's theorem. Congruence distributive varieties and Jonsson's theorem. Universal classes and quasi-varieties.
Prerequisite: MATH 5320.
Learning Outcomes
1. Analyze standard examples of universal algebras arising from logic, algebra, and linear algebra.
2. Construct and manipulate homomorphisms, subalgebras, products, and congruences within universal algebraic systems.
3. Apply the relationships between equations, free algebras, and varieties to characterize algebraic classes.
4. Classify subdirectly irreducible algebras within various varieties.
5. Apply Jonsson's lemma and Los's theorem to solve complex problems related to varieties.
6. Relate the theory of varieties to broader concepts and special cases within model theory.

MATH 5438. Topics in Foundations
3 Credits
Topics in modern foundations. The material covered will reflect current research topics in the field and may vary each time the course is offered. To be taken up to 3 times. May be repeated up to 9 credits.
Learning Outcomes
1. Gain knowledge of advanced methods in the area of foundations.
2. Develop potential to explore literature in the area of foundations.
3. Develop potential to conduct supervised research in the area of foundations.

MATH 5440. Partial Differential Equations I
3 Credits (3)
The basic equations of mathematical physics. Laplace, Heat and Wave Equations. The method of characteristics, introduction to conservation laws, special solutions.
Prerequisite(s): MATH 5220 and MATH 5365 or consent of instructor.

Learning Outcomes

1. Formulate the basic equations of mathematical physics from physical principles and classify them (elliptic, parabolic, hyperbolic).
2. Apply analytical techniques (separation of variables, Fourier series) to solve the Heat and Wave equations.
3. Solve boundary and initial value problems for classical Partial Differential Equations (PDEs).
4. Interpret special solutions of PDEs in applied contexts.
5. Evaluate the stability and uniqueness of solutions to PDEs.

MATH 5445. Partial Differential Equations II
3 Credits (3)
Sobolev spaces theory: basic definitions and properties, embedding theorems, weak solutions of boundary value problems and variational methods for partial differential equations.
Prerequisite(s): MATH 5460 or consent of instructor.
Learning Outcomes

1. Define and apply key concepts in Sobolev space theory.
2. Apply embedding theorems to analyze function spaces.
3. Formulate and solve boundary value problems for PDEs using weak solutions.
4. Apply variational methods to analyze solutions of partial differential equations.

MATH 5450. Abstract Algebra II: Fields, Rings and Modules
3 Credits (3)
Topics covered include field extensions; algebraic closure; polynomials rings; irreducibility criteria; Noetherian rings; algebraic sets; Nullstellensatz; modules; applications to linear algebra.
Prerequisite(s): MATH 5340 or consent of instructor.
Learning Outcomes

1. Apply factorization properties of rings (UFD, PID, ED) to solve algebraic problems.
2. Apply irreducibility criteria to univariate polynomials over various fields.
3. Construct field extensions and determine their key properties.
4. Analyze the structure and basic properties of modules.
5. Apply the structure theorem for modules over a PID to classify modules.
6. Compute the rational canonical form of a matrix.

MATH 5453. Module Theory and Homological Algebra
3 Credits (3)
Introductory concepts of homological algebra, including projective, injective and flat modules; projective and injective resolutions; exactness of functors; homology of chain complexes; derived functors.
Prerequisite(s): MATH 5450 or consent of instructor.

MATH 5455. Introduction to Commutative Algebra and Algebraic Geometry
3 Credits (3)
Introduction to the basic notions and techniques of modern algebraic geometry, including the necessary commutative algebra foundation. Topics likely to include algebraic and projective varieties, Nullstellensatz, morphisms, rational and regular functions, local properties. Other topics may include Noether normalization, dimension theory, singularities, sheaves, schemes, Grobner bases.
Prerequisite(s): MATH 5450 or consent of instructor.

MATH 5458. Topics in Algebra
3 Credits
Topics in modern algebra. The material covered will reflect current research topics in the field and may vary each time the course is offered. To be taken up to 3 times. May be repeated up to 9 credits.
Learning Outcomes

1. Gain knowledge of advanced methods in the area of algebra.
2. Develop potential to explore literature in the area of algebra.
3. Develop potential to conduct supervised research in the area of algebra.

MATH 5460. Measure and Integration
3 Credits (3)
Measure spaces, measurable functions, extension and decomposition theorems for measures, integration on measure spaces, absolute continuity, iterated integrals.
Prerequisite: MATH 5365 or consent of instructor.
Learning Outcomes

1. Define key concepts in measure theory and distinguish between them.
2. Apply extension and decomposition theorems to determine the structure of measures.
3. Construct the Lebesgue integral on general measure spaces.
4. Compare the Lebesgue integral to the Riemann integral using concrete examples.
5. Evaluate and manipulate iterated integrals using absolute continuity and Fubini's theorem.

MATH 5463. Real Analysis
3 Credits (3)
Differentiation, Lp spaces, Banach spaces, measure and topology, other selected topics.
Prerequisite: MATH 5460.
Learning Outcomes

1. Analyze the topological structure, duality properties, and important inequalities of Lp spaces.
2. Apply concepts from measure theory and topology to analyze the behavior of functions and sets in real analysis.
3. Evaluate differentiability and integrability using advanced real analysis techniques.
4. Distinguish between pointwise and norm-based convergence of function sequences.
5. Solve problems involving the completeness, continuity, and compactness of Banach spaces.

MATH 5465. Introduction to Functional Analysis
3 Credits (3)
Banach spaces. The three basic principles: uniform boundedness principle, closed graph/open mapping theorems, Hahn-Banach theorem.
Prerequisite: MATH 5463, or consent of instructor.
Learning Outcomes

1. Define and analyze the structure of normed and Banach spaces.
2. Apply the Hahn-Banach Theorem to investigate the properties of dual spaces.
3. Apply the Uniform Boundedness Principle, the Open Mapping Theorem, and the Closed Graph Theorem to solve problems in functional analysis.
4. Define the properties of compact and self-adjoint operators.
5. Apply spectral theory to analyze self-adjoint operators.

MATH 5468. Topics in Analysis
3 Credits

Topics in modern analysis. The material covered will reflect current research topics in the field and may vary each time the course is offered. To be taken up to 3 times. May be repeated up to 9 credits.

Learning Outcomes

1. Gain knowledge of advanced methods in the area of analysis.
2. Develop potential to explore literature in the area of analysis.
3. Develop potential to conduct supervised research in the area of analysis.

MATH 563. Algebra with Connections
3 Credits (3)

Connections between Algebra and other K-12 curriculum strands, especially Geometry and Probability / Data Analysis. Apply algebraic modeling and reasoning to a variety of mathematical problem solving situations. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.
Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 564. From Number to Algebra
3 Credits (3)

The progression from Number to Algebra in the K-12 curriculum as a concrete-to-abstract progression. Key concepts considered across the grade levels include the different uses of variables, equivalence in different contexts, patterns, and ratios. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.
Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 567. From Measurement to Geometry
3 Credits (3)

The progression from Measurement to Geometry in the K-12 curriculum as a concrete-to abstract progression. Important concepts such as angle, length, and area progress from concrete, measurable situations to more abstract problems which require reasoning and proof. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.
Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 581. Abstract Algebra II: Fields, Rings and Modules
3 Credits (3)

Topics covered include field extensions; algebraic closure; polynomials rings; irreducibility criteria; Noetherian rings; algebraic sets; Nullstellensatz; modules; applications to linear algebra.
Prerequisite(s): MATH 526 or consent of instructor.

MATH 582. Module Theory and Homological Algebra
3 Credits (3)

Introductory concepts of homological algebra, including projective, injective and flat modules; projective and injective resolutions; exactness of functors; homology of chain complexes; derived functors.
Prerequisite(s): MATH 581 or consent of instructor.

MATH 583. Introduction to Commutative Algebra and Algebraic Geometry
3 Credits (3)

Introduction to the basic notions and techniques of modern algebraic geometry, including the necessary commutative algebra foundation. Topics likely to include algebraic and projective varieties, Nullstellensatz, morphisms, rational and regular functions, local properties. Other topics may include Noether normalization, dimension theory, singularities, sheaves, schemes, Grobner bases.
Prerequisite(s): MATH 581 or consent of instructor.

MATH 593. Measure and Integration
3 Credits (3)

Measure spaces, measurable functions, extension and decomposition theorems for measures, integration on measure spaces, absolute continuity, iterated integrals.
Prerequisite: MATH 528 or consent of instructor.

MATH 5996. Special Topics
1-3 Credits

Specific subjects to be announced in the Schedule of Classes. May be for unlimited credit with approval of the department.

Learning Outcomes

1. Analyze advanced concepts in the selected topic area.
2. Apply specialized mathematical methods to solve complex problems within the topic area.
3. Critique current research and developments in the topic area.
4. Communicate findings from the topic area in professional written and oral formats.

MATH 5997. Directed Reading
1-6 Credits

Readings. May be repeated for a maximum of 6 credits. Consent of instructor required. Graded: S/U.

Learning Outcomes

1. Summarize key concepts from assigned mathematical literature in a written report.
2. Critique mathematical arguments presented in advanced texts.
3. Synthesize information from multiple mathematical sources to form a coherent overview.
4. Communicate understanding of the assigned readings through a written report or oral presentation.

MATH 5999. Master's Thesis
1-15 Credits

Thesis. May be repeated up to 99 credits.

Learning Outcomes

1. Formulate a significant mathematical research problem suitable for a Master's thesis.
2. Apply appropriate mathematical methods to investigate the research problem.
3. Interpret research results in the context of existing mathematical literature.
4. Produce a Master's thesis meeting scholarly standards.
5. Defend the Master's thesis in an oral examination.

MATH 6991. Doctoral Research
1-15 Credits

Research. May be repeated up to 88 credits.

Learning Outcomes

1. Identify and refine an original doctoral research problem into a testable hypothesis or clear objectives.
2. Design a rigorous research plan for the doctoral research.
3. Implement the initial stages of the rigorous research plan.
4. Evaluate initial research findings within the academic context.
5. Communicate research progress and results through appropriate scholarly formats (written paper, oral presentation).

MATH 6996. Special Topics
1-15 Credits

Selected topics. May be repeated up to 88 credits.

Learning Outcomes

1. Integrate advanced mathematical theories to solve problems related to the selected topic.
2. Solve complex problems requiring specialized mathematical tools.
3. Critique research trends and debates in the topic area.

4. Present an advanced analysis of the topic area through written and oral communication.

MATH 7000. Doctoral Dissertation
1-15 Credits
Dissertation. May be repeated up to 88 credits.
Learning Outcomes
1. Conduct original research advancing knowledge in mathematics.
2. Apply rigorous methodologies to address complex research questions.
3. Integrate research findings into the scholarly literature through a publishable paper.
4. Produce a doctoral dissertation meeting professional standards.
5. Defend the doctoral dissertation in an oral examination.

Statistics Courses

STAT 3110. Statistics for Engineers and Scientists
3 Credits (3)
Modern probability and statistics with applications to the engineering sciences.
Prerequisite: C - or better in MATH 1521G or MATH 1521H.
Learning Outcomes
1. Apply probability concepts and statistical methods to analyze data relevant to engineering and scientific problems.
2. Interpret descriptive statistics, probability distributions, and inferential techniques in context-specific applications.
3. Construct confidence intervals and perform hypothesis tests to support decision-making in engineering contexts.
4. Use statistical software and tools to model, visualize, and communicate results from experimental and observational data.

STAT 4210. Probability: Theory and Applications
3 Credits (3)
Basic probability distributions including binomial, normal; random variables, expectation; laws of large numbers; central limit theorem.
Prerequisite(s): C- or better in MATH 2530G and C- or better in at least one-3000 level MATH or STAT course.
Learning Outcomes
1. Be able to compute discrete probabilities using combinatorial methods.
2. Understand and use conditional probability, independence and Bayes' Formula to compute probabilities.
3. Demonstrate understanding and use of discrete and continuous random variables including Bernoulli, Binomial, Poisson, Geometric, Normal, Exponential and Gamma.
4. Understand joint and conditional probability distributions and use them to compute probabilities.
5. Learn about basic limit theorems such as the Central Limit Theorem and the Laws of Large Numbers.

STAT 4220. Statistics: Theory and Applications
3 Credits (3)
Point and interval estimation; sufficiency; hypothesis testing; regression; analysis of variance; chi-square tests.
Prerequisite: C- or better in STAT 4210.
Learning Outcomes
1. Explain and apply the principles of point and interval estimation, including properties such as unbiasedness and consistency.
2. Analyze statistical models using concepts of sufficiency and likelihood to support inference procedures.
3. Conduct and interpret hypothesis tests, including those based on regression, ANOVA, and chi-square methods.
4. Evaluate the appropriateness of statistical techniques for real-world data and communicate results effectively in applied contexts.

STAT 5210. Probability: Theory and Applications
3 Credits (3)
Same as STAT 4210 with additional work for graduate students.
Learning Outcomes
1. Be able to compute discrete probabilities using combinatorial methods.
2. Understand and use conditional probability, independence and Bayes' Formula to compute probabilities.
3. Demonstrate understanding and use of discrete and continuous random variables including Bernoulli, Binomial, Poisson, Geometric, Normal, Exponential and Gamma.
4. Understand joint and conditional probability distributions and use them to compute probabilities.
5. Learn about basic limit theorems such as the Central Limit Theorem and the Laws of Large Numbers.

STAT 5220. Statistics: Theory and Applications
3 Credits (3)
Same as STAT 4220 with additional work for graduate students.
Learning Outcomes
1. Explain and apply the principles of point and interval estimation, including properties such as unbiasedness and consistency.
2. Analyze statistical models using concepts of sufficiency and likelihood to support inference procedures.
3. Conduct and interpret hypothesis tests, including those based on regression, ANOVA, and chi-square methods.
4. Evaluate the appropriateness of statistical techniques for real-world data and communicate results effectively in applied contexts.

STAT 5230. Elementary Stochastic Processes
3 Credits (3)
Markov chains, Poisson processes, Brownian motion, branching processes, and queuing processes, with applications to the physical, biological, and social sciences.
Prerequisite: STAT 5210 or consent of instructor.
Learning Outcomes
1. Apply conditional expectation and generating functions to analyze simple stochastic processes.
2. Describe and distinguish among key stochastic processes (Markov chains, Poisson processes).
3. Apply stochastic models to evaluate problems in the physical, biological, and social sciences.
4. Evaluate the long-term behavior of stochastic processes using transition probabilities and limiting distributions.
5. Analyze the Brownian motion process and its fundamental properties.

STAT 5310. Foundations of Probability
3 Credits (3)
Probability spaces, expectation and conditional expectation, limit theorems and laws of large numbers.
Prerequisite: MATH 5460.

Learning Outcomes

1. Define an abstract probability space via measure theory, regarding expectation as abstract integration and study its properties such as linearity and monotonicity.
2. Study the convergence of random variables and Weak and Strong Laws of Large Numbers.
3. Compare and employ almost sure convergence, convergence in probability, convergence in Lp, and convergence in distribution to analyze the behavior of sequences of random variables.
4. Define the weak convergence of probability measures, apply it to characterize the weak convergence on the set of real numbers, and study Central Limit Theorems.
5. Introduce the concept of stochastic process, define martingales and study the martin-gale convergence theorems.

STAT 5320. Advanced Topics in Stochastic Processes
3 Credits (3)
Markov processes, martingales, Brownian motion, the Ito calculus, stochastic differential equations.
Prerequisite: STAT 5310.
Learning Outcomes

1. Analyze the structure and behavior of continuous-time Markov processes and martingales.
2. Derive the fundamental properties of Brownian motion and explain its role in stochastic modeling.
3. Apply Ito calculus to solve stochastic differential equations in theoretical contexts.
4. Formulate stochastic differential equations from applied problems.
5. Explain and apply the Feynman-Kac formula, the martingale problem, and the Girsanov formula.
6. Evaluate stochastic models arising in various disciplines.
7. Interpret the solutions of stochastic models using advanced probability theory.

STAT 5330. Continuous Multivariate Analysis
3 Credits (3)
Theory and applications of the multivariate normal distribution.
Prerequisite: STAT 5220, or consent of instructor.
Learning Outcomes

1. Explain the theoretical foundations and properties of the multivariate normal distribution.
2. Apply principal component analysis and linear discriminant analysis to solve multivariate problems.
3. Evaluate the structure and relationships among multiple continuous variables using matrix-based statistical methods.
4. Interpret results from multivariate analyses in real-world applications.
5. Communicate findings from multivariate analyses clearly in a written report.

STAT 5335. Linear Models
3 Credits (3)
Core topics include distribution of quadratic forms, theory of regression, analysis of variance and covariance in linear models. Advanced topics chosen from random and mixed linear models, generalized linear, growth curve, and nonlinear models, quartile and copula regression. May be repeated up to 6 credits.
Prerequisite: STAT 5330.
Learning Outcomes

1. Analyze linear models using the distribution of quadratic forms and the theory of least squares estimation.
2. Apply regression, ANOVA, and ANCOVA models to determine relationships among variables.
3. Evaluate the assumptions and limitations of linear modeling frameworks (random and mixed effects models).
4. Explain the theory behind generalized linear models, nonlinear models, and quantile regression.
5. Assess the applicability of advanced modeling techniques to complex data sets.

STAT 5340. Advanced Theory of Statistics I
3 Credits (3)
Testing hypotheses, probability and sufficiency, uniformly most powerful tests, unbiasedness, invariance, and minimax principle.
Prerequisite: STAT 5220 or consent of instructor.
Learning Outcomes

1. Explain foundational concepts in statistical inference (hypothesis testing, sufficiency).
2. Construct statistical tests using criteria such as unbiasedness and invariance.
3. Analyze the properties of statistical tests using the minimax principle.
4. Apply the Neyman-Pearson lemma to derive uniformly most powerful (UMP) tests.
5. Evaluate the theoretical properties of statistical procedures.
6. Justify the use of statistical procedures in complex inference problems based on theoretical properties.

STAT 5345. Advanced Theory of Statistics II
3 Credits (3)
Estimation of parameters; unbiased estimators; equivariance; Bayes properties; large sample theory and optimality.
Prerequisite: STAT 5340 or consent of instructor.
Learning Outcomes

1. Analyze methods for estimating parameters and their properties (unbiased, consistent, efficient).
2. Apply the principles of equivariance to construct and evaluate estimators.
3. Construct and evaluate Bayes estimators in various contexts.
4. Evaluate estimators using large sample theory and asymptotic optimality criteria.
5. Compare classical and Bayesian approaches to estimation.
6. Justify the selection of estimation methods based on theoretical and practical considerations.

STAT 5348. Topics in Probability and Statistics
3 Credits
Topics in modern probability and statistics. The material covered will reflect current research topics in the field and may vary each time the course is offered. To be taken up to 3 times. May be repeated up to 9 credits.
Learning Outcomes

1. Gain knowledge of advanced methods in the areas of probability and statistics.
2. Develop potential to explore literature in the areas of of probability and statistics.
3. Develop potential to conduct supervised research in the areas of of probability and statistics.

Phone: (575) 646-3904

Website: https://math.nmsu.edu/

Mathematics (Actuarial Science and Insurance) - Bachelor of Science

The concentration in Actuarial Science and Insurance draws on courses from mathematics and business to prepare students for a mathematical career in insurance. The coursework in this emphasis focuses on the analysis of risk and its applications to insurance finance. Students fulfilling the requirements for the Actuarial Science and Insurance Concentration earn a minor in Risk Management and Insurance.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I (Departmental/College Requirement) [1]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
Area III: Laboratory Science Course (4 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II (Departmental/College Requirement)	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [3]		**3**
Departmental/College Requirements		
MATH 1531	Introduction to Higher Mathematics	3
MATH 2415	Introduction to Linear Algebra	3
MATH 2530G	Calculus III	3
MATH 3110	Introduction to Modern Algebra	3
or MATH 3120	Introduction to Analysis	
STAT 3110	Statistics for Engineers and Scientists	3
STAT 4210	Probability: Theory and Applications	3
STAT 4220	Statistics: Theory and Applications	3
Departmental Electives		
Select at least an additional 9 credits of approved upper-division courses prefixed MATH or STAT (6 credits must be 400-level), excluding the following:		9
MATH 3997	Directed Readings	
MATH 4991	Undergraduate Research	
MATH 4997	Directed Reading	
STAT 400	Undergraduate Research	
Non-Departmental Requirements (in addition to Gen.Ed/VWW) [4]		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BLAW 316	Legal Environment of Business	3
or BLAW 385V	Employment and Consumer Law	
CSCI 1720	Computer Science I	4
BFIN 322	Principles of Insurance	3
BFIN 341	Financial Analysis and Markets	3
Select one option from the following three:		9
OPTION 1		
BFIN 323	Life/Health/Employee Benefits	
Select two courses from the following:		
BFIN 303V	Personal Financial Planning and Investing in a Global Economy	
or BFIN 452	Personal Financial Planning for Professionals	
BFIN 324	Property and Liability Insurance	
BFIN 391	Finance Internship and Cooperative Education I	
OPTION 2		
BFIN 324	Property and Liability Insurance	
Select two courses from the following:		
BFIN 303V	Personal Financial Planning and Investing in a Global Economy	
or BFIN 452	Personal Financial Planning for Professionals	
BFIN 323	Life/Health/Employee Benefits	
BFIN 391	Finance Internship and Cooperative Education I	
OPTION 3		
Select two courses from the following:		
BFIN 456	Business Risk Management	
BFIN 303V	Personal Financial Planning and Investing in a Global Economy	
or BFIN 452	Personal Financial Planning for Professionals	
BFIN 323	Life/Health/Employee Benefits	
BFIN 324	Property and Liability Insurance	
BFIN 391	Finance Internship and Cooperative Education I	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 [5]		**25**
6 credits must be upper division		
Total Credits		**120**

1. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
2. See the General Education (p. 262) section of the catalog for a full list of courses.

[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses. Note one of the VWW requirements will be satisfied using the 9 hour rule with the FIN courses that are required for the degree.

[4] A grade of C- or better must be earned.

[5] Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Science with a major in Mathematics with a Concentration in Actuarial Science and Insurance, there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Some students may be able to bypass one or more courses in the calculus sequence MATH 1511G - MATH 1521G - MATH 2530G. The calculus sequence, Introduction to Higher Mathematics, and Linear Algebra provide knowledge that is basic to further work, and students are advised to complete them or their equivalent as early as possible.

First Year		Credits
ENGL 1110G or ENGL 1110H	Composition I (C- or better) or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I (C- or better) [1] or Calculus and Analytic Geometry I Honors	4
Area III: Laboratory Science Course [2]		4
CSCI 1720	Computer Science I	4
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II (C- or better) or Calculus and Analytic Geometry II Honors	4
Area V: Humanities Course [2]		3
ECON 2110G	Macroeconomic Principles	3
	Credits	**32**

Second Year		
ACCT 2110	Principles of Accounting I	3
MATH 1531	Introduction to Higher Mathematics (C- or better)	3
MATH 2530G	Calculus III (C- or better)	3
ECON 2120G	Principles of Microeconomics Honors (C- or better, and will count towards Area IV, Gen.Ed))	3
BFIN 322	Principles of Insurance (C- or better)	3
Area VI: Creative and Fine Arts Course [2]		3
MATH 2415	Introduction to Linear Algebra (C- or better)	3
STAT 3110	Statistics for Engineers and Scientists (C- or better)	3
ACCT 2120	Principles of Accounting II	3
BFIN 341	Financial Analysis and Markets	3
	Credits	**30**
Third Year		
VWW - Viewing a Wider World [3]		3
MATH 3110 or MATH 3120	Introduction to Modern Algebra (C- or better, Fall Only) [4] or Introduction to Analysis	3
OPTION 1,2 or 3 Course (C- or better) [5]		6
Elective Course(s) [6]		12
MATH/STAT Elective Course: 300/3000-level or higher (C- or better) [7,8]		3
MATH/STAT Elective Course: 400/4000-level (C- or better) [8]		3
	Credits	**30**
Fourth Year		
MATH/STAT Elective Course: 400/4000-level (C- or better) [8]		3
Option 1,2 or 3 Course (C- or better) [5]		3
STAT 4210	Probability: Theory and Applications (C- or better)	3
BLAW 316 or BLAW 385V	Legal Environment of Business (C- or better in either) or Employment and Consumer Law	3
Elective Course(s) [6]		7-9
STAT 4220	Statistics: Theory and Applications (C- or better)	3
Elective Course - Upper Division [6]		6
	Credits	**28-30**
	Total Credits	**120-122**

[1] Math Placement: MATH 1511G Calculus and Analytic Geometry I is the starting Math course for the degree, however, students may need to complete any prerequisites prior to enrolling into this course.

[2] See the General Education (p. 262) section of the catalog for a full list of courses.

[3] See the Viewing a Wider World (p. 266) section for a full list of courses. Please note that the second VWW requirement will be satisfied by the 9 hour rule using the FIN courses that are required for the degree.

[4] MATH 3110 Introduction to Modern Algebra is only offered in the Fall semesters, however MATH 3120 Introduction to Analysis is taught in the Spring and may be used as a substitute.

[5] Do not mix options; pick one throughout.
OPTION 1: BFIN 323 Life/Health/Employee Benefits; two courses from (BFIN 303V Personal Financial Planning and Investing in a Global Economy OR BFIN 452 Personal Financial Planning for Professionals); BFIN 324 Property and Liability Insurance; BFIN 391 Finance Internship and Cooperative Education I.
OPTION 2: BFIN 324 Property and Liability Insurance; two courses from (BFIN 303V Personal Financial Planning and Investing in a Global Economy OR BFIN 452 Personal Financial Planning for

Professionals); BFIN 323 Life/Health/Employee Benefits; BFIN 391 Finance Internship and Cooperative Education I.
OPTION 3: BFIN 456 Business Risk Management; two courses from (BFIN 303V Personal Financial Planning and Investing in a Global Economy OR BFIN 452 Personal Financial Planning for Professionals); BFIN 323 Life/Health/Employee Benefits; BFIN 324 Property and Liability Insurance; BFIN 391 Finance Internship and Cooperative Education I.

[6] Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

[7] MATH/STAT 300/3000-level courses that cannot be taken to fulfill this requirement: MATH 3997 Directed Readings.

[8] MATH/STAT 400/4000-level courses that cannot be taken to fulfill this requirement: MATH 4991 Undergraduate Research, MATH 4997 Directed Reading, STAT 400 Undergraduate Research.

Mathematics (Applied Mathematics) - Bachelor of Science

The Applied Mathematics concentration is intended to prepare students planning a mathematically oriented career upon graduation. The coursework in this concentration provides a foundation in mathematics important in many scientific and engineering applications.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
English Composition - Level 2		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
or ENGL 2210M	Professional and Technical Communication for Multilingual Students	
ENGL 2215G	Advanced Technical and Professional Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I (Departmental/College Requirement) [1]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits) [2]		
Area IV: Social/Behavioral Sciences Course (3 credits) [2]		
Either an Area III/IV: Laboratory Sciences or Social/Behavioral Sciences Course (4 credits or 3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II (Departmental/College Requirement)	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [3]		**6**
Departmental/College Requirements		
MATH 1531	Introduction to Higher Mathematics	3
MATH 2415	Introduction to Linear Algebra	3
MATH 2530G	Calculus III	3
MATH 3140	Introduction to Numerical Methods	3
MATH 3160	Introduction to Ordinary Differential Equations	3
MATH 4210	Complex Variables	3
MATH 4220	Fourier Series and Boundary Value Problems	3
STAT 3110	Statistics for Engineers and Scientists	3
STAT 4210	Probability: Theory and Applications	3
Departmental Electives		
Select at least 6 credits of approved additional upper-division courses prefixed MATH or STAT (one must be 400-level), excluding the following:		6
MATH 3997	Directed Readings	
MATH 4991	Undergraduate Research	
MATH 4997	Directed Reading	
STAT 400	Undergraduate Research	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
CSCI 1720	Computer Science I (C- or better)	4
Select a minimum of 9 credit hours of electives to form a coherent cluster in an applied area from the following: [4]		9
Examples of acceptable clusters:		
Signals		
E E 320	Signals and Systems I	
E E 395	Introduction to Digital Signal Processing	
E E 496	Introduction to Communication Systems	
Structures		
PHYS 1310G	Calculus -Based Physics I [5]	
C E 233	Mechanics-Statics	
C E 315	Structural Analysis	
Operations Research		
I E 311	Engineering Data Analysis	
I E 365	Quality Control	
I E 413	Engineering Operations Research I	
I E 423	Engineering Operations Research II	
I E 460	Evaluation of Engineering Data	
Algorithm Theory		
CSCI 2220	Introduction to Data Structures and Algorithms	
CSCI 3730	Compilers and Automata Theory	
CSCI 3720	Data Structures and Algorithms	

Bioinformatics		
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology [5]	
BIOL 2110L	Principles of Biology: Cellular and Molecular Biology Laboratory [5]	
CSCI 4305	Bioinformatics	
Choose one from the following:		
CSCI 2220	Introduction to Data Structures and Algorithms	
CSCI 3730	Compilers and Automata Theory	
CSCI 3710	Software Development	
CSCI 3720	Data Structures and Algorithms	
Computer Systems		
CSCI 2210	Object-Oriented Programming	
or CSCI 2220	Introduction to Data Structures and Algorithms	
CSCI 3710	Software Development	
CSCI 3730	Compilers and Automata Theory	
CSCI 4120	Operating Systems I	
CSCI 4405	Artificial Intelligence I	
CSCI 4410	Computer Graphics I	
CSCI 4140	Database Management Systems I	
CSCI 4245	Computer Networks I	
CSCI 4250	Human-Centered Computing	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 [6]		**34**
9-15 credits must be Upper-Division		
Total Credits		**120-121**

1 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 A grade of C- or better must be earned. Students may propose clusters subject to departmental approval. A cluster must contain CSCI 1720 Computer Science I. A major or minor in any of the following fields (along with CSCI 1720 Computer Science I) will also fulfill the Cluster Electives requirement: Computer Science, Physics, Biology, Chemistry and Biochemistry, Chemical Engineering, Engineering Physics, Electrical and Computer Engineering, Industrial Engineering, Mechanical Engineering, Civil Engineering, Economics and Finance.

5 If these courses are selected, they could count towards the General Education Area III requirement.

6 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Science with a major in Mathematics with a Concentration in Applied Mathematics, there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Some students may be able to bypass one or more courses in the calculus sequence MATH 1511G - MATH 1521G - MATH 2530G. The calculus sequence, Introduction to Higher Mathematics, and Linear Algebra provide knowledge that is basic to further work, and students are advised to complete them or their equivalent as early as possible.

First Year		**Credits**
ENGL 1110G or ENGL 1110H	Composition I (C- or better) or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I (C- or better) [1] or Calculus and Analytic Geometry I Honors	4
Area III: Laboratory Science Course [2]		4
CSCI 1720	Computer Science I (C- or better)	4
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II (C- or better) or Calculus and Analytic Geometry II Honors	4
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Science Course [2]		3-4
Area V: Humanities Course [2]		3
Elective Course [3]		1
	Credits	**30-31**
Second Year		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area VI: Creative and Fine Arts Course [2]		3
MATH 2415	Introduction to Linear Algebra (C- or better)	3
MATH 2530G	Calculus III (C- or better)	3
Elective Course(s) [3]		6
Area IV: Social/Behavioral Science Course [2]		3
MATH 1531	Introduction to Higher Mathematics	3
MATH 3160	Introduction to Ordinary Differential Equations	3
Cluster Course (C- or better)		3
	Credits	**30**
Third Year		
VWW - Viewing a Wider World Course [4]		3
STAT 3110	Statistics for Engineers and Scientists (C- or better)	3
MATH 4210	Complex Variables (C- or better)	3

Cluster Course (C- or better)		6
Elective Course(s) [3,5]		9
MATH 3140	Introduction to Numerical Methods (C- or better)	3
MATH 4220	Fourier Series and Boundary Value Problems (C- or better)	3
	Credits	**30**
Fourth Year		
VWW - Viewing a Wider World [4]		3
MATH/STAT Elective Course: 300/3000-level or higher (C- or better) [6,7]		3
STAT 4210	Probability: Theory and Applications (C- or better)	3
Elective Course - Upper Division [3]		12
MATH/STAT Elective Course: 400/4000-level (C- or better) [7]		3
Elective Course(s) [3]		6
	Credits	**30**
	Total Credits	**120-121**

1. Math Placement: MATH 1511G Calculus and Analytic Geometry I is the starting Math course for the degree, however, students may need to complete any prerequisites prior to enrolling into this course.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
4. See the Viewing a Wider World (p. 266) section for a full list of courses.
5. Students who plan to get a Masters in MATH should take MATH 3120 Introduction to Analysis as an elective.
6. MATH/STAT 300/3000-level courses that cannot be taken to fulfill this requirement: MATH 3997 Directed Readings.
7. MATH/STAT 400-level courses that cannot be taken to fulfill this requirement: MATH 4991 Undergraduate Research, MATH 4997 Directed Reading, STAT 400 Undergraduate Research.

Mathematics (Computational Mathematics) - Bachelor of Science

The concentration in Computational Mathematics draws on courses from mathematics and computer science to provide a deeper understanding of the mathematical principles underlying computation.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
English Composition - Level 2		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
or ENGL 2210M	Professional and Technical Communication for Multilingual Students	
ENGL 2215G	Advanced Technical and Professional Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I (Departmental/College Requirement) [1]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Science Course (4 credits) [2]		
Area IV: Social/Behavioral Sciences Course (3 credits) [2]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Science Course (4 credits or 3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II (Departmental/College Requirement)	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [3]		**6**
Departmental/College Requirements		
MATH 1531	Introduction to Higher Mathematics	3
or CSCI 2310	Discrete Mathematics for Computer Science	
MATH 2415	Introduction to Linear Algebra	3
MATH 2530G	Calculus III	3
MATH 3140	Introduction to Numerical Methods	3
STAT 3110	Statistics for Engineers and Scientists	3
STAT 4210	Probability: Theory and Applications	3
or MATH 4230	Applied Linear Algebra	
Departmental Electives		
Select at least 9 additional upper-division credits of approved courses prefixed MATH or STAT, excluding the following:		9
MATH 3997	Directed Readings	
MATH 4991	Undergraduate Research	
MATH 4997	Directed Reading	
Non-Departmental Requirements (in addition to Gen.Ed/VWW) [4]		
Select a minimum of 12 credit hours from the following		12
CSCI 2220	Introduction to Data Structures and Algorithms	
CSCI 3720	Data Structures and Algorithms	
CSCI 3730	Compilers and Automata Theory	
CSCI 3790	Algorithm Design & Implementation	
CSCI 4225	Introduction to Cryptography	
CSCI 4430	Graph Data Mining	

Second Language Requirement: (not required)	
Electives, to bring the total credits to 120 [5]	**41**
15 credits must be Upper-Division	
Total Credits	**120-121**

1. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. A grade of C- or better must be earned.
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Note: It is strongly recommended that mathematics majors in the Computational Mathematics Concentration consider a minor or second major in an area that uses mathematics, such as physics or computer science. All programs should be planned with the guidance of a departmental advisor. More information is available at www.math.nmsu.edu. *(*https://math.nmsu.edu/*)*

Second Language Requirement

For the Bachelor of Science in Mathematics with a Concentration in Computational Mathematics there is no second language requirement.

A Suggested Plan of Study

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Some students may be able to bypass one or more courses in the calculus sequence MATH 1511G Calculus and Analytic Geometry I - MATH 1521G Calculus and Analytic Geometry II, MATH 2530G Calculus III.The calculus sequence, Introduction to Higher Mathematics, and Linear Algebra provide knowledge that is basic to further work, and students are advised to complete them or their equivalent as early as possible.

First Year		**Credits**
ENGL 1110G	Composition I (C- or better)	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I (C- or better) [1] or Calculus and Analytic Geometry I Honors	4
Area III: Laboratory Science Course [2]		4
Non - Departmental Requirement Course [4]		4
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course [2]		3-4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II (C- or better) or Calculus and Analytic Geometry II Honors	4
Elective Course(s) [3]		4
	Credits	**30-31**
Second Year		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area V: Humanities Course [2]		3
MATH 2415	Introduction to Linear Algebra	3
MATH 2530G	Calculus III	3
Elective Courses [3]		6
Area IV: Social/Behavioral Sciences Course [2]		3
Area VI: Creative and Fine Arts Course [2]		3
MATH 1531	Introduction to Higher Mathematics	3
MATH/STAT Upper - Division Elective Course [6]		3
	Credits	**30**
Third Year		
Viewing a Wider World Course [5]		3
STAT 3110	Statistics for Engineers and Scientists	3
Non - Departmental Required Course [4]		3
Elective Courses [3]		6
MATH 3140	Introduction to Numerical Methods	3
MATH/STAT Upper - Division Elective Course [6]		3
Elective Courses - Upper Division [3]		9
	Credits	**30**
Fourth Year		
MATH/STAT Upper - Division Elective Course [6]		3
Viewing a Wider World Course [5]		3
Non - Departmental Requirement Courses [4]		6
Elective Course(s) - Upper Division [3]		6
Elective Courses [3]		9
STAT 4210	Probability: Theory and Applications	3
	Credits	**30**
	Total Credits	**120-121**

1. Math Placement: MATH 1511G Calculus and Analytic Geometry I is the starting Math course for the degree, however, students may need to complete any prerequisites prior to enrolling into this course.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
4. Choose from CSCI 2220 Introduction to Data Structures and Algorithms, CSCI 3720 Data Structures and Algorithms, CSCI 3730 Compilers and Automata Theory, CSCI 3790 Algorithm Design &

Implementation, CSCI 4425 Introduction to Deep Learning, or CSCI 4430 Graph Data Mining.

5 See the Viewing a Wider World (p. 266) section for a full list of courses.

6 MATH/STAT Upper division courses that cannot be taken to fulfill this requirement: MATH 3997 Directed Readings MATH 4991 Undergraduate Research, and MATH 4997 Directed Reading.

Mathematics (Foundations) - Bachelor of Science

The concentration in Foundations draws on courses from mathematics and philosophy to provide a close look at the underlying logical and philosophical issues in mathematics.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
English Composition - Level 2		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
or ENGL 2210M	Professional and Technical Communication for Multilingual Students	
ENGL 2215G	Advanced Technical and Professional Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I (Departmental/College Requirement) [1]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Science Course (4 credits) [2]		
Area IV: Social/Behavioral Sciences Course (3 credits) [2]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Science Course (4 credits or 3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II (Departmental/College Requirement)	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [3]		**3**
Departmental/College Requirements		
MATH 1531	Introduction to Higher Mathematics	3
MATH 2415	Introduction to Linear Algebra	3
MATH 2530G	Calculus III	3
MATH 3110	Introduction to Modern Algebra	3
or MATH 3120	Introduction to Analysis	
MATH 3130	Introduction to Geometry	3
MATH 4110V	Great Theorems in Mathematics	3
MATH 4320	Logic and Set Theory	3
Departmental Electives		
Select at least 9 additional upper-division credits of approved courses prefixed MATH or STAT (at least 3 must be 400-level), excluding the following:		9
MATH 3997	Directed Readings	
MATH 4991	Undergraduate Research	
MATH 4997	Directed Reading	
Non-Departmental Requirements (in addition to Gen.Ed/VWW) [4]		**13**
CSCI 1720	Computer Science I	
PHIL 312	Formal Logic	
Select two courses from the following, including at least one of PHIL 316:		
PHIL 316	Philosophy of Mathematics	
PHIL 350	Epistemology	
PHIL 351	Philosophy of Science	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 [5]		**40**
15 credits must be upper division.		
Total Credits		**120-121**

1 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

2 See the General Education (p. 262) section of the catalog for a full list of courses

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses. This course must come from outside the college. Note that one of the VWW requirements will be satisfied using the 9 hour rule with the PHIL courses that are required for the degree.

4 A grade of C- or better must be earned.

5 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Science in Mathematics with a Concentration in Foundations there is no second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for

students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Some students may be able to bypass one or more courses in the calculus sequence MATH 1511G - MATH 1521G - MATH 2530G. The calculus sequence, Introduction to Higher Mathematics, and Linear Algebra provide knowledge that is basic to further work, and students are advised to complete them or their equivalent as early as possible.

First Year		Credits
ENGL 1110G or ENGL 1110H	Composition I (C- or better) or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I (C- or better) [1] or Calculus and Analytic Geometry I Honors	4
Area III: Laboratory Science Course [2]		4
CSCI 1720	Computer Science I (C- or better)	4
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Science Course [2]		3-4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II (C- or better) or Calculus and Analytic Geometry II Honors	4
Elective Course [3]		3
	Credits	**29-30**
Second Year		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area V: Humanities Course [2]		3
Elective Course [3]		3
MATH 2415	Introduction to Linear Algebra (C- or better)	3
MATH 2530G	Calculus III (C- or better)	3
Area IV: Social/Behavioral Sciences Course [2]		3
Area VI: Creative and Fine Arts Course [2]		3
PHIL 312	Formal Logic	3
MATH 1531	Introduction to Higher Mathematics	3
MATH/STAT Elective Course: 3000-level or higher (C- or better) [4,6]		3
	Credits	**30**
Third Year		
Upper level Philosophy course [8]		3
VWW - Viewing a Wider World [5]		3
MATH 3110 or MATH 3120	Introduction to Modern Algebra (C- or better in either) or Introduction to Analysis	3
MATH/STAT Elective Course: 3000-level or higher (C- or better) [4,6]		3
Elective Course [3]		3
Elective Course(s) - Upper Division [3]		6
MATH 4320	Logic and Set Theory	3
PHIL 316	Philosophy of Mathematics	3
MATH/STAT Elective Course: 4000-level (C- or better) [6]		3
	Credits	**30**
Fourth Year		
Elective Course(s) - Upper Division [3]		12
MATH 4110V	Great Theorems in Mathematics	3
Elective Course(s) [3]		13
MATH 4320 or MATH 3130	Logic and Set Theory or Introduction to Geometry	3
	Credits	**31**
	Total Credits	**120-121**

1. Math Placement: MATH 1511G Calculus and Analytic Geometry I is the starting Math course for the degree, however, students may need to complete any prerequisites prior to enrolling into this course.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
4. MATH/STAT 3000-level courses that cannot be taken to fulfill this requirement: MATH 3997 Directed Readings.
5. See the Viewing a Wider World (p. 266) section for a full list of courses.
6. MATH/STAT 4000-level courses that cannot be taken to fulfill this requirement: MATH 4991 Undergraduate Research, MATH 4997 Directed Reading, STAT 400 Undergraduate Research.
7. MATH 3110 Introduction to Modern Algebra is only offered in the Fall semesters. However, MATH 3120 Introduction to Analysis is taught in the Spring and may be used as a substitute.
8. Choose from PHIL 350 Epistemology or PHIL 351 Philosophy of Science.

Mathematics (General Mathematics) - Bachelor of Science

Students seeking a foundation in pure mathematics and flexibility in the curriculum are encouraged to pursue the General Mathematics Concentration. Students choosing this emphasis should work closely with a faculty advisor to select courses appropriate to their interests.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
English Composition - Level 2		

Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
or ENGL 2210M	Professional and Technical Communication for Multilingual Students	
ENGL 2215G	Advanced Technical and Professional Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I (Departmental/College Requirement) [1]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Science Course (4 credits) [2]		
Area IV: Social/Behavioral Sciences Course (3 credits) [2]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Science Course (4 credits or 3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II (Departmental/College Requirement)	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [3]		**6**
Departmental/College Requirements		
MATH 1531	Introduction to Higher Mathematics	3
MATH 2415	Introduction to Linear Algebra	3
MATH 2530G	Calculus III	3
MATH 3110	Introduction to Modern Algebra	3
MATH 3120	Introduction to Analysis	3
Departmental Electives		
Select at least 18 additional upper-division credits of approves courses prefixed MATH or STAT (at least 12 must be 4000-level), excluding the following:		18
MATH 3997	Directed Readings	
MATH 4991	Undergraduate Research	
MATH 4997	Directed Reading	
STAT 400	Undergraduate Research	
Non-Departmental Requirements (in addition to Gen.Ed/VWW) [4]		
CSCI 1720	Computer Science I	4
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 [5]		**43**
18 credits must be Upper-Division		
Total Credits		**120-121**

1 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

2 See the General Education (p. 262) section of the catalog for a full list of courses

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 A grade of C- or better must be earned.

5 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Note: It is strongly recommended that mathematics majors in the General Mathematics Concentration consider a minor or second major in an area that uses mathematics, such as physics or computer science. All programs should be planned with the guidance of a departmental advisor. More information is available at www.math.nmsu.edu. *(*https://math.nmsu.edu/*)*

Second Language Requirement

For the Bachelor of Science in Mathematics with a Concentration in General Mathematics there is no second language requirement.

A Suggested Plan of Study

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Some students may be able to bypass one or more courses in the calculus sequence MATH 1511G Calculus and Analytic Geometry I - MATH 1521G Calculus and Analytic Geometry II, MATH 2530G Calculus III.The calculus sequence, Introduction to Higher Mathematics, and Linear Algebra provide knowledge that is basic to further work, and students are advised to complete them or their equivalent as early as possible.

First Year		**Credits**
ENGL 1110G or ENGL 1110H	Composition I (C- or better) or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I (C- or better) [1] or Calculus and Analytic Geometry I Honors	4
CSCI 1720	Computer Science I (C- or better) [1]	4
Area: Laboratory Science Course [2]		4
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course [2]		3-4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II (C- or better) or Calculus and Analytic Geometry II Honors	4
Elective Course [3]		3
	Credits	**29-30**
Second Year		
Choose one from the following:		3

ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area V: Humanities Course [2]		3
MATH 2415	Introduction to Linear Algebra	3
MATH 2530G	Calculus III	3
Elective Course(s) [3]		6
Area IV: Social/Behavioral Sciences Course [2]		3
Area VI: Creative and Fine Arts Course [2]		3
MATH 1531	Introduction to Higher Mathematics	3
MATH/STAT Elective Course: 300-level or higher (C- or better) [4,6]		3
	Credits	**30**
Third Year		
MATH 3110	Introduction to Modern Algebra	3
Viewing a Wider World Course [5]		3
MATH/STAT Elective Course: 300-level or higher (C- or better [4,6]		3
Elective Course(s) [3]		12
MATH 3120	Introduction to Analysis	3
MATH/STAT Elective Coruse: 400/4000-level (C- or better) [6]		3
Elective Course - Upper Division [3]		3
	Credits	**30**
Fourth Year		
MATH/STAT Elective Course(s): 400/4000-level (C- or better) [6]		9
Viewing a Wider World Course [5]		3
Elective Course(s) - Upper Division [3]		15
Elective Course [3]		4
	Credits	**31**
	Total Credits	**120-121**

1. Math Placement: MATH 1511G Calculus and Analytic Geometry I is the starting Math course for the degree, however, students may need to complete any prerequisites prior to enrolling into this course.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
4. MATH/STAT 3000-level courses that cannot be taken to fulfill this requirement: MATH 3997 Directed Readings.
5. See the Viewing a Wider World (p. 266) section for a full list of courses.
6. MATH/STAT 400/4000-level courses that cannot be taken to fulfill this requirement: MATH 4991 Undergraduate Research, MATH 4997 Directed Reading, STAT 400 Undergraduate Research.

Mathematics (Physics) - Bachelor of Science

The concentration in Physics draws on courses from mathematics and physics to provide a deeper understanding of the mathematical principles underlying principles of physics.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I (Departmental/College Requirement) [1]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Science Course (4 credits) [2]		
Area IV: Social/Behavioral Sciences Course (3 credits) [2]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Science Course (4 credits or 3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II (Departmental/College Requirement)	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [3]		**6**
Departmental/College Requirements		
MATH 1531	Introduction to Higher Mathematics	3
MATH 2415	Introduction to Linear Algebra	3
MATH 2530G	Calculus III	3
MATH 3110	Introduction to Modern Algebra	3
or MATH 3120	Introduction to Analysis	
MATH 3160	Introduction to Ordinary Differential Equations	3
STAT 3110	Statistics for Engineers and Scientists	3
or STAT 4210	Probability: Theory and Applications	
Departmental Electives		
Select at least 9 additional upper-division credits of approved courses prefixed MATH or STAT (at least 3 must be 400-level), excluding the following:		9
MATH 3997	Directed Readings	
MATH 4991	Undergraduate Research	

MATH 4997	Directed Reading	
Non-Departmental Requirements (in addition to Gen.Ed/VWW) [4]		**21**
Select a minimum of 21 credit hours from among the following:		
PHYS 2110	Mechanics (Must also take PHYS 2011L)	
PHYS 2110L	Experimental Mechanics	
PHYS 2120	Heat, Light, and Sound (Must also take PHYS 2120L)	
PHYS 2120L	Heat, Light, and Sound Laboratory	
PHYS 2140	Electricity and Magnetism (Must also take PHYS 2140L)	
PHYS 2140L	Electricity & Magnetism Laboratory	
PHYS 315	Modern Physics	
PHYS 395	Intermediate Mathematical Methods of Physics	
PHYS 451	Intermediate Mechanics I	
PHYS 454	Intermediate Modern Physics I	
PHYS 455	Intermediate Modern Physics II	
PHYS 461	Intermediate Electricity and Magnetism I	
PHYS 462	Intermediate Electricity and Magnetism II	
PHYS 476	Computational Physics	
PHYS 495	Mathematical Methods of Physics I	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 [5]		**32**
15 credits must be upper division.		
Total Credits		**120-121**

1. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. A grade of C- or better must be earned.
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Science in Mathematics with a Concentration in Physics there is no second language requirement.

Mathematics (Probability and Statistics) - Bachelor of Science

The concentration in Probability and Statistics provides students with a strong background in mathematical, probabilistic, and statistical analysis. Students also develop skills in the analysis of problems that arise in science, engineering, and other areas. The program provides a path to graduate studies or a career in industry.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
English Composition - Level 2		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
or ENGL 2210M	Professional and Technical Communication for Multilingual Students	
ENGL 2215G	Advanced Technical and Professional Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I (Departmental/College Requirement) [1]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits) [2]		
Area IV: Social/Behavioral Sciences Course (3 credits) [2]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 credits or 3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II (Departmental/College Requirement)	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [3]		**6**
Departmental/College Requirements		
MATH 1531	Introduction to Higher Mathematics	3
MATH 2415	Introduction to Linear Algebra	3
MATH 2530G	Calculus III	3
MATH 3120	Introduction to Analysis	3
MATH 3140	Introduction to Numerical Methods	3
STAT 3110	Statistics for Engineers and Scientists	3
STAT 4210	Probability: Theory and Applications	3
STAT 4220	Statistics: Theory and Applications	3
Departmental Electives		
Select at least 9 additional upper-division credits of approved courses prefixed MATH or STAT (at least 3 credits must be 400/4000-level), excluding the following:		9
MATH 3997	Directed Readings	
MATH 4991	Undergraduate Research	

MATH 4997	Directed Reading	
STAT 400	Undergraduate Research	
Non-Departmental Requirements (in addition to Gen.Ed/VWW) [4]		
Select one course from the following:		3
CSCI 1220	Computer Programming Fundamentals: Python	
CSCI 1235	R Programming I	
Additional Requirements		
Select one option from the following:		6
OPTION 1		
A ST 465	Statistical Analysis I	
A ST 466	Statistical Analysis II	
OPTION 2		
I E 311	Engineering Data Analysis	
Select one course from the following:		
I E 365	Quality Control	
I E 460	Evaluation of Engineering Data	
I E 466	Reliability	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 [5]		**38**
12 credits must be upper division		
Total Credits		**120-121**

1. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. A grade of C- or better must be earned.
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor. Students should also consult their advisor about choosing the courses A ST 503 SAS Basics and A ST 505 Statistical Inference I as electives.

Second Language Requirement

For the Bachelor of Science in Mathematics with a Concentration in Statistics there is no second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Some students may be able to bypass one or more courses in the calculus sequence MATH 1511G - MATH 1521G - MATH 2530G. The calculus sequence, Introduction to Higher Mathematics, and Linear Algebra provide knowledge that is basic to further work, and students are advised to complete them or their equivalent as early as possible.

First Year		**Credits**
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
Area III: Laboratory Science Course [2]		4
Choose one from the following:		3
CSCI 1220	Computer Programming Fundamentals: Python	
CSCI 1235	R Programming I	
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Area VI: Creative and Fine Arts Course [2]		3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Area V: Humanities Course [2]		3
Elective Course [3]		3
	Credits	**31**
Second Year		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Elective Course(s) [3]		9
Area IV: Social/Behavioral Sciences Course [2]		3
MATH 2415	Introduction to Linear Algebra	3
MATH 2530G	Calculus III	3
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course [2]		3-4
STAT 3110	Statistics for Engineers and Scientists	3
MATH 3140	Introduction to Numerical Methods	3
	Credits	**30-31**
Third Year		
MATH 1531	Introduction to Higher Mathematics	3
STAT 4210	Probability: Theory and Applications	3
Elective Course(s) [3]		9
Elective Course - Upper Division [3]		6
STAT 4220	Statistics: Theory and Applications	3
MATH 3120	Introduction to Analysis	3
VWW - Viewing a Wider World [5]		3
	Credits	**30**
Fourth Year		
MATH/STAT Elective Course: 400/4000-level [6]		3
OPTION Course		6
VWW - Viewing a Wider World [5]		3
Elective Course - Upper Division [3]		6
MATH/STAT Elective Course: 300/4000- level or higher (C- or better) [4,6]		6
Elective Course(s) [3,6]		5
	Credits	**29**
	Total Credits	**120-121**

[1] Math Placement: MATH 1511G Calculus and Analytic Geometry I is the starting Math course for the degree, however, students may need to complete any prerequisites prior to enrolling into this course.
[2] See the General Education (p. 262) section of the catalog for a full list of courses.
[3] Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
[4] MATH/STAT 300/3000-level or higher courses that cannot be taken to fulfill this req MATH 4991 Undergraduate Research, and STAT 400 Undergraduate Research.
[5] See the Viewing a Wider World (p. 266) section for a full list of courses.
[6] MATH/STAT 400/4000-level courses that cannot be taken to fulfill this requirement: MATH 4991 Undergraduate Research, MATH 4997 Directed Reading, STAT 400 Undergraduate Research.

Mathematics (Secondary Mathematics Education) - Bachelor of Science

The concentration in Secondary Mathematics Education allows a flexible program providing a student with a path to graduate studies in mathematics or a career in industry, as well as all the mathematics and education courses required for certification as a secondary education teacher in mathematics.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I (Departmental/College Requirement) [1]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: Social/Behavioral Sciences Course (3 credits) [2]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Science Course (4 credits or 3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II (Departmental/College Requirement)	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [3]		**3**
Departmental/College Requirements		
MATH 1531	Introduction to Higher Mathematics	3
MATH 2415	Introduction to Linear Algebra	3
MATH 2530G	Calculus III	3
MATH 3110	Introduction to Modern Algebra	3
or MATH 3120	Introduction to Analysis	
MATH 3130	Introduction to Geometry	3
MATH 4110V	Great Theorems in Mathematics	3
STAT 3110	Statistics for Engineers and Scientists	3
Departmental Electives		
Select at least 9 additional upper-division credits of approves courses prefixed MATH or STAT (at least 6 must be 400-level), excluding the following:		9
MATH 3997	Directed Readings	
MATH 4991	Undergraduate Research	
MATH 4997	Directed Reading	
STAT 400	Undergraduate Research	
Non-Departmental Requirements (in addition to Gen.Ed/VWW) [4]		
CSCI 1720	Computer Science I	4
EDUC 3120	Multicultural Education	3
EDUC 3997	Secondary Field Experience	3
EDUC 4420	Teaching Mathematics at the Middle and High School Level	3
EDUC 4820	Secondary Student Teaching	9
EDUC 4821	Middle and High School Student Teaching Seminar	3
READ 4330	Content Area Literacy	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 [5]		**22**
3 hours must be upper division.		
Total Credits		**120-121**

[1] MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
[2] See the General Education (p. 262) section of the catalog for a full list of courses
[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses. Note that one of the VWW requirements will be satisfied

using the 9 hour rule with the EDUC courses that are required for the degree.

4 A grade of C- or better must be earned.

5 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Notes for Minor in Education

Students must apply to the Teacher Education Program (TEP) before they can progress in the 400 level education courses. EDUC 3120 Multicultural Education, EDUC 3997 Secondary Field Experience, and SPED 3105 Introduction to Special Education in a Diverse Society are prerequisites for TEP entrance. Students can apply for TEP during the semester in which they are completing the last of these prerequisites. Students will also need to have declared the Minor in Secondary Education before applying to TEP.

Second Language Requirement

For the Bachelor of Science in Mathematics with a Concentration in General Mathematics there is no second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Some students may be able to bypass one or more courses in the calculus sequence MATH 1511G - MATH 1521G - MATH 2530G. The calculus sequence, Introduction to Higher Mathematics, and Linear Algebra provide knowledge that is basic to further work, and students are advised to complete them or their equivalent as early as possible.

First Year		Credits
ENGL 1110G or ENGL 1110H	Composition I (C- or better) or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I (C- or better) [1] or Calculus and Analytic Geometry I Honors	4
Elective Course [3]		6-7
CSCI 1720	Computer Science I (C- or better)	4
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Area VI: Creative and Fine Arts Course [2]		3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II (C- or better) or Calculus and Analytic Geometry II Honors	4
PHYS 1310G	Calculus -Based Physics I	3
PHYS 1310L	Calculus -Based Physics I Lab	1
	Credits	**32-33**
Second Year		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area V: Humanities Course [2]		3
Area IV: Social/Behavioral Sciences Course [2]		3
MATH 2415	Introduction to Linear Algebra (C- or better)	3
MATH 2530G	Calculus III (C- or better)	3
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Science Course [2]		3-4
EDUC 3120	Multicultural Education	3
MATH 1531	Introduction to Higher Mathematics	3
MATH/STAT Elective Course: 300/3000-level or higher (C- or better) [4,6]		3
Elective Course		3
	Credits	**30-31**
Third Year		
MATH 4110V or MATH 3130	Great Theorems in Mathematics or Introduction to Geometry	3
EDUC 3997	Secondary Field Experience	3
MATH 3110 or MATH 3120	Introduction to Modern Algebra ((C- or better in either)) [7] or Introduction to Analysis	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Elective Course [3]		10
READ 4330	Content Area Literacy	3
STAT 3110	Statistics for Engineers and Scientists	3
MATH/STAT Elective Course: 400/4000-level (C- or better) [6]		3
	Credits	**31**
Fourth Year		
MATH 3130 or MATH 4110V	Introduction to Geometry or Great Theorems in Mathematics	3
MATH/STAT Elective Course: 400/4000-level (C- or better) [6]		3
VWW - Viewing a Wider World Course [5]		3
Elective Course - Upper Division		3
EDUC 4420	Teaching Mathematics at the Middle and High School Level	3
EDUC 4820	Secondary Student Teaching	9
EDUC 4821	Middle and High School Student Teaching Seminar	3
	Credits	**27**
	Total Credits	**120-122**

1 Math Placement: MATH 1511G Calculus and Analytic Geometry I is the starting Math course for the degree, however, students may need to complete any prerequisites prior to enrolling into this course.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-

case basis and students should discuss elective requirements with their advisor.

[4] MATH/STAT 300/400-level courses that cannot be taken to fulfill this requirement: MATH 3997 Directed Readings.

[5] See the Viewing a Wider World (p. 266) section for a full list of courses.

[6] MATH/STAT 400-level courses that cannot be taken to fulfill this requirement: MATH 4991 Undergraduate Research, MATH 4997 Directed Reading, STAT 400 Undergraduate Research.

[7] MATH 3110 Introduction to Modern Algebra is only offered in the Fall semesters. However, MATH 3120 Introduction to Analysis is taught in the Spring and may be used as a substitute.

Applied Mathematics - Supplemental Major

The program consists of 24 credits in the designated list of courses. To earn a supplementary major in applied mathematics a student must earn 15 credits from Categories I.A and I.B of which at least 9 credits must be from Category I.B. A student must also earn 9 credits from the Category II list of related disciplines. The courses in Category II may be taken from any combination of areas. A student may not earn a bachelor's degree in mathematics and also a supplementary major in applied mathematics.

Prefix	Title	Credits
Requirements		
Category I.A.		
Select two from the following:		6
MATH 3140	Introduction to Numerical Methods	
MATH 3160	Introduction to Ordinary Differential Equations	
STAT 3110	Statistics for Engineers and Scientists	
Category I.B.		
Select three from the following:		9
MATH 3110	Introduction to Modern Algebra	
MATH 3120	Introduction to Analysis	
MATH 4320	Logic and Set Theory	
MATH 4310	Introduction to Topology	
MATH 4210	Complex Variables	
MATH 4220	Fourier Series and Boundary Value Problems	
MATH 4230	Applied Linear Algebra	
STAT 4210	Probability: Theory and Applications	
STAT 4220	Statistics: Theory and Applications	
Category II		
Select 9 credits from the following Related disciplines:		9
C E 315	Structural Analysis	
C E 331	Fluid Mechanics and Hydraulics	
C E 356	Fundamentals of Environmental Engineering	
C E 382	Hydraulic and Hydrologic Engineering	
CSCI 3720	Data Structures and Algorithms	
CSCI 4410	Computer Graphics I	
CSCI 4305	Bioinformatics	
CSCI 4215	Parallel Programming	
CHME 305	Transport Operations I: Fluid Flow	
CHME 306	Transport Operations II: Heat and Mass Transfer	
CHME 412	Process Dynamics and Control	
CHME 441	Chemical Kinetics and Reactor Engineering	
CHEM 433	Physical Chemistry I	
CHEM 456	Inorganic Structure and Bonding	
ECON 405	Introductory Econometrics	
ECON 457	Mathematical Economics	
ECON 498	Independent Study (with approval)	
E E 395	Introduction to Digital Signal Processing	
E E 473	Introduction to Optics	
E E 475	Control Systems Synthesis	
E E 496	Introduction to Communication Systems	
E E 497	Digital Communication Systems I	
BFIN 355	Investments	
BFIN 385	Analysis of Financial Markets and Institutions	
BFIN 453	Investment Analysis	
I E 365	Quality Control	
I E 413	Engineering Operations Research I	
I E 423	Engineering Operations Research II	
I E 460	Evaluation of Engineering Data	
I E 466	Reliability	
M E 332	Vibrations	
M E 333	Intermediate Dynamics	
M E 338	Fluid Mechanics	
M E 341	Heat Transfer	
PHYS 395	Intermediate Mathematical Methods of Physics	
PHYS 451	Intermediate Mechanics I	
PHYS 454	Intermediate Modern Physics I	
PHYS 455	Intermediate Modern Physics II	
PHYS 461	Intermediate Electricity and Magnetism I	
PHYS 462	Intermediate Electricity and Magnetism II	
PHYS 476	Computational Physics	
PHYS 480	Thermodynamics	
PHYS 485	Independent Study	
PHYS 495	Mathematical Methods of Physics I	
SUR 351	Spatial Data Adjustment I	
SUR 451	Spatial Data Adjustment II	
SUR 461	GNSS Positioning	
CSCI 5510	Automata, Languages, Computability [1]	
CSCI 5505	Analysis of Algorithms [1]	
Total Credits		**24**

[1] Student must be eligible to take 500-level courses.

Mathematics - Undergraduate Minor

A student must pass 18 or more credit hours in MATH and STAT courses, with at least 9 of the credits in upper division courses completed at NMSU and three of those 9 credits in courses numbered above 400.

Prefix	Title	Credits
Requirements		
Select 18 credits or more in MATH and STAT courses, with at least 9 of the credits in upper division courses and three of those 9 credits in courses numbered above 400: [1]		18
The following courses are excluded from the minor:		
Courses numbered below MATH 1350G		
MATH 2134G	Fundamentals of Elementary Math II	
MATH 2992	Directed Study	
MATH 3997	Directed Readings	
MATH 4991	Undergraduate Research	

MATH 4997	Directed Reading	
STAT 400	Undergraduate Research	
At most one can be selected from the following:		3
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
STAT 3110	Statistics for Engineers and Scientists	
Total Credits		**18**

[1] MATH 4996 Special Topics must be approved by the department for credit toward the minor. Any course taught outside the Department of Mathematical Sciences but cross-listed with a MATH or STAT course, must also be approved by the department for credit toward the minor. A student may not earn a bachelor's degree in mathematics or a supplementary major in applied mathematics and also earn a minor in mathematics.

Military Science

Undergraduate Program Information

The Military Science program leads to a commission as an officer in the Army Reserve, National Guard or Active Duty Army. The program consists of four parts:

1. the student's academic major,
2. nondepartmental courses of value to the military service,
3. courses in military science and
4. a six-week Leader Development and Assessment course.

The department offers a four-year program divided into two parts: the basic course (two years) and the advanced course (two years). Selected students may qualify for the two-year program with prior military service or successful completion of a six-week summer Leaders' Training Course. Financial assistance and scholarships are available for qualified individuals. Students should contact the Department of Military Science to obtain additional information.

Requirements

Courses should be taken in sequence, normally one per semester. The student's Military Science advisor will recommend course sequence. Military Science students must sign up for and attend courses plus laboratories. Departmental requirements may not be taken S/U.

Prefix	Title	Credits
Basic Course Freshman		
M SC 110	Introduction to Military Science	2
M SC 111	Introduction to Leadership	2
Basic Course Sophomore		
M SC 210	Self/Team Development	3
M SC 211	Leadership in Action and Team Building	3
M SC 225	Directed Studies	1-3
Advanced Course Junior		
M SC 310	Leading Small Organizations I	3
M SC 310 L	Leading Small Organizations I Lab	1
M SC 320	Leading Small Organizations II	3
M SC 320 L	Leading Small Organizations II Lab	1
M SC 325	Advanced Directed Studies	1-3
M SC 350	Cadet Summer Training Advanced Course	3
Advanced Course Senior		
M SC 401	Leadership Challenges and Goal Setting	3
M SC 401 L	Leadership Challenges and Goal Setting Lab	1
M SC 402	Transition to Lieutenant	3
M SC 402 L	Transition to Lieutenant Lab	1
M SC 425	Practicum	1-4
Nondepartmental Requirements		
Select one course in Military History to meet Professional Military Education requirements. [1]		3
Total Credits		**35-42**

[1] See your Military Science advisor for specific courses.

Minors for the Department

- Military Science - Undergraduate Minor (p. 878)

LTC Christopher Beckwith, Department Head

Assistant Professor of Military Science: Major Joshua Campbell; **Military Science Instructors**: SFC Wendell Carter; MSG Justin Spangler **National Guard Liaisons**: SSG Christian Aguirre; **Logistics Technician**: Mr. Raul Guerrero: **Human Resources Assistant**: Mr. Julian Ramos; **Event Planner Senior**: Mrs. Monica Dunivan

Military Science Courses

MLSL 1110. Introduction to Army Leadership
2 Credits (1+1,2P)
This course provides an introduction to the Army and basic Soldier skills. Students receive an introduction to the Army Profession and examine what it means to be a professional in the U.S. Army. The overall focus is on developing fundamental knowledge and comprehension of the Army Leadership Requirements Model (ALRM) while understanding the Reserve Officers' Training Corps (ROTC) program, its purpose in the Army, and its advantages for the student. Students also begin learning map reading and land navigation.
Learning Outcomes
1. Identify and describe the Army leader attribute and competency categories described in the Army Leadership Requirements Model.
2. Analyze and demonstrate methods for creating and sustaining an organizational climate of trust, ensuring all individuals are treated with dignity and respect.
3. Develop and implement plans for prioritizing, planning, preparing, executing, evaluating, and assessing training within a military context.
4. Apply critical and creative thinking to solve problems and make decisions in Army scenarios.

MLSL 1110L. Introduction to Army Leadership I Laboratory
1-3 Credits (1-3)
In this weekly lab, students will apply initial instruction from MLSL 1110 on fieldcraft, first aid, and team building. The lab will be facilitated by MS III Cadets and supervised by MS IV's and cadre.
Learning Outcomes
1. Demonstrate proficiency in individual Soldier skills such as fieldcraft and first aid through practical exercises and assessments.
2. Explain and practice Army customs and courtesies in various scenarios, demonstrating appropriate behavior and respect.
3. Execute team, squad, and platoon movements, showcasing knowledge of tactical formations and commands.

MLSL 1120. Introduction to Army Leadership II
2 Credits (1+1,2P)
This course introduces students to the personal challenges and competencies that are critical for effective leadership. Students learn how to develop personal life skills such as critical thinking, time management, goal setting, and communication. Students learn the basics of the communication process and the importance for leaders to develop the essential skills to effectively communicate in the Army.
Learning Outcomes
1. Identify and describe the Army leader attribute and competency categories as outlined in the Army Leadership Requirements Model.
2. Demonstrate methods for creating and sustaining an organizational climate of trust in which all individuals are treated with dignity and respect.
3. Develop plans for prioritizing, planning, preparing, executing, evaluating, and assessing training within a military context.
4. Apply critical and creative thinking skills to solve problems and make decisions in Army scenarios.

MLSL 1120L. Introduction to Leadership Lab
1 Credit (1P)
Planning, coordination, execution and evaluation of training and activities in a collaborative training environment with both basic and advanced course students from within the ROTC program. Students develop and refine leadership skills in positions of responsibility. Restricted to Las Cruces campus only.
Prerequisite: MLSL 1110.
Learning Outcomes
1. Leadership Development: Demonstrate an understanding of leadership theories and principles, Apply leadership skills in a real-world context Reflect on personal leadership strengths and areas for growth.
2. Effective Communication: Develop effective communication skills to peers, cadre, and instructors, Foster positive and open communication, Demonstrate the ability to adapt to constructive feedback and guidance.
3. Reflective Practice: Engage in reflective practice to assess personal growth and learning throughout the course, Identify strategies for continuous improvement in leadership skills.
4. Teamwork and Collaboration: Collaborate effectively within the ROTC cadet cohort, Work as a team to address challenges and enhance the ROTC program.
5. Time Management and Goal Setting: Learn time management techniques, Learn and apply study skills, Learn to develop SMART goals and implement plans to achieve them.

MLSL 1129. Introduction to Military Fitness I
2 Credits (2)
This course provides a hands-on overview of the fitness requirements needed to serve in the U.S. Army. Students are introduced to, and expected to complete exercises and routines to build their individual strength, endurance, and speed to meet the demands of training and Soldier tasks.
Learning Outcomes
1. Identify and describe the key physical requirements for successful service in the U.S. Army.
2. Complete the Army Combat Fitness Test (ACFT) and achieve a passing score.
3. Complete the Combat Water Survival Test (CWST) and achieve a passing score.

MLSL 1130. Introduction to Military Fitness II
2 Credits (2P)
This course provides a hands-on overview of the fitness requirements needed to serve in the U.S. Army. Students are introduced to and expected to complete exercises and routines to build their individual strength, endurance, and speed to meet the demands of training and Soldier tasks.
Learning Outcomes
1. Describe the physical requirements for service in the U.S. Army.
2. Pass the Army Combat Fitness Test (ACFT).
3. Pass the Combat Water Survival Test (CWST).

MLSL 2110. Foundations of Army Leadership I
3 Credits (2+1,2P)
This course focuses on leadership and ethics. The course adds depth to the Cadets knowledge of the different leadership styles. Cadets will conduct a leadership analysis of famous leaders and self-assessment of their leadership style. The Army Profession is presented through understanding Culture Awareness, Values, Ethics, and how to apply both to different situations they may encounter as a leader. Army Values and Ethics and their relationship to the Law of Armed Conflict (LOAC) and philosophy of military service are presented through video clips and historical vignettes followed small group discussions with cadets.
Learning Outcomes
1. Apply the Army leader attributes and competency categories described in the Army Leadership Requirements Model.
2. Design and implement strategies for creating and sustaining an organizational climate of trust in which all individuals are treated with dignity and respect.
3. Develop a systematic approach to prioritizing, planning, preparing, executing, evaluating, and assessing training exercises and demonstrate their execution.
4. Use critical and creative thinking skills to analyze historical leaders and develop a personal leadership philosophy.

MLSL 2110L. Foundations of Army Leadership I Laboratory
1,3 Credits (1,3P)
Planning, coordination, execution and evaluation of training and activities in a collaborative training environment with both basic and advanced course students from within the ROTC program. Students develop and refine leadership skills in positions of responsibility. Restricted to Las Cruces campus only.
Learning Outcomes
1. Demonstrate proficiency in individual Soldier skills.
2. Apply Army customs and courtesies.
3. Demonstrate effective team, squad, and platoon movement drills by conducting exercises and adhering to tactical procedures.

MLSL 2120. Foundations of Army Leadership II
3 Credits (2+1,2P)
This course focuses on Army doctrine and decision-making. The course begins with analytical techniques, creative thinking skills, and the Army problem-solving process related to situations faced by leaders when making decisions. Troop Leading Procedures (TLPs) and Operations Orders (OPORDs) will lead Cadets to understand Army Doctrine and Symbology. Squad tactics will be covered in classes on Offensive Operations and Defensive Operations inside of the Army's operating environmental concept of Multidomain Operations.

Learning Outcomes

1. Apply the Army leader attribute and competency categories from the Army Leadership Requirements Model by demonstrating their integration into various leadership plans.
2. Implement strategies to create and sustain an organizational climate of trust by developing plans that promote dignity and respect for all individuals.
3. Develop and apply an approach to prioritizing, planning, preparing, executing, evaluating, and assessing training by creating and demonstrating successful exercise plans in a practical setting.
4. Demonstrate critical and creative thinking to analyze complex decision-making scenarios related to Army doctrine and tactics, develop solutions, and present a decision-making strategy that addresses the challenges of Multidomain Operations, Offensive Operations, and Defensive Operations.

MLSL 2120L. Foundations of Army Leadership II Lab
1 Credit (1,3P)
Cadets apply their knowledge outside the classroom in hands-on performance-oriented environments during the weekly lab, which is facilitated by MS III Cadets and supervised by MSIVs and cadre.
Prerequisite: MLSL 2120.
Learning Outcomes

1. Demonstrate proficiency in individual Soldier skills by successfully executing practical exercises as assessed by MS IVs and cadre.
2. Apply Army customs and courtesies in various lab scenarios and perform protocols correctly.
3. Coordinate team, squad, and platoon exercises by leading these exercises in a lab setting and adhering to tactical procedures.

MLSL 2129. Foundations of Military Fitness I
2 Credits
This course provides a hands-on overview of the fitness requirements needed to serve in the U.S. Army. Students are introduced to, and expected to complete exercises and routines to build their individual strength, endurance, and speed to meet the demands of training and Soldier tasks.
Learning Outcomes

1. Summarize the physical requirements for service in the US Army.
2. Pass the Army Combat Fitness Test (ACFT).
3. Pass the Combat Water Survival Test (CWST).

MLSL 2130. Foundations of Military Fitness II
2 Credits (2P)
This course provides a hands-on overview of the fitness requirements needed to serve in the U.S. Army. Students are introduced to and expected to complete exercises and routines to build their individual strength, endurance, and speed to meet the demands of training and Soldier tasks.
Learning Outcomes

1. Summarize the physical requirements for service in the United States Army.
2. Pass the Army Combat Fitness Test (ACFT).
3. Pass the Combat Water Survival Test (CWST).

MLSL 2992. Directed Studies in Military Science
1-3 Credits
Independent projects conducted under the direction of designated faculty.

Learning Outcomes

1. Identify and articulate key concepts and theories relevant to the specific topic of study by preparing a comprehensive research paper, report, portfolio, or presentation that synthesizes current knowledge and insights.

MLSL 3103. Recent American Military History
3 Credits (3)
History explains the present and informs the future. We will cover America's major military engagements from the Colonial Period to today's headlines. Whatever challenges you encounter as a leader – conflict resolution, resource limitations, teamwork deficiencies – leaders who served before you confronted many of the same issues. You can draw from their experiences to create your own solution. History teaches that while we may learn from our mistakes, it is generally much less painful to learn from the mistakes of others.
Learning Outcomes

1. Describe the military's role in society.
2. Examine the evolution of war and the progression of military professionalism.
3. Analyze the major wars fought by the US Army, using the Principles of War.
4. Discuss the role of the US military in joint operations.
5. Discuss the role of the US Army in humanitarian operations and nation-building at home and abroad.
6. Analyze lessons learned from military history to the Contemporary Operating Environment.

MLSL 3110. Leading Small Organizations I
3 Credits (3)
Part of the Senior ROTC Advanced Course, this course provides a Focus on training management and the warfighting functions. It is an academically challenging course were Cadets study, practice, and apply the fundamentals of Training Management and how the Army operates through the Warfighting functions. At the conclusion of this course, Cadets will be capable of planning, preparing, and executing training for a squad conducting small unit tactics. Includes one lab meeting per week using peer facilitation overseen by MSL IV, supervised by ROTC Cadre and three physical fitness sessions per week. Students must meet Basic Course of Military Science requirements to enroll in this course.
Corequisite: MLSL 3110L.
Learning Outcomes

1. Demonstrate an understanding of leadership theories and principles.
2. Foster positive and open communication.
3. Engage in reflective practice to assess personal growth and learning throughout the course.
4. Collaborate effectively within the ROTC cadet cohort.
5. Develop effective communication skills to peers, cadre, and instructors.
6. Apply leadership skills in a real-world context Reflect on personal leadership strengths and areas for growth.
7. Demonstrate the ability to adapt to constructive feedback and guidance.
8. Identify strategies for continuous improvement in leadership skills.
9. Work as a team to address challenges and enhance the ROTC program.

MLSL 3110L. Leading Small Organizations I Lab
1 Credit (1,3P)

Planning, coordination, execution and evaluation of training and activities with advance course students and ROTC program. Students develop and refine leadership skills in positions of responsibility. Open only to students taking MLSL 3110.
Corequisite(s): MLSL 3110.
Learning Outcomes

1. Collaborate effectively within the ROTC cadet cohort.
2. Demonstrate an understanding of leadership theories and principles.
3. Apply leadership skills in a real-world context Reflect on personal leadership strengths and areas for growth.
4. Develop effective communication skills to peers, cadre, and instructors.
5. Foster positive and open communication.
6. Demonstrate the ability to adapt to constructive feedback and guidance.
7. Engage in reflective practice to assess personal growth and learning throughout the course.
8. Identify strategies for continuous improvement in leadership skills.
9. Work as a team to address challenges and enhance the ROTC program.

MLSL 3120. Leading Small Organizations II
3 Credits (3)
Part of the Senior ROTC Advanced Course, this course provides a focus on applied leadership in small unit operations. Cadets will be capable of planning, coordinating, navigating, motivating and leading a platoon in the execution of a mission. This includes one lab meeting per week using peer facilitation overseen by MSL IVs, supervised by ROTC Cadre and three physical fitness sessions per week. Successful completion of this course is a requirement to Cadet Summer Training Advance Camp during the summer, at Fort Knox, KY. Successful in completion of this course is a requirement to attend Summer Camp or Advanced Camp during the summer.
Prerequisite: MLSL 3110.
Corequisite: MLSL 3120L.
Learning Outcomes

1. Focus on applied leadership in small unit operations.
2. Cadets study, practice, and apply the fundamentals of direct level leadership and small unit tactics at the platoon level.
3. Cadets will be capable of planning, coordinating, navigating, motivating and leading a platoon in the execution of a mission.

MLSL 3120L. Leading Small Organizations II Lab
1 Credit (1,3P)
Practice and refinement of leadership skills. Different roles assigned for students at different levels in the program. Planning, coordination, execution and evaluation of training and activities with advance course students and ROTC program. Open to students taking MLSL 3120.
Corequisite: MLSL 3120.
Learning Outcomes

1. Leadership Development: Demonstrate an understanding of leadership theories and principles, Apply leadership skills in a real-world context Reflect on personal leadership strengths and areas for growth.
2. Effective Communication: Develop effective communication skills to peers, cadre, and instructors, Foster positive and open communication, Demonstrate the ability to adapt to constructive feedback and guidance.
3. Reflective Practice: Engage in reflective practice to assess personal growth and learning throughout the course, Identify strategies for continuous improvement in leadership skills.
4. Teamwork and Collaboration: Collaborate effectively within the ROTC cadet cohort, work as a team to address challenges and enhance the ROTC program.
5. Time Management and Goal Setting: Learn time management techniques, Learn and apply study skills, Learn to develop SMART goals and implement plans to achieve them.

MLSL 3129. Military Fitness III
2 Credits (2)
A general program that focuses on activities and principles that promote physical fitness, achieve and maintain athletic prowess, and accomplish related research and service goals. Includes instruction in human movement studies, motivation studies, rules and practice of specific sports, exercise and fitness principles and techniques, basic athletic injury prevention and treatment, and organizing and leading fitness and sports programs.
Prerequisite: MLSL 2229.
Learning Outcomes

1. Demonstrate an understanding of leadership theories and principles.
2. Work as a team to address challenges and enhance the ROTC program.
3. Collaborate effectively within the ROTC cadet cohort.
4. Identify strategies for continuous improvement in leadership skills.
5. Engage in reflective practice to assess personal growth and learning throughout the course.
6. Demonstrate the ability to adapt to constructive feedback and guidance.
7. Foster positive and open communication.
8. Develop effective communication skills to peers, cadre, and instructors.
9. Apply leadership skills in a real-world context Reflect on personal leadership strengths and areas for growth.

MLSL 3130. Remember Bataan
2 Credits (2)
This will be a history course that explores the impacts of WWII on the state of New Mexico, with a particular emphasis on the Battle of Bataan. This course will incorporate a few different approaches to achieve the desired learning objectives listed below. 1) Historical Approach: The traditional lecture-based approach to history will be utilized to cover some of the course content. Two texts will largely inform the discussion: Dorothy Cave's Beyond Courage and It Tolled for New Mexico by Eva Matson. 2) Living History: Examining living history artifacts that exist throughout the state; discussions with families of survivors; discussions about what the legacy of Bataan means to today's society. 3) Service-based learning: This is an educational approach that integrates meaningful community service with academic learning. In a service-based learning course, students engage in hands-on experiences that address real community needs while reflecting on and applying academic concepts. The goal is to enhance students' understanding of course content, develop their civic responsibility, and foster a sense of social awareness. Only one module of the course will be devoted to this style of learning. Instructors will steer students towards volunteering with the Remember Bataan Foundation, volunteering at White Sands Missile Range to support the Bataan Memorial Death March, or designed and implementing their own community service initiative in close

coordination with and incorporating guidance from the instructors if they decide to go this third route. May be repeated up to 8 credits.

Learning Outcomes

1. Understanding the Context of World War II: Define the key events and factors that led to the outbreak of World War II, explain the geopolitical and economic situation of New Mexico before the war.
2. Analyzing New Mexico's Role in the War Effort: Assess the contributions of New Mexico to the war effort, including the development of the Manhattan Project and the establishment of military bases.
3. Examining Social Changes on the Home Front: Describe the social and economic changes that occurred in New Mexico during World War II, analyze the impact of wartime policies on women, minorities, and everyday life in the state.
4. Exploring the Battle of Bataan: Summarize the key events and significance of the Battle of Bataan, evaluate the role of New Mexican units and individuals in the battle.
5. Examining the Experiences of POWs and Veterans: Explore the experiences of New Mexican soldiers as prisoners of war in Bataan, analyze the challenges faced by veterans upon their return to New Mexico and their integration into post-war society.
6. Assessing Economic and Technological Changes: Evaluate the economic boom in New Mexico after World War II, examine the technological advancements that occurred and their long-term effects on the state.
7. Analyzing the Legacy and Commemoration: Assess how the Battle of Bataan is memorialized in New Mexico, analyze the lasting impact of World War II on the state and its modern perspectives.
8. Research and Communication Skills: Conduct independent research on specific aspects of New Mexico's history during World War II, communicate findings effectively through written assignments and discussions.
9. Critical Thinking and Synthesis: Apply critical thinking skills to analyze historical sources and perspectives, synthesize information to form well-reasoned arguments about the impact of World War II on New Mexico. 1
10. Cultural Competency: Recognize and appreciate the diverse contributions of individuals from different backgrounds in New Mexico during World War II, understand the cultural implications of wartime experiences on various communities within the state.

MLSL 3992. Advanced Directed Studies
1,3 Credits (1,3)

Directed individual study of advanced subjects under the guidance of ROTC Instructors.

Learning Outcomes

1. Demonstrate an understanding of leadership theories and principles.
2. Demonstrate the ability to adapt to constructive feedback and guidance.
3. Engage in reflective practice to assess personal growth and learning throughout the course.
4. Identify strategies for continuous improvement in leadership skills.
5. Collaborate effectively within the ROTC cadet cohort.
6. Work as a team to address challenges and enhance the ROTC program.
7. Foster positive and open communication.
8. Develop effective communication skills to peers, cadre, and instructors.
9. Apply leadership skills in a real-world context Reflect on personal leadership strengths and areas for growth.

MLSL 3999. Cadet Summer Training Advanced Course
3 Credits (3)

Advanced Camp is a 31-day training event which takes place at Fort Knox, KY. Cadets are mentally and physically tested during a 12-day consequence driven field training exercise that replicates a combat training center rotation. Successful completion of the Advanced Camp is a requirement for commissioning. Each cadet will be evaluated during the time they are at Advanced Camp.

Prerequisite: MLSL 3110, MLSL 3110L, MLSL 3120, MLSL 3120L.

Learning Outcomes

1. Designed for the cadet to demonstrate proficiency to the Advanced Camp Instructor.
2. Cadets are evaluated on their ability to lead at the Squad and Platoon levels, both in garrison and tactical environments.
3. Assess a Cadet's ability to demonstrate proficiency in basic officer leadership tasks.

MLSL 4110. Leadership Challenges and Goal Setting
3 Credits (3)

Part of the Senior ROTC Advanced Course, this course provides a focus on development of the Army Officer. It is an academically challenging course were Cadets develop knowledge, skills, and abilities to plan, resource, and assess training at the small unit level. Cadets also learn about Army programs that support counseling subordinates and evaluating performance, values and ethics, career planning, and legal responsibilities. At the conclusion of this course, Cadets will be familiar with how to plan, prepare, execute, and continuously assess the conduct of training at the company or field grade officer level. Includes a lab per week overseeing MSL IV lesson facilitation and supervised by ROTC Cadre and three physical fitness sessions per week.

Prerequisite: MLSL 3120.

Corequisite: MLSL 4110L.

Learning Outcomes

1. Leadership and the Army Profession: Proficiency in creating and sustaining an organizational climate of trust in which all individuals are treated with dignity and respect, Proficiency in the Army leader attribute and competency categories described in the Leadership Requirements Model, Proficiency in developing others (i.e. setting conditions, creating opportunity, providing feedback, and enhancing learning) across the institutional, operational, and self-development domains, Proficiency as an Army professional who embraces the Army's culture of service, instills discipline, and lives the Army Values.
2. Mission Command: Proficiency in the principles of mission command, Proficiency in the elements of command and the elements of control, Proficiency in C2 Warfighting Function tasks and employment of the C2 system to generate and apply combat power, Proficiency in the fundamentals of the operations process to enable leaders to understand, visualize, describe, direct, lead, and assess operations, Proficiency in critical creative thinking.
3. Operations: Proficiency in synchronizing all Warfighting Functions in Multi-Domain Operations in support of Joint Operations, Proficiency in understanding the Operational Environment across all domains, Proficiency in sustainment functions supporting Army Operations.
4. Training: Proficiency in prioritizing, planning and preparing, executing, evaluating and assessing training.

MLSL 4110L. Leadership Challenges and Goal Setting Lab
1,3 Credits (1,3P)

Different roles assigned for students at different levels in the program. Practice and refinement of leadership skills. Planning coordination, execution and evaluation of training and activities with basic course students and ROTC program. This course is a leadership lab and its for all MLSL levels of the program as they all work together in getting all of the drills and trainings done with one another.
Corequisite: MLSL 4110.
Learning Outcomes

1. Leadership and the Army Profession: Proficiency in creating and sustaining an organizational climate of trust in which all individuals are treated with dignity and respect, Proficiency in the Army leader attribute and competency categories described in the Leadership Requirements Model, Proficiency in developing others (i.e. setting conditions, creating opportunity, providing feedback, and enhancing learning) across the institutional, operational, and self-development domains, Proficiency as an Army professional who embraces the Army's culture of service, instills discipline, and lives the Army Values.
2. Mission Command: Proficiency in the principles of mission command, Proficiency in the elements of command and the elements of control, Proficiency in C2 Warfighting Function tasks and employment of the C2 system to generate and apply combat power, Proficiency in the fundamentals of the operations process to enable leaders to understand, visualize, describe, direct, lead, and assess operations, Proficiency in critical creative thinking.
3. Operations: Proficiency in synchronizing all Warfighting Functions in Multi-Domain Operations in support of Joint Operations, Proficiency in understanding the Operational Environment across all domains, Proficiency in sustainment functions supporting Army Operations.
4. Training: Proficiency in prioritizing, planning and preparing, executing, evaluating and assessing training.

MLSL 4120. Transition to Lieutenant
3 Credits (3)
The final course within the Senior ROTC Advanced Course, this course is an academically challenging course were Cadets further develop knowledge, skills, and abilities required of junior officers pertaining to the Army in Unified Land Operations and Company Grade Officer roles and responsibilities. This course includes reading assignments, homework assignments, small group assignments, briefings, case studies, practical exercises, a mid-term exam, and an Oral Practicum as the final exam. The Oral Practicum explores the Cadet's knowledge of how they will be prepared for the 20 Army Warfighting Challenges (AWFC) covered throughout the ROTC Advanced Course. Successful completion of this course will assist in preparing Cadets for their BOLC B course following graduation and commissioning. It is a mandatory requirement for commissioning. Includes a lab per week overseeing MSL III lesson facilitation and supervised by ROTC Cadre and three physical fitness sessions per week.
Prerequisite: MLSL 4110.
Corequisite: MLSL 4120L.
Learning Outcomes

1. Leadership and the Army Profession: Proficiency in creating and sustaining an organizational climate of trust in which all individuals are treated with dignity and respect, Proficiency in the Army leader attribute and competency categories described in the Leadership Requirements Model, Proficiency in developing others (i.e. setting conditions, creating opportunity, providing feedback, and enhancing learning) across the institutional, operational, and self-development domains, Proficiency as an Army professional who embraces the Army's culture of service, instills discipline, and lives the Army Values.
2. Mission Command: Proficiency in the principles of mission command, Proficiency in the elements of command and the elements of control, Proficiency in C2 Warfighting Function tasks and employment of the C2 system to generate and apply combat power, Proficiency in the fundamentals of the operations process to enable leaders to understand, visualize, describe, direct, lead, and assess operations, Proficiency in critical creative thinking.
3. Operations: Proficiency in synchronizing all Warfighting Functions in Multi-Domain Operations in support of Joint Operations, Proficiency in understanding the Operational Environment across all domains, Proficiency in sustainment functions supporting Army Operations.
4. Training: Proficiency in prioritizing, planning and preparing, executing, evaluating and assessing training.

MLSL 4120L. Transition to Lieutenant Lab
1,3 Credits (1,3P)
Different roles assigned for students at different levels in the program. Practice and refinement of leadership skills. Planning, coordination, execution, and evaluation of training and activities with basic course students and ROTC program.
Corequisite: MLSL 4120.
Learning Outcomes

1. Leadership and the Army Profession: Proficiency in creating and sustaining an organizational climate of trust in which all individuals are treated with dignity and respect, Proficiency in the Army leader attribute and competency categories described in the Leadership Requirements Model, Proficiency in developing others (i.e. setting conditions, creating opportunity, providing feedback, and enhancing learning) across the institutional, operational, and self-development domains, Proficiency as an Army professional who embraces the Army's culture of service, instills discipline, and lives the Army Values.
2. Mission Command: Proficiency in the principles of mission command, Proficiency in the elements of command and the elements of control, Proficiency in C2 Warfighting Function tasks and employment of the C2 system to generate and apply combat power, Proficiency in the fundamentals of the operations process to enable leaders to understand, visualize, describe, direct, lead, and assess operations, Proficiency in critical creative thinking.
3. Operations: Proficiency in synchronizing all Warfighting Functions in Multi-Domain Operations in support of Joint Operations, Proficiency in understanding the Operational Environment across all domains, Proficiency in sustainment functions supporting Army Operations.
4. Training: Proficiency in prioritizing, planning and preparing, executing, evaluating and assessing training.

MLSL 4129. Military Fitness IV
2 Credits (2)
A general program that focuses on activities and principles that promote physical fitness, achieve and maintain athletic prowess, and accomplish related research and service goals. Includes instruction in human movement studies, motivation studies, rules and practice of specific sports, exercise and fitness principles and techniques, basic athletic injury prevention and treatment, and organizing and leading fitness and sports programs. May be repeated up to 6 credits.
Prerequisite: MLSL 3329.
Learning Outcomes

1. Proficiency in developing others (i.e. setting conditions, creating opportunity, providing feedback, and enhancing learning) across the institutional, operational, and self-development domains.
2. Proficiency in creating and sustaining an organizational climate of trust in which all individuals are treated with dignity and respect.

3. Proficiency as an Army professional who embraces the Army's culture of service, instills discipline, and lives the Army Values.
4. Proficiency in the Army leader attribute and competency categories described in the Leadership Requirements Model.

MLSL 4992. Practicum
1,3 Credits (1,3+1,3P)
Independent projects conducted under the direction of the Professor of Military Science, and concerned with analysis of selected leadership or management problems. Course not eligible for S/U grade.
Learning Outcomes
1. Leadership and the Army Profession.
2. Proficiency in creating and sustaining an organizational climate of trust in which all individuals are treated with dignity and respect.
3. Proficiency as an Army professional who embraces the Army's culture of service, instills discipline, and lives the Army Values.
4. Proficiency in developing others (setting conditions, creating opportunity, providing feedback, and enhancing learning) across the institutional, operational, and self-development domains.
5. Proficiency in the Army leader attribute and competency categories described in the Leadership Requirements Model.

Phone: (575) 646-6856

Website: https://armyrotc.nmsu.edu/

Military Science - Undergraduate Minor

The minor in Military Science is administered by the Department of Military Science (Army ROTC) in the College of Arts and Sciences. To obtain a minor in Military Science a student must complete a total of 19 credits, all of which must be upper division. A grade of C- or better must be obtained for each course. The only credits in which a grade of S will be accepted is MLSL 3999 Cadet Summer Training Advanced Course. Students should contact the Department of Military Science to obtain additional information.

Molecular Biology & Interdisciplinary Life Sciences

Graduate Program Information

Students of the molecular life sciences seek to reduce complex biological processes to a set of understandable molecular or chemical structure and function relationships. Integration of this knowledge into the context of complex living tissues interacting with the environment is the ultimate goal. This requires that the expertise from many diverse traditional disciplines be directed along converging experimental lines. The Ph.D. program in Molecular Biology & Interdisciplinary Life Sciences (MOLB-ILS) is designed to facilitate an interdisciplinary approach to graduate research, utilizing both traditional techniques and the latest advances in biotechnology, including the extraordinary power of recombinant DNA methodology. Participants in this program will take core courses in biochemistry, molecular biology and cell biology. Subsequent course work will be tailored for the individual student, depending upon his or her research emphasis. Participation in regular seminar programs will be expected to provide students with the widest possible scientific background. Financial aid, in the form of a limited number of MB teaching and research assistantships, is available on a competitive basis. Research Assistantships may also be available from individual faculty within the Molecular Biology & Interdisciplinary Life Sciences Graduate Program.

Only the most competitive students are admitted with assistantship support.

The MOLB-ILS program offers curricula leading to the M.S. and Ph.D. degrees in the areas of biochemistry, molecular genetics, molecular biology, cell biology, bioinformatics, and microbiology. Admission to the MOLB-ILS Program without deficiency is based on an undergraduate program essentially equivalent to that pursued by an undergraduate major in chemistry, biology, agronomy, horticulture, biochemistry, or microbiology at this university. An entering student is required to complete the Graduate Record Examination (General Aptitude). Undergraduate deficiency courses must be passed with a minimum grade of B.

Applicants are strongly encouraged to contact at least three individual program faculty before applying to identify a prospective advisor and laboratory in which to pursue graduate research. Previous course records and GPA standings (typically minimum of 3.3/4.0), GRE scores (typically minimum of 300 combined verbal and quantitative), TOEFL scores of foreign applicants (typically minimum of 550 on the paper-based or 213 on the computer-based), a letter of interest from the applicant that identified faculty laboratories of interest, and three letters of reference regarding research performance or potential are weighted heavily during the selection process.

Students with a B.S. degree in one of the disciplines listed above can expect to earn the MS degree in about 30 credits, including at least 6 credits of thesis research. The Ph.D. degree can be earned in about 30 to 40 credits of formal course work, plus additional thesis research credits, for a minimum total of 75 credits beyond the B.S. because research is central in both the M.S. and Ph.D. curricula, early selection of a research advisor is required.

Ph.D. degree candidates will successfully complete a written and oral qualifying examination based on their proposed research and the subject matter in the core courses (below) at the end of the first year of study. Also at this time, the master's or doctoral committee is organized to assist in planning a program appropriate to the background and goals of the student. Ph.D. candidates will subsequently complete a comprehensive written examination and oral examination approximately at the end of the second year of study. A final, formal presentation and oral defense of the original research documented in the M.S. or Ph.D. thesis completes the degree requirements.

Master Degree(s)

- Molecular Biology - Master of Science (p. 175)

Doctoral Degree(s)

- Molecular Biology - Doctor of Philosophy (p. 231)

Minors

- Bioinformatics (with Computer Science) - Graduate Minor (p. 254)
- Molecular Biology - Graduate Minor (p. 259)
- Molecular Biology- Undergraduate Minor (p. 880)

A. Ashley, Ph.D. (Colorado State University)– Department of Chemistry and Biochemistry– cellular response to DNA replication stress and damage; maintenance of genomic integrity in eukaryotes; R. Ashley, Ph.D. (Colorado State University)– Department of Animal and Range Sciences– progesterone¹s actions mediated by membrane receptors, and chemokines¹ effects in early pregnancy and breast cancer; D.

Bailey, Ph.D., (Cornell)– Department of Biology; S. Belteton, Ph.D. (Purdue University) - Dept of Botany and Plant Pathology - Plant tissue morphogenesis; R. Chinnasamy, Ph.D. (National Chemical Laboratory-Pune, India)– Department of Chemistry and Biochemistry; A. Corcoran, Ph.D. (University of California Los Angeles)– Molecular Biology Program; C. Cramer, Ph.D. (North Carolina State University) – onion breeding and horticulture; R. Creamer, Ph.D., (University of California-Davis)– Department of Entomology Plant and Weed Science– plant virology, fungal endophytes; J. Curtiss, Ph.D. (University of Colorado-Boulder)– Department of Biology– molecular genetics of eye development; S. Fuentes-Soriano, Ph.D. (University of Missouri-Saint Louis)– Department of Animal and Range Science–; I. Guzman, Ph.D. (New Mexico State University)– Department of Plant and Environmental Sciences; K. A. Hanley, Ph.D. (University of California San Diego)– Department of Biology– emerging vector-borne viruses; I. Hansen, Ph.D. (University of Wurzburg, Germany)– Department of Biology– molecular vector biology; S. Hanson (Wisconsin)– Department of Entomology Plant and Weed Science– viral plant pathogens; J. Hernandez Gifford, Ph.D. (Washington State University)– Department of Animal and Range Sciences– reproductive physiology; O. Holguin, Ph.D. (New Mexico State University)– Department of Plant and Environmental Sciences– biochemistry including etabolomics and proteomics with a focus on chemical analysis technique; J. Houston, Ph.D. (Texas A&M University)– Department of Chemical & Materials Engineering– biomedical engineering, flow cytometry, fluorescence dynamics, biophotonics, and instrumentation development; K. Houston, Ph.D. (University of Texas)– Department of Chemistry and Biochemistry– hormonal carcinogenesis; G. Lopez-Martinez, Ph.D. (Ohio State University)– Department of Biology– short and long-term effects that single and repeated bouts of environmental stress can have on animals; D.N. Lozada, Ph.D. (University of Arkansas)– Department of Plant and Environmental Sciences; S. Lusetti, Ph.D. (University of Wisconsin-Madison)–Department of Chemistry and Biochemistry– DNA replication, recombination and repair; B.G. Milligan, Ph.D. (University of California-Davis)– Department of Biology– plant evolutionary biology; N. Pietrasiak, Ph.D. (University of California-Riverside– Department of Plant and Environmental Sciences– cyanobacterial phylogenetics, molecular ecology of terrestrial algae, biocrusts; J. Randall, Ph.D., Program Director (New Mexico State University)– Department of Entomology Plant and Weed Science– molecular plant physiology, genetics, and plant/microbe interactions; I. Ray, Ph.D. (Wisconsin-Madison)– Department of Plant and Environmental Sciences– plant genetic engineering, primary and secondary metabolism, stress, legumes; L. Rodriguez-Uribe, Ph.D. (New Mexico State University)– Department of Plant and Environmental Sciences; A. Romero-Olivares, Ph.D. (University of California Irvine)- Department of Biology- impacts to our ecosystems; E. E. Serrano, Ph.D. (Stanford)– Department of Biology– neuroscience, genetics, science and ethics; C. B. Shuster, Ph.D., (Tufts University)– Department of Biology– regulation of mitosis and cytokinesis, role of the cytoskeleton during early development; G. Smith, Ph.D. (North Carolina State)– Department of Biology-environmental gene probes, microbial biodegradation; J. Song, Ph.D. (Washington)– statistical computing, systems biology, bioinformatics, computer vision; P. Trainor, Ph.D. (University of Louisville)– Department of Economics, Applied Statistics and International Business; J. Xu, Ph.D. (Second Military Medical University, China)– Department of Biology– functional genomics and population genetics of mosquito-malaria interactions; E. Yukl (Oregon Health and Science University) - Department of Chemistry and Biochemistry– structural biology and bioinorganic chemistry

Molecular Biology Courses

MOLB 448. Special Research Problems
1-3 Credits
Individual investigation, theoretical or experimental, under the supervision of a molecular biology faculty member. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

MOLB 520. Molecular Cell Biology
3 Credits (3)
Same as BIOL 520.

MOLB 542. Biochemistry I
3 Credits (3)
Same as BCHE 542. B or better required.

MOLB 545. Molecular and Biochemical Genetics
3 Credits (3)
Same as BCHE 545 and BIOL 545.

MOLB 546. Biochemistry II
3 Credits (3)
Same as BCHE 546.

MOLB 550. Topics in Molecular Biology
1-3 Credits
Selected topics of current interest in field of molecular biology for master's level students. May be repeated up to 12 credits.
Learning Outcomes
1. Learning goals are dependent upon topic and instructor.

MOLB 590. Discussions in Molecular Biology
1 Credit (1)
Oral presentations of ongoing research and/or research proposal for the masters thesis. Must be repeated twice for masters and a minimum of three times for doctoral students. May be repeated up to 4 credits.
Learning Outcomes
1. To expose students to the fundamentals of speaking, including organization, and listening.
2. To understand and gain practice oral presentations.
3. Encourage critical thinking and discussion of scientific material during presentations.

MOLB 597. Laboratory Rotations/Research Discussions
1-3 Credits
All entering students are required to take at least one credit, during their first semester, in which they will circulate through at least three different labs working on assigned problems and discussing research programs. May be repeated for a maximum of 4 credits. Graded S/U.

MOLB 598. Special Research Programs
1-3 Credits
Individual investigation, experimental or theoretical, under the supervision of a molecular biology faculty member. Course may be repeated up to a total of 6 credits with committee approval.

MOLB 599. Master's Thesis
1-15 Credits (1-15)
Experimental and scholarly research leading to the preparation of a master's thesis.

MOLB 600. Molecular Biology Research
1-15 Credits
Laboratory research efforts prior to successful completion of doctoral comprehensive exam.

MOLB 650. Advanced Topics in Molecular Biology
1-3 Credits
Discussions and lectures on topics of current interest in molecular biology for doctoral students.

MOLB 698. Advanced Research Projects
1-9 Credits
Individualized special research assignments for doctoral-level students. Up to 9 credits, with approval of committee. Graded S/U.

MOLB 700. Doctoral Dissertation Research
1-15 Credits
Research for doctoral students after completing comprehensive exams.

Name: Molecular Biology & Interdisciplinary Life Sciences Graduate Program

Office Location: W361 Chemistry Building

Phone: (575) 646-3437

Website: http://molb.nmsu.edu

Facebook: https://www.facebook.com/nmsumolbio (https://www.facebook.com/nmsumolbio/)

Molecular Biology- Undergraduate Minor

The Molecular Biology Program offers opportunities for students to gain theoretical training and hands-on experience in the methods of molecular biology, cellular biology, and/or bioinformatics. A formal undergraduate minor in Molecular Biology is offered and is described below; a grade of C or better is required to certify the courses. A minor in Bioinformatics is currently under development; for planning purposes, please refer to the program office for the most recent drafts of the Bioinformatics minor requirements.
This program consists of a minimum of 18 hours, distributed through five or six areas.

Prefix	Title	Credits
Organic Chemistry:		**4-5**
CHEM 314	Organic Chemistry II	
CHEM 315	Organic Chemistry Laboratory	
CHEM 2115	Survey of Organic Chemistry and Laboratory	
Introductory Genetics:		**3**
AGRO 305	Principles of Genetics	
ANSC 305	Principles of Genetics	
BIOL 305	Principles of Genetics	
HORT 305	Principles of Genetics	
Cell Biology:		**3**
BIOL 377	Cell Biology	
BIOL 490	Neurobiology	
Advanced Genetics:		**3**
BCHE 396	Biochemistry II, Lecture and Laboratory	
BIOL 478	Molecular Biology of Microorganisms	
Additional Advanced Courses: [1]		**5**
BIOL 474	Immunology	
BIOL 475	Virology	
BIOL 451	Physiology of Microorganisms	
BIOL 467	Evolution	
BIOL 477	Applied and Environmental Microbiology	
TOX 461	Toxicology I	
Total Credits		**18-19**

[1] Additional credit hours from the following, or additional courses from any of the above five areas, as needed to meet a minimum of 18 credit hours

Successful completion of the minor will be certified by the Molecular Biology Program. A grade of "C" or better is required of all minor courses.

Music

Undergraduate Program Information

MISSION, VISION, AND VALUES STATEMENTS

The mission of the NMSU Music Department is:

- To prepare students for professional careers and/or the pursuit of advanced degrees in music and music-related fields
- To empower our students to be life-long learners by providing a foundational education in music supported by our strong commitment to teaching, performance, scholarship and service
- To provide impactful opportunities for our diverse student body to perform, study, create and experience music
- To serve as an artistic destination for our community at an Hispanic-serving institution in the southwest U.S. border region

Vision Statement: We seek to elevate the role of music as essential to society, both as an expressive art form and an integral component of a universal education.

We will continue to:

- Enhance our public presence in the region as a destination for all students and for the community as a place of artistic and musical excellence
- Lead in the development of adaptive and relevant programs and curricula based on the needs of an ever-changing society
- Raise our profile through outstanding instruction, student success and retention, faculty scholarship and performance, and the engagement of our ensembles with the community, statewide and regionally, and with all students, regardless of major
- Foster a learning environment that recognizes the changing needs and special culture of our community, and promotes diversity and openness in our programs and instruction and in the music we study and perform.

The Department of Music values:

Access – we believe everyone in our community, regardless of background or experience, should have the opportunity to experience music in their lives
Elevation – we believe that by offering superior musical opportunities we can improve the quality of life for students and our community
Inclusion – we believe that individual expression and identity should be reflected in our musical experiences and is vital for both personal and institutional success

Admission into the Program

For a student to be officially accepted as a Music major or minor, he/she must do the following:

- perform an audition for a panel of no less than three Music faculty members
  - one of whom must be the director of his/her program area
  - one of whom must be the applied teacher of the student's principal instrument

Any student declaring Music as his/her major may be accepted for a one-semester probationary period. During that first semester, the Music faculty will determine if the student has the necessary skills and work ethic to continue as a major. The student's course work, ensemble participation and applied jury will be the basis for the decision to allow the student to continue or not.

Departmental Requirements for all Bachelor's Degrees (Music Core)

A student must earn a grade of C- or better in all departmental requirements for any degree in the Department of Music. All students wishing to pursue a music degree must audition. Contact the department for current audition requirements.

If students change major(s) or minor(s) or do not complete the requirements for the minor at the time of graduation, they may only count a maximum of 9 credits of the applied/occupational credits toward graduation.

Recital Requirements for Music Performance and Education Degrees

Bachelor of Music

All performance majors are required to give a half recital (30 minutes of music) in the junior year and a full recital (60 minutes of music) in the senior year.

Bachelor of Music Education

All music education majors will give a half recital (30 minutes of music) in their major performance area.

B.A. Degree Program Information

All B.A. Degree Students must submit and have approved a Program of Study by the end of their Sophomore year. Programs of study will be submitted to the B.A. Degree coordinator and will determine a focus for elective courses and the Capstone Project. The Capstone Project will be derived from the program of study. The B.A. concentration in pre-Speech-Language Pathology does not lead to certification at the undergraduate level.

Applied Music Requirements for All Music Degrees

Music Education and Music Performance degrees require at least two semesters of applied music study at the 430 level. Students pursuing a Bachelor of Arts Degree in Music (any track) must complete at least four semesters of applied music study at the 230 level and at least two semesters at the 330 level. B.A. students may take applied lessons at the 430 level, but it is not a requirement for this degree path.

All students enrolling in applied music will audition and obtain permission from an applied teacher before enrolling for applied music credit.

Students may obtain further information by contacting the music department.

Other Music Requirements, Fees and Regulations

1. A Piano Proficiency Examination is required of all music performance and music education majors. Each student must enroll in Functional Piano or Applied Piano every semester, until the Proficiency is passed. Detailed requirements may be obtained from the Department of Music office. Students must pass the piano Proficiency Exam before presenting a Senior Recital.
2. Qualitative grade-point average for graduation in music is 2.0 or higher. All grades in required music courses must be C- or better.
3. An instrument rental fee is charged each semester for students using university instruments. Consult the music department concerning these fees.
4. All applied students pay an additional fee. Consult the music department concerning these fees.
5. Outside groups and individuals must have special permission to use music department facilities. Contact the music office for additional information.

Music Ensemble

All students majoring or minoring in Music, must enroll and participate in the ensemble appropriate for their particular degree plan. The appropriate ensemble will be determined by degree requirements in consultation with the student's advisor and ensemble directors. The student must enroll each and every semester he/she is considered full-time until the degree requirements are met, for a minimum of 8 semesters (Music Performance), 7 semesters (Music Education), 6 semesters (B.A. Degrees). Any student receiving any kind of financial assistance through the Music Department must enroll each and every semester while he/she is attending NMSU. Music Education Students will not receive Music Scholarship funds during their semester of Student Teaching. For more information, contact the Music Office.

Music Scholarships and Awards

Scholarships and grants for music majors are administered through the performance areas. To be eligible for a music major scholarship or grant, students must first be admitted into the program. Program admission requirements include an audition for a panel of no less than three Music faculty members. One must be the major ensemble director of his/her program area (band, choir, opera, orchestra, keyboard). One must be the applied teacher of the student's principal instrument and the other must be a full-time Music faculty member from any area. Specific audition information and requirements for each performance area can be found on the Auditions page (https://music.nmsu.edu/admissions/auditions.html). (https://theatre.nmsu.edu/auditions/audition-faqs.html)

In order to have all paperwork processed before the beginning of the Fall semester, students are encouraged to have all scholarship and financial aid application materials in to the Office of Financial Aid by March 1.

The most up to date information on scholarships and grants can be obtained from the Coordinator of Scholar Dollar$ in the office of the Dean of Arts and Sciences in Breland Hall.

For more information on any of the following scholarships please call (575) 646-2421 or email music@nmsu.edu.

Service awards for non-majors are available based upon ensemble need and funding availability. For more information regarding these awards or to set up an audition, please contact one of the following:

- **Winds and Percussion:** (575) 646-2304
- **Vocal:** (575) 646-2304
- **Strings:** (575) 646-1647
- **Keyboard:** (575) 646-2228

MUSIC - Master of Music

The Master's degree is designed to help music educators and conductors progress in their professional development, and to help performance or collaborative/performance majors prepare for a career as a professional musician and/or prepare for acceptance to a D.M.A. or other terminal degree program in music.

Graduate Program Information

The Master of Music degree is offered in the following areas of study: Conducting, Music Education and Performance. Applicants are expected to have an undergraduate degree in music or music education equivalent to that represented by the BM or BME degree from New Mexico State University. The music department does not require the Graduate Record Exam, but does expect each applicant to possess graduate-level language and writing skills. For admission into the Master of Music degree program, all applicants must have an undergraduate GPA of at least 3.0 and submit at least two letters of recommendation from music professionals. An audition, either in person or by recording, is required for entrance into the Performance or Conducting programs. Auditions will be based upon, but not limited to, prescribed repertory.

For acceptance into the Music Education program, the applicant must have completed a Bachelor of Music Education degree comparable to the one offered by NMSU or take the requisite undergraduate courses at NMSU leading to state licensure before enrolling in graduate courses. (Contact the Music Department for details.)

Note: The degree offered is a Master of Music. The student's official transcript and diploma will only indicate that degree. The area of study (Conducting, Music Education, Performance, Piano Collaborative/ Performance) will not be included as part of the official degree title.

Recital Requirements for Performance and Conducting

A graduate recital plus an analytical paper are required of all candidates in Performance and Conducting. Students must be enrolled in their applied area during the semester the recital is given. A minimum of 60 minutes of music is required for all Performance recitals. A minimum of three major works for the appropriate ensemble is required for all Conducting recitals. The recital may only be given after at least 6 hours of graduate applied or conducting courses have been successfully completed.

Program of Study and Committee Selection

After admission, each student must successfully complete MUSC 471 Graduate Theory Review before subsequent enrollment in other music theory courses. He or she must also successfully complete MUSC 477 Graduate Music History Review before subsequent enrollment in other music history courses.

During the first semester of study, a tentative Program of Study is planned, documented and filed by the student in consultation with the advisor in his or her major field. The Program of Study is subject to approval by the Music Department Head and the Graduate Music Committee. The student will also select, in consultation with his or her advisor, an advisory committee consisting of the advisor, and two additional faculty members.

Candidacy

In order to qualify for candidacy the student (except those in the online Music Education program) must meet the Graduate School requirement of 12 credits of graduate work in residence and must show evidence of a satisfactory quality of work in the required courses, demonstrate the desired progress in his or her performance area and, where required, submit a recital program, thesis topic, or project proposal for approval.

Thesis

A thesis is optional in Music Education and is encouraged for students considering completion of a terminal degree. Music Education candidates not writing a thesis must develop and complete an approved project before the oral examination.

Final Examination

All Master of Music candidates must take a final comprehensive oral examination. The final oral examination may not be scheduled until the graduate recital (with analytical paper) is completed or a final draft of the Music Education project or thesis has been approved by the candidate's advisor.

Fees

Fees, in addition to tuition, will be assessed for all applied hours and recitals. (Consult the Music Department for details).

Degrees for the Department

Bachelor Degree(s)

- Music (Instrumental Performance) - Bachelor of Music (p. 901)
- Music (Piano Performance) - Bachelor of Music (p. 903)
- Music (Pre-Speech Language Pathology) - Bachelor of Arts (p. 898)
- Music (Theatre) - Bachelor of Arts (p. 899)
- Music (Vocal Performance) - Bachelor of Music (p. 905)
- Music - Bachelor of Arts (p. 896)
- Music Education (K12 Instrumental) - Bachelor of Music Education (p. 907)
- Music Education (K12 Vocal) - Bachelor of Music Education (p. 909)

Master Degree(s)

- Music (Collaborative Piano) - Master of Music (p. 176)
- Music (Conducting) - Master of Music (p. 177)
- Music (Music Education) - Master of Music (p. 177)
- Music (Music Education) - Master of Music (Online) (https://catalogs.nmsu.edu/global/nmsu-global/music-music-education-mm-online/)
- Music (Performance) - Master of Music (p. 178)

Minors for the Department

- Music - Undergraduate Minor (p. 911)

Professor, Fred Bugbee, Department Head

Professors Shearer, ***Associate Professors*** Daughtrey, Espinoza, Mapp, Martinez-Rios, Smyth, Taylor, Vega-Albela; ***Assistant Professors*** Dalager,

Gerleman, Moore, Mzyk, Shin, Winter; ***College Assistant Professor*** *Arahata, Plominska,* ***College Instructor*** Gunnarson, Neely

F. Bugbee, Department Head, D.M.A. (Eastman School of Music-- percussion, history; Y. Arahata D.M.A. (Eastman School of Music)-- Piano, Collaborative piano, theory; J. Dalager, D.M.A. (Eastman School of Music)-- Trumpet, Jazz Band; S. Daughtrey, D.M. (Indiana University)-- B.A. coordinator, diction, pedagogy, history; *J. Espinoza, M.M. (Carnegie Mellon)-- Philharmonic, Cello, Bass, ear-training; A. Gerleman, D.M.A (Michigan State University)-- Director of Choral Studies; E. Gunnarson, M.M. (New Mexico State University)-- voice, functional piano; M. Mapp (Kansas University)-- Director of Bands, conducting; J. Martinez-Rios, M.M (Western Michigan)-- viola, functional piano; M. Moore, D.M.A. (Kansas University)-- clarinet, woodwind techniques; D. Mzyk, D.M.A. (University of Nevada, Las Vegas)-- Low Brass; S. Neely, M.M. (University of Texas at San Antonio)-- vocal coordinator, opera workshop; M. Plominska (University of Nevada, Las Vegas)-- Flute, Ear Training; J. Shearer, D.M.A. (Eastman School of Music-- graduate coordinator, history; J-W Shin, (University of Illinois at Urbana-Champaign)-- piano, history; Smyth, D.M.A. (Kansas University)- Athletic Bands, music education, Jazz Band; R. Taylor, D.M.A (University of Arizona)-- saxophone, theory; ear-training*; *D. Vega-Albela M.M. (Western Michigan)--Philharmonic, violin; A. Winter, D.M.A. (University of North Texas)-- Horn, music education*

Music Courses

MUSC 1110G. Music Appreciation: Jazz
3 Credits (3)
This course explores the ideas of music in society and its cultural relevance and is designed to increase the students' appreciation of music as well as to enhance their listening skills. Students are introduced to various periods, styles, and composers of music and become acquainted with knowledge and appreciation of Jazz from various cultures and times.
Learning Outcomes
1. Develop a vocabulary of musical terms, and be able to describe music using those terms
2. Demonstrate knowledge of composers, their music and their relationship to historical periods
3. Recognize how music played and plays a political, social, and cultural function
4. Identify well-known pieces and the historical and social context in which they were composed
5. Demonstrate basic understanding of music notation and musical communication

MUSC 1130G. Music Appreciation: Western Music
3 Credits (3)
This course explores the ideas of music in society and its cultural relevance and is designed to increase the students' appreciation of music as well as to enhance their listening skills. Students are introduced to various periods, styles, and composers of music and become acquainted with knowledge and appreciation of Western music from various cultures and times.
Learning Outcomes
1. Develop a vocabulary of musical terms, and be able to describe music using those terms
2. Demonstrate knowledge of composers, their music and their relationship to historical periods
3. Recognize how music played and plays a political, social, and cultural function
4. Identify well-known pieces and the historical and social context in which they were composed
5. Demonstrate basic understanding of music notation and musical communication

MUSC 1210. Fundamentals of Music for Non-majors
3 Credits (3)
A beginning course in the fundamentals of music, this course includes notation, scales, key signatures and intervals. Aural comprehension is introduced through singing intervals, scales and triads and dictating simple rhythmic and melodic patterns and students explore the basic components of music. Traditional Grading with RR.
Learning Outcomes
1. Demonstrate and apply standard notation of pitch, rhythm, scales, intervals, key signatures, triads, and simple melodic and harmonic composition
2. Develop and improve basic aural skills
3. Read musical notation
4. Improve and expand understanding of fundamental musical techniques and concepts

MUSC 1310. Recital Attendance
0.5 Credits (.5+1P)
This course is for music students to attend and participate in a good number of convocation, concert, and recital performances, creating a wider appreciation for the performing arts. May be repeated up to 4 credits. Restricted to: Music and Music Education majors. S/U Grading with RR. Restricted to Las Cruces campus only.
Learning Outcomes
1. Encourage student observation of serious music
2. Provide opportunities for public performances
3. To create a greater sense of community within the student body

MUSC 1410. Introduction to Music Education
2 Credits (2)
This course is an overview of teaching in the music classroom through readings and observations. Students will be introduced to the skills needed to become a reflective educator, develop observation techniques, and demonstrate knowledge of the current state of the profession. Restricted to Las Cruces campus only.
Learning Outcomes
1. Make observations and analyze the current state of musical education in public schools
2. Describe characteristics of good teaching in music
3. Articulate a personal philosophy of music education
4. Reflect on personal strengths and weaknesses as a teacher of music

MUSC 1440. Class Voice I
1 Credit (1)
Group instruction in voice and vocal pedagogy for instrumental Music Education majors, offering basic principles of healthy vocal production with particular attention to diction, development of vocal range, and the ability to impart that knowledge to elementary, junior and/or high school age students. Restricted to: Music Education majors. Traditional Grading with RR. Restricted to Las Cruces campus only.
Learning Outcomes
1. Provide the basic understanding of healthy vocal production. Including, but is not limited to, the following topics: Expanding vocal range; Learning how to practice and learn songs effectively and efficiently; Provide basic understanding of vocal pedagogy; Introduction to diction

2. Aims to equip students with the ability to impart that knowledge to elementary, junior and/or high school age students.

MUSC 1450. Ear Training I
1 Credit (1)
To develop the ability to accurately hear, identify, sing and notate musical elements including rhythm, melody, intervals and harmony Traditional Grading with RR. Restricted to Las Cruces campus only. May be repeated up to 1 credit.
Learning Outcomes
1. Counting rhythms at sight using the Eastman Counting System.
2. Singing melodies at sight using solfege syllables.
3. Writing out rhythmic patterns.
4. Writing out melodic patterns.
5. Identifying and singing intervals.
6. Identifying and singing chord / triad qualities.

MUSC 1451. Ear Training II
1 Credit (1)
To develop the ability to accurately hear, identify, sing and notate musical elements including rhythm, melody, intervals and harmony Restricted to Las Cruces campus only.
Prerequisite(s): Grade of C- or better in MUSC 1450.
Learning Outcomes
1. Counting rhythms at sight using the Eastman Counting System
2. Singing melodies at sight using solfege syllables
3. Writing out rhythmic patterns
4. Writing out melodic patterns
5. Identifying and singing intervals
6. Identifying and singing chord / triad qualities

MUSC 1460. Music Theory I
3 Credits (3)
Introduction to vocabulary and syntax of 4-voice 18th c. chorale music through study and harmonic analysis. May be repeated up to 3 credits.
Learning Outcomes
1. To learn the vocabulary and syntax of 4-voice 18th c. chorale music through study and harmonic analysis.

MUSC 1461. Music Theory II
3 Credits (3)
Expansion of vocabulary and syntax of 4-voice 18th c. chorale music through study, harmonic analysis, and part writing.
Prerequisite(s): Grade of C or better in MUSC 1460.
Learning Outcomes
1. To expand and apply the vocabulary and syntax of 4-voice, 18th c. chorale music through study, harmonic analysis, and part writing.

MUSC 1470. Functional Piano I
2 Credits (2)
Scales, chords, memorization. Harmonization of simple melodies with the ability to play simple melodies and rhythms. May be taken for unlimited credit. Restricted to music majors. No S/U option.
Learning Outcomes
1. 5 finger hand position in all keys
2. I-IV-I-V7-I cadences in all keys
3. One octave scales with hands together in C, G, D and F (major and minor)
4. Root position cross–over triads, solid and broken (major and minor)
5. Simple sight reading, harmonizing and transposition
6. Prepared pieces from the textbook
7. Simple improvisation
8. Play 2 simple vocal exercises
9. Identify intervals, key signatures and chords 1
10. Correct posture and hand position 1
11. Musical issues such as phrasing, slurs and dynamics 1
12. Good practice habits and techniques

MUSC 1471. Functional Piano II
2 Credits (2)
Scales, chords, memorization. Harmonization of simple melodies with the ability to play simple melodies and rhythms. May be taken for unlimited credit. Restricted to music majors. No S/U option.
Prerequisite: MUSC 1470 or consent of instructor.
Learning Outcomes
1. Two octave scales with hands separate in C, G, D, A, E, B and F (major and minor)
2. I-IV-I-V-V7-I cadences in above mentioned keys in root position and 1st inversion
3. Simple sight reading, harmonization and transposition
4. Prepared pieces from the book
5. Simple improvisation
6. Identify intervals, key signatures and chords
7. Correct posture and hand position
8. Musical issues such as phrasing, slurs and dynamics
9. Good practice habits and techniques

MUSC 1472. Functional Piano III
2 Credits (2)
For music majors preparing for the Piano Proficiency Examination. May be taken for unlimited credit. Restricted to music majors. No S/U option.
Prerequisite: MUSC 1471 or consent of instructor.
Learning Outcomes
1. Keys learned in previous semesters, adding F# and C# (D flat)
2. Secondary dominant chords added to cadence patterns
3. Two-octave, , root position arpeggios, major and minor
4. Intro to chord charts, harmonization
5. More difficult sight–reading and transpositions
6. More difficult prepared pieces
7. Accompany a piece for any instrument on the Mid-Term Recital (required)

MUSC 1992. Applied Music
1-2 Credits (1-2)
Private or group instruction for non-music majors, secondary instruments, and music majors preparing for 2000-level applied music. May be taken for unlimited credit. May be repeated up to 99 credits.
Learning Outcomes
1. Development of Musical Abilities.
2. Development of Technical Abilities.

MUSC 2110. Chamber Ensemble
1 Credit (1)
This course is an exploration of chamber ensembles, allowing students to develop their abilities with their instruments in a group setting. Students will gain a broader understanding of chamber ensemble through study of musical history, as well as various practice exercises and performances. May be repeated up to 16 credits. Restricted to Las Cruces campus only.
Prerequisite(s): by audition only.

Learning Outcomes

1. Improve performance skills
2. Develop and improve performance skills in a group setting
3. Develop understanding and interpretation within the context of music history
4. Refine and improve technical ability
5. Demonstrate proper technique and usage

MUSC 2120. Major Ensemble
1 Credit (1)
This course is an exploration of major ensembles, allowing students to develop their abilities with their instruments in a group setting. Students will gain a broader understanding of major ensemble through study of musical history, as well as various practice exercises and performances. May be repeated up to 24 credits.
Prerequisite: by audition only.
Learning Outcomes

1. Improve performance skills
2. Develop and improve performance skills in a group setting
3. Develop understanding and interpretation within the context of music history
4. Refine and improve technical ability
5. Demonstrate proper technique and usage

MUSC 2130. Jazz Ensemble
1 Credit (1)
This course is an exploration of jazz ensembles, allowing students to develop their abilities with their instruments in a group setting. Students will gain a broader understanding of jazz ensemble through study of musical history, as well as various practice exercises and performances. May be repeated up to 10 credits. Restricted to Las Cruces campus only.
Prerequisite(s): By audition only.
Learning Outcomes

1. Improve performance skills
2. Develop and improve performance skills in a group setting
3. Develop understanding and interpretation within the context of music history
4. Refine and improve technical ability
5. Demonstrate proper technique and usage
6. Develop and improve improvisation skills

MUSC 2132. Percussion Ensemble
1 Credit (1)
Study and performance of contemporary percussion ensemble literature. May be repeated up to 5 credits. Restricted to Las Cruces campus only.
Prerequisite(s): by audition only.
Learning Outcomes

1. Improve performance skills
2. Develop and improve performance skills in a group setting
3. Develop understanding and interpretation within the context of music history
4. Refine and improve technical ability
5. Demonstrate proper technique and usage

MUSC 2151. An Introduction to World Music, Jazz and Music Research
3 Credits (3)
Introduces world music and jazz within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works. A major component will be the development of effective research and scholarly writing skills for the music major or minor. May be repeated up to 3 credits. Restricted to: Music majors and minors. Restricted to Las Cruces campus only.
Learning Outcomes

1. This course will cover fundamental concepts and styles associated with world music (ethnomusicology), jazz and popular music, an overview of the Western European tradition, and an intense focus on research and writing about music.
2. Emphasis will be placed on writing skills as they apply to the college experience in general and the world of music education and performance in particular.
3. Students will become acquainted with the diverse ways cultures create and are affected by their respective musical arts.
4. Focus will be on style evolution, forms, genres, composers, literature, and, where appropriate, performers

MUSC 2210. Diction I
2 Credits (2)
This course is designed to prepare students for singing in multiple languages using concepts of the International Phonetic Alphabet. Students will work to master the basics of phonetic singing to improve their overall musical abilities. Restricted to Las Cruces campus only.
Learning Outcomes

1. Correctly and consistently form vowel and consonant sounds when speaking and singing in multiple languages
2. Correctly and consistently transcribe texts in multiple languages using the International Phonetic Alphabet
3. Understand and explain the International Phonetic Alphabet's usage and symbols
4. Develop and apply the concept of lyric diction to singing
5. Gain fluency, accuracy, and confidence in pronunciation of sung text

MUSC 2220. Diction II
2 Credits (2)
This course serves as a continuing study in the concepts of the International Phonetic Alphabet. Students will continue to improve and practice their diction to develop their singing and musical abilities in order to begin the mastery of lyric diction. Restricted to music majors. Restricted to Las Cruces campus only.
Prerequisite: MUSC 2210 or consent of instructor.
Learning Outcomes

1. Correctly and consistently form vowel and consonant sounds when speaking and singing in multiple languages
2. Correctly and consistently transcribe texts in multiple languages using the International Phonetic Alphabet
3. Understand and explain the International Phonetic Alphabet's usage and symbols
4. Develop and apply the concept of lyric diction to singing.
5. Gain fluency, accuracy, and confidence in pronunciation of sung text.
6. Demonstrate ability to notate song texts according to IPA standards

MUSC 2240. Music History and Literature: Antiquity through Baroque
3 Credits (3)
Surveys Western art music within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works from antiquity through the end of the Baroque era. An additional emphasis will be given to effective research and scholarly writing skills. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better in MUSC 1450 and 1460.

Learning Outcomes

1. The purpose of the course is to survey the beginning history of music from the earliest ancient times through the Baroque period, ca.

MUSC 2310. Sound and Music Technology
1 Credit (1)
This course serves as an overview of current technologies and principles for the recording and production of sound, and the use of computer-based technologies for the production of music. Restricted to: MUSC,MED majors. Traditional Grading with RR. Restricted to Las Cruces campus only.
Prerequisite(s): MUSC 1460.
Learning Outcomes

1. Demonstrate fundamental knowledge of techniques and practices of music recording and production
2. Demonstrate ability to properly use computer-based technologies to produce and record music
3. Demonstrate ability to create music recordings
4. Work with a variety of recording, production, and sound reinforcement tools
5. Apply basic and mixed editing techniques
6. Use audio editing and file management techniques
7. Demonstrate knowledge of music technology vocabulary
8. Explain and understand the development of various music technologies

MUSC 2451. Ear Training III
1 Credit (1)
Continuation of MUSC 1451, advanced sight singing, dictation. Restricted to Las Cruces campus only.
Prerequisite(s): Grade of C- or better in MUSC 1451.
Learning Outcomes

1. Count rhythms at sight using the Eastman Counting System
2. Sing melodies at sight and prepared using Solfege syllables
3. Write out rhythmic patterns
4. Write out melodic patterns
5. Identify and singing intervals
6. Identify and sing chord / triad qualities
7. Write out harmonic dictation

MUSC 2452. Ear Training IV
1 Credit (1)
Continuation of MUS 2451, advanced sight singing, dictation. Restricted to Las Cruces campus only.
Prerequisite(s): Grade of C or better in MUSC 2451 and MUSC 2460.
Learning Outcomes

1. Count rhythms at sight using the Eastman Counting System
2. Sing scales and sequences as assigned for the level
3. Sing melodies at sight using solfege syllables
4. Write out rhythmic patterns in both simple and compound meters
5. Write out melodic patterns in both major and minor tonalities
6. Identify, label and sing intervals
7. Identify, label and sing chords and extended harmonic qualities, i.e. V7 and inversions
8. Write out harmonic progressions in both two and four part forms including secondary dominants and modulations.
9. Accurately detect melodic and rhythmic errors in dictation examples.

MUSC 2460. Music Theory III
3 Credits (3)
Analysis of Baroque and Classical Music. Vocabulary and syntax of 18th and 19th c. Western art music through study, chordal/formal analysis, and composition. Restricted to Las Cruces campus only.
Prerequisite(s): Grade of C or better in MUSC 1461.
Learning Outcomes

1. To learn and apply the vocabulary and syntax of 18th and 19th c. Western art music through study, chordal/formal analysis, and composition.
2. Topics covered include: Two-Voice Eighteenth Century Counterpoint; Fugue; Borrowed Chords; Neapolitan 6th Chords; Augmented 6th Chords; Sonata Form; Rondo Form.

MUSC 2461. Music Theory IV
3 Credits (3)
Analysis of Romantic, Post-Romantic, Impressionist, and Twelve-Tone Music. Vocabulary and syntax of late 19th and early 20th c. Western art music through study, micro/macro analysis, and composition. Restricted to Las Cruces campus only.
Prerequisite(s): Grade of C or better in MUSC 2460.
Learning Outcomes

1. To learn and apply the vocabulary and syntax of late 19th and early 20th c. music through study, micro/macro analysis, and composition.

MUSC 2470. Functional Piano IV
2 Credits (2)
For music majors preparing for Piano Proficiency Examination. May be taken for unlimited credit. Restricted to music majors. No S/U option. May be repeated up to 99 credits.
Prerequisite: MUSC 1472 or consent of instructor.
Learning Outcomes

1. Keys learned in previous semesters, adding A flat, E flat, and B flat
2. Secondary dominant chords added to cadence patterns, all inversions
3. Arpeggios, all inversions
4. More difficult sight–reading and transpositions
5. More difficult prepared pieces
6. Four part pieces (hymns)
7. Accompany a piece for any instrument onthe Mid-Term Recital (required) Score reading and transposition

MUSC 2510. Applied Music I
1-4 Credits
Individual instruction to develop technique, musicianship, performance and improvisational skills, as well as knowledge of significant repertoire. Prerequisite of an audition to register for course. May be repeated up to 16 credits.
Learning Outcomes

1. Individual instruction to develop technique, musicianship, performance and improvisational skills.

MUSC 2740. Pride Marching Band
1 Credit (1)
The Pride Marching Band performs at all NMSU home football games and select away games. The marching band is open to all students at NMSU and supports both instrumental and visual units. May be repeated up to 8 credits.
Learning Outcomes

1. To cultivate within the student a value system that encourages community service.

2. To provide the performer with experiences that will enable them to communicate thoughts/ideas/emotions in a unique and personal manner using his/her instrument, body, and physical motion.
3. To instill in students a commitment to life-long learning.
4. To promote personal growth through the rehearsal and performance of music, choreography, and drill of high quality.
5. To encourage students to continuously participate in and support artistic performances following graduation.

MUSC 2993. Opera Workshop
1 Credit (1)
Study, translation, analysis, rehearsal and performance of opera. Entry into course by audition. May be repeated up to 10 credits.
Learning Outcomes
1. Students will learn fundamentals of acting for singers, stage technique, movement, role preparation, character development, and audition techniques.
2. Students will prepare and perform Opera/Musical Theatre Scenes.

MUSC 2996. Special Topics I
1-3 Credits
Emphasis on special areas of music; designed for highly motivated students. May be repeated up to 99 credits.
Learning Outcomes
1. Varies.

MUSC 301. Marching Band Techniques
2 Credits (2)
This course will help students develop the techniques needed to administer and teach all aspects of a contemporary high school marching band. This includes drill conception and design, instruction, organization, and administration. Stylistic varieties of marching fundamentals, show conception, fundamentals of charting and teaching drill, computer-aided drill design, traditional show design, contemporary show design, rehearsal techniques, and organizational concepts. Restricted to: Music, Music Education majors. Traditional Grading with RR.
Learning Outcomes
1. Develop the techniques needed to administer and teach all aspects of a contemporary high school marching band.

MUSC 302. Music History and Literature: Classic through Romantic
3 Credits (3)
Surveys Western art music within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works from the beginnings of the Classic era through the end of the Romantic era. An additional emphasis will be given to effective research and scholarly writing skills. Restricted to: Music Majors and Minors majors.
Prerequisite: A grade of C- or better in MUSC 2240.
Learning Outcomes
1. A study of Western Culture music from the beginnings of the Classic Era through the end of the Romantic Era.

MUSC 303. Music History and Literature: 20th Century Through the Present
3 Credits (3)
Surveys Western art music within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works from the beginning of the 20th Century through the Present. An additional emphasis will be given to effective research and scholarly writing skills. Restricted to: MUS minors and majors.
Prerequisite: A grade of C- or better in MUSC 302.
Learning Outcomes
1. To develop an understanding Western Art Music within a historical and cultural context, focusing on representative works from the beginning of the 20th Century through the Present.

MUSC 315. Brass Techniques I
1 Credit (1)
Methods and techniques of teaching high brass instruments, for music education majors. Main campus only.
Learning Outcomes
1. To learn the fundamentals of playing the trumpet and horn.
2. To learn basic maintenance of the instrument and common problems that may arise.
3. Learn instrument assembly, embouchure formation, tone production, hand position and fingerings.

MUSC 316. Brass Techniques II
1 Credit (1)
Methods and techniques of teaching low brass instruments, for music education majors. Las Cruces campus student only.
Learning Outcomes
1. To learn the fundamentals of playing brass instruments.
2. To learn basic maintenance of the instrument and common problems that may arise.

MUSC 317. Woodwind Techniques I
1 Credit (1)
Methods and techniques of teaching woodwind instruments (clarinet and Basson), for music education majors. Las Cruces campus only.
Learning Outcomes
1. To prepare students to teach clarinet and bassoon at the beginning and intermediate levels in a public school environment.

MUSC 318. Woodwind Techniques II
1 Credit (1)
Methods and techniques of saxophone and oboe, for music education majors.
Learning Outcomes
1. To learn the fundamentals of playing the flute, saxophone, and oboe.
2. To learn basic maintenance of the instrument and common problems that may arise.
3. Learn instrument assembly, embouchure formation, hand position and fingerings.

MUSC 319. String Techniques I
1 Credit (1)
Methods and techniques of teaching low string instruments, for music education majors. Las Cruces Campus Only.
Learning Outcomes
1. Knowledge of pedagogy required to answer questions about posture, position, and technique for cello and bass in addition to history and evolution of the instruments.
2. Play Major scales in keys up to two sharps and two flats on both the cello and bass.

MUSC 321. Instrumental Techniques for Vocal Music Education Majors
2 Credits (2)
Methods of teaching brass, woodwind, percussion, stringed and fretted instruments for vocal music education majors. Restricted to: Music and Music Education majors. Traditional Grading with RR.

Learning Outcomes

1. Demonstrate an understanding of various approaches and teaching techniques that may be utilized in the instruction of beginning-level instrumental music students.
2. Develop knowledge of selection, purchase, and maintenance of equipment.

MUSC 322. Guitar Methods
1 Credit (1)
Methods and techniques of teaching guitar, for Music Education majors.
Learning Outcomes

1. Demonstrate appropriate strategies for teaching guitar in individual and class settings.
2. Diagnose and guide correct guitar performance techniques.
3. Have a working knowledge of guitar specific topics, including correct left- hand and right-hand position and technique, classical and American sitting position, finger style and flat pick technique, multi-part solo playing, chord strumming, reading standard notation, reading tablature.

MUSC 323. Percussion Technique I
1 Credit (1)
Methods and techniques of teaching fundamental percussion instruments (snare drum, timpani, keyboards and essential accessories).
Learning Outcomes

1. Demonstrate appropriate strategies for teaching percussion in individual and class settings.
2. Diagnose and guide correct percussion performance techniques.

MUSC 324. Percussion Technique II
1 Credit (1)
Methods and techniques of teaching marching percussion, drum set, and a continuation of techniques discussed in MUS 323. Restricted to: MUS,M ED majors. Traditional Grading with RR.
Prerequisite: A grade of C- or better in MUS 323.
Learning Outcomes

1. Demonstrate advanced strategies for teaching percussion in individual and class settings.

MUSC 325. Beginning Conducting
1 Credit (1)
A study of the fundamentals of conducting and rehearsal strategies with an emphasis on beginning technique applicable to all ensembles. Reading of musical scores with application via laboratory ensemble experience is included. Restricted to: Music and Music Education majors. May be repeated up to 1 credit.
Prerequisite: A grade of C or better in MUSC 2451 and MUSC 2460.
Learning Outcomes

1. Develop the musicianship of the student.
2. Development of basic conducting techniques.
3. Develop a knowledge of appropriate terminology, tempi, and transpositions.
4. Establishment of a gestural (nonverbal) vocabulary.
5. Cultivation of self-awareness and effective interaction through nonverbal communication.

MUSC 326. Instrumental Conducting
3 Credits (3)
Will continue from MUSC 325 in the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques as it relates to the instrumental ensemble. The class will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS,M ED majors. Traditional Grading with RR.
Prerequisite: A grade of C- or better in MUSC 325.
Learning Outcomes

1. Establishment of a gestural (nonverbal) vocabulary as it relates to the instrumental ensemble.

MUSC 327. Choral Conducting
3 Credits (3)
Continuation of conducting study with emphasis on choral rehearsal techniques, ensemble management, and literature. Restricted to: Music and Music Education majors. Traditional Grading with RR.
Prerequisite: A grade of C or better in MUSC 325.
Learning Outcomes

1. Establishment of a gestural (nonverbal) vocabulary as it relates to choral ensembles.

MUSC 330. Applied Music II
1-4 Credits
Continuation from MUS 2510. Individual instruction to develop technique, musicianship, performance and improvisational skills, as well as knowledge of significant repertoire. May be repeated up to 16 credits. Restricted to: Music and Music Education majors. Traditional Grading with RR.
Prerequisite: A grade of C or better in MUSC 2992 plus a juried audition.
Learning Outcomes

1. Individual instruction to develop technique, musicianship, performance and improvisational skills.

MUSC 340. Junior Recital
1 Credit (1)
Public solo performance under the supervision of the appropriate applied instructor. 30 minutes of musical performance is required. Consent of Instructor required.
Corequisite: MUSC 330.
Learning Outcomes

1. Development of the ability to Perform publicly in a solo capacity.
2. Development of practice skills and time management.

MUSC 341. BA Capstone
1-2 Credits (1-2)
The objective of the Capstone course for the BA degree in Music is to demonstrate the accumulation, understanding and knowledge of the student's course of study. This will take the form of an analytical paper, recital, research paper, composition or other equally encompassing project approved by the Instructor of Record. This may involve coursework from the student's minor area of study and be a multi-disciplinary collaborative effort. Restricted to: Music majors.
Prerequisite: A B- or better in MUSC 2460 and MUSC 302.
Learning Outcomes

1. Each project results in a scholarly and creative product that serves as a tangible and measurable indication of the extent to which students have mastered the critical thinking, reading, writing, and oral communication skills that are part of the learning objectives of the program.

MUSC 346. Elementary Music Methods
2 Credits (2)
Lesson planning, curriculum, teaching methodology, materials, and procedures for teaching music in an elementary school. Emphasis on

methodology of Koday and Orff, teaching in a multicultural setting, and developing reflective practitioners. This course requires field experience in the public schools. May be repeated up to 2 credits.
Prerequisite: A grade of C or better in MUSC 1410.
Learning Outcomes
1. Students will identify and apply ideas from various music education pedagogical approaches including Orff and Kodaly.
2. The ability to develop lesson plans for primary school teaching.

MUSC 349. Secondary Music Methods
2 Credits (2)
Lesson planning, curriculum, teaching methodology, materials, and procedures for teaching music in the middle school and high school. Emphasis on teaching in a multicultural setting and developing reflective practitioners. Restricted to: Music Education majors.
Prerequisite(s): A grade of C or better in MUSC 346.

MUSC 350. Chamber Music
1 Credit (1)
Small performing ensembles that may include strings, woodwinds, brass, pianos, percussion, and voices. Prerequisite of an audition for this course. May be repeated up to 16 credits.
Learning Outcomes
1. Gain practical experience in the art of collaborative performance.
2. Prepare and perform chamber works.
3. Learn to express musical opinions, and to respect those of others.

MUSC 351. Opera Workshop
1 Credit (1)
Study, translation analysis, rehearsal and performance of opera or musical theater. Prerequisite of an audition. May be repeated up to 10 credits.
Learning Outcomes
1. Gain practical experience in the art of collaborative performance.
2. Learn to express musical opinions, and to respect those of others.
3. Prepare and perform a large work.

MUSC 360. Special Topics II
1-3 Credits
Emphasis on special areas of music; designed for highly motivated students. May be repeated up to 99 credits.
Learning Outcomes
1. Varies.

MUSC 361. Concert Choir II
1 Credit (1)
Composed of both music and nonmusic majors. Emphasis on vocal techniques, sight-singing, and basics of choral musicianship. Students must assume leadership role. Registration into course based on audition. May be repeated up to 88 credits.
Learning Outcomes
1. Demonstrate a thorough knowledge of the ensemble's repertoire.
2. Articulate an understanding of the fundamental practical and musical elements necessary to the development of a successful choral ensemble.
3. Possess an expanded knowledge of vocal technique, vocal health, choral techniques, choral repertoire, expressive diction, and the relationship between text and music.

MUSC 362. Philharmonic Orchestra II
1 Credit (1)
The University Philharmonic Orchestra is open to all students and performs a wide variety of standard orchestral literature. The orchestra performs each semester and the objectives include refining technique, stylistic characteristics, intonation, balance, bowings, color, rhythmic integrity and dynamics. Prerequisite of an audition. May be repeated up to 10 credits.
Learning Outcomes
1. Participants will improve the way they listen to themselves, to each other into the composers work.
2. Participants will also learn to perform with an adequate level of proficiency.
3. Identify how their individual parts relate to the rest of the orchestra.

MUSC 363. Jazz Ensembles II
1 Credit (1)
Performance ensemble that explore repertoire written for big band, including (but not limited to) dance band, swing, and contemporary compositions. May be repeated up to 10 credits.
Prerequisite: By audition only.
Learning Outcomes
1. Improve Performance Skills.
2. Improve Group Performance Skills.
3. Gain Improvisations Skills.
4. Develop knowledge of Repertoire.
5. Refine and improve technical ability.

MUSC 365. Composition I
2 Credits (2)
Significant forms for various media. Emphasis on structural aspects of original composition. May be repeated up to 2 credits.
Prerequisite: A grade of B or better in MUSC 1460.
Learning Outcomes
1. Demonstrate the ability to analyze a variety of musical compositions
2. Demonstrate the ability to develop musical compositions from basic melodic, harmonic, rhythmic, and formal structures
3. Create new musical compositions from variety of perspectives for smaller chamber ensembles

MUSC 368. University Singers II
1 Credit (1)
Select concert and touring choir of undergraduate and graduate students performing a cappella and accompanied choral literature. May be repeated up to 10 credits.
Prerequisite: By audition only.
Learning Outcomes
1. Develop Performance Skills.
2. Develop ensemble performance skills.
3. Refine and improve technical ability.
4. Demonstrate proper technique and usage.

MUSC 370. Wind Symphony II
1 Credit (1)
This elite ensemble of 50 highly qualified graduate and undergraduate students performs a varied repertoire of the highest quality literature for winds. Members will also perform concerts of chamber winds literature each semester. This ensemble is dedicated to professional level performance while fostering the musical growth of its members. Conducted by the Director of Bands, this group serves as the flagship for the entire university bands program. May be repeated up to 10 credits.
Prerequisite: by audition only.

Learning Outcomes

1. Develop Performance Skills.
2. Develop Ensemble Performance Skills.
3. Demonstrate proper technique and usage.
4. Develop understanding and interpretation within the context of music history.
5. Refine and improve technical ability.

MUSC 372. Marching Band II
1 Credit (1)
Composed of both majors and nonmajors. Opportunity to perform all varieties of music in a contemporary style marching unit. May be repeated up to 5 credits.
Learning Outcomes

1. Develop and improve performance skills in a group setting.
2. Demonstrate proper technique and usage.
3. Refine and improve technical ability.
4. Develop understanding and interpretation within the context of music history.

MUSC 374. Percussion Ensembles II
1 Credit (1)
Study and performance of contemporary percussion ensemble literature. Students must assume a leadership role. May be repeated up to 5 credits.
Prerequisite: By audition only.
Learning Outcomes

1. Improve performance skills.
2. Develop and improve performance skills in a group setting.
3. Develop understanding and interpretation within the context of music history.
4. Refine and improve technical ability.
5. Demonstrate proper technique and usage.

MUSC 380. Symphonic Band II
1 Credit (1)
This is a select large ensemble, chosen by audition. It provides a challenging musical environment for skilled performers by programming repertoire that ranges from works for chamber winds, to standards of the wind band literature, to cutting edge literature. Conducted by the Associate Director of Bands, this ensemble is comprised of music majors and non-music majors alike and provides the less experienced student an opportunity to hone and refine performance skills. May be repeated up to 10 credits.
Prerequisite: By audition only.
Learning Outcomes

1. Improve Performance Skills.
2. Develop and improve performance skills in a group setting.
3. Develop understanding and interpretation within the context of music history.
4. Refine and improve technical ability.
5. Demonstrate proper technique and usage.

MUSC 386. Applied Music Pedagogy and Literature I
2 Credits (2)
Methods, materials, problems, literature, and techniques in teaching individual lessons. Consent of Instructor required.
Learning Outcomes

1. Development of appropriate pedagogical skills.
2. Development of ability to write program notes.

MUSC 390. Survey of Wind Literature
2 Credits (2)
An examination of beginning to advanced literature for wind bands with an emphasis on the needs of middle and high school ensembles. It will include a means to determine the quality of a piece as well as the standardized level of difficulty (grading).
Prerequisite: A grade of C- or better in MUSC 2452 and MUSC 2461.
Learning Outcomes

1. Understanding of wind band literature with an emphasis on the needs of middle and high school ensembles.
2. Understanding a means to determine the quality of a piece as well as the standardized level of difficulty.

MUSC 391. Survey of Orchestral Literature
2 Credits (2)
An examination of beginning to advanced literature for both string orchestra and symphony orchestra with an emphasis on the needs of middle and high school ensembles. A means to determine the quality of a piece as well as the standardized level of difficulty (grading) will be included. May be repeated up to 2 credits.
Prerequisite: A grade of C- or better in MUSC 2452 and MUSC 2461.
Learning Outcomes

1. Identify significant composers and compositions that are appropriate for all grade levels and applicable to teaching music through a performance-based environment in an orchestral setting
2. Determine the quality of a work based on aesthetic ideals
3. Determine appropriate programming strategies and repertoire selection dependent upon level of difficulty and/or varying ability levels.

MUSC 392. Survey of Choral Literature
2 Credits (2)
An examination of beginning to advanced literature for choir with an emphasis on the needs of middle and high school ensembles. A means to determine the quality of a piece as well as the standardized level of difficulty (grading) will be included. Restricted to: Music and Music Education majors.
Prerequisite: A grade of C- or better in MUSC 2452 and MUSC 2461.
Learning Outcomes

1. Identify significant composers and compositions that are appropriate for all grade levels and applicable to teaching music through a performance-based environment in a choral setting.

MUSC 393. Instructional Strategies I for Instrumentalists
2 Credits (2)
An examination of beginning to advanced literature for instrumentalists with an emphasis on the needs of middle and high school ensembles. The course includes a means to determine the quality of a piece as well as the standardized level of difficulty (grading). It also allows for full ensemble instrumentation to experience both playing the repertoire and peer teaching to better rehearsal skills.
Prerequisite: A grade of C- or better in MUSC 1410.
Learning Outcomes

1. The ability to assess the graded needs of middle and high school ensembles.
2. The development of rehearsal skills.

MUSC 394. Instructional Strategies II for Instrumentalists
2 Credits (2)
The course focuses on rehearsal techniques for middle and high school ensembles. It includes a means to determine the quality of a piece of

music as well as the standardized level of difficulty (grading). Students must also passing the TEP exam in order to enroll in this course.
Prerequisite: A grade of C- or better in MUSC 1410.
Learning Outcomes
1. The development of rehearsal techniques for middle and high school ensembles

MUSC 395. Instructional Strategies I for Vocalists
2 Credits (2)
An examination of beginning to advanced literature for vocalists with an emphasis on the needs of middle and high school ensembles. The course includes a means to determine the quality of a piece as well as the standardized level of difficulty (grading). It also allows for full ensemble instrumentation to experience both playing the repertoire and peer teaching to better rehearsal skills. Students must also pass the TEP exam to enroll in this course.
Prerequisite: A grade of C- or better in MUSC 1410.
Learning Outcomes
1. The ability to assess the graded needs of middle and high school ensembles.
2. The development of rehearsal skills.

MUSC 396. Instructional Strategies II for Vocalists
2 Credits (2)
The course focuses on rehearsal techniques for middle and high school ensembles. It includes a means to determine the quality of a piece of music as well as the standardized level of difficulty (grading). Students will also need to pass the TEP exam in order to enroll in the course.
Prerequisite: A grade of C- or better in MUSC 1410.
Learning Outcomes
1. The development of rehearsal techniques for middle and high school ensembles.

MUSC 397. Administrative Music Methods
1 Credit (1)
Lesson planning, curriculum, teaching methodology, materials, and procedures for teaching music in the middle school and high school. Emphasis on administration. Students must also pass the TEP exam to enroll in this course.
Prerequisite: A grade of C- or better in MUSC 1410.
Learning Outcomes
1. Gain insight and experience with administrative strategies and procedures in secondary classroom
2. Work on interview skills as well as resume and cover letter composition
3. Collect a set of usable tools that a student can carry with them into their first job.
4. Gain familiarity with laws and regulations regarding programs and money spent

MUSC 413. Form and Analysis
3 Credits (3)
Forms in tonal music and basic analytic techniques including music from diverse cultures and media. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better in MUSC 2452 and MUSC 2461.
Learning Outcomes
1. Gain a fuller knowledge of musical patterns of organization, and use that knowledge in learning repertoire.
2. Communicate the essence of a work in performance more effectively by making interpretive decisions that are in alignment with the work's formal processes and the composer's intent.
3. Listen to performances and recordings with a deeper, quicker understanding of the web of structure that gives coherence to a work.

MUSC 415. Orchestration
3 Credits (3)
Scoring for full orchestra and various instrumental combinations with consideration of instrument timbres, strengths, weaknesses and ranges. May be repeated up to 3 credits. Restricted to: Music and Music Education majors.
Prerequisite: A grade of C- or better in MUSC 2452,MUSC 2461 and MUSC 2310.
Learning Outcomes
1. Write effectively and idiomatically for voice, orchestra, and Band.

MUSC 417. Studio Accompanying
2 Credits (2)
Practical application of collaborative piano skills in a studio setting for Piano Performance majors. May be repeated up to 12 credits.
Learning Outcomes
1. Benefit from the teaching of other faculty, and learn more about the specific challenges of playing each instrument.
2. Explore how to adapt factors such as dynamics and pacing when accompanying different instruments and voices.
3. Discover the balance between musical leading and following.

MUSC 421. Music of the Baroque Era
3 Credits (3)
An overview of the music of the Baroque era with an emphasis on history and literature. May be repeated up to 3 credits.
Prerequisite: MUSC 303.
Learning Outcomes
1. Discuss the historical and social context from which Baroque music developed.
2. Summarize the career of several well-known Baroque composers.
3. Outline the musical traits common and unique to different regions in the Baroque period and name the most important Baroque genres.
4. Describe the musical style of several well-known and lesser-known Baroque composers, citing examples from specific works.
5. Examine thirty-three Baroque musical works.
6. Write a term paper based on an analysis of a Baroque musical work.
7. Interpret and perform Baroque works with an understanding of historically-informed performance.
8. Describe Baroque string, wind, brass, keyboard, and percussion instruments: their appearance, construction, and manner of playing.

MUSC 422. Music of the Classic Era
3 Credits (3)
An overview of the music of the Classic era with an emphasis on history and literature.
Prerequisite: MUSC 303.
Learning Outcomes
1. Discuss the historical and social context from which Classical music developed.
2. Outline the musical traits common and unique to different regions in the Classical period.
3. Summarize the development of the symphony, opera and other main genres in the eighteenth century.
4. Write scholarly papers on music.

MUSC 424. Music of the Twentieth Century
3 Credits (3)
An overview of the music of the Twentieth Century with an emphasis on history and literature. Consent of Instructor required.
Prerequisite: MUSC 303.
Learning Outcomes
1. Discuss the historical and social context from which Twentieth Century music developed.

MUSC 429. Opera: History and Literature
3 Credits (3)
An overview of the operatic art form from the Florentine Camerata and Baroque opera through current 21st-century works, with an emphasis on historical context, composers, and significant works. Restricted to: Music, Music Education majors.
Prerequisite(s): MUSC 303 or consent of instructor.
Learning Outcomes
1. The student will be able to effectively identify and discuss operatic developments and traditions in historical context as well as demonstrate a knowledge of operatic composers and significant operatic works.

MUSC 430. Applied Music III
1-4 Credits
Continuation from MUS 330. Individual instruction to develop technique, musicianship, performance and improvisational skills, as well as knowledge of significant repertoire. May be repeated up to 16 credits. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.
Prerequisite(s): A grade of C or better in MUSC 330 plus a juried audition.

MUSC 432. 21st Century Piano Skills
1 Credit (1)
To guide students' keyboard versatility, particularly the skills practical and meaningful in various roles as a professional pianist in the 21st century music. The course explores performance in a variety of settings including sight-reading, efficient music learning, jazz, lead sheet harmonization, improvisation and arranging, alto and tenor clef reading, transposition, and quickly grasping the musical styles of the given new repertoire. May be repeated up to 6 credits.
Learning Outcomes
1. Sight-read and learn new music efficiently across a range of genres and ensemble settings.
2. Harmonize melodies using lead sheets and chord symbols in jazz, folk, hymn, and popular music stylistic appropriateness.
3. Arrange and improvise music in various musical contexts, including classical, jazz, and contemporary idioms.
4. Transpose short passages and chord progressions into different keys at sight.
5. Read and play treble, bass, alto, and tenor clefts with functional fluency (such as reading the B-flat clarinet part in duo music and SATB choir repertoire, with selected parts).
6. Identify and apply appropriate stylistic features when performing new repertoire.
7. Demonstrate professional preparation and keyboard versatility in mock performance scenarios reflective of real-world gigs (for example: church, musical theater, cocktail hour, large ensemble, etc).

MUSC 440. Senior Recital
1-2 Credits (1-2)
Public solo performance under the supervision of the appropriate applied instructor. 60 minutes of musical performance is required for enrollment of 2 hours credit. 30 minutes of musical performance is required for enrollment of 1 hour credit. May be repeated up to 2 credits. Traditional Grading with RR.
Corequisite: MUSC 430.
Learning Outcomes
1. Cumulation of public performance skills.
2. The ability to write program notes.

MUSC 441. Supervised Studio Teaching
2 Credits (2)
Teaching of private lessons under supervision. May be repeated up to 6 credits.
Learning Outcomes
1. Development of applied teaching skills.

MUSC 450. Research Methods
3 Credits (3)
Introduction to methodology of music research. Emphasis on important scholarly resources and academic writing. Restricted to Music majors. No S/U grading option.
Learning Outcomes
1. Develop an understanding methodology of music research.

MUSC 470. Special Topics III
1-3 Credits
Designed for highly motivated students. Independent study and individual guidance. May be taken for unlimited credit. May be repeated up to 99 credits.
Learning Outcomes
1. Varies.

MUSC 471. Graduate Theory Review
3 Credits (3)
Comprehensive and accelerated study of modes, diatonic harmony, and classical form of the common practice period. Restricted to: Music majors. Traditional Grading with RR.
Learning Outcomes
1. Develop an understanding of modes, diatonic harmony, and classical form of the common practice period.

MUSC 475. Intermediate Conducting
3 Credits (3)
Serves as a bridge from undergraduate conducting study to the graduate level. Advanced undergraduate students may enroll to learn how the graduate program in conducting functions. The course also serves as the introductory experience for newly admitted graduate conducting majors. After successful completion of this course, students will be able to: Study musical scores from a conducting perspective; Demonstrate effective predetermined gestures and movements; Lead an ensemble; Research and give presentations related to composers and their music; Demonstrate advanced knowledge of conducting practices.
Prerequisite: A grade of C- or better in MUSC 326 or MUSC 327.
Learning Outcomes
1. Develop the musicianship of the student.
2. Development of basic to advanced conducting techniques.
3. Gain a knowledge of appropriate terminology, tempi, and transpositions.
4. Cultivation of self-awareness and effective interaction through nonverbal communication.

MUSC 476. Diction Review
2 Credits (2)

Review of the International Phonetic Alphabet (IPA) and pronunciation rules for singing in English, Latin, Italian, German and French. For graduate choral conducting and vocal performance (students who did not pass the diction proficiency exam).

Learning Outcomes

1. Refamiliarize their knowledge of the IPA and its uses in singing including its symbols and connection to vocal anatomy and physiology.
2. Apply knowledge of IPA to pronunciation and enunciation of English, Latin, Italian, German and French.
3. Continue to refine awareness of the movements of the vocal articulators and their effect on speech sounds and singing tone.
4. Gain further exposure to role models for lyric diction in all languages studied.
5. Reinforce fluency, accuracy, and confidence in pronunciation, enunciation, and expression of sung text.
6. Apply the concept of lyric diction to both solo and ensemble singing at a graduate level as well as applying pedagogical concepts into professional contexts.

MUSC 477. Graduate Music History Review
3 Credits (3)

Comprehensive and accelerated study of music history from antiquity to the present Restricted to: Music majors. Traditional Grading with RR.

Learning Outcomes

1. Develop an understanding of music history from antiquity to the present.

MUSC 481. The Collaborative Musician
1-15 Credits (1-15)

This course integrates one-on-one meeting and group performance. The goal is to guide the students' topic interests, expand their knowledge of musical repertoire, styles, composers, and/or interpretation. May be repeated up to 15 credits.

Learning Outcomes

1. Prepare and perform a mixture of vocal one instrumental collaborative work.
2. Learn the skills necessary to collaborate successfully with other musicians, including listening, having an open and constructive communication, and developing stronger keyboard skills as applicable to ensemble settings.
3. Prepare a professional comprehensive Repertoire List with all categories (solo piano, collaborative music, chamber music, large ensemble).
4. Learning diversity of teaching styles.
5. Learn more about the specific challenges of playing each instrument and instrumental family.
6. Adapt factors such as dynamics and pacing when collaborating with different instruments and voices.
7. Discover and apply the balance between musical leading and following.
8. Learn to express musical opinions and respect those of others.

MUSC 486. Applied Music Pedagogy and Literature II
2 Credits (2)

Methods, materials, problems, literature, and techniques in teaching individual lessons. Consent of Instructor required. Restricted to: Music majors. Traditional Grading with RR.

Learning Outcomes

1. Development of appropriate pedagogical skills.

MUSC 498. Independent Study
1-3 Credits

For students with a strong musical background wishing to explore content beyond the traditional curriculum. May be repeated up to 6 credits. Restricted to majors.

Prerequisite: consent of instructor.

Learning Outcomes

1. Varies.

MUSC 511. Survey of Traditional Harmony
3 Credits (3)

Tonal harmony in common practice and theory of the late 17th, 18th, and early 19th centuries. Restricted to: Music majors. Traditional Grading with RR.

Prerequisite(s): A grade of B or better in MUSC 471.

MUSC 513. Twentieth Century Art Music
3 Credits (3)

Analytical techniques, structural design and compositional materials from Debussy to the Minimalist school in historical context. Restricted to: Music majors.

Prerequisite(s): A grade of B or better in MUSC 471.

MUSC 518. Seminar in Music Theory
3 Credits (3)

Varying topics in Music Theory, providing a more specific and in-depth study of the particular topic. Restricted to: Music majors. Traditional Grading with RR. May be repeated up to 6 credits.

Prerequisite: A grade of B or better in MUSC 471.

Learning Outcomes

1. Varies.

MUSC 519. Seminar in Music History
3 Credits (3)

Varying topics in Music History, providing a more specific and in-depth study of the particular topic. May be repeated up to 6 credits. Restricted to: MUS majors.

Prerequisite: A grade of B or better in MUSC 477.

Learning Outcomes

1. Varies.

MUSC 521. Music of the Baroque Era: History and Literature
3 Credits (3)

An overview of the music of the Baroque Era with an emphasis on history and literature. May be repeated up to 3 credits.

Prerequisite: A grade of B or better in MUSC 477.

Learning Outcomes

1. Discuss the historical and social context from which Baroque music developed.
2. Summarize the career of several well-known Baroque composers.
3. Outline the musical traits common and unique to different regions in the Baroque period and name the most important Baroque genres.
4. Describe the musical style of several well-known and lesser-known Baroque composers, citing examples from specific works.
5. Examine thirty-three Baroque musical works.
6. Write a term paper based on an analysis of a Baroque musical work.
7. Interpret and perform Baroque works with an understanding of historically-informed performance.

8. Describe Baroque string, wind, brass, keyboard, and percussion instruments: their appearance, construction, and manner of playing.

MUSC 522. Music of the Classical Era: History and Literature
3 Credits (3)
An overview of the music of the Classical era with an emphasis on history and literature. Restricted to: MUS majors.
Prerequisite(s): A grade of B or better in MUSC 477.

MUSC 523. Music of the Romantic Era: History and Literature
3 Credits (3)
An overview of Romantic era music, with an emphasis on history and literature. Restricted to MUS Majors. May be repeated up to 3 credits.
Prerequisite: A grade of B or better in MUSC 477.
Learning Outcomes
1. Develop an in depth knowledge of composers of the Romantic era
2. Develop the ability to Recognize Major compositions of the Romantic Era
3. Develop the ability to analyze works from the Romantic Era.

MUSC 529. Opera History and Literature
3 Credits (3)
An overview of the operatic art form from the Florentine Camerata and Baroque opera through current 21st-century works, with an emphasis on historical context, composers, and significant works. Restricted to: M ED,MUS majors.
Prerequisite(s): A grade of B or better in MUSC 477.
Learning Outcomes
1. The student will be able to effectively identify and discuss operatic developments and traditions in historical context as well as demonstrate a knowledge of operatic composers and significant operatic works.

MUSC 530. Seminar in Music Education
3 Credits (3)
Varying topics in Music Education, providing a more specific and in-depth study of the particular topic. Restricted to: MUS majors. May be repeated up to 3 credits.
Learning Outcomes
1. Varies.

MUSC 531. Music Education in the Diverse Classroom
3 Credits (3)
This course is designed to provide an introduction to diverse and at-risk student groups in educational settings in the music classroom. It will help the course participants explore strategies and gain skills to enhance the musical growth of marginalized groups of students. There is an emphasis on identification, behavioral patterns, building interpersonal relationships, and will include a critical review of selected current research studies in music education. Armed with this knowledge, course participants will be better prepared to understand at-risk students and how best to implement strategies in the classroom. May be repeated up to 3 credits. Restricted to: MUS majors.
Learning Outcomes
1. Students will access and utilize the basic research journals and other sources of research reports and summaries, including those identified using computer technology in the field of music education.
2. Students will describe the structure of most qualitative research studies and their aide in identifying student traits.
3. Students will understand and use most of the language, terms and vocabulary found in qualitative research reports in discussing and identifying behavioral patterns of at-risk students.
4. Students will appraise qualitative research in a systematic way; analyze and review what the research produced in order to isolate the strategies available to incorporate in classroom teaching scenarios.
5. Students will independently retrieve, critique and summarize research related to at-risk students in music education.

MUSC 532. 21st Century Piano Skills
1 Credit (1)
To guide students' keyboard versatility, particularly the skills practical and meaningful in various roles as a professional pianist in the 21st century music—The course explores performance in a variety of settings including sight-reading, efficient music learning, jazz, lead sheet harmonization, improvisation and arranging, alto and tenor clef reading, transposition, and quickly grasping the musical styles of the given new repertoire. May be repeated up to 15 credits.
Learning Outcomes
1. Sight-read and learn new music efficiently across a range of genres and ensemble settings.
2. Harmonize melodies using lead sheets and chord symbols in jazz, folk, hymn, and popular music stylistic appropriateness.
3. Arrange and improvise music in various musical contexts, including classical, jazz, and contemporary idioms.
4. Transpose short passages and chord progressions into different keys at sight.
5. Read and play treble, bass, alto, and tenor clefts with functional fluency (such as reading the B-flat clarinet part in duo music and SATB choir repertoire, with selected parts).
6. Identify and apply appropriate stylistic features when performing new repertoire.
7. Demonstrate professional preparation and keyboard versatility in mock performance scenarios reflective of real-world gigs (for example: church, musical theater, cocktail hour, large ensemble, etc).

MUSC 533. Vocal Literature for Piano
2 Credits (2)
This course provides pianists with an in-depth exploration of voice literature from the Baroque and Classical periods to contemporary repertoire, with a focus on art song traditions across languages and cultures. Emphasis is placed on the stylistic, historical, and linguistic aspects of major song literature, including German Lieder, French mélodie, English and American art song, and other significant repertoires beyond canon. Through listening, score study, and performance, students will develop the collaborative skills necessary for effective partnership with vocalists, including issues of interpretation, diction, phrasing, and stylistic nuance. Special attention will be given to repertoire selection, transposition, and the pianist's role in rehearsal and performance. This course is designed to build both knowledge and practical tools for pianists. Basic knowledge of vocal diction is needed to take this course.
Learning Outcomes
1. Identify and describe key composers, styles, and historical contexts of major vocal literature from Baroque period through the 21st century.
2. Analyze and interpret art song and operatic Aria repertoire across multiple languages and traditions, including German Lieder, French mélodie, Italian, English, American, Spanish, and Russian songs.
3. Explore and contextualize art song from Japanese, Korean, Chinese, and Indigenous traditions, and demonstrate familiarity through listening, discussion, and performance.
4. Demonstrate effective collaborative skills with vocalists, including score preparation, phrasing, and stylistic sensitivity.

5. Apply knowledge of IPA and diction principles to support accurate pronunciation and interpretation in German, French, English, Spanish, and other languages commonly found in vocal repertoire.
6. Evaluate, translate, and discuss song texts, musical settings, and performance practices.
7. Perform representative works from multiple stylistic periods in a collaborative setting, exhibiting both technical proficiency and interpretive insight.

MUSC 534. Instrumental Sonatas and Duo Repertoire for Piano
2 Credits (2)
This course provides pianists with an in-depth study of major sonatas and duo repertoire for piano and instruments—including strings, woodwinds, brass, and selected percussion. Emphasis is placed on historical style, interpretive collaboration, rehearsal strategies, and performance practice. In addition, skills for quickly learning new pieces, reducing orchestral reduction effectively, and developing technical and musical refinement skills will be covered. Students will explore key repertoire from the Baroque through Contemporary eras, developing the musical, technical, and interpersonal skills needed to perform as equal partners in recital settings. The course includes score study, listening, class coaching, and ensemble work. Pianists will gain practical experience performing with a variety of instrumentalists and develop fluency in stylistic nuance, balance, articulation, and cueing.

Learning Outcomes
1. Analyze and interpret instrumental duo repertoire from the Baroque through Contemporary periods, with attention to historical style, performance practice, and techniques.
2. Demonstrate collaborative rehearsal techniques, including cueing, balance, articulation, and phrasing appropriate to various instrumental partners.
3. Apply practical strategies for quickly learning new repertoire, including major Sonatas, complex stand-alone pieces, and orchestral reductions with skills to adjust the orchestral reduction as needed.
4. Perform collaboratively with a range of instrumentalists (strings, woodwinds, brass, and percussion), showing stylistic fluency, musicality, and technical confidence.
5. Identify and discuss defining characteristics of major composers and stylistic schools represented in the duo repertoire.
6. Exhibit professional rehearsal and communication etiquette, score preparation, and adaptability across diverse collaborative settings.

MUSC 535. Current Issues in Music Education
3 Credits (3)
This course examines the rich and challenging complexities of music teaching and learning from a variety of perspectives. Educational theory to pedagogical inquiry of current educational practice will be examined, calling students to critically reflect on such professional activities as lesson planning, curriculum design, repertoire choice, program assessment, advocacy in the arts, and student evaluation. Restricted to: MUS (Music Ed track only) majors.

Learning Outcomes
1. An understanding of the complexities of music teaching and learning from a variety of perspectives.

MUSC 540. Graduate Recital/Analytical Paper
4 Credits (4)
This course is for students completing a Master of Music with a Performance emphasis. A public recital will be given and an accompanying research paper will be submitted. Restricted to: MUS majors.

Learning Outcomes
1. Development of performance skills.
2. Development of research ability.
3. Development of writing skills.

MUSC 574. Advanced Choral Conducting I
3 Credits (3)
This course will continue the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.
Prerequisite(s): A grade of B or better in MUSC 475.

MUSC 575. Advanced Choral Conducting II
3 Credits (3)
This is the final course in preparation for the student's graduate conducting concert. It will continue the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.
Prerequisite(s): A grade of B or better in MUSC 574.

MUSC 576. Advanced Instrumental Conducting I
3 Credits (3)
The role of the conductor is to lead, react to, alter, and reinforce the performance of the ensemble. This course will continue in the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.
Prerequisite(s): A grade of B or better in MUSC 475.

MUSC 577. Advanced Instrumental Conducting II
3 Credits (3)
The role of the conductor is to lead, react to, alter, and reinforce the performance of the ensemble. This course will continue in the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.
Prerequisite(s): A grade of B or better in MUSC 576.

MUSC 578. Advanced Choral Literature
2-3 Credits (2-3)
An examination of significant choral works from 1200 to the present, including composers, genres, and historical context May be repeated up to 3 credits. Restricted to: MUS majors.
Prerequisite(s): A grade of B or better in MUSC 475.

MUSC 579. Advanced Instrumental Literature
2-3 Credits (2-3)
An examination of significant instrumental works from the Baroque period to the present, including composers, genres, and historical context May be repeated up to 3 credits. Restricted to: MUS majors.
Prerequisite(s): A grade of B or better in MUSC 475.

MUSC 580. Ensemble Performance
1 Credit (1)
Performance in university ensembles. May be repeated up to 99 credits.
Prerequisite: By audition only.
Learning Outcomes
1. Improve performance skills.
2. Develop and improve performance skills in a group setting.
3. Develop understanding and interpretation within the context of music history.
4. Refine and improve technical ability.
5. Demonstrate proper technique and usage.

MUSC 581. The Collaborative Pianist
1 Credit (1)
This course integrates one-on-one meeting and group performance. The goal is to guide the students' topic interests, expand their knowledge of musical repertoire, styles, composers, and/or interpretation. May be repeated up to 15 credits.
Learning Outcomes
1. Prepare and perform a mixture of vocal one instrumental collaborative work.
2. Learn the skills necessary to collaborate successfully with other musicians, including listening, having an open and constructive communication, and developing stronger keyboard skills as applicable to ensemble settings.
3. Prepare a professional comprehensive Repertoire List with all categories (solo piano, collaborative music, chamber music, large ensemble).
4. Learning diversity of teaching styles.
5. Learn about the specific challenges of playing each instrument and instrumental family.
6. Adapt factors such as dynamics and pacing when collaborating with different instruments and voices.
7. Discover and apply the balance between musical leading and following.
8. Learn to express musical opinions and respect those of others.

MUSC 582. Applied Music
2-4 Credits (2-4)
For music majors, individual instruction, including improvisation skills and techniques. Students may enroll for 2 or 4 credits. Students must audition in order to enroll. Consent of instructor required. May be repeated up to 24 credits.
Learning Outcomes
1. Develop of Musical Performance Attributes.
2. Development of technical Skills.
3. Development of Aural Skills.
4. Development of Musical Analytical Skills.
5. Development of Improvisatory Skills.

MUSC 586. Applied Music Pedagogy and Literature III
2 Credits (2)
Methods, materials, problems, literature, and techniques in teaching individual lessons. Restricted to: Music majors.
Prerequisite: A grade of B or better in MUSC 486.
Learning Outcomes
1. Development of appropriate pedagogical skills.

MUSC 598. Special Research Programs
1-4 Credits
May be taken for unlimited credit. May be repeated up to 99 credits.
Learning Outcomes
1. Varies.

MUSC 599. Master's Thesis
15 Credits
Thesis. May be repeated up to 88 credits.
Learning Outcomes
1. Varies.

Phone: (575) 646-2421

Website: http://music.nmsu.edu/ (http://music.nmsu.edu)

Music - Bachelor of Arts

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students that wish to pursue this degree would be best served in completing this program as an accompanying degree or double major to an already existing program, completing this program with one of the concentrations, or students judiciously select a minor to accompany the BA in Music

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
	English Composition - Level 1 (4 credits) [1]	
	English Composition - Level 2 (3 credits) [1]	
	Oral Communication (3 credits) [1]	
Area II: Mathematics [1]		*3-4*
Area III/IV: Laboratory Sciences and Social Behavioral Sciences [1]		*10-11*
PHYS 1125G	Physics of Music (Physics of Music (suggested fulfilment of Area III, not required))	
	Area IV: Social Behavioral Sciences Course (3 credits) [1]	
	Either an Area III or IV: Laboratory Sciences or Social/Behavioral Sciences Course (3-4 credits) [1]	
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing a Wider World [2]		**6**
Departmental Requirements		
Theory and Ear Training Courses		
MUSC 1450	Ear Training I	1
MUSC 1451	Ear Training II	1
MUSC 1460	Music Theory I	3
MUSC 1461	Music Theory II	3
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
History and Literature Courses		
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 302	Music History and Literature: Classic through Romantic	3

MUSC 303	Music History and Literature: 20th Century Through the Present	3
Techniques Courses		*2*
MUSC 2310	Sound and Music Technology	1
MUSC 325	Beginning Conducting	1
Performance Courses		
Any 2000 level MUSC ensemble [3]		3
MUSC 2510	Applied Music I [4]	4
MUSC 330	Applied Music II [5]	2
Any 300 level MUSC Ensemble [3]		3
MUSC 1310	Recital Attendance (4 semesters with .5 credits each)	2
MUSC 1470	Functional Piano I (or applied piano)	2
MUSC 341	BA Capstone	1-2
Departmental Electives		
Any 300 level MUSC Electives		6
Any 400 level MUSC Electives		6
Non-Departmental Requirements		
Minor Field Courses		*15*
Second Language Requirements (not required) [6]		**0**
Electives, to bring the total credits to 120 [7]		**9-13**
Total Credits		**120**

1. See the General Education Section (p. 262) of the catalog for a full list of courses
2. See the Viewing a World Section (p. 266) of the catalog for a full list of courses
3. Students must complete this requirement for 1 credit for a total of 3 semesters.
4. Students must complete this requirement for 1 credit for a total of 4 semesters.
5. Students must complete this requirement for 1 credit for a total of 2 semesters.
6. Because of the number of credits required for a music degree, including required ensembles and applied lessons, music students are not required to meet the Second Language Requirements.
7. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts- Music there is no second language requirement for the degree.

A Suggested Plan of Study

Additional classes may be needed based on placement test results and course prerequisites. Visit with an advisor for help with creating a customized plan. This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		**Credits**
MUSC 1310	Recital Attendance	0.5
MUSC 1450	Ear Training I (Fall only)	1
MUSC 1460	Music Theory I (Fall only)	3
MUSC 1470	Functional Piano I (Fall only)	2
MUSC 2510	Applied Music I	1
MUSC 2120	Major Ensemble	1
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
Area II: Mathematics Course [1]		3-4
MUSC 1310	Recital Attendance	0.5
MUSC 1451	Ear Training II	1
MUSC 1461	Music Theory II	3
MUSC 2510	Applied Music I	1
MUSC 2120	Major Ensemble	1
ENGL 2221G or ENGL 2210G or ENGL 2210H	Writing in the Humanities and Social Science or Professional and Technical Communication or Professional and Technical Communication	3
Minor Field Course		3
	Credits	**28-29**
Second Year		
MUSC 1310	Recital Attendance	0.5
MUSC 2310	Sound and Music Technology	1
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
MUSC 2510	Applied Music I	1
MUSC 2120	Major Ensemble	1
Area IV: Social/Behavioral Science Course [1]		3
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	0-3
MUSC 1310	Recital Attendance	0.5
MUSC 2510	Applied Music I	1
300-level Major Ensemble Course		1
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
Area III: Laboratory Science Course [1]		4
AREA V		
PHYS 1125G	Physics of Music (Suggested)	
Electives as needed		6
	Credits	**26-29**
Third Year		
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 325	Beginning Conducting	1
MUSC 330	Applied Music II	1
300-level Major Ensemble Course		1
300-level Music Elective		3
Either an Area III: Laboratory Sciences Course or Area IV: Social/Behavioral Science Course [1]		3-4
MUSC 303	Music History and Literature: 20th Century Through the Present	3
MUSC 330	Applied Music II	1
300-level Major Ensemble Course		1
300-level Music Elective Course		3
Minor Field Course		6
VWW: Viewing a Wider World Course [2]		3

Elective Course(s) as needed		5
	Credits	**34-35**
Fourth Year		
Elective Course(s)		4
400-level Music Elective Course		3
Minor Field Course		3
Elective Course		3
General Education Elective Course [1]		3
MUSC 341	BA Capstone	1-2
400-level Music Elective Course		3
Minor Field Course(s)		6
Elective Course		3
VWW: Viewing a Wider World Course [2]		3
	Credits	**32-33**
	Total Credits	**120-126**

1 See the General Education Section (p. 262) of the catalog for a full list of courses

2 See the Viewing a World Section (p. 266) of the catalog for a full list of courses

Music (Pre-Speech Language Pathology) - Bachelor of Arts

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 (4 credits) [1]		
English Composition - Level 2 (3 credits) [1]		
Oral Communication (3 credits) [1]		
Area II: Mathematics		
MATH 1350G	Introduction to Statistics (concentration course)	3
Area III/IV: Laboratory Sciences and Social Behavioral Sciences [1]		
PHYS 1125G	Physics of Music (suggested fulfilment of Area III, not required)	4
PSYC 1110G	Introduction to Psychology	3
LING 2110G	Introduction to the Study of Language and Linguistics (concentration course)	3
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		*3*
CEPY 1120G	Human Growth and Behavior (recommended)	
Viewing a Wider World [2]		**6**
Departmental Requirements		
Theory and Ear Training Courses		
MUSC 1450	Ear Training I	1
MUSC 1451	Ear Training II	1
MUSC 1460	Music Theory I	3
MUSC 1461	Music Theory II	3
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
History and Literature Courses		
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 303	Music History and Literature: 20th Century Through the Present	3
Techniques Courses		
MUSC 2310	Sound and Music Technology	1
MUSC 325	Beginning Conducting	1
Performance Courses		
MUSC 2510	Applied Music I [3]	4
MUSC 330	Applied Music II [4]	2
Any 200 level MUSC Ensemble [5]		3
Any 300 level MUSC Ensemble [5]		3
MUSC 1310	Recital Attendance [6]	4
MUSC 1470	Functional Piano I (or applied piano)	2
MUSC 341	BA Capstone	1-2
Departmental/College Electives		
Six credits of any 300-level MUSC Courses		6
Six credits of any 400-level MUSC Courses		6
Non-Departmental Requirements		
Concentration Courses		
MATH 1215	Intermediate Algebra	3
SPHS 2110	Introduction to Communication Disorders	3
SPHS 4610	Language Acquisition	3
SPHS 4720	Anatomy and Physiology of Speech Mechanisms	3
SPHS 4510	Phonetics	3
SPHS 4620	Speech and Hearing Science	3
Second Language Requirements (not required) [7]		**0**
Electives, to bring the total credits to 120 [8]		**9-10**
Total Credits		**120**

1 See the General Education Section (p. 262) of the catalog for a full list of courses

2 See the Viewing a World Section (p. 266) of the catalog for a full list of courses

3 Students must complete this requirement for 1 credit for a total of 4 semesters.

4 Students must complete this requirement for 1 credit for a total of 2 semesters.

5 Students must complete this requirement for 1 credit for a total of 3 semesters.

6 Students must complete this requirement for .5 credit for a total of 4 semesters.

7 Because of the number of credits required for a music degree, including required ensembles and applied lessons, music students are not required to meet the Second Language Requirements.

8 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-

case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study

Additional classes may be needed based on placement test results and course prerequisites. Visit with an advisor for help with creating a customized plan. This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		Credits
MUSC 1310	Recital Attendance	0.5
MUSC 1450	Ear Training I (Fall only)	1
MUSC 1460	Music Theory I (Fall only)	3
MUSC 1470	Functional Piano I (Fall only)	2
MUSC 2510	Applied Music I	1
MUSC 2120	Major Ensemble	1
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
MATH 1215	Intermediate Algebra (required for upper division Psychology & Mathematics course)	3
SPHS 2110	Introduction to Communication Disorders	3
MUSC 1310	Recital Attendance	0.5
MUSC 1451	Ear Training II	1
MUSC 1461	Music Theory II	3
MUSC 2510	Applied Music I	1
MUSC 2120	Major Ensemble	1
CEPY 1120G	Human Growth and Behavior (Meets the General Education Elective requirement)	3
ENGL 2221G or ENGL 2210G or ENGL 2210H	Writing in the Humanities and Social Science or Professional and Technical Communication or Professional and Technical Communication	3
LING 2110G	Introduction to the Study of Language and Linguistics (Meets the Area IV requirement)	3
	Credits	**34**
Second Year		
MUSC 1310	Recital Attendance	0.5
MUSC 2310	Sound and Music Technology	1
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
MUSC 2510	Applied Music I	1
2000-level MUSC Ensemble Course		1
SPHS 4510	Phonetics	3
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
MUSC 1310	Recital Attendance	0.5
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 2510	Applied Music I	1
300-level MUSC Major Ensemble Course		1
MATH 1350G	Introduction to Statistics	3
PSYC 1110G	Introduction to Psychology (AREA IV)	3
Area III: Laboratory Science Course [1]		4
PHYS 1125G	Physics of Music (suggested)	
	Credits	**29**
Third Year		
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 325	Beginning Conducting	1
MUSC 330	Applied Music II	1
300-level MUSC Major Elective Course		6
300-level MUSC Ensemble Course		1
MUSC 386	Applied Music Pedagogy and Literature I (Vocal Ped & Lit suggested Upper-division MUSC Elective)	
Area V: Humanities Course [1]		3
Elective Course		3
SPHS 4520	Audiology (Strongly recommended, prerequisite for SPHS 4620)	
MUSC 303	Music History and Literature: 20th Century Through the Present	3
MUSC 330	Applied Music II	1
300-level MUSC Major Ensemble Course		1
SPHS 4610	Language Acquisition	3
SPHS 4620	Speech and Hearing Science	3
VWW: Viewing a Wider World Course [2]		3
	Credits	**32**
Fourth Year		
MUSC 1440	Class Voice I (suggested)	
400-level MUSC Music Elective		6
Elective Course		6
SPHS 4710	Speech Disorders Across the Lifespan (Strongly sugggested prerequisite to SPHS4820/SPHS 4830)	
SPHS 4720	Anatomy and Physiology of Speech Mechanisms	3
VWW: Viewing a Wider World Course [2]		3
MUSC 341	BA Capstone	1-2
Elective Course		3
SPHS 4810	Clinical Methods and Procedures (suggested)	
SPHS 4820	Neural Bases of Communication Disorders (suggested)	
SPHS 4830	Aural Rehabilitation (suggested)	
Area VI: Creative and Fine Arts Course [1]		3
	Credits	**25-26**
	Total Credits	**120-121**

1. See the General Education Section (p. 262) of the catalog for a full list of courses
2. See the Viewing a World Section (p. 266) of the catalog for a full list of courses

Music (Theatre) - Bachelor of Arts

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 (4 credits) [1]		
English Composition - Level 2 (3 credits) [1]		
Oral Communication (3 credits) [1]		
Area II: Mathematics [1]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
PHYS 1125G	Physics of Music (Physics of Music (suggested fulfilment of Area III, not required))	
Area IV: Social/Behavioral Sciences (3 credits)		
Either an Area III or IV: Laboratory Sciences or Social/Behavioral Sciences Course (3-4 credits)		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
This requirement is satisfied by the 9-credit rule with the THEA 1000 level courses required for the Concentration		
Viewing a Wider World [2]		**6**
Departmental Requirements		
Theory and Ear Training Courses		
MUSC 1450	Ear Training I	1
MUSC 1451	Ear Training II	1
MUSC 1460	Music Theory I	3
MUSC 1461	Music Theory II	3
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
History and Literature Courses		
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 303	Music History and Literature: 20th Century Through the Present	3
Techniques Courses		
MUSC 2310	Sound and Music Technology	1
MUSC 325	Beginning Conducting	1
Performance Courses		
MUSC 1310	Recital Attendance [3]	2
MUSC 2510	Applied Music I [4]	4
MUSC 330	Applied Music II [5]	2
Any 200 Level MUSC Ensemble [6]		3
Any 300 level MUSC Ensemble [6]		3
MUSC 1470	Functional Piano I (or applied piano)	2
MUSC 341	BA Capstone	1-2
Departmental Electives		
Six credits of 300-level MUSC Elective courses		6
Six credits of 400 level MUSC courses		6
Non-Departmental Requirements (other than Gen.Ed/WW)		
Concentration Courses		
THEA 1223	The Art of Theatre	3
THEA 1221	Beginning Acting	3
THEA 1222	Stage Movement	3
THEA 2421	Vocal Production for the Actor	3
THEA 317	Musical Theatre	3
THEA 356	Theatre Production (May substitute MUSC 351) [7]	2
THEA 417	Musical Theatre II	3
THEA 395	Directing I	3
DANC 2460	Dance for Musical Theatre	2
Second Language Requirements (not required) [8]		**0**
Electives, to bring the total credits to 120 [9]		**5-8**
Total Credits		**120**

1. See the General Education Section (p. 262) of the catalog for a full list of courses
2. See the Viewing a World Section (p. 266) of the catalog for a full list of courses
3. Students will complete the requirements with .5 credit for 4 semesters
4. Students will complete the requirements with 1 credit for 4 semesters
5. Students will complete the requirements with 1 credit for 2 semesters
6. Students will complete the requirements with 1 credit for 3 semesters
7. Students will complete the requirements with 1 credit for 2 semesters
8. Because of the number of credits required for a music degree, including required ensembles and applied lessons, music students are not required to meet the Second Language Requirements.
9. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts- Music with a concentration in Theatre there is no second language requirement for the degree.

A Suggested Plan of Study

Additional classes may be needed based on placement test results and course prerequisites. Visit with an advisor for help with creating a customized plan. This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		Credits
MUSC 1310	Recital Attendance	0.5
MUSC 1450	Ear Training I	1
MUSC 1460	Music Theory I	3
MUSC 2510	Applied Music I	1
MUSC 2120	Major Ensemble	1
MUSC 1470	Functional Piano I	2
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
MATH 1130G	Survey of Mathematics	3
THEA 1223	The Art of Theatre	3
MUSC 1310	Recital Attendance	0.5
MUSC 1451	Ear Training II	1
MUSC 1461	Music Theory II	3
MUSC 2510	Applied Music I	1
MUSC 2120	Major Ensemble	1
Area IV: Social/Behavioral Sciences Course [1]		3

ENGL 2221G or ENGL 2210G or ENGL 2210H	Writing in the Humanities and Social Science or Professional and Technical Communication or Professional and Technical Communication	3
Elective Course		2
	Credits	**33**
Second Year		
MUSC 1310	Recital Attendance	0.5
MUSC 2310	Sound and Music Technology	1
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
MUSC 2510	Applied Music I	1
MUSC 2120	Major Ensemble	1
THEA 1221	Beginning Acting	3
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
MUSC 1310	Recital Attendance	0.5
MUSC 2510	Applied Music I	1
Elective Course		1-3
MUSC 2452	Ear Training IV (suggested)	
MUSC 2461	Music Theory IV (suggested)	
THEA 1222	Stage Movement	3
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
Area III: Laboratory Sciences Course		4
PHYS 1125G	Physics of Music	
	Credits	**26-28**
Third Year		
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 325	Beginning Conducting	1
MUSC 330	Applied Music II	1
300-level MUSC Major Ensemble		1
300-level MUSC Music Elective		3
THEA 2421	Vocal Production for the Actor	3
THEA 317	Musical Theatre	3
DANC 2460	Dance for Musical Theatre	2
MUSC 303	Music History and Literature: 20th Century Through the Present	3
MUSC 330	Applied Music II	1
300-level MUSC Major Ensemble		1
300-level Music Elective		3
MUSC 351 or THEA 356	Opera Workshop or Theatre Production	1
THEA 417	Musical Theatre II	3
VWW: Viewing a Wider World Course [2]		3
Area VI: Creative and Fine Arts Course [1]		3
Elective Course		2
Either an Area III: Laboratory Sciences Course or Area IV: Social/Behavioral Sciences Course [1]		3-4
	Credits	**40-41**
Fourth Year		
300-level MUSC Major Ensemble		1
400-level MUSC Music Elective		3
MUSC 351 or THEA 356	Opera Workshop or Theatre Production	1
THEA 395	Directing I	3
Theatre History Elective recommended (upper-division)		
Area V: Humanities Course [1]		3
MUSC 341	BA Capstone	1-2
400-level MUSC Music Elective		3
Elective Course (Upper-Division)		3
Theatre History Elective recommended		
VWW: Viewing a Wider World Course [2]		3
	Credits	**21-22**
	Total Credits	**120-124**

1. See the General Education Section (p. 262) of the catalog for a full list of courses
2. See the Viewing a World Section (p. 266) of the catalog for a full list of courses

Music (Instrumental Performance) - Bachelor of Music

The Bachelor of Music (BM) curriculum is designed to prepare students for performance careers and private studio teaching and serves as a foundation for advanced study toward master's and doctoral degrees: M.M., D.M.A., or Ph.D in Music. In addition, the BM degree may lead to positions as professional entertainers or teachers at the college and university levels, or lead to music related work in the business world.

Requirements - Basic Music and Performance

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 129 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1, 2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
PHYS 1125G	Physics of Music (Physics of Music (suggested fulfilment of Area III, not required))	
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
Music Theory and Ear Training		
MUSC 1450	Ear Training I	1
MUSC 1460	Music Theory I	3
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
MUSC 1451	Ear Training II	1

MUSC 1461	Music Theory II	3
MUSC 2452	Ear Training IV	1
MUSC 2461	Music Theory IV	3
MUSC 413	Form and Analysis	3
History and Literature		
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 303	Music History and Literature: 20th Century Through the Present	3
Choose two 400-level music history course from the following:		6
MUSC 421	Music of the Baroque Era	
MUSC 422	Music of the Classic Era	
MUSC 424	Music of the Twentieth Century	
MUSC 429	Opera: History and Literature	
Techniques		
MUSC 2310	Sound and Music Technology	1
MUSC 325	Beginning Conducting	1
MUSC 326	Instrumental Conducting	3
or MUSC 327	Choral Conducting	
MUSC 386	Applied Music Pedagogy and Literature I	2
MUSC 415	Orchestration	3
MUSC 441	Supervised Studio Teaching	2
Performance		
MUSC 1310	Recital Attendance (take for eight semesters for a total of 4 credits)	4
Applied Music		*20*
MUSC 2510	Applied Music I (Instrumental)	
MUSC 330	Applied Music II (Instrumental)	
MUSC 430	Applied Music III (Instrumental) [4]	
MUSC 340	Junior Recital	1
MUSC 440	Senior Recital [5]	2
Applied or Functional Piano		4
Instrumental Ensemble		12
Second Language Requirement: (not required)		
Electives, to bring the total credits to 127		**0**
Total Credits		**127-130**

1 See the General Education (p. 262) section of the catalog for a full list of courses.

2 A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course selected first.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 All Music Majors must take MUSC 430 Applied Music III for a minimum of 2 semesters.

5 Music Performance students must take MUSC 440 Senior Recital for 2 credits.

Second Language Requirement

For the Bachelor of Music in Music with a Concentration in Instrumental Performance, there is no second language requirement for the degree.

Piano Proficiency

- Students must pass Piano Proficiency before presenting a Senior Recital.
- Students must enroll for Functional Piano until the Proficiency is passed

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		**Credits**
MUSC 1310	Recital Attendance	0.5
MUSC 1450	Ear Training I	1
MUSC 1460	Music Theory I (Fall only)	3
MUSC 1470	Functional Piano I (Fall Only) [1]	2
MUSC 2120	Major Ensemble	1
MUSC 2510	Applied Music I	2
ENGL 1110G or ENGL 1110H	Composition I [2] or Composition I Honors	4
MATH 1130G	Survey of Mathematics [2]	3
MUSC 1310	Recital Attendance	0.5
MUSC 1451	Ear Training II (Spring only)	1
MUSC 1461	Music Theory II (Spring only)	3
MUSC 1471	Functional Piano II (Spring only) [1]	2
MUSC 2310	Sound and Music Technology	1
MUSC 2510	Applied Music I	2
2000-level Instrument Ensemble Course		1
ENGL 2210G or ENGL 2221G or ENGL 2210H	Professional and Technical Communication [2] or Writing in the Humanities and Social Science or Professional and Technical Communication	3
	Credits	**30**
Second Year		
MUSC 1310	Recital Attendance	0.5
MUSC 2451	Ear Training III (Fall only)	1
MUSC 2460	Music Theory III (Fall only)	3
MUSC 2510	Applied Music I	2
300-Level Instrument Ensemble Course		1
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
AREA V Course		3
MUSC 1310	Recital Attendance	0.5
MUSC 2452	Ear Training IV (Spring only)	1
MUSC 2461	Music Theory IV (Spring only)	3
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 2510	Applied Music I	2
300-level Instrument Ensemble Course		1
Area III: Laboratory Science Course [3]		4
PHYS 1125G	Physics of Music (Suggested)	
	Credits	**28**
Third Year		
MUSC 1310	Recital Attendance	0.5
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 325	Beginning Conducting [2]	1

MUSC 330	Applied Music II [2]	3
MUSC 386	Applied Music Pedagogy and Literature I	2
300-level Instrument Ensemble Course(s)		2
Area VI: Creative and Fine Arts Course [3]		3
Area IV: Social/Behavioral Sciences Course [3]		3
MUSC 1310	Recital Attendance	0.5
MUSC 303	Music History and Literature: 20th Century Through the Present	3
MUSC 326 or MUSC 327	Instrumental Conducting (Spring only) or Choral Conducting	3
MUSC 330	Applied Music II	3
MUSC 340	Junior Recital	1
300-level Instrument Ensemble Course(s)		2
Either an Area III: Laboratory Sciences Course or Area IV: Social/Behavioral Sciences Course [3]		3-4
	Credits	**33-34**
Fourth Year		
MUSC 1310	Recital Attendance	0.5
MUSC 413	Form and Analysis (Fall only)	3
MUSC 430	Applied Music III (Fall only)	3
MUSC 441	Supervised Studio Teaching	2
300-level Instrument Ensemble Course(s)		2
Music History Elective (400-level)		3
VWW: Viewing a Wider World Course(s) [4]		6
MUSC 1310	Recital Attendance	0.5
MUSC 415	Orchestration [2]	3
MUSC 430	Applied Music III [2]	3
MUSC 440	Senior Recital	2
300-level Instrument Ensemble Course(s)		2
400-level Music History Elective Course		3
	Credits	**33**
	Total Credits	**124-125**

1. Functional Piano is not a required course. It is recommended that students take it at the appropriate level until ready to pass the required Piano Proficiency
2. These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
3. See the General Education (p. 262) section of the catalog for a full list of courses.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Music (Piano Performance) - Bachelor of Music

The Bachelor of Music (BM) curriculum is designed to prepare students for performance careers and private studio teaching and serves as a foundation for advanced study toward master's and doctoral degrees: M.M., D.M.A., or Ph.D in Music. In addition, the BM degree may lead to positions as professional entertainers or teachers at the college and university levels, or lead to music related work in the business world.

Requirements - Basic Music and Performance

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 127 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1, 2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
PHYS 1125G	Physics of Music (Physics of Music (suggested fulfilment of Area III, not required))	
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
Music Theory and Ear Training		
MUSC 1450	Ear Training I	1
MUSC 1460	Music Theory I	3
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
MUSC 1451	Ear Training II	1
MUSC 1461	Music Theory II	3
MUSC 2452	Ear Training IV	1
MUSC 2461	Music Theory IV	3
MUSC 413	Form and Analysis	3
History and Literature		
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 303	Music History and Literature: 20th Century Through the Present	3
Choose two 400-level music history course from the following:		6
MUSC 421	Music of the Baroque Era	
MUSC 422	Music of the Classic Era	
MUSC 424	Music of the Twentieth Century	
MUSC 429	Opera: History and Literature	
Techniques		
MUSC 2310	Sound and Music Technology	1
MUSC 325	Beginning Conducting	1
MUSC 386	Applied Music Pedagogy and Literature I	2
MUSC 486	Applied Music Pedagogy and Literature II	2
Performance		
MUSC 1310	Recital Attendance (take eight semesters for a total of 4 credits)	4
MUSC 2110	Chamber Ensemble (take two semesters for a total of 2 credits)	2
Applied Music		*20*
MUSC 2510	Applied Music I (Piano)	
MUSC 330	Applied Music II (Piano)	

MUSC 430	Applied Music III (Piano) [4]	
MUSC 340	Junior Recital	1
MUSC 350	Chamber Music (take two semesters for a total of 2 credits)	2
MUSC 417	Studio Accompanying (take two semesters for a total of 4 credits)	4
MUSC 440	Senior Recital [5]	2
Ensemble		4
Secondary Applied		4
Upper Level Music Electives		4
Second Language Requirement: (not required)		
Electives, to bring the total credits to 125		**0**
Total Credits		**125-128**

1 See the General Education (p. 262) section of the catalog for a full list of courses.
2 A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course selected first.
3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4 All Music Majors must take MUSC 430 Applied Music III for a minimum of 2 semesters.
5 Music Performance students must take MUSC 440 Senior Recital for 2 credits.

Second Language Requirement

For the Bachelor of Music in Music with a Concentration in Piano Performance, there is no second language requirement for the degree.

Secondary Proficiency

- Students must pass Secondary Proficiency before presenting a Senior Recital.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		**Credits**
MUSC 1310	Recital Attendance (S/U grading)	0.5
MUSC 1450	Ear Training I (Fall Only; C- or better) [1]	1
MUSC 1460	Music Theory I (Fall only; C- or better) [1]	3
MUSC 2510	Applied Music I (C- or better)	2
Secondary Applied Music Course (C- or better)		2
2000-level Ensemble Course (C- or better)		1
ENGL 1110G or ENGL 1110H	Composition I (C- or better) [1] or Composition I Honors	4
MATH 1130G	Survey of Mathematics (C- or better) [1]	3
MUSC 1310	Recital Attendance (S/U grading)	0.5
MUSC 1451	Ear Training II (Spring only, C- or better) [1]	1
MUSC 1461	Music Theory II (Spring only; C- or better) [1]	3
MUSC 2310	Sound and Music Technology	1
MUSC 2510	Applied Music I	2
Secondary Applied Music Course (C- or better) [1]		2
2000-level Ensemble Course (C- or better)		1
ENGL 2210G or ENGL 2210H	Professional and Technical Communication (C- or better) [1] or Professional and Technical Communication	3
AREA III or IV course		3-4
	Credits	**33-34**
Second Year		
MUSC 1310	Recital Attendance	0.5
MUSC 2451	Ear Training III (Fall only; C- or better) [1]	1
MUSC 2460	Music Theory III (Fall only; C- or better) [1]	3
MUSC 2510	Applied Music I	2
300-level Music Ensemble Course (C- or better)		1
COMM 1115G or HNRS 2175G	Introduction to Communication (C- or better) or Introduction to Communication Honors	3
Area IV: Social/Behavioral Science Course [2]		3
MUSC 1310	Recital Attendance	0.5
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 2452	Ear Training IV (Spring only; C- or better) [1]	1
MUSC 2461	Music Theory IV (Spring only; C- or better) [1]	3
MUSC 2510	Applied Music I	2
300-level Music Ensemble Course (C- or better)		1
Area V: Humanities Course [2]		3
Area III: Laboratory Sciences Course		4
PHYS 1125G	Physics of Music (Suggested)	
	Credits	**31**
Third Year		
MUSC 1310	Recital Attendance (S/U grading)	0.5
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 325	Beginning Conducting (C- or better) [1]	1
MUSC 330	Applied Music II (C- or better) [1]	3
MUSC 386	Applied Music Pedagogy and Literature I (C- or better)	2
MUSC 2110	Chamber Ensemble	1
Area VI: Creative and Fine Arts Course [6]		3
MUSC 1310	Recital Attendance (S/U grading)	0.5
MUSC 303	Music History and Literature: 20th Century Through the Present	3
MUSC 330	Applied Music II (C- or better) [1]	3
MUSC 340	Junior Recital (C- or better) [1]	1
MUSC 2110	Chamber Ensemble (C- or better)	1
Music Elective (upper Level)		2
VWW Course		3
General Education Elective		3-4
	Credits	**30-31**
Fourth Year		
MUSC 1310	Recital Attendance (S/U grading)	0.5
MUSC 413	Form and Analysis (Fall only; C- or better) [1]	3
MUSC 430	Applied Music III (C- or better) [1]	3
MUSC 486	Applied Music Pedagogy and Literature II (C- or better)	2
MUSC 350	Chamber Music (C- or better)	1
MUSC 417	Studio Accompanying (C- or better)	2
VWW: Viewing a Wider World Courses [3]		3
MUSC 1310	Recital Attendance (S/U Grading)	0.5
MUSC 350	Chamber Music (By audition only; C- or better)	1

MUSC 417	Studio Accompanying (C- or better)	2
MUSC 430	Applied Music III (C- or better)	3
MUSC 440	Senior Recital (C- or better) [1]	2
400-level Music History Elective Course (C- or better) [1]		6
Music Elective (upper Level)		2
	Credits	**31**
	Total Credits	**125-127**

1 Students are responsible for understanding and enrolling in any co-requisite courses and completing any prerequisites prior to enrolling in this course.
2 See the General Education (p. 262) section of the catalog for a full list of courses.
3 See the Viewing a Wider World (p. 266) section for a full list of courses.

Music (Vocal Performance) - Bachelor of Music

The Bachelor of Music (BM) curriculum is designed to prepare students for performance careers and private studio teaching and serves as a foundation for advanced study toward master's and doctoral degrees: M.M., D.M.A., or Ph.D in Music. In addition, the BM degree may lead to positions as professional entertainers or teachers at the college and university levels, or lead to music related work in the business world.

Requirements - Basic Music and Performance

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 129 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1, 2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
PHYS 1125G	Physics of Music (Physics of Music (suggested fulfilment of Area III, not required))	
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Sciences Course or Social/ Behavioral Sciences Course (4 or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
Music Theory and Ear Training		
MUSC 1450	Ear Training I	1
MUSC 1460	Music Theory I	3
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
MUSC 1451	Ear Training II	1
MUSC 1461	Music Theory II	3
MUSC 2452	Ear Training IV	1
MUSC 2461	Music Theory IV	3
MUSC 413	Form and Analysis	3
History and Literature		
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 303	Music History and Literature: 20th Century Through the Present	3
MUSC 429	Opera: History and Literature	3
Techniques		
MUSC 2210	Diction I: Lyric Diction for Singers	2
MUSC 2220	Diction II: Advanced Lyric Diction for Singers	2
MUSC 2310	Sound and Music Technology	1
MUSC 325	Beginning Conducting	1
MUSC 386	Applied Music Pedagogy and Literature I	2
MUSC 486	Applied Music Pedagogy and Literature II	2
Performance		
MUSC 1310	Recital Attendance (take for eight semesters for a total of 4 credits)	4
Applied Music		*19*
MUSC 2510	Applied Music I (Vocal)	
MUSC 330	Applied Music II (Vocal)	
MUSC 430	Applied Music III (Vocal) [4]	
MUSC 340	Junior Recital	1
MUSC 440	Senior Recital [5]	2
Choral Ensembles		6
Opera Ensembles		6
Applied or Functional Piano		4
Second Language Requirement: (required - see below)		**8**
Electives, to bring the total credits to 129		**0**
Total Credits		**129-132**

1 See the General Education (p. 262) section of the catalog for a full list of courses.
2 A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course selected first.
3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4 All Music Majors must take MUSC 430 Applied Music III for a minimum of 2 semesters.
5 Music Performance students must take MUSC 440 Senior Recital for 2 credits.

Second Language Requirement

For the Bachelor of Music in Music with a Concentration in Vocal Performance the student must do the following:

Prefix	Title	Credits
FREN 1110 & GRMN 1110	French I and German I	8
or a high school equivalent		

Piano Proficiency

- Students must pass Piano Proficiency before presenting a Senior Recital.

- Students must enroll for Functional Piano until the Proficiency is passed.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		Credits
MUSC 1310	Recital Attendance	0.5
MUSC 1450	Ear Training I (Fall only)	1
MUSC 1460	Music Theory I (Fall only)	3
MUSC 1470	Functional Piano I [1]	2
MUSC 2210	Diction I: Lyric Diction for Singers (Fall only; odd academic year only)	2
MUSC 2510	Applied Music I	2
2000-level Choral Ensemble Course		1
ENGL 1110G or ENGL 1110H	Composition I [2] or Composition I Honors	4
MATH 1130G	Survey of Mathematics [2]	3
MUSC 1310	Recital Attendance	0.5
MUSC 1451	Ear Training II (Spring only)	1
MUSC 1461	Music Theory II (Spring only)	3
MUSC 1471	Functional Piano II [1]	2
MUSC 2510	Applied Music I	2
MUSC 2220	Diction II: Advanced Lyric Diction for Singers (Spring only-odd academic year only)	2
2000-level Choral Ensemble Course		1
ENGL 2221G or ENGL 2210G or ENGL 2210H	Writing in the Humanities and Social Science [2] or Professional and Technical Communication or Professional and Technical Communication	3
	Credits	**33**
Second Year		
MUSC 1310	Recital Attendance	0.5
MUSC 2310	Sound and Music Technology [2]	1
MUSC 2451	Ear Training III (Fall only) [2]	1
MUSC 2460	Music Theory III (Fall only) [2]	3
MUSC 2510	Applied Music I (Choral Ensemble Course)	2
MUSC 2993	Opera Workshop	1
Choral Ensemble Course		1
MUSC 386	Applied Music Pedagogy and Literature I (Fall only; even academic year only)	2
MUSC 1310	Recital Attendance [2]	0.5
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 2452	Ear Training IV (Spring only)	1
MUSC 2461	Music Theory IV (Spring only)	3
MUSC 2993	Opera Workshop	1
MUSC 2510	Applied Music I	2
2000-level Choral Ensemble Course		1
Area III: Laboratory Sciences Course [3]		4
PHYS 1125G	Physics of Music (Suggested)	
	Credits	**27**
Third Year		
MUSC 1310	Recital Attendance	0.5
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 325	Beginning Conducting [1]	1
MUSC 330	Applied Music II [1]	2
MUSC 351	Lyric Theatre	1
300-level Choral Ensemble Course		1
MUSC 486	Applied Music Pedagogy and Literature II (Fall only; odd academic year only)	2
Area IV: Social/Behavioral Sciences Course [3]		3
COMM 1115G	Introduction to Communication	3
Area VI: Creative and Fine Arts Course [4,5]		3
MUSC 1310	Recital Attendance	0.5
MUSC 303	Music History and Literature: 20th Century Through the Present	3
MUSC 330	Applied Music II	2
MUSC 340	Junior Recital	1
MUSC 351	Lyric Theatre	1
300-level Choral Ensemble Course		1
GRMN 1110	German I	4
Area V: Humanities Course [3]		3
General Education Elective Course [3,5]		3
	Credits	**38**
Fourth Year		
MUSC 1310	Recital Attendance	0.5
MUSC 351	Lyric Theatre	1
MUSC 413	Form and Analysis (Fall only) [2]	3
MUSC 429	Opera: History and Literature (Fall only; even year only)	3
MUSC 430	Applied Music III [2]	2
FREN 1110	French I	4
VWW: Viewing a Wider World Course(s) [4]		6
MUSC 1310	Recital Attendance	0.5
MUSC 415	Orchestration	3
Either an Area III: Laboratory Sciences Course or Area IV: Social/Behavioral Sciences Course [3]		3-4
MUSC 430	Applied Music III [2]	2
MUSC 440	Senior Recital [2]	2
MUSC 351	Lyric Theatre	1
	Credits	**31-32**
	Total Credits	**129-130**

1. Functional Piano is not a required course. It is recommended that students take it at the appropriate level until ready to pass the required Piano Proficiency
2. These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
3. See the General Education (p. 262) section of the catalog for a full list of courses.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. It is possible to use the nine credit rule to satisfy this requirement.

Music Education (K12 Instrumental) - Bachelor of Music Education

The Bachelor of Music Education (BME) is a diversified four- to five-year degree program of teaching, performance, and specialized studies in music. The goal of this degree is to prepare the student for certification to teach music in the public schools, and serves as a foundation for advanced study toward master's and doctoral degrees: M.M., M.M.E., D.M.A. or Ph.D in music education.

Requirements: Basic Music and Performance

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 133.5 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1,2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
PHYS 1125G	Physics of Music (suggested fulfilment of Area III, not required)	
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
Music Theory and Ear Training		
MUSC 1450	Ear Training I	1
MUSC 1451	Ear Training II	1
MUSC 2451	Ear Training III	1
MUSC 2452	Ear Training IV	1
MUSC 1460	Music Theory I	3
MUSC 1461	Music Theory II	3
MUSC 413	Form and Analysis	3
MUSC 2460	Music Theory III	3
MUSC 2461	Music Theory IV	3
History and Literature		
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 303	Music History and Literature: 20th Century Through the Present	3
Techniques		
MUSC 1440	Class Voice I	1
MUSC 2310	Sound and Music Technology	1
MUSC 325	Beginning Conducting	1
MUSC 326	Instrumental Conducting	3
MUSC 415	Orchestration	3
Select six instrumental tech courses from the following:		6
MUSC 315	Brass Techniques I	
MUSC 316	Brass Techniques II	
MUSC 317	Woodwind Techniques I	
MUSC 318	Woodwind Techniques II	
MUSC 319	String Techniques I	
MUSC 322	Guitar Methods	
MUSC 323	Percussion Technique I	
MUSC 324	Percussion Technique II	
Performance		
MUSC 1310	Recital Attendance (take seven semesters for a total of 3.5 credits)	3.5
MUSC 2130	Jazz Ensemble ((not required for string students))	1
or MUSC 363	Jazz Ensembles II	
MUSC 372	Marching Band II (student must enroll for two semesters (not required for string students)) [4]	2
or MUSC 2740	Pride Marching Band	
Applied Music		*9*
MUSC 2510	Applied Music I (Instrumental)	
MUSC 330	Applied Music II (Instrumental)	
MUSC 430	Applied Music III (Instrumental) [5]	
MUSC 440	Senior Recital	1-2
Instrumental Ensemble		4
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Professional Education Courses		
CEPY 2110	Learning in the Classroom	3
EDUC 4820	Secondary Student Teaching	9
EDUC 4821	Middle and High School Student Teaching Seminar	3
MUSC 1410	Introduction to Music Education	2
MUSC 346	Elementary Music Methods	2
MUSC 393	Instructional Strategies I for Instrumentalists	2
MUSC 394	Instructional Strategies II for Instrumentalists	2
MUSC 397	Administrative Music Methods	1
READ 4330	Content Area Literacy	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Second Language Requirement: (not required)		
Electives, to bring the total credits to 131.5		**0**
Total Credits		**131.5-135.5**

1 See the General Education (p. 262) section of the catalog for a full list of courses.

2 A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course selected first.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 String students may substitute MUSC 2110, MUSC 350 or MUSC 362 for MUSC 372 Marching Band II.

5 All Music Majors must take MUSC 430 Applied Music III for a minimum of 2 semesters.

Second Language Requirement

For the Bachelor of Music Education in Music Education with a Concentration in K-12: Instrumental, there is no second language requirement for the degree.

Piano Proficiency

- Students must pass Piano Proficiency before presenting a Senior Recital.
- Students must enroll for Functional Piano until Proficiency is passed.

Music Education Requirement

- Students must pass the TEP Exam beforetaking MUSC 346 Elementary Music Methods or MUSC 393 Instructional Strategies I for Instrumentalists
- Students must present Senior Recital before student teaching.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics andENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Functional Piano is not a required course. Though not listed under recommended coursework each term, it is recommended that students take it at the appropriate level each semester until ready to pass the required Piano Proficiency.

First Year		Credits
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1130G	Survey of Mathematics [1]	3
MUSC 1310	Recital Attendance	0.5
MUSC 1440	Class Voice I (Fall only) [1]	1
MUSC 1450	Ear Training I (Fall only) [1]	1
MUSC 1460	Music Theory I (Fall only) [1]	3
MUSC 2510	Applied Music I	1
MUSC 372 or MUSC 2740	Marching Band II (Marching Band I will also fufill this requirement) or Pride Marching Band	1
MUSC 1310	Recital Attendance	0.5
MUSC 1410	Introduction to Music Education	2
MUSC 1451	Ear Training II	1
MUSC 1461	Music Theory II	3
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 2310	Sound and Music Technology	1
MUSC 2510	Applied Music I	1
2000-level Instrumental Ensemble Course		1
ENGL 2210G or ENGL 2221G or ENGL 2210H	Professional and Technical Communication [1] or Writing in the Humanities and Social Science or Professional and Technical Communication	3
	Credits	**30**
Second Year		
MUSC 1310	Recital Attendance	0.5
MUSC 2451	Ear Training III (Fall Only)	1
MUSC 2460	Music Theory III (Fall Only) [1]	3
Four Instrumental Tech Courses		4
MUSC 2510	Applied Music I	1
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 372 or MUSC 2740	Marching Band II or Pride Marching Band	2
CEPY 2110	Learning in the Classroom	3
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
MUSC 1310	Recital Attendance	0.5
MUSC 2452	Ear Training IV (Spring only) [1]	1
MUSC 2461	Music Theory IV (Spring only) [1]	3
MUSC 2510	Applied Music I	1
MUSC 303	Music History and Literature: 20th Century Through the Present	3
2000-level Instrumental Ensemble Course		1
Area V: Humanities Course [2]		3
Either an Area III: Laboratory Sciences Course or Area IV: Social/Behavioral Sciences Course [2]		3-4
	Credits	**36-37**
Third Year		
MUSC 1310	Recital Attendance	0.5
MUSC 325	Beginning Conducting [1]	1
MUSC 330	Applied Music II [1]	1
MUSC 346	Elementary Music Methods	2
MUSC 413	Form and Analysis	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
300-level Instrument Ensemble Course		1
General Education Elective Course [2,6]		3
Instrumental Tech Courses		2
Area IV: Social/Behavioral Science Course [2]		3
MUSC 1310	Recital Attendance	0.5
MUSC 326	Instrumental Conducting (Spring Only) [1]	3
MUSC 393	Instructional Strategies I for Instrumentalists	2
MUSC 430	Applied Music III [1]	2
MUSC 415	Orchestration	3
300-level Instrument Ensemble Course		1
Area III: Laboratory Science Course [1]		4
PHYS 1125G	Physics of Music (Suggested)	
	Credits	**35**
Fourth Year		
MUSC 1310	Recital Attendance	0.5
MUSC 2130 or MUSC 363	Jazz Ensemble (not required for string students) or Jazz Ensembles II	1
MUSC 394	Instructional Strategies II for Instrumentalists	2
MUSC 397	Administrative Music Methods	1
MUSC 430	Applied Music III [1]	2
MUSC 440	Senior Recital	1-2
READ 4330	Content Area Literacy	3
VWW - Viewing a Wider World Course(s) [3]		6
Area VI: Creative and Fine Arts Course [6]		3
EDUC 4820	Secondary Student Teaching (taken in last semester)	9

EDUC 4821	Middle and High School Student Teaching Seminar (taken in last semester)	3
	Credits	**31.5-32.5**
	Total Credits	**132.5-134.5**

1 These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
2 See the General Education (p. 262) section of the catalog for a full list of courses.
3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
6 May use the nine-credit rule to fulfill this requirement

Music Education (K12 Vocal) - Bachelor of Music Education

The Bachelor of Music Education (BME) is a diversified four- to five-year degree program of teaching, performance, and specialized studies in music. The goal of this degree is to prepare the student for certification to teach music in the public schools, and serves as a foundation for advanced study toward master's and doctoral degrees: M.M., M.M.E., D.M.A. or Ph.D in music education.

Requirements: Basic Music and Performance

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 135.5 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1, 2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
PHYS 1125G	Physics of Music (Physics of Music (suggested fulfilment of Area III, not required))	
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Science Course or Social/ Behavioral Sciences Course (4 or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
Music Theory and Ear Training		
MUSC 1450	Ear Training I	1
MUSC 1451	Ear Training II	1
MUSC 2451	Ear Training III	1
MUSC 2452	Ear Training IV	1
MUSC 1460	Music Theory I	3
MUSC 1461	Music Theory II	3
MUSC 2460	Music Theory III	3
MUSC 2461	Music Theory IV	3
MUSC 413	Form and Analysis	3
History and Literature		
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 303	Music History and Literature: 20th Century Through the Present	3
Techniques		
MUSC 2210	Diction I: Lyric Diction for Singers	2
MUSC 2310	Sound and Music Technology	1
MUSC 321	Instrumental Techniques for Vocal Music Education Majors	2
MUSC 325	Beginning Conducting	1
MUSC 327	Choral Conducting	3
MUSC 386	Applied Music Pedagogy and Literature I	2
MUSC 415	Orchestration	3
Performance		
MUSC 1310	Recital Attendance (take seven semesters for a total of 3.5 credits)	3.5
Applied Music		*9*
MUSC 2510	Applied Music I (Vocal)	
MUSC 330	Applied Music II (Vocal)	
MUSC 430	Applied Music III (Vocal) [4]	
MUSC 440	Senior Recital	1-2
Vocal Ensemble		7
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Professional Education Courses		
CEPY 2110	Learning in the Classroom	3
EDUC 4820	Secondary Student Teaching	9
EDUC 4821	Middle and High School Student Teaching Seminar	3
MUSC 1410	Introduction to Music Education	2
MUSC 346	Elementary Music Methods	2
MUSC 395	Instructional Strategies I for Vocalists	2
MUSC 396	Instructional Strategies II for Vocalists	2
MUSC 397	Administrative Music Methods	1
READ 4330	Content Area Literacy	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Second Language Requirement: (not required)		
Electives, to bring the total credits to 132.5		
Total Credits		**130.5-134.5**

1 See the General Education (p. 262) section of the catalog for a full list of courses.
2 A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course selected first.
3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4 All Music Majors must take MUSC 430 Applied Music III for a minimum of 2 semesters.

Second Language Requirement

For the Bachelor of Music Education in Music Education with a Concentration in K-12: Vocal, there is no second language requirement for the degree.

Piano Proficiency

- Students must pass Piano Proficiency before presenting a Senior Recital.
- Students must enroll for Functional Piano until Proficiency is passed.

Music Education Requirement

- Students must pass the TEP Exam before taking MUSC 346 Elementary Music Methods or MUSC 395 Instructional Strategies I for Vocalists.
- Students must present Senior Recital before student teaching.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Functional Piano is not a required course. Though not listed under the recommended coursework each term, it is recommended that students continue to take it at the appropriate level until ready to pass the required Piano Proficiency

First Year		Credits
MUSC 1310	Recital Attendance	0.5
MUSC 1450	Ear Training I	1
MUSC 1460	Music Theory I (Fall only)	3
MUSC 2210	Diction I: Lyric Diction for Singers (Fall Only-odd acdemic year only)	2
MUSC 2510	Applied Music I	1
2000-level Choral Ensemble Course		1
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1130G	Survey of Mathematics [1]	3
MUSC 1310	Recital Attendance	0.5
MUSC 1410	Introduction to Music Education	2
MUSC 1451	Ear Training II (Spring only) [1]	1
MUSC 1461	Music Theory II (Spring only) [1]	3
MUSC 2220	Diction II: Advanced Lyric Diction for Singers (Spring only-odd academic year only) [1]	2
2000-level Choral Ensemble Course		1
MUSC 2310	Sound and Music Technology	1
MUSC 2510	Applied Music I	1
AREA IV		3
	Credits	**30**
Second Year		
MUSC 1310	Recital Attendance	0.5
MUSC 2451	Ear Training III	1
MUSC 2460	Music Theory III	3
MUSC 2510	Applied Music I	1
Choral Ensemble Course		1
MUSC 321	Instrumental Techniques for Vocal Music Education Majors (Fall only, even academic year only)	2
MUSC 386	Applied Music Pedagogy and Literature I (Fall only, even academic year only)	2
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
ENGL 2210G or ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication or Professional and Technical Communication	3
MUSC 1310	Recital Attendance	0.5
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
MUSC 2452	Ear Training IV (Spring only) [1]	1
MUSC 2461	Music Theory IV (Spring only) [1]	3
MUSC 2510	Applied Music I	1
2000-level Choral Ensemble Course		1
Area III: Laboratory Science Course		4
PHYS 1125G	Physics of Music (Suggested)	
CEPY 2110	Learning in the Classroom	3
	Credits	**33**
Third Year		
MUSC 1310	Recital Attendance	0.5
MUSC 302	Music History and Literature: Classic through Romantic	3
MUSC 325	Beginning Conducting	1
MUSC 330	Applied Music II	1
300-level Choral Ensemble Course		1
MUSC 346	Elementary Music Methods	2
MUSC 413	Form and Analysis [1]	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
General Education Elective Course [6]		3
MUSC 1310	Recital Attendance	0.5
MUSC 303	Music History and Literature: 20th Century Through the Present	3
MUSC 327	Choral Conducting (Spring only) [1]	3
MUSC 430	Applied Music III	2
300-level Choral Ensemble Course		1
MUSC 395	Instructional Strategies I for Vocalists	2
MUSC 415	Orchestration (Spring only)	3
Either an Area III: Laboratory Sciences Course or Area IV: Social/Behavioral Sciences Course		3-4
	Credits	**35-36**
Fourth Year		
Semester 2		
MUSC 1310	Recital Attendance	0.5
MUSC 396	Instructional Strategies II for Vocalists	2
MUSC 397	Administrative Music Methods	1
MUSC 430	Applied Music III [1]	2
300-level Choral Ensemble Course		1
MUSC 440	Senior Recital	1
READ 4330	Content Area Literacy	3
VWW: Viewing a Wider World Course(s) [3]		6
Area V: Humanities Course		3
EDUC 4820	Secondary Student Teaching (taken in last semester)	9

EDUC 4821	Middle and High School Student Teaching Seminar (taken in last semester)	3
	Credits	**31.5**
	Total Credits	**129.5-130.5**

[1] These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
[2] See the General Education (p. 262) section of the catalog for a full list of courses.
[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
[6] It is possible to complete this requirement through the 9 credit rule.

Music - Undergraduate Minor

A student may not earn both a bachelor's degree in the Department of Music and a minor in Music.

Prefix	Title	Credits
Required Courses		
MUSC 1450	Ear Training I	1
MUSC 1460	Music Theory I	3
MUSC 1451	Ear Training II	1
MUSC 1461	Music Theory II	3
MUSC 2240	Music History and Literature: Antiquity through Baroque	3
Upper division elective credits		9
Applied music		2
Ensemble		2
Total Credits		**24**

Philosophy

Undergraduate Program Information

A major in philosophy serves not only as preparation for further graduate study in philosophy but also as an area of concentration in a liberal arts program. A philosophy major is appropriate for students planning to attend medical school as well as for those students interested in a career that requires critical reading and argument analysis. Such careers include business, theology and above all, law. For students who are especially interested in careers in law, politics, or public policy, the Department also offers a major in Justice, Political Philosophy, and Law.

While the course requirements for these majors should meet the ends of the liberal arts student, those students interested in graduate study in philosophy or in a career in law are encouraged to seek advice from a faculty advisor as early in their career as possible.

A minor program in philosophy requiring 18 hours of course work is also offered as well as a minor in Ethics and a minor in Justice, Political Philosophy, and Law. For more information visit the Department of Philosophy's web page at philos.nmsu.edu (http://philos.nmsu.edu).

Degrees for the Department

- Justice, Political Philosophy, and Law - Bachelor of Arts (p. 914)
- Philosophy - Bachelor of Arts (p. 915)

Minors for the Department

- Ethics - Undergraduate Minor (p. 917)
- Justice, Poltical Philosophy, and Law - Undergraduate Minor (p. 917)
- Philosophy - Undergraduate Minor (p. 918)

Timothy Cleveland, Department Head

Professors Cleveland, Walker, Keleher ***Associate Professors*** Vessel, Klockseim ***College Professor*** Noonan

Philosophy Courses

PHIL 1115G. Introduction to Philosophy
3 Credits (3)
In this course, students will be introduced to some of the key questions of philosophy through the study of classical and contemporary thinkers. Some of the questions students might consider are: Do we have free will? What is knowledge? What is the mind? What are our moral obligations to others? Students will engage with and learn to critically assess various philosophical approaches to such questions.
Learning Outcomes
1. Comprehend and differentiate between various philosophical approaches to questions within fields such as metaphysics, epistemology, ethics, and aesthetics.
2. Critically evaluate various philosophical arguments and positions.

PHIL 1120G. Logic, Reasoning, & Critical Thinking
3 Credits (3)
The purpose of this course is to teach students how to analyze, critique, and construct arguments.The course includes an introductory survey of important logical concepts and tools needed for argument analysis. These concepts and tools will be use to examine select philosophical and scholarly texts.
Learning Outcomes
1. Comprehend components of arguments.
2. Acquire a general understanding of the essential logical concepts needed for argument analysis, such as validity, soundness, deduction, and induction.
3. Critically assess arguments with an aim toward identifying what constitutes effective and reasonable argument strategies.
4. Learn to identify common logical fallacies.
5. Apply knowledge of argumentation principles to philosophical and scholarly texts

PHIL 1140G. Philosophy and World Religions
3 Credits (3)
A philosophical enquiry into the religious life; an introduction to philosophical questions about religions focused on consideration of some of the traditional approaches to God and what it means to be religious. May be repeated up to 3 credits.
Learning Outcomes
1. Identify and describe philosophical theories regarding religion.
2. Develop and enhance your critical thinking skills, particularly in the evaluation of arguments about the truth or applicability of particular religious or secular viewpoints.
3. Analyze the teachings of world religions by describing their similarities and differences.
4. Explain the philosophical beliefs, practices, and ethical standards of the major world religions as well as emerging religious movements.

5. Explain how each religion evolved historically, philosophically, and spiritually as well as the contemporary ideas and practices each religion.

PHIL 1145G. Philosophy, Law, and Ethics
3 Credits (3)
An introduction to practical problems in moral, social, political, and legal philosophy. Topics to be discussed may include ecology, animal rights, pornography, hate speech on campus, same-sex marriage, justice, abortion, terrorism, treatment of illegal immigrants, and New Mexican Aboriginal Peoples' land claims.
Learning Outcomes
1. The aim of this course is to familiarize students with some of the ethical and philosophical issues that arise in connection with laws/legality in general and criminal and constitutional law in the U.S. in particular.
2. It examines issues in moral philosophy, political philosophy, and philosophy of law.
3. A question to which we repeatedly return is whether the law does and/or ought to have some necessary relation to the demands of justice and morality. Among the topics we'll cover are: What is a law? Natural law vs. positive law and legal positivism vs. natural law theory; Utilitarian, divine command, Kantian, and natural law theories of moral rightness/wrongness; The distinction between the normative and the non-normative; Is there a moral duty to obey the law? Plato's Crito and R.P. Wolff's "philosophical anarchism."; J.S. Mill and classical liberalism; Mill's "harm principle" ("the state should restrict the liberty of competent adults via the criminal law only to prevent them from wrongfully harming other persons"); Legal paternalism. Should the state make it harder for citizens to smoke tobacco and/or marijuana, for their own good?; Should voluntary euthanasia be legal? Is there a constitutional "right to die"?; How should judges determine the meaning of vaguely worded constitutional requirements (e.g. "free exercise of religion," no "unreasonable search and seizure," no "cruel and unusual punishment," etc.)? Originalist vs. nonoriginalist approaches; The First Amendment, free speech, and freedom of religion; The death penalty and "cruel and unusual punishment"; The insanity defense in criminal law; Does the 14th Amendment's requirement of "equal protection" under the law compel states to recognize same sex marriage?; The Fourth Amendment and its prohibition of "unreasonable search and seizure."

PHIL 2110G. Introduction to Ethics
3 Credits (3)
This course introduces students to the philosophical study of morality and will explore questions concerning our human obligations to others and related issues. Students may be asked to relate various approaches to ethics to present-day ethical debates and their own lives.
Learning Outcomes
1. Differential between various ethical theories, which may include virtue ethics, deontology, and consequentialism.
2. Critically evaluate various ethical theories and positions.

PHIL 2230G. Philosophical Thought
3 Credits (3)
In this course, students will grapple with some of the key questions of philosophy through the study of classical and contemporary thinkers. Students will become familiar with the perennial problems in subfields of philosophy such as metaphysics, epistemology, ethics, and aesthetics. They will learn to approach these problems both critically and sympathetically.
Learning Outcomes
1. Comprehend and differentiate between various philosophical approaches to questions within fields such as metaphysics, epistemology, ethics, and aesthetics.
2. Critically evaluate various philosophical arguments and positions.
3. Identify the differences that characterize the major subfields of philosophy.

PHIL 305. Philosophy and Literature
3 Credits (3)
Examination of philosophical ideas as presented in selected literary works and literary criticism.

PHIL 306. Philosophy Through Film
3 Credits (3)
An exploration of a range of philosophical issues through the use of film. Topics include personal identity and memory, faith and the problem of evil, free will and moral responsibility, and the meaning of life. Films may include The Prestige, Memento, The Third Man, A Clockwork Orange, Fight Club, and Synecdoche, New York.

PHIL 312. Formal Logic
3 Credits (3)
Introduction to symbolic logic and its application in the analysis of arguments in scientific and ordinary discourse.

PHIL 315. Philosophy of Language
3 Credits (3)
A critical examination of philosophical inquiries into the syntactic, semantic, and pragmatic dimensions of language.

PHIL 316. Philosophy of Mathematics
3 Credits (3)
Survey of traditional philosophical problems and views concerning the nature of mathematics including such questions as: What is the nature of mathematical knowledge? What is mathematical truth? What is a number? What is proof? What is the relationship between logic and mathematics?

PHIL 320. Social and Political Philosophy
3 Credits (3)
This course critically examines such fundamental concepts as liberty, equality and human rights.

PHIL 322. Environmental Ethics
3 Credits (3)
Explores the ethical and topical issues raised by mining and grazing, air and water pollution, factory farming, global warming, and treatment of animals. It also studies some recent ecological movements such as ecofeminism, social ecology, and deep ecology.

PHIL 328. Applied Ethics
3 Credits (3)
Examines the implications of utilitarianism, Kantian ethics, natural law theory, and other moral theories for controversial moral issues such as the death penalty, euthanasia, abortion, genetic engineering, gay marriage, affirmative action, and pornography.

PHIL 331. Philosophy of Religion
3 Credits (3)
The nature, fundamental concepts, and problems of religion. Emphasis on the significance of religion for creative and practical value.

PHIL 332. Ethics and Global Poverty
3 Credits (3)
Philosophical scrutiny of and moral reflection on various aspects of global poverty and foreign aid. For example: Is poverty fundamentally a

lack of income, or can it be understood as a failure to meet basic needs, or as a lack of valuable freedom? Do human rights exist? What, if any, are the moral obligations of rich countries to poor countries? Can foreign aid be immoral? How should the answers to these questions influence public policy? Restricted to: Main campus only.

PHIL 341. Ancient Philosophy
3 Credits (3)
Introduction to the philosophies of the pre-Socratics, Socrates, Plato, Aristotle, with brief discussion of the Epicureans and Stoics.

PHIL 344. Modern Philosophy
3 Credits (3)
Foundations of contemporary thought: introduction to the philosophies of Descartes, Bacon, Spinoza, Leibniz, Locke, Berkeley, Hume, Kant, and Hegel.

PHIL 346. Philosophy of Mind
3 Credits (3)
Examination of some of the most influential accounts of the mind, focusing on such issues as the relation between the mind and the body, mental causation and consciousness.

PHIL 350. Epistemology
3 Credits (3)
Introduction to epistemology. The philosophical critique of alleged ways of knowing. An examination of the nature of truth.

PHIL 351. Philosophy of Science
3 Credits (3)
Philosophical examination of the methodology of science. The logical, metaphysical, epistemological, and ethical critique of science and its impact on human affairs.

PHIL 361. Special Topics
3 Credits (3)
Specific subjects announced in the Schedule of Classes. May be repeated for a maximum of 9 credits.

PHIL 363. Independent Studies
1-3 Credits
For students with some background in philosophy. Independent work in a specific area. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

PHIL 373. Ethical Theory
3 Credits (3)
The critical examination of the justification of ethical theories with particular attention to the language of moral discourse.

PHIL 376. Philosophy of Law
3 Credits (3)
Ethical, logical, and epistemological implications of law, together with an analysis of the rhetoric of legal practice.

PHIL 380. Metaphysics
3 Credits (3)
Introduction to metaphysics: a treatment of such issues as the meaning of existence, the mind-body problem, the problem of universals, and free will versus determinism.

PHIL 385. Human Nature and the Good Life
3 Credits (3)
An examination of some of the most historically and philosophically influential conceptions of human nature and corresponding accounts of the good life.

PHIL 397. Existentialism
3 Credits (3)
The origins of existentialist thought in philosophy and literature, including the thought of Nietzsche, Kierkegaard, Dostoyevsky, Camus, and Sartre. The course covers topics in ethics and political philosophy, metaphysics, philosophical psychology, philosophy of religion, and other sub-disciplines of philosophy.

PHIL 435. Internship in Philosophy and Law
3 Credits (3)
Supervised hands-on experience for Justice, Political Philosophy, and Law majors to gain professional expertise of the law working with lawyers or judges in law offices, court rooms, and other professional legal settings. Student must be in junior and above standing to enroll. May be repeated up to 6 credits.
Prerequisite: Completion of 12 Philosophy credits; 2.5 GPA;.
Learning Outcomes
1. Demonstrate practical knowledge, analytical ability and critical thinking of professional legal work by becoming familiar with such legal tasks as: preparing pleadings; preparing discovery, responding to discovery; controlling and organizing documents, information; preparing trial notebooks; preparing motions; contacting and responding to clients, witnesses, courts.

PHIL 448. Writing Philosophy
3 Credits (3)
A workshop on writing philosophy papers. Includes how to read and understand philosophical writing, organize a paper effectively, present a clear and forceful argument, and avoid common mistakes.
Prerequisite(s): completed 18 hours of philosophy credit.

PHIL 451. AI, Ethics, and Society
3 Credits (3)
This course explores the ethical dimensions of current and emerging applications of artificial intelligence. Students will engage with key philosophical questions, including the definition of AI and the moral status of advanced AI agents. The course examines pressing societal issues, such as labor automation and technological unemployment, ownership and distributive justice in AI development, the influence of AI on media disinformation, and concerns surrounding plagiarism. Future-oriented topics will address the possibility of AI exceeding human cognitive abilities and the implications of the Technological Singularity hypothesis. Through critical readings, discussion, and analytical writing, students will develop a robust framework for evaluating the ethical challenges posed by AI technologies.
Learning Outcomes
1. Engage philosophical theories and methods to critically analyze AI-related issues.
2. Evaluate competing moral and political arguments about the development and use of AI.
3. Formulate arguments in valid form about responsibility, fairness, and power in algorithmic systems.
4. Critically interpret contemporary academic literature on ethics and technology.
5. Produce philosophical essays that integrate normative theory and applied analysis.

PHIL 463. Independent Studies
1-3 Credits
For students with a strong background in philosophy. Independent work in a specific area. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

PHIL 532. Advance Studies in Ethics and Global Poverty
3 Credits (3)

Advanced philosophical scrutiny of and moral reflection on various aspects of global poverty and foreign aid. For example: Is poverty fundamentally a lack of income, or can it be understood as a failure to meet basic needs, or as a lack of valuable freedom? Do human rights exist? What, if any, are the moral obligations of rich countries to poor countries? Can foreign aid be immoral? How should the answers to these questions influence public policy? Restricted to: Main campus only.

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Justice, Political Philosophy, and Law - Bachelor of Arts

The aim of a Justice, Political Philosophy, and Law (JPPL) arts major is to cultivate a reasoned understanding of law and legal institutions, as well as the moral theories that support the value and justice of these institutions. JPPL offers a sequence of courses totaling 36 credit hours in critical thinking, law, policy, global justice, ethical theory, political philosophy, moral theory, feminist philosophy, and human rights. The interdisciplinary component of the major ensures that students have a well-rounded understanding of issues of justice and law. JPPL students will be well-prepared for further studies or careers in law, philosophy, politics, public service, education, human rights, or public policy.

Admission to JPPL is open to any student in good standing in the College of Arts and Sciences.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1, 2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences [1]		*10-11*
Area III: Laboratory Sciences course (4 credits)		
Area IV: Social/Behavioral Sciences Course (3 credits)		
Either an Area III: Laboratory Science course (4 credits) or an Area IV: Social/Behavioral Sciences course (3 credits)		
Area V: Humanities		
Select one from the following: [3]		3
PHIL 1115G	Introduction to Philosophy	
PHIL 1145G	Philosophy, Law, and Ethics	
PHIL 2230G	Philosophical Thought	
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		
PHIL 2110G	Introduction to Ethics (Introductory Course-Departmental/College Requirement also) [3]	3
Viewing a Wider World [4]		**6**
Departmental/College Requirements		
Introductory Courses		
PHIL 1120G	Logic, Reasoning, & Critical Thinking [3]	3
or PHIL 312	Formal Logic	
Law, Politics, and Ethics		
PHIL 320	Social and Political Philosophy	3
PHIL 373	Ethical Theory	3
PHIL 376	Philosophy of Law	3
PHIL 435	Internship in Philosophy and Law	3
Intellectual History		
Select one from the following:		3
HNRS 2140G	Plato and the Discovery of Philosophy	
PHIL 341	Ancient Philosophy	
PHIL 344	Modern Philosophy	
Human Rights and Global Justice		
Select two from the following:		6
PHIL 322	Environmental Ethics	
PHIL 332	Ethics and Global Poverty	
PHIL 385	Human Nature and the Good Life	
Philosophical Writing		
PHIL 448	Writing Philosophy	3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Interdisciplinary Perspectives on Law, Politics, and Justice		
HIST 414	The Constitution and U.S. History	3
or POLS 391	Constitutional Law	
Select one from the following:		3
CJUS 302	Crime, Justice and Society	
CJUS 306	Criminal Procedural Law	
CJUS 307	Law of Evidence	
CJUS 360	The Juvenile Justice System	
CJUS 399	New Mexico Law	
CJUS 424	Forensic Law	
CJUS 425	Issues in Ethics, Law, and Criminal Justice	
CJUS 428	Mexican-Americans and Issues of Social Justice	
CJUS 429	Immigration & Justice	
CJUS 435	Political Penology	
CJUS 453	Women and Justice	
GNDR 453	Women and Politics	
HNRS 2140G	Plato and the Discovery of Philosophy	
HNRS 2180G	Citizen and State Great Political Issues	
HNRS 304V	Dilemmas of War and Peace	
HNRS 306V	Science, Ethics and Society	
HNRS 335V	Legal Issues in Modern Society	
HNRS 353V	Justice without Prejudice	
HNRS 378V	Technology and Policy	
HNRS 387V	Comparative Perspectives on Women	
HNRS 388V	Leadership and Society	
HNRS 390V	Worlds of Buddhism	
PHIL 306	Philosophy Through Film	
PHIL 328	Applied Ethics	
PHIL 361	Special Topics	
POLS 382	Classical Political Thought	
POLS 383	Modern Political Thought	

POLS 385	American Political Thought	
POLS 395	Law and Society	
PSYC 3510	Psychology and the Law	
SOCI 3510	Crime and Society	
SOCI 3520	Juvenile Delinquency	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 [5]		**49-47**
Select sufficient electives to bring total to 120, including 48 upper-division.		
Total Credits		**120**

1 See the General Education section of the catalog for a full list of courses.

2 A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the course first.

3 Students must take either PHIL 1115G Introduction to Philosophy, PHIL 1145G Philosophy, Law, and Ethics, or PHIL 2230G Philosophical Thought; PHIL 2110G Introduction to Ethics; and either PHIL 1120G Logic, Reasoning, & Critical Thinking or PHIL 312 Formal Logic to fulfill the Introductory courses requirement.

4 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

5 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in Justice, Political Philosophy, and Law there is no second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1130G	Survey of Mathematics [1]	3
PHIL 1145G	Philosophy, Law, and Ethics	3
Area IV: Social and Behavioral Science Course [2]		3
PHIL 2110G	Introduction to Ethics	3
Area III: Laboratory Science Course [2]		4
Area VI: Creative and Fine Arts Course [2]		3
Choose from one of the following:		3
COMM 1115G	Introduction to Communication	
HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
Elective Courses		4
	Credits	**30**

Sophomore		
Choose from one of the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
ENGL 2215G	Advanced Technical and Professional Communication	
Choose from one of the following:		3
PHIL 1120G	Logic, Reasoning, & Critical Thinking	
PHIL 312	Formal Logic	
Area III: Laboratory Science Course OR Area IV: Social and Behavioral Science Course [2]		3-4
Elective Course		6
PHIL 373	Ethical Theory	3
PHIL 320	Social and Political Philosophy	3
VWW: Viewing a Wider World Course [3]		3
Elective Courses		6
	Credits	**30-31**
Junior		
PHIL 376	Philosophy of Law	3
Choose from one of the following:		3
HNRS 2140G	Plato and the Discovery of Philosophy	
PHIL 341	Ancient Philosophy	
PHIL 344	Modern Philosophy	
Upper-Division Elective Course [1]		3
PHIL 322	Environmental Ethics	3
PHIL 332	Ethics and Global Poverty	3
VWW: Viewing a Wider World Course [3]		3
Upper-Division Elective Course [1]		3
Elective Courses		9
	Credits	**30**
Senior		
PHIL 448	Writing Philosophy [1]	3
Interdisciplinary Perspectives Course (see non-departmental requirements list)		6
Upper-Division Elective Course [1]		9
Elective Courses		12
	Credits	**30**
	Total Credits	**120-121**

1 These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Philosophy - Bachelor of Arts

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or

elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1, 2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits)		
Area IV: Social/Behavioral Sciences Course (3 credits)		
Either an Area III: Laboratory Sciences Course (4 credits) or an Area IV: Social/Behavioral Sciences Course (3 credits)		
Area V: Humanities		*3*
Either of the following courses will count towards the Introductory Philiosophy Course Departmental/College Requirement also		
PHIL 1115G	Introduction to Philosophy	
or PHIL 2230G	Philosophical Thought	
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1, 3]		*3*
Viewing A Wider World [4]		**6**
Departmental/College Requirements		
Introductory Philosophy		
This requirement is completed by the Area V: Humanities course		
Ethics		
Select one from the following:		3
PHIL 320	Social and Political Philosophy	
PHIL 373	Ethical Theory	
PHIL 376	Philosophy of Law	
Logic		
PHIL 1120G	Logic, Reasoning, & Critical Thinking [5]	3
or PHIL 312	Formal Logic	
History of Philosophy		
Select one from the following:		3
HNRS 2140G	Plato and the Discovery of Philosophy	
PHIL 341	Ancient Philosophy	
PHIL 344	Modern Philosophy	
Applied Ethics		
Select one from the following:		3
PHIL 322	Environmental Ethics	
PHIL 328	Applied Ethics	
PHIL 332	Ethics and Global Poverty	
Select two from the following:		6
PHIL 315	Philosophy of Language	
PHIL 316	Philosophy of Mathematics	
PHIL 346	Philosophy of Mind	
PHIL 350	Epistemology	
PHIL 351	Philosophy of Science	
PHIL 380	Metaphysics	
Philosophical Writing		
PHIL 448	Writing Philosophy	3
Additional Requirements		
Select at least an additional 12 credits in philosophy, 6 of which are courses numbered 300 or above. The following HNRS course may replace a 300 level or above philosophy course.		12
HNRS 2140G	Plato and the Discovery of Philosophy	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120		
Select sufficient electives to bring total to 120, including 48 upper-division. [7]		47-49
Total Credits		**120**

1. See the General Education section of the catalog for a full list of courses.
2. A Mathematics is required for the degree but students may need to take any prerequisites needed to enter the course first.
3. The General Education Elective requirement will be satisfied with one of the "G" courses that are options under the Logic and history of Philosophy requirements listed under the Departmental/College Requirements section.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. For the Logic course requirement, students can take either PHIL 1120G Logic, Reasoning, & Critical Thinking or PHIL 312 Formal Logic. If students select PHIL 312, it will not count towards the General Education Elective requirement.
6. PHIL 323V will not count towards the Viewing A Wider World requirement, students will need to select two other courses for that requirement.
7. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in Philosophy there is no second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1130G	Survey of Mathematics [1]	3
PHIL 2230G	Philosophical Thought	3
FYEX 1112	The Freshman Year Experience	3
Area IV: Social and Behavioral Science Course [2]		3
Choose from one of the following:		3
COMM 1115G	Introduction to Communication	
HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
Area III: Laboratory Science Course [2]		4
Area VI: Fine Arts Course [2]		3
General Education Elective Course [2]		3

Elective Course		1
	Credits	**30**
Sophomore		
Choose from one of the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science [1]	
PHIL Elective Course		3
Area III: Laboratory Science Course OR Area IV: Social and Behavioral Science Course [2]		3-4
Choose from one of the following:		3
PHIL 320	Social and Political Philosophy	
PHIL 373	Ethical Theory	
PHIL 376	Philosophy of Law	
VWW: Viewing a Wider World Course [3]		3
Elective Courses		15
	Credits	**30-31**
Junior		
Choose from one of the following:		3
PHIL 1120G	Logic, Reasoning, & Critical Thinking	
PHIL 312	Formal Logic	
Choose from one of the following:		3
PHIL 315	Philosophy of Language	
PHIL 316	Philosophy of Mathematics	
PHIL 346	Philosophy of Mind	
PHIL 350	Epistemology	
PHIL 351	Philosophy of Science	
PHIL 380	Metaphysics	
Choose from one of the following:		3
PHIL 315	Philosophy of Language	
PHIL 316	Philosophy of Mathematics	
PHIL 346	Philosophy of Mind	
PHIL 350	Epistemology	
PHIL 351	Philosophy of Science	
PHIL 380	Metaphysics	
Choose from one of the following:		3
PHIL 341	Ancient Philosophy	
PHIL 344	Modern Philosophy	
HNRS 2140G	Plato and the Discovery of Philosophy	
VWW: Viewing a Wider World Course [3]		3
Upper-Division Elective Courses		9
Elective Courses		6
	Credits	**30**
Senior		
PHIL 448	Writing Philosophy [1]	3
PHIL Applied Ethics Elective Course (choose from list)		3
PHIL Elective Course (any level)		3
PHIL Upper-Division Elective Course		6
Upper-Division Elective Courses		12
Elective Course		3
	Credits	**30**
	Total Credits	**120-121**

[1] These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

[2] See the General Education (p. 262) section of the catalog for a full list of courses.

[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Ethics - Undergraduate Minor

A student who earns a Bachelor of Arts in Philosophy may not also earn a minor in Ethics.

Prefix	Title	Credits
Required Courses		
PHIL 1115G	Introduction to Philosophy	3
or PHIL 2230G	Philosophical Thought	
PHIL 1120G	Logic, Reasoning, & Critical Thinking	3
or PHIL 312	Formal Logic	
PHIL 373	Ethical Theory	3
or PHIL 2110G	Introduction to Ethics	
Select three from the following, of which at least two must be upper division: [1]		9
CJUS 425	Issues in Ethics, Law, and Criminal Justice	
HNRS 304V	Dilemmas of War and Peace	
HNRS 306V	Science, Ethics and Society	
JOUR 377V	Mass Media Ethics	
PHIL 322	Environmental Ethics	
PHIL 328	Applied Ethics	
PHIL 332	Ethics and Global Poverty	
SUR 401	Ethics and Professionalism in Surveying and Mapping	
Total Credits		**18**

[1] Students may earn up to 3 credits in this category from special topics or Honors courses approved by the head of the Department of Philosophy.

Justice, Poltical Philosophy, and Law - Undergraduate Minor

The aim of Justice, Political Philosophy, and Law is to cultivate a reasoned understanding of law and legal institutions, as well as the moral theories that support the value and justice of these institutions. The JPPL minor offers a sequence of courses in critical thinking, law, policy, global justice, ethical theory, political philosophy, moral theory, and human rights. JPPL students will be well-prepared for further studies or careers in law, philosophy, politics, public service, education, human rights, or public policy.

Prefix	Title	Credits
Introductory Courses		
Select one from the following:		3
PHIL 1145G	Philosophy, Law, and Ethics	
PHIL 1115G	Introduction to Philosophy	
PHIL 2230G	Philosophical Thought	
PHIL 1120G	Logic, Reasoning, & Critical Thinking	3
or PHIL 312	Formal Logic	
PHIL 2110G	Introduction to Ethics	3
Philosophy of Law		
PHIL 376	Philosophy of Law	3

Human Rights and Global Justice		
Select one from the following:		3
PHIL 320	Social and Political Philosophy	
PHIL 322	Environmental Ethics	
PHIL 332	Ethics and Global Poverty	
PHIL 341	Ancient Philosophy	
PHIL 373	Ethical Theory	
PHIL 448	Writing Philosophy	
Elective		
Select one from the following:		3
PHIL 320	Social and Political Philosophy	
PHIL 322	Environmental Ethics	
PHIL 328	Applied Ethics	
PHIL 332	Ethics and Global Poverty	
PHIL 344	Modern Philosophy	
PHIL 373	Ethical Theory	
PHIL 376	Philosophy of Law	
PHIL 448	Writing Philosophy	
Total Credits		**18**

Philosophy - Undergraduate Minor

A student who earns a Bachelor of Arts in Philosophy may not also earn a minor in Philosophy.

Prefix	Title	Credits
Required Courses		
PHIL 1115G	Introduction to Philosophy	3
or PHIL 2230G	Philosophical Thought	
PHIL 1120G	Logic, Reasoning, & Critical Thinking	3
or PHIL 312	Formal Logic	
Select one from the following:		3
PHIL 2110G	Introduction to Ethics	
PHIL 328	Applied Ethics	
PHIL 373	Ethical Theory	
Select 9 credits from Philosophy at the 300 or above level		9
Total Credits		**18**

Physics

Undergraduate Program Information

A Bachelor's degree in Physics at New Mexico State University provides the basis for careers in industry, teaching, the military, government or for study toward advanced degrees in physics or engineering. It should also provide the skills that recipients of physics degrees have listed as among the most important in obtaining their current positions, including problem solving ability, computer skills, mathematical skills, and laboratory skills, as well as knowledge of physics. The undergraduate program has the following educational objectives:

1. **Competitiveness.** Graduates are competitive in internationally recognized academic, government and industrial environments.
2. **Adaptability.** Graduates exhibit success in solving complex technical problems in a broad range of disciplines.
3. **Collaboration/Teamwork and Leadership.** Graduates have a proven ability to function as part of and/or lead interdisciplinary teams.

The Bachelor of Science degree in Physics is accredited by the Applied and Natural Science Accreditation Commission (ANSAC) of ABET, https://www.abet.org, under the General Criteria and the Program Criteria for Applied and Natural Science Programs.

Further information about the department may be found on the web at phys.nmsu.edu (https://phys.nmsu.edu). All incoming (new or transfer) students must schedule an orientation meeting with the department head and/or the undergraduate program head before their first semester at NMSU. All students will be assigned a faculty advisor in the physics department to discuss course selection, career resources, internships and coops, and other topics.

Graduate Program Information

The Department of Physics offers programs in many areas of emphasis leading to the MS and Ph.D. degrees. Admission to these programs is competitive and selection of applicants is based on undergraduate and/or previous graduate grade-point averages, performance on the general and subject Graduate Record Examination, other evidence of prior academic and research accomplishments submitted by the applicant, and reference letters, as well as, in the case of applicants for the doctoral program, matching of the applicant's research interests, as described by the student's statement of purpose, to the Department's research activities.

All degree-seeking graduate students must satisfy the relevant Graduate School requirements, successfully complete a 3-credit, 500-level laboratory, and demonstrate or develop knowledge of computer programming. All Ph.D. students and non-thesis Master's students must pass a qualifying examination based on undergraduate physics courses at the 400 level. Additional course requirements are described below; courses taken S/U may not be used to satisfy any of the degree requirements, including the lab requirement for Master's and Ph.D. students.

The qualifying and comprehensive examination outcomes are decided by vote of the entire faculty, based on the recommendations of the corresponding examination committees. For the qualifying examination, the faculty may decide that

- a student pass at the doctoral level;
- pass at the master's level;
- be requested to retake the exam at the next available opportunity; or
- terminate graduate study.

For the written part of the comprehensive examination, the faculty may decide that

- a student be given an unconditional pass;
- be given a conditional pass, with the requirement that the student produce additional evidence of research accomplishments during the oral part of the exam before being granted admission to candidacy;
- repeat the written part the next time it is offered; or
- terminate graduate study.

In addition, the faculty may decide to discontinue financial support to a student based on the student's performance on the qualifying or comprehensive examination. Students will receive written notification of the exam's outcome from the Graduate Physics Program Head within 30 days of the exam. Appeals must be addressed to the Physics Department

Head within 30 days of receiving written notification of the exam's outcome and will be decided by the physics faculty.

A student granted an unconditional or conditional pass on the written part of the comprehensive examination must take the oral part in the same semester that the written part was taken; the student's Ph.D. committee makes the final decision, following the oral part of the comprehensive examination, on admission of the student to the candidacy to the doctoral degree.

Students may choose areas of emphasis from a variety of experimental, theoretical and computational research programs in the department. The current major research areas of the department include condensed matter physics and materials science, optics, particle and nuclear physics, and others. These research projects are supported by multimillion-dollar funding by various federal agencies and two national laboratories within the state of New Mexico: Los Alamos National Laboratory and Sandia National Laboratories. In addition to the in-house research, the department conducts collaborative research programs with

- The Brookhaven National Laboratory,
- The Center for Integrated NanoTechnologies,
- Los Alamos National Laboratory,
- Sandia National Laboratories,
- The Thomas Jefferson Laboratory,
- Fermilab,
- Air Force Research Laboratory and
- other national and international laboratories.

The department is housed in a newly-renovated building which contains research laboratories, classrooms, offices and a computational laboratory.

Degrees for the Department

Bachelor Degree(s)

- Physics - Bachelor of Arts (p. 931)
- Physics - Bachelor of Science (p. 933)

Master Degree(s)

- Physics - Master of Science (p. 179)

Doctoral Degree(s)

- Physics - Doctor of Philosophy (p. 233)

Minors for the Department

- Physics - Graduate Minor (p. 260)
- Physics - Undergraduate Minor (p. 935)

Professor, Stefan Zollner, Department Head

Associate Professor, Matthew Sievert, Undergraduate Program Head

Professor, Michael Engelhardt, Graduate Program Head

Professor, Boris Kiefer, Engineering Physics Program Head

Professors Engelhardt, Kiefer, Vasiliev, Zollner; ***Associate Professors*** Paolone, Sievert, Urquidi; ***Assistant Professors*** Duran, Miao, Ruth, Sufian; ***College Professors*** Mi. Burkardt; ***College Research Professors*** Bruce; ***Emeritus Faculty*** Burleson, DeAntonio, Gibbs, Hearn, Kanim, Kyle, Nakotte, Ni, Papavassiliou, Pate-Morales.

Graduate Faculty *S. Zollner, Department Head, Ph.D. (Stuttgart)– experimental condensed matter and applied physics; M. Sievert, Undergraduate Program Head, Ph.D. (Ohio State)– theoretical nuclear and particle physics; M. Engelhardt, Graduate Program Head, Ph.D. (Erlangen)– computational nuclear and particle physics; B. Kiefer, Engineering Physics Program Head, Ph.D. (Michigan)– computational condensed matter physics, mineral physics; R. Carrasco, Ph.D. (New Mexico State)– experimental condensed matter physics; B. Duran, Ph.D. (Temple)– experimental nuclear and particle physics; T. M. Hearn, Ph.D. (Cal Tech)– seismic tomography, seismology; L. Miao, Ph.D. (Tulane)– experimental condensed matter physics; M. Paolone, Ph.D. (South Carolina)– experimental nuclear and particle physics; V. Papavassiliou, Ph.D. (Yale)– experimental nuclear and particle physics; S. F. Pate-Morales, Ph.D. (Pennsylvania)– experimental nuclear and particle physics; D. Ruth, Ph.D. (New Hampshire)– experimental nuclear physics; R. Sufian, Ph.D. (Kentucky)– theoretical and computational nuclear and particle physics; J. Urquidi, Ph.D. (Texas Tech)– materials science, neutron and X-ray scattering; I. Vasiliev, Ph.D. (Minnesota)– computational materials science.*

Geophysics Courses

GPHY 450. Selected Topics
1-3 Credits
Readings, discussions, lectures or laboratory studies of selected areas of geophysics. May be repeated for a maximum of 12 credits.
Prerequisite: consent of instructor.

GPHY 520. Selected Topics
1-3 Credits
Formal treatment of graduate topics not covered in regular courses. May be repeated for unlimited credit.
Prerequisites: graduate standing, consent of instructor, and selection of a specific topic prior to registration.

GPHY 560. Applied Inverse Theory
3 Credits (3)
Inversion of data with an emphasis on geophysical problems. Curve fitting, tomography, earthquake location, over determined and under determined problems, linear and nonlinear problems. Computing experience desirable. Consent of Instructor required.

GPHY 598. Special Research Problems
1-3 Credits
Individual investigations, either analytical or experimental. May be repeated for unlimited credit.

GPHY 599. Master's Thesis
1-15 Credits (1-15)
Thesis.

GPHY 620. Advanced Topics in Geophysics
3 Credits (3)
Advanced formal treatment of a topic or topics not covered in regular courses. May be repeated for unlimited credit.
Prerequisite: consent of instructor.

GPHY 700. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation.

Physics Courses

PHYS 1110. Explorations in Physics
1 Credit (1)

This course will introduce students to university resources, pre-professional student societies, learning strategies to help strengthen academic performance, and will explore career paths for graduates. Students will also discuss the roles of physicists in society, physics research being performed at and nearby NMSU, and what the latest discoveries in physics tell us about nature and the universe.

Learning Outcomes

1. Describe effective learning strategies for science/engineering classes.
2. Give examples of impactful scientists from groups underrepresented in physics and describe their career paths.
3. Research examples of positions open to physics majors.
4. Identify critical components of an effective resume.
5. Write a professional cover letter for an internship/undergraduate research application.
6. Discuss the boundaries of ethical science and give an example of an accidental breach of ethics.
7. Describe the societal impact of misinformation about scientific results or research.
8. Explore ways scientists can engage with the general public to shape the discourse of knowledge or the ways scientists are perceived.
9. List some of the burning questions current physicists are trying to answer. 1
10. Establish a sense of community within the department, the university, and the greater physics world. 1
11. Discover useful resources to help with academic success and avoid pitfalls while pursuing a physics degree. 1
12. Better understand the value of a physics degree, and what can be expected entering the workforce or academia. 1
13. Understand and discuss how the field of physics connects with the issues and problems facing society today.

PHYS 1111. Introductory Computational Physics
3 Credits (2+2P)

Introduction to computational techniques for the solution of physics-related problems.

Prerequisite: a C- or better in MATH 1220G or MATH 1250G or MATH 1511G.

Learning Outcomes

1. Use computers for visualizing and analyzing data.
2. Apply techniques of structured programming and software development.
3. Trouble shoot and debug programs.

PHYS 1112. Introductory Physics for the Health Sciences
3 Credits (3)

Algebra-level introduction to topics required for the Health Sciences including basic mechanics (including sound, mechanical waves and fluids), heat and thermodynamics, electricity and magnetism, optics and electromagnetic waves, atomic and nuclear physics and applications to medical imaging. Restricted to Community Colleges campuses only.

Prerequisite(s): MATH 1215 or Equivalent.

Learning Outcomes

1. The objective of the course is to familiarize the student with the concepts and methods used in the underlying physics associated with various Health Science disciplines.
2. The course will demonstrate how the basic principles of mechanics, thermodynamics, electricity, magnetism, electromagnetic waves and optics can be applied to solve particular problems in Health Sciences applications. Introduces the student to selected topics in modern physics including quantum physics, atomic and nuclear physics.

PHYS 1115G. Survey of Physics with Lab
4 Credits (3+3P)

Overview of the concepts and basic phenomena of physics. This course provides a largely descriptive and qualitative treatment with a minimum use of elementary mathematics to solve problems. No previous knowledge of physics is assumed. Includes laboratory.

Learning Outcomes

1. Apply concepts of classical mechanics (such as velocity, acceleration, force, inertia, momentum, torque, work, energy) to simple static and dynamic systems.
2. Apply concepts of thermodynamics (such as heat, temperature, internal energy, entropy) to simple processes.
3. Apply concepts of electricity and magnetism (such as fields, potential, charge conservation, static and dynamic induction) to simple circuits, motors, and other simple contrivances.
4. Apply simple geometric and wave optics in simple situations.
5. Test ideas using modern laboratory equipment.
6. Estimate experimental uncertainties.
7. Use computers to analyze and report laboratory results.
8. Draw appropriate conclusions from quantitative scientific observations.
9. Accurately and clearly communicate the results of scientific experiments.

PHYS 1125G. Physics of Music
4 Credits (3+2P)

Introduction for non-science majors to basic concepts, laws, and skills in physics, in the context of a study of sound, acoustics, and music.

Learning Outcomes

1. Demonstrate converting units and other aspects of dimensional analysis in the working of numerical problems.
2. Apply basic classical mechanics to static and dynamic fluids, including Archimedes'principle and Bernoulli's principle.
3. Apply the general properties of waves to simple models of musical instruments.
4. Demonstrate knowledge of basic operating principles of wind, string, and percussion instruments.
5. Demonstrate knowledge of how objectively measurable properties of sound waves correspond to the perceptions of pitch, loudness, and timbre.
6. Demonstrate understanding of the description of vibrations and waves in terms of Fourier's Theorem and normal modes.
7. Demonstrate understanding of vocalization in terms of physical principles such as resonance and fluid dynamics.
8. Demonstrate understanding of how the ear works.

PHYS 1230G. Algebra-Based Physics I
3 Credits (3)

An algebra-based treatment of Newtonian mechanics. Topics include kinematics and dynamics in one and two dimensions, conservation of energy and momentum, rotational motion, equilibrium, and fluids.

Learning Outcomes

1. Demonstrate converting units and other aspects of dimensional analysis in the working of numerical problems.

2. Apply principles of Newtonian mechanics to predict and account for simple phenomena modeled by the motion of particles in one and two dimensions.
3. Apply principles of Newtonian mechanics to predict and account for simple phenomena modeled by the motion of a rigid body in two dimensions.
4. Apply Newton's theory of gravitation to circular orbits and demonstrate understanding of how Kepler's laws of planetary motion provide the empirical foundation for Newton's theory.
5. Apply the mathematics of vectors to the principles of Newtonian mechanics.
6. Apply principles of Newtonian mechanics to the case of static and dynamic incompressible fluids, including Archimedes'and Bernoulli's principles.

PHYS 1230L. Algebra-Based Physics I Lab
1 Credit (3P)
A series of laboratory experiments associated with the material presented in PHYS 1230G. May be repeated up to 3 credits.
Prerequisite/Corequisite: PHYS 1230G.
Learning Outcomes
1. Explain the scientific method.
2. Test ideas using modern laboratory equipment.
3. Estimate experimental uncertainties using statistical methods.
4. Use computers to analyze and report laboratory results.
5. Draw appropriate conclusions from quantitative scientific observations.
6. Accurately and clearly communicate the results of scientific experiments.

PHYS 1240G. Algebra-Based Physics II
3 Credits (3)
The second half of a two semester algebra-based introduction to Physics. This course covers electricity, magnetism and optics.
Prerequisite(s): a C- or better in PHYS 1230G or PHYS 2230G.
Learning Outcomes
1. Be able to state Coulomb's Law and Gauss's laws and apply them.
2. Apply the concepts of electric charge, electric field and electric potential to solve problems.
3. Analyze simple DC and AC circuits.
4. Apply the Lorentz force to solve problems.
5. Apply Faraday's law of induction (and Lenz's law) to solve problems.
6. Apply ray optics to practical lens systems such as microscopes and corrective lenses.
7. Apply the wave nature of light to the phenomena of reflection, refraction, and diffraction.

PHYS 1240L. Algebra-Based Physics II Lab
1 Credit (3P)
A series of laboratory experiments associated with the material presented in PHYS 1240 May be repeated up to 3 credits.
Prerequisite/Corequisite: PHYS 1240G.
Learning Outcomes
1. Explain the scientific method.
2. Test ideas using modern laboratory equipment.
3. Estimate experimental uncertainties using statistical methods.
4. Use computers to analyze and report laboratory results.
5. Draw appropriate conclusions from quantitative scientific observations.
6. Accurately and clearly communicate the results of scientific experiments.

PHYS 1310G. Calculus -Based Physics I
3 Credits (3)
A calculus level treatment of classical mechanics and waves, which is concerned with the physical motion concepts, forces, energy concepts, momentum, rotational motion, angular momentum, gravity, and static equilibrium.
Prerequisite: a C- or better in ENGR 190 or MATH 1511G or higher.
Learning Outcomes
1. Describe the relationships among position, velocity, and acceleration as functions of time.
2. Use the equations of kinematics to describe motion under constant acceleration.
3. Analyze linear motion using Newton's laws, force, and linear momentum.
4. Analyze rotational motion using torque and angular momentum.
5. Analyze motion using work and energy.

PHYS 1310L. Calculus -Based Physics I Lab
1 Credit (3P)
A series of laboratory experiments associated with the material presented in Calculus-based Physics I. Students will apply the principles and concepts highlighting the main objectives covered in coursework for Calculus-based Physics I.
Prerequisite(s)/Corequisite(s): PHYS 1310G.
Learning Outcomes
1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Experience the relationship between theory and experiment.

PHYS 1311. Problems in Calculus-Based Physics I
0.5-1 Credits (.5-1)
This is a supplemental course for Calculus-based Physics I. May be repeated up to 1 credits.
Corequisite(s): PHYS 1310G.

PHYS 1320G. Calculus -Based Physics II
3 Credits (3)
A calculus level treatment of classical electricity and magnetism. It is strongly recommended that this course is taken at the same time as Calculus-based Physics II laboratory.
Prerequisite: a C- or better in (PHYS 2110 or PHYS 1310G) and (ENGR 190 or MATH 1521G or higher).
Learning Outcomes
1. Apply the concepts of electric charge, electric field and electric potential to solve problems.
2. Sketch the electric field in the vicinity of point, line, sheet, and spherical distributions of static electric charge.
3. Sketch the magnetic field in the vicinity of line, ring, sheet, and solenoid distributions of steady current.

4. Describe the relationship between electric field and electric potential.
5. Calculate the Lorentz force on a moving charge for simple geometries of the fields and use it to analyze the motion of charged particles.
6. Apply the integral forms of Maxwell's equations.
7. Calculate the energy of electromagnetic fields.
8. Analyze DC circuits.

PHYS 1320L. Calculus -Based Physics II Lab
1 Credit (3P)
A series of Laboratory experiments associated with the material presented in Calculus-Based Physics II. Students will apply the principles and concepts highlighting the main objectives covered in coursework for Calculus-Based Physics II.
Prerequisite(s)/Corequisite(s): PHYS 1320G. Prerequisite(s): A C- or better in PHYS 2110L or PHYS 1310L.
Learning Outcomes
1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Experience the relationship between theory and experiment

PHYS 1321. Problems in Calculus-Based Physics II
0.5-1 Credits (.5-1)
This is a supplemental course for Calculus-based Physics II.
Corequisite(s): PHYS 1320G.

PHYS 2110. Mechanics
3 Credits (3)
Newtonian mechanics.
Prerequisite/Corequisite: MATH 1511G or higher.
Learning Outcomes
1. Describe matter as particles or extended objects, analyze forces or torques acting on it, and apply Newton's laws to determine if the object is in equilibrium or predict any change in the motion of such an object.
2. Apply vector algebra to predict motion or analyze interactions in one or two dimensions.
3. Apply techniques of conservation laws (linear momentum, energy, angular momentum) to determine the effect of interactions that are internal or external to the system studied.
4. Analyze systems in simple harmonic motion and explain qualitatively under what condition a driven oscillating system shows the phenomenon of resonance.
5. Use multiple representations to build, interpret and communicate a model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
6. Given two or more cases, perform a ranking task by evaluating the similarities (comparison) or differences (contrast) in the cases and applying physics principles.
7. Self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
8. Analyze real-world phenomena by defining and formulating the question or problem, constructing simplified idealized models(and stating their limitations), and applying appropriate mathematical reasoning to make predictions or explain a phenomenon or function.
9. Communicate effectively with audiences of different scientific backgrounds by recognizing their needs and making the communication relevant and impactful. 1
10. Work collegially and collaboratively in diverse teams both as a leader and as a member in pursuing a common goal.

PHYS 2110L. Experimental Mechanics
1 Credit (3P)
Laboratory experiments associated with the material presented in PHYS 2110. Science majors.
Prerequisite/Corequisite: PHYS 2110.
Learning Outcomes
1. Test scientific questions or ideas using appropriate laboratory equipment.
2. Collect experimental data and evaluate the outcomes of an experiment qualitatively and quantitatively.
3. Estimate measurement uncertainty.
4. Apply appropriate methods of analysis to raw data, including graphical or statistical methods, and computer-based tools.
5. Draw appropriate conclusions from quantitative scientific data.
6. Communicate the process and the outcomes of an experiment and reflect on possible revisions in the procedure.
7. Work effectively as part of a team.
8. Demonstrate professional responsibility.

PHYS 2111. Supplemental Instruction to PHYS 2110
1 Credit (1)
This Optional workshop as a supplement to PHYS 2110. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credit.
Corequisite: PHYS 2110.
Learning Outcomes
1. Analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. In the contexts of concepts and physical laws discussed in PHYS 2110, apply quantitative analysis to solve problems, including the use of scientific notation, unit conversion and vector algebra.
4. Self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. Develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2120. Heat, Light, and Sound
3 Credits (3)
Calculus-level treatment of thermodynamics, geometrical and physical optics, and sound.
Prerequisite: a C- or better in PHYS 2110 or PHYS 1310G, and MATH 1511G or higher.
Learning Outcomes
1. Analyze real world phenomena that meet specific needs and use scientific judgement to draw conclusions.

2. Use multiple representations to build, interpret and communicate scientific models, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. Analyze oscillations and wave phenomena.
4. Analyze properties of sound waves.
5. Analyze properties of light using interference and diffraction.
6. Analyze light propagation through media using index of refraction and optical apparatus.
7. Analyze optical systems using light propagation.
8. Analyze the laws of thermodynamics and use them to describe processes in gases and other states of matter.

PHYS 2120L. Heat, Light, and Sound Laboratory
1 Credit (3P)
Laboratory experiments associated with the material presented in PHYS 2120. Science majors.
Prerequisite: a C- or better in PHYS 2110L or PHYS 1310L.
Prerequisite/Corequisite: PHYS 2120.
Learning Outcomes
1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Understand the relationship between theory and experiment.

PHYS 2121. Supplemental Instruction to PHYS 2120
1 Credit (1)
This optional workshop supplements PHYS 2120 "Heat, Light, and Sound". Students actively apply concepts and methods introduced in PHYS 2120 to problem solving and quantitative analysis. May be repeated up to 1 credit.
Corequisite: PHYS 2120.
Learning Outcomes
1. Analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. In the contexts of concepts and physical laws discussed in PHYS 2121, apply quantitative analysis to solve problems involving wave propagation and interference, geometric optics, heat transfer and thermodynamics.
4. Self-checkreasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. Develop learning strategies and use metacognition to promote thinking in the discipline

PHYS 2140. Electricity and Magnetism
3 Credits (3)
Charges and matter, the electric field, Gauss law, the electric potential, the magnetic field, Ampere's law, Faraday's law, electric circuits, alternating currents, Maxwell's equations, and electromagnetic waves.
Prerequisite: a C- or better in PHYS 2110 or PHYS 1310G, and MATH 1511G or higher.
Prerequisite/Corequisite: MATH 1521G.
Learning Outcomes
1. Analyze real-world phenomena by deciding what information is relevant and constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomenon or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. Use a physics problem-solving strategy: i. Identify relevant concepts. ii. Introduce and study simplified models. iii. Use symmetry arguments. iv. Establish the relation between known and unknown quantities. v. Calculate a quantitative result using appropriate mathematical methods. vi. Self-check reasonableness of assumptions and solutions.
4. Analyze/predict the interaction of charged particles, dipoles, or conductors with electric or magnetic fields. Apply concepts of force, work, or energy.
5. Describe sources of electric fields or magnetic fields and calculate field vectors for a point in space.
6. Apply Gauss's law to calculate electric fields for symmetric charge distributions or to determine surface charges on conductors in electrostatic equilibrium.
7. Apply Ampere's law and the Law of Biot-Savart to calculate magnetic fields.
8. Evaluate if magnetic flux changes and if an electric field or electric current is induced. Determine the direction of the induced current or the non-Coulomb electric field by applying Lenz's law. Apply Faraday's law to relate the rate of change of magnetic flux with the magnitude of emf induced.
9. Calculate and discuss properties of electric circuits (dc) with resistors, capacitors, and inductors applying Kirchhoff's rules or Ohm's law. 1
10. Discuss how the presence of a capacitor or an inductor modifies the behavior of a (dc) circuit and determine the time dependence of the current. 1
11. For a series RLC-circuit (or RC, LC, RL) with an ac-voltage source apply the concept of impedance or reactance to calculate the current through or voltages across each of the circuit elements, especially in the low-frequency limit, high-frequency limit, or at the resonant frequency.

PHYS 2140L. Electricity & Magnetism Laboratory
1 Credit (3P)
Laboratory experiments associated with the material presented in PHYS 2140.
Prerequisite: a C- or better in PHYS 2110 or PHYS 1310G.
Prerequisite/Corequisite: PHYS 2140.
Learning Outcomes
1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.

7. Present experimental results in written form in appropriate style and depth.
8. Understand the relationship between theory and experiment.

PHYS 2141. Supplemental Instruction to PHYS 2140
1 Credit (1)
Optional workshop as a supplement to PHYS 2140. The tutorial sessions focus on reasoning and hands-on problem solving.
Corequisite: PHYS 2140.
Learning Outcomes
1. Analyze real-world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomenon or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. In the contexts of concepts and physical laws discussed in PHYS 2140, apply quantitative analysis to solve problems, including the use of symmetry to study electric and magnetic fields. Practice concepts of calculus applied to charge and current distributions.
4. Self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. Develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2230G. General Physics for Life Science I
3 Credits (3)
This algebra-based introduction to general physics covers mechanics, waves, sound, and heat. Special emphasis is given to applications in the life sciences. This course is recommended for students in the life sciences and those preparing for the physics part of the MCAT.
Prerequisite: A C- or better in MATH 1220G or higher.
Learning Outcomes
1. Modeling: analyze real-world phenomena by deciding what information is relevant and constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain phenomena or function; use multiple representations to build, interpret and communicate the model,including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text; critique assumptions and determine how to test the validity of a model and use the comparison of experimental data and prediction to refine the model.
2. Conceptual understanding: describe the motion of any object in terms of displacement, velocity, and acceleration; analyze external forces acting on an object and determine if a system is in equilibrium or relate the net force to changes in motion; predict or analyze motion using conservation laws for energy and momentum; analyze forces and torques fora rigid object in static equilibrium; for a static fluid determine pressure and the buoyant force; apply idealized models of fluid flow to the circulatory system; describe the properties of pressure waves known as sound, apply the model of standing waves to musical instruments and discuss how sound is used to sense the environment; predict qualitative changes in the internal energy of a thermodynamic system when energy has been transferred due to work or heat and justify those predictions using conservation of energy (First law of thermodynamics). Identify which heat transfer processes occur in a described situation.
3. Quantitative reasoning: use a physics problem-solving strategy (Identify relevant concepts; Introduce and study simplified models; Use symmetry arguments; Establish the relation between known and unknown quantities; Calculate a quantitative result using appropriate mathematical methods; Self-check reasonableness of assumptions and solutions); use scientific notation accurately and convert units if necessary.
4. Communicating scientific information: interpret or generate graphs or other visual representations and be able to switch between various representations including text,mathematical description, or diagrams.

PHYS 2230L. Laboratory to General Physics for Life Science I
1 Credit (1)
Laboratory experiments in topics associated with material presented in PHYS 2230G.
Prerequisite(s)/Corequisite(s): PHYS 2230G. Restricted to Las Cruces campus only.

PHYS 2231. Supplemental Instruction to General Physics for Life Sciences I
1 Credit (1)
This optional workshop supplements Physics for Life Sciences I. The tutorial sessions focus on reasoning and hands-on problem solving.
Corequisite: PHYS 2230G.
Learning Outcomes
1. analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. in the contexts of concepts and physical laws discussed in PHYS 2230, apply quantitative analysis to solve problems, including the use of scientific notation, unit conversion and vector algebra.
4. self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2240G. General Physics for Life Science II
3 Credits (3)
This algebra-based course covers electricity, magnetism, light, atomic physics, and radioactivity. Special emphasis is given to applications in the life sciences This course is recommended for students in the life sciences and those preparing for the physics part of the MCAT.
Prerequisite: a C- or better in PHYS 1230G or PHYS 2230G, and MATH 1220G or higher.
Learning Outcomes
1. Modeling: analyze real world phenomena by constructing simplified idealized models (an abstract description) that allow making predictions or explaining a phenomena or function; use multiple representations to build and communicate the model, including sketches, mathematical expressions, diagrams or graphs; decide what information is relevant and critique assumptions and models of others; determine how to test the validity of a model and use comparison of experimental data and prediction to refine the model.
2. Conceptual understanding: electric or magnetic fields can be used to describe interactions of objects that contain charges with their surroundings; changes that occur as a result of interactions are constrained by conservation laws (such as conservation of energy, conservation of charge or conservation of nucleon number); many macroscopic properties of materials can be described using microscopic models or related to their geometry; electromagnetic radiation can be modeled as a wave or as fundamental particles (photons); the direction of propagation of a wave may change when it encounters a boundary surface between two media of different

properties (reflection or refraction); the spontaneous radioactive decay of nuclei is described by probability.
3. Quantitative reasoning: apply quantitative analysis and appropriate mathematical reasoning to describe or explain phenomena; use scientific notation accurately and convert units if necessary.
4. Communicating scientific information: interpretor generate graphs or other visual representations (e.g. field lines, equipotential lines) and be able to switch between various representations including text, mathematical description, or diagrams.

PHYS 2240L. Laboratory to General Physics for Life Science II
1 Credit (1)
Laboratory experiments in topics associated with material presented in PHYS 2240.
Prerequisite(s)/Corequisite(s): PHYS 2240G. Restricted to Las Cruces campus only.

PHYS 2241. Supplemental Instruction to General Physics for Life Sciences II
1 Credit (1)
This optional workshop is a supplement to Physics for Life Science II. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credits.
Corequisite(s): PHYS 2240G.
Learning Outcomes
1. analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. in the contexts of concepts and physical laws discussed in PHYS 2240, apply quantitative analysis to solve problems, including the use of scientific notation, unit conversion and vector algebra.
4. self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2996. Special Topics
1,4 Credits
Topics to be announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes
1. Varies.

PHYS 2997. Independent Study
1-3 Credits
Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.
Learning Outcomes
1. Varies

PHYS 303V. Energy and Society in the New Millennium
3 Credits (3)
Traditional and alternative sources of energy. Contemporary areas of concern such as the state of depletion of fossil fuels; nuclear energy, solar energy, and other energy sources; environmental effects; nuclear weapons; and health effects of radiation. Discussion of physical principles and impact on society. Focus on scientific questions involved in making decisions in these areas. No physics background required.

PHYS 304. Forensic Physics
4 Credits (3+3P)
Theories, laboratory, and field techniques in the area of forensic physics.

PHYS 305V. The Search for Water in the Solar System
3 Credits (3)
Examines the formation, abundance and ubiquity of water in our Solar System stemming from comets, Martian and Lunar poles, Earth's interior and into the outer reaches of the Solar System. Topics will include nuclear synthesis, Solar System formation, remote sensing, as well as past, present and future NASA missions for water.
Learning Outcomes
1. Learn how to apply scientific reasoning for understanding the evolution of the universe.
2. Learn the location of possible water resources in the solar system and beyond.
3. Learn how to use remote sensing to identify water in distant stellar objects and their atmospheres.
4. Acquire the ability to apply knowledge of mathematics, science and applied sciences (scientific expertise).
5. Recognize the need for an ability to engage in life-long learning (Life-long learning).

PHYS 315. Modern Physics
3 Credits (3)
An introduction to relativity and quantum mechanics, with applications to atoms molecules, solids, nuclei, and elementary particles.
Prerequisite: a C- or better in MATH 2530G and PHYS 2140 or PHYS 1320G.
Learning Outcomes
1. Communication: an ability to communicate effectively with a range of audiences.
2. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 316. Supplemental Instructions to PHYS 315
1 Credit (1)
This optional workshop supplements PHYS 315 "Modern Physics". Students actively apply concepts and methods introduced in PHYS 315 to problem solving and quantitative analysis.
Corequisite(s): PHYS 315.

PHYS 325. Intermediate Experimental Physics
3 Credits (1+6P)
An exploration of a variety of experimental techniques in physics with an emphasis on the proper determination of statistical and systematic uncertainties. Students will work in teams and prepare professional written and oral reports of their work. This course cannot be used to replace M E 345 for students majoring in engineering.
Prerequisite(s)/Corequisite(s): PHYS 315. Prerequisite(s): a C- or better in PHYS 2140L or PHYS 1320L.
Learning Outcomes
1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, Analyze, and Interpret Data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 350. Special Topics
1-3 Credits
Lectures, demonstrations, and discussions on such topics as lasers and holography, energy sources, clouds, and biophysics. May be repeated for a maximum of 12 credits under different subtitles.

PHYS 380. Individual Study
1-3 Credits
Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

PHYS 395. Intermediate Mathematical Methods of Physics
3 Credits (3)
Introduction to the mathematics used in intermediate-level physics courses. Topics include vector calculus, curvilinear coordinates, matrices, linear algebra, function spaces, partial differential equations, and special functions. This course cannot be used to replace M E 228 or M E 328 for students majoring in engineering. May be repeated up to 3 credits.
Prerequisite(s)/Corequisite(s): MATH 3160. Prerequisite(s): a C- or better in MATH 2530G.
Learning Outcomes
1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 400. Undergraduate Research
1-3 Credits
May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

PHYS 420. Capstone Project I
3 Credits (3P)
Application of engineering physics principles to a significant design project. Includes teamwork, written and oral communication and realistic technical, economic and public safety requirements.

PHYS 421. Capstone Project II
3 Credits (3P)
Continuation of PHYS 420.

PHYS 450. Selected Topics
1-3 Credits
Readings, lectures or laboratory studies in selected areas of physics. May be repeated for a maximum of 12 credits.

PHYS 451. Intermediate Mechanics I
3 Credits (3)
Newtonian mechanics, including an introduction to the Lagrangian formulation. Topics include central force motion, rigid body motion, noninertial reference frames, oscillating systems, and classical scattering.
Prerequisite(s)/Corequisite(s): MATH 3160. Prerequisite(s): a C- or better in PHYS 2110 or PHYS 1310G, and MATH 2530G.
Learning Outcomes
1. Set up equations of motion for classical mechanical systems and solve them.
2. Identify conserved quantities and understand the circumstances under which they arise (symmetries); in particular, know how to use conservation of energy, momentum, angular momentum to solve problems.
3. Fluently use three-dimensional calculus as a language to do the above; be able to use spherical and cylindrical coordinates.
4. Understand the paradigmatic examples of the harmonic oscillator, central force (in particular, gravitational) motion and rigid body motion, which serve as starting points for investigating more complicated realistic problems.

PHYS 454. Intermediate Modern Physics I
3 Credits (3)
Introduction to quantum mechanics, focusing on the role of angular momentum and symmetries, with application to many atomic and subatomic systems. Specific topics include intrinsic spin, matrix representation of wave functions and observables, time evolution, and motion in one dimension.
Prerequisite: a C- or better in PHYS 315.
Prerequisite/Corequisite: MATH 3160 and PHYS 395.
Learning Outcomes
1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 455. Intermediate Modern Physics II
3 Credits (3)
Continuation of subject matter of PHYS 454. Specific topics include rotation and translation in three dimensions, solution of central potential problems, perturbation theory, physics of identical particles, scattering theory, and the interaction between photons and atoms.
Prerequisite: a C- or better in PHYS 454, MATH 3160, and PHYS 395.
Learning Outcomes
1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 461. Intermediate Electricity and Magnetism I
3 Credits (3)
The first part of a two-course sequence in classical electrodynamics. Covered topics include static electric and magnetic fields, Laplace's and Poisson's equations, electromagnetic work and energy, Lorentz force, Gauss's, Biot-Savart, and Ampere's laws, Maxwell's equations, as well as electric and magnetic fields in matter.
Prerequisite: a C- or better in PHYS 2140 or PHYS 1320G or equivalent and a C- or better in MATH 2530G.
Prerequisite/Corequisite: MATH 3160 and PHYS 395.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 462. Intermediate Electricity and Magnetism II
3 Credits (3)
Continuation of subject matter of PHYS 461. Covered topics include Maxwell's equations and their applications, electromagnetic waves, reflection, refraction, dispersion, radiating systems, interference and diffraction, as well as Lorentz transformations and relativistic electrodynamics.
Prerequisite: a C- or better in PHYS 461, MATH 3160, and PHYS 395.
Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 468. Intermediate X-ray Diffraction
3 Credits (3)
Introduction to x-ray diffraction and reflectivity spectra. Topics include X-ray sources and detectors, atomic spectra, characteristic x-rays, thermionic emission, synchrotron radiation, instrument components, and beam conditioners. Prerequisite(s): a C- or better in PHYS 315 and PHYS 325
Learning Outcomes

1. Knowledge of structural properties of materials
2. Experimental x-ray characterization techniques
3. Presentation and writing skills in the discipline
4. Ethics, teamwork, and career opportunities

PHYS 471. Modern Experimental Optics
3 Credits (1+6P)
Cumulative experience course in experimental optics.
Prerequisite: a C- or better in PHYS 315 and PHYS 325.
Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and professional responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 475. Advanced Laboratory Practices for Materials
3 Credits (1+6P)
Cumulative experience course in advanced laboratory practices involving experiments in atomic, molecular, and condensed matter physics.
Prerequisite: a C- or better in PHYS 315 and PHYS 325.
Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, Analyze, and Interpret Data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 476. Computational Physics
3 Credits (3)
Scientific visualization, numerical differentiation and interpolation, numerical integration, root finding, linear algebra, eigensystems, ODE's, Boundary value problems, PDE's, Monte-Carlo calculations, data description and analysis, Fast Fourier Transforms, and applications to advanced physics problems. Recommended is the knowledge of a programming language.
Prerequisite: a C- or better in PHYS 1111 or equivalent and MATH 3160.
Learning Outcomes

1. learn how to use computers for solving problems in the physical sciences,
2. obtain skills to implement numerical simulation and modeling strategies,
3. learn how to monitor and analyze data graphically, during and after computation,
4. obtain workflow organization skills needed for the solution of complicated systems.

PHYS 480. Thermodynamics
3 Credits (3)
Thermodynamics and statistical mechanics. Basic concepts of temperature, heat, entropy, equilibrium, reversible and irreversible processes. Applications to solids, liquids, and gases.
Prerequisite: a C- or better in PHYS 2120, PHYS 315, and MATH 2530G.
Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 485. Independent Study
1-3 Credits
Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

PHYS 488. Introduction to Condensed Matter Physics
3 Credits (3)
Crystal structure, X-ray diffraction, energy band theory, phonons, cohesive energy, conductivities, specific heats, p-n junctions, defects, surfaces, and magnetic, optical, and low-temperature properties.
Prerequisite: a C- or better in PHYS 315.
Learning Outcomes
1. Learn the fundamental concepts of solid-state physics: classification of solids, crystal structure, band structure of solids, lattice vibrations, optical and magnetic properties of solids.
2. Develop an ability to formulate and solve complex problems in solid state physics by applying the fundamental principles of physics and mathematics.
3. Develop and ability to acquire and apply new knowledge using appropriate learning strategies.

PHYS 489. Introduction to Modern Materials
3 Credits (3)
Structure and mechanical, thermal, electric, and magnetic properties of materials. Modern experimental techniques for the study of material properties.
Prerequisite: a C- or better in PHYS 315.
Learning Outcomes
1. Learn the fundamental concepts of the physics of modern materials, such as crystal structure, properties of materials, and experimental techniques.
2. Develop an ability to formulate and solve complex problems in the area of physics of modern materials by applying the principles of physics and mathematics.
3. Develop an ability to acquire and apply new knowledge using appropriate learning strategies.

PHYS 493. Experimental Nuclear Physics
3 Credits (1+6P)
Cumulative experience course in nuclear physics such as measurement of radioactivity, absorption of radiation, nuclear spectrometry.
Prerequisite: a C- or better in PHYS 315 and PHYS 325.
Learning Outcomes
1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communications: an ability to communicate effectively with a range of audiences.
3. Ethical and professional responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 495. Mathematical Methods of Physics I
3 Credits (3)
Applications of mathematics to experimental and theoretical physics. Topics include vector analysis, Fourier series and transforms, Green's functions, special functions, complex variables, tensor algebra and analysis.
Prerequisite: a C- or better in MATH 3160 and PHYS 395.
Learning Outcomes
1. Deploy the tools of vector analysis and expansion into complete sets of functions to treat problems arising, e.g., in electrodynamics.
2. Understand the elements of functional analysis underpinning, e.g., quantum mechanics, such as representations, operators and their inverses and spectra.
3. Evaluate integrals of analytic functions using the calculus of residues.
4. Take advantage of the transformation behavior, under symmetry operations, of representations of physical quantities, by casting physical relations in tensor language.

PHYS 500. Special Topics Seminar
1-2 Credits
Treatment of topics not covered by regular courses. Graded S/U. May be repeated.

PHYS 511. Mathematical Methods of Physics I
3 Credits (3)
Applications of mathematics to experimental and theoretical physics. Topics include vector analysis, Fourier series and transforms, Green's functions, special functions, complex variables, tensor algebra and analysis.
Learning Outcomes
1. Deploy the tools of vector analysis and expansion into complete sets of functions to treat problems arising, e.g., in electrodynamics.
2. Understand the elements of functional analysis underpinning, e.g., quantum mechanics, such as representations, operators and their inverses and spectra.
3. Evaluate integrals of analytic functions using the calculus of residues.
4. Take advantage of the transformation behavior, under symmetry operations, of representations of physical quantities, by casting physical relations in tensor language.

PHYS 520. Selected Topics
1-3 Credits
This is a lecture/laboratory course designed to present the basic concepts, the techniques and the tools to synthesize and characterize nanometer scale materials, and the latest achievements in current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics and energy. It is intended for a multidisciplinary audience with a variety of backgrounds. This course should be suitable for graduate students as well as advanced undergraduates. Topics covered will include: nanoscience and nanotechnology, nanofabrication, self-assembly, colloidal chemistry, sol-gel, carbon nanotubes, graphene, thin film, lithography, physical vapor deposition, chemical vapor deposition, quantum dots, lithium batteries, X-ray diffraction, scanning electron microscopy, transmission electron microscopy, nanoelectronics, nanophotonics and nanomagnetics, etc. Students must also have completed (EH&S Safety training to include the courses: (1) Employee & Hazard Communication Safety (HazCom); (2) Hazardous Waste Management; and (3) Laboratory Standard) trainings to enroll. Crosslisted with: CHME 467 . May be repeated up to 3 credits.
Prerequisite: (CHEM 1226 or CHEM 1215G), (PHYS 1230G or PHYS 1310G).

PHYS 521. Individual Study
1-3 Credits

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.
Prerequisites: graduate standing, consent of instructor, and selection of a specific topic prior to registration.

PHYS 528. Fundamentals of Photonics
4 Credits (3+3P)
Ray, wave and guided optics, lasers and thermal sources, radiometry, photon detection and signal-to-noise ratio. Elements of photonic crystals, polarization, acousto-optics, electro-optics, and optical nanostructures. Recommended foundation (PHYS 1320G or PHYS2120) and (E E 473 or PHYS 473), Taught with E E 478. Crosslisted with E E 528.
Learning Outcomes
1. Describe the fundamental properties of light.
2. Formulate the concepts of ray, wave, and photon optics mathematically.
3. Represent and incorporate basic elements of an optical system.
4. Perform an analysis of a simple photonic/optical system mathematically by hand and with computer tools such as MATLAB.
5. Discuss ethical, societal, and professional issues related to photonics and optics.

PHYS 551. Classical Mechanics
3 Credits (3)
Lagrangian and Hamiltonian formulation of dynamics. Advanced treatments of most topics listed under PHYS 451, plus canonical transformations and Hamilton-Jacobi theory. PHYS 451 strongly recommended.

PHYS 554. Quantum Mechanics I
3 Credits (3)
Wave function, indeterminacy, classical limit. Schrodinger equation. Atomic and nuclear systems. Angular momentum, intrinsic spin, identical particles. Scattering theory. Mathematical formalism, symmetry and conserved quantities. Perturbation theory. Dirac theory, introduction to quantized fields. PHYS 451 and PHYS 454 strongly recommended.

PHYS 555. Quantum Mechanics II
3 Credits (3)
Continuation of topics in PHYS 554.
Prerequisites: PHYS 554 or consent of instructor.

PHYS 561. Electromagnetic Theory I
3 Credits (3)
Detailed advanced treatments of most topics listed under PHYS 461, PHYS 462, plus multipole radiation, collisions of charged particles and bremsstrahlung, scattering, and radiation reaction. PHYS 461 and PHYS 462 strongly recommended.

PHYS 562. Electromagnetic Theory II
3 Credits (3)
Continuation of topics in PHYS 561.
Prerequisites: PHYS 561 or consent of instructor.

PHYS 568. Elements of X-ray Diffraction
3 Credits (3)
Same as PHYS 468, but additional work required. Crosslisted with: CHME 588.

PHYS 571. Advanced Experimental Optics
3 Credits (1+6P)
Taught with PHYS 471 with additional work required at the graduate level.
Learning Outcomes
1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and professional responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 575. Advanced Physics Laboratory
3 Credits (1+6P)
Selected experiments in atomic, molecular, nuclear and condensed-matter physics.
Learning Outcomes
1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 576. Advanced Computational Physics I
3 Credits (3)
Advanced treatment of topics listed under PHYS 476 plus additional work. Applications of numerical methods to advanced physics problems. Recommended is the knowledge of a programming language.
Learning Outcomes
1. learn to numerically solve problems that require higher mathematical and theoretical analysis,
2. experience how graduate research will be advanced and accelerated by the use of scientific computing skills.

PHYS 584. Statistical Mechanics
3 Credits (3)
Thermodynamics review. Probability, entropy, equilibrium. Canonical and grand canonical ensembles. Classical and quantum statistics. Degenerate and classical gases. Application to the equilibrium properties of solids, liquids, and gases. Kinetic theory and transport processes.

PHYS 589. Modern Materials
3 Credits (3)

Same as PHYS 489 with differentiated assignments for graduate students. PHYS 554 recommended.

Learning Outcomes

1. Learn the fundamental concepts of the physics of modern materials, such as crystal structure, properties of materials, and experimental techniques.
2. Develop an ability to formulate and solve complex problems in the area of physics of modern materials by applying the principles of physics and mathematics.
3. Develop an ability to acquire and apply new knowledge using appropriate learning strategies.

PHYS 591. Advanced High-Energy Physics I
3 Credits (3)
Taught with PHYS 491 with additional work required at the graduate level.
Prerequisite(s): PHYS 555 or consent of instructor.

PHYS 593. Advanced Experimental Nuclear Physics
3 Credits (1+6P)
Advanced experimental investigation of topics such as measurement of radioactivity, absorption of radiation, and nuclear spectrometry.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 597. Space Plasma Physics
3 Credits (3)
Same as PHYS 497 but with added requirements.

PHYS 599. Master's Thesis
1-15 Credits (1-15)
Thesis.

PHYS 600. Research
1-15 Credits
Doctoral research. May be repeated.

PHYS 620. Advanced Topics in Physics
1-3 Credits
Advanced formal treatment of topics not covered in regular courses. May be repeated for a maximum of 9 credits.
Prerequisite: consent of instructor.

PHYS 650. General Relativity I
3 Credits (3)
Basic foundations and principles of general relativity, derivation of the Einstein field equations and their consequences, the linearized theory, the Bel-Petrov classification of the curvature tensor, derivation of the Schwarzschild solution and the four basic tests of general relativity.
Prerequisite(s): PHYS 511 or PHYS 561 or consent of instructor.

PHYS 680. Independent Study
1-3 Credits
Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.
Prerequisite: graduate standing or consent of instructor.

PHYS 688. Advanced Condensed Matter Physics
3 Credits (3)
Continuation of the advanced condensed matter physics presented in PHYS 588. Topics include electronic structure methods, optical, magnetic, and transport properties of solids, semiconductors, crystalline defects, nanostructures, and noncrystalline solids. PHYS 588 strongly recommended.

Learning Outcomes

1. Learn the fundamental concepts of advanced condensed state physics: band theory of solids, electronic structure methods, optical and magnetic properties of solids, bulk semiconductors, and properties of nano-structured materials.
2. Develop an ability to formulate and solve complex problems in advanced condensed matter physics.
3. Develop an ability to to study independently and acquire new knowledge using appropriate learning strategies.

PHYS 689. Advanced Modern Materials
3 Credits (3)
Advanced topics in the physics of modern materials, such as crystalline, amorphous, polymeric, nanocrystalline, layered, and composite materials and their surfaces and interfaces. PHYS 555, PHYS 588, and PHYS 589 recommended.

Learning Outcomes

1. Learn the fundamental concepts of the physics of modern materials, such as crystalline, amorphous, polymeric, nanostructured, layered, and composite materials.
2. Develop an ability to formulate and solve complex problems in the area of advanced physics of modern materials.
3. Develop an ability to to study independently and acquire new knowledge using appropriate learning strategies.

PHYS 691. Quantum Field Theory I
3 Credits (3)
Path integrals, gauge invariance, relativistic quantum mechanics, canonical quantization, relativistic quantum field theory, introduction to QED.
Prerequisites: PHYS 555 and PHYS 562, or consent of instructor.

PHYS 692. Quantum Field Theory II
3 Credits (3)
QED, running coupling constant, QCD, electroweak theory, asymptotic freedom, deep inelastic scattering, basic QCD phenomenology, path integrals in quantum field theory, lattice QCD.
Prerequisite: PHYS 691 or consent of instructor.

PHYS 700. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation.

Phone: (575) 646-3831
Website: https://phys.nmsu.edu/ (https://phys.nmsu.edu)

Physics - Bachelor of Arts

The curriculum for the Bachelor of Arts degree is designed for students who would like to have a firm foundation in physics combined with study in another area and greater flexibility in choosing elective courses. The program requires a minor in a second field of study chosen by the student in consultation with an advisor. A second major may be used to satisfy the program requirement for a minor.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [2]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits) [1,3]		
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [1,3]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World [4]		**6**
Departmental Requirements [5]		
PHYS 1110	Explorations in Physics	1
PHYS 1111	Introductory Computational Physics	3
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	4
PHYS 2111	Supplemental Instruction to PHYS 2110	1
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	4
PHYS 2141	Supplemental Instruction to PHYS 2140	1
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory	4
PHYS 2121	Supplemental Instruction to PHYS 2120	1
PHYS 315	Modern Physics	3
PHYS 316	Supplemental Instructions to PHYS 315	1
PHYS 325	Intermediate Experimental Physics	3
PHYS 395	Intermediate Mathematical Methods of Physics	3
PHYS 451	Intermediate Mechanics I	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 462	Intermediate Electricity and Magnetism II	3
PHYS 480	Thermodynamics	3
Non-Departmental Requirements (in addition to Gen.Ed/VWW) [5]		
MATH 2530G	Calculus III	3
MATH 3160	Introduction to Ordinary Differential Equations	3
Select 18 credits from a Minor in a second field from another department		18
Second Language Requirement: (required - see below)		**0-8**
Electives, to bring the total credits to 120 [5,6]		**0-9**
Total Credits		**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
3. See alternatives for meeting General Education requirements.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
5. May not be taken S/U and must earn a grade of C- or better.
6. Elective credit may vary based on General Education course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their Physics Advisor.

Second Language Requirement

For the Bachelor of Arts in Physics there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120	French I and French II	8
GRMN 1110 & GRMN 1120	German I and German II	8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	8
For Heritage Speakers:		
SPAN 1220	Spanish for Heritage Learners II	3
or SPAN 2210	Spanish for Heritage Learners III	
PORT 1110	Portuguese I	3
or PORT 1120	Portuguese II	

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
FREN 1120	French II	4
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
OR		
Challenge the 1110/1120/1220/2210 level for the following courses:		
PORT 1110	Portuguese I	3
or PORT 1120	Portuguese II	
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

Suggested Minors for the Bachelor of Arts Physics Major

Astronomy Minor— A Bachelor of Arts in Physics with a minor in Astronomy provides an excellent preparation for students who wish to pursue graduate studies in Astrophysics or Astronomy.

Pre-Medicine Studies Minor— Students wishing to attend a medical or dental post-graduate school are strongly encouraged to obtain a minor in a life science field such as biochemistry, biology, human biology or microbiology.

Prelaw Minor— Students wishing to attend a post-graduate law school should obtain a minor in a law-related field, such as government, accounting, finance, or international business.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Full-time students are usually required to take at least 15 credits per semester.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
PHYS 1110	Explorations in Physics	1
PHYS 1111	Introductory Computational Physics [1]	3
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics [1]	4
PHYS 2111	Supplemental Instruction to PHYS 2110	1
	Credits	**17**
Semester 2		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [1] or Calculus and Analytic Geometry II Honors	4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [1]	4
PHYS 2141	Supplemental Instruction to PHYS 2140 [1]	1
Area V: Humanities Course [2]		3
	Credits	**15**
Second Year		
Semester 1		
MATH 2530G	Calculus III [1]	3
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory [1]	4
PHYS 2121	Supplemental Instruction to PHYS 2120	1
Area VI: Creative and Fine Arts Course [2]		3
Minor (or Elective) Course		3
	Credits	**14**
Semester 2		
MATH 3160	Introduction to Ordinary Differential Equations [1]	3
PHYS 315	Modern Physics [1]	3
PHYS 316	Supplemental Instructions to PHYS 315	1
PHYS 325	Intermediate Experimental Physics [1]	3
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
Minor (or Elective) Course		3
	Credits	**16**
Third Year		
Semester 1		
PHYS 395	Intermediate Mathematical Methods of Physics [1]	3
PHYS 451	Intermediate Mechanics I [1]	3
PHYS 461	Intermediate Electricity and Magnetism I [1]	3
VWW: Viewing a Wider World Course [3]		3
First Course in Second Language Series		3-4
	Credits	**15-16**
Semester 2		
PHYS 462	Intermediate Electricity and Magnetism II [1]	3
PHYS 480	Thermodynamics [1]	3
VWW: Viewing a Wider World Course [3]		3
Area IV: Social and Behavioral Science Course [2]		3

Next Course in Second Language Series [1]		3-4
	Credits	**15-16**
Fourth Year		
Semester 1		
PHYS 454	Intermediate Modern Physics I [1]	3
Minor (or Elective) Course		3
Minor (or Elective) Course		3
Minor (or Elective) Course		3
Elective Course		3
	Credits	**15**
Semester 2		
PHYS 455	Intermediate Modern Physics II [1]	3
Minor (or Elective) Course		3
Minor (or Elective) Course		3
Elective Course		4-2
	Credits	**13-11**
	Total Credits	**120**

1 These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Physics - Bachelor of Science

A Bachelor of Science degree in physics at NMSU prepares a student well for graduate study in physics, astrophysics, or engineering or for a variety of careers in research and teaching. Students who plan to seek employment at the B.S. level are advised to take the concentration area curricula as part of their electives in addition to the general and departmental requirements. The program of study should be chosen by the student in consultation with a physics faculty advisor.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. The Bachelor of Science degree in Physics is accredited by the Applied and Natural Science Accreditation Commission (ANSAC) of ABET, https://www.abet.org (https://nam10.safelinks.protection.outlook.com/?url=https%3A%2F%2Fwww.abet.org%2F&data=05%7C02%7Cgdmart%40nmsu.edu%7C1f05aec125ce44c5a30808dcf1f7ba03%7Ca3ec87a89fb84158ba8ff11ba[illegible]%7C1%7C0%7C638651293476050792%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C0%7C%7C%7C&sdata=AG9ueMYqrAq%2FxwaQB0jjK90WuBEVGL%2FpZHDfDccblm8%3D&reserved=0), under the General Criteria with no applicable program criteria.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [2]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Sciences Course (4 credits) [1,3]		
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [1,3]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World [4]		**6**
Departmental Requirements [5]		
PHYS 1110	Explorations in Physics	1
PHYS 1111	Introductory Computational Physics	3
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	4
PHYS 2111	Supplemental Instruction to PHYS 2110	1
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	4
PHYS 2141	Supplemental Instruction to PHYS 2140	1
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory	4
PHYS 2121	Supplemental Instruction to PHYS 2120	1
PHYS 315	Modern Physics	3
PHYS 316	Supplemental Instructions to PHYS 315	1
PHYS 325	Intermediate Experimental Physics	3
PHYS 395	Intermediate Mathematical Methods of Physics	3
PHYS 451	Intermediate Mechanics I	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 462	Intermediate Electricity and Magnetism II	3
PHYS 480	Thermodynamics	3
Select an additional 6 credits in physics numbered 300 or above		6
Advanced Laboratory		
Select 3 credits from the following:		3
PHYS 471	Modern Experimental Optics	
PHYS 475	Advanced Laboratory Practices for Materials	
PHYS 493	Experimental Nuclear Physics	
Non-Departmental Requirements (in addition to Gen.Ed/VWW) [5]		
MATH 2530G	Calculus III	3
MATH 3160	Introduction to Ordinary Differential Equations	3
Select one of the following:		8
CHEM 1215G & CHEM 1225G	General Chemistry I Lecture and Laboratory for STEM Majors and General Chemistry II Lecture and Laboratory for STEM Majors	
CHEM 1216 & CHEM 1226	General Chemistry I Lecture and Laboratory for CHEM Majors and General Chemistry II Lecture and Laboratory for CHEM Majors	
Second Language Requirement: (required - see below)		**0-8**

Electives, to bring the total credits to 120 [5,6]	**1-10**
Total Credits	**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
3. See alternatives for meeting General Education requirements.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
5. May not be taken S/U and must earn a grade of C- or better.
6. Approved physics and technical electives are decided by Physics Advisors.

Students who plan to pursue graduate study in physics or astrophysics are strongly advised to take one or more senior-level courses in nuclear physics, space physics, condensed matter physics, astronomy, or computational physics. Students who plan to seek employment at the B.S. level are advised to select one of the following emphasis areas: Applied Physics, Computational Physics, or Materials Science. The program of study should be chosen by the student in consultation with a physics faculty advisor. Some recommended courses are listed below.

Applied Physics: 12 credits of upper division E E, M E, or CSCI courses;

Computational Physics: CSCI 1110 Computer Science Principles, CSCI 1115G Modern Computing in Practice , MATH 1531, and PHYS 476;

Materials Science: 12 credits of upper-division courses selected from CHME 361, PHYS 450, PHYS 468, PHYS 471, PHYS 475, PHYS 488, and PHYS 489.

Second Language Requirement

For the Bachelor of Science in the Physics there is a one year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120	French I and French II	8
GRMN 1110 & GRMN 1120	German I and German II	8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	8
For Heritage Speakers:		
SPAN 1220	Spanish for Heritage Learners II	3
or SPAN 2210	Spanish for Heritage Learners III	
PORT 1110	Portuguese I	3
or PORT 1120	Portuguese II	

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3

Option 3:

Prefix	Title	Credits
Challenge the 1120 level for the following courses:		
FREN 1120	French II	4
or GRMN 1120	German II	
or JAPN 1120	Japanese II	
or SPAN 1120	Spanish II	
OR		
Challenge the 1110/1120/1220/2210 level for the following courses:		
PORT 1110	Portuguese I	3
or PORT 1120	Portuguese II	
or SPAN 1220	Spanish for Heritage Learners II	
or SPAN 2210	Spanish for Heritage Learners III	

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of two years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

Dual Degree (BS/MS) Program

This program option is designed to provide a means for physics undergraduates to obtain an MS degree in physics after taking only an additional 18 credits for the MS. These 18 credits can be obtained in two semesters (and perhaps one summer term to write and defend an MS thesis). Students electing this option will follow the regular undergraduate BS in physics curriculum, except that they are advised to take the advanced laboratory course at the 500-level to meet both the BS and MS degree requirements. They can also apply up to nine credits of their undergraduate courses numbered 450 and above and up to twelve credits total (including 500-level courses) towards their MS degree. Students interested in this dual degree must be admitted to the MS in Physics graduate program and must fulfill all degree requirements for the MS degree in Physics.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for

students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Full-time students are usually required to take at least 15 credits per semester.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
PHYS 1110	Explorations in Physics	1
PHYS 1111	Introductory Computational Physics [1]	3
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics [1]	4
PHYS 2111	Supplemental Instruction to PHYS 2110 [1]	1
	Credits	**17**
Semester 2		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [1] or Calculus and Analytic Geometry II Honors	4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [1]	4
PHYS 2141	Supplemental Instruction to PHYS 2140 [1]	1
Area IV: Social and Behavioral Science Course [2]		3
	Credits	**15**
Second Year		
Semester 1		
CHEM 1215G or CHEM 1216	General Chemistry I Lecture and Laboratory for STEM Majors [1] or General Chemistry I Lecture and Laboratory for CHEM Majors	4
MATH 2530G	Calculus III [1]	3
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory [1]	4
PHYS 2121	Supplemental Instruction to PHYS 2120	1
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
	Credits	**15**
Semester 2		
CHEM 1225G or CHEM 1226	General Chemistry II Lecture and Laboratory for STEM Majors [1] or General Chemistry II Lecture and Laboratory for CHEM Majors	4
MATH 3160	Introduction to Ordinary Differential Equations [1]	3
PHYS 315	Modern Physics [1]	3
PHYS 316	Supplemental Instructions to PHYS 315	1
PHYS 325	Intermediate Experimental Physics [1]	3
Area V: Humanities Course [2]		3
	Credits	**17**
Third Year		
Semester 1		
PHYS 451	Intermediate Mechanics I [1]	3
PHYS 461	Intermediate Electricity and Magnetism I [1]	3
PHYS 395	Intermediate Mathematical Methods of Physics [1]	3
VWW: Viewing a Wider World Course [3]		3
First Course in Second Language Series		3-4
	Credits	**15-16**
Semester 2		
PHYS 462	Intermediate Electricity and Magnetism II [1]	3
PHYS 480	Thermodynamics [1]	3
Area VI: Creative and Fine Arts Course [2]		3
VWW: Viewing a Wider World Course [3]		3
Next Course in Second Language Series [1]		3-4
	Credits	**15-16**
Fourth Year		
Semester 1		
PHYS 454	Intermediate Modern Physics I [1]	3
Physics Upper-Division Elective Courses [1]		6
Elective Courses		6
	Credits	**15**
Semester 2		
PHYS 455	Intermediate Modern Physics II [1]	3
Advanced Physics Laboratory [1]		3
Elective Courses		5-3
	Credits	**11-9**
	Total Credits	**120**

1 These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Physics - Undergraduate Minor

A student cannot earn a BA or a BS in Physics and a minor in Physics. The minor in Physics requires a minimum of 18 credits distributed as follows:

Prefix	Title	Credits
Requirements		
PHYS 2110	Mechanics	3
or PHYS 1310G	Calculus -Based Physics I	
PHYS 2140	Electricity and Magnetism	3
or PHYS 1320G	Calculus -Based Physics II	
PHYS 315	Modern Physics	3
Select 3-9 credits from the following:		3-9
PHYS 2120	Heat, Light, and Sound	
Other Physics courses numbered 300 or above		
Select 0-6 credits from the following: [1]		0-6
A E 362	Orbital Mechanics	
C E 301	Mechanics of Materials	
CHME 361	Engineering Materials	
CHME 470	Introduction to Nuclear Energy	
CHME 471	Health Physics	
CHEM 433	Physical Chemistry I	
or CHEM 433 H	Physical Chemistry I Honors	
E E 473	Introduction to Optics	
E E 478	Fundamentals of Photonics	
M E 333	Intermediate Dynamics	

M E 338	Fluid Mechanics	
M E 340	Applied Thermodynamics	
Total Credits		**18**

[1] Other courses may be chosen with the approval of the Physics department head.

Political Science, Public Law and Administration

Undergraduate Program Information

The study of political science, public law and administration blends the strengths of a liberal arts education while preparing students for a career in their field. Career opportunities can include positions in: federal, state, and local government; public administration and public service; non-profit organizations; and in public policy analysis.

The political science major program calls for a thorough preparation in the study of government and politics as described below with the opportunity for those interested in specific careers to concentrate in one of the subfields:

- American government and politics,
- public law,
- public administration and policy,
- comparative politics,
- political theory and
- international relations.

The department also offers an interdisciplinary supplementary major in Law and Society, which is supportive of law-related careers.

A political science minor program involving 18 credits of course work is also offered. A subfield minor or a general minor may be selected. In addition, the department participates in an interdisciplinary minor in Contemporary Social Studies.

Graduate Program Information

The Department of Political Science, Public Law and Administration offers two Masters degrees and a graduate minor:

- the Master of Arts (MA) in Political Science,
- the Master of Public Administration (MPA) and
- a graduate minor in Security Studies.

The programs are designed to prepare students both for diverse careers in the public sector and for further training at the doctoral level. The MPA program is accredited by the Network of Schools of Public Policy, Affairs and Administration (NASPAA), a distinction held by fewer than one-quarter of MPA programs nationwide. The MPA program offers a joint degree with the Department of Criminal Justice (MPA/MCJ). Students in this joint degree program can earn two master's degrees with fewer credits than would be required to earn those degrees independently.

The department is also one of the lead departments for the interdisciplinary Ph.D. program in Transborder and Global Human Dynamics.

Admission

Prospective graduate students in either the MA or MPA should demonstrate a 3.0 grade point average for the second half of their undergraduate course work. For students with a GPA of less than 3.0, GRE scores are required, though this requirement may be waived if the undergraduate degree was awarded more than five years before applying. Applicants to either program are required to submit an application online. See instructions at: https://apply.nmsu.edu/apply/. Applications include three letters of recommendation, a writing sample, and a personal statement concerning their interest in pursuing a graduate degree. Additional information concerning program requirements and the admission process can be obtained from either the department's MA chair or MPA director. Under exceptional circumstances the department may exempt students from the minimal requirements. Application for admission to the Graduate School should clearly indicate the program in which the student wishes to enroll. Applications for admission to the MPA program are reviewed twice a year, once in the Fall semester and once in the Spring semester. Applications to the Ph.D. in Transborder and Global Human Dynamics are revewed once a year in the Spring semester for starting the program in the Fall semester.

Students interested in the MPA/MCJ joint degree option must apply and be accepted in to the two departments separately, and indicate their interest on their applications in one of the joint degree programs.

General Requirements

Students in both the MA and MPA programs select either a thesis or non-thesis option. Students planning on continuing their studies in a doctoral program or wishing to establish expertise related to a specific career objective are strongly encouraged to select the thesis option. The non-thesis option is suggested for students desiring immediate employment or seeking to enhance their current employment situations. Course work outside the department must have prior advisor approval to ensure a well-integrated program of study. Complete information on the requirements for either program should be obtained directly from the department. Most MA and MPA courses are offered in the evening or online.

Minors

The Department of Political Science, Public Law and Administration offers a general undergraduate Political Science minor and specialized sub field minors. In addition, the department participates in an interdisciplinary minor in Contemporary Social Studies with History and other departments.

A student cannot earn both a B.A. in Political Science and a general minor in Political Science. Political Science majors may pursue a subfield minor in the department, however, they cannot double count any upper division courses in Political Science toward the minor.

Degrees for the Department

Bachelor Degree(s) & Supplemental Major(s)

- Law and Society - Supplemental Major (p. 948)
- Political Science - Bachelor of Arts (p. 945)

Master Degree(s) & Dual Degree(s)

- MPA-MCJ Program - Dual Degree (p. 176)
- Political Science - Master of Arts (p. 180)
- Public Administration - Master of Public Administration (p. 181)

Doctoral Degree(s)

- Transborder and Global Human Dynamics - Doctor of Philosophy (p. 236)

Minors for the Department

- American Government and Politics - Undergraduate Minor (p. 947)
- Comparative Politics - Undergraduate Minor (p. 947)
- International Relations - Undergraduate Minor (p. 947)
- Political Science - Undergraduate Minor (p. 948)
- Political Theory - Undergraduate Minor (p. 948)
- Public Administration - Undergraduate Minor (p. 948)
- Public Law - Undergraduate Minor (p. 948)
- Security Studies - Graduate Minor (p. 261)

Professor, Neil Harvey, Department Head

Professors Harvey, Medina; ***Associate Professors*** Conner, Hirschauer, Kang; ***Assistant Professors*** Gomez, Lee, Sukala, Ter-Mkrtchyan; ***College Professor*** Williams; ***Emeritus Professors*** Baker, Hynes, Lapid, Seckler, Slaton, Taggart, Winn.

N. Harvey, Ph.D., Department Head (Univ. Essex) - Mexican politics, comparative politics, Latin America, migration and border politics; N. Baker (emerita) Ph.D. (Tulane Univ.) - public law, American politics, presidency; T. Conner, Ph.D., (Univ. Oklahoma) - public administration, Native American politics, public budgeting; D. Gomez, Ph.D., (Univ. California-Santa Barbara) - American politics, public opinion, social media, presidency, race and politics; S. Hirschauer, Ph.D., (Old Dominion University) - international relations, security studies, gender, migration and identity, comparative politics; P. Hynes (emerita) Ph.D., (New Mexico State University) - Commercial Space Research, Personal and Commercial Spaceflight; S. Kang, Ph.D., (Univ. Georgia) - public and non-profit management, organizational theory and behavior, public sector volunteering; Y. Lapid (emeritus) Ph.D., (Columbia Univ.) – international relations theory, comparative foreign policy, international organizations; C. Lee, Ph.D., (Rutgers University) - public management, non-profit management, civil society and political participation, equity and social justice; C. Medina, Ph.D., (Univ. Colorado, Denver) - public administration, public policy, education policy, qualitative methods; K. Seckler (emerita) J.D. (Univ. of New Mexico) - Law and Society ,New Mexico state and local government, US Supreme Court, US and NM Constitutions; C. Slaton (emerita) Ph.D., (Hawaii) - American politics, American political thought, university and community engagement, public administration, conflict resolution; W. Taggart (emeritus) Ph.D., (Florida State) - public administration, public policy, American politics; A. Ter-Mkrtchyan, Ph.D., (Univ. Oklahoma) - nonprofit governance and accountability, environmental policy and administration, energy policy; J. S. Williams, J.D., Ph.D., (Univ. South Carolina) - Law and Social Change, Constitutional Law, Civil Liberties, African American history since 1865; R. G. Winn (emeritus) Ph.D., (Arizona State)– public administration, policy analysis, environmental policy

POLS 1110G. Introduction to Political Science
3 Credits (3)
This course covers fundamental concepts in political science, such as political theories, ideologies, and government systems.
Learning Outcomes
1. Construct reasoned civic discourse to advocate a stance or examine alternate positions.
2. Identify fundamental concepts and theories in politicalscience.
3. Analyze data and information in order to gain a deeper understanding of the material.
4. Articulate how the public influence and are influenced by politics.
5. Identify and compare government systems from democracy to authoritarian, as well as models of analysis of contemporary international relations.

POLS 1111. Introductory Government Seminar
1 Credit (1)
Introduction to the government major. Designed to assist students in planning college experience and preparing for upper division course work and resesarch May be repeated up to 1 credit.
Learning Outcomes
1. This course is designed for the beginning government major.
2. Its goal is to improve your educational experience at the university and within the Department of Government. In this class we hope to develop some basic skills necessary for successful completion of a degree in Government.
3. These include the skills of critical reading, critical writing, oral presentation and research methods.
4. Additionally, we will use this seminar to introduce you to Government faculty, to plan your government degree and to acquaint you with the services and opportunities the department and the university has to offer.
5. Finally, we hope to begin the discussion of where you will go next, when you complete your degree in Government.

POLS 1120G. American National Government
3 Credits (3)
This course explains the role of American national government, its formation and principles of the Constitution; relation of state to the national government; political parties and their relationship to interest groups. This course also explains the structure of the legislative, executive, and judicial branches.
Learning Outcomes
1. Explain the historical and political foundations of the government of the United States;
2. Explain the precursors to, and the development and adoption of the United States Constitution;
3. Explain the United States federal system, the basics of federalism, and the changing relationship of state and federal power;
4. Describe the power, structure and operation of the main institutions of government, namely the legislative, executive, judicial, and the federal bureaucracy;
5. Explain the development and role of political parties and interest groups;
6. Identify the constitutional basis of civil rights and civil liberties and their changing interpretation; and
7. Describe the role of demographics, public opinion and the media in American politics.

POLS 1130G. Issues in American Politics
3 Credits (3)
This course is designed to introduce the students to the contemporary study of American political issues. The course analysis of government policies, examining various approaches to the economy, democracy and the structure and the function of American political institutions.
Learning Outcomes
1. Explain the basic themes and concepts of political science and their application to contemporary issues.
2. Explain the major forces, interests, and institutions of American democratic politics.

3. Describe and define how beliefs, assumptions, and values are influences by factors such as politics, geography, economics, culture, biology, history, and social institutions.

POLS 2120G. International Relations
3 Credits (3)
This course covers the analysis of significant factors in world politics, including nationalism, national interest, political economy, ideology, international conflict and collaboration, balance of power, deterrence, international law, and international organization.
Learning Outcomes
1. Explain the interrelationships between countries and people in the world,
2. Demonstrate an awareness of current events in the world.
3. Describe several theories of International Relations
4. Explain and identify theories of power and decision making among states in the world.
5. Describe and evaluate issues that relate to International Politics, and how individuals are affected by them.
6. Describe the role of Intergovernmental Organizations in International Politics.
7. Identify the role war plays in International Politics.
8. Explain how economics is intertwined with International Politics.
9. Demonstrate an understanding of role of international terrorism and its impacts on global diplomacy. 1
10. Articulate how beliefs, assumptions, and values are influenced by factors such as politics, geography, economics, culture, history, government, and social institutions.

POLS 2996. Special Topics
3 Credits (3)
Specific topics to be announced in Schedule of Classes. Community Colleges only. May be repeated for a maximum of 12 credits.
Learning Outcomes
1. Varies

POLS 300. Political Research Skills
3 Credits (3)
Introduction to methods of political analysis and fundamentals of research design, including basic methods for the collection and analysis of political data.
Learning Outcomes
1. To gain understanding of research design and methods for collection and analysis of political data.
2. To understand how political scientists collect and analyze data in their research.
3. To appreciate the ethical and methodological issues that are common in political science research.

POLS 308. Prepping for Law School Admissions Test
1 Credit (1)
This workshop helps students understand the law school application process and prepare to take the Law School Admissions Test (LSAT). May be repeated up to 2 credits.
Learning Outcomes
1. To prepare students to do well in the Law School Admissions Test (LSAT).
2. To help students understand the law school application process.

POLS 313. Model United Nations
3 Credits (3)
Issues related to the United Nations and international law/organizations through simulations, discussions and research projects.
Prerequisite: GPA of 2.5 or better and consent of instructor.
Learning Outcomes
1. Articulate a strong understanding of the UN in international politics and diplomacy.
2. Demonstrate ability in conducting research, public speaking, and diplomacy skills.
3. Demonstrate literacy in current global issues and the politics and cultures of the countries that students are assigned to represent.
4. Express global understanding and appreciation of cultural activities.

POLS 314. Advanced Model UN
3 Credits (3)
Advanced topics, research and preparation for Model United Nations activities. Consent of instructor required. Restricted to: Main campus only.
Prerequisite(s): POLS 313, minimum GPA 2.5.

POLS 315. Politics and Film
3 Credits (3)
Exploration of political themes, images, and representation in film and other media. May be repeated for a maximum of 6 credits under different subtitles.

POLS 320. Making Public Policy
3 Credits (3)
The course examines how U.S. public policy is made, including the examination of the major institutional and non-institutional players, politics, issues and power critical to the policy process. Interactive discussion sessions bridge theory to policy-making and political action in substantive policy issues. Restricted to: Main campus only. May be repeated up to 3 credits.
Learning Outcomes
1. Develop knowledge of how public policy is made in the United States at various levels of government (federal, state and local) and in relation to demands from interest groups and other stakeholders
2. Develop knowledge of specific public policy areas (such as environmental policy, energy policy, etc.
3. Develop excellence in research skills as well as written and oral communication of topics in the area of domestic policy

POLS 321. Topics in Public Policy
3 Credits (3)
Course examines issues in public policy. May be repeated up to 6 credits.
Learning Outcomes
1. Develop knowledge and analytical skills with regard to particular topics within the subfield of public policy

POLS 324. Environmental Policy & Administration
3 Credits (3)
This course introduces students to the history, development and formation of the central dimensions of environmental policy, politics and administration in the United States. Students also explore key substantive environmental policy issues (energy policy, natural resource and waste management policies, national parks and wildlife protection, and air and water pollution), and the global dimensions of climate change, environmental justice and sustainability. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of historical and contemporary aspects of environmental policy, politics and administration in the United States
2. Develop ability to critically analyze environmental policy debates
3. Develop ability to effectively communicate analysis of environmental policy and administration in oral and written forms

POLS 325. Education Policy and Politics
3 Credits (3)
Overview of current pressing policy issues and political debates on education in the U.S., including school choice, vouchers, accountability, and affirmative action. Multiple topics and perspectives covered, with political economy as the main approach. May be repeated up to 3 credits.
Learning Outcomes

1. Understand the historical development and changing federal role in education policy, including major federal education laws and reforms.
2. Examine critical issues and trends in federal education policy, as well as the various actors and perspectives involved in education debates and decision-making.
3. Explore policy process theories and apply them to the analysis of federal education events.
4. Study in depth a federal education policy issue by examining its progress through the various stages of the policy process.

POLS 326. Public Policy & Indigenous Communities
3 Credits (3)
Study of historical and contemporary public policy and law that deals with the special legal status of Native American tribes and tribal members.
Learning Outcomes

1. Become familiar with the body of public policy and the area of law that deals with the special legal status of Native American tribes and tribal members
2. Examine the history, the public policy and the law that has impacted the ability of these indigenous communities to exercise their inherent sovereignty
3. Investigate the history, legislation, policies and landmark cases that have shaped this important area of government in the United States

POLS 330. Introduction to Public Administration
3 Credits (3)
Public administration involves the full range of government agencies, non-profit organizations, and private contractors involved in the implementation of public policy at the federal, state, and local level. This course introduces students to the formal study of public administration and will explore major challenges in public service, the management of public and non-profit organizations, administrative ethics and law, leadership theory, and financial and personnel management. Restricted to: Main campus only. May be repeated up to 3 credits.
Learning Outcomes

1. Gain a strong foundation in the the major issues, theories and challenges of public administration
2. Develop skills to critically analyze key problems in public administration
3. Develop ability to effectively communicate the main issues, theories and challenges of public administration in both oral and written form

POLS 331. Special Topics in Public Administration
3 Credits (3)
Special topics in public administration. May be repeated for a maximum of 6 credits under different subtitles.

POLS 335. Management of Nonprofit Organizations
3 Credits (3)
This course provides an introduction to the nonprofit sector, its nature, scope, and functions, and an overview of a range of nonprofit management concerns and practices. Students will confront the critical issues facing the sector. Activities are designed to expand the management skills of students by offering analytical tools and knowledge, and providing opportunities to test the application of these skills. May be repeated up to 3 credits.
Learning Outcomes

1. Gain a strong foundation in the study of nonprofit organizations and management issues
2. Expand students' management skills
3. Gain experience in application of management skills

POLS 343. Congress and the Legislative Process
3 Credits (3)
This class reviews the history, structure, membership, operation, power and culture of the American Congress. Restricted to: Main campus only.
Learning Outcomes

1. Develop knowledge of the functions and goals of the US Congress, specifically how federal legislation is drafted, debated and passed.
2. Develop skills in debating legislative bills through in-class simulations
3. Develop excellence in research and written and oral communication of significant topics in the study of the US Congress and legislative processes

POLS 345. The Supreme Court
3 Credits (3)
This class studies the history and operation of the Supreme Court, as well as landmark cases that have shaped American government and the Court.

POLS 348. Political Parties and Interest Groups
3 Credits (3)
Organization, principles, and functions of political parties and interest groups in the U.S.

POLS 350. Special Topics in American Government
3 Credits (3)
Special topics in American government. May be repeated for a maximum of 6 credits under different subtitles.

POLS 351V. Conspiracy Theories in American Politics
3 Credits (3)
This course explores the origins, evolution, and impact of conspiracy theories in American politics. Students analyze prominent theories, their formation and spread, and their influence on public discourse and political life.
Learning Outcomes

1. Identify and analyze the historical origins and evolution of conspiracy theories in American politics.
2. Evaluate the impact of conspiracy theories on public discourse, political movements, and government policies.
3. Critically assess the evidence and arguments presented in support of various conspiracy theories.
4. Explore the psychological factors that contribute to belief in conspiracy theories and their influence on individual and collective behavior.

POLS 353. Women and Politics
3 Credits (3)
An examination of women's participation in U.S. electoral politics as voters, candidates, and officeholders; political activism in issue-based movements and strategies for affecting public policy; leadership as administrators and managers in public service agencies. Also explores the influence of feminism in changing women's roles socially, legally, and politically.

POLS 354. Native American Politics
3 Credits (3)
This course explores the rights of Native Americans and the politics, policy, and administration of tribal governments with a focus on the history and current relationship between Native Nations and the US political system. Students will learn about Native peoples' cultural responses, forms of resistance, and adaptations to colonization. Restricted to: Main campus only.
Learning Outcomes
1. Develop a strong understanding of historical and contemporary issues in Native American policy in the United States
2. Develop skills to critically analyze debates over Native American policy
3. Develop skills to effectively communicate analysis of Native American policy in oral and written forms

POLS 360. World Politics
3 Credits (3)
Introduction to major theories and concepts for understanding fundamental problems and issues in international relations May be repeated up to 3 credits.
Learning Outcomes
1. Identify and critically evaluate the major concepts (theory) and practices (reality) of International Relations.
2. Identify, define, and critically think about themes and key issues unique to International Relations and evaluate their pros and cons.
3. Develop knowledge, analytical ability and critical thinking about global efforts and challenges to International Relations.

POLS 361. Special Topics in International Relations
3 Credits (3)
Course examines contemporary issues in international relations. Repeatable under different subtitles. May be repeated up to 6 credits.

POLS 362. International Political Economy
3 Credits (3)
Political factors in international economic relations; theories of political economy.

POLS 364. National Security
3 Credits (3)
Analysis of theories, concepts, historical development and current issues of significance for US national security
Learning Outcomes
1. Analyze international issues from a National Security policy perspective and examine major theoretical approaches (or "paradigms") of National Security
2. Critically examine the historical evolution and the most prominent and contemporary challenges of National Security
3. Acquire abilities to synthesize and articulate important debates in the National Security literature and connect them to current national, regional, and global crises.

POLS 365. Introduction to Security Studies
3 Credits (3)
Introduction to the field of security studies, with focus on theories and issues in the study of security in international politics, including emerging 21st century security challenges related to cyberspace, A.I., information warfare and virtual deterrence.
Learning Outcomes
1. Analyze international issues from a security studies perspective and examine major theoretical approaches (or "paradigms") of security studies
2. Critically examine the historical evolution and the most prominent and contemporary challenges of security studies
3. Synthesize and articulate important debates in the security studies literature and connect them to current national, regional, and global challenges and crises.

POLS 366. American Foreign Policy
3 Credits (3)
Formulation, content and rationale of current foreign policies of the U.S. May be repeated up to 3 credits.
Learning Outcomes
1. Develop knowledge of the historical development and current practice of US foreign policy
2. Develop the skills necessary to conduct independent research and written and oral communication of significant topics in US foreign policy

POLS 367. Terrorism
3 Credits (3)
An introductory course using an interdisciplinary framework to explore definitions, historical roots, contemporary manifestations and future trends in political terrorism.

POLS 368. Human Security
3 Credits (3)
Introduction to human security, its focus on security of the individual as opposed to the security of the state since the end of the Cold War and the emergence of global challenges such as environmental crises, public health, and cybersecurity of the virtual self.
Learning Outcomes
1. Identify and critically evaluate the major concepts and practices in human security
2. Define, identify and critically think about key issue areas in human security
3. Develop a coherent body of research in regard to a human security topic of your interest; engage with complex knowledge about human security and apply your analysis to a specific phenomenon.
4. Investigate current, global efforts and challenges in regard to human security.

POLS 370. Comparative Politics
3 Credits (3)
Comparative study of similarities and differences to be found in political systems across the world, with emphasis on the structure and performance of modern states, accountability of government institutions, parties and elections, social movements, and public policies. May be repeated up to 3 credits.
Learning Outcomes
1. Develop knowledge of main issues and concepts in the study of comparative politics.
2. Increase analytical ability to explain similarities and differences between political systems

3. Promote critical thinking regarding the human and environmental consequences of government policies in addressing common public policy problems.

POLS 371. Latin American Politics
3 Credits (3)
Comparative study of government systems and political change in Latin American countries, with focus on challenges of social inequality, democratization, regional integration, relations with the United States, and the rights of women, LGBTQ* community, Indigenous and Afro-descendent peoples. May be repeated up to 3 credits.
Learning Outcomes
1. Develop knowledge of how historical legacies, domestic politics, and global relations shape contemporary politics in Latin America
2. Increase analytical ability to explain similarities and variation in contemporary politics in Latin America
3. Develop critical thinking regarding how to explain the persistence and political implications of socioeconomic inequalities and discrimination in Latin America
4. Develop oral and written communication skills in expressing knowledge, concepts, and comparative analysis

POLS 372. Special Topics in Comparative Politics
3 Credits (3)
Course examines contemporary issues in comparative politics. May be repeated under different subtitles. Restricted to: Main campus only.

POLS 373. Resistance Movements in World Politics
3 Credits (3)
Comparative study of contemporary resistance movements and social protests around the world with a focus on their origins, demands, ideologies, strategies and impacts. May be repeated up to 3 credits.
Learning Outcomes
1. Develop knowledge of concepts of power and resistance movements and their applicability in many parts of the world.
2. Increase analytical ability to explain variation in the motives, strategies and impacts of resistance movements.
3. Promote critical thinking regarding how we choose to address inequalities, injustices and dissent.
4. Develop oral and written communication skills of key concepts and original research.

POLS 378. U.S.-Mexico Border Politics
3 Credits (3)
Analysis of contemporary challenges facing the U.S.-Mexican border, including immigration, binational cooperation, drug trafficking, corruption, human rights violations and security. May be repeated up to 3 credits.
Learning Outcomes
1. Develop knowledge of the main issues and controversies in US-Mexico border politics.
2. Increase analytical ability to explain the implementation and results of border policies for local communities and the environment.
3. Promote critical thinking regarding the merits of alternative policies and future possibilities.

POLS 379. Mexican Politics
3 Credits (3)
Study of the politics and government of contemporary Mexico with focus on challenges of democratization, human rights, public policies, Mexico-US relations, and internal security. May be repeated up to 3 credits.
Learning Outcomes
1. Develop knowledge of main issues and concepts in the study of Mexican politics.
2. Develop ability to conduct online research on current issues in Mexican politics.
3. Promote critical thinking regarding the causes and consequences of criminal violence in Mexican politics and how it may be best addressed.

POLS 380V. Political Ideologies
3 Credits (3)
Introduction to the prevailing political ideologies in the modern world and the ways in which modern nations operating under one or more of these ideologies attempt to answer fundamental questions about the allocation and distribution of rights, liberties, and other things of value. In addition, the course work and discussions attempt to address recent political, social, and economic events in various areas of the world. May be repeated up to 3 credits.
Learning Outcomes
1. To understand the historical origins of major political ideologies and their impacts on different societies.
2. To communicate in oral presentation and written work the main characteristics of different political ideologies in a comparative context.
3. To analyze current uses of political ideologies in government and society.

POLS 382. Classical Political Thought
3 Credits (3)
Analysis of main currents in political thought from ancient Greece and Rome to the high Middle Ages.

POLS 383. Modern Political Thought
3 Credits (3)
Historical and theoretical examination of political ideas and ideologies from Machiavelli to Nietzsche. Topics include liberalism, conservatism, romanticism, communism, and Nihilism.

POLS 385. American Political Thought
3 Credits (3)
Introduction to major American thinkers and historical currents from colonial time to the present. May be repeated up to 3 credits.
Learning Outcomes
1. To understand the nature of the specifically American form of constitutionalism, as compared to its alternatives;
2. To understand the idea of progress in American history, including its colonial origins and its contemporary manifestation under the terms of progressivist ideology;
3. To understand the meaning and origin of American conservatism, and its place in contemporary political life;
4. To understand the dynamics of shifting political and institutional power relationships (including issues of centralization and decentralization) in relation to the above; and
5. To understand the general relationship between cultural phenomena and questions of political order.

POLS 387. Religion and Politics
3 Credits (3)
Survey of major points of interaction between politics and religion in the U.S., using theoretical, historical, and institutional analysis.

POLS 388. Contemporary Political Thought
3 Credits (3)

Introduction to the major thinkers and political arguments in contemporary political thought, from after Nietzsche to the present day. Topics include liberalism, fascism, existentialism, and post-liberal thought.

Learning Outcomes

1. Demonstrate an understanding of the critical debates related to political ideologies and movements from the 20th century to the present day.
2. Evaluate the historical, cultural, and intellectual contexts that have shaped contemporary political thought.
3. Critically examine the historical evolution of political thought in the post-Nietzschean world, including its political, cultural, and intellectual causes.

POLS 390. Special Topics in Public Law
3 Credits (3)
Course examines various issues in public law. May be repeated under different subtitles.

POLS 391. Constitutional Law
3 Credits (3)
The class explores the reasoning and political context of the Supreme Court cases that define the distribution and limits of governmental powers and duties under the U.S. Constitution, including separation of powers and federalism. Restricted to: Main campus only.

POLS 392. Civil Liberties
3 Credits (3)
The course examines the reasoning and political context of major Supreme Court cases defining constitutional rights of free speech, religious liberty, free press and criminal procedural rights.

POLS 394. Judicial Process
3 Credits (3)
Class examines the structure, function and purpose of the American judicial system. Restricted to: Main campus only.

POLS 395. Law and Society
3 Credits (3)
Class critically explores the development, role and impact of law on society, covering different philosophies and theories of law, different world legal systems, and different issue areas of law and society. Restricted to: Main campus only. May be repeated up to 3 credits.

Learning Outcomes

1. To understand the development, role and impac to law on society
2. To gain knowledge of different philosophies and theories of law
3. To gain knowledge of different legal systems around the world and key issues in law and society
4. To gain skills in critical analysis of debates in law and society
5. To gain skills in effective communication of analysis of law and society in oral and written forms

POLS 396. International Law
3 Credits (3)
Nature, growth, and scope of law of nations, rights and obligations of states in peace and war, current issues.

POLS 399. New Mexico Law
3 Credits (3)
Examination of the history, development and implementation of law in New Mexico with an emphasis on legal issues unique to New Mexico. Crosslisted with: CJUS 399. May be repeated up to 3 credits.

Learning Outcomes

1. To understant the unique legal issues of New Mexico through critical examination of the history, development and implementation of law in the state.
2. To develop skills to critically analze debates over legal issues in New Mexico.
3. To develop skills to effectively communicate analysis of legal issues in New Mexico in oral and written forms.

POLS 405. Directed Readings
1-3 Credits
Individualized readings. Course subtitled. May be repeated for a maximum of 6 credits. Graded S/U. Consent of instructor required.

POLS 406. Independent Study
1-3 Credits
Individualized research. Course subtitled. May be repeated for a maximum of 6 credits. Consent of instructor required.

POLS 407. Workshop
1-6 Credits (1-6)
Focus on skills related to careers in government and political science. Specific topics announced in the Schedule of Classes; Only three credits apply toward government major or minor requirements. May be repeated up to 6 credits.

Learning Outcomes

1. Develop skills related to careers in government and public service

POLS 410. Internship
1-12 Credits
Hands-on experience working with public agencies, political campaigns, elected officials & non-profits. May be repeated for a maximum of 12 credits; only 3 credits apply toward government major or minor requirements. Consent of instructor required. Graded: S/U.
Prerequisite(s): Completion of 12 government credits, 2.5 GPA, junior and above standing.

POLS 411. Service Learning Experience
3 Credits (3)
Experiential learning through a community service project. May be subtitled to reflect service activity. May be repeated for a total of 6 credits; only 3 credits apply toward government major or minor requirements.
Prerequisites: completion of 12 government credits, junior or above standing, and consent of instructor.

POLS 412. Practicum in Student Government
3 Credits (3)
Research of issues in student government. Consent of instructor required. Graded: S/U.
Prerequisite(s): Student government participation, completion of 12 POLS credits, junior or senior standing.

POLS 415. Senior Seminar
2 Credits (2)
Review and integration of political skills acquired in the Government Department. Students will focus on critical essay writing and oral presentation of a synthesis of knowledge gained from prior departmental coursework May be repeated up to 2 credits.

Learning Outcomes

1. To integrate knowledge from various classes during the students' coursework as a Government major.

2. To effectively communicate in oral and written forms a synthesis of main issues, theories, scholars and actors in the various sub-fields of the government major.

POLS 469. Globalization
3 Credits (3)
Analysis of the globalization process. Covers theories of globalization, the global economy, political globalization, global culture, transnational social movements, transnational migration and world labor market, global cities, and local-global linkages. Same as SOCI 4460. May be repeated up to 3 credits.

POLS 493. Mass Communications Law
3 Credits (3)
Examination of legal issues relating to mass media in the United States. Invasion of privacy, libel, sedition, copyright, and advertising regulation. Same as JOUR 493 and COMM 493.

POLS 502. Research Methods in Government
3 Credits (3)
Contemporary methods of political analysis, including mathematical and statistical techniques and computer applications. MPA students must complete this class with a B- or better. MA students must complete either POLS 502 or POLS 503 with a B- or better.

POLS 503. Qualitative Research Methods
3 Credits (3)
An overview of qualitative research methods such as fieldwork, ethnography, content analysis, case studies, focus groups and grounded theory. Introduces students to epistemology (the study of knowledge) and to basic components of research design. Explores activist scholarship, ethical dilemmas in research, and software tools for computer assisted analysis. Especially useful for students preparing theses, dissertation, or other research projects. MA students must complete either POLS 503 or POLS 502 with a B- or better.

POLS 505. Directed Readings
1-3 Credits
Selected topics in government. May be repeated for a total of 6 credits. Graded S/U.
Prerequisite: consent of instructor.

POLS 510. Internship
1-6 Credits
Assignment with a public agency and research report. Only 3 credits apply toward degree requirements. Graded S/U.
Prerequisite: approval of graduate advisor.

POLS 517. Selected Topics in Government
3 Credits (3)
Selected issues which may cross sub-fields of the discipline. May be repeated for a total of 6 credits.

POLS 519. Proseminar in Public Administration
3 Credits (3)
Review of classic and contemporary theory and practice in public administration. Application of written and oral skills to the presentation and defense of essays on various aspects of public administration. To be completed with a B- or better.
Prerequisite(s): 30 credits of M.P.A.

POLS 522. Public Sector Economics I
3 Credits (3)
Introduction to the economic rationale for government intervention in the economy and the effects of that intervention on economic agents and the economy in general. Emphasis on the expenditure side of government policies. Same as AEEC 522.

POLS 524. Introduction to the Nonprofit Sector
3 Credits (3)
Advanced study of the nature and operation of the nonprofit sector and how it interacts with public policy. The course provides an overview of the nonprofit sector, its scope, structure, history, values, distinct contributions to society, place in the government service delivery systems, and selected public policy issues that affect it.
Learning Outcomes
1. Demonstrate an understanding of the unique nature of the nonprofit sector, and distinguish it from the public (government) and private (business, for-profit) sectors in form and delivery systems.
2. Provide a description of the historical, theoretical, and legal perspectives on nonprofit organizations, as well as current trends and challenges facing the sector.
3. Evaluate the scope of the nonprofit activity in the U.S. and demonstrate an understanding of the major nonprofit subsectors, such as health care, arts, social service, and religious organizations.
4. Determine how nonprofit organizations and business firms can constructively learn from one another.
5. Explain and justify the role and function of nonprofit organizations and the myriad ways in which nonprofit organizations serve our communities and enhance our society.

POLS 525. Seminar in the Nonprofit and Philanthropic Sector
3 Credits (3)
Advanced study of the role of philanthropy and nonprofit organizations in society. Addresses the theoretical and academic foundations of research literature in the field from a variety of disciplines.
Learning Outcomes
1. A better understanding of the various issues and topics of the Nonprofit/Philanthropic sector studied by scholars in the field.
2. An ability to discuss major findings and theories in the field of Nonprofit and Philanthropic Studies.
3. The knowledge to discuss and critique research designs and methods that have been utilized in Nonprofit/Philanthropic Studies.
4. An ability to frame new research questions (and/or, extend knowledge) related to nonprofit organizations and philanthropy.

POLS 526. Performance Management of Public and Nonprofit Organizations
3 Credits (3)
Advanced study of the theory and practice of performance measurement and management, how to select key performance indicators, implement a performance management system and use performance measures. Examines importance of leadership roles and accountability in managing public and nonprofit organizations.
Learning Outcomes
1. To understand the inextricable connection between performance measurement and strategic planning in developing effective organizations.
2. To develop the skills to implement performance management systems in organizations, regardless of level of authority within these organizations.
3. To gain skills to adeptly navigate organizational challenges that impede implementation of performance management systems.

POLS 527. Issues in Public Management
3 Credits (3)
Selected issues in public management. May be repeated under different subtitles for a total of 6 credits.

POLS 530. Seminar in Public Policy
3 Credits (3)
Survey of the political, administrative, and technical aspects of policy making in government. MA students taking POLS 530 as part of their core requirements must complete the class with a B- or better.

POLS 536. Public Policy and Indigenous Communities
3 Credits (3)
Indigenous communities are found throughout North, Central and South America. This course addresses the history, development and governance of these communities. Different sections of the course may choose to focus on different indigenous communities. All courses will consider the principles of governance internal to indigenous communities as well as the governing relationships between indigenous communities and modern states.

POLS 537. Issues in Public Policy
3 Credits (3)
Selected issues in public policy. May be repeated under a different subtitle for a total of 6 credits.

POLS 540. Seminar in Public Administration
3 Credits (3)
Survey course on the theory and practice of program, personnel, and financial management in government and the private, nonprofit sector. MA students taking POLS 540 as part of their core requirements must complete the class with a B- or better.

POLS 541. Public Budgeting
3 Credits (3)
Budgetary processes; budget classification, analysis, and evaluation. MPA students must complete this class with a B- or better.

POLS 542. Public Sector Human Resources Management
3 Credits (3)
Exploration of public personnel systems and practices, including job analysis, compensation, performance evaluation, recruitment, and labor-management relations. MPA students must complete this class with a B- or better.

POLS 543. Skills Workshop
1-6 Credits (1-6)
Focus on management of task skills in selected areas of public administration. Specific topics will appear in the Schedule of Classes. May be repeated up to 6 credits.
Learning Outcomes
1. Develop specific skills related to the practice of public administration

POLS 544. Public Policy Analysis
3 Credits (3)
Environment of policy analysis; various descriptive and quantitative designs for analyzing and evaluating public policy. Problems of policy analysis. MPA students must complete this class with a B- or better.
Prerequisite(s): POLS 502 or consent of instructor.

POLS 547. Government Organizations
3 Credits (3)
Historical overview and present applications of organization theory in public management. MPA students must complete this class with a B- or better.

POLS 548. Public Sector Leadership
3 Credits (3)
Theories and styles of leadership.

POLS 549. Ethics in Government
3 Credits (3)
Examination of standards, perspectives, and issues for ethical decision-making in public agencies. MPA students must complete this class with a B- or better.

POLS 550. Seminar in American Politics
3 Credits (3)
Overview of American political institutions. Includes study of American constitutional theory; legislative, executive, and judicial functions and processes; political parties and interest groups; and public policy formulation. MA students taking POLS 550 as part of their core requirements must complete the class with a B- or better.

POLS 560. Seminar in International Relations Theory
3 Credits (3)
A critical overview of leading approaches and controversies in international relations theory. The purpose of the course is to introduce students to contending theoretical perspectives and conceptual frameworks that help make sense of contemporary world politics. MA students taking POLS 560 as part of their core requirements must complete the class with a B- or better.

POLS 563. Issues in International Relations
3 Credits (3)
Selected issues in international relations. May be repeated under a different subtitle for a total of 6 credits.

POLS 564. Advanced National Security Policy
3 Credits (3)
Major topical, theoretical, and regional issues in national security policy.

POLS 565. Advanced Issues in Security Studies
3 Credits (3)
Advanced study of theories, concepts and key issues in the area of security studies, including historical security problems and emerging 21st century challenges related to cyberspace, A.I., information warfare and virtual deterrence.
Learning Outcomes
1. Analyze international issues from a security studies perspective and examine major theoretical approaches (or "paradigms") of security studies.
2. Critically examine the historical evolution and the most prominent and contemporary challenges of security studies.
3. Synthesize and articulate important debates in the security studies literature and connect them to current national, regional, and global challenges and crises.

POLS 567. Advanced Issues in Terrorism
3 Credits (3)
Advanced study of theories of the causes of terrorism, responses to varieties of terrorism, and major issues in the study of terrorism, historically and today
Learning Outcomes
1. Examine core ideas in studies of terrorism (theoretically and factually)
2. Introduce and develop an understanding about the causes of terrorism and possible solutions
3. Acquire abilities to gain knowledge, think critically, analytically, and synthetically of countries and violence, and varieties of terrorism over time and throughout the world.

POLS 568. Advanced Issues in Human Security
3 Credits (3)
Advanced study of major theories, concepts and issues in the study of human security, such as environmental crises, public health, and cybersecurity of the virtual self.

Learning Outcomes

1. Identify and critically evaluate the major concepts and practices in human security;
2. Define, identify and critically think about key issue areas in human security.
3. Develop a coherent body of research in regard to a human security topic of your interest; engage with complex knowledge about human security and apply your analysis to a specific phenomenon.
4. Investigate current, global efforts and challenges in regard to human security.

POLS 569. Advanced Issues in Globalization
3 Credits (3)
Analysis of the globalization process. Covers theories of globalization; global economy; political globalization; global culture; transnational social movements; transnational migration and world labor market; global cities; local-global linkages. Same as SOCI 5460. May be repeated up to 3 credits.

POLS 570. Seminar in Comparative Politics
3 Credits (3)
Examination of methods used for comparing various types of political entities. Investigation of criteria needed to examine a concept across cultures or national boundaries. MA students taking POLS 570 as part of their core requirements must complete the class with a B- or better.

POLS 574. Contemporary Comparative Studies
3 Credits (3)
Major topical, theoretical, and regional issues in international politics. May be repeated once.

POLS 578. Seminar in the U.S.-Mexican Border
3 Credits (3)
An analysis of the political environment along the United States-Mexico border and a survey of the literature available for a number of contemporary issues.

POLS 579. Seminar in Mexican Politics
3 Credits (3)
Advanced research on politics and government of Mexico.

POLS 580. Seminar in Political Theory
3 Credits (3)
Examination of major issues in political theory, including democracy, sovereignty, classical and modern traditions of thought. May be repeated with different subject matter. MA students taking POLS 580 as part of their core requirements must complete the class with a B- or better.

POLS 587. Seminar in Religion and Politics
3 Credits (3)
Historical, theoretical and comparative analyses of the interaction between politics and religion.

POLS 593. Issues in Public Law
3 Credits (3)
Selected issues in public law. May be repeated under a different subtitle for a total of 6 credits.

POLS 596. International Law
3 Credits (3)
Nature, growth and scope of law of nations; rights and obligations of states in peace and war; current issues.

POLS 598. Special Research Programs
1-3 Credits
Individual investigations either theoretical, analytical or experimental. Three credits may be taken per semester for a total of 6 credits for thesis students, and 9 credits for non-thesis students. Consent of instructor required.

POLS 599. Master's Thesis
1-15 Credits
Thesis.

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Political Science - Bachelor of Arts

Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1,2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
POLS 1120G	American National Government	
POLS 1110G	Introduction to Political Science	
or HNRS 2180G	Citizen and State Great Political Issues	
Area III: Laboratory Sciences Course (4 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [4]		**6**
Departmental/College Requirements		
The department requires (POLS 1120G) and (POLS 1110G or HNRS 2180G) as degree requirements. These courses will count towards the General Education and Departmental requirements [3]		
POLS 1111	Introductory Government Seminar [3]	1
POLS 300	Political Research Skills	3
or		
Another social science research methods course [5]		
Select one upper-division course from four of six subfields:		*12*
Public Administration and Policy (POLS 20/30 series)		
American Government and Politics (POLS 40/50 series)		
International Relations (POLS 60 series, may include HNRS 304V)		
Comparative Politics (POLS 70 series may include HNRS 307V)		
Political Theory POLS 80 series may include POLS 380V)		
Public Law (POLS 90 series)		
POLS 415	Senior Seminar (take in final year)	2

Select additional credits in government to bring total credits in major to 33, including 20 upper-division.	9
Second Language: (required - see below)	**0-14**
Electives, to bring the total credits to 120 [6]	**38-54**
Total Credits	**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. A Mathematics course is required for the degree but students may need to take any prerequisites needed to enter the Mathematics course of their course first.
3. Majors should complete these lower level requirements before registering for upper-division government credits.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
5. A list of approved options is available in the department office.
6. Elective credit may vary based on General Education course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Note: Students may not count S/U grades taken in their major unless the particular course is regularly graded S/U. All courses must be passed with grades of C- or better. In addition, while research methods courses taken outside of the department may count toward the methods requirement, only POLS 300 Political Research Skills counts toward the 33 credits in the major.

Up to twelve hours of internship credit are available. However, only three hours count toward the major. Internship guidelines are available in the department office and on the Government Department web page, http://deptofgov.nmsu.edu/.

Second Language Requirement

For the Bachelor of Arts in Government there is a two year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120 & FREN 2110 & FREN 2120	French I and French II and French III and French IV	3-14
GRMN 1110 & GRMN 1120 & GRMN 2110 & GRMN 2120	German I and German II and German III and German IV	3-14
JAPN 1110 & JAPN 1120 & JAPN 2110 & JAPN 2120	Japanese I and Japanese II and Japanese III and Japanese IV	3-14
SPAN 1110 & SPAN 1120 & SPAN 2110 & SPAN 2120	Spanish I and Spanish II and Spanish III and Spanish IV	3-14
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220 & SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	3-9

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
SIGN 2110	American Sign Language III	3

Option 3:

Prefix	Title	Credits
Challenge the 2120 level for the following courses:		
OR		
Challenge the 1120/2210 level for the following courses:		
PORT 1120 or SPAN 2210	Portuguese II Spanish for Heritage Learners III	3

Option 4:

Pass a three-credit, upper-division course (numbered 300 or above) taught in a second language by the department of Languages and Linguistics.

Option 5:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 6:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 7:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 8:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4

MATH 1130G	Survey of Mathematics [1]	3
Choose from one of the following:		3
POLS 1120G	American National Government	
POLS 1110G or HNRS 2180G	Introduction to Political Science or Citizen and State Great Political Issues	
FYEX 1112	The Freshman Year Experience	3
Area V: Humanities Course [2]		3
Choose from one of the following:		3
COMM 1115G	Introduction to Communication	
HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
Choose from one of the following:		3
POLS 1110G	Introduction to Political Science	
POLS 1120G	American National Government	
POLS 1111	Introductory Government Seminar	1
Area III: Laboratory Science Course [2]		4
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**30**
Sophomore		
Choose from one of the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
POLS Series Elective Courses		6
First Course in Second Language Series (or Elective)		3-4
Next Course in Second Language Series (or Elective)		3-4
General Education Elective Course		3
POLS 300	Political Research Skills	3
Elective Courses		9
	Credits	**30-32**
Junior		
Next Courses in Second Language Series (or Elective)		6
VWW: Viewing a Wider World Courses [3]		6
POLS Series Elective Courses		6
POLS Elective Course		3
Upper-Division Elective Course		3
Elective Courses		6
	Credits	**30**
Senior		
POLS 415	Senior Seminar (Spring Only)	2
POLS Upper-Division Elective Courses		6
Upper-Division Elective Courses		18
Elective Course		4
	Credits	**30**
	Total Credits	**120-122**

1 These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

American Government and Politics - Undergraduate Minor

Students pursuing a subfield minor may count a maximum of 3 credits in an independent studies course or an internship. Students may request permission to substitute courses between subfields, subject to approval of the Department of Government undergraduate committee.

Prefix	Title	Credits
Required Courses		
POLS 1120G	American National Government	3
POLS 1110G or HNRS 2180G	Introduction to Political Science Citizen and State Great Political Issues	3
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from the same subfield.		12
Total Credits		**18**

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HNRS 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including POLS 380V Political Ideologies (political theory), and 90 series (public law).

Comparative Politics - Undergraduate Minor

Students pursuing a subfield minor may count a maximum of 3 credits in an independent studies course or an internship. Students may request permission to substitute courses between subfields, subject to approval of the Department of Government undergraduate committee.

Prefix	Title	Credits
Required Courses		
POLS 1120G	American National Government	3
POLS 1110G or HNRS 2180G	Introduction to Political Science Citizen and State Great Political Issues	3
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from the same subfield.		12
Total Credits		**18**

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HNRS 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including POLS 380V Political Ideologies (political theory), and 90 series (public law).

International Relations - Undergraduate Minor

Students pursuing a subfield minor may count a maximum of 3 credits in an independent studies course or an internship. Students may request permission to substitute courses between subfields, subject to approval of the Department of Government undergraduate committee.

Prefix	Title	Credits
Required Courses		
POLS 1120G	American National Government	3

POLS 1110G	Introduction to Political Science	3
or HNRS 2180G	Citizen and State Great Political Issues	
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from the same subfield.		12
Total Credits		**18**

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HNRS 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including POLS 380V Political Ideologies (political theory), and 90 series (public law).

Political Science - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
POLS 1120G	American National Government	3
POLS 1110G	Introduction to Political Science	3
or HNRS 2180G	Citizen and State Great Political Issues	
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from different subfields.		12
Total Credits		**18**

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HNRS 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including POLS 380V Political Ideologies (political theory), and 90 series (public law).

Political Theory - Undergraduate Minor

Students pursuing a subfield minor may count a maximum of 3 credits in an independent studies course or an internship. Students may request permission to substitute courses between subfields, subject to approval of the Department of Government undergraduate committee.

Prefix	Title	Credits
Required Courses		
POLS 1120G	American National Government	3
POLS 1110G	Introduction to Political Science	3
or HNRS 2180G	Citizen and State Great Political Issues	
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from the same subfield.		12
Total Credits		**18**

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HNRS 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including POLS 380V Political Ideologies (political theory), and 90 series (public law).

Public Administration - Undergraduate Minor

Students pursuing a subfield minor may count a maximum of 3 credits in an independent studies course or an internship. Students may request permission to substitute courses between subfields, subject to approval of the Department of Government undergraduate committee.

Prefix	Title	Credits
Required Courses		
POLS 1120G	American National Government	3
POLS 1110G	Introduction to Political Science	3
or HNRS 2180G	Citizen and State Great Political Issues	
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from the same subfield.		12
Total Credits		**18**

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HNRS 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including POLS 380V Political Ideologies (political theory), and 90 series (public law).

Public Law - Undergraduate Minor

Students pursuing a subfield minor may count a maximum of 3 credits in an independent studies course or an internship. Students may request permission to substitute courses between subfields, subject to approval of the Department of Government undergraduate committee.

Prefix	Title	Credits
Required Courses		
POLS 1120G	American National Government	3
POLS 1110G	Introduction to Political Science	3
or HNRS 2180G	Citizen and State Great Political Issues	
Select 12 additional credits, of which at least 9 are upper division, including 3 upper division courses from the same subfield.		12
Total Credits		**18**

The subfield series include courses in the 20/30 series (public administration and policy), 40/50 series (American government and politics), 60 series and HNRS 304V Dilemmas of War and Peace (international relations), 70 series (comparative politics), 80 series, including POLS 380V Political Ideologies (political theory), and 90 series (public law).

Law and Society - Supplemental Major

The Department of Government also coordinates a supplementary major in law and society that may be taken in addition to a regular major. The program is designed to allow students to combine law-related classes offered across a range of departments and disciplines. It is of particular interest to undergraduates interested in law school or who contemplate careers in fields closely related to the legal profession, such as government, politics, social work or law enforcement.

Requirements

The supplementary major consists of 24 credits chosen from the courses listed below. At least 18 credits must be earned in upper-division courses and 6 credits must be earned from listed courses outside the student's primary major. Candidates for the Law and Society degree must declare their supplementary major prior to completing the last 9 credits of the program.

Prefix	Title	Credits
Core Courses		
Select three from the following four courses, or two from this group and any one from the next group immediately below it:		9
CJUS 1120	Criminal Law	
POLS 395	Law and Society	
POLS 391	Constitutional Law	
POLS 394	Judicial Process	
You may choose one of the following three classes to count as a core course:		
CJUS 306	Criminal Procedural Law	
POLS 392	Civil Liberties	
JOUR 493	Media Law	
Communication Skills		
Select one from the following:		3
COMM 3120	Persuasion Theory and Practice	
ENGL 2130G	Advanced Composition	
PHIL 448	Writing Philosophy	
Critical Thinking Skills		
Select one from the following:		3
POLS 382	Classical Political Thought	
PHIL 1120G	Logic, Reasoning, & Critical Thinking	
PHIL 312	Formal Logic	
Jurisprudence		
Select one from the following:		3
CJUS 307	Law of Evidence	
CJUS 424	Forensic Law	
POLS 385	American Political Thought	
PHIL 376	Philosophy of Law	
PSYC 3510	Psychology and the Law	
SOCI 3510	Crime and Society	
Legal Policy Issues		
Select two from the following:		6
BLAW 316	Legal Environment of Business	
BLAW 385V	Employment and Consumer Law	
CJUS 2120	Criminal Courts and Procedure	
CJUS 332	Correctional Law	
POLS 345	The Supreme Court	
POLS 387	Religion and Politics	
POLS 390	Special Topics in Public Law	
POLS 396	International Law	
HNRS 335V	Legal Issues in Modern Society	
HRTM 3220	Hospitality and Travel Law	
PHIL 1145G	Philosophy, Law, and Ethics	
PHIL 320	Social and Political Philosophy	
SOCI 3520	Juvenile Delinquency	
Or either one of the following:		
CJUS 399	New Mexico Law	
POLS 399	New Mexico Law	
Total Credits		**24**

Psychology

Undergraduate Program Information

Students may take a major in psychology either as an area of emphasis in a liberal arts program or in preparation for further graduate education leading to professional careers in psychology. A major in psychology may be appropriate for the liberal arts student who wishes to pursue a career involving extensive social interaction and requiring solutions to people-related problems. Such careers include law, business, parenting, government, education, and management. Professional careers in psychology generally require some post-baccalaureate education. These careers include provision of clinical and counseling services, conducting research, applying research findings in industrial or government settings, and doing teaching and research in colleges and universities. All students, but especially those planning to apply to graduate school, are encouraged to take PSYC 3110 Experimental Methods and PSYC 3120 Psychological Measurement PSYC 3110 Experimental Methods, no later than the Spring semester of their junior year.

Requirements for the Bachelor of Arts in Psychology are listed here (p. 955). Satisfying these requirements should provide an adequate exposure to psychology for the liberal arts student and a basic foundation for students seeking a career in psychology. Students wishing to prepare for a professional career in psychology are especially encouraged to work closely with an advisor, as early as possible.

Graduate Program Information

Admission

The Department of Psychology offers graduate work leading to the Master of Arts and Doctor of Philosophy degrees. To maximize consideration for admittance, candidates should submit applications by January 15. Note that the Psychology Department does not offer training in counseling or clinical psychology.

Students will be admitted to graduate study on the basis of their potential for achievement in research, scholarship and teaching. The most promising applicants will be accepted. The number of students that the department can successfully accommodate is limited, therefore it will not always be possible to admit all qualified applicants. The admissions committee will consider any material that a candidate for admission wishes to present.

Students with bachelor degrees should apply for admittance to the master's program even if their eventual goal is a Ph.D.
Students with a master's degree in psychology-related disciplines or from other institutions may apply directly to the Ph.D. program.

A completed Graduate School admission application (https://apply.nmsu.edu/apply/) (online only) should include all of the following:

1. Complete transcripts of all college work (minimum 3.0 GPA).
2. Three letters of recommendation from professors, employers or others qualified to evaluate your potential for graduate work .
3. A letter explaining your research interests and experience, career goals, and an indication of the faculty member(s) whose work is of particular interest to you .
4. A curriculum vitae or résumé.

5. A writing sample (e.g., a paper you wrote for a course, a senior thesis, or a master's thesis) uploaded through online application system. Ideally, the sample should demonstrate your ability to write clearly about psychological research.
6. GRE scores (optional but highly encouraged)

As per NMSU Graduate School policy, admission to the doctoral program is conditional upon passing a qualifying exam. In Psychology this generally involves giving a presentation about a completed, empirical Masters thesis project to an examining committee. Also, If there are perceived gaps in preparedness, once at NMSU, candidates may be asked to complete certain coursework/research projects to address deficiencies.

A number of potential minors are available to interested students, including a minor in statistics (p.). Additional information about a minor may be found in the listing of the home department in this catalog.

Degrees for the Department

Bachelor Degree(s)

- Psychology - Bachelor of Arts (p. 955)
- Psychology - Bachelor of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/psychology-ba-online/)

Master Degree(s)

- Experimental Psychology - Master of Arts (p. 159)

Doctoral Degree(s)

- Experimental Psychology - Doctor of Philosophy (p. 225)

Minors for the Department

- Psychology - Graduate Minor (p. 260)
- Psychology - Undergraduate Minor (p. 958)

Andrew R. A. Conway, Department Head

Professors Conway, Hout, MacDonald, Madson, Marks, Trafimow; ***Associate Professors*** Guynn, Ketelaar, Kroger, Simon; ***Assistant Professors*** Fraune; ***Emeritus Faculty*** Cowie, Johnston, McDonald, Paap, Schvaneveldt, Stephan, Thompson.

A. R. A. Conway, Ph.D. (South Carolina) - human intelligence, cognitive abilities; M. Fraune, Ph.D. (Indiana)- Human/Robot Interaction; M. J. Guynn, Ph.D. (New Mexico)– human memory; M.C. Hout, Ph.D. (Arizona State) - visual cognition; T. Ketelaar, Ph.D. (Michigan)– social psychology, emotion; J. K. Kroger, Ph.D. (California-Los Angeles)– biopsychology, cognitive neuropsychology; J. MacDonald, Ph.D (Purdue)– engineering psychology, auditory perception; L.J. Madson, Ph.D. (Iowa State)– scholarship of teaching & learning, gender, sexuality; M.J. Marks, Ph.D. (Illinois, Urbana-Champaign)– social psychology, sexual behaviors, relationships; D.A. Simon, Ph.D. (California- Los Angeles)– cognition, learning and performance; D. Trafimow, Ph.D. (Illinois, Urbana-Champaign)– social cognition.

Psychology Courses

PSYC 1110G. Introduction to Psychology
3 Credits (3)
This course will introduce students to the concepts, theories, significant findings, methodologies, and terminology that apply to the field of psychology.
Learning Outcomes
1. Explain how the scientific method and psychological research methodologies are used to study the mind and behavior.
2. Recall key terms, concepts, and theories in the areas of neuroscience, learning, memory, cognition, intelligence, motivation and emotion, development, personality, health, disorders and therapies, and social psychology.
3. Explain how information provided in this course can be applied to life in the real world.
4. Identify the major theoretical schools of thought that exist in psychology as they relate to the self, the culture, and the society.

PSYC 1115. Introduction to the Psychology Major
1 Credit (1)
This course is designed to give Psychology majors the knowledge and tools they need to get the most out of the major and assist them in making informed decisions about career choices in Psychology. There are two main goals for this course. The first is to provide students with helpful tools and resources to enhance their experience as a Psychology major. The second goal is to delineate the knowledge and skills that students are expected to acquire with a Psychology degree and to convey how these can be applied in their future academic, professional, and personal endeavors beyond graduation. During the semester, students will discuss the subdisciplines of Psychology and explore career options with varying levels of education. Students will learn about course requirements for the Psychology major and experiential learning opportunities available outside the classroom. This 1-credit course is required for Psychology majors. It is recommended that students take this course as soon as they declare Psychology as their major. This course may be taken in conjunction with Introduction to Psychology.
Prerequisite/Corequisite: PSYC 1110G.
Learning Outcomes
1. Demonstrate knowledge and understanding of the subdisciplines of Psychology.
2. Demonstrate knowledge and understanding of the requirements of the Psychology major and experiential opportunities available to Psychology majors.
3. Identify career opportunities available to individuals with varying levels of education in Psychology and related fields (e.g., BA, MA, PhD, etc.).
4. Adopt strategies to prepare for future success in a job search or graduate school application.
5. Exhibit information literacy skills (e.g., literature searches, use of APA format) that will facilitate success in future Psychology courses.
6. Identify personal attributes as a student, areas of Psychology that are aligned with personal strengths, and strategies to make the most of personal strengths as a student.

PSYC 2110. Social Psychology
3 Credits (3)
This course is an introduction to the scientific study of human social influence and interaction, and explores how an individual's actions, emotions, attitudes and thought processes are influenced by society and other individuals. May be repeated up to 3 credits.
Prerequisite: PSYC 1110G, MATH 1215, and ENGL 1110G.
Learning Outcomes
1. Identify concepts, theories, scientific methods, and research findings relevant to social psychology.
2. Explain how situational, social, and individual factors influence behavior.

3. Apply social psychological concepts to real-life events, current social issues and problems, and one's own life.

PSYC 2120. Developmental Psychology
3 Credits (3)
Study of human physical and psychological change and stability from a lifespan development perspective. May be repeated up to 3 credits.
Prerequisite: PSYC 1110G, MATH 1215, and ENGL 1110G.
Learning Outcomes
1. Explain theories, methods and research findings of lifespan developmental psychology.
2. Describe the interaction between physical, cognitive, and psychosocial development across the lifespan.
3. Compare and contrast major developmental theories and discuss what each brings to or adds to the study of lifespan developmental psychology.
4. Identify factors that influence psychological development across the lifespan.
5. Apply basic principles of developmental psychology to one's own life experiences.
6. Analyze historical and cultural factors that influence development across the lifespan.

PSYC 2210. Abnormal Psychology
3 Credits (3)
This course provides students with an introduction to the field of abnormal psychology. Subject areas include history, methods, theories, etiologies, classification and treatment of disorders. May be repeated up to 3 credits.
Prerequisite: PSYC 1110G, MATH 1215 and ENGL 1110G.
Learning Outcomes
1. Recognize terms used within the field of abnormal psychology.
2. Compare various methods for defining abnormal behavior.
3. Evaluate the development of classification systems that define "normal" and "abnormal" from historical, social, and cultural contexts.
4. Critically evaluate the symptoms and etiologies of mental health disorders in the current psychological diagnostic system.
5. Describe treatment modalities for mental health disorders.
6. Identify biological and psychological processes in mental health disorders.

PSYC 2220. Cognitive Psychology
3 Credits (3)
The course provides an overview of human cognitive processes such as attention, perception, memory, language, categorization, decision-making, reasoning, and problem solving. Includes methods, theories, and applications. May be repeated up to 3 credits.
Prerequisite: PSYC 1110G, MATH 1215, and ENGL 1110G.
Learning Outcomes
1. Describe research findings in the major areas of human cognition.
2. Differentiate the research methods used to study the various topics in cognitive psychology.
3. Apply theories of cognition to the results of laboratory research.
4. Apply the research on cognitive psychology to topics in the real world.

PSYC 2221. Applied Psychology
3 Credits (3)
Explanation of the psychological principles of everyday living. Emphasizes motivation, learning of intelligent behavior, and applications of psychology to social issues. Community Colleges only.
Learning Outcomes
1. The objective of this course is to orient students to the personality characteristics, interpersonal competencies, ethical decision-making skills, and other professional traits associated with pursuing a career in a helping profession.
2. Identify the requirements for becoming a helping professional, characteristics of a skilled helper, and cultural factors that impact helping professionals
3. Explain your personal strengths and weaknesses as a potential helper.
4. Demonstrate appropriate helping strategies based upon the special characteristics of clients.
5. Compare the capabilities that individual, family, group, community, and online interventions offer you as a future helper.
6. Identify the ethical and legal issues that impact helping professionals
7. Analyze the potential impact of your future ethical and professional standards as a helping professional
8. Explain how your role as a helping professional is impacted by your professional affiliation and ethical principles
9. Analyze how worsening personal problems and increasing stress can impact the kinds and quality of our responses to life and the people around us.

PSYC 2230. Psychology of Adjustment
3 Credits (3)
This course focuses on the individual's adjustment to society, and the application of psychological principles to the understanding of adjustment.
Learning Outcomes
1. Explain the internal and external factors associated with the psychology of adjustment.
2. Evaluate contributions from psychology to adjustment concepts and processes.
3. Describe the different explanations of how individuals adjust to their environments.
4. Describe how self-identities develop and how they affect relations with others.
5. Identify resources available for assistance with adjustment-related concerns.

PSYC 2250. Brain and Behavior
3 Credits (3)
A general survey of the biological foundations of behavior and mental processes. Students will gain an understanding of anatomy, physiology, and chemistry of the nervous system and their relationships to human behavior. May be repeated up to 3 credits.
Prerequisite: PSYC 1110G, MATH 1215 and ENGL 1110G.
Learning Outcomes
1. Identify and describe basic neuroanatomical structures and functions.
2. Identify and describe chemical processes of the nervous system.
3. Apply course concepts to psychological processes, such as learning, memory, sensation, perception, drive states, sleep, and language.
4. Apply course concepts to psychological disorders, such as schizophrenia and mood and anxiety disorders.

5. Describe the techniques used to study the relationship between brain and behavior.

PSYC 2311. A Study of Substance Abuse through Learning
3 Credits (3)
Physiological and psychological impact of drug use on human behavior. Emphasizes practical applications of intervention and prevention in the community. Community Colleges only.
Learning Outcomes
1. Through readings and discussions, students will be able to describe the role that gender, ethnicity, and age have in alcohol and drug use.
2. Through readings and discussions, students will be able to learn past and current perspectives of addiction.
3. Through readings, discussions and student presentations, students will be able to distinguish between different types of abuse-able drugs and be able to classify them.
4. Through readings, discussions, lectures and guest speaker's students will be able to describe the role of addiction and criminal behavior.
5. Through readings and discussions, students will be able to discuss the Models and Theories of Drug Dependence and Addiction.
6. Through readings, discussions and evaluation of case studies students will be able to discuss the definitions of Substance Abuse, Dependence Addiction.
7. Through readings and discussions, students will be able to acquaint themselves with the effects of Addictive Behavior on Family Systems.
8. Through readings discussions, students will be able to Discuss Disorders Co-Occurring with Substance Abuse
9. Through readings and community service learning outing, students will be able to discuss how important the concepts of Prevention, Intervention and Treatment in drug addiction.1
10. Through readings and community service learning outing students will be able to discuss Alcohol/Drug Recovery Treatment Relapse Prevention 1
11. Through completion of Service Learning and field assignment students will be able to discuss the role of AA/NA in Recovery Treatment. 1
12. Through attendance of a Drug Court Hearing students will be knowledgeable of the role of Drug Courts in prevention and treatment of drug addiction.

PSYC 3110. Experimental Methods
4 Credits (3+1P)
The basic skills of literature search, experimental design, research methodology, and research reporting are emphasized; includes laboratory.
Prerequisite: PSYC 1110G, PSYC 1115, PSYC 2110, PSYC 2220, and either MATH 1350G, MATH 2350G, or A ST 311.
Learning Outcomes
1. Identify, discuss, synthesize, and present original scientific literature (journal articles) on specific psychological research topics.
2. Pose a testable research question and suggest falsifiable hypotheses.
3. Design and conduct a behavioral research study that satisfies the scientific goals of description, prediction, and explanation.
4. Draw conclusions based on the results of statistical analyses.
5. Write up a behavioral research study in APA format.
6. Discuss and apply the ethical considerations pertaining to conducting psychological research.
7. Apply the techniques of psychological research to real-world societal concerns.

PSYC 3120. Psychological Measurement
3 Credits (3)
The objective of this class is for you to develop broad conceptual knowledge, as well as specific concrete skills, when developing, analyzing and interpreting psychological measures and the data that come from them. We will learn through in-depth discussion and hands-on applications: e.g., exploring the purpose and meaning of measurement, taking a wide range of actual measures, analyzing measurement data in a variety of different ways. Overall, you will learn from this class whether a measure/test is measuring what we think it should, on the basis of reliability, validity, and fairness.
Prerequisite: PSYC 1110G, PSYC 1115, PSYC 2110, PSYC 2220.
Learning Outcomes
1. Learn how to develop, analyze, and interpret psychological measures.
2. Learn how to determine whether a measure/test is measuring what we think it should, on the basis of reliability, validity, and fairness.

PSYC 3210. Perception
3 Credits (3)
Primary emphasis on vision. Topics include measurement of sensations, development of visual-motor coordination, reading, speech perception, picture perception, illusions, 3-dimensional space, and causes and consequences of visual abnormalities.
Prerequisite: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 3110.
Learning Outcomes
1. To provide a comprehensive knowledge of topics within sensation and perception, including topics in vision, hearing, smell, taste, and touch.

PSYC 3220. Learning
3 Credits (3)
Covers: habituation, Pavlovian conditioning, Thorndikian learning, stimulus generalization, transfer of training, and the learning and forgetting of related and unrelated material.
Prerequisite: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 3110.
Learning Outcomes
1. Recognize and distinguish between various learning situations, especially classical/Pavlovian and Instrumental learning and their many facets and applications.
2. Identify some of the key conditions necessary for learning to take place, and that may prevent learning from taking place – rather more nuanced than most intro psych books suggest.
3. Identify and evaluate different basic situations to suggest how learning might be structured to cause changes in behavior in both humans and other animals.

PSYC 3230. Memory
3 Credits (3)
Examines facets of human memory from the information processing viewpoint, including encoding, storage, and retrieval and memory-aiding techniques.
Prerequisite: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 3110 or consent of instructor.

PSYC 3310. Emotion
3 Credits (3)

An overview of the past century of research on human emotion from WIlliam James to Antonio Damasio. Explores a cognitive science perspective on emotion that includes questions about developmental, physiological, and evolutionary aspects of emotion and an exploration of the proximate and ultimate functions of emotion. Topics range from understanding the feeling component of emotion to understanding the role of facial displays of emotion.
Prerequisite: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311G, and PSYC 3110 or consent of instructor.

PSYC 3320. Psychology of Personality
3 Credits (3)
Introduces personality theories and supporting research. Psychoanalytic, physiological, and behavioral theories as they apply to personality are examined. Focuses on normal personality functioning.
Prerequisite: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 3110.

PSYC 3330. Sexual Behavior
3 Credits (3)
Examines viewpoints of the evolution, control and function of human sexual behavior. Includes human sexuality, reproduction, male-female conflicts and the social implications of sex.
Prerequisite: PSYC 1110G, MATH 1215, and ENGL 1110G.

PSYC 3410. Health Psychology
3 Credits (3)
Life stress, surgical stress, coronary-prone behavior, biofeedback, pain control, psychosocial approaches to geriatrics and cancer, behavioral treatments for addictions, obesity, and interpersonal issues in health care.
Prerequisite: PSYC 1110G.

PSYC 3510. Psychology and the Law
3 Credits (3)
Discretionary practices in the judicial system including pretrial procedures, jury selection, jury decision making, eyewitness testimony, insanity, expert witnesses, and probation judgments.
Prerequisite: PSYC 1110G.

PSYC 3520. Evolutionary Psychology
3 Credits (3)
This course introduces the student to the science of Evolutionary Psychology. In this class we will explore how evolutionary psychologists think about a variety of topics ranging from our capacity for (and appreciation of) art, emotions, and beauty to an exploration of the "design" of our minds in regards to mating, status striving, social behavior and cultural production.
Prerequisite: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311G, and PSYC 3110 or consent of instructor.

PSYC 359. Psychology of Gender
3 Credits (3)
Examines theories and research on the psychological functioning of women and men in North American society, including influential theories of gender in psychology and current controversies in the psychological literature. Topics include those unique to women and unique to men in development across the lifespan, work, physical and mental health, sexuality, victimization, gender stereotypes, gender comparisons in abilities and personality, and biological, social, and cultural influences on behavior. Crosslisted with: GNDR 359.
Prerequisite: PSYC 1110G.

PSYC 3910. Advanced Research Seminar
4 Credits (2+4P)
Psychological research in conjunction with designing, conducting, writing, and presenting an independent research project. May also include various computer applications. Will discuss issues regarding application to graduate programs. Course should be taken no later than the first semester of senior year. May be repeated up to 4 credits.
Prerequisite: PSYC 3110.

PSYC 3996. Special Topics
1-3 Credits
May be taken under different subtitles announced in the Schedule of Classes for unlimited credit. May not be taken twice under the same subtitle. May be repeated up to 12 credits.
Prerequisite: PSYC 1110G.

PSYC 4210. Thinking
3 Credits (3)
Research and theory pertaining to human thinking and problem solving. Effective problem-solving methods and common obstacles to problem solving are analyzed.
Prerequisite: PSYC 1110G and PSYC 3110.

PSYC 4220. Human-Computer Psychology
3 Credits (3)
Theories, methodologies, and data from psychology applicable to interface design, with an emphasis on construction and application of conceptual psychological models.
Prerequisite: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 3110 or consent of instructor.

PSYC 4510. History & Systems of Psychology
3 Credits (3)
History of the scientific study of the mind and behavior. Covers the historical origins of philosophical and scientific approaches to Psychology and the development of influential schools of thought in psychology from the Classical Period through the Modern Era.
Prerequisite: PSYC 1110G and PSYC 3110.
Learning Outcomes
1. Apply knowledge of important historical events/figures in scientific psychology by demonstrating an ability to explain how past ideas/thinkers/events have shaped current theory and methodology in scientific psychology.
2. Explain key ideas and concepts in contemporary scientific psychology by demonstrating an ability to draw connections between our current understanding and earlier approaches to the study of the mind.
3. Generate sophisticated arguments/opinions regarding contemporary questions in scientific psychology by demonstrating an ability to frame questions that draw upon a sophisticated understanding of the history of scientific psychology, while also being able to distinguish between well-informed and naïve answers to those questions.

PSYC 4991. Research
1-3 Credits
Individual research projects supervised by a department faculty member. May be repeated up to 6 credits.
Prerequisite: PSYC 3110 and consent of instructor.
Learning Outcomes
1. Varies.

PSYC 4992. Directed Readings
1-3 Credits
May be repeated up to 6 credits.
Prerequisite: PSYC 1110G and consent of instructor.

PSYC 4996. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes
1. Varies.

PSYC 4998. Field Experience
1-3 Credits
Working with preschool, juvenile delinquent, handicapped, aged, convict, or mentally ill. Approximately five hours scheduled work per week per credit. May be repeated up to 6 credits.
Prerequisite: 6 psychology credits and consent of instructor.
Learning Outcomes
1. Varies.

PSYC 4999. Senior Capstone Seminar in Psychology
1 Credit (1)
In an architectural context, a capstone is the top-most stone that completes a building. In an academic context, a capstone is the final class that completes a student's curriculum. Capstone classes provide students with an opportunity "to demonstrate comprehensive learning in their major through some type of product or performance" (Palomba & Banta, 1999, p. 124). In other words, a capstone is a class in which senior psychology majors are required to pull together what they have learned in their previous classes and use this integrating experience to demonstrate they are capable of doing what they should be able to do when they graduate from the program (e.g., think critically and develop a realistic plan to pursue a career in psychology or a psychology-related field). This process serves a dual purpose. First, it allows psychology majors with a final opportunity to practice and demonstrate the skills they will need to succeed after graduation on the job or in graduate school. Second, it provides the Psychology Department with a final opportunity to assess whether or not it has been successful in its mission to produce competent psychology majors.
Prerequisite: PSYC 3110, PSYC 3120.
Learning Outcomes
1. Demonstrate critical thinking skills by reading and discussing current topics in Psychology.
2. Demonstrate content knowledge in Psychology by reading and discussing current topics in Psychology.
3. Demonstrate critical thinking skills by performing standardized assessments administered by the Department of Psychology.
4. Demonstrate content knowledge by performing standardized assessments administered by the Department of Psychology.

PSYC 5110. Quantitative Methods in Psychology I
3 Credits (3)
Statistical concepts emphasizing distributions and methods most appropriate to the data, models, and theories in psychology. Emphasis on distributions, probability and basic inferential statistics in Psychological research. Includes basics of Analysis of Variance (ANOVA) and Multiple Regression in Psychological research.
Learning Outcomes
1. Students will be able to recognize appropriate usage of, and be able to implement, basic statistical techniques: Central tendency, variability, z-scores, t-tests, ANOVA, correlation, two predictor regression.

PSYC 5120. Quantitative Methods in Psychology II
3 Credits (3)
Statistical concepts emphasizing distributions and methods most appropriate to the data, models, and theories in psychology. Emphasis on advanced ANOVA and Multiple Regression in Psychological research.
Prerequisite: PSYC 5110 or equivalent.
Learning Outcomes
1. Students will become familiar with situations and applications of advanced ANOVA techniques and Multiple Regression and Correlation.

PSYC 5210. Computer Methodology
3 Credits (3)
Use of computers in psychological research with emphasis on developing experimental control programs.

PSYC 5220. Methods in Cognitive Psychology
3 Credits (3)
Experimental and correlational methodologies appropriate for investigating cognitive psychological theories and problems.
Prerequisite: PSYC 5320 or consent of instructor.

PSYC 5230. Methods in Social Psychology
3 Credits (3)
Experimental, quasi-experimental, and correlational methodologies appropriate for investigating social psychological theories and problems.
Prerequisite: Graduate student in psychology or consent of instructor.

PSYC 5310. Engineering Psychology
3 Credits (3)
Covers concepts, methods, and findings of human performance. Treats the human as a subsystem that receives, stores and processes information, makes decisions, and acts within a human-machine environment system.

PSYC 5320. Cognition
3 Credits (3)
Examines theoretical and empirical work on human cognition. Topics include: information processing theories, pattern recognition, memory, attention, language, problem solving, decision making, and reasoning.

PSYC 5330. Social Psychology
3 Credits (3)
Current and traditional theories, research findings, and research methodologies of social psychology.

PSYC 5340. Learning and Memory
3 Credits (3)
Classical areas of learning, including instrumental and classical conditioning paradigms, habituation, reinforcement variables, stimulus generalization and transfer, and memory.

PSYC 5350. Sensation and Perception
3 Credits (3)
Stimulus and decision variables in judging auditory and visual events. Topics include: detection of signals; signal intensity versus perceived strength; size, shape, and movement perception; reading and listening.

PSYC 540. History and Systems of Psychology
3 Credits (3)
History of scientific method emphasizing outstanding methodological problems of contemporary science, especially psychology. Covers recent history of psychology and development of schools of psychology.

PSYC 5410. Foundations of College Teaching
3 Credits (3)
This class serves both new and experienced teachers. It will help new teachers design and conduct a successful course and help experienced teachers improve their teaching.

Learning Outcomes

1. Identify best practices in research on the scholarship of teaching and learning.
2. Create effective learning activities that: balance theoretical principles and broad application of disciplinary topics, discourage the unauthorized use of generative AI, effectively integrate academic digital tools as appropriate.
3. Practice effective communication and course delivery skills by teaching short lessons given to classmates.
4. Examine tools and techniques for professional development and self-assessment.
5. Explore effective and ethical uses generative AI.

PSYC 5910. Research Seminar in Psychology
1 Credit (1)
Presentations on research by students, faculty, and guest speakers. May be repeated up to 99 credits.
Learning Outcomes

1. Varies.

PSYC 5991. Special Research Programs
1-3 Credits
Individual investigations either analytical or experimental. May be repeated up to 99 credits.
Learning Outcomes

1. Varies.

PSYC 5996. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 99 credits.
Learning Outcomes

1. Varies.

PSYC 5999. Master's Thesis
1-15 Credits
Thesis. May be repeated up to 88 credits.
Learning Outcomes

1. Varies.

PSYC 698. Special Research Programs
1-3 Credits
Individual investigations either analytical or experimental. May be repeated for credit.

PSYC 6991. Doctoral Research
1-15 Credits
This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination. May be repeated up to 88 credits.
Learning Outcomes

1. Varies on research.

PSYC 7000. Doctoral Dissertation
1-15 Credits
Dissertation. May be repeated up to 88 credits.
Learning Outcomes

1. Varies.

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Psychology - Bachelor of Arts

General Requirements

Students must complete all University degree requirements, which include: General Education requirements (p. 262),Viewing a Wider World requirements (p. 266), and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students must receive a C- or better in courses.

Prefix	Title	Credits
General Education		
Area I: Communications		*9-10*
English Composition - Level 1		
Select one from the following		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Select one from the following		3
ENGL 2210G	Professional and Technical Communication (Recommended)	
or ENGL 2210H	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Select one from the following		
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		*3*
Select one from the following (students may need to complete prerequisites) [1]		
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Select one of the following from Area III: Laboratory Sciences (4 credits)		
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	

BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
Area IV: Social/Behavioral Sciences Course		
PSYC 1110G	Introduction to Psychology	
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [2]		
Area V: Humanities		*3*
Select any Area V: Humanites course, but one of the following PHIL courses is recommended: [2]		
PHIL 1145G	Philosophy, Law, and Ethics	
PHIL 1115G	Introduction to Philosophy	
PHIL 1140G	Philosophy and World Religions	
PHIL 2230G	Philosophical Thought	
PHIL 1120G	Logic, Reasoning, & Critical Thinking	
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective [2]		*3-4*
Viewing A Wider World [3]		**6**
Departmental/College Requirements (additional credits beyond Gen Ed)		**21**
PSYC 1110G	Introduction to Psychology (this course will count towards the Area IV requirement above)	
PSYC 1115	Introduction to the Psychology Major	
Core Content		
PSYC 2110	Social Psychology	
PSYC 2120	Developmental Psychology	
PSYC 2220	Cognitive Psychology	
PSYC 2250	Brain and Behavior	
Research Methods		
PSYC 3120	Psychological Measurement [4]	
PSYC 3110	Experimental Methods	
Capstone		
PSYC 4999	Senior Capstone Seminar in Psychology	
PSYC upper division electives to bring total PSYC upper division credits to 20 [5]		*12*
Non-Departmental Requirements (some overlap with Gen.Ed/VWW)		
Philosophy course 300-level or above [6]		3
Statistics Course requirement, can be completed with one of the following (all but A ST 311 will count towards Gen.Ed requirements) [1, 7]		
A ST 311	Statistical Applications	
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
Introductory Biology requirement, can be completed with one of the following (all will count towards Gen.Ed requirements) [8]		
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
Second Language: (required- see below) [9]		**13-15**
Electives, to bring the total credits to 120 [10]		**22**
Total Credits		**119-124**

1. Either MATH 1350G Introduction to Statistics, MATH 2350G Statistical Methods is required for the degree but students may need to take any prerequisites needed to enter MATH 1350G or MATH 2350G first.
2. See the General Education (p. 262) of the catalog for a full list of courses
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4. PSYC 3120 Psychological Measurement : prerequisite of PSYC 1110G Introduction to Psychology, PSYC 2110 Social Psychology,PSYC 2220 Cognitive Psychology, and either MATH 1350G,MATH 2350G, or A ST 311. PSYC 3110 Experimental Methods: prerequisite of PSYC 3120 Psychological Measurement .
5. Additional electives to bring total credits in psychology to at least 36, with at least 20 of those 36 credits being upper division.
6. PHIL 346 Philosophy of Mind or PHIL 351 Philosophy of Science recommended
7. Students who are considering graduate study are strongly encouraged to take math classes beyond the minimum statistics course requirement.
8. A course that includes a laboratory is highly recommended, and is required if intended to satisfy Gen Ed Area III
9. The number of credits needed to complete the Second Language requirement depends on which option the student uses and whether the student is able to begin study at a level beyond the introductory course
10. Elective credit may vary based on General Education course selection, second language requirements, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in Psychology there is a two year second language requirement, the options to complete this requirement are listed below. The number of credits that a student needs to take may vary depending on what level they come in with. Please speak with an advisor for more information as to which courses you will need to take to fulfill the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120 & FREN 2110 & FREN 2120	French I and French II and French III and French IV	3-14
GRMN 1110 & GRMN 1120 & GRMN 2110 & GRMN 2120	German I and German II and German III and German IV	3-14
JAPN 1110 & JAPN 1120 & JAPN 2110 & JAPN 2120	Japanese I and Japanese II and Japanese III and Japanese IV	3-14
SPAN 1110 & SPAN 1120 & SPAN 2110 & SPAN 2120	Spanish I and Spanish II and Spanish III and Spanish IV	3-14

PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
For Heritage Speakers:		
SPAN 1210 & SPAN 1220 & SPAN 2210	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II and Spanish for Heritage Learners III	3-9

Option 2:

Prefix	Title	Credits
Complete the following sequence for American Sign Language (with a C- or better):		
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
SIGN 2110	American Sign Language III	3

Option 3:

Prefix	Title	Credits
Challenge the 1120/2210 level for the following courses:		
PORT 1120	Portuguese II	3
or SPAN 2210	Spanish for Heritage Learners III	

Option 4: Computer Science Track

Prefix	Title	Credits
CSCI 1220	Computer Programming Fundamentals: Python	3
CSCI 1225	Python Programming II	3
CSCI 1235	R Programming I	3
Under special circumstances, alternative combinations of CSCI courses may be approved by the Department Head		
Total Credits		**9**

Option 5: Math Track

Prefix	Title	Credits
MATH 1220G	College Algebra	3
MATH 1250G	Trigonometry & Pre-Calculus	4
MATH 1511G	Calculus and Analytic Geometry I	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Total Credits		**15**

Option 6:

Pass a three-credit, upper-division course (numbered 300/3000 or above) taught in a second language by the department of Languages and Linguistics.

Option 7:

Obtain college certification of completion of three years of a second language at the high school level with a grade of C- or higher in the second-year level.

Option 8:

By obtaining certification of a working knowledge of a Native American language from the American Indian program director.

Option 9:

By obtaining, from the head of the Department of Languages and Linguistics, certification of a working knowledge of a second language if such language is not taught at NMSU.

Option 10:

In the case of a foreign student who is required to take the TOEFL exam admission, the dean will automatically waive the second language requirement.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1350G Introduction to Statistics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
Choose from one of the following:		3
MATH 1350G	Introduction to Statistics [1]	
MATH 2350G	Statistical Methods [1]	
A ST 311	Statistical Applications [1]	
PSYC 1110G	Introduction to Psychology	3
Area V: Humanities Course (recommend one of the following) [2]		3
PHIL 1115G	Introduction to Philosophy	
PHIL 2230G	Philosophical Thought	
FYEX 1112	The Freshman Year Experience [2]	3
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
Choose from one of the following:		4
BIOL 1120G & BIOL 2110L	Human Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
First Course in Second Language Series		3-4
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**29-30**

Sophomore		
Choose from one of the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science [1]	
Area III: Laboratory Science Course OR Area IV: Social and Behavioral Science Course [2]		3-4
General Education Elective Course [2]		3-4
Next Course in Second Language Series [1]		3-4
PSYC Core Content (refer to degree requirements list) [1]		12
PSYC 2110	Social Psychology	
PSYC 2120	Developmental Psychology	
PSYC 2220	Cognitive Psychology	
PSYC 2250	Brain and Behavior	
Next Course in Second Language Series (OR Elective Course if Second Language Requirement Fulfilled) [1]		3-4

Minor (or Elective) Course		3-4
	Credits	**30-35**
Junior		
PSYC 3120	Psychological Measurement	3
PSYC 3110	Experimental Methods	0-4
PSYC upper-division elective course		3
Final Course in Second Language Series (OR Elective Course if Second Language Requirement Fulfilled)		3-4
VWW: Viewing a Wider World Course [3]		3
Upper division minor or elective courses		15
	Credits	**27-32**
Senior		
PSYC 4999	Senior Capstone Seminar in Psychology	1
PSYC Upper-Division Elective Courses [1]		9
PHIL Upper-Division Elective Course [1]		3
Viewing a Wider World Course [3]		3
Upper-Division Minor (or Elective) Courses [1]		12
PHED (or other) elective course		6
	Credits	**34**
	Total Credits	**120-131**

1 These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Psychology - Undergraduate Minor

A student must pass at least 18 credits in Psychology courses with grades of C- or higher, and at least 9 of those credits must be upper division. A student may not earn both a BA in Psychology and a minor in Psychology.

Theatre Arts

Undergraduate Program Information

With strong emphases in acting, musical theater, new works and design/technical theatre, the program prepares students for graduate study, life in the profession, or a myriad of related job fields. Students gain practical experience through a wide array of courses designed to expose them to the varied aspects and job positions involved in theatrical production. Practical experience is gained via work on our public productions. The faculty is augmented by nationally-renowned guest theatre artists.

A minimum of 62 credits with a grade of C- or higher in theatre arts is required for the major. Theatre Arts does not require a second language.

Students enrolled in this department's major or minor may count credits in required applied courses toward their degrees beyond the normal maximum of 9 credits allowed in the College of Arts and Sciences. However, if a student changes the major or does not complete the requirements for the minor at the time of graduation, they may only count a maximum of 9 credits of the applied credits toward graduation.

Students preparing to teach in public schools may qualify for certification by completing the Bachelor of Science in Education degree with theatre arts as a teaching field. (See curricula in the College of Health, Education & Social Transformation (https://hest.nmsu.edu/) section).

At any time the Theatre Arts program may be undergoing curriculum changes. For the most up-to-date information about degree requirements please visit https://theatre.nmsu.edu/ or visit the Theatre Arts Department in room 318 in the ASNMSU Center for the Arts Building on University Ave at Espina.

Degrees for the Department

- Theatre Arts (Design/Technical/Management) - Bachelor of Arts (p. 965)
- Theatre Arts (Musical Theatre) - Bachelor of Arts (p. 966)
- Theatre Arts - Bachelor of Arts (p. 963)

Minors for the Department

- Theatre Arts - Undergraduate Minor (p. 968)

Professor, Wil Kilroy, Department Head/Managing Director

Associate Professors: Hamilton, Lury ***Assistant Professors:*** Hermanson, Krohn, Striebel ***College Assistant Professor:*** Masters **Adjunct Professors**: Fredrickson, Mojica ***Emeritus:*** Brunson, Storm ***Professional Staff***: Carruthers, Davila, Wilkinson ***Office Staff:*** Wayt

Theatre Arts Courses

THEA 1110G. Introduction to Theatre
3 Credits (3)
This course provides an introduction to the study of theatre. Students will examine various components that comprise theatre, such as acting, directing, playwriting, dramaturgy, scenic and costume design, stagecraft, spectatorship, history, theory, and criticism.
Learning Outcomes
1. Define and discuss basic theater terms and concepts.
2. Discuss the fundamental elements of theatre, and the ways in which theatre differs from other art forms.
3. Analyze and critique the elements of a live theatrical production.
4. Identify and describe the roles of various theatre artists including actors, directors, playwrights, dramaturges, and designers.

THEA 1210G. Acting for Non-Majors
3 Credits (3)
This class gives non-majors experience in the depth and craft of the actor's art. Students will learn various terms, techniques, and practices of acting and will demonstrate their understanding in class. Through exercises and improvisations, partnered scenes, and group work, students will be better able to appreciate the work of others as they learn techniques of performing. May be repeated up to 3 credits.
Learning Outcomes
1. Develop fundamental physical, vocal, analytical, and imaginative skills for acting for the stage.
2. Apply fundamental techniques of voice and movement for the stage.
3. Apply principles of play text analysis to understand story, character, and meaning.
4. Gain a better understanding of an actor's approach to goals, tactics, and obstacles.
5. Engage in character creation and development while preparing and performing monologues and scenes.
6. Learn a common vocabulary to help discuss the process of acting.

7. Employ collaborative methods of work with a partner and in groups.
8. Observe and evaluate acting skills of other actors.
9. Increase verbal and physical communication skills which are applicable in any field. 1
10. Develop personal and social responsibility via group work, research and self-reflection. 1
11. Increase confidence and self-esteem via continuous presentations with supportive feedback.

THEA 1221. Beginning Acting
3 Credits (3)
Basic understanding of self-expression through a variety of physical exercises, improvisation, and character study, culminating in scene or monologue work. Restricted to: THTR majors.
Learning Outcomes
1. Apply a common vocabulary that serves as a foundation in acting for the theatre major and minor.
2. Communicate effectively in front of an audience, applying learned concepts while exercising freedom and control of voice, body, and imagination.
3. Analyze the written character and live performance.
4. Provide objective feedback to your classmate's work as well as your own, that supports a greater understanding of our craft while building trust within the collaborative ensemble.

THEA 1222. Stage Movement
3 Credits (3)
Physical techniques for the actor to develop kinesthetic awareness and skills in characterization, archetypes, and stage combat. Restricted to: THTR majors.
Learning Outcomes
1. To provide fundamental training in a variety of movement techniques which can be applied to both theatrical performance and physical communication in everyday life.
2. Observation and critical skills will be advanced through class participation and outside assignments
3. Class exercises are aimed at guiding participants to uncover their own creative expression, while working with efficient, healthy body alignment

THEA 1223. The Art of Theatre
3 Credits (3)
This course introduces the variety and scope of theatre professions, the value and goals of the theatre major and an analysis of the art form from script to stage. Restricted to: Required for THTR majors majors.
Learning Outcomes
1. An overview of the history of theatre in the Western world
2. A general understanding of the artistic roles and functions within the theatre industry (including within NMSU Theatre as a model)
3. A strong preparation for independent in-depth script analysis and theatre critique

THEA 1310. Introduction to Costuming
3 Credits (3)
This course introduces students to basic skills generally used in creating costumes for theatre. During the semester students will be introduced to the costume shop, equipment, supplies, and processes. They will learn the process of sewing a garment and running a stage production.
Prerequisite(s)/Corequisite(s): THEA 1310L. Restricted to: THTR majors.
Learning Outcomes
1. Demonstrate basic hand and machine sewing skills.
2. Use basic costume craft tools and techniques.
3. Analyze fabric selection for the stage.
4. Draft and use patterns.
5. Take body measurements for patterning and construct a costume from those measurements.
6. Combine interpersonal communication skills with costume construction skills.
7. Analyze a script for costume design purposes.
8. Build a garment.

THEA 1310L. Costume Craft Lab
1 Credit (1)
Class members will assist in construction for productions in a studio environment.
Prerequisite(s)/Corequisite(s): THEA 1310.
Learning Outcomes
1. This laboratory class compliments THEA 1310: Costume Crafts.
2. It gives the student an opportunity to put into practice the skills learned in THEA 1310 as well as be introduced to and participate in the day-to-day operations of the Costume Shop.

THEA 1415. Running Crew I
2 Credits (1+2P)
Students learn about backstage and front of house production positions and work on a technical aspect of a product in a rehearsal and performance environment.
Learning Outcomes
1. Students will learn one, or more, of the basic technical elements of theatrical crew work.

THEA 2310. Stagecraft
3 Credits (3)
Student will explore basic skills for scenic designers and techniques of set construction for the stage, including building scenery, rigging, painting and properties.
Prerequisite(s)/Corequisite(s): THEA 2310L.
Learning Outcomes
1. Demonstrate a range of technical skills, which will qualify them to assist in the basic technical production of a play.
2. Demonstrate and apply how to safely and competently use hand tools, power tools, electrical, and electronic stage equipment.
3. Analyze the technical aspects of a play in performance.
4. Read and construct scenery from ground plans, elevations, and drawings.
5. Analyze a script from the perspective of a designer, artistic, and/ or technical director.

THEA 2310L. Stagecraft Laboratory
1 Credit (1)
Class members will assist with construction for productions in a studio environment.
Prerequisite(s)/Corequisite(s): THEA 2310.
Learning Outcomes
1. History of scenic design and the development of present day stage design.
2. How to create and interpret basic scenic ground plans, elevations, and detail drawings.
3. To construct basic scenic structures to include flats and platforms.

4. Various techniques of scenic painting and decorating.
5. The installations of theatre lighting instruments and sound equipment.

THEA 2340. Introduction to Design
3 Credits (3)
Introduction into our visual world via the language of designers, focusing on collaboration, creative thinking and presentation skills. The varied design professions in theatre and the performing arts will be explored. Restricted to: Required of all THTR Majors.
Learning Outcomes
1. Apply design vocabulary and descriptions when speaking about design.
2. Identify design tools and make choices about where to use them.
3. Apply the foundation information in understanding how design tools work.
4. Apply correct terminology in assessing design and script analysis.
5. Read and understand some of the design documents commonly used in the industry.

THEA 2415. Running Crew II
1 Credit (1)
Students learn about backstage and front of house production positions and work on a technical aspect of a product in a rehearsal and performance environment.
Learning Outcomes
1. To provide students with “hands on” experience participating in being a member of a running crew on a theatrical production.
2. Students will learn one, or more, of the basic technical elements of theatrical crew work.

THEA 2421. Vocal Production for the Actor
3 Credits (3)
Exploration and development of the actor's vocal instrument, including relaxation, projection, diction and articulation.
Learning Outcomes
1. Apply concepts of alignment, relaxation, breath support, resonance, projection, and articulation for your personal and professional benefit.
2. Refine vocal 'problem solving' which will carry into your personal and professional life.
3. Apply vocal concepts to a variety of text in order to understand and appreciate your voice and its capabilities, both intellectually and sensorially.
4. Apply the vocal/speech tools consciously and behavior-ally, as an aid in the search for musicality of the voice in conjunction with truth and believability.

THEA 2993. Theatre Workshop I
0.5 Credits (.5)
Required for all freshman and sophomore theatre majors, this course coordinates all processes within Theatre Arts, providing a forum for discussion and feedback. May be repeated up to 4 credits. Restricted to Las Cruces campus only.
Learning Outcomes
1. This lab course is designed to create community via group meetings with your peers while providing a platform for our guest artists to present information regarding our profession.
2. As time allows, group discussions and sharing will further the sense of community and collaboration with your peers.
3. This forum also provides an opportunity to discuss and provide feedback for each production in the ASTC season.

THEA 2996. Theatre Topics
1-3 Credits (1-3)
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits.
Learning Outcomes
1. Varies

THEA 300. Theatre Workshop II
0.5 Credits (.5)
Required for all junior and senior theatre majors, this course coordinates all processes within Theatre Arts, providing a forum for discussion and feedback. May be repeated up to 4 credits. Restricted to Las Cruces campus only.

THEA 303. Theatre History I
3 Credits (3)
History of theatre and drama from ancient Greece to the English Renaissance.

THEA 304. Theatre History II
3 Credits (3)
History of theatre and drama from the Restoration to the 20th century.
Prerequisite: THEA 303 or Permission of Instructor.
Learning Outcomes
1. To gain the ability to analyze and interpret various texts from varied time periods.
2. To connect historical knowledge of theatre to contemporary situations.
3. To understand how theatre of the past influences theatre of the present.

THEA 305. Advanced Vocal Production
3 Credits (.3)
Advanced exploration and development of the actor's vocal instrument. May be repeated up to 3 credits.
Prerequisite(s): THEA 2421.

THEA 306. Script Analysis
3 Credits (3)
This class is designed to give you tools and specific processes to help you read and break down a text, so that you can make it come alive for audiences in the varied genres of theatre, film and animation.
Learning Outcomes
1. Determine the dramatic structure of a script
2. Write an analysis of a script for production
3. Verbally communicate an analysis of a script for production
4. Analyze a script from a specific perspective such as actor, director, designer, animator, etc.

THEA 307V. Society in Style: Fashion, History and Culture
3 Credits (3)
History of clothing for theatrical purposes, origins and evolution of period clothing in relation to social, political, and aesthetic factors of different periods.
Learning Outcomes
1. Students will be able to connect changes in clothing styles, applicable to the stage, to various social, political, historical, and cultural contexts.
2. Students will be able to analyze a theatrical or film script for what style of clothing would be appropriate in order to stage the text.

3. Students will present creative projects, based on research, thereby enhancing their analytical and practical design skills.

THEA 308. Creative Writing: Playwriting
3 Credits (3)
Technique of one-act playwriting, and analysis of dramatic structure. Crosslisted with: ENGL 308
Prerequisite(s): ENGL 1110G.

THEA 310. Styles in Acting
3 Credits (3)
Analysis of differing styles of acting through scene work representing various time periods and genres. Consent of Instructor required. May be repeated up to 3 credits.
Prerequisite: THEA 1221 or THEA 1210 with a C- or better.

THEA 311. Acting for Film and Television
3 Credits (3)
Specific techniques of acting for the camera are explored via hands-on experiential learning and an introduction to the business of the TV/Film industry.
Learning Outcomes
1. To understand the acting techniques needed for film and TV work.
2. To understand the differences between acting for live theatre and acting for the camera.
3. To self-reflect on individual performances in order to further grow in the art.

THEA 313. Improvisation
3 Credits (3)
Long and/or short form improvisation techniques in addition to a variety of exercises exploring terminology, character work and the elements of comedy.
Prerequisite(s): THEA 1210 or THEA 1221.

THEA 315. Theatre in New York City
3 Credits (3)
Students are introduced to the professional world of theatre via productions, speakers, and tours during this travel course. May be repeated up to 6 credits.
Learning Outcomes
1. To gain insight into professional theatre by viewing and reviewing Broadway productions in NYC.
2. To receive information about the business of theatre via guests who are theatre professionals.
3. To become familiar with job opportunities backstage via guided tours of professional theatre spaces in New York.

THEA 317. Musical Theatre
3 Credits (3)
Acting class focused on developing and refining skills necessary for performing in musicals. May be repeated up to 9 credits.
Prerequisite(s): THEA 1221 or THEA 1210 with a C- or better.

THEA 323. American Drama
3 Credits (3)
Masterworks of American drama from the 20th century to the present. Crosslisted with: ENGL 323.

THEA 324. Singing for Musical Theatre
3 Credits (3)
Students will gain an understanding of stronger vocal health, aural skills, and rehearsal practice strategies as they work on musical theatre singing techniques and performances including solos, duets and small groups, and a final public showcase.
Learning Outcomes
1. The ability to practice strong vocal habits in order to independently maintain vocal health.
2. Identify and utilize proper vocal warm-up techniques.
3. Display an improved level of music reading and aural awareness.
4. Analyze and break down a piece of theatrical music into components for focused learning.
5. Perform pieces of music theatre both individually and in a group with increased ease

THEA 330. Special Topics: Variable
3 Credits (3)
Specific subjects to be announced in the Schedule of Classes.
Learning Outcomes
1. To gain knowledge and/or skill in a specialty area of theatre

THEA 334. Introduction to Stage Makeup
3 Credits (3)
Basic principles of stage makeup: straight, character, and specialty. Includes study of various products, methods of application, and the effects of lighting on makeup.

THEA 337. Independent Study
1-3 Credits (1-3)
Students propose and design their own course not covered through regular course offerings under the guidance of faculty. Consent of Instructor required. May be repeated up to 6 credits.

THEA 341. Scene Painting
3 Credits (3)
Use of historical painting techniques in a project-driven classroom. Projects include 2-D and 3-D work, color mixing and theory, painting scenery, and the use of paint for effects.
Prerequisite(s): THEA 2310.

THEA 343. Costume Patterning
3 Credits (3)
Basic techniques in the production of flat patterns for modern and period silhouettes including some draping techniques. Consent of Instructor required. May be repeated up to 3 credits.
Learning Outcomes
1. Advanced training in costume design; the ability to create an original pattern in order to be able to make a costume item that is original

THEA 345. Costume Practicum
1 Credit (1)
A practical course intended to provide students additional experience and greater responsibility within the workings of the Costume Shop. May be repeated up to 1 credits.
Prerequisite(s): THEA 1310.

THEA 346. Scenic Practicum
1 Credit (1)
A practical course intended to provide students additional experience and greater responsibility within the workings of the Scene Shop. May be repeated up to 2 credits. Graded: S/U Grading (S/U, Audit).
Prerequisite(s): THEA 2310.

THEA 347. Lighting Practicum
1 Credit (1)
A practical course intended to provide students hands-on experience executing theatrical lighting.

THEA 348. Running Crew III
1 Credit (1)

Students will work on a technical aspect of a production in a rehearsal and performance environment. May be repeated up to 1 credit.
Prerequisite: THEA 1310,THEA 1415, and THEA 2415.
Learning Outcomes
1. To gain practical experience via work on a production.

THEA 349. Running Crew IV
1 Credit
Students will work on a technical aspect of a production in a rehearsal and performance environment.
Prerequisite(s): THEA 1415.

THEA 352. Costume Design
3 Credits (3)
Basic principles of costume design, including script analysis, principles of design, drawing and painting. May be repeated up to 3 credits.
Prerequisite: THEA 2340.
Learning Outcomes
1. To analyze a text in order to make appropriate design decisions.
2. To understand the principles of costume design and be able to communicate designs via various methods.

THEA 353. Scene Design
3 Credits (3)
Design for the performing arts. Basic design skills and projects to exercise those skills, history of design in the theatre and the designer's role in the production process. Final project includes a finished scene design.
Prerequisite: THEA 2310 and 2340 or consent of instructor.
Learning Outcomes
1. Gain the ability to communicate a set design via various means.
2. To understand the designer's role in the production process.
3. To communicate design ideas to collaborators.

THEA 354. Sound Design
3 Credits (3)
Hands-on training in theatrical sound design and implementation.
Prerequisite: THEA 2340.
Learning Outcomes
1. To understand the design elements of theatre sound.
2. To work with software in order to create sound for theatre.

THEA 355. Lighting Design
3 Credits (3)
Basic aspects of theatre lighting, including electricity, color theory, history, and types of lighting instruments.
Prerequisite: THEA 2340.
Learning Outcomes
1. To understand lighting equipment and how it functions.
2. To be able to create lighting using elements of design such as color theory.

THEA 356. Theatre Production
1-3 Credits
Participation in the production of theatrical performances by stage managing, acting, designing, dramaturgy, or directing. May be repeated for a maximum of 6 credits. Graded S/U.

THEA 357. Computer Scenographics
3 Credits (3)
Project-oriented course teaching basic computer modeling skills. Projects focus on the creation of communication tools designers use in the theatrical process. Students will develop portfolios of completed projects. Consent of instructor required. May be repeated up to 3 credits.
Prerequisite: THEA 2340 and THEA 352, THEA 353, or THEA 355.
Learning Outcomes
1. To gain the ability to draft via computer programs.
2. To create a portfolio of design projects.
3. To gain the ability to communicate using various design tools.

THEA 366. Summer Theatre
1-3 Credits
Experience in professional or academic summer theatre. May be repeated for a maximum of 3 credits. Graded: S/U. Restricted to THTR majors.
Prerequisite(s): Consent of department head.

THEA 384. Stage Management
3 Credits (3)
Study of stage management techniques and their application to play production. A working knowledge of union rules, and the procedure to facilitate these through proper communication skills.

THEA 395. Directing I
3 Credits (3)
Study and application of basic stage directing techniques.
Prerequisite(s): THEA 1210 or THEA 1221.

THEA 408. Shakespeare I
3 Credits (3)
Study in Shakespeare's early poems and plays. Repeatable for up to six credits under different subtitles.
Learning Outcomes
1. Analyze Shakespeare's poetry using the methods of close reading
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays;
3. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance

THEA 409. Shakespeare II
3 Credits (3)
Study in Shakespeare's later plays. ENGL 408 is not a prerequisite. Repeatable for up to six credits under different subtitles. Crosslisted with ENGL 409.
Learning Outcomes
1. Analyze Shakespeare's poetry using the methods of close reading;
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays;
3. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance.

THEA 410. Advanced Acting: Contemporary Methods
3 Credits (3)
Acting techniques will be explored focusing on current trends in the profession, from Stanislavski, to Hagen to Meisner. Restricted to: THTR majors.
Prerequisite: THEA 1210 or THEA 1221.

THEA 414. Collaborative Theatre-Making
3 Credits (3)

This course introduces students to the techniques, skills and practice of the collaborative creation of new theatrical material. May be repeated up to 6 credits.

Learning Outcomes

1. Students will be introduced to research methods which allow for the creation of original theatrical work.
2. Students will be assigned teams and will learn the collaborative process, from the sharing of research to clear communication skills.
3. Students will be able to present original work, via a directed rehearsal process with peers.

THEA 417. Musical Theatre II
3 Credits (3)
A continuation of THEA 317, allowing for more advanced musical theatre techniques.
Prerequisite(s): THEA 317.

THEA 430. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits.

THEA 435. Directed Reading
1-3 Credits
Directed individualized studies. May be repeated for a maximum of 3 credits.

THEA 439. Senior Seminar
3 Credits (3)
Course preparing students for professions in and related to the theatre. Restricted to: THTR majors.

THEA 450. The Michael Chekhov Acting Intensive
3 Credits (3)
An intensive overview of the performance techniques attributed to Michael Chekhov, applied to theatrical scenes and presentations. May be repeated up to 6 credits. Consent of Instructor required.

THEA 535. Directed Study
1-3 Credits (1-3)
For the highly motivated student. Independent projects and individual guidance. Graduate standing and consent of instructor required. May be repeated up to 6 credits.

Name: Wil Kilroy, Department Head

Office Location: ASNMSU Center for the Arts, Room 321

Phone: (575) 646-5122

Website: https://theatre.nmsu.edu/

Theatre Arts - Bachelor of Arts

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1, 2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Science Course (4 credits) [1]		
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Sciences or Social/Behavioral Course (4 or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
THEA 1221	Beginning Acting	3
THEA 1222	Stage Movement	3
THEA 1223	The Art of Theatre	3
THEA 2310 & 2310L	Stagecraft and Stagecraft Laboratory	4
THEA 1310 & 1310L	Introduction to Costuming and Costume Craft Lab	4
THEA 1415	Running Crew I	2
THEA 2993	Theatre Workshop I (.5 X 4 semesters) [4]	2
THEA 2421	Vocal Production for the Actor	3
THEA 2415	Running Crew II	1
THEA 2340	Introduction to Design	3
THEA 303	Theatre History I (Offered in alternate years)	3
THEA 304	Theatre History II (Offered in alternate years)	3
THEA 345	Costume Practicum	1
THEA 346	Scenic Practicum	1
THEA 347	Lighting Practicum	1
THEA 348	Running Crew III	1
THEA 349	Running Crew IV	1
THEA 395	Directing I	3
THEA 439	Senior Seminar (Offered Fall only)	3
THEA elective courses		
Select one from the following:		3
THEA 306	Script Analysis	
THEA 307V	Society in Style: Fashion, History and Culture	
THEA 308	Creative Writing: Playwriting	
THEA 323	American Drama	
Select one from the following:		3
THEA 352	Costume Design	
THEA 353	Scene Design	
THEA 354	Sound Design	
THEA 355	Lighting Design	
Select 9 credits from THEA 300/400 level courses [5]		9
2 credits required as senior capstone		2
THEA 430	Special Topics [2] credits required as senior capstone	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 [6]		**17-20**
Total Credits		**120**

1 See the General Education (p. 262) section of the catalog for a full list of courses.
2 A Mathematics General Education course is required but students may need to take any prerequisites needed to enter the course selected first.
3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

[4] Theatre majors must enroll in Theatre Workshop each semester. THEA 2993 Theatre Workshop I for freshmen and sophomores and THEA 300 Theatre Workshop II for juniors and seniors, 2 credits total for each course equaling a total of 4 credits.

[5] Courses from this category must not duplicate selections above.

[6] Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in Theatre Arts there is no second language requirement for the degree.

A Suggested Plan of Study

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G or ENGL 1110H	Composition I (C- or better) or Composition I Honors	4
MATH 1130G	Survey of Mathematics (C- or better) [1]	3
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course [2]		3-4
THEA 1221	Beginning Acting (C- or better) [3]	3
THEA 1223	The Art of Theatre (Either an Area III/IV: Laboratory Science Course or Social/ Behavioral Sciences Course)	3
THEA 2993	Theatre Workshop I (C- or better)	0.5
Area IV: Social/Behavioral Sciences Course [2]		3
Area V: Humanities Course [2]		3
THEA 2310 & 2310L or THEA 1222	Stagecraft (C- or better in both; tech design take this 2nd semester; performers take Stage Movement) [3] or Stage Movement	3-4
THEA 1415	Running Crew I (C- or better)	2
THEA 2993	Theatre Workshop I (C- or better)	0.5
Elective Course [6]		2
	Credits	**30-32**
Sophomore		
Choose one from the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
THEA 1310 & 1310L	Introduction to Costuming and Costume Craft Lab (C- or better in both) [3]	4
THEA 2993	Theatre Workshop I (C- or better)	0.5
THEA 303	Theatre History I (C- or better)	3
THEA 2421	Vocal Production for the Actor (C- or better)	3
THEA 2415	Running Crew II (C- or better)	1
THEA 2340	Introduction to Design (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
THEA 1222 or THEA 2310 ***and*** THEA 2310L	Stage Movement (C- or better; performers take Stagecraft and lab 2nd year, design/tech students take Stage Movement) or Stagecraft ***and*** Stagecraft Laboratory	3-4
THEA 2993	Theatre Workshop I (C- or better)	0.5
THEA 304	Theatre History II (C- or better)	3
THEA 345	Costume Practicum (C- or better)	1
THEA 347	Lighting Practicum (C- or better)	1
THEA 348	Running Crew III (C- or better)	1
Choose one from the following:		3
THEA 308	Creative Writing: Playwriting	
THEA 323	American Drama	
	Credits	**33-34**
Junior		
Area III: Laboratory Science Course [2]		4
General Education Elective Course [2]		3-4
THEA 300	Theatre Workshop II (C- or better)	0.5
THEA 346	Scenic Practicum (C- or better)	1
THEA 349	Running Crew IV (C- or better)	1
Viewing a Wider World Courses [5]		6
THEA 395	Directing I (C- or better)	3
Choose one from the following:		3
THEA 352	Costume Design (C- or better)	
THEA 353	Scene Design (C- or better)	
THEA 354	Sound Design (C- or better)	
THEA 355	Lighting Design (C- or better)	
THEA Elective Course (Upper-Division) (C- or better)		3
THEA 300	Theatre Workshop II (C- or better)	0.5
Elective Courses [6]		4
	Credits	**29-30**
Senior		
THEA 300	Theatre Workshop II (C- or better)	0.5
Area VI: Creative and Fine Arts Course [2]		3
THEA Elective Courses (Upper-Division)(C- or better)		6
THEA 439	Senior Seminar (C- or better)	3
Elective Courses (Upper-Division) [6]		9
THEA 300	Theatre Workshop II (C- or better)	0.5
Elective Courses [6]		6
	Credits	**28**
	Total Credits	**120-124**

[1] MATH 1130G Survey of Mathematics is suggested for the degree but students may need to take any prerequisites needed to enter MATH 210G first or any other General Education Mathematics course.

[2] See the General Education (p. 262) section of the catalog for a full list of courses

[3] THEA 1221 Beginning Acting, THEA 2310 Stagecraft/ THEA 2310L Stagecraft Laboratory, THEA 1310 Introduction to Costuming/ THEA 1310L Costume Craft Lab can be taken in any order, but all five courses must be completed by the end of Year Two.

[5] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

[6] Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Theatre Arts (Design/Technical/Management) - Bachelor of Arts

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1, 2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Science Course (4 credits) [1]		
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Sciences or Social/Behavioral Course (4 or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
THEA 1221	Beginning Acting	3
THEA 1222	Stage Movement	3
THEA 1223	The Art of Theatre	3
THEA 2310 & 2310L	Stagecraft and Stagecraft Laboratory	4
THEA 1310 & 1310L	Introduction to Costuming and Costume Craft Lab	4
THEA 1415	Running Crew I	2
THEA 2993	Theatre Workshop I (.5 X 4 semesters) [4]	2
THEA 2421	Vocal Production for the Actor	3
THEA 2415	Running Crew II	1
THEA 2340	Introduction to Design	3
THEA 300	Theatre Workshop II (.5 X 4 semesters) [4]	2
THEA 303	Theatre History I (Offered in alternate years)	3
THEA 304	Theatre History II (Offered in alternate years)	3
THEA 345	Costume Practicum	1
THEA 346	Scenic Practicum	1
THEA 347	Lighting Practicum	1
THEA 348	Running Crew III	1
THEA 349	Running Crew IV	1
THEA 395	Directing I	3
THEA 439	Senior Seminar (Offered Fall only)	3
Design/Technical/Management Concentration Coursework		
THEA 330	Special Topics: Variable	3
THEA 356	Theatre Production	3
THEA 384	Stage Management	3
Theatre Elective Courses		
Select one from the following:		3
THEA 306	Script Analysis	
THEA 307V	Society in Style: Fashion, History and Culture	
THEA 308	Creative Writing: Playwriting	
THEA 323	American Drama	
Select one from the following:		3
THEA 352	Costume Design	
THEA 353	Scene Design	
THEA 354	Sound Design	
THEA 355	Lighting Design	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 [6]		**17-20**
Total Credits		**120**

[1] See the General Education (p. 262) section of the catalog for a full list of courses.

[2] A Mathematics General Education course is required but students may need to take any prerequisites needed to enter the course selected first.

[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

[4] Theatre majors must enroll in Theatre Workshop each semester. THEA 2993 Theatre Workshop I for freshmen and sophomores and THEA 300 Theatre Workshop II for juniors and seniors, 2 credits total for each course equaling a total of 4 credits.

[5] Courses from this category must not duplicate selections above.

[6] Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in Theatre Arts there is no second language requirement for the degree.

A Suggested Plan of Study

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		Credits
ENGL 1110G or ENGL 1110H	Composition I (C- or better) or Composition I Honors	4
MATH 1130G	Survey of Mathematics (C- or better) [1]	3
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course [2]		3-4
THEA 1221	Beginning Acting (C- or better) [3]	3

THEA 1223	The Art of Theatre (Either an Area III/IV: Laboratory Science Course or Social/ Behavioral Sciences Course)	3
THEA 2993	Theatre Workshop I (C- or better)	0.5
Area IV: Social/Behavioral Sciences Course [2]		3
Area V: Humanities Course [2]		3
THEA 2310 & 2310L or THEA 1222	Stagecraft (C- or better in both; tech design take this 2nd semester; performers take Stage Movement) [3] or Stage Movement	3-4
THEA 1415	Running Crew I (C- or better)	2
THEA 2993	Theatre Workshop I (C- or better)	0.5
Elective Course [6]		2
	Credits	**30-32**
Sophomore		
Choose one from the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
THEA 1310 & 1310L	Introduction to Costuming and Costume Craft Lab (C- or better in both) [3]	4
THEA 2993	Theatre Workshop I (C- or better)	0.5
THEA 303	Theatre History I (C- or better)	3
THEA 2421	Vocal Production for the Actor (C- or better)	3
THEA 2415	Running Crew II (C- or better)	1
THEA 2340	Introduction to Design (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
THEA 1222 or THEA 2310 ***and*** THEA 2310L	Stage Movement (C- or better; performers take Stagecraft and lab 2nd year, design/tech students take Stage Movement) or Stagecraft ***and*** Stagecraft Laboratory	3-4
THEA 2993	Theatre Workshop I (C- or better)	0.5
THEA 304	Theatre History II (C- or better)	3
THEA 345	Costume Practicum (C- or better)	1
THEA 347	Lighting Practicum (C- or better)	1
THEA 348	Running Crew III (C- or better)	1
Choose one from the following:		3
THEA 308	Creative Writing: Playwriting	
THEA 323	American Drama	
	Credits	**33-34**
Junior		
Area III: Laboratory Science Course [2]		4
General Education Elective Course [2]		3-4
THEA 300	Theatre Workshop II (C- or better)	0.5
THEA 346	Scenic Practicum (C- or better)	1
THEA 349	Running Crew IV (C- or better)	1
Viewing a Wider World Courses [5]		6
THEA 395	Directing I (C- or better)	3
Choose one from the following:		3
THEA 352	Costume Design (C- or better)	
THEA 353	Scene Design (C- or better)	
THEA 354	Sound Design (C- or better)	
THEA 355	Lighting Design (C- or better)	
THEA Elective Course (Upper-Division) (C- or better)		3
THEA 300	Theatre Workshop II (C- or better)	0.5
Elective Courses [6]		4
	Credits	**29-30**
Senior		
THEA 300	Theatre Workshop II (C- or better)	0.5
Area VI: Creative and Fine Arts Course [2]		3
THEA Elective Courses (Upper-Division)(C- or better)		6
THEA 439	Senior Seminar (C- or better)	3
Elective Courses (Upper-Division) [6]		9
THEA 300	Theatre Workshop II (C- or better)	0.5
Elective Courses [6]		6
	Credits	**28**
	Total Credits	**120-124**

1 MATH 1130G Survey of Mathematics is suggested for the degree but students may need to take any prerequisites needed to enter MATH 210G first or any other General Education Mathematics course.

2 See the General Education (p. 262) section of the catalog for a full list of courses

3 THEA 1221 Beginning Acting, THEA 2310 Stagecraft/ THEA 2310L Stagecraft Laboratory, THEA 1310 Introduction to Costuming/ THEA 1310L Costume Craft Lab can be taken in any order, but all five courses must be completed by the end of Year Two.

5 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

6 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Theatre Arts (Musical Theatre) - Bachelor of Arts

The Musical Theatre concentration is designed to provide students with training in musical theatre performance, including singing, dancing and acting.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics [1, 2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
Area III: Laboratory Science Course (4 credits) [1]		

Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Either an Area III/IV: Laboratory Sciences or Social/Behavioral Course (4 or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
THEA 1221	Beginning Acting	3
THEA 1222	Stage Movement	3
THEA 1223	The Art of Theatre	3
THEA 2310 & 2310L	Stagecraft and Stagecraft Laboratory	4
THEA 1310 & 1310L	Introduction to Costuming and Costume Craft Lab	4
THEA 1415	Running Crew I	2
THEA 2993	Theatre Workshop I (.5 X 4 semesters) [4]	2
THEA 2421	Vocal Production for the Actor	3
THEA 2415	Running Crew II	1
THEA 2340	Introduction to Design	3
THEA 300	Theatre Workshop II (.5 X 4 semesters) [4]	2
THEA 303	Theatre History I	3
THEA 304	Theatre History II	3
THEA 317	Musical Theatre	3
THEA 345	Costume Practicum	1
THEA 346	Scenic Practicum	1
THEA 347	Lighting Practicum	1
THEA 348	Running Crew III	1
THEA 349	Running Crew IV	1
THEA 395	Directing I	3
THEA 417	Musical Theatre II	3
THEA 439	Senior Seminar	3
Select one from the following:		3
THEA 306	Script Analysis	
THEA 308	Creative Writing: Playwriting	
THEA 323	American Drama	
Select one from the following:		3
THEA 352	Costume Design	
THEA 353	Scene Design	
THEA 354	Sound Design	
THEA 355	Lighting Design	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
DANC 2460	Dance for Musical Theatre	2
Select 4-6 credits from the following:		4-6
DANC 1130	Ballet I	
DANC 1150	Modern Dance I	
DANC 2130	Ballet II	
DANC 2150	Modern Dance II	
DANC 3130	Ballet III	
DANC 3150	Modern Dance III	
Voice or Applied Music-Vocal [4]		*6*
MUSC 1992	Applied Music	
MUSC 2120	Major Ensemble	
MUSC 2993	Opera Workshop	
MUSC 351	Opera Workshop	
MUSC 361	Concert Choir II	
MUSC 363	Jazz Ensembles II	
THEA 324	Singing for Musical Theatre	
Second Language Requirement: (not required)		
Electives, to bring the total credits to 120 [6]		**6-11**
Total Credits		**120**

1 See the General Education (p. 262) section of the catalog for a full list of courses.

2 A Mathematics General Education course is required but students may need to take any prerequisites needed to enter the course selected first.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 Two of the required vocal credits may be in choral ensemble or opera workshop.

5 Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Arts in Theatre Arts with a Concentration in Musical Theatre there is no second language requirement for the degree.

A Suggested Plan of Study

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		**Credits**
ENGL 1110G	Composition I (C- or better)	4
MATH 1130G	Survey of Mathematics (C- or better) [1]	3
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Science Course [2]		3-4
THEA 1221	Beginning Acting (Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Science Course) [3]	3
THEA 1223	The Art of Theatre (C- or better)	3
THEA 2993	Theatre Workshop I	0.5
Area III: Laboratory Science Course [2]		4
Area IV: Social/Behavioral Sciences Course [2]		3
THEA 2310 & 2310L or THEA 1222	Stagecraft (C- or better) [3] or Stage Movement	3-4
THEA 1415	Running Crew I (C- or better)	2
THEA 2993	Theatre Workshop I (C- or better)	0.5
	Credits	**29-31**
Sophomore		
Choose from one of the following:		3
ENGL 2210G	Professional and Technical Communication Honors	
ENGL 2221G	Writing in the Humanities and Social Science	
THEA 1310 & 1310L	Introduction to Costuming and Costume Craft Lab (C- or better in both) [3]	4

THEA 2993	Theatre Workshop I (C- or better)	0.5
THEA 2415	Running Crew II (C- or better)	1
THEA 2421	Vocal Production for the Actor (C- or better)	3
THEA 2340	Introduction to Design (C- or better)	3
THEA 303	Theatre History I (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
THEA 1222 or THEA 2310 ***and*** THEA 2310L	Stage Movement (C- or better) or Stagecraft ***and*** Stagecraft Laboratory	3-4
THEA 2993	Theatre Workshop I (C- or better)	0.5
THEA 317	Musical Theatre (C- or better)	3
THEA 345	Costume Practicum (C- or better)	1
THEA 348	Running Crew III (C- or better)	1
DANC 2460	Dance for Musical Theatre (C- or better)	2
MUSC 1992	Applied Music (C- or better) [4]	2
	Credits	**33-34**
Junior		
Area V: Creative and Fine Arts Course [2]		3
Area V: Humanities Course [2]		3
THEA 300	Theatre Workshop II (C- or better)	0.5
THEA 346	Scenic Practicum (C- or better)	1
THEA 347	Lighting Practicum (C- or better)	1
THEA 349	Running Crew IV (C- or better)	1
Choose one from the following:		3
THEA 306	Script Analysis	
THEA 308	Creative Writing: Playwriting	
THEA 323	American Drama	
MUSC 1992	Applied Music (C- or better) [4]	2
THEA 300	Theatre Workshop II (C- or better)	0.5
THEA 304	Theatre History II (C- or better)	3
THEA 395	Directing I (C- or better)	3
THEA 417	Musical Theatre II (C- or better)	3
MUSC 1992	Applied Music (DANC Course Elective (C- or better)) [4]	2
Elective Courses [8]		2
	Credits	**28**
Senior		
Viewing a Wider World Courses [6]		6
General Education Elective Course [2]		3-4
DANC Course Elective Courses [7]		4-6
THEA 300	Theatre Workshop II (C- or better)	0.5
THEA 439	Senior Seminar (C- or better)	3
THEA 300	Theatre Workshop II (Elective Course (Upper-Division))	0.5
Choose one from the following:		3
THEA 352	Costume Design (C- or better)	
THEA 353	Scene Design (C- or better)	
THEA 354	Sound Design (C- or better)	
THEA 355	Lighting Design (C- or better)	
Elective Courses (Upper-Division) [8]		10
	Credits	**30-33**
	Total Credits	**120-126**

1 MATH 1130G Survey of Mathematics is suggested for the degree but students may need to take any prerequisites needed to enter MATH 1130G first or any other General Education Mathematics course.

2 See the General Education (p. 262) section of the catalog for a full list of courses

3 THEA 1221 Beginning Acting, THEA 2310 Stagecraft/ THEA 2310L Stagecraft Laboratory, THEA 1310 Introduction to Costuming/ THEA 1310L Costume Craft Lab can be taken in any order, but all five courses must be completed by the end of Year Two.

4 Students must complete a total of 6 credits of THEA 324 Singing for Musical Theatre, MUSC 1992 Applied Music (2 credits can be fulfilled with MUSC 2120, MUSC 2993, MUSC 351, MUSC 361 Concert Choir II, or MUSC 368)

6 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

7 **DANC Courses:** (be mindful of course prerequisites when registering)

- DANC 1130 Ballet I
- DANC 1150 Modern Dance I
- DANC 2130 Ballet II
- DANC 2150 Modern Dance II
- DANC 3130 Ballet III
- DANC 3150 Modern Dance III

8 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Theatre Arts - Undergraduate Minor

The Department of Theatre Arts has one minor in Theatre Arts. Students must pass a minimum of 18 credits in consultation with a theatre department faculty member. NOTE: 9 credits must be 300 level and above. THEA credits must earn grades of C- or higher to earn the minor. A student cannot earn both a BA in Theatre Arts and a minor in Theatre Arts.

College of Business

Dean - ***Bryan Ashenbaum***

Associate Dean for Research and Graduate Programs - ***Carlo Mora***

Associate Dean for Student Affairs and Curriculum - ***Benjamin Widner***

Assistant Dean for Budget and Finance - ***Lourdes Alvarado-Salas***

Mission of the College of Business

The College of Business transforms lives by providing highly respected programs, instruction and scholarly activities that drive economic, social, educational and community development for New Mexico's diverse population.

Requirements for the Bachelor Degrees

- Successful completion of the New Mexico General Education Requirements and NMSU Viewing a Wider World Courses.
- Successful completion of College of Business Requirements below and major requirements. For the Bachelor of Arts in Economics, see the Economics and International Business (p. 988) section for specific requirements.
- A minimum cumulative grade point average (GPA) of 2.0 in all courses taken at NMSU to meet lower and upper division business core and major requirements.
- All majors except Economics and International Business require a minimum cumulative GPA of 2.0 in all courses taken to meet the requirements of the major. For Economics and International Business majors, a minimum cumulative GPA of 2.5 is required for courses taken to meet the requirements for the major.
- A minimum of 50% of business credits required for a Bachelor of Accountancy or Bachelor of Business Administration degree or 18 business credits required for a Bachelor of Arts in Economics degree must be completed in the College of Business and a minimum of 12 credits required in the major must be completed in the College. See sections below for major-specific transfer criteria. A total of no more than six credits of courses designated as 300E may be used to satisfy the required upper division business elective, the ECON/A ST elective, and electives in the major.

The only courses that may be taken on an S/U option by students in the College of Business are those designated S/U only, general electives outside the college, and up to 9 credits of HNRS courses used to fulfill General Education requirements.

Before taking upper-division courses (numbered 300 or above) offered by the College of Business, students must complete all lower-division course requirements with the required minimum grades or better.

Upper division business course credits completed more than ten years prior to the degree application will be reviewed by the course department head and dean (or a designee) to determine their continued suitability to satisfy current degree, major and minor requirements and learning objectives.

Course Requirements

Prefix	Title	Credits
General Education Requirements		
Grades of C- or better are required in general education communications courses.		
Area I: Communications		
English Composition - Level 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I Multilingual	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra (Foundation Requirement) [1]	3
Area III/IV: Laboratory Science and Social/Behavioral SciencesCourses		*10*
Area III: Laboratory Science Course (4 credit) [2]		
Grades of C- or better are required in ECON 2110G and ECON 2120G.		
ECON 2110G	Macroeconomic Principles (Business Core: Lower Division)	
ECON 2120G	Microeconomics Principles (Business Core: Lower Division)	
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		*3*
MATH 1430G	Applications of Calculus I	
Viewing a Wider World Courses [3]		**6**
Foundation Requirements [4]		
Choose one from the following (grade of C- or better required):		3
If MATH 1350G is taken before MATH 1220G then the Statistics course will satisfy the Area II Requirement and MATH 1220G must be taken as a foundation requirement [1]		
MATH 1350G	Introduction to Statistics (Foundation Requirement)	
A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)	
Business Core: Lower Division (minimum grades of C- required)		
ACCT 2110	Principles of Accounting I (not recommended for freshman year)	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
BCIS 485	Enterprise Resource Planning [5]	3
or MGMT 344	Production and Operations Management	
or MGMT 470	Project Management in Organizations	
Upper division Economics or Applied Statistics elective from the following prefixes: A ST (excluding A ST 311), ECON		3
Upper division business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
Major Courses [6]		**24-27**
Electives, to bring the total credits 120		
Select additional credits to bring total degree credits to a minimum of 120 and upper division credits to 48. The number of general elective credits varies by student and major. [6]		13-16
Total Credits		**120**

1 Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

[3] A description of the requirement and a listing of approved VWW courses can be found in this catalog under Required Courses (p. 262).

[4] All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G, MATH 1430G and MATH 1350G orA ST 311 must be completed.

[5] Management - Project Supply Change majors may not use MGMT 470 Project Management in Organizations to satisfy this requirement since it is a requirement in the major; Accounting majors must take BCIS 485 Enterprise Resource Planning.

[6] Major course credits and Elective credits vary based on the major chosen. Please see the departmental/major pages for specifics on the number of major and elective credits required: Economics (Bachelor of Arts) (p. 997); Accounting (p. 981); Economics (p. 998); Finance (p. 1011); General Business (p. 1023); Information Systems (p. 983); International Business (p. 1002); Management (p. 1018); Marketing (https://business.nmsu.edu/strategic-marketing/).

Associate in Prebusiness Degree

To complete the associate degree, 60 credits are required, including the General Education Requirements, College of Business Foundation and Business Core (lower division) requirements.

A minimum cumulative grade point average of 2.0 is also required. The last 15 credits towards the degree must be earned through the NMSU system.

Minors in Business

Minors are available in

- accounting
- advertising
- banking and financial planning
- business administration
- business law
- economics
- enterprise systems
- entrepreneurship and innovation
- finance
- information systems
- international business
- management
- marketing
- professional selling
- risk management and insurance

Students pursuing the Bachelor of Individualized Studies or the Bachelor of Applied Studies are not eligible for minors from the College of Business other than the minor in business administration. At least 12 credits of the minor must be completed at the NMSU College of Business.

Preprofessional Programs

NMSU offers a number of programs designed for transfer to professional schools through its undergraduate colleges. The programs that are administered by the College of Business is Prelaw, it is also administered through the College of Arts and Sciences

Prelaw Students

Law schools will accept undergraduates who have earned bachelor's degrees in any major. Many prelaw students take some law courses in their undergraduate program. The College of Arts and Sciences supervises a Supplementary Major in Law and Society, which includes courses from a number of departments and several colleges. It is described under "Government" in the Arts and Sciences chapter. The College of Business offers a number of Business Law courses which can be found under the prefix BLAW in the course description chapter later in this catalog. The Department of Philosophy in the College of Arts and Sciences offers both a major and a minor in Justice, Political Philosophy, and Law that cultivates a reasoned understanding of law and legal institutions, as well as the moral theories that support the value and justice of these institutions. The description of this major is found under the description "Philosophy."

Because the practice of law often involves business-related problems, the majors in the college provide an excellent preparation for the prelaw student. The college has attorneys on the faculty who are available as advisors. Please contact the Finance Department for more information.

Transferring Business Courses

The Transfer Course Equivalency Search tool found at https://miniapps.nmsu.edu/transfer/ serves as *a general guide* in evaluation of transfer courses. However, transferability and applicability to an NMSU business or accounting degree or minor is not guaranteed until review and approval by the College of Business. Generally, for an upper division business course taken elsewhere to fulfill the requirements of an upper division business "equivalent" course at NMSU, the transferring school must have been accredited by AACSB at the time the course was taken, or, if not, have been regionally accredited and the course's content and rigor comparable to the "equivalent" course offered at NMSU. Transfer students are encouraged to contact the Associate Academic Dean in the College of Business for content and rigor review of potential upper division transfer courses prior to or shortly after enrollment at NMSU.

Associate Degree

- Prebusiness - Associate in Prebusiness (p. 972)

Bachelors Degrees

A

- Accounting - Bachelor of Accountancy (p. 981)
- Accounting - Bachelor of Accountancy (Online) (https://catalogs.nmsu.edu/global/nmsu-global/accounting-bachelor-accountancy-online/)

E

- Economics (Energy Economics) - Bachelor of Business Administration (p. 1000)
- Economics - Bachelor of Arts in Economics (p. 997)
- Economics - Bachelor of Business Administration (p. 998)

F

- Finance (Financial Analysis) - Bachelor of Business Administration (p. 1013)

- Finance (Risk Management and Insurance) - Bachelor of Business Administration (p. 1014)
- Finance - Bachelor of Business Administration (p. 1011)

G

- General Business (Entrepreneurship) - Bachelor of Business Administration (p. 1025)
- General Business - Bachelor of Business Administration (p. 1023)
- General Business - Bachelor of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/general-business-bba-online/)

H

- Human Resource Management - Undergraduate Minor (p. 1032)

I

- Information Systems - Bachelor of Business Administration (p. 983)
- Information Systems - Bachelor of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/information-systems-bba-online/)
- International Business - Bachelor of Business Administration (p. 1002)

M

- Management (Human Resource Management) - Bachelor of Business Administration (p. 1027)
- Management (Human Resource Management) - Bachelor of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/management-human-resource-management-bba-online/)
- Management (Project & Supply Chain Management) - Bachelor of Business Administration (p. 1029)
- Management (Small Business Management & Entrepreneurship) - Bachelor of Business Administration (p. 1031)
- Marketing (Advertising) - Bachelor of Business Administration (p. 1042)
- Marketing (PGA Golf Management) - Bachelor of Business Administration (p. 1043)
- Marketing (Professional Selling) - Bachelor of Business Administration (p. 1045)
- Marketing (Strategic Marketing) - Bachelor of Business Administration (p. 1047)
- Marketing - Bachelor of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/marketing-bba-online/)

Masters Degrees

A

- Accounting - Master of Accountancy (p. 93)
- Applied Statistics - Master of Science (p. 107)

B

- Business Administration (Agribusiness) - Master of Business Administration (p. 117)
- Business Administration (Finance) - Master of Business Administration (p. 119)
- Business Administration (Health Services Management) - Master of Business Administration (p. 120)
- Business Administration (Health Services Management) - Master of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/business-administration-health-services-mgt-mba-online/)
- Business Administration (Information Systems) - Master of Business Administration (p. 121)
- Business Administration (Information Systems) - Master of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/business-administration-information-systems-mba-online/)
- Business Administration (Public Utility Regulations) - Master of Business Administration (p. 123)
- Business Administration (Public Utility Regulations) - Master of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/business-administration-public-utility-regulations-mba-online/)
- Business Administration - Master of Business Administration (p. 115)
- Business Administration - Master of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/business-administration-mba-online/)

E

- Economics (Econometrics) - Master of Arts (p. 145)
- Economics (Public Policy) - Master of Arts (p. 145)
- Economics (Public Utility Policy and Regulation) - Master of Arts (p. 146)
- Economics (Public Utility Policy and Regulation) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/economics-public-utility-policy-regulation-ma-online/)
- Economics - Master of Arts (p. 144)
- Economics - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/economics-ma-online/)

Doctoral Degrees

A

- Applied Statistics - Doctor of Philosophy (p. 203)

B

- Business Administration (Management) - Doctor of Philosophy (p. 208)
- Business Administration (Marketing) - Doctor of Philosophy (p. 209)

E

- Economic Development - Doctor of Economic Development (p. 214)

Graduate Certificates

- Finance - Graduate Certificate (p. 248)
- Public Utility Regulation and Economics - Graduate Certificate (p. 250)
- Public Utility Regulation and Economics - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/public-utility-regulation-economics-gr-certificate-online/)

Undergraduate Minors

- Accounting - Undergraduate Minor (p. 985)
- Advertising - Undergraduate Minor (p. 1049)
- Business Administration - Undergraduate Minor (p. 987)
- Business Law - Undergraduate Minor (p. 1016)
- Economics - Undergraduate Minor (p. 1005)
- Enterprise Systems - Undergraduate Minor (p. 986)
- Entrepreneurship - Undergraduate Minor (p. 1017)
- Finance - Undergraduate Minor (p. 1017)
- Human Resource Management - Undergraduate Minor (p. 1032)
- Information Systems - Undergraduate Minor (p. 986)
- International Business - Undergraduate Minor (p. 1005)
- Management - Undergraduate Minor (p. 1033)
- Management - Undergraduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/management-undergraduate-minor-online/)
- Marketing - Undergraduate Minor (p. 1049)
- Professional Selling - Undergraduate Minor (p. 1049)
- Risk Management and Insurance - Undergraduate Minor (p. 1017)
- Risk Management and Insurance - Undergraduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/risk-management-insurance-undergraduate-minor-online/)

Graduate Minors

- Applied Statistics - Graduate Minor (p. 254)
- Economics - Graduate Minor (p. 255)
- Information Systems - Graduate Minor (p. 257)

Accreditation

New Mexico State University has been accredited since 1926 by the Higher Learning Commission of the North Central Association of Colleges and Secondary Schools as a degree-granting institution. The university was accredited in 1954 by the American Association of University Women.

The baccalaureate and graduate degree programs in business and accounting offered in the College of Business are accredited by AACSB International—The Association to Advance Collegiate Schools of Business.

Prebusiness - Associate in Prebusiness

Students must complete all University degree requirements, which include: General Education requirements and elective credits to total at least 60 credits. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirements		
Area I: Communications		
English Composition Level I		
ENGL 1110G	Composition I [2]	4
English Composition Level II		
ENGL 2210G	Professional and Technical Communication Honors [2]	3
Oral Communication		
COMM 1115G	Introduction to Communication [2]	3
or COMM 1130G	Public Speaking	
Area II: Mathematics		
MATH 1220G	College Algebra [1, 2]	3
Areas III/IV: Laboratory Science and Social/Behavioral Sciences		*10*
ECON 2110G	Macroeconomic Principles [2]	
ECON 2120G	Principles of Microeconomics [2]	
Select one course from Area III: Laboratory Science (4 credits) [3]		
Area V: Humanities		
Select one course from Area V: Humanities. [3]		3
Area VI: Creative/Fine Arts		
Select one course from Area VI: Creative/Fine Arts [3]		3
General Education Elective		
MATH 1430G	Applications of Calculus I [2]	3
Program Requirements		
ACCT 2110	Principles of Accounting I [2]	3
ACCT 2120	Principles of Accounting II [2]	3
BCIS 1110	Introduction to Information Systems [2]	3
BUSA 1110	Intro to Business [2]	3
MATH 1350G	Introduction to Statistics [2]	3
Electives, to bring the total credits to 60 [4,5]		**13**
Total Credits		**60**

1. MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.
2. A grade of C- or better is required.
3. See the General Education Section (p. 262) of the catalog for a full list of courses.
4. Elective credit may vary based on General Education course selection, second language requirements, prerequisites, dual credit, A credit, double majors and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 60 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
5. Although only 60 credits, excluding developmental coursework, are required for the degree, depending on required developmental coursework and electives taken, total credits actually earned may exceed 60.

Accounting and Information Systems

Undergraduate Program Information

The Bachelor of Accountancy degree is available to students choosing accounting as a major. The curriculum is designed to prepare you for the excellent opportunities that exist in public accounting practice and in business, government and nonprofit organizations. It is also appropriate for those who may choose to seek either the Master of Accountancy or the Master of Business Administration degree after graduation.

The Information Systems program students for a variety of administrative and technical positions in a wide range of organizations. Potential employers include information system service organizations, public accounting/consulting firms, manufacturing and merchandising

business, banks and other financial institutions, government and others that rely on information systems to support their business.

Graduate Program Information

The major objective of the Master of Accountancy (MAcc) program is to provide students with an increased depth of knowledge of accounting to prepare students more adequately for careers as professional accountants in financial institutions, government, not-for-profit organizations and public practice. The program is designed to provide a technical and theoretical foundation in accountancy at the advanced level and yet allow the student to take courses to accommodate individual needs. The Master of Accountancy also provides students a path to satisfy the 150 credits necessary to become a Certified Public Accountant.

Degrees for the Department

Bachelor Degrees

- Accounting - Bachelor of Accountancy (p. 981)
- Accounting - Bachelor of Accountancy (Online) (https://catalogs.nmsu.edu/global/nmsu-global/accounting-bachelor-accountancy-online/)
- Information Systems - Bachelor of Business Administration (p. 983)
- Information Systems - Bachelor of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/information-systems-bba-online/)

Master Degree

- Accounting - Master of Accountancy (p. 93)

Minors for the Department

- Accounting - Undergraduate Minor (p. 985)
- Enterprise Systems - Undergraduate Minor (p. 986)
- Information Systems - Graduate Minor (p. 257)
- Information Systems - Undergraduate Minor (p. 986)

Kevin Melendrez, Ph.D., Department Head

Professor Clemons, Mora-Monge; ***Associate Professor*** Arslan, Ewing, Joo, Melendrez, Zhang; ***Assistant Professor*** Cano-Bejar, Fuqua, Park, Perez, Rosser; ***College Associate Professor*** Hamilton; **College Assistant Professor** Mitchell, Shindi; ***Emeritus Professor*** Billiot, Foster, Mills, Oliver, Scribner, Seipel, Tunnell

F. Arslan, Ph.D. (Texas - El Paso)- information systems; M. J. Billiot (emeritus), D.B.A. (Mississippi State) C.P.A.-managerial and financial accounting; A. Cano-Bejar, Ph.D. (National Tsing Hua) - information systems; R. Clemons, Ph.D. (Texas A&M) C.P.A - taxation; R. Ewing, Ph.D. (Kentucky) C.P.A., C.M.A. - managerial accounting; T. Foster (emeritus), Ph.D. (Penn State); D. Fuqua, Ph.D. (New Mexico State) - supply chain optimization and big data predictive analytics; P. Hamilton, MBA (New Mexico State); T. Joo, Ph.D. (Arkansas) C.P.A - financial accounting and taxation; K. Melendrez, Ph.D. (Arizona)– financial accounting; S. Mills (emeritus), Ph.D. (Texas Tech) C.P.A.; P. Mitchell, MAcc (New Mexico State) C.P.A.; C. Mora -Monge, Ph.D. (Toledo) - supply chain management, information systems; R. Oliver (emeritus) Ph.D. (New Mexico State); J. Park, Ph.D. (Louisiana State) - financial accounting and accounting information systems; R. Perez, Ph.D. (Oregon) - financial accounting and audit; D. Rosser, Ph.D. (Arkansas) - financial accounting and audit; E. Scribner (emeritus), Ph.D.(Oklahoma State)- C.P.A.; C. Seipel (emeritus), Ph.D.(Oklahoma State)– C.P.A., C.F.E.; R. Shindi, Ph.D. (New Mexico State) - human-computer interaction; L. Tunnell (emeritus), Ph.D. (Oklahoma State) C.P.A.; Y. Zhang, Ph.D. (Texas Tech) - financial accounting.

Accounting Courses

ACCT 1115. Accounting Principles I
3 Credits (2+2P)
This is an introductory course in the theory and practice of accounting that covers the purpose of accounting, the accounting process, and the various types of ownership structure. Also covered are types of business, career opportunities in accounting, analyzing financial transactions, adjusting entries, accounting worksheets, financial statements, and the closing process. Computerized exercise problems are used to assist student understanding and proficiency. This course is only offered for fall enrollment.

ACCT 1120. Accounting Principles II
3 Credits (2+2P)
This course is a continuation of theory and practice of accounting study began in ACCT 1115. Specialized accounting procedures for a service business and its environment, entrepreneurship, and small businesses are emphasized. Topics covered include the modified cash basis and combination journal, accounting for cash, payroll accounting, employee earnings and deductions, payroll accounting, employer taxes, and reports. Restricted to Community Colleges campuses only.
Prerequisite: ACCT 1115 or ACCT 2110.

ACCT 1150. QuickBooks
3 Credits (2+2P)
An introductory course to QuickBooks Pro accounting software, including setting up a new company and chart of accounts; recording transactions for service and merchandising businesses with customers, vendors and employees; bank reconciliations; payroll; end-of-period procedures; financial reporting; managing lists; and running reports and forms and customizing them. Restricted to Community Colleges campuses only.
Prerequisite: Working knowledge of computers and accounting or consent of instructor.
Learning Outcomes
1. Understand differences and similarities between a manual accounting system and QuickBooks Online.
2. Identify and execute the four levels of operation within QuickBooks: New Company Setup, Lists, Activities, and Reports.
3. Record sales/collections, purchase/payments, inventory, adjusting entries.
4. Set up payroll, record payroll transactions, print paychecks, and view various payroll related reports.
5. Produce a variety of reports and financial statements.
6. Analyze reports to identify and correct errors.

ACCT 1410. Personal Tax Preparation
3 Credits (3)
Introduces basic federal and state tax codes for preparing individual income tax returns. Emphasis on use of tax software. Students will be required to pass a certification exam and assist in preparing individual tax returns for low income and elderly taxpayers.
Learning Outcomes
1. Explain basic personal income tax filing status requirements.
2. Use appropriate tax software to prepare simple income tax returns for individuals.
3. Answer basic tax questions.

4. Demonstrate personal and professional interview skills in an environment that demands confidentiality issues at all levels.

ACCT 200. A Survey of Accounting
3 Credits (3)
Emphasis on financial statement interpretation and development of accounting information for management. For engineering, computer science, and other non business majors. Community Colleges only.
Prerequisite: one C S course or consent of instructor.

ACCT 2110. Principles of Accounting I
3 Credits (3)
An introduction to financial accounting concepts emphasizing the analysis of business transactions in accordance with generally accepted accounting principles (GAAP), the effect of these transactions on the financial statements, financial analysis, and the interrelationships of the financial statements.
Learning Outcomes
1. Analyze business transactions, their effects on the financial statements and the interrelationships of the financial statements involving the following:Cash transactions; Receivables and Net Realizable Value; Operational Assets and Depreciation; Inventory; Current Liabilities; Long-term Liabilities
2. Define, identify and demonstrate the impact of adjusting entries on financial statements.
3. Explain and demonstrate the differences between cash and accrual basis accounting.
4. Define and identify generally accepted accounting principles.

ACCT 2120. Principles of Accounting II
3 Credits (3)
An introduction to the use of accounting information in the management decision making processes of planning, implementing, and controlling business activities. In addition, the course will discuss the accumulation and classification of costs as well as demonstrate the difference between costing systems.
Prerequisite(s): ACCT 2110.
Learning Outcomes
1. Identify the differences between financial and managerial accounting.
2. Illustrate the accumulation of costs in cost accounting systems.
3. Describe the basic elements of the budgeting process, its objectives and budget preparation.
4. Define and classify cost behavior.
5. Perform cost-volume-profit analysis for decision-making.
6. Perform differential (incremental) analysis for business decision making.
7. Explain the cause of the variance and its effect on the income statement.
8. Explain and demonstrate the difference between traditional costing and activity-based costing.

ACCT 2170. Payroll Accounting
3 Credits (2+2P)
Covers payroll accounting procedures and controls, tax and employment laws, and tax reports that form the core of payroll responsibilities. Restricted to Community Colleges campuses only.
Prerequisite: ACCT 2110 or ACCT 1115.
Learning Outcomes
1. Identify payroll terminology and concepts, required payroll records, and various laws and regulations affecting payroll operations.
2. Calculate gross wages and deductions.
3. Record, journalize and post payroll transactions in accordance with GAAP using the appropriate accounting records (payroll registers, employee earnings records, journals, and ledgers).
4. Prepare and accurately complete payroll tax reports for timely filing.

ACCT 2220. Computerized Accounting
3 Credits (3)
This course requires the prior knowledge from Survey of Accounting or Principles of Accounting I (Financial). It employs integrated accounting software for payroll, inventory control, accounts payable, accounts receivable and general ledger functions. Course reviews the accounting cycle.
Prerequisite: ACCT 2110 or ACCT 1120.
Learning Outcomes
1. Set up a computerized accounting system and chart of accounts for a business enterprise.
2. Record sales/collections, purchase/payments, inventory, payroll, and adjusting entries using accounting software.
3. Identify the manual transactions underlying the computerized accounting systems.
4. Produce a variety of reports and financial statements using accounting software.
5. Analyze reports to identify and correct errors.

ACCT 2520. Introduction to Auditing
3 Credits (3)
Surveys auditing concepts and processes used by management and assurance professionals that include audit standards, reports, professional ethics, legal liability, evidence accumulation, audit planning, internal controls, transaction cycles, other engagements and operational auditing. Restricted to Community Colleges campuses only.
Prerequisite: ACCT 1115 or ACCT 2110.
Learning Outcomes
1. Describe the attest function.
2. Identify the professional and regulatory standards that impact the auditing profession.
3. Use audit planning techniques to assess risks, calculate materiality and prepare audit programs.
4. Evaluate factual situations to identify internal control deficiencies, significant deficiencies, and material weaknesses.
5. Identify types of evidence and practice documenting the results of performing audit tests.
6. Use various audit sampling to determine whether sufficient evidence has been obtained.
7. Identify audit procedures performed in the completion of an audit.
8. Select the appropriate audit report for various factual situations.
9. Demonstrate knowledge of other attestation and assurance services performed by CPAs as well as other types of services, which independent auditors may or may not perform.

ACCT 301. Financial Accounting I
3 Credits (3)
Concepts, principles, and practices of financial accounting, stressing the determination of income and financial position. A student who does not pass the class within three attempts will not be allowed to take class for a fourth.
Prerequisite(s): C or better in ACCT 2110 or (OATS 120 and OATS 121) and ACCT 2120.

ACCT 302. Financial Accounting II
3 Credits (3)
A continuation of ACCT 301.
Prerequisite(s): C- or better in ACCT 301.

ACCT 351. Accounting Systems
3 Credits (3)
Covers accounting information systems as processors of data for financial reporting and control of economic organizations.
Prerequisite: C or better in ACCT 2110 or (OATS 120 and OATS 121) and ACCT 2120.

ACCT 353. Cost Accounting
3 Credits (3)
The development and use of cost accounting information for inventory valuation, income determination, and cost control. A student who does not pass the class within three attempts will not be allowed to take class for a fourth.
Prerequisite(s): C or better in ACCT 2110 or (OATS 120 and OATS 121) and ACCT 2120.

ACCT 403. Federal Taxation I
3 Credits (3)
Basic federal income tax laws; emphasis on determination of taxable income of individuals. A student who does not pass the class within three attempts will not be allowed to take class for a fourth.
Prerequisite(s): C or better in ACCT 2110 or (OATS 120 and OATS 121) and ACCT 2120.

ACCT 451. Auditing Theory and Practices
3 Credits (3)
Auditing standards, audit evidence, auditors reports and opinions, and professional responsibilities.
Prerequisite(s): ACCT 351 and C- or better in ACCT 302.

ACCT 455. Federal Taxation II
3 Credits (3)
Federal income tax laws applicable to partnerships, corporations, fiduciaries, tax research, tax planning.
Prerequisite(s): C- or better in ACCT 403 or consent of instructor.

ACCT 456. Accounting for Nonprofit Organizations
3 Credits (3)
Control and reporting problems unique to governmental units and other nonprofit organizations. Fund accounting principles, procedures, and reports.
Prerequisite(s): C- or better in ACCT 302.

ACCT 458. Accounting Data Analytics
3 Credits (3)
Data Analytics in financial and managerial accounting and auditing. Restricted to: Accounting majors.
Prerequisite: C- or Better in ACCT 301.
Learning Outcomes
1. Understand how both financial and managerial accountants as well as auditors can benefit from using data analytics.
2. Understand how data is collected, created, stored, and shared by technology and be able to identify and evaluate the veracity of sources of unstructured and structured data for use in analysis.
3. Create visualizations of data to provide clear insights into associations, relationships, outliers and other data intimations related to accounting anomalies.
4. Understand and be able to identify business risks and ethical issues related to data collection, storage, and use.

ACCT 490. Selected Topics
1-3 Credits
Current topics in accounting. Prerequisites vary according to the seminar offered. May be repeated for a maximum of 12 credits under different subtitles.

ACCT 498. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated up to 3 credits. Consent of Instructor required.
Prerequisite(s): Consent of instructor.

ACCT 500. Concepts in Accounting
1 Credit (1)
Development, interpretation, and use of accounting information for financing, investing, operating, and managerial decision making.
Prerequisite(s): Admitted to MBA program.

ACCT 503. Accounting for Managers
3 Credits (3)
Concepts and principles of financial and managerial accounting. Presents techniques used to measure business transactions, prepare financial statements, techniques for management decision-making, planning, and control. Not open to MAcc students. May be repeated up to 3 credits.
Prerequisite: Graduate students only.
Learning Outcomes
1. Interpret and apply relevant financial accounting information.
2. Understand cost behaviors and perform breakeven analyses.
3. Prepare and analyze budgets and profitability reports.
4. Use accounting information to make management decisions involving activity-based costing and strategic management.
5. Students can think critically to solve problems.
6. Students can understand management issues from a global perspective.

ACCT 510. Technical and Professional Communication for Accountants
3 Credits (3)
Effective writing strategies for professional communications. Students will learn to write with a professional style and proper English usage and to work with a variety of technical and lay audiences. Emphasis on initiation, planning, composition, and evaluation of business and accounting workplace scenarios to develop communication skills used in a business environment. Restricted to: Master of Accountancy majors.

ACCT 530. Advanced Accounting
3 Credits (3)
This course is designed to provide in-depth study of current financial accounting concepts related to business combinations, financial statement consolidations, and foreign currency transactions and translations. Restricted to: Master of Accountancy majors.
Prerequisite(s): ACCT 302 with a grade of C or better.

ACCT 544. Financial Statement Analysis and Valuation
3 Credits (3)
Valuation of firms using financial information, financial statement analysis, and the valuation of individual assets and liabilities. Restricted to: Master of Accountancy majors.
Prerequisite(s): Acct 302; Graduate students only.

ACCT 550. Special Topics
3 Credits (3)

Seminars in current topics in various areas of accounting including financial, managerial, auditing, taxation, systems, and fund accounting. Prerequisites vary according to topic being offered.

ACCT 551. Advanced Auditing Theory and Practice
3 Credits (3)
Understanding and evaluating internal control in an EDP environment. Statistical sampling applications and current issues in auditing. Restricted to: Master of Accountancy majors.
Prerequisite(s): ACCT 451.

ACCT 555. Federal Tax Research
3 Credits (3)
Tax research methodology including case materials, critical judicial decisions, journal articles, and research services. Emphasis on tax planning. Restricted to: Master of Accountancy majors.
Prerequisite(s): ACCT 403.

ACCT 558. Artificial Intelligence in Accounting
3 Credits (3)
This course covers the concepts and applications of artificial intelligence (AI) in accounting. The course topics are automation, machine learning including advanced data analytics and natural language processing, and generative AI. Restricted to Master of Accountancy Students.
Learning Outcomes
1. Explain the main concepts and components of AI and how they relate to accounting.
2. Identify the opportunities and challenges of using AI in accounting.
3. Compare and contrast different types of AI and their applications in accounting.
4. Apply various AI tools to perform accounting tasks and solve accounting problems.
5. Critically assess the ethical, social, and professional implications of using AI in accounting.

ACCT 559. Ethics and Professionalism in Accounting
3 Credits (3)
Introduction to ethical reasoning, integrity, objectivity, independence , and professional accounting issues Students will apply the concepts and theories to accounting-specific cases. Restricted to: Master of Accountancy majors.
Prerequisite(s): C or better in ACCT 451.

ACCT 560. Taxation of Corporations and Shareholders Advanced
3 Credits (3)
Effects of taxation on the organization, operation, and reorganization of corporations and on their shareholders. Restricted to: Master of Accountancy majors.
Prerequisite(s): ACCT 403.

ACCT 564. Financial Accounting Research
3 Credits (3)
Interpretation and application of accounting principles to financial reporting issues of business and nonbusiness organizations. Consent of Instructor required. Restricted to: Master of Accountancy majors.
Prerequisite(s): ACCT 302.

ACCT 580. Professional Accountancy
3 Credits (3)
Prepares students for the accounting profession and professional certification through study of a wide range of topics similar to those a student might encounter in their first year of employment. Restricted to: Master of Accountancy majors.

ACCT 598. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with prior approval of the department head. A maximum of 3 credits may be earned.
Prerequisite: consent of instructor.

ACCT 599. Master's Thesis
15 Credits
Thesis.

Business Computer Systems

BCIS 1110. Introduction to Information Systems
3 Credits (3)
Examination of information systems and their impact on commerce, education, and personal activities. Utilization of productivity tools for communications, data analysis, information management and decision-making.
Learning Outcomes
1. Describe the social impact of information literacy and systems in relation to commerce, education, and personal activities.
2. Explain how to use the information resources legally, safely, and responsibly in relation to ethical, security, and privacy issues.
3. Evaluate bias, accuracy and relevance of information and its sources.
4. Use productivity tools for communications, data analysis, information management and decision-making.
5. Describe and use current information systems and technologies

BCIS 1160. Windows
1-3 Credits (1-3)
This course prepares students to develop the skills needed to deploy and manage Windows. Students will learn how to manage and troubleshoot Windows devices in a secure network environment. Students will also learn to run multiple operating systems using client Hyper-V. Microsoft Intune will be utilized to teach students to manage Windows mobile and desktop devices in a cloud-based environment. Out-of-class computer work is required. May be repeated up to 6 credits.
Learning Outcomes
1. Demonstrate how to install Windows.
2. Execute System Utilities.
3. Explain how to manage disks and file systems.
4. Recount the features of user management.
5. Describe Windows security features.
6. Identify the features of user productivity tools and application support.
7. Highlight the steps to complete performance tuning and system recovery.
8. Outline in detail how Microsoft Intune Device Management is utilized.
9. Summarize how to run multiple operating systems inside a virtual machine using Client Hyper-V. 1
10. Summarize Enterprise Computing. 1
11. Illustrate Remote Access and Client Support processes.

BCIS 1215. Introduction to MS Excel I
3 Credits
This course introduces Microsoft Excel spreadsheet software. Coverage includes creating, editing, manipulating, and printing workbooks, charts, features and commands, spreadsheet design, formulas, and functions.
Learning Outcomes
1. Identify the basic Excel (spreadsheet) concept.
2. Describe and apply basic skills of worksheet and cell formatting, charts, and tables.

3. Recognize and demonstrate the concepts of creating, editing, and formatting worksheets.
4. Apply and demonstrate the concepts of working with charts.
5. Apply formulas and functions.
6. Analyze data using formulas and compiling workbook data.

BCIS 1220. Introduction to MS Word
3 Credits (2+2P)
This course introduces MS Word software. Basic word processing techniques and applications will be covered. Students will create, revise, store, share and retrieve documents. Students will learn various formatting techniques, use of tables, use of references tools. May be repeated up to 6 credits.
Learning Outcomes
1. Manage documents: navigate within documents; format documents; save and share documents; and inspect documents for issues.
2. Insert and format text, paragraphs, and sections: Insert text and paragraphs; format text and paragraphs; create and configure document settings.
3. Manage tables and lists: create tables; modify tables; create and modify lists.
4. Create and manage references: create and manage reference elements; create and manage reference tabs.
5. Insert and format graphic elements: insert illustrations/text boxes; format illustrations and text boxes; add text to graphic elements; modify graphic elements.
6. Manage document collaboration: add and manage comments; manage change tracking.

BCIS 1230. Introduction to MS PowerPoint
3 Credits (3)
Introduction to the electronic presentation, specifically how to use, design and edit presentation graphics for use in a variety of personal and business applications. Students will learn how to create and work with design templates, auto layouts, and background slides. Also covered are how to add tables, charts, clip art, pictures, video, sound and animation effects.
Prerequisite: BCIS 1220 or ability to demonstrate keyboarding and Windows proficiency.
Learning Outcomes
1. Create, edit, format, and save PowerPoint presentations.
2. Create and change templates.
3. Create, apply, and customize Master slides.
4. Create, apply, and customize presentation themes.
5. Create, apply, and customize styles presentations.

BCIS 1750. Microsoft Outlook and Office Procedures
3 Credits (3)
This course provides information about office principles and procedures that are used in the fast-paced offices of today. Student will become proficient using Microsoft Outlook and other current technologies to develop the foundational skills necessary to manage email, appointments, contacts, and tasks.
Prerequisite: ENGL 1110G.
Learning Outcomes
1. Demonstrate office skills in office communications, record management, proofreading, research techniques, planning meetings and conferences, writing and dictating correspondence.
2. Describe the technologies of the modern office such as electronic mail, word processing, information processing, and telecommunications.
3. Perform a mastery of punctuation, grammar, writing skills and indexing skills.
4. Manage records, make travel arrangements, and execute general administrative duties.
5. Define ethics and ethical behavior.
6. Manage the Outlook environment efficiently within a professional business setting.
7. Manage messages in an organized way for productivity.
8. Manage schedules to clearly communicate among professionals.
9. Manage contacts and groups to effectively connect business individuals.

BCIS 2120. Desktop Publishing
3 Credits (3)
This course utilizes a variety of software packages to produce reports, brochures, advertisements, correspondence and newsletters. Various software packages are used such as Microsoft Office Publisher® and Adobe® InDesign CS Suite.
Prerequisite: BCIS 1110.
Learning Outcomes
1. Effectively utilize the features of Microsoft Publisher, such as create, open, edit, save, view and print a publication.
2. Design and create top quality publications using templates, color schemes, text and graphics suitable for academic professional, and personal use.
3. Merge publications while working with advanced formatting.
4. Produce publications using design techniques, font schemes, object manipulation, and layout guides.

BCIS 2130. Web Design
3 Credits (3)
Design and create a website using HTML, CSS, web development tools and industry-recognized software while applying best practices in site management and business web presence.
Learning Outcomes
1. Students will identify and apply best practices for web design in a business setting.
2. Students will create a basic web page utilizing WC3 principles.
3. Students will explain the importance and impact of web presence in today's business environment.
4. Students will determine and utilize web page features and techniques for a specific business.
5. Students will create a web design management plan for business.
6. Students will discuss web page tools for performance and web traffic analytics.
7. Students will identify web design components for a mobile society.

BCIS 2221. MS Word®II
3 Credits (2+2P)
This course provides an in-depth study of MS Word software. Students will learn how to create professional business documents, templates, customize themes, mail merge, and reports with citations and references.
Prerequisite: OTEC 1101 or keyboarding proficiency.

Learning Outcomes

1. Create, edit, format, and save Word documents.
2. Create reports using chosen reference style which includes citations and bibliography.
3. Create a multiple-page report with tables, footnotes, and endnotes.
4. Create a professional newsletter, which includes inserting section breaks, formatting columns, inserting symbols, and distinguishing between online and inline objects.
5. Create and change templates.
6. Create, apply, and customize document themes.
7. Create, apply, and customize styles.
8. Create and edit documents using mail merge with data sources and main documents.

BCIS 2310. Spreadsheets and Data Analysis
3 Credits (3)
Evaluation of and advanced applications of electronic spreadsheets. Basic concepts of business statistics, data analysis, and management science integrated in a contemporary spreadsheet environment. Emphasizes practical applications and business decision making.
Prerequisite: BCIS 1110.
Learning Outcomes

1. Develop and work with professional-looking worksheets.
2. Integrate Microsoft Excel®® with other Microsoft programs.
3. Work with multiple worksheets and workbooks.
4. Perform what-if analyses.
5. Enhance Microsoft Excel®® with Visual Basic®.
6. Use Microsoft Excel® to perform statistical analyses.

BCIS 321. Introduction to Software Development and Programming
3 Credits (3)
Computer algorithm development and programming logic in the context of business information systems using current programming environments. Includes program design, data types, data structures, control structures, arrays, and principles of object-oriented programming. May be repeated up to 3 credits.
Prerequisite: C- or better in BCIS 1110; and MATH 1215.
Learning Outcomes

1. Students are proficient in Python and knowledgeable on programming.
2. Students can use programming knowledge to work on business case studies involving data.

BCIS 338. Business Information Systems I
3 Credits (3)
This course covers the business and managerial applications/implications of management information systems (MIS) and an introduction to business analytics. In doing so, the course blends technical know-how with decision-making and systems integration. Additionally, this course provides you with working knowledge of productivity software (i.e., spreadsheet software).
Prerequisite: BCIS 1110 or consent of instructor.
Learning Outcomes

1. Students can explain how information systems and business analytics are used in business.
2. Students can construct intermediate and Advance levels of Excel spreadsheet application.
3. Students can construct intermediate-level O365 Cloud applications, Databases, and Collaborations.
4. Students can describe what business professionals need to know about computer hardware/Software/Security/Social Media and Business Intelligent.
5. Students can describe what business professionals need to know about and business processes and improvement.
6. Apply information systems viz. spreadsheet and analytics software, to solve business problems.

BCIS 350. Information Systems Analysis and Design
3 Credits (3)
An introduction to the analysis and design of secure information systems.
Prerequisite(s): Concurrently with BCIS 338 or consent of instructor.

BCIS 461. Business Analytics I
3 Credits (3)
This course provides an understanding of how organizations can utilize technology to successfully collect, organize, manipulate, use, and present data. The course blends the use of current technology with the managerial practices involving business analytics. The emphasis of the course will be on data management practices and the production of descriptive analytics. Crosslisted with: BCIS 561.
Prerequisite(s): BCIS 338 or consent of instructor.

BCIS 466. Business Analytics II
3 Credits (3)
This course provides an understanding of how organizations can build and test predictive models, utilizing business-related data to estimate model parameters. The emphasis of the course will be on utilizing data management systems to produce useful predictive analytics. Crosslisted with: BCIS 566.
Prerequisite(s): BCIS 461 or consent of the instructor.

BCIS 475. Database Management Systems
3 Credits (3)
Design, development, and use of database management systems in the business environment. Specifically, we will focus on both operational databases and analytical databases (Data Warehouse and Data Marts). Cross-listed with BCIS 575.
Prerequisite: BCIS 338 or consent of instructor.
Learning Outcomes

1. Describe fundamental database terminology and explain the primary features of database management systems.
2. Explain relational database concepts, such as primary key and referential integrity, normalization, and triggers.
3. Explain what a data model is.
4. Write SQL, the standard language of relational databases, at an advanced level.
5. Design a data model and code/implement it as a database solution using SQL.
6. Describe the fundamental concepts of Data Warehouses.
7. Design and build data warehouses.
8. Describe emergent database topics such as big data, data lakes, NoSQL.
9. Understand how a database can be used with Python programming language and MS Excel.

BCIS 480. Introduction to Cybersecurity: Exploring Computer, Network, and Data Security Principles
3 Credits (3)
This course introduces students to fundamental principles of cybersecurity and computer security. Through comprehensive

exploration, students gain a deep understanding of diverse cybersecurity concepts spanning various domains. The curriculum covers essential aspects of computer security, including cryptography, authentication, access control, threat identification, counterattack strategies, and detection/prevention methods. These concepts are applied across application software, operating systems, networks, mobile apps, and databases. The course also covers securing network-based applications and network security fundamentals like TCP/IP, firewalls, intrusion detection, and vulnerability management. Ultimately, students develop a robust foundation in cybersecurity and computer security, preparing them for the digital landscape. Cross-listed with BCIS 580. May be repeated up to 3 credits.

Prerequisite: BCIS 338 or consent of instructor.

Learning Outcomes

1. Describe the key security requirement of confidentiality, integrity, and availability.
2. Discuss the types of security threats and attacks that must be dealt with and give examples of the types of threats and attacks that apply to different categories of computer and network assets.
3. Explain the fundamental security design principles.
4. Define e-commerce, understand how e-commerce differs from e-business, identify the primary technological building blocks underlying e-commerce, and recognize major current themes in e-commerce.
5. Identify and describe the unique features of e-commerce technology and discuss their business significance.
6. Understand the scope of e-commerce crime and security problems, the key dimensions of e-commerce security, and the tension between security and other values.
7. Identify the key security threats in the e-commerce environment.
8. Describe how technology helps secure Internet communications channels and protect networks, servers, and clients.

BCIS 482. Management of Information Security
3 Credits (3)

Provides management overview of information security and thorough examination of administration of information security. Surveys field of information security including planning, policy and programs, protection and people relative to information security.

Prerequisite: BCIS 338 or consent of instructor.

Learning Outcomes

1. Explain the fundamental concepts pertaining to the management of information security within the context of organizations.
2. Describe commonly used information systems (IS) security standards and guidelines.
3. Create IS security management and policy as well as risk management plans.
4. Explain the behavioral aspects of IS security and discuss the development of security culture within organizations.
5. Explain the technical aspects of IS security, including issues related to cryptography and network security.
6. Describe and evaluate the regulatory and ethical aspects of information system security (primarily within the United States and European Union context).

BCIS 485. Enterprise Resource Planning
3 Credits (3)

This course covers concepts in enterprise resource planning (ERP). Topics include how ERP integrates business processes across functional areas—such as the procurement process and the sales order process—and how businesses use ERP information systems in day-to-day operations as well as for performance monitoring.. SAP software will be utilized in multiple hand-on examples of ERP software, serving as a real-world illustration of an ERP system.

Prerequisite: C- or better in BCIS 338 or BCIS 350 or ACCT 351.

Learning Outcomes

1. Explain business processes common to most businesses--order processing, inventory management, and procurement.
2. Distinguish between master and transactional data common to most organizations.
3. Describe the cash-to-cash cycle in a production environment.
4. Explain how a business process often spans different functional areas of the business: accounting, marketing, and material management.
5. Describe how enterprise systems, such as SAP, integrate business functional areas into one enterprise-wide information system.
6. Use critical thinking to make decisions.

BCIS 490. Selected Topics
1-3 Credits

Current topics in business systems analysis. Consent of Instructor required.

BCIS 498. Independent Study
1-3 Credits

Individual studies directed by consenting faculty with prior approval of the department head. May be repeated for a maximum of 3 credits.

Prerequisites: junior or above standing and consent of instructor.

BCIS 502. Business Information Systems
3 Credits (3)

Analysis of information systems as integral parts of business organizations, including the responsibility of management to understand their capabilities and uses in handling the organization s information flow and providing appropriate information for decision making.

Prerequisite: graduate students only.

BCIS 510. AI and Machine Learning for Supply Chain Decision-Making
3 Credits (3)

This course provides an understanding of the use of artificial intelligence (AI) and machine learning (ML) in supply chain operations, focusing on data-driven decision-making. Students will apply predictive and prescriptive models to address challenges in forecasting, inventory management, customer segmentation, and sourcing, among others.

Prerequisite: Programming Foundations (either CSCI 4525 or CSCI 4520), AI Foundations (CSCI 5405, CSCI 5420 or EE 565).

Learning Outcomes

1. Understand the most common supply chain management challenges and the potential for AI to address them.
2. Apply traditional AI and ML techniques such as regression and clustering to solve supply chain problems.
3. Assess model performance in the context of the supply chain.
4. Compare customer and supplier segmentation models.
5. Develop basic AI-driven supply chain decision support tools.
6. Reflect on the ethical implications of AI/ML applications in the supply chain.
7. Understand the implications of data management on developing AI decision support tools.

BCIS 550. Information Systems Analysis and Design
3 Credits (3)

Information systems development methodologies and the system life cycle. Justifying and managing systems development projects. Not open to students who have taken BCIS 350. Students must be Graduate Students to enroll. May be repeated up to 3 credits.

Learning Outcomes

1. Describe foundations of systems development.
2. Explain systems development life cycle and key methodologies.
3. Depict how to conduct planning in systems development.
4. Determine and structure system requirements.
5. Apply principles and guidelines to design interfaces, forms and databases.
6. Understand the major issues in the systems implementation and maintenance.

BCIS 561. Business Analytics I
3 Credits (3)

This course provides an understanding of how organizations can utilize technology to successfully collect, organize, manipulate, use, and present data. The course blends the use of current technology with the managerial practices involving business analytics. The emphasis of the course will be on data management practices and the production of descriptive analytics. Not open to students who have taken BCIS 461. No S/U or audit option.

Prerequisite: BCIS 338.

Learning Outcomes

1. Identify the reasons for and the evolution of computerized support in managerial decision making.
2. Describe the business intelligence (BI) methodology and concepts.
3. Identify and explain various types of analytics.
4. Explain the nature of data in the context of BI and Business Analytics.
5. Describe statistical modeling and its relationship to business analytics.
6. Apply descriptive and inferential statistics techniques.
7. Explain the importance of data/information visualization and apply different types of visualization techniques.
8. Explain the basic concepts of data warehousing.
9. Explain data integration and the extraction, transformation, and load (ETL) processes. 1
10. Describe the essence of business performance management (BPM). 1
11. Describe balanced scorecard and Six Sigma as performance measurement systems. 1
12. Explain the objectives and benefits of data mining. 1
13. Learn the standardized data mining process. 1
14. Enhance your communication (presentation and report writing), creative thinking, problem-solving, and analytical skills.

BCIS 566. Business Analytics II
3 Credits (3)

This course provides an understanding of how organizations can build and test predictive models, utilizing business-related data to estimate model parameters. The emphasis of the course will be on utilizing data management systems to produce useful predictive analytics. Not open to students who have taken BCIS 466. No S/U or audit option.

Prerequisite: BCIS 561.

Learning Outcomes

1. Identify and explain various types of analytics.
2. Define data mining as an enabling technology for business analytics.
3. Learn the standardized data mining processes and the different methods and algorithms of data mining.
4. Build working knowledge of the existing data mining software tools.
5. Describe text analytics and understand the need for text mining.
6. Learn the process of carrying out a text mining project and the common methods for sentiment analysis.

BCIS 575. Database Management Systems
3 Credits (3)

Design, development, and use of database management systems in the business environment. Not open to students who have taken BCIS 475.

Prerequisite: BCIS 350 or BCIS 550.

Learning Outcomes

1. Describe fundamental database terminology and explain the primary features of database management systems. (Cognitive Level: Understand)
2. Explain relational database concepts, such as primary key and referential integrity, normalization, and triggers. (Cognitive Level: Understand)
3. Explain what a data model is. (Cognitive Level: Understand)
4. Write SQL--the standard language of relational databases--at an advanced level. (Cognitive Level: Apply)
5. Design a data model and code/implement it as a database solution using SQL. (Cognitive Level: Create)
6. Describe the fundamental concepts of Data Warehouses. (Cognitive Level: Understand)
7. Design and build data warehouses. (Cognitive Level: Create)
8. Describe emergent database topics such as graph databases, big data, data lakes, NoSQL. (Cognitive Level: Understand)
9. Demonstrate how a database can be used with Python programming language and MSExcel. (Cognitive Level: Apply)

BCIS 580. Introduction to Cybersecurity: Exploring Computer, Network, and Data Security Principles
3 Credits (3)

This course introduces students to fundamental principles of cybersecurity and computer security. Through comprehensive exploration, students gain a deep understanding of diverse cybersecurity concepts spanning various domains. The curriculum covers essential aspects of computer security, including cryptography, authentication, access control, threat identification, counterattack strategies, and detection/prevention methods. These concepts are applied across application software, operating systems, networks, mobile apps, and databases. The course also covers securing network-based applications and network security fundamentals like TCP/IP, firewalls, intrusion detection, and vulnerability management. Ultimately, students develop a robust foundation in cybersecurity and computer security, preparing them for the digital landscape. Not open to students who have taken BCIS 480. No S/U or audit option. May be repeated up to 3 credits.

Prerequisite: BCIS 338 or equivalent or consent of instructor.

Learning Outcomes

1. Describe the key security requirement of confidentiality, integrity, and availability.
2. Discuss the types of security threats and attacks that must be dealt with and give examples of the types of threats and attacks that apply to different categories of computer and network assets.
3. Explain the fundamental security design principles.
4. Define e-commerce, understand how e-commerce differs from e-business, identify the primary technological building blocks

underlying e-commerce, and recognize major current themes in e-commerce.
5. Identify and describe the unique features of e-commerce technology and discuss their business significance.
6. Understand the scope of e-commerce crime and security problems, the key dimensions of e-commerce security, and the tension between security and other values.
7. Identify the key security threats in the e-commerce environment.
8. Describe how technology helps secure Internet communications channels and protect networks, servers, and clients.

BCIS 582. Management of Information Security
3 Credits (3)
Provides management overview of information security and thorough examination of administration of information security. Surveys field of information security including planning, policy and programs, protection and people relative to information security. Not open to students who have taken BCIS 482.
Prerequisite: BCIS 338 or equivalent or consent of instructor.
Learning Outcomes
1. Explain the fundamental concepts of the management of information security within the context of organizations.
2. Describe commonly used information systems (IS) security standards and guidelines.
3. Create IS security management and policy as well as risk management plans.
4. Explain the behavioral aspects of IS security and discuss the development of security culture within organizations.
5. Explain the technical aspects of IS security, including issues related to cryptography and network security.
6. Describe and evaluate the regulatory aspects of information system security (primarily within the United States and European Union context).

BCIS 585. Enterprise Resource Planning & Business Processes
3 Credits (3)
Enterprise-wide information systems and their use in enterprise resource planning (ERP). This course will examine the many cross-functional business processes. Other topics include ERP implementation issues, change management, and business process re-engineering. Hands-on exercises use SAP Enterprise software. Not open to students who have taken BCIS 485. May be repeated up to 3 credits.
Prerequisite: C- or better in ACCT 351 or BCIS 502.
Learning Outcomes
1. Business processes common to most businesses, including order processing, procurement, inventory management, etc.
2. How a business process often spans different functional areas of the business: accounting, marketing, etc.
3. How enterprise systems, such as SAP, integrate business functional areas into one enterprise-wide information system.
4. Process modeling to depict the sequence of tasks completed in a business process.
5. Master data common to most businesses (e.g. customer, vendor, inventory, etc.).
6. The issues involved in implementing an ERP system.

BCIS 590. Special Topics
1-3 Credits (1-3)
Seminars in selected current topics in business computer systems. May be repeated up to 3 credits.
Prerequisite(s): Vary according to topic being offered.

BCIS 598. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with prior approval of department head. A maximum of 3 credits may be earned.
Prerequisite: consent of instructor.

Department of Accounting and Information Systems

Business Complex, Suite 232

Phone: (575) 646-4901, Fax: (575) 646-1552

Website: https://business.nmsu.edu/acct-and-is (https://business.nmsu.edu/acct-and-is/)

Accounting - Bachelor of Accountancy

Every candidate for the Bachelor of Accountancy degree must fulfill the following requirements in addition to the General Education, Viewing a Wider World requirements, College of Business Foundation and the Business Core Courses, and Electives.

In order to count toward the Bachelor of Accountancy, upper-division transfer courses in accounting

1. must have been taken at an institution with AACSB Accounting accreditation or
2. be part of the New Mexico Business Articulation Matrix.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Course Requirements

Prefix	Title	Credits
General Education Requirements		
Grades of C- or better are required in general education communications courses.		
Area I: Communications		
English Composition - Level 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		

MATH 1220G	College Algebra (Foundation Requirement) [1,2]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
Grades of C- or better required for ECON 2110G and ECON 2120G.		
ECON 2110G	Macroeconomic Principles (Credits are counted in Business Core)	
ECON 2120G	Principles of Microeconomics Honors (Credits are counted in Business Core)	
Area III: Laboratory Sciences (4 credits) [3]		
Area V: Humanities [3]		*3*
Area VI: Creative and Fine Arts [3]		*3*
General Education Elective		*3*
MATH 1430G	Applications of Calculus I (must earn a grade of at least C-) [2]	
Viewing a Wider World Courses [3]		**6**
Departmental/College Requirements		
Foundation Requirements		
Grade of C- or better required:		
A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)	3
Business Core: Lower Division (minimum grades of C- required)		
ACCT 2110	Principles of Accounting I (not recommended for freshman year)	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
MGMT 344	Production and Operations Management	3
BCIS 485	Enterprise Resource Planning	3
Upper Division Business Elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
Major Courses		
ACCT 301	Financial Accounting I [5]	3
ACCT 302	Financial Accounting II	3
ACCT 351	Accounting Systems	3
ACCT 353	Cost Accounting [5]	3
ACCT 403	Federal Taxation I [5]	3
ACCT 451	Auditing Theory and Practices	3
ACCT 458	Accounting Data Analytics	3
Upper Division Business Elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
ACCT Upper Division Electives		*3*
Second Language: (not required)		
Electives, to bring the total credits to 120 [6]		**13**
Total Credits		**120**

1. MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G.
2. All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II: General Education course or the General Education Elective requirements: MATH 1220G (https://catalogs.nmsu.edu/search/?P=MATH%201220G), MATH 1430G (https://catalogs.nmsu.edu/search/?P=MATH%201430G) and A ST 311 (https://catalogs.nmsu.edu/search/?P=A%20ST%20311) must be completed.
3. See the General Education (p. 262) section of the catalog for a full list of courses.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses and how to fulfill this requirement.
5. A student who does not pass ACCT 301 Financial Accounting I, ACCT 353 Cost Accounting, or ACCT 403 Federal Taxation I within three attempts will not be allowed to take the class for a fourth.
6. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
MATH 1220G	College Algebra (C- or better) [1]	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) [1]	
ENGL 1110H	Composition I Honors (C- or better) [1]	
ENGL 1110M	Composition I ((for multicultural/international students only and a C- or better)) [1]	
Area V: Humanities Course [2]		3
Elective Course		3
	Credits	**16**
Spring		
MATH 1430G	Applications of Calculus I [1]	3
BUSA 1110	Intro to Business (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors (C- or better)	
Area III: Laboratory Science Course [2]		4
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Second Year		
Fall		
A ST 311	Statistical Applications (C- or better) [1]	3
ECON 2110G	Macroeconomic Principles ((counts towards Area IV Gen.Ed and a C- or better)) [1]	3

ACCT 2110	Principles of Accounting I (C- or better)	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication ((counts towards Area I Gen.Ed, and a C- or better)) [1] or Professional and Technical Communication	3
Elective Course		3
	Credits	**15**
Spring		
Elective Course		3
ECON 2120G	Principles of Microeconomics Honors ((counts towards Area IV Gen.Ed, and a C- or better)) [1]	3
ACCT 2120	Principles of Accounting II (C- or better) [1]	3
Elective Course		4
VWW - Viewing a Wider World Course [3]		3
	Credits	**16**
Third Year		
Fall		
ACCT 301	Financial Accounting I (C- or better) [1]	3
ACCT 351 or ACCT 353	Accounting Systems [1, 4] or Cost Accounting	3
BCIS 338	Business Information Systems I [1]	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
	Credits	**15**
Spring		
ACCT 302	Financial Accounting II (C- or better) [1]	3
Choose one from the following: [4]		3
ACCT 351	Accounting Systems [1]	
ACCT 353	Cost Accounting [1]	
ACCT 403	Federal Taxation I [1]	
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets [1]	3
VWW - Viewing a Wider World Course [3]		3
	Credits	**15**
Fourth Year		
Fall		
Choose one from the following: [4]		3
ACCT 351	Accounting Systems [1]	
ACCT 353	Cost Accounting [1]	
ACCT 403	Federal Taxation I [1]	
ACCT 458	Accounting Data Analytics	
ACCT Upper Division Elective Course [1, 5]		3
BCIS 485	Enterprise Resource Planning [1]	3
MGMT 344	Production and Operations Management	3
Any Business Upper-Division Elective Course (excluding A ST 311)		3
	Credits	**15**
Spring		
ACCT 451	Auditing Theory and Practices [1]	3
ACCT Upper-Division Elective Course [1,5]		3
MGMT 449	Strategic Management	3
Any Business Upper-Division Elective Course (excluding A ST 311)		3
	Credits	**12**
	Total Credits	**120**

1 These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 Students must take all four courses: ACCT 351 Accounting Systems, ACCT 353 Cost Accounting, ACCT 403 Federal Taxation I and ACCT 458 Accounting Data Analytics.
Students who does not pass ACCT 301 Financial Accounting I, ACCT 353 Cost Accounting, or ACCT 403 Federal Taxation I within three attempts will not be allowed to take the class for a fourth.

5 Graduate-Level Coursework Substitution: At the discretion of the Accounting Department and the Academic Dean of the Business College, qualified juniors/seniors may be allowed to enroll in graduate-level accounting courses to satisfy these requirements.
**qualified juniors/seniors who plan to pursue a Master of Accountancy should consult with the Master of Accountancy program coordinator for details about the requirements that must be met to qualify for early acceptance.*

Information Systems - Bachelor of Business Administration

Every candidate for this major must fulfill the following requirements in addition to the general education common core, College of Business foundation and business core (p. 968), Viewing a Wider World requirements and general electives.

Please note that some of the courses listed may have a prerequisite which would require a student to take an additional course. Substitutions for some of these courses may be considered if a student makes this request to the department.

Note: The Information Systems major is also offered through an Online Distance Education Degree Completion Program. Program information is available on the College of Business website: https://business.nmsu.edu/online/

Course Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses.		
Area I: Communications		
English Composition - Level 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		

Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra (Foundation Requirement) [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
ECON 2110G	Macroeconomic Principles (Credits are counted in Business Core)	
ECON 2120G	Principles of Microeconomics Honors (Credits are counted in Business Core)	
Area III: Laboratory Sciences Course (4 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1430G	Applications of Calculus I (Foundation Requirement)	3
Viewing a Wider World [3]		**6**
Departmental/College Requirements		
Foundation Requirements [4]		
A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)	3
Business Core: Lower Division (minimum grades of C- required)		
ACCT 2110	Principles of Accounting I (not recommended for freshman year)	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
MGMT 344	Production and Operations Management	3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311		3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		3
Major Courses		
BCIS 321	Introduction to Software Development and Programming	3
BCIS 350	Information Systems Analysis and Design	3
BCIS 461	Business Analytics I	3
BCIS 475	Database Management Systems	3
Select 12 credits of Information Systems Electives		*12*
BCIS 466	Business Analytics II	
BCIS 480	Introduction to Cybersecurity: Exploring Computer, Network, and Data Security Principles	
BCIS 482	Management of Information Security	
BCIS 485	Enterprise Resource Planning	
BCIS 490	Selected Topics	
ICT 339	Introduction to Digital Forensics and Incident Response	
ICT 377	Computer Networking I	
ICT 477	Computer Networking II	
Second Language: (not required)		
Electives, to bring the total credits to 120 [5]		**16**
Total Credits		**120**

1. Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses and how to fulfill this requirement.
4. All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G, MATH 1430G and A ST 311 must be completed.
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
MATH 1220G	College Algebra (C- or better) [1]	3
BUSA 1110	Intro to Business (C- or better)	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) [1]	
ENGL 1110H	Composition I Honors (C- or better) [1]	
ENGL 1110M	Composition I (for multicultural/international students only and a C- or better) [1]	
Area V: Humanities Course [2]		3
Elective Course [3]		3
	Credits	**16**
Spring		
MATH 1430G	Applications of Calculus I [1]	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	

HNRS 2175G	Introduction to Communication Honors (C- or better)	
Area III: Laboratory Science Course [2]		4
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Second Year		
Fall		
A ST 311	Statistical Applications (C- or better) [1]	3
ECON 2110G	Macroeconomic Principles (counts towards Area IV Gen.Ed and a C- or better) [1]	3
ACCT 2110	Principles of Accounting I (C- or better)	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication (counts towards Area I Gen.Ed, and a C- or better) [1] or Professional and Technical Communication	3
Elective Course [3]		4
	Credits	**16**
Spring		
Elective Course [3]		3
ECON 2120G	Principles of Microeconomics Honors (counts towards Area IV Gen.Ed, and a C- or better) [1]	3
ACCT 2120	Principles of Accounting II (C- or better) [1]	3
VWW - Viewing a Wider World Course [4]		3
BCIS 321	Introduction to Software Development and Programming	3
	Credits	**15**
Third Year		
Fall		
BCIS 338	Business Information Systems I [1]	3
BCIS 350	Information Systems Analysis and Design [1]	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
Information Systems Elective Course [1,5]		3
	Credits	**15**
Spring		
BCIS 475	Database Management Systems [1]	3
Information Systems Elective Course [1, 5]		3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets [1]	3
VWW - Viewing a Wider World Course [4]		3
	Credits	**15**
Fourth Year		
Fall		
BCIS 461	Business Analytics I	3
Information Systems Elective Course [1, 5]		3
MGMT 344	Production and Operations Management [1]	3
ECON or A ST Upper-Division Elective Course (excluding A ST 311)		3
Elective Course [3]		3
	Credits	**15**
Spring		
Information Systems Elective Course [1, 5]		3
Elective Course [3]		3
MGMT 449	Strategic Management [1]	3
Any Business Upper-Division Elective Course (excluding A ST 311)		3
	Credits	**12**
	Total Credits	**120**

1 These courses have prerequisites and it is the student's responsibility for checking and fulfilling all course prerequisites listed for these courses

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

4 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

5 Information Systems Elective Courses:

- BCIS 466 Business Analytics II, BCIS 480 Introduction to Cybersecurity: Exploring Computer, Network, and Data Security Principles,BCIS 485 Enterprise Resource Planning BCIS 490 Selected Topics
- ICT 339 Introduction to Digital Forensics and Incident Response, ICT 377 Computer Networking I, ICT 477 Computer Networking II

Accounting - Undergraduate Minor

To obtain a minor in Accounting, a student must complete 18 or more credit hours of approved course work in Accounting (ACCT), of which at least 12 hours are in courses numbered 300, or higher. All courses for the minor must be completed with a grade of C- or better. At least 12 credits must be completed at NMSU.

This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

Prefix	Title	Credits
Required Courses		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
ACCT 301	Financial Accounting I	3
Select three from the following:		9
ACCT 302	Financial Accounting II	
ACCT 351	Accounting Systems	
ACCT 353	Cost Accounting	
ACCT 403	Federal Taxation I	
ACCT 451	Auditing Theory and Practices	
ACCT 455	Federal Taxation II	
ACCT 456	Accounting for Nonprofit Organizations	
BCIS 485	Enterprise Resource Planning	
Total Credits		**18**

Of the 12 hours of upper-division Accounting classes required for the minor, a minimum of 6 must be taken at NMSU. At least 12 credit hours must be completed at the NMSU College of Business. To count toward the minor, upper-division transfer courses must have been taken at an institution with AACSB Accounting accreditation.

Enterprise Systems - Undergraduate Minor

To obtain a minor in Enterprise Systems, a student must complete 18 or more credit hours of approved course work. A cumulative grade point average of at least 2.0 over the 18 hours must be earned. At least 12 credits must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

Prefix	Title	Credits
Required Courses		
ACCT 351	Accounting Systems	3
BCIS 485	Enterprise Resource Planning	3
BCIS 482	Management of Information Security	3
BFIN 360	Financial Information Technology	3
Select one from the following:		3
MGMT 351	Supply Chain Management	
MGMT 344	Production and Operations Management	
Select one from the following:		3
ACCT 353	Cost Accounting	
MGMT 345V	Quality and Competitiveness: An International Perspective	
MGMT 470	Project Management in Organizations	
BFIN 475	International Managerial Finance	
Total Credits		**18**

Information Systems - Undergraduate Minor

To obtain a minor in Information Systems (IS), a student must complete 18 or more credit hours of approved coursework in IS. A cumulative grade point average of at least 2.0 over the 18 hours must be earned. At least 12 credits must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

Prefix	Title	Credits
Required Courses		
BCIS 338	Business Information Systems I	3
BCIS 350	Information Systems Analysis and Design	3
BCIS 475	Database Management Systems	3
Select 9 credits from the following:		*9*
BCIS 321	Introduction to Software Development and Programming	
BCIS 461	Business Analytics I	
BCIS 466	Business Analytics II	
BCIS 480	Introduction to Cybersecurity: Exploring Computer, Network, and Data Security Principles	
BCIS 482	Management of Information Security	
BCIS 485	Enterprise Resource Planning	
BCIS 490	Selected Topics	
Total Credits		**18**

Business Administration

Graduate Program Information

The business and accounting programs at NMSU, including the MBA program, are accredited by AACSB International - The Association to Advance Collegiate Schools of Business.

The Master of Business Administration (MBA) program is a professional program designed to provide students with a solid background in business practices and the problem-solving and people skills needed to become successful leaders in the global business environment. Program graduates are prepared for administrative or managerial positions in a wide variety of organizations, both private and governmental. The MBA program is offered in a traditional classroom with some online delivery and in a cohort-based distance program with a synchronous online component. Details are available at https://business.nmsu.edu/mba (https://business.nmsu.edu/mba/).

The Ph.D. program in Business Administration offers the opportunity to specialize in either Marketing or Management.

Degrees for the Department

Master's Degree(s)

- Business Administration (Agribusiness) - Master of Business Administration (p. 117)
- Business Administration (Finance) - Master of Business Administration (p. 119)
- Business Administration (Health Services Management) - Master of Business Administration (p. 120)
- Business Administration (Health Services Management) - Master of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/business-administration-health-services-mgt-mba-online/)
- Business Administration (Information Systems) - Master of Business Administration (p. 121)
- Business Administration (Information Systems) - Master of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/business-administration-information-systems-mba-online/)
- Business Administration (Public Utility Regulations) - Master of Business Administration (p. 123)
- Business Administration (Public Utility Regulations) - Master of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/business-administration-public-utility-regulations-mba-online/)
- Business Administration - Master of Business Administration (p. 115)
- Business Administration - Master of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/business-administration-mba-online/)

F. Arslan, Ph.D. (Texas - El Paso) -- information systems; R. Adkisson, Ph.D. (Emeritus); P. G. Benson, Ph.D. (Emeritus); M. J. Billiot, D.B.A. (Emeritus); J. W. Bishop, Ph.D. (Virginia Tech) – human resource management and organizational behavior; L. Blank, Ph.D. (Tennessee) – micro economics, economics of regulated utilities; D. M. Boje, Ph.D. (Emeritus); R. Clemons, Ph.D. (Texas A&M) -- C.P.A., taxation; N. H. Compton, J.D. (Emeritus); B.F. Daily, Ph.D. (Emeritus); D. L. Daniel, Ph.D. (Emeritus), M.E. de Boyrie, Ph.D. (Florida International) – international finance and trade issues; P. W. Dorfman, Ph.D. (Emeritus); C. E. Enomoto, Ph.D. (Emeritus); C. A. Erickson, Ph.D. (Arizona State) – monetary theory,

macroeconomics; C. Flinchbaugh, Ph.D. (Kansas) – Organizational behavior, human resources; C. Gard, Ph.D. (University of Washington) – biostatistics; D. A. Gegax, Ph.D. (Emeritus) ; M. Hyman. Ph.D. (Emeritus); D. James, J.D. (Utah) - business law; I.M. Jasso, Ph.D. (Houston) – advertising, strategy; M. Jun, Ph.D. (Georgia State) – production and operations management; J. Kreie, Ph.D. (Emeritus); D. Kealy, M.A. (Yale), J.D. (Concord Law School) -- business law; L. LaPlue, Ph.D. (Tennessee) -- international and environmental economics.; Y. F. Lee, Ph.D. (Southern Illinois-Carbondale) – international finance, international trade, international monetary system, economic development; J. Loveland, Ph.D. (Emeritus); K. J. Martin, Ph.D. (Emeritus); R. McFerrin, Ph.D. (Emeritus); J. T. McGuckin, Ph.D. (Emeritus); K. D. Melendrez, Ph.D. (Arizona) – financial accounting; S. K. Mills, Ph.D. (Emeritus); C. Mora-Monge, Ph.D. (Toledo) – supply chain management, information systems; J. A. Nelson, Ph.D. (Emeritus); M. Niculescu, Ph.D. (Cincinnati) – modeling consumer behavior; R. Oliver, Ph.D. (Emeritus); N. A. Oretskin, J.D. (Emeritus); J. T. Peach, Ph.D. (Emeritus); R. T. Peterson (Emeritus); J. Tim Query, Ph.D. (Emeritus); S. Rahman, Ph.D. (Texas-El Paso) - personal financial planning, financial analysis and markets; G. A. Rosile, Ph.D. (Emeritus); H. Sankaran, Ph.D. (Houston) – corporate finance, investments; E. T. Sautter, Ph.D. (Emeritus); E. A. Scribner, Ph.D. (Emeritus); C. Sroka, Ph.D. (Ohio State) -- count data models; R. L. Steiner, Ph.D. (Oklahoma State) – likelihood methods, discrete distributions; J. E. Teich, Ph.D. (Emeritus); D. M. VanLeeuwen, Ph.D. (Oregon State) – statistics; B. Widner, Ph.D. (Colorado State) – urban/regional, public finance, development; C. Yildirim, Ph.D. (Texas Tech) -- retirement planning investment choices, behavioral finance; Y. You, Ph.D. (Wisconsin) -- linguistic framing, anthropomorphism; Y. Zhang, Ph.D. (Texas Tech) -- financial accounting; J. Zhu (Iowa) -- marketing analytics, machine learning.

Business Administration Courses

B A 105. Special Topics
1-3 Credits
Current topics in business and economics.

B A 291. Business Administration and Economics Internship and Cooperative Education I
1-3 Credits
Introduction and applications of the principles of business administration and economics. Registration in one course allowed per co-op work phase; a minimum of 12 work weeks is required. Open only to students in the College of Business. Option of S/U or a grade. The amount of academic credit (1-3 cr.) will be determined by the academic experience, and not by the work experience.

B A 305. Leadership Training for COB Ambassadors
1 Credit (1)
Leadership development for volunteers serving as COB student ambassadors, focusing on COB undergraduate business degree programs, NMSU student services, public speaking and public relations.

B A 391. Business Administration and Economics Internship and Cooperative Education II
1-3 Credits
Applications of the principles of business administration and economics. Registration in one course allowed per co-op work phase; a minimum of 12 work weeks is required. Open only to students in the College of Business. Option of S/U or a grade. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not by the work experience.

B A 490. Selected Topics
3 Credits (3)
Prerequisites vary according to the seminar being offered.

B A 498. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.
Prerequisite: junior or above standing and consent of instructor.

B A 500. Macroeconomic Essentials
1 Credit (1)
Macroeconomic theory and public policy, national income concepts, unemployment, inflation, economic growth and international payment problems. Restricted to: MBA Major majors majors.

B A 501. Quantitative Tools for the MBA
1 Credit (1)
An overview of critical topics in math and statistics that will provide a quantitative foundation for students entering the Master of Business Administration program. Admission to the MBA program.

B A 545. Business Ethics
3 Credits (3)
Understanding of business ethics, social responsibilities of business organizations, and personal codes of conduct. Complexities of moral reasoning and principles of ethical behavior.

B A 550. Special Topics
3 Credits (3)
Interdisciplinary seminar in selected current business topics.
Prerequisite(s): Prerequisites vary according to the seminar being offered.

B A 590. Professional Paper/Presentation
3 Credits (3)
Paper written in close coordination with sponsoring professor and presented near the end of the student's final semester in the M.B.A. program. The paper will consist of a professional business report, a case study of a business or organization or a research report. Restricted to: MBA majors.
Prerequisite(s): Minimum of 3.0 average in: ACCT 503, BLAW 502, BFIN 503, and MKTG 503 or AEEC 551.

B A 598. Special Research Programs
1-3 Credits
Individual investigations either analytical or experimental. A maximum of 3 credits may be earned.
Prerequisite: consent of instructor.

B A 599. Master's Thesis
15 Credits
Thesis.

Name: College of Business MBA Program

Office Location: Business Complex 131

Phone: (575) 646-8003

Website: https://business.nmsu.edu/mba (https://business.nmsu.edu/mba/)

Business Administration - Undergraduate Minor

This minor is available to all bachelors degree seeking students, except those seeking the *Bachelor of Accountancy* and the *Bachelor of Business Administration* degrees. It is the only minor in Business open to students

in the Bachelor of Applied Studies and the Bachelor of Individualized Studies. At least 12 of the credits for the minor must be completed in the NMSU College of Business.

Minor Requirements

Choose 18 credits of coursework from these business core courses: Nine of the credits must be at the upper division level.

Prefix	Title	Credits
Lower Division		
ACCT 2110	Principles of Accounting I [1]	
ACCT 2120	Principles of Accounting II [1]	
BCIS 1110	Introduction to Information Systems	
BUSA 1110	Intro to Business	
ECON 2110G	Macroeconomic Principles [1]	
ECON 2120G	Principles of Microeconomics	
Upper Division		
BCIS 338	Business Information Systems I	
BLAW 316	Legal Environment of Business	
BFIN 341	Financial Analysis and Markets [1]	
MGMT 309	Human Behavior in Organizations	
MKTG 303	Principles of Marketing	
MGMT 344	Production and Operations Management [2]	
or MGMT 470	Project Management in Organizations	
or BCIS 485	Enterprise Resource Planning	

[1] Courses satisfy background knowledge requirements for the MBA program when completed with a B- grade or better.

[2] Only one course may be applied to this minor.

Notes: A minimum GPA of 2.0 is required in the coursework for the minor.

Several courses listed above have prerequisites. It is the responsibility of the student to determine course prerequisites and other registration requirements.

Economics, Applied Statistics, and International Business

Undergraduate Program Information

The Department of Economics, Applied Statistics, and International Business (EASIB) offers undergraduate degrees in two majors in the bachelor of business administration -- one in economics and one in international business. The Department also offers a bachelor of arts in economics. Economics majors work in business, government, and the non-profit sector. The economics major is also a good choice for students who plan to attend graduate school in economics, law, business, and other areas. International business is a good major for those interested in working in the international operations of a business or interested in working outside the United States. International Business graduates often obtain jobs in areas such as management or marketing then work in areas related to international aspects of the business.

Graduate Program Information

Graduate Study in Economics

EASIB cooperates with the Department of Agricultural Economics and Agricultural Business (AEAB) in offering graduate programs in economics, agricultural economics and economic development. The programs are jointly administered by faculty from the two departments. The objective of the master's program is to prepare students for professional positions in business, government, or research institutions. Our master's degrees also are good preparation for those considering applying to a Ph.D. program. EASIB offers a Master of Arts in economics. There are three concentrations: regulatory economics, policy analysis, and econometrics. For more information on the Master of Science degree in agricultural economics, refer to the Agricultural Economics (p. 343) section in this catalog. The Doctor of Economic Development, also jointly administered by the EASIB and AEAB, is a unique program that provides advanced training in applied economic development. Graduates find jobs in industry and government.

Graduate Study in Applied Statistics

A graduate degree administered directly by EASIB is the Master of Applied Statistics. This degree is designed to produce graduates proficient in current practices in statistics and able to enter directly into positions in industry, government or private business. After completing this degree, a person will have the skills needed to execute data analyses, design experiments, and design and analyze surveys.

Graduate Study in Business Administration

The Department of Economics, Applied Statistics, and International Business cooperates with other departments of the College of Business to offer a Master of Business Administration and a Ph.D. in Business Administration. Within the Ph.D. program, the department offers a minor area of study and provides statistics courses to support the doctoral program. More information about these programs is available in this catalog under the **College of Business (https://catalogs.nmsu.edu/nmsu/business/#text).**

Degrees for the Department

Bachelor Degree(s)

- Economics (Energy Economics) - Bachelor of Business Administration (p. 1000)
- Economics - Bachelor of Arts in Economics (p. 997)
- Economics - Bachelor of Business Administration (p. 998)
- International Business - Bachelor of Business Administration (p. 1002)

Master Degree(s)

- Applied Statistics - Master of Science (p. 107)
- Economics (Econometrics) - Master of Arts (p. 145)
- Economics (Public Policy) - Master of Arts (p. 145)
- Economics (Public Utility Policy and Regulation) - Master of Arts (p. 146)
- Economics (Public Utility Policy and Regulation) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/economics-public-utility-policy-regulation-ma-online/)
- Economics - Master of Arts (p. 144)
- Economics - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/economics-ma-online/)

Doctoral Degree(s)

- Applied Statistics - Doctor of Philosophy (p. 203)
- Economic Development - Doctor of Economic Development (p. 214)

Minors for the Department

- Applied Statistics - Graduate Minor (p. 254)
- Economics - Graduate Minor (p. 255)
- Economics - Undergraduate Minor (p. 1005)
- International Business - Undergraduate Minor (p. 1005)

Graduate Certificates

- Public Utility Regulation and Economics - Graduate Certificate (p. 250)
- Public Utility Regulation and Economics - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/public-utility-regulation-economics-gr-certificate-online/)

Department Head: *Y. F. Lee, Ph.D. (Southern Illinois-Carbondale)-international finance and trade, international monetary system, economic development;*

Professors *L. Blank, Ph.D. (Tennessee, Knoxville)- microeconomic theory, managerial economics, and regulatory economics; C, Erickson, Ph.D. (Arizona State)-regional (Latin American) economic growth and development; money and banking; R. L. Steiner, Ph.D. (Oklahoma State)-likelihood methods, discrete distributions, and exact tests; B. Widner, Ph.D. (Colorado State)-urban/regional development, managerial economics, and public finance; D. M. VanLeeuwen, Ph.D. (Oregon State)-statistics*

Associate Professors *J. Caldwell Ph.D. (Illinois)-energy economics, utility rate design, climate policy; C. Gard, Ph.D. (Washington)-biostatistics, and breast cancer risk prediction; L. LaPlue (Tennessee)-international and environmental economics; M. Li, Ph.D.(Pennsylvania State)-labor, urban, and agricultural economics; J. Mamkhezri, Ph.D. (New Mexico)-energy, natural resources, environmental and health economics; C. Sroka (Ohio State)-count data models, and health economics*

Assistant Professors *J. Dawson Ph.D. (UW-Madison)—statistics, biostatistics; S. Jeon Ph.D. (North Carolina)-environmental statistics, extreme value analysis, and spatio-temporal modeling.*

College Assistant, Associate, and Full Professors: *(College Associate Prof.) B. Bai, MS (New Mexico State)-applied statistics, behavioral science; (College Assistant Prof.) C. Blume, Master of Accountancy (New Mexico State); (College Full Prof.) M. Downes, Ph.D. (New Mexico)—environmental and natural resources economics, econometries and quantitative economics; (College Associate Prof.) F. Pallares, DED (New Mexico State)—economic development; (College Full Prof.) L. Vargas, DED (New Mexico State)-international development, institutional economics, and border economics.*

Emeritus Faculty *R. V. Adkisson, Ph.D. (Nebraska)-international, public finance, economic development; K. Brook, Ph.D. (Texas-Austin)-macroeconomic theory, monetary policy; D.L. Clason, Ph.D. (Kansas State); D. L. Daniel, Ph.D. (Southern Methodist)-nonparametric, statistical computing, and environmental research; C. Enomoto, Ph.D. (Texas A&M)-econometrics, economic theory; M. Ellis, Ph.D. (California-Riverside)-economic development; D. A. Gegax, Ph.D. (Wyoming)-public utility economics, industrial organization; W. R. Gould, Ph.D. (North Carolina State)-biological sampling, wildlife and fisheries estimation. B. N. Matta, Ph.D. (Texas-Austin); J. T. McGuckin, Ph.D. (Wisconsin-Madison); J. T. Peach, Ph.D. (Texas-Austin)-quantitative economics, border studies, economic development; A.V. Popp, Ph.D., (Northern Illinois); D.B. Smith, Ph.D., E. S. Willman, Ph.D. (Indiana).*

Applied Statistics Courses

A ST 311. Statistical Applications
3 Credits (3)
Techniques for describing and analyzing economic and biological data; estimation, hypothesis testing, regression and correlation; basic concepts of statistical inference. May be repeated up to 3 credits.
Prerequisite: MATH 1215 or higher.
Learning Outcomes

1. Describe a data set with graphical tools and computed measures.
2. Explain the relationship between two numerical variables using correlation and regression.
3. Understand how probability and sampling methods are used to make statistical inferences.
4. Draw inference from a sample to a population using confidence intervals and hypothesis tests.
5. Understand the relationship between population parameters and sample statistics.
6. Understand the basic procedure of data production with sampling and experimental design.

A ST 450. Special Topics
1-4 Credits
Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

A ST 465. Statistical Analysis I
3 Credits (3)
An analytic introduction to the theory and methods of statistical inference. Sampling, frequency distributions (z, t, x2, F), estimation, testing, and simulation. Crosslisted with: A ST 565.
Prerequisite(s): MATH 2530G or consent of instructor.

A ST 466. Statistical Analysis II
3 Credits (2+2P)
Continuation of A ST 465. An analytic introduction to the theory and methods of statistical inference. Sampling, frequency distributions (z, t, x2, F), estimation, testing, and simulation. Crosslisted with: A ST 566.
Prerequisite(s): A ST 465 or consent of instructor.

A ST 498. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with prior approval of the department head. Maximum of 3 credits per semester and a grand total of 3 credits.

A ST 503. SAS Basics
3 Credits (2+2P)
An introduction to the statistical software package, SAS, and its utilization in an interactive computing environment, primarily PC/SAS. Provides a fundamental understanding of the structure of SAS, its data management capabilities, and how to invoke a variety of descriptive and simple statistical SAS procedures.
Corequisite(s): A ST 505.

A ST 504. Statistical Software Applications
1 Credit (1)
Optional Computing course to accompany A ST 506. Computer analysis of topics covered in A ST 505 and A ST 506.
Prerequisite(s): A ST 503.
Corequisite(s): A ST 506.

A ST 505. Statistical Inference I
4 Credits (3+2P)
A qualitative introduction to the concepts and methods of statistical inference. Sampling, frequency distributions (z, t, x2, F), estimation, and testing. One-way analysis of variance. Simple linear regression.
Prerequisite: consent of the instructor.

A ST 506. Statistical Inference II
3 Credits (2+2P)
Introduction to multiple regression; the analysis of variance for balanced studies; multiple comparisons, contrasts, factorials, experimental designs through split plots. May be repeated up to 3 credits.
Prerequisite: A ST 505 and the ability to use a standard computer package such as SAS (may be satisfied by A ST 503) or consent of instructor.
Learning Outcomes
1. Formulate models, construct ANOVA tables for balanced designs, and conduct complete analyses accounting for factorial treatment structures, and standard experimental design structures, including the completely randomized design, the randomized complete block design, completely randomized design with subsampling, the completely randomized design with a covariate, and the split-plot design.
2. Assess model adequacy including assessing constancy of variance and normality assumptions.
3. Choose an appropriate multiple comparisons procedure to control the experiment wise or family wise Type I error rate.
4. Use contrasts to conduct pre-planned comparisons.
5. Identify the experimental unit(s) in an experiment; formulate a model and conduct an analysis appropriately accounting for the experimental unit(s).
6. Conduct a complete analysis of data from a designed experiment and interpret findings.

A ST 507. Advanced Regression
3 Credits (3)
Examination of multiple regression; residual analysis, collinearity, variable selection, weighted least squares, polynomial models, and nonlinear regression: linearizable and intrinsically nonlinear models. May be repeated up to 3 credits.
Prerequisite: A ST 505 or consent of instructor.
Learning Outcomes
1. Understand the fundamental philosophy behind regression.
2. Conduct a proper regression analysis, including making inferences and predictions.
3. Address common pitfalls in regression, including model assumption and collinearity issues.
4. Use the R language to perform regression analysis.

A ST 509. Statistical Models for Complex Data Structures
3 Credits (3)
Statistical models for data that are not normally distributed or data with correlated observations. Covers generalized linear models for discrete and mixed models for correlated data structures. Analysis of data with unbalanced and missing cells.
Prerequisite: A ST 507 with a grade of B- or higher.
Learning Outcomes
1. Analyze data using classical regression and generalized linear models.
2. Derive quantities of interest from fitted models.
3. Formulate the appropriate hierarchical model for different analytical goals and data structures.
4. Use statistical software to fit hierarchical models and assess the adequacy of the model.
5. Interpret summaries of fitted hierarchical models.

A ST 511. Statistical Methods for Data Analytics
3 Credits (3)
Statistics fundamentals, with an emphasis on inferential methods, linear regression, and practical applications to data analytics. A ST majors should not take this course if they have already completed A ST 505.
Learning Outcomes
1. Understand descriptive and inferential methods commonly used in data analytics
2. Formulate linear regression models and fit models using statistical software
3. Properly interpret the results of statistical analyses
4. Effectively communicate statistical methods and results orally and in writing

A ST 512. Quantitative Analysis for Business Decisions
3 Credits (3)
Identification, collection, and analysis of an organization's data both internal and external, and use of the resultant information in managerial decision making.
Learning Outcomes
1. Understand statistical methods commonly used in business.
2. Identify statistical considerations in the design of studies.
3. Properly interpret the results of statistical analyses and use results to make decisions regarding business problems.
4. Effectively communicate business decisions orally and in writing, using statistics to defend decisions, as appropriate.

A ST 515. Statistical Analysis with R
3 Credits (3)
Introduction to R data types, basic calculations and programming, data input and manipulation, one and two sample tests, ANOVA, regression, diagnostics, graphics, probability distributions, and basic simulations in the R software environment.
Prerequisite(s): A ST 505 or equivalent with consent of instructor.

A ST 540. Predictive Analytics
3 Credits (3)
This course covers data analytic techniques that can be used to predict and classify observations outside of the original data. Material includes linear and nonlinear regression models, linear and nonlinear classification models, and classification and regression trees. Students will gain hands-on experience using modern software packages to build predictive models and quantify the accuracy of these models.
Prerequisite(s): A ST 507 or consent of instructor.

A ST 550. Special Topics
1-4 Credits
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

A ST 554. Practicum in Statistics
3 Credits (3)
Practical experience in data analysis and the reporting of results; selecting and using statistical methods to analyze and interpret real-world problems; written and oral communication of findings
Prerequisite: A ST 503, A ST 506, A ST 507, and A ST 566.
Learning Outcomes
1. Work with real data to gain substantial experience in data analysis, writing, and presentation.
2. Research and apply a variety of statistical methods, some of which students may not have encountered in prior coursework.

3. Apply knowledge and skills gained throughout the program of study, integrating content from across the MS in A ST curriculum.

A ST 555. Applied Multivariate Analysis
3 Credits (3)
Multivariate analysis of linear statistical models, including MANOVA and repeated measures. Analysis of correlation and covariance structures, including principal components, factor analysis, and canonical correlation. Classification and discrimination techniques. May be repeated up to 3 credits.
Prerequisite: A ST 506 and A ST 504.
Learning Outcomes
1. Understand the details of various multivariate techniques, emphasizing connections to univariate techniques where applicable.
2. Select appropriate multivariate techniques for a given data set and problem.
3. Use statistical software to perform multivariate analyses.
4. Correctly interpret, write about, and present the results of multivariate analyses.

A ST 565. Statistical Analysis I
3 Credits (3)
An analytic introduction to the theory and methods of statistical inference. Sampling, frequency distributions (z, t, x2, F), estimation, testing, and simulation. Taught with A ST 465.
Prerequisite(s): MATH 1521G or consent of instructor.
Learning Outcomes
1. To learn and understand the analysis in the theory and methods of statistical inference including sampling, frequency distributions (z, t, x2, F), estimation, testing, and simulation.

A ST 566. Statistical Analysis II
3 Credits (2+2P)
Continuation of A ST 565. Crosslisted with: A ST 466.
Prerequisite(s): A ST 565 or consent of instructor.

A ST 568. Applied Linear Models II
3 Credits (3)
The relation of full to less-than-full rank linear models; complex data structures, including messy data, empty cells, and components of variance: extensions to categorical data analysis and nonparametric methods. Continues some emphasis on computational aspects.
Prerequisite: A ST 567.

A ST 596. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with prior approval by department head. May be repeated for a maximum of 3 credits.
Prerequisite: consent of instructor.

A ST 598. Special Research Problems
1-6 Credits
Individual analytical or experimental projects. Restricted to majors. Graded S/U.

A ST 599. Master's Thesis
1-6 Credits
Thesis.

A ST 609. Linear Model Theory
3 Credits (3)
Theoretical treatment of linear models. Covers fixed effects and mixed effects models; models that are full rank, less than full rank, and over-parametrized. Prior to enrollment students should have a basic understanding of undergraduate-level matrix algebra.
Prerequisite: A ST 565, A ST 566, A ST 506, and A ST 509.
Learning Outcomes
1. Derive estimators of model parameters using design matrices, including models that are full rank, less than full rank, and over-parameterized.
2. Derive the expectation vector and variance matrix of a linear transformation of a random data vector.
3. Derive common test statistics and their distributions for fixed effects and mixed effects models with a balanced design.
4. Understand the mathematical properties of variance-covariance matrices and their implications for model estimation and inference.
5. Derive and interpret diagnostics for linear models.

A ST 616. Computational Statistics
3 Credits (3)
An introduction to topics in computational statistics including: methods for generating random variables, large scale hypothesis testing, resampling, bootstrapping, permutation tests, the Expectation-Maximization algorithm, Markov chain Monte Carlo methods, and computational approaches in Bayesian inference. Includes some applications of computational statistics in the sciences. Previous experience with programming, while helpful, is not required.
Prerequisite: A ST 505 and A ST 566.
Learning Outcomes
1. Conduct large-scale hypothesis testing
2. Generate random numbers and random variables
3. Implement Markov chain Monte Carlo methods for conducting Bayesian inference
4. Import and manipulate data using R
5. Employ bootstrapping methods for making inferences and conduct statistical hypothesis testing using permutation tests

A ST 645. Time Series Methods
3 Credits (3)
Theory and methods for analyzing, modeling, and forecasting time series. Covers ARIMA models, spectral analysis, filtering, and state-space models. Previous experience using the R programming language is helpful but not required. Students should have a basic understanding of undergraduate-level matrix algebra and trigonometry.
Prerequisite: A ST 565 and A ST 507.
Learning Outcomes
1. Explore time series datasets for autocorrelation, cross-correlation, and stationarity
2. Select appropriate models for analyzing and forecasting time series data
3. Identify regular patterns and frequencies in time series data
4. Fit time series models using statistical software
5. Understand mathematical theory underlying time series models

A ST 665. Bayesian Theory
3 Credits (3)
Provides an overview of theory underlying Bayesian inference. Topics include Likelihood and Sufficiency Principles, concepts from decision theory, construction of prior distributions, Bayesian point estimation, tests and confidence regions.
Prerequisite: A ST 565 and A ST 566.
Learning Outcomes
1. Understand the theoretical justification for using Bayesian methods as a means of statistical inference

2. Apply decision-theoretic principles to evaluate estimators under different loss functions
3. Develop prior distributions using the concepts of entropy, conjugacy, and non-informativeness
4. Derive basic point estimators using Bayesian principles
5. Understand testing and confidence region methods used for Bayesian inference

A ST 700. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation for the Applied Statistics doctoral program. Students must have advancement to candidacy in order to enroll in this course. May be repeated up to 36 credits.
Learning Outcomes
1. Make substantive progress towards completing a dissertation that fulfills the requirements for the Applied Statistics doctoral degree.

Economics Courses

ECON 1110G. Survey of Economics
3 Credits (3)
This course will develop students' economics literacy and teaches students how economics relates to the everyday life of individuals, businesses and society in general. The course will also introduce students to the roles different levels of governments play in influencing the economy. At the conclusion of the course, students will be able to identify economic causes for various political and social problems at national and international levels, and have a better understanding of everyday economic issues that are reported in media and public forums.
Learning Outcomes
1. Gain and demonstrate a contextual understanding of economic terms and concepts.
2. Recognize and analyze common economic issues which relate to individual markets and the aggregate economy.
3. Learn basic economic principles that influence global trading and challenges relating to globalization.
4. Outline the implications of various economic policies on individuals and on economies.
5. Demonstrate ability to use diagrams and graphs to explain economic principles, policies and their applications.
6. Appreciate and understand how individual decisions and actions, as a member of society, affect economies locally, nationally and internationally.
7. Explain the roles of governments in influencing buyer and seller behavior in the market and how government failure occurs when intervention fails to improve or actually worsens economic outcomes.
8. Be able to apply course concepts to interpret, evaluate and think critically about economic events and policies, especially as regularly reported in the media and other public forums.

ECON 2110G. Macroeconomic Principles
3 Credits (3)
Macroeconomics is the study of national and global economies. Topics include output, unemployment and inflation; and how they are affected by financial systems, fiscal and monetary policies.
Learning Outcomes
1. Explain the concepts of opportunity cost, comparative advantage and exchange.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium and use supply and demand curves to analyze responses of markets to external events.
3. Explain the circular flow model and use the concepts of aggregate demand and aggregate supply to analyze the response of the economy to disturbances.
4. Explain the concepts of gross domestic product, inflation and unemployment and how they are measured.
5. Describe the determinants of the demand for money, the supply of money and interest rates and the role of financial institutions in the economy.
6. Define fiscal policy and monetary policies and how these affect the economy.
7. Students will be able to identify the causes of prosperity, growth, and economic change over time and explain the mechanisms through which these causes operate in the economy.

ECON 2120G. Microeconomics Principles
3 Credits (3)
This course will provide a broad overview of microeconomics. Microeconomics is the study of issues specific to households, firms, or industries with an emphasis on the role of markets. Topics discussed will include household and firm behavior, demand and supply,government intervention, market structures, and the efficient allocation of resources.
Learning Outcomes
1. Explain the concept of opportunity cost.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium.
3. Use supply and demand curves to analyze responses of markets to external events.
4. Use supply and demand analysis to examine the impact of government intervention.
5. Explain and calculate price elasticity of demand and other elasticities.
6. Demonstrate an understanding of producer choice, including cost and break-even analysis.
7. Compare and contrast the following market structures: perfect competition, monopoly, monopolistic competition, and oligopoly.

ECON 2120H. Principles of Microeconomics Honors
3 Credits (3)
Microeconomic theory and public policy: supply and demand, theory of the firm, market allocation of resources, income distribution, competition and monopoly, governmental regulation of businesses and unions. Must be a Crimson Scholar.
Learning Outcomes
1. Explain the concept of opportunity cost.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium.
3. Use supply and demand curves to analyze responses of markets to external events.
4. Use supply and demand analysis to examine the impact of government intervention.
5. Explain and calculate price elasticity of demand and other elasticities.
6. Demonstrate an understanding of producer choice, including cost and break-even analysis.

7. Compare and contrast the following market structures: perfect competition, monopoly, monopolistic competition, and oligopoly.

ECON 304. Money and Banking
3 Credits (3)
Income measurement and determination, monetary and fiscal policies. May be repeated up to 3 credits.
Prerequisite: ECON 2110G or ECON 2110H or equivalent.
Learning Outcomes
1. Understand the role of the financial system in the economy.
2. Identify the components of the financial system.
3. Understand the related concepts of net present value and yield to maturity.
4. Understand the structure and role of the federal reserve system.
5. Understand the role of monetary policy in determining economic activity.

ECON 311. Intermediate Macroeconomic Theory
3 Credits (3)
Analysis of gross domestic product, the Classical, Keynesian, and Neo-Keynesian theories of income, employment, inflation and growth.
Prerequisite: ECON 2110G or ECON 2110H.
Learning Outcomes
1. Learn the uses and abuses of macroeconomic data
2. Learn the role of economic theory in understanding economic issues and forecasting economic behavior
3. Learn the causes and consequences of short-run economic fluctuations and long-run economic growth
4. Learn the role of government in the macroeconomy
5. By the end of the class, you should be able to describe the state of the macroeconomy and analyze the consequences of economic policy actions from several perspectives

ECON 312. Intermediate Microeconomic Theory
3 Credits (3)
Contemporary economic theory with emphasis upon value and distribution.
Prerequisite: ECON 2120G or ECON 2120H or equivalent.
Learning Outcomes
1. Gain an understanding of the language of Intermediate Microeconomics.
2. Know the underlying structure of economic models such as supply and demand, consumer theory, producer theory and market structure.
3. Understand the assumptions of economic models.
4. Be able to solve a supply and demand model.
5. Demonstrate critical thinking skills by applying economic models to a wide variety of policy questions.

ECON 324V. Developing Nations
3 Credits (3)
Economic analysis of problems related to development of developing nations. Issues such as growth, industrialization, poverty, population, international trade, foreign debt, and international economic relations.

ECON 325V. Economic Development of Latin America
3 Credits (3)
Economic analysis of problems related to development in Latin America, including the agrarian problem, debt and austerity programs, industrialization, inflation and unemployment, the drug trade, U.S.-Latin American relations, development strategies. Also individual countries problems. May be repeated up to 3 credits.
Learning Outcomes
1. Identify the basic components of economic growth and development
2. Understand how Latin America fell behind other regions in terms of economic development
3. Compare various policies implemented to support economic development in Latin America, as well as the successes and failures of these policies
4. Gain a basic understanding of how to conduct independent research to be demonstrated by the completion of a term paper addressing an issue related to economic development in a nation or region of Latin America

ECON 332. Public Finance
3 Credits (3)
This course will examine the roles of government in modern, market-oriented, mixed economies. It will examine justifications for government participation in resource allocation, income distribution, and economic stabilization focusing primarily on the fiscal functions of government, taxation and public expenditure. Students will apply basic microeconomic analysis to analyze the impacts of public taxation and expenditures on economic decisions made elsewhere in the economy. In this course the emphasis will be on understanding the workings of public finance in fiscal federalist systems like the United States, but the principles taught will be applicable across other economic systems. Prerequisites: ECON 2120G or ECON 2120H

ECON 335V. Business and Government
3 Credits (3)
Relation of government to business through regulation; political, legal, and social implications. Crosslisted with: MGMT 335G

ECON 337V. Natural Resource Economics
3 Credits (3)
Gain insight into important natural resource problems of our time. Apply economic principles to problems in the preservation, use, and development of agricultural, range, mineral, water, forestry, fishery, and environmental resources. Understand the use of cost-benefit analysis for government natural-resource projects, policies, and programs. Same as AEEC 337V.
Prerequisite: ECON 1110G or ECON 2120G or ECON 2120H.

ECON 345. Energy Economics
3 Credits (3)
Examines the economics of energy production including oil, coal, natural gas, renewables, and conservation as a substitute for energy production. Emphasis is on federal and state regulatory framework, and resulting public policy issues from a regional and national perspective.
Prerequisite(s): (ECON 2110G or ECON 2110H), (ECON 2120G or ECON 2120H).

ECON 384V. Water Resource Economics
3 Credits (3)
Use of economic principles to evaluate current and emerging issues in water resources. Applications focus on use of economic methods of analysis to current policy decisions surrounding agricultural, municipal, industrial, and environmental uses of water. Same as AEEC 384V.
Prerequisite: AEEC 1110 or ECON 2120G or ECON 2120H.

ECON 405. Introductory Econometrics
3 Credits (3)
Multiple regression and correlation applied to economics and business; inference techniques; significance tests; simultaneous equations, estimation, and problems.
Prerequisite: MATH 1350G or A ST 311 (or equivalent).

Learning Outcomes

1. Demonstrate knowledge of probability and statistics and basic expected value theory.
2. Define the relationship between population statistics and sample statistics.
3. Explain the method of ordinary least squares.
4. Understand multiple regression, correlation, inference techniques, and significance tests.
5. Interpret basic econometric results.

ECON 445. Oil and Natural Gas Economics
3 Credits (3)
Examines the economics of oil and gas production. Topics covered include transportation, refining, federal and state regulatory framework, and resulting public policy issues from a regional and national perspective.
Prerequisite: (ECON 2110G or ECON 2110H), (ECON 2120G or ECON 2120H).
Learning Outcomes

1. Oil and Natural Gas Production
2. Oil and Natural Gas Transportation and Storage
3. Advanced oil and gas market analysis
4. Economic analysis of government energy policy and regulation

ECON 449. Open Economy Macroeconomics
3 Credits (3)
This course studies theoretical and empirical macroeconomics in international dimension. It covers from the fundamental concepts of national income and growth, monetary/fiscal and exchange rate policies, foreign exchange markets, international trade and finance, and regionalization/economic integration to the impact analysis of these macroeconomic fundamentals in the open economy. Crosslisted with: I B 449.
Prerequisite(s): BFIN 341 OR ECON 311.

ECON 450. International Economics
3 Credits (3)
Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations. Crosslisted with: I B 450
Prerequisite(s): ECON 2110G or ECON 2110H and ECON 2120G or ECON 2120H.

ECON 457. Mathematical Economics
3 Credits (3)
Application of mathematical tools, especially the calculus, to economic theory.
Prerequisite(s): MATH 1430G or equivalent.

ECON 461. Environmental Economics
3 Credits (3)
Economic foundations for public decision-making about environmental resources utilizing tools from intermediate microeconomic theory. Emphasis on the welfare economic approach for the provision of public goods with specific emphasis on market failure, externalities, benefit-cost analysis, and methods for valuing environmental resources and human health.
Prerequisite: ECON 2120G Principles of Microeconomics.
Learning Outcomes

1. Students will develop an understanding of environmental economics and interactions between the natural environment, markets, and politics and regulation.
2. Students will develop familiarity with the tools of economic analysis and will develop marketable skills in benefit-cost analysis, non-market valuation, natural resource management and valuation, program evaluation, survey research and applied data analysis.

ECON 471. Electricity Economics
3 Credits (3)
Regulatory policy and economic analysis related to the Electric Industry. Topics include characteristics of a utility and legal justification for regulation; characteristics and functions of a regulatory commission; history and structure of the industry; technology and network design; revenue requirements; cost allocation; and basic retail rate design. Crosslisted with: ECON 571.
Prerequisite(s): ECON 345.

ECON 490. Selected Topics
1-3 Credits
Current topics in economics. Subject matter to be designated for each semester.

ECON 498. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated for a maximum of 3 credits.
Prerequisite: junior or above standing and consent of instructor.

ECON 503. Managerial Economics
3 Credits (3)
Theory and application of microeconomics to the management of organizations. May be repeated up to 3 credits.
Prerequisite: Graduate students only.
Learning Outcomes

1. Apply and explain economic and business concepts and terminology.
2. Develop critical thinking skill to solve economic- and business-related problems.
3. Solve economic- and business-related problems using quantitative information.
4. Apply and relate ethical implication in economic and business contexts.
5. Analyze economic and business case studies.
6. Demonstrate critical and efficient course engagement between/among peers in the traditional/online environment.

ECON 511. The Economics of Imperfect Markets
3 Credits (3)
A rigorous course in microeconomics covering uncertainty and information, game theory, general equilibrium, market power and market failures.
Learning Outcomes

1. Students should be able to demonstrate an understanding of the microeconomic underpinnings of general equilibrium theory, as well as welfare economics.
2. Students should be able to examine externalities, and be able to examine decision making under cases of risk and uncertainty.
3. Further, students will have a good understanding of the theory behind economic impact analysis, and a grasp of modern economic impact analysis software.

ECON 545. Econometrics II
3 Credits (3)
Application of statistical techniques to estimation of economic relationships: demand functions, production and cost functions, and macroeconomic equations.

Prerequisite: AEEC 5240.

Learning Outcomes

1. To learn and use statistical techniques to estimate economic relationships: demand functions, production and cost functions, and macroeconomic equations.

ECON 550. Special Topics
1-3 Credits
Seminars in selected current topics in the various areas of economics. Prerequisites vary according to the topic being offered.

ECON 571. Regulatory Policy and Industry Analysis: Electricity I
3 Credits (3)
Regulatory policy and economic analysis related to the Electric Industry. Topics include: characteristics of a utility and legal justification for regulation; characteristics and functions of a regulatory commission; history and structure of the industry; technology and network design; revenue requirements; cost allocation; and basic retail rate design.

ECON 572. Regulatory Policy and Industrial Analysis: Water and Natural Gas
3 Credits (3)
Regulatory policy and economic analysis related to the Natural Gas and Water industries. Topics include: history and structure of the industry; technology and network design; revenue requirements; cost allocation; and retail rate design.

ECON 573. Regulatory Policy and Industry Analysis: Electricity II
3 Credits (3)
Regulatory policy and economic analysis related to the Electric industry. Topics include: optimal generation mix; ancillary services; environmental policies; rate case procedures and strategies for effective testimony; advanced retail rate design; wholesale exchanges; unbundled transmission tariffs; market institutions and how different markets function; state and federal deregulation policies; Federal Energy Regulatory Commission orders and policies; demand-side management; and regulatory treatment of non-traditional retail services. Consent of instructor required.
Prerequisite(s): ECON 571 or consent of instructor.

ECON 574. Advanced Seminar Regulatory Policy and Industry Analysis
3 Credits (3)
Advanced seminar and writing course specializing in regulatory policy and regulatory casework. Topics Include: special policy & regulatory issues in telecommunications, electricity, natural gas, and water; preparation of written testimony; expert witness effectiveness including cross-examination; and contested case management. This course involves extensive reading and writing assignments. Consent of instructor required.
Prerequisite(s): ECON 571 or consent of instructor.

ECON 596. Independent Study
3 Credits (3)
Individual study program. Each offering will cover a subtitle. Maximum of 3 credits in a semester and 6 credits in a program. Consent of instructor required.

Economic Development Courses

ECDV 550. Introduction to Local and Regional Development
3 Credits (3)
Serves as the introductory course in the Doctor of Economic Development program. Overview of the economic development field.

ECDV 590. Special Topics
1-3 Credits (1-3)
Selected topics in the area of Economic Development. Subtitle reflects content. May be repeated up to 9 credits. Consent of instructor required.

ECDV 596. Individual Study
1-3 Credits (1-3)
Individual studies directed by consenting faculty with the prior approval of the Department Head. May be repeated up to 6 credits.

ECDV 661. Regional Economic Modeling
3 Credits (3)
Introduction to the tools and methods of regional economic development analysis.

Learning Outcomes

1. Learn the tools and methods of regional economic development analysis.

ECDV 664. Population Economics
3 Credits (3)
Examines the causes and consequences of demographic change. Examines theories of basic demographic processes, population projection and estimation. Consent of instructor required.

Learning Outcomes

1. Train students to learn the qualitative and quantitative studies and methods for the economic development based on population theories.

ECDV 668. Economic Development Finance
3 Credits (3)
Focuses on the tools and methods of economic development finance.

ECDV 670. Research in Economic Development
3 Credits (3)
Intense examination of the academic literature on economic development at all levels.
Prerequisites: ECDV 651, ECDV 661 and ECDV 662.

ECDV 671. Sustainable Economic Development
3 Credits (3)
Focuses on the interconnections between economic development and the environment. Provides a broad set of tools and ideas related to the impacts of human activities on the environment.

Learning Outcomes

1. Understand the interconnections between economic development and the environment. Gain experience with a broad set of tools and ideas related to the impacts of human activities on the environment.

ECDV 673. Research Methods
3 Credits (3)
An overview of alternative research methods and tools. Students explore quantitative and qualitative research methods as alternatives and complements to statistical methods. Research design, ethics, and presentation are emphasized.
Prerequisites: AEEC 501, AEEC 502 and AEEC 540.

ECDV 681. Urban Economic Development
3 Credits (3)
Examines causes and consequences of economic change in urban and metropolitan areas. Covers both theory and tools for analysis.

Learning Outcomes

1. Learn causes and consequences of economic change in urban and metropolitan areas, under the studies of theories and practices.

ECDV 682. Rural Development
3 Credits (3)

Examines causes and consequences of economic change in rural areas, communities and small, open economies. Covers both theory and tools for analysis.

Learning Outcomes

1. Learn causes and consequences of economic change in rural areas, communities and small, open economies under the studies of theories and practices.

ECDV 683. Seminar in National Economic Development
3 Credits (3)
Explores specific examples and cases of rural and urban economic development. Involves applied analysis of specific rural and/or urban economic issues/projects.

Learning Outcomes

1. Learn and understand specific examples and cases of rural and urban economic development. Gain experience with applied analysis of specific rural and/or urban economic issues/projects.

ECDV 692. Seminar in Economic Development
3 Credits (3)
Seminars in selected topics in economic development. Subtitle reflects content. May be repeated up to 9 credits.
Prerequisite: Completion of at least nine semester hours of ECDV courses.

ECDV 694. Internship
1-9 Credits (1-9)
Field internship in Economic Development. May be repeated up to 9 credits.

Learning Outcomes

1. Gain field experience and training in Economic Development.

ECDV 699. Doctoral Project
1-9 Credits (1-9)
Doctoral Project. May be repeated up to 9 credits. Completion of all DED coursework and successful completion of comprehensive exams.

International Business Courses

I B 317. International Marketing
3 Credits (3)
Focuses on decisions relating to entering markets, market segmentation, marketing strategies, and tactics in the international arena. Same as MKTG 317.

Learning Outcomes

1. Develop understanding about what is involved in making international marketing decisions, including product, price, promotion, and place decisions to create a marketing mix.
2. Acquire an overview on the contemporary issues in global marketing and the unique challenges faced by marketing managers in the dynamic global environment.
3. Develop insights into how differences in global economic, cultural, social, political, and legal environments can affect marketing decisions.
4. Develop strategic thinking in the context of complex problems and challenges faced by the contemporary global executives and managers.
5. Develop ability to integrate the important global societal dimensions of diversity, environmental concerns, ethics, and technological change into their thinking.
6. Develop knowledge and skills to analyze cross-cultural variables and their impact on international marketing.
7. Discover sources of information for researching and evaluating international markets.
8. Communicate effectively about marketing issues in group discussions, oral presentations and written reports.
9. Work effectively as a team member in analyzing marketing issues. 1
10. Develop leadership skills necessary to deal with the uncertainty and changes faced by today's global marketers.

I B 351. International Business
3 Credits (3)
The various aspects of international business, and identification and analysis of problems encountered by multinational companies.
Prerequisite: Junior standing or consent of instructor.

Learning Outcomes

1. To understand the operations of international business including international trade, finance, marketing, corporate management, political relations, business culture and ethics, and other business topics.

I B 398. International Business and Economic Environments
3 Credits (3)
Description and analysis of various world regions, e.g., Pacific Rim, Eastern Europe, South Asia. Region will vary from semester to semester.

I B 449. Open Economy Macroeconomics
3 Credits (3)
This course studies theoretical and empirical macroeconomics in international dimension. It covers from the fundamental concepts of national income and growth, monetary/fiscal and exchange rate policies, foreign exchange markets, international trade and finance, and regionalization/economic integration to the impact analysis of these macroeconomic fundamentals in the open economy. Crosslisted with: ECON 449.
Prerequisite(s): BFIN 341 OR ECON 311.

I B 450. International Economics
3 Credits (3)
Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations. Crosslisted with: ECON 450G
Prerequisite(s): ECON 2110G or ECON 2110H and ECON 2120G or ECON 2120H.

I B 475. International Finance
3 Credits (3)
International aspects of financial transactions, decision-making, banking and financial markets. Crosslisted with: BFIN 475 and BFIN 575.
Prerequisite(s): BFIN 341.

I B 489. Senior Seminar in International Business
3 Credits (3)
Capstone class for I B majors. Integration of previous classwork via the examination of case studies and completion of a major project.
Prerequisite: I B core.

Office Location: Department of Economics, Applied Statistics, and International Business (EASIB), Business Complex (BC), Room 234

Phone: Main Office (575) 646-7211

Website: https://business.nmsu.edu/academic-departments/easib/index.html (https://business.nmsu.edu/academic-departments/easib/)

Economics - Bachelor of Arts in Economics

The Bachelor of Arts major in Economics is the only bachelor of arts degree offered through the College of Business. It has the advantage of including a large number of general electives. This feature provides great flexibility to the student who, in addition to completing the courses for a major in economics, may wish to take a double major or take courses from a wide variety of other subjects of his or her own choosing. This program is suitable for, among others, students who plan to go to graduate school in economics, law, business, the social sciences or other areas.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses.		
Area I: Communications		
English Composition - Level 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
English Composition - Level 2		
Choose one from the following:		3
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra (Foundation Requirement) [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
ECON 2110G	Macroeconomic Principles (Credits are counted in Business Core)	
ECON 2120G	Principles of Microeconomics Honors (Credits are counted in Business Core)	
Area III: Laboratory Sciences Course (4 credits) [2]		
Area V: Humanitites [2]		*3*
Area V: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1430G	Applications of Calculus I (must earn a grade of at least C-) [1]	3
Viewing A Wider World Courses [3]		**6**
Departmental/College Requirements		
Foundation Requirements (minimum grade of C- required)		
A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)	3
ACCT 2110	Principles of Accounting I	3
Major Courses [5]		
ECON 304	Money and Banking	3
ECON 311	Intermediate Macroeconomic Theory	3
ECON 312	Intermediate Microeconomic Theory	3
ECON 405	Introductory Econometrics	3
ECON 457	Mathematical Economics	3
At least two electives must be from the following:		*6*
ECON 332	Public Finance	
ECON 449	Open Economy Macroeconomics	
ECON 450	International Economics	
Additional ECON Upper Division Electives		*6*
Second Language: (not required)		
Electives, to bring the total credits to 120 [6]		**49**
Total Credits		**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses and how to fulfill this requirement.
3. Economics majors must earn a minimum cumulative GPA of 2.5 in the 27 credits of departmental requirements.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
MATH 1220G	College Algebra (C- or better) [1]	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) [1]	
ENGL 1110H	Composition I Honors (C- or better) [1]	
ENGL 1110M	Composition I (C- or better) [1]	
Area V: Humanities Course [2]		3
Elective course [3]		3
Elective Course [3]		3
	Credits	**16**
Spring		
MATH 1430G	Applications of Calculus I (C- or better) [1]	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors (C- or better)	
Area III: Laboratory Science Course [2]		4
Area VI: Creative Fine Arts Course [2]		3
Elective Course [3]		3
	Credits	**16**

Second Year		
Fall		
A ST 311	Statistical Applications (C- or better)	3
ECON 2110G	Macroeconomic Principles ((C- or better, counts towards Area IV Gen.Ed))	3
ACCT 2110	Principles of Accounting I (C- or better)	3
Choose one from the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication (C- or better) or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science (C- or better)	
Elective Course [3]		3
	Credits	**15**
Spring		
ECON 2120G	Principles of Microeconomics Honors ((C- or better, counts towards Area IV Gen.Ed)) [1]	3
Viewing a Wider World Course [4]		3
Elective Course [3]		4
Elective Course [3]		3
Elective Course [3]		3
	Credits	**16**
Third Year		
Fall		
ECON 304	Money and Banking [1]	3
ECON 311	Intermediate Macroeconomic Theory [1]	3
Elective Course [3]		3
Elective Course [3]		3
Elective Course [3]		3
	Credits	**15**
Spring		
ECON 312	Intermediate Microeconomic Theory [1]	3
ECON 405	Introductory Econometrics [1]	3
Viewing a Wider World Course [4]		3
Elective Course [3]		3
Elective Course [3]		3
	Credits	**15**
Fourth Year		
Fall		
ECON 457	Mathematical Economics	3
Choose one Upper-Division Elective in ECON from the following: [5]		3
ECON 332	Public Finance [1]	
ECON 449	Open Economy Macroeconomics [1]	
ECON 450	International Economics	
Elective Course [3]		3
Elective Course [3]		3
Elective Course [3]		3
	Credits	**15**
Spring		
Choose one Upper-Division Elective in ECON from the following (it must differ from the Fall semester): [5]		3
ECON 332	Public Finance [1]	
ECON 449	Open Economy Macroeconomics [1]	
ECON 450	International Economics	
ECON Upper-Division Elective Course [5]		3
ECON Upper-Division Elective Course [5]		3
Elective Course [3]		3
	Credits	**12**
	Total Credits	**120**

1. Prerequisites are required, students are responsible for checking and fulfilling course prerequisites listed in the catalog.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. Upper Division ECON electives are typically only offered during certain semesters, so students must plan accordingly.
   Fall: ECON 337V Natural Resource Economics, ECON 449 Open Economy Macroeconomics
   Fall/Summer: ECON 457 Mathematical Economics
   Spring: ECON 384V Water Resource Economics
6. **International Business Double Majors:** Students may not receive credit for I B 489 Senior Seminar in International Business For this reason, students majoring in both Economics and International Business must consult with the Department Head to arrange a suitable substitution.

Economics - Bachelor of Business Administration

This program is especially suitable for students who find economics interesting and who intend, perhaps without additional formal education beyond the Bachelor degree, to take jobs in business or government. This degree prepares you for a wide variety of jobs including those leading eventually to positions of executive responsibility. It is also appropriate for those who may choose to seek a Master of Business Administration degree after graduation. It is also a great degree for someone interested in pursuing a career as a lawyer.

In addition to completing general education, (p. 262) College of Business foundation and business core (p. 968), Viewing a Wider World (p. 266) requirements, and general electives (see above), every candidate for the bachelor of business administration in economics must complete each of these courses with a grade of C- or better.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses.		
Area I: Communications		
English Composition - Level 1		

Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra (Foundation Requirement) [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
ECON 2110G	Macroeconomic Principles (Credits are counted in Business Core)	
ECON 2120G	Principles of Microeconomics Honors (Credits are counted in Business Core)	
Area III: Laboratory Sciences Course (4 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1430G	Applications of Calculus I (must earn a grade of at least C- (foundation requirement)) [1]	3
Viewing A Wider World Courses [3]		**6**
Departmental/College Requirements		
Foundation Requirements [4]		
A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)	3
Business Core: Lower Division (minimum grades of C- required)		
ACCT 2110	Principles of Accounting I (not recommended for freshman year)	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
MGMT 344	Production and Operations Management	3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, BFIN, I B, MGMT, MKTG (excluding A ST 311)		6
Major Courses [5]		
ECON 304	Money and Banking	3
ECON 311	Intermediate Macroeconomic Theory	3
ECON 312	Intermediate Microeconomic Theory	3
ECON 405	Introductory Econometrics	3
ECON Upper Division Electives		*12*
At least two electives must be from the following:		
ECON 332	Public Finance	
ECON 449	Open Economy Macroeconomics	
ECON/I B 450	International Economics	
ECON 457	Mathematical Economics	
Second Language: (not required)		
Electives, to bring the total credits to 120 [6]		**16**
Total Credits		**120**

1. Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses and how to fulfill this requirement.
4. All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G, MATH 1430G and A ST 311 must be completed.
5. Economics majors must earn a minimum cumulative GPA of 2.5 in the 27 credits of departmental requirements.
6. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
MATH 1220G	College Algebra (C- or better) [1]	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) [1]	
ENGL 1110H	Composition I Honors (C- or better) [1]	
ENGL 1110M	Composition I (C- or better) [1]	
Area V: Humanities [2]		3
Elective Course [3]		3
	Credits	**16**
Spring		
MATH 1430G	Applications of Calculus I (C- or better) [1]	3
BUSA 1110	Intro to Business (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors (C- or better)	

Area III: Laboratory Science Course [2]		4
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Second Year		
Fall		
A ST 311	Statistical Applications (C- or better)	3
ECON 2110G	Macroeconomic Principles (C- or better, counts towards Area IV Gen.Ed)	3
ACCT 2110	Principles of Accounting I (C- or better)	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication (C- or better, counts towards Area I Gen.Ed) [1] or Professional and Technical Communication	3
Elective Course [3]		3
	Credits	**15**
Spring		
ECON 2120G	Principles of Microeconomics Honors (C- or better, counts towards Area IV Gen.Ed) [1]	3
ACCT 2120	Principles of Accounting II	3
Elective Course [3]		4
Elective Course [3]		3
Viewing a Wider World Course [4]		3
	Credits	**16**
Third Year		
Fall		
ECON 304	Money and Banking [1]	3
ECON 311	Intermediate Macroeconomic Theory [1]	3
BCIS 338	Business Information Systems I [1]	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
	Credits	**15**
Spring		
ECON 312	Intermediate Microeconomic Theory [1]	3
ECON 405	Introductory Econometrics [1]	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
Viewing a Wider World Course [4]		3
	Credits	**15**
Fourth Year		
Fall		
Choose one Upper-Division Elective in ECON from the following:		3
ECON 332	Public Finance [1]	
ECON 449	Open Economy Macroeconomics [1]	
ECON 450 or I B 450	International Economics or International Economics	
ECON 457	Mathematical Economics	
ECON Upper-Division Elective [5]		3
ECON or A ST Upper-Division Elective Course (excluding A ST 311) [5]		3
Choose one from the following:		3
BCIS 485	Enterprise Resource Planning [1]	
MGMT 344	Production and Operations Management [1]	
MGMT 470	Project Management in Organizations	
Elective Course [3]		3
	Credits	**15**
Spring		
ECON Upper-Division Elective Course [5]		3
ECON Upper-Division Elective Course [5]		3
MGMT 449	Strategic Management [1]	3
Any Business Upper-Division Elective Course (excluding A ST 311)		3
	Credits	**12**
	Total Credits	**120**

1. Prerequisites are required, students are responsible for checking and fulfilling course prerequisites listed in the catalog.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. Upper Division ECON electives are typically only offered during certain semesters, so students must plan accordingly.
   Fall: ECON 337V Natural Resource Economics, ECON 449 Open Economy Macroeconomics
   Fall/Summer: ECON 457 Mathematical Economics
   Spring: ECON 384V Water Resource Economics
6. **International Business Double Majors:** Students may not receive credit for I B 489 Senior Seminar in International Business For this reason, students majoring in both Economics and International Business must consult with the Department Head to arrange a suitable substitution.

Economics (Energy Economics) - Bachelor of Business Administration

This program is especially suitable for students interested in a career in the energy sector. This degree prepares you for jobs in the energy sector, including those in administration, and those leading eventually to positions of executive responsibility.

the concentration in energy economics must complete the following: ECON 345 (https://catalogs.nmsu.edu/search/?P=ECON%20332) Energy Economics (3 cr.), ECON 335v (https://catalogs.nmsu.edu/search/?P=ECON%20336) Business and Government (3 cr.), ECON 445 (https://catalogs.nmsu.edu/search/?P=ECON%20401) Oil and Natural Gas Economics (3 cr.), and ECON 471 (https://catalogs.nmsu.edu/search/?P=ECON%20450) Electricity Economics (3 cr.).

In addition to completing general education, (p. 262) College of Business foundation and business core (p. 968), Viewing a Wider World (p. 266) requirements, and general electives (see above), every candidate for the bachelor of business administration in economics must complete each of these courses with a grade of C- or better.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses.		
Area I: Communications		
English Composition - Level 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra (Foundation Requirement) [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
ECON 2110G	Macroeconomic Principles (Credits are counted in Business Core)	
ECON 2120G	Principles of Microeconomics Honors (Credits are counted in Business Core)	
Area III: Laboratory Sciences Course (4 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1430G	Applications of Calculus I (must earn a grade of at least C- (foundation requirement)) [1]	3
Viewing A Wider World Courses [3]		**6**
Departmental/College Requirements		
Foundation Requirements (minimum grade of C- required)		
A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed.)	3
Business Core: Lower Division (minimum grades of C- required)		
ACCT 2110	Principles of Accounting I (not recommended for freshman year)	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
MGMT 344	Production and Operations Management	3
Two Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, BFIN, I B, MGMT, MKTG (excluding A ST 311)		6
Major Courses [4]		
ECON 304	Money and Banking	3
ECON 311	Intermediate Macroeconomic Theory	3
ECON 312	Intermediate Microeconomic Theory	3
ECON 405	Introductory Econometrics	3
ECON Upper Division Electives		*12*
At least two electives must be from the following:		
ECON 332	Public Finance	
ECON 449	Open Economy Macroeconomics	
ECON/I B 450	International Economics	
ECON 457	Mathematical Economics	
Concentration Coursework		
ECON 345	Energy Economics	3
ECON 335V	Business and Government	3
ECON 445	Oil and Natural Gas Economics	3
ECON 471	Electricity Economics	3
Second Language: (not required)		
Electives, to bring the total credits to 120 [5]		**4**
Total Credits		**120**

1. Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses and how to fulfill this requirement.
4. Economics majors must earn a minimum cumulative GPA of 2.5 in the 27 credits of departmental requirements.
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
MATH 1220G	College Algebra (C- or better) [1]	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) [1]	
ENGL 1110H	Composition I Honors (C- or better) [1]	
ENGL 1110M	Composition I (C- or better) [1]	
Area V: Humanities [2]		3
Elective Course [3]		3
	Credits	**16**
Spring		
MATH 1430G	Applications of Calculus I (C- or better) [1]	3

BUSA 1110	Intro to Business (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors (C- or better)	
Area III: Laboratory Science Course [2]		4
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Second Year		
Fall		
A ST 311	Statistical Applications (C- or better)	3
ECON 2110G	Macroeconomic Principles (C- or better, counts towards Area IV Gen.Ed)	3
ACCT 2110	Principles of Accounting I (C- or better)	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication (C- or better, counts towards Area I Gen.Ed) [1] or Professional and Technical Communication	3
Elective Course [3]		3
	Credits	**15**
Spring		
ECON 2120G	Principles of Microeconomics Honors (C- or better, counts towards Area IV Gen.Ed) [1]	3
ACCT 2120	Principles of Accounting II	3
Elective Course [3]		4
Elective Course [3]		3
Viewing a Wider World Course [4]		3
	Credits	**16**
Third Year		
Fall		
ECON 304	Money and Banking [1]	3
ECON 311	Intermediate Macroeconomic Theory [1]	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
ECON 345	Energy Economics	3
	Credits	**15**
Spring		
ECON 312	Intermediate Microeconomic Theory [1]	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
Viewing a Wider World Course [4]		3
ECON 335V	Business and Government	3
	Credits	**15**
Fourth Year		
Fall		
Choose one Upper-Division Elective in ECON from the following:		3
ECON 332	Public Finance [1]	
ECON 449	Open Economy Macroeconomics [1]	
ECON 450 or I B 450	International Economics or International Economics	
ECON 457	Mathematical Economics	
Any Business Upper-Division Elective Course (excluding A ST 311) [5]		3
MGMT 344	Production and Operations Management [1]	3
BCIS 338	Business Information Systems I	3
Any Business Upper-Division Elective Course (exclusing A ST 311)		3
	Credits	**15**
Spring		
ECON 405	Introductory Econometrics	3
ECON 445	Oil and Natural Gas Economics	3
MGMT 449	Strategic Management [1]	3
ECON 471	Electricity Economics	3
	Credits	**12**
	Total Credits	**120**

1. Prerequisites are required, students are responsible for checking and fulfilling course prerequisites listed in the catalog.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. Upper Division ECON electives are typically only offered during certain semesters, so students must plan accordingly.
   Fall: ECON 337V Natural Resource Economics, ECON 449 Open Economy Macroeconomics
   Fall/Summer: ECON 457 Mathematical Economics
   Spring: ECON 384V Water Resource Economics
6. **International Business Double Majors:** Students may not receive credit for I B 489 Senior Seminar in International Business For this reason, students majoring in both Economics and International Business must consult with the Department Head to arrange a suitable substitution.

International Business - Bachelor of Business Administration

The Bachelor of Business Administration in International Business is intended for those who plan to work for businesses with operations abroad or between the United States and foreign countries. The program prepares you for positions requiring knowledge of international payments, foreign exchange markets, global marketing, export and import procedures, and international investments.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above.

In addition to the course work indicated below, students must satisfy the following two requirements:

Second language: Students must demonstrate oral and written proficiency at the intermediate mid-level according to ACTFL (American Council on the Teaching of Foreign Languages) proficiency guidelines.

International experience requirement: Students must engage in an international experience equivalent to a semester abroad in a university where the language of instruction is not English. The department will

determine the appropriateness of international experience. Study abroad programs must be pre-approved by IB advisors and the Department Head.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses.		
Area I: Communications		
English Composition - Level 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra (Foundation Requirement) [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
ECON 2110G	Macroeconomic Principles (Credits are counted in Business Core)	
ECON 2120G	Principles of Microeconomics Honors (Credits are counted in Business Core)	
Area III: Laboratory Sciences Course (4 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1430G	Applications of Calculus I (Foundation Requirement, must earn a grade of at least C-) [1]	3
Viewing a Wider World [3]		**6**
Departmental/College Requirements		
Foundation Requirements [4]		
A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)	3
Business Core: Lower Division (minimum grades of C- required)		
ACCT 2110	Principles of Accounting I (not recommended for freshman year)	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
MGMT 344	Production and Operations Management	3
Two Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, BFIN, I B, MGMT, MKTG (excluding A ST 311)		6
Major Courses [5]		
I B 351	International Business	3
I B/ECON 450	International Economics	3
I B/ECON 449	Open Economy Macroeconomics	3
Choose two from the following:		*6*
I B 475	International Managerial Finance	
or BFIN 475	International Managerial Finance	
ECON 324V	Developing Nations	
I B 398	International Business and Economic Environments	
Upper Division Courses: Functional Business area		*15*
Courses must be in a single functional business area beyond elsewhere required for the I B major [6]		
Second Language (See "Second language requirement" description above)		
International Experience (see "International experience requirement" description above)		
Electives, to bring the total credits to 120 [7]		**10**
Total Credits		**120**

1. Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses and how to fulfill this requirement.
4. All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G, MATH 1430G and A ST 311 must be completed.
5. Candidates must earn a minimum cumulative GPA of 2.5 in all major course requirements. At least 12 of the 15 credit hours counted toward the international business major courses must be earned at NMSU. No more than 3 of the 15 required major credits may be earned while studying abroad.
6. At least 9 of the 15 credit hours counted toward the international business functional area must be earned at NMSU. No more than 6 of the 15 required business functional area credits may be earned while studying abroad.
7. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
MATH 1220G	College Algebra (C- or better) [1]	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) [1]	
ENGL 1110H	Composition I Honors (C- or better) [1]	
ENGL 1110M	Composition I (C- or better) [1]	
Area V: Humanities Course [2]		3
Elective Course [3]		3
	Credits	**16**
Spring		
MATH 1430G	Applications of Calculus I (C- or better) [1]	3
BUSA 1110	Intro to Business (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors (C- or better)	
Area III: Laboratory Science Course [2]		4
Area VI: Fine Arts Course [2]		3
	Credits	**16**
Second Year		
Fall		
A ST 311	Statistical Applications (C- or better)	3
ECON 2110G	Macroeconomic Principles (C- or better, counts towards Area IV Gen.Ed)	3
ACCT 2110	Principles of Accounting I (C- or better)	3
ENGL 2210G	Professional and Technical Communication (C- or better, counts towards Area I Gen.Ed) [1]	3
Viewing a Wider World Course [4]		3
	Credits	**15**
Spring		
ECON 2120G	Principles of Microeconomics Honors (C- or better, counts towards Area IV Gen.Ed) [1]	3
ACCT 2120	Principles of Accounting II	3
Elective Course [2]		4
Elective Course [3]		3
Viewing a Wider World Course [4]		3
	Credits	**16**
Third Year		
Fall		
I B 351	International Business [1]	3
Upper Division Course- Functional Business Area		3
BCIS 338	Business Information Systems I [1]	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
	Credits	**15**
Spring		
BFIN 341	Financial Analysis and Markets [1]	3
Upper Division Course: Functional Business area		3
BLAW 316	Legal Environment of Business	3
Business Upper- Division Elective (excluding A ST 311) [3]		3
I B 475	International Managerial Finance	3
	Credits	**15**
Fourth Year		
Fall		
Choose one from the following:		3
ECON 324V	Developing Nations	
I B 398	International Business and Economic Environments (spring only)	
BFIN 475 or I B 475	International Managerial Finance (Fall only) or International Managerial Finance	
Choose one from the following:		3
MGMT 344	Production and Operations Management [1]	
MGMT 470	Project Management in Organizations	
BCIS 485	Enterprise Resource Planning [1]	
Upper Division Course: Functional Business area		3
Any Business Upper-Division Elective Course (excluding A ST 311)		3
ECON 450 or I B 450	International Economics or International Economics	3
	Credits	**15**
Spring		
ECON 449 or I B 449	Open Economy Macroeconomics or Open Economy Macroeconomics	3
MGMT 449	Strategic Management [1]	3
Upper-Division Course: Functional Business area		3
Upper-Division Course: Functional Business area		3
	Credits	**12**
	Total Credits	**120**

1 Prerequisites are required, students are responsible for checking and fulfilling course prerequisites listed in the catalog.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

4 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

5 Upper Division ECON electives are typically only offered during certain semesters, so students must plan accordingly.

6 Students are required to take the following in order to meet the requirements for the degree:

- I B 450 International Economics or ECON 450 International Economics

7 **International Business Double Majors:** Students may not receive credit for I B 489 Senior Seminar in International Business For this reason, students majoring in both Economics and International Business must consult with the Department Head to arrange a suitable substitution.

Other Requirements for the Major

Foreign language: Students must demonstrate oral and written proficiency at the intermediate mid-level according to ACTFL (American Council on the Teaching of Foreign Languages) proficiency guidelines. (Process for demonstrating proficiency to be coordinated with the NMSU

Department of Languages and Linguistics. Any costs associated with proficiency demonstration will be paid by the student.)

International experience requirement: Students must partake of an international experience equivalent to a semester abroad in a university where the language of instruction is not English. The department will determine appropriateness of international experience. Study abroad programs must be pre-approved by IB advisors and Department Head.

Economics - Undergraduate Minor

The undergraduate minor in economics is appropriate for those who seek a better understanding of how micro- and macro-economic forces influence individuals, business and government decision making. Students thinking of a career in banking and finance, government service, or law will find the minor helpful.

A minor in economics consists of 18 or more credit hours of approved course work in economics (ECON), of which at least 12 are numbered 300 or higher, all completed with a grade of C- or higher. At least 12 credits must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

Prefix	Title	Credits
Required Courses		
ECON 2110G	Macroeconomic Principles [1]	3
ECON 2120G	Principles of Microeconomics [1]	3
ECON 304	Money and Banking	3
or ECON 311	Intermediate Macroeconomic Theory	
ECON 312	Intermediate Microeconomic Theory	3
Upper-division courses (300 or higher) in economics		6
Total Credits		**18**

[1] ECON 1110G Survey of Economics may be substituted for one of Econ 251G Principals of Macroeconomics or Econ 252G Principals of Microeconomics with the approval of the Head of the Department of Economics, Applied Statistics, and International Business.

International Business - Undergraduate Minor

A minor in international business provides the student with a background in international business that can be useful in many settings given the increasing intensity of globalization. Especially those who wish to find work with large companies with an international presence or for those who may want to own their own business dealing internaionally, the minor in international business can help lay the groundwork for a successful career.

A minor consists of 18 or more credit hours of approved course work in the International Business core, all completed with a grade of C- or higher. At least 12 credits must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

Prefix	Title	Credits
Required Courses		
I B 351	International Business	3
ECON/I B 450	International Economics	3
BFIN/I B 475	International Managerial Finance	3
or ECON 449	Open Economy Macroeconomics	
I B 489	Senior Seminar in International Business	3
Select one from the following:		3
ECON 324V	Developing Nations	
I B 398	International Business and Economic Environments	
Upper-division business course		3
Total Credits		**18**

In addition, I B minors must meet the foreign language proficiency requirement described below.

Students must demonstrate oral and written proficiency in a foreign language at the intermediate mid-level according to the ACTFL (American Council on the Teaching of Foreign Languages) proficiency guidelines. (Process for demonstrating proficiency to be coordinated with the NMSU Department of Languages and Linguistics. Any costs associated with proficiency demonstration will be paid by the student.)

Finance

Undergraduate Program Information

Finance is about managing money and cash flow for business organizations, governments, and individuals. The study of finance involves examining the theory and techniques of managing money, including analysis and management of risk. Finance students learn to apply tools and concepts from mathematics, statistics, economics, and accounting to financial decision-making. With this knowledge, finance graduates are in high demand by employers and command some of the highest salaries for college graduates. Depending upon their career goals and interests, finance majors may use the electives in the major to focus their program of study on Corporate Finance, Investments, or Risk Management and Insurance.

Degrees for the Department

- Finance (Financial Analysis) - Bachelor of Business Administration (p. 1013)
- Finance (Risk Management and Insurance) - Bachelor of Business Administration (p. 1014)
- Finance - Bachelor of Business Administration (p. 1011)

Minors

Entrepreneurship, Finance, and Risk Management & Insurance minors, can only be earned by non-finance majors. The Business Law minor is open to all majors.

- Business Law - Undergraduate Minor (p. 1016)
- Entrepreneurship - Undergraduate Minor (p. 1017)
- Finance - Undergraduate Minor (p. 1017)
- Risk Management and Insurance - Undergraduate Minor (p. 1017)

- Finance - Graduate Certificate (p. 248)

Harikumar Sankaran, Professor, Department Head

Professors de Boyrie, Sankaran; ***Associate Professor*** Rahman; ***Assistant Professor***s: Graciano; Memon; Morohunfolu; ***College Professors***: Castille; Groves; James, Kealy; ***College Associate Professor***: Kerr; ***College Assistant Professor***: Guerrero; ***Emeritus Professors*** Fortin, Martin, Oretskin, Query

Business Finance Courses

BFIN 2110. Introduction to Finance
3 Credits (3)
Introduces tools and techniques of financial management. Includes time value of money; financial planning, diversification and risk; debt and equity investment decisions; and financial statement analysis.
Prerequisite(s): OATS 106 or higher; OATS 120 or ACCT 2110; ECON 1110G or ECON 2110G.
Learning Outcomes
1. Explain the time value of money and its application in decision-making, including calculating present and future values of single payment and series of payments.
2. Identify the major sources of external long-term financing for corporations.
3. Explain risk-return tradeoff as it relates to diversification.
4. Differentiate the role of finance from other related disciplines such as accounting and economics.
5. Demonstrate knowledge of capital markets and securities (debt and equity).
6. Describe basic types of financial ratios and their uses.
7. Demonstrate the ability to prepare cash flows and make qualitative judgments on the relevance of the changes from one time frame to another.

BFIN 303V. Personal Financial Planning and Investing in a Global Economy
3 Credits (3)
Provides a framework for successful personal financial planning within an individual's career and income. Covers personal money management, federal and state taxation, the mathematics of finance and credit, housing, inflation, insurance, savings, and investments. Majors and minors may not use this course to satisfy their finance requirements.
Learning Outcomes
1. Students will develop an understanding of how globalization and international affairs impact their personal financial planning.
2. Students will develop an understanding of how knowledge from a variety of disciplines, including capital market history, the political environment, government, mathematics, behavioral economics, and statistics, are important to financial planning.
3. Students will develop an understanding of the core areas of a personal financial planning course which include: the financial planning process, time value of money, measuring financial health, tax planning, liquid asset management, the role of credit, consumer loans, home and auto financing, investment basics, domestic and international securities markets, bond investing, equity investing, mutual funds and retirement planning.
4. Students will integrate knowledge of international financial markets into the personal financial planning process by developing and writing their own personal financial plan.

BFIN 311. Financial Futures Markets
3 Credits (3)
Course taught with AEEC 3220.
Learning Outcomes
1. Understand and explain the concept of risk, list various sources of risks observed in businesses, and identify common methods used to manage risk.
2. Articulate the role that derivative markets play in reducing risk and illustrate how they can be used in practice to reduce risk.
3. Illustrate how derivative markets can be used to generate income and manage risk through hedging.
4. Demonstrate an understanding of the vocabulary associated with derivatives and derivative markets.

BFIN 322. Principles of Insurance
3 Credits (3)
Theory and practice of insurance and its economics and social significance; review of the major lines of insurance including life, health, and property liability insurance.
Learning Outcomes
1. Differentiate between traditional risk management and enterprise risk management.
2. Identify risks for business and in your personal life.
3. Evaluate and select risk treatment techniques based on the risks identified.
4. Differentiate between insurance, reinsurance, self-insurance, and a captive insurance program.
5. Distinguish between insurance and risk management concepts and operations.
6. Examining the needs for personal insurance policies for individuals and families.

BFIN 323. Life/Health/Employee Benefits
3 Credits (3)
Approaches to problems of employee security from the perspective of businesses. Topics including pensions, profit-sharing plans, 401(k) plans, group life and health plans, and flexible benefit programs. The course also addresses individual life, health, and annuity contracts within a financial planning context. May be repeated up to 3 credits.
Prerequisite/Corequisite: BFIN 322.
Learning Outcomes
1. Understand the various types of life insurance and annuity contracts and their uses.
2. Know how life and health insurers are regulated.
3. Analyze the insurance marketplace and health care reform.
4. Review contractual provisions of life insurance policies.
5. Understand how human life value is determined.
6. Calculate life contingencies and pricing of life and health insurance.

BFIN 324. Property and Liability Insurance
3 Credits (3)
Analysis of property and liability insurance with emphasis on handling of commercial exposures. Review of property and liability company operations including rate making and insurance accounting. May be repeated up to 3 credits.
Prerequisite/Corequisite: BFIN 322.
Learning Outcomes
1. Determine if an insurance policy covers an insurance claim.
2. Calculate the amount payable for an insurance claim.
3. Choose the insurance needed for a given situation.
4. Define frequently used insurance terms and acronyms.
5. Explain the responsibility of the various insurance functions.

BFIN 325. Real Estate Principles and Law I
3 Credits (3)
Real estate law and the fundamental aspects of the real estate purchase transaction and the real estate lease agreement. Topics include real estate brokerage, marketing of real estate, fundamental legal aspects of real estate, present and future interests, air and water rights, methods of

transfer, basics of financing and liens, and real estate leases. Same as BLAW 325.

BFIN 341. Financial Analysis and Markets
3 Credits (3)
Financial analysis for business financing and investing decisions.
Prerequisite: ACCT 2110, ECON 2110G, ECON 2120G, MATH 1220G, A ST 311 or MATH 1350G.
Learning Outcomes
1. Solve time value of money problems.
2. Identify bond risk characteristics and calculate bond values.
3. Understand and apply dividend valuation models.
4. Compute returns and risks for single stocks and portfolio of stocks.
5. Solve capital budgeting problems.
6. Calculate component and weighted average costs of capital.

BFIN 350. Financial Statement Analysis
3 Credits (3)
This course will provide a structured approach to assessing a company's historical performance, forecasting its future performance, and determining its equity value. It introduces a mix of practical tools and theoretical concepts used in FSA. Throughout the course, you can make informed judgments about cash flow, earnings quality, hidden assets and liabilities, and overall business performance. Additionally, you will learn to integrate key principles from accounting, finance, economics, and business strategy to guide effective financial decision-making.
Prerequisite: BFIN 341 with a grade of C- or better.
Learning Outcomes
1. Develop a comprehensive framework for analyzing a business.
2. Understand the underlying business model and the story behind financial statements (Balance Sheet, Income Statement, Cash Flow Statement).
3. Gain familiarity with the disclosure of information in 10-K filings and accompanying financial statement notes.
4. Achieve proficiency in calculating and interpreting financial ratios.
5. Evaluate the quality, profitability, solvency, and liquidity of financial statements from the perspectives of various stakeholders.
6. Understand the implications of accounting errors, whether due to intentional manipulation or unintentional mistakes.
7. Learn about earnings announcements and their significance.
8. Apply various valuation methods and scenarios to calculate an organization's value effectively.

BFIN 355. Investments
3 Credits (3)
Analysis of investment risks and rewards and of the problems of portfolio selection and management. Operation of the securities market.
Prerequisite: BFIN 341 with a grade of C- or better.
Learning Outcomes
1. Understand the Investment Environment: Students will be able to describe the structure and function of financial markets and institutions, including the various asset classes and financial instruments available to investors.
2. Analyze Risk and Return: Students will learn to calculate and interpret key risk and return metrics and understand their historical trends, explore the relationship between risk and return in the context of portfolio management.
3. Apply Modern Portfolio Theory (MPT): Students will learn to apply the principles of Modern Portfolio Theory to construct and manage investment portfolios, including the concepts of efficient diversification and performance evaluation.
4. Evaluate Fixed Income and Derivative Securities: Students will develop the skills to analyze and value fixed-income securities and derivatives, including bonds, options, and other complex financial instruments.
5. Conduct Security Analysis and Equity Valuation: Students will be equipped to perform security analysis to determine the valuation of individual securities and assess their appropriateness for inclusion in an investment portfolio, understand the implications of market efficiency on investment strategies.
6. Develop Practical Investment Skills: Students will learn to open and manage a brokerage account, transfer funds, and execute trades, develop criteria for selecting stocks, making buy and sell decisions, and managing a portfolio through hands-on experience with a paper trading account.

BFIN 360. Financial Information Technology
3 Credits (3)
Integrated use of electronic financial information resources with spreadsheet and word processing applications in investigating financial issues and solving financial problems.
Prerequisite: A grade of C- or better in BFIN 341 or consent of instructor.
Learning Outcomes
1. Build and use spreadsheets to illustrate relationships among financial and economic variables: a) Accessing financial and economic information from various internet sources and placing b) Manipulating financial and economic data using spreadsheet formulas, tools, and functions c) Computing financial results using spreadsheet formulas, tools, and functions d) Diagramming and illustrating relationships between different financial and economic variables using charts and graphs.
2. Enhance student engagement with discussions on current events and topics in Finance.

BFIN 385. Analysis of Financial Markets and Institutions
3 Credits (3)
Analysis of the financial system, emphasizing its institutions and instruments.
Prerequisite: BFIN 341 with a grade of C- or better.
Learning Outcomes
1. Understand how financial markets function.
2. Learn the role in raising capital for the economy.
3. Analyze interest rates.
4. Analyze financial instruments.

BFIN 391. Finance Internship and Cooperative Education I
1-3 Credits
Introduction and application of finance principles in a work environment. Open only to students in the finance major or minor who will be working with an approved employer in a finance related position, over a period of 12 weeks or at least 300 work hours. Consent of instructor required.

BFIN 392. Insurance Internship and Cooperative Education I
1-3 Credits (1-3)
Introduction and application of insurance principles in a work environment. Open only to students in the finance major or insurance minor who will be working with an approved employer in an insurance related position, over a period of 12 weeks or at least 300 work hours. Consent of instructor required. Restricted to Finance majors.

BFIN 393. Banking Internship and Cooperative Education
1-3 Credits (1-3)
Professional banking experience with opportunities to engage in business analysis and to observe application of business principles in the management of a banking entity or a regulatory agency with banking oversight. Open only to students in the finance major or banking minor who will be working with an approved employer in a banking related position, over a period of 12 weeks or at least 300 work hours. May be repeated up to 3 credits. Consent of Instructor required.

BFIN 452. Personal Financial Planning for Professionals
3 Credits (3)
Introduction to personal financial planning, including goal setting and fact finding, cash management, credit, housing, retirement planning, taxation and estate planning. This course is intended for those planning careers in personal financial advising in one of the various financial services environments.
Prerequisite: BFIN 341, or consent of Instructor.
Learning Outcomes
1. Describe the financial planning process, assess the external environment, use goals to establish financial direction, and analyze a client's present financial position.
2. Estimate the impacts of income tax planning strategies, apply the basic process for retirement planning, and define the considerations for estate planning.
3. Evaluate the roles of various insurance products in managing risks, and recognize the professional and ethical aspects of financial planning.

BFIN 453. Investment Analysis
3 Credits (3)
Efficiency of capital markets, modern portfolio management, special topics of current interest to investment analysts.
Prerequisite: BFIN 355.
Learning Outcomes
1. Model forecasted financial statements using Excel.
2. Build equity asset valuation models using Excel.
3. Build financial models in Excel to estimate risk and return for individual stock.
4. Build financial models in Excel to construct an efficiently diversified portfolio.
5. Make decisions regarding investments for the Wetherbe Student-Managed Investment Fund.

BFIN 454. Fixed Income Markets, Instruments and Derivatives
3 Credits (3)
Course provides a broad introduction to treasury, corporate, municipal, mortgage backed and asset backed bond markets. The analytical techniques for valuing bonds, quantifying their exposure to changes in interest rate and credit risk exposures and investment decision-making are explored.
Prerequisite: BFIN 341.
Learning Outcomes
1. Basic understanding of the functions of the treasury bond market.
2. Be able to value credit products.
3. Conduct quantitative analysis of risk affecting bond instruments.
4. Understand Yield Curve.
5. Term Structure Estimation.
6. Work with Fixed-Income Derivatives.

BFIN 455. Derivative Markets and Securities
3 Credits (3)
Institutional aspects of derivative markets and the arbitrage based pricing of derivative instruments such as stock options, interest rate options, future contracts and swaps. The applied component of the course demonstrates use of these instruments as hedge and/or investment vehicles.
Prerequisite: BFIN 355.
Learning Outcomes
1. Analyze properties of stock options.
2. Be able to execute trading strategies using options and futures.
3. Be able to use the binomial pricing model to value options.
4. Be able to work with Option Greeks.
5. Be able to set up basic hedges using futures contracts.
6. Have a working knowledge of Interest Rate Futures.

BFIN 456. Business Risk Management
3 Credits (3)
The operational risks faced by firms and the study of various methods of handling these risks, including loss prevention, risk retention, self-insurance, corporate insurance programs, and capital markets.
Prerequisite: BFIN 322.
Learning Outcomes
1. Develop an understanding of risk management and its basic concepts.
2. Discuss alternative approaches to risk management and develop the knowledge to analyze the features and benefits of enterprise risk management.
3. Gain knowledge regarding risk assessments and the fundamental requirements for a successful risk management program through risk classification and risk analysis tools and techniques.
4. Apply risk control techniques to the identified risks and learn the importance of insurance and risk transfer.
5. Explore the importance of risk management strategy and risk management policy while understanding the techniques to implement a successful risk management program.
6. Develop knowledge about creating a risk-aware culture and understanding an organization's risk appetite.
7. Understand risk governance and how corporate governance requirements impact an organization's risks.
8. Learn risk assurance and risk reporting within an organization to expand their knowledge regarding internal control and corporate social responsibility.

BFIN 466. Financial Policy Decisions
3 Credits (3)
The course is designed to facilitate the practical application of the tools and concepts of basic corporate finance to actual business problems. By evaluating and solving actual problems involving financial management concepts, students will enhance their understanding of these tools and their ability to apply them in the business world. Cases will encompass a range of corporate financial problems. The application of artificial intelligence when analyzing the cases will be covered.
Prerequisite: BFIN 360.
Learning Outcomes
1. Provide students with cases that are not guided.
2. Use prompts to generate solutions to their own generated questions, use of prompts and critical thinking in asking/coming up with questions for AI and themselves to solve.

3. Use AI to change PDF data within the case into Excel spreadsheets.
4. Use AI to extract text data (for example, analyst report and social media).
5. Use AI to analyze data provided within the cases/perform interactive data analysis.

BFIN 470. Real Estate Appraisal
3 Credits (2+2P)
This course addresses issues influencing the value of real estate with some emphasis upon rural properties. Topics include courthouse records, property taxes, appraisal methodology, expert courtroom testimony, condemnation, and legal issues. Students will take field trips and write appraisals. Course material is relevant to students in Finance, Accounting, and Pre-Law, as well as Agriculture. Accredited for hours to apply to both pre-licensing and continuing education requirements of the New Mexico Real Estate Commission for both Appraisers and Real Estate Brokers. Cross-listed with AEEC 4550. May be repeated up to 3 credits.
Learning Outcomes
1. Distinguish between the Income Approach, Cost Approach, and Sales Comparison Approach.
2. Identify market abstracted influences on value.
3. Apply proper appraisal methodology.
4. Demonstrate appraisal knowledge by writing a residential appraisal and a farm appraisal.

BFIN 475. International Managerial Finance
3 Credits (3)
International aspects of financial transactions, decision-making, banking and financial markets. Taught with: I B 475 and BFIN 575.
Learning Outcomes
1. Explain and evaluate how the globalization process moves a business from a purely domestic focus in its financial relationships and composition to one truly global in scope.
2. Describe what three major corporate currency exposures arise from multinational business.
3. Define and explain the terms that are used in reference to exchange rates and currency regimes in addition to analyzing the characteristics of an ideal currency.
4. Explain how nations measure their level of international economic activity and how that is measured by the balance of payments.
5. Show how interest rates and inflation affect each country and currency.
6. Identify the forms of currency quotations used by currency dealers, financial institutions, and agents of all kinds when conducting foreign exchange transactions.
7. Distinguish between spot, forward, swaps, and other types of foreign exchange financial instruments as well as foreign currency futures and options contracts.

BFIN 480. Management of Financial Institutions
3 Credits (3)
Asset and liability management of financial institutions; emphasis on commercial bank management.
Prerequisite: BFIN 385 or consent of instructor.
Learning Outcomes
1. Learn bank management techniques.
2. Learn asset and liability management.
3. Learn capital adequacy.
4. Learn bank market structure.

BFIN 490. Selected Topics
1-3 Credits
Current topics in finance.
Prerequisites: vary according to the seminar being offered.

BFIN 498. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.
Prerequisites: junior or above standing and consent of instructor.

BFIN 500. Concepts in Finance
1 Credit (1)
An overview of fundamental principles of finance necessary for prospective MBA students who do not have an undergraduate background in finance. Includes: Time value of money concepts and calculations; risk and calculation of return given appropriate risk measures; bond risk characteristics and calculation of the value of a bond; calculation of the value of common stock (determination as to whether a stock is over-valued or under-valued); and calculation of the costs of capital and capital budgeting problems using the cost of capital.
Prerequisite(s): admitted to MBA Program or consent of course department.

BFIN 503. Financial Management
3 Credits (3)
Theory and application of financial analysis to asset management, project evaluation, capital structure, and dividend policy. Interrelationships among financial and other organizational decisions. May be repeated up to 3 credits.
Prerequisite: Graduate students only.
Learning Outcomes
1. Students will be able to compute the risk and return of portfolios and be able to process information to make prudent investment decisions.
2. Students will be able to conduct feasibility studies using capital budgeting techniques.
3. Students will be able to recognize and evaluate any real options present in capital budgeting situations.
4. Students will be able to compute bond values and analyze the impact of changes in interest rates and credit spreads.

BFIN 511. Financial Derivative Markets
3 Credits (3)
This course examines advanced futures and options strategies for income generation and risk management. Coverage includes a variety of markets, e.g., interest rates, stock indexes, metals, currencies, livestock, and grains. Both technical and fundamental trading strategies are identified and discussed. Same as AEEC 3220/BFIN 311 with additional coursework required at the graduate level. Cannot receive credit for both AEEC 3220/BFIN 311 and AEEC 5220/AEEC 5220. Taught with AEEC 5220.
Learning Outcomes
1. Define risk and identify methods of managing risk.
2. Demonstrate understanding of vocabulary associated with derivatives and derivative markets.
3. Identify the role that derivative markets play in reducing risk.
4. Demonstrate a basic understanding of derivative markets including their use in risk management and income generation.

BFIN 521. Personal Financial Planning for Professionals
3 Credits (3)

Introduction to personal financial planning, including goal setting and fact finding, cash management, credit, housing, retirement planning, taxation and estate planning. This course is intended for those planning careers in personal financial advising in one of the various financial services environments. For Graduate students only

Learning Outcomes

1. Describe the financial planning process, assess the external environment, use goals to establish financial direction, and analyze a client's present financial position.
2. Estimate the impacts of income tax planning strategies, apply the basic process for retirement planning, and define the considerations for estate planning.
3. Evaluate the roles of various insurances products in managing risks, and recognize the professional and ethical aspects of financial planning

BFIN 535. Investment Concepts
3 Credits (3)

Investments in common stocks and other securities. Risk and return, securities markets, portfolio theory and management. For Graduate students only

Learning Outcomes

1. Model forecasted financial statements using Microsoft Excel.
2. Build financial models in Excel to estimate risk and return for individual stock.
3. Build financial models in Excel to construct an efficiently diversified portfolio.
4. Make decisions regarding investments for the Wetherbe Student-Managed Investment Fund.

BFIN 545. Fixed Income Markets, Instruments and Derivatives
3 Credits (3)

Course provides a broad introduction to treasury, corporate, municipal, mortgage backed and asset backed bond markets. The analytical techniques for valuing bonds, quantifying their exposure to changes in interest rate and credit risk exposures and investment decision-making are explored. Assignments and exams will be differentiated from the undergraduate cross-listed course. In addition, graduate students are expected to complete a project. For Graduate students only.

Learning Outcomes

1. Describe basic features of a fixed-income security.
2. Describe mechanisms available for issuing bonds in primary markets.
3. Analyze repurchase agreements (repos) and the risks associated with them.
4. Compute invoice prices, yields, spot rates, and forward rates.
5. Compute PVBP, duration and convexity of a bond, duration of a portfolio of bonds.
6. Construct the term-structure of interest rates, Yield curve strategies.
7. Describe the process of calibrating a binomial interest rate tree to match a specific term structure.
8. Explain the principles underlying, and factors that influence, the market's pricing of CDS.
9. Explain and execute interest rate swaps.

BFIN 555. Derivative Markets and Securities
3 Credits (3)

Institutional aspects of derivative markets and the arbitrage based pricing of derivative instruments such as stock options, interest rate options, future contracts and swaps. The applied component of the course demonstrates use of these instruments as hedge and/or investment vehicles. Same as BFIN 455 with differentiated assignments for graduated students. For Graduate students only.

Learning Outcomes

1. Define forward contracts, futures contracts, options (call and puts), swaps, and credit derivatives and compare their basic characteristics.
2. Determine the value at expiration and profit from a long or a short position in a call or put option, or combinations such as straddles, covered calls, spreads, put-call parity etc.
3. Explain how the concepts of arbitrage, replication, and risk neutrality are used in pricing derivatives.
4. Explain how the value of an option is determined using a multiperiod-period binomial model.
5. Describe how the Black-Scholes-Merton model is used to value European options on equities.
6. Interpret each of the option Greeks.
7. Describe how a delta hedge is executed.
8. Define implied volatility and explain how it is used in options trading.
9. Describe a futures contract: long and short positions, hedging, basis risk, and hedge ratios

BFIN 566. Advanced Financial Management
3 Credits (3)

Application and integration of financial theory, concepts, and practice using the case method.

Prerequisite: BFIN 503.

Learning Outcomes

1. Provide students with cases that are not guided.
2. Use prompts to generate solutions to their own generated questions, use of prompts, and critical thinking in asking/coming up with questions for AI and themselves to solve.
3. Use AI to change PDF data within the case to Excel spreadsheets.
4. Use AI to extract text data (for example, analyst reports and social media).
5. Use AI to analyze data provided within the cases/perform interactive data analysis.

BFIN 575. International Managerial Finance
3 Credits (3)

International aspects of financial transactions, decision-making, banking and financial markets. Taught with: I B 475 and BFIN 475.

Learning Outcomes

1. Explain and evaluate how the globalization process moves a business from a purely domestic focus in its financial relationships and composition to one truly global in scope.
2. Describe what three major corporate currency exposures arise from multinational business.
3. Define and explain the terms that are used in reference to exchange rates and currency regimes in addition to analyzing the characteristics of an ideal currency.
4. Explain how nations measure their level of international economic activity and how that is measured by the balance of payments.
5. Show how interest rates and inflation affect each country and currency.
6. Identify the forms of currency quotations used by currency dealers, financial institutions, and agents of all kinds when conducting foreign exchange transactions.

7. Distinguish between spot, forward, swaps, and other types of foreign exchange financial instruments as well as foreign currency futures and options contracts.

BFIN 581. Management of Financial Institutions
3 Credits (3)
Asset and liability management of financial institutions; emphasis on commercial bank management. For Graduate students only.
Learning Outcomes
1. Describe the Financial System and Competing Financial Service Institutions.
2. Describe the impact of government policy and regulation on the banking industry.
3. Explain the array of organizational structures in Banking: Unit, Branch, Holding. Company and Electronic Services.
4. Analyze the Balance Sheets and Income Statements of Banks.
5. Measure and evaluate the performance of Banks and their principal competitors.
6. Apply different liquidity management strategies.

BFIN 590. Selected Topics
1-3 Credits (1-3)
Current topics in finance. Taught with BFIN 490 with differentiated assignments for graduate students. Consent of instructor required.

BFIN 598. Special Research Programs
1-3 Credits
Directed individual reading or research.
Prerequisite: consent of instructor.

Department of Finance

Office Location: Business Complex, Room 221

Phone: (575) 646-3201

Website: https://business.nmsu.edu/academic-departments/finance/index.html (https://business.nmsu.edu/academic-departments/finance/)

Finance - Bachelor of Business Administration

Finance is the crossroads of economics, strategy, and accounting, and the study of how firms and individuals allocate resources over time and under uncertain conditions. The finance curriculum provides a core foundation in corporate finance, investments, and financial institutions. The theory and concepts are then applied to problem-solving in various areas, including financial markets and institutions, corporate finance, international financial management, stock valuation and portfolio allocation, fixed-income markets, derivatives, and risk management and insurance.

The structure of the BBA in Finance curriculum includes a set of core courses, electives, and a capstone course. Students may pursue a BBA in Finance with or without declaring a concentration. The Finance Department offers two concentrations: (1) Financial Analysis, and (2) Risk Management and Insurance (RMI). The Financial Analysis concentration focuses on Investments and Corporate Finance. The RMI concentration focuses on Property and Liability; Life, Health, and Employee Benefits; and Business Risk Management. If a student chooses not to pursue a concentration, they need to complete the required core courses for finance majors, the capstone course for finance majors, and may select any four electives with the BFIN.

Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses. At least twelve of the credits for the major must be completed at NMSU.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses		
Area I: Communications		
English Composition Level - 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
Area III: Laboratory Sciences [2]		4
Grades of C- or better are required in ECON 2110G and ECON 2120G.		
ECON 2110G	Macroeconomic Principles	3
ECON 2120G	Principles of Microeconomics Honors	3
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective [2]		*3*
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
Foundation Requirements (Grade of C- or better required)		
MATH 1430G	Applications of Calculus I	3
A ST 311	Statistical Applications	3
Business Core: Lower Division (minimum grades of C- required)		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3

BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
MGMT 344	Production and Operations Management	3
Upper Division Business Elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (exlcuding A ST 311)		6
Required Core Courses for Finance Majors		*15*
BFIN 322	Principles of Insurance	
BFIN 350	Financial Statement Analysis	
BFIN 355	Investments	
BFIN 360	Financial Information Technology	
BFIN 385	Analysis of Financial Markets and Institutions	
Required Capstone Course:		*3*
BFIN 466	Financial Policy Decisions	
Twelve credits of elective courses with the BFIN prefix and with a course number above BFIN 310.		*12*
Second Langrage (not required)		
Electives, to bring total credits to 120 [4]		**7**
Total Credits		**120**

1. Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Every candidate for this major must fulfill the general education common core (p. 262), College of Business foundation and business core (p. 968), Viewing a Wider World (p. 262) requirements, and general electives, in addition to the requirements for the major. Given below is a suggested study plan for a student pursuing a Finance major.

A Suggested Plan of Study for Students

Freshman		
Fall		**Credits**
MATH 1220G	College Algebra [1]	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose Choose one fron the following:		4
ENGL 1110G	Composition I [1]	
ENGL 1110H	Composition I Honors [1]	
ENGL 1110M	Composition I (for multicultural/international students only and C- or better) [1]	
AreaV: Humanaties Course [2]		3
Elective Course		3
	Credits	**16**
Spring		
MATH 1430G	Applications of Calculus I [1]	3
BUSA 1110	Intro to Business	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors	
Area III: Laboratory Science Course [2]		4
Area VI: Creative Fine Arts Course [2]		3
	Credits	**16**
Sophomore		
Fall		
A ST 311	Statistical Applications (C- or better)	3
ECON 2110G	Macroeconomic Principles (Counts towards Area IV Gen-Ed and a C- or better) [1]	3
ACCT 2110	Principles of Accounting I (C- or better)	3
ENGL 2210G	Professional and Technical Communication (Counts towards Area I Gen Ed. and C- or better)	3
Or		
ENGL 2210H	Professional and Technical Communication	
ECON 2120G	Principles of Microeconomics Honors	3
	Credits	**15**
Spring		
MKTG 303	Principles of Marketing	3
BCIS 338	Business Information Systems I	3
MGMT 344	Production and Operations Management	3
VWW Viewing a Wider World Course [3]		6
	Credits	**15**
Junior		
Fall		
BFIN 341	Financial Analysis and Markets	3
BFIN 322	Principles of Insurance	3
MGMT 309	Human Behavior in Organizations	3
ACCT 2120	Principles of Accounting II	3
Elective Course		3
	Credits	**15**
Spring		
BFIN 355	Investments	3
BFIN 360	Financial Information Technology	3
BFIN 385	Analysis of Financial Markets and Institutions	3
BLAW 316	Legal Environment of Business	3
COB Elective Course		3
	Credits	**15**
Senior		
Fall		
BFIN 350	Financial Statement Analysis	3
Two BFIN electives above BFIN 310		6
Elective Course		3
Elective Course		3
	Credits	**15**

Spring		
BFIN 466	Financial Policy Decisions	3
Two BFIN electives above BFIN 310		6
MGMT 449	Strategic Management	3
Elective Course		1
	Credits	**13**
	Total Credits	**120**

Finance (Financial Analysis) - Bachelor of Business Administration

Finance is the crossroads of economics, strategy, and accounting, and the study of how firms and individuals allocate resources over time and under uncertain conditions. The finance curriculum provides a core foundation in corporate finance, investments, and financial institutions. The theory and concepts are then applied to problem-solving in various areas, including financial markets and institutions, corporate finance, international financial management, stock valuation and portfolio allocation, fixed-income markets, derivatives, and risk management and insurance.

The structure of the BBA in Finance curriculum includes a set of core courses, electives, and a capstone course. Students may pursue a BBA in Finance with or without declaring a concentration. The Finance Department offers two concentrations: (1) Financial Analysis, and (2) Risk Management and Insurance (RMI). The Financial Analysis concentration focuses on Investments and Corporate Finance. The RMI concentration focuses on Property and Liability; Life, Health, and Employee Benefits; and Business Risk Management. If a student chooses not to pursue a concentration, they need to complete the required core courses for finance majors, the capstone course for finance majors, and may select any four electives with the BFIN prefix above BFIN 310.

Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses. At least twelve of the credits for the major must be completed at NMSU.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses		
Area I: Communications		
English Composition Level - 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
Area III: Laboratory Sciences [2]		4
Grades of C- or better are required in ECON 2110G and ECON 2120G.		
ECON 2110G	Macroeconomic Principles	3
ECON 2120G	Principles of Microeconomics Honors	3
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective [2]		*3*
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
Foundation Requirements (Grade of C- or better required)		
MATH 1430G	Applications of Calculus I	3
A ST 311	Statistical Applications	3
Business Core: Lower Division (minimum grades of C- required)		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
MGMT 344	Production and Operations Management	3
Upper Division Business Elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (exlcuding A ST 311)		6
Required Core Courses for Finance Majors		*15*
BFIN 322	Principles of Insurance	
BFIN 350	Financial Statement Analysis	
BFIN 355	Investments	
BFIN 360	Financial Information Technology	
BFIN 385	Analysis of Financial Markets and Institutions	
Required Capstone Course		*3*
BFIN 466	Financial Policy Decisions	
Financial Analysis Concentration (12 credits from the following)		*12*
BFIN 311	Financial Futures Markets	
BFIN 452	Personal Financial Planning for Professionals	
BFIN 453	Investment Analysis	
BFIN 454	Fixed Income Markets, Instruments and Derivatives	
BFIN 455	Derivative Markets and Securities	
BFIN 470	Real Estate Appraisal	
BFIN 475	International Managerial Finance	
BFIN 480	Management of Financial Institutions	
BFIN 498	Independent Study	

BFIN 391	Finance Internship and Cooperative Education I	
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**7**
Total Credits		**120**

1 Students may be required to takeMATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Every candidate for this major must fulfill the general education common core (p. 262), College of Business foundation and business core (p. 968), Viewing a Wider World (p. 262) requirements and general electives, in addition to the requirement for the major. Given below is a suggested study plan for a student pursuing a Finance major. If a student chooses to pursue one or more than one concentration, they should choose the electives that pertain to the concentration. If students choose not to pursue a concentration, they may take courses from any concentration or from any BFIN prefix above BFIN 310.

A Suggested Plan of Study for Students

Freshman

Fall		**Credits**
MATH 1220G	College Algebra	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I (for multicultural/international students only and C- or better)	
Area V: Humanaties Course [2]		3
Elective Course		3
	Credits	**16**
Spring		
MATH 1430G	Applications of Calculus I	3
BUSA 1110	Intro to Business	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors	
Area III: Laboratory Science COurse [2]		4
Area VI: Creative Fine Arts Course [2]		3
	Credits	**16**

Sophomore

Fall		
Choose one of the following:		3
A ST 311	Statistical Applications (C- or better)	
ECON 2110G	Macroeconomic Principles (Counts towards Area IV Gen-Ed and C- or better)	3
ACCT 2110	Principles of Accounting I (C- or better)	3
ENGL 2210G	Professional and Technical Communication (Counts towards Area I Gen-Ed and C- or better)	3
Or		
ENGL 2210H	Professional and Technical Communication	
ECON 2120G	Principles of Microeconomics Honors	3
	Credits	**15**
Spring		
MKTG 303	Principles of Marketing	3
BCIS 338	Business Information Systems I	3
Choose one from the following:		3
MGMT 344	Production and Operations Management	
VWW Viewing a Wider World [3]		6
	Credits	**15**
Junior		
Fall		
BFIN 341	Financial Analysis and Markets	3
BFIN 322	Principles of Insurance	3
MGMT 309	Human Behavior in Organizations	3
ACCT 2120	Principles of Accounting II	3
Elective Course		3
	Credits	**15**
Spring		
BFIN 355	Investments	3
BFIN 360	Financial Information Technology	3
BFIN 385	Analysis of Financial Markets and Institutions	3
BLAW 316	Legal Environment of Business	3
COB Elective Course		3
	Credits	**15**
Senior		
Fall		
BFIN 350	Financial Statement Analysis	3
Two BFIN electives from the list for Financial Analysis concentration		6
Elective Course		3
Elective Course		3
	Credits	**15**
Spring		
BFIN 466	Financial Policy Decisions	3
Two BFIN electives from the list for Financial Analysis concentration		6
MGMT 449	Strategic Management	3
Elective Course		1
	Credits	**13**
	Total Credits	**120**

Finance (Risk Management and Insurance) - Bachelor of Business Administration

Finance is the crossroads of economics, strategy, and accounting, and the study of how firms and individuals allocate resources over time

and under uncertain conditions. The finance curriculum provides a core foundation in corporate finance, investments, and financial institutions. The theory and concepts are then applied to problem-solving in various areas, including financial markets and institutions, corporate finance, international financial management, stock valuation and portfolio allocation, fixed-income markets, derivatives, and risk management and insurance.

The structure of the BBA in Finance curriculum includes a set of core courses, electives, and a capstone course. Students may pursue a BBA in Finance with or without declaring a concentration. The Finance Department offers two concentrations: (1) Financial Analysis, and (2) Risk Management and Insurance (RMI). The Financial Analysis concentration focuses on Investments and Corporate Finance. The RMI concentration focuses on Property and Liability; Life, Health, and Employee Benefits; and Business Risk Management. If a student chooses not to pursue a concentration, they need to complete the required core courses for finance majors, the capstone course for finance majors, and may select any four electives with the BFIN prefix above BFIN 310.

Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses. At least twelve of the credits for the major must be completed at NMSU.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses		
Area I: Communications		
English Composition Level - 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
Area III: Laboratory Sciences [2]		4
Grades of C- or better are required in ECON 2110G and ECON 2120G.		
ECON 2110G	Macroeconomic Principles	3
ECON 2120G	Principles of Microeconomics Honors	3
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective [2]		*3*
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
Foundation Requirements (grade of C- or better required)		
MATH 1430G	Applications of Calculus I	3
A ST 311	Statistical Applications	3
Business Core: Lower Division (minimum grades of C- required)		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
MGMT 344	Production and Operations Management	3
Upper Division Business Elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (exlcuding A ST 311)		6
Required Core Courses for Finance Majors		*15*
BFIN 322	Principles of Insurance	
BFIN 350	Financial Statement Analysis	
BFIN 355	Investments	
BFIN 360	Financial Information Technology	
BFIN 385	Analysis of Financial Markets and Institutions	
Required Capstone Course		*3*
BFIN 456	Business Risk Management	
Risk Management and Insurance Concentration (12 credits from the following)		*12*
BFIN 323	Life/Health/Employee Benefits	
BFIN 324	Property and Liability Insurance	
BFIN 392	Insurance Internship and Cooperative Education I	
BFIN 452	Personal Financial Planning for Professionals	
BFIN 453	Investment Analysis	
OR		
BFIN 454	Fixed Income Markets, Instruments and Derivatives	
BFIN 490	Selected Topics	
BFIN 498	Independent Study	
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**7**
Total Credits		**120**

1. Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

[4] Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Every candidate for this major must fulfill the general education common core (p. 262), College of Business foundation and business core (p. 968), Viewing a Wider World (p. 262) requirements and general electives, in addition to the requirement for the major. Given below is a suggested study plan for a student pursuing a Finance major. If a student chooses to pursue one or more than one concentration, they should choose the electives that pertain to the concentration. If students choose not to pursue a concentration, they may take courses from any concentration or from any FIN prefix above FIN 310.

A Suggested Plan of Study for Students

Freshman		
Fall		**Credits**
MATH 1220G	College Algebra [1]	3
BCIS 1110	Introduction to Information Systems	3
Choose one from the following:		4
ENGL 1110G	Composition I [1]	
ENGL 1110H	Composition I Honors [1]	
ENGL 1110M	Composition I (for multicultural/international students only and C- or better) [1]	
Area V: Humanities Course [2]		3
Elective Course		3
	Credits	**16**
Spring		
MATH 1430G	Applications of Calculus I [1]	3
BUSA 1110	Intro to Business	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors	
Area III: Laboratory Sciences [2]		4
Area VI: Creative Fine Arts Course [2]		3
	Credits	**16**
Sophomore		
Fall		
A ST 311	Statistical Applications (C- or better)	3
ECON 2110G	Macroeconomic Principles (Counts towards Area IV Gen-Ed and C- or better)	3
ACCT 2110	Principles of Accounting I	3
ENGL 2210G	Professional and Technical Communication	3
Or		
ENGL 2210H	Professional and Technical Communication	
ECON 2120G	Principles of Microeconomics Honors	3
	Credits	**15**
Spring		
MKTG 303	Principles of Marketing	3
BCIS 338	Business Information Systems I	3
MGMT 344	Production and Operations Management	3
VWW Viewing a Wider World Course [3]		6
	Credits	**15**
Junior		
Fall		
BFIN 341	Financial Analysis and Markets	3
BFIN 322	Principles of Insurance	3
MGMT 309	Human Behavior in Organizations	3
ACCT 2120	Principles of Accounting II	3
Elective Course		3
	Credits	**15**
Spring		
BFIN 355	Investments	3
BFIN 360	Financial Information Technology	3
BFIN 385	Analysis of Financial Markets and Institutions	3
BLAW 316	Legal Environment of Business	3
COB Elective Course		3
	Credits	**15**
Senior		
Fall		
BFIN 350	Financial Statement Analysis	3
Two BFIN electives from the list for RMI concentration		6
Elective Course		3
Elective Course		3
	Credits	**15**
Spring		
BFIN 456	Business Risk Management	3
Two BFIN electives from the list for RMI concentration		6
MGMT 449	Strategic Management	3
Elective Course		1
	Credits	**13**
	Total Credits	**120**

Business Law - Undergraduate Minor

In a world that is increasingly subject to laws and regulations, every business needs employees who are savvy about the laws that affect business. The Business Law minor is comprised of a series of courses designed to provide a strong background in a wide range of laws that business needs to be aware of, and provide students with the ability to recognize – and avoid – legal pitfalls. Additionally, the Business Law minor will provide students with a clear understanding of how legal disputes are resolved and the ability to appreciate the cost and complexity of disputes, and enable students to reduce the costs and complexities by being able to communicate clearly with lawyers about the legal issues.

Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses. At lease twelve of the credits for the minor must be completed in the NMSU College of Business. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies. Students interested in pursuing this minor should contact the Finance Department Head in BC 221 (https://map.nmsu.edu/?ct/).

Prefix	Title	Credits
Required Courses		
BLAW 316	Legal Environment of Business	3
BLAW 313	Sports and the Law	3
BLAW 385V	Employment and Consumer Law	3
BLAW 330	Entrepreneurial Law	3
Take any 2 courses from the following:		**6**
BLAW 325	Real Estate Principles and Law I	
HRTM 3220	Hospitality and Travel Law	
AEEC 3240	Agricultural and Natural Resource Law	
HNRS 335V	Legal Issues in Modern Society	
POLS 391	Constitutional Law	
Total Credits		**18**

Entrepreneurship - Undergraduate Minor

The Entrepreneurship minor is designed to promote entrepreneurship to students across the NMSU campus. This minor will appeal to creative and ambitious students who envision launching and managing their own business or entering careers in innovation-driven fields.

Requirements

Completion of 18 credits from the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses. This minor is not open to students in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

Prefix	Title	Credits
Required Core Courses		
MGMT 310V	Entrepreneurial Mindset	3
MGMT 332	Human Resources Management	3
MGMT 361	Small Business Management	3
MGMT 461	Entrepreneurial Decision Making	3
Select two (2) other upper-division College of Business courses		6
Total Credits		**18**

Finance - Undergraduate Minor

The minor in Finance, available to students in most majors (business and non-business), affords students the opportunity to select their minor courses to provide a focus on any one of several sub-specialties within the field of Finance. Faculty advisors in the department can assist students in selecting their Finance electives to provide a focus in financial management, financial planning, or investments. (This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.)

Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses and a minimum cumulative GPA of 2.0 in the BFIN courses. At least twelve credits for the minor must be completed in the NMSU College of Business.

Prefix	Title	Credits
Required Courses		
ACCT 2110	Principles of Accounting I	3
BFIN 341	Financial Analysis and Markets	3
Select any three additional, upper division, finance courses [1]		9
Select any additional upper division business course		3
Select one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics	
Total Credits		**21**

[1] Upper division Finance courses must have a number greater than 310.

Risk Management and Insurance - Undergraduate Minor

The minor in Insurance, available to students in most majors (business and non-business), affords students the opportunity to supplement their major field of study with specialized expertise in the field of risk management and insurance.

Requirements

Completion of the courses listed below (including any prerequisites) with a minimum cumulative GPA of 2.0 in these courses. At least twelve of the credits for the minor must be completed in the NMSU College of Business. The minor is not available to students in the Bachelor of Individualized Studies or the Bachelor of Applied Studies.

Prefix	Title	Credits
Required Courses		
BFIN 322	Principles of Insurance	3
BFIN 341	Financial Analysis and Markets	3
or BFIN 303V	Personal Financial Planning and Investing in a Global Economy	
BLAW 316	Legal Environment of Business	3
or BLAW 385V	Employment and Consumer Law	
Any three upper division finance courses chosen from the following.		9
BFIN 323	Life/Health/Employee Benefits	
BFIN 324	Property and Liability Insurance	
BFIN 392	Insurance Internship and Cooperative Education I	
BFIN 456	Business Risk Management	
BFIN 498	Independent Study	
BFIN 452	Personal Financial Planning for Professionals [1]	
Total Credits		**18**

[1] BFIN 452 Personal Financial Planning for Professionals cannot be taken if BFIN 303V Personal Financial Planning and Investing in a Global Economy is applied toward the minor.

Management

Undergraduate Program Information

The Department of Management invites you to consider a **Management Major** in one of the three concentrations:

1. Human Resource Management,
2. Project and Supply Chain Management, or
3. Small Business Management and Entrepreneurship.

The study of management offers the opportunity to develop skills in utilizing human, physical, and economic resources to achieve organizational objectives. These are important cross-functional skills in today's competitive job market. Do you like to work with people? Need help solving people's problems at work? Hope to start your own business? Want to run an environmental project, or a bank, a store, a farm, or a government agency? Are you interested in how people from diverse backgrounds work together to achieve common goals? If you answered yes to any of these questions, you should consider a major in management. The mission of the department is to prepare graduates with a Bachelor of Business Administration for management careers in a broad spectrum of New Mexico, national, and globally oriented businesses. Management graduates work in small and large agricultural, manufacturing, government, transportation, public utility, merchandising, health care, environmental, and communications organizations, among others.

The **General Business Major** is based on a broad range of College of Business course options rather than a narrow focus on a single discipline. With a Bachelor of Business Administration in General Business, graduates find careers in large and small businesses, government agencies, and the nonprofit sector. The general business major is well-suited to both part-time and full-time working students. The degree path allows students to select courses that will better meet their individual schedules. The Entrepreneurship Concentration is ideal for a student interested in starting or acquiring a small business or entering a family business upon graduation. The curriculum focuses on small and new enterprises, reflecting the entrepreneurial nature of contemporary local and global businesses.

Graduate Program Information

The Department of Management offers graduate coursework leading to a Doctor of Philosophy (Ph.D.) in Business Administration. Areas of emphasis for doctoral students are:

- organizational behavior,
- human resource management,
- entrepreneurship,
- project management,
- strategic management, and
- supply chain management.

Research in the above areas is currently being conducted by the faculty, ensuring that doctoral candidates will work at the forefront of knowledge in these areas. The Ph.D. program is intended to provide broad graduate-level training in business administration. Students are required to complete appropriate courses in research methods and applied statistics. For further information on the Management Ph.D., please consult the program website: https://business.nmsu.edu/phd-management/index.html (https://business.nmsu.edu/phd-management/)

Degrees for the Department

Bachelor Degree(s)

- General Business (Entrepreneurship) - Bachelor of Business Administration (p. 1025)
- General Business - Bachelor of Business Administration (p. 1023)
- General Business - Bachelor of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/general-business-bba-online/)
- Management (Human Resource Management) - Bachelor of Business Administration (p. 1027)
- Management (Project & Supply Chain Management) - Bachelor of Business Administration (p. 1029)
- Management (Small Business Management & Entrepreneurship) - Bachelor of Business Administration (p. 1031)

Doctoral Degree(s)

- Business Administration (Management) - Doctor of Philosophy (p. 208)

Minors for the Department

- Human Resource Management - Undergraduate Minor (p. 1032)
- Management - Undergraduate Minor (p. 1033)

Carol Flinchbaugh, Ph.D., Department Head

Professors Bishop, Flinchbaugh, Shen; ***Associate Professors*** Franklin, Pimentel, Scott; ***Assistant Professors*** Leenders, Parkinson; ***College Assistant Professors*** Ortiz, Rodriquez-Borbon, Villa

- James Bishop, Ph.D. (Virginia Polytechnic Institute and State University) - Organizational Behavior, Research Methods
- Carol Flinchbaugh, Ph.D. (University of Kansas) - Human Resource Management, Organizational Behavior
- Rebecca Franklin, Ph.D. (Oklahoma State University) - Entrepreneurship, Organizational Behavior
- Hugo Leenders, Ph.D. (University of Colorado) - Strategic Management
- Luis Ortiz, Ph.D. (University of Texas-Pan American) - Human Resource Management, Small Business Management
- Shaun Parkinson, Ph.D. (Washington State University) - Human Resource Management, Organizational Behavior
- Victor Pimentel, Ph.D. (Washington State University) - Operations Management; Supply Chain Management
- Ivan Rodriguez-Borbon, Ph.D. (New Mexico State University) - Operations Management; Supply Chain Management
- Rebecca Scott, Ph.D. (University of North Texas) - Operations Management; Supply Chain Management
- Zixing Shen, Ph.D. (Case Western Reserve University) - Business Information Systems, Organizational Behavior
- Maria Villa, MBA (New Mexico State University) - Business Administration, Organizational Behavior

Management Courses

MGMT 2110. Principles of Management
3 Credits (3)
An introduction to the basic theory of management including the functions of planning, organizing, staffing, leading, and controlling; while considering management's ethical and social responsibilities.
Learning Outcomes

1. Explain the major functions of management including planning, organizing, communications, controlling, motivating, leading, and staffing.
2. Recognize major developments in the history of management thought.
3. Describe the basic managerial processes including decision-making and other key skills necessary for managers to perform their roles.

4. Identify an organization's stakeholders and the importance of social and ethical responsibility of managers.
5. Explain the formulation and implementation of strategic planning, including the relationship between goals, plans, vision statements, and mission statements.
6. Describe the strategies managers use to help organizations adapt to changing internal and external environments.
7. Explain organizational change, forces for change, sources of resistance to change, and the techniques managers can use to implement and facilitate change.

MGMT 309. Human Behavior in Organizations
3 Credits (3)
Interpersonal and organizational behavior, motivation, communication, team building, leadership, diversity management, legal and ethical issues, and politics in organizations.
Learning Outcomes
1. Analyze behavior of people at work in all types of organizations.
2. Understand what influences human motivation, communication, team relationships.
3. Understand how human interactions in an organization influence employee and organizational performance.

MGMT 310V. Entrepreneurial Mindset
3 Credits (3)
This course provides the opportunity to learn to think like an entrepreneur in the broader context of social entrepreneurship, intrapreneurship, creative problem solving, opportunity recognition, and innovation.
Learning Outcomes
1. Define and explain entrepreneurial skills, behaviors, and attributes.
2. Describe and assess your own entrepreneurial skills, behaviors, and attributes and evaluate your potential for an entrepreneurial career.
3. Describe and assess the entrepreneurial process by identifying and employing various strategies for business idea generation, assessing business opportunities, and identifying the key steps in the start-up process.

MGMT 332. Human Resources Management
3 Credits (3)
Introductory course in human resources management. Includes recruitment, selection, legal and ethical implications, performance appraisal, training, compensation, safety, and union-management relations.
Learning Outcomes
1. Provides basic understanding of the functional areas in Human Resource Management (HRM), including recruitment, selection, performance management, compensation, employee development, legal compliance, and union-management relations.
2. Understand the concerns and functions of the principal actors in employment systems: employees, management, and government.
3. Enable an understanding of how to strategically align HR practices with organizational goals and achieve effective workforce management and performance.

MGMT 333. Training and Development
3 Credits (3)
Training and development of human capital, including training needs assessment, training approaches and techniques, and evaluation of training effectiveness.
Learning Outcomes
1. Research and practice various methods of delivering management training and development programs, including, lectures, experiential exercises, simulations, self-assessment tools and questionnaires to stimulate self-reflection.
2. Analyze one's own skills as a trainer and areas needing improvement.
3. Conduct training needs assessments via questionnaires and interviews.
4. Evaluate the success of a training program by collecting and interpreting feedback from training session participants and the course instructor.

MGMT 335V. Business and Government
3 Credits (3)
Crosslisted with: ECON 335G

MGMT 344. Production and Operations Management
3 Credits (3)
Management of physical and human resources; management of information systems and decision-making in operations; applications in various organizations.
Prerequisite: MATH 1350G or A ST 311; and BCIS 338 or BCIS 350.
Learning Outcomes
1. Develop an understanding of the challenges and solutions in operations, production, and delivery of goods and services in manufacturing and service organizations.
2. Employ quantitative and analytical techniques in industrial and service settings to enhance decision-making in operations management.
3. Evaluate the use of sustainable practices in operations and their influence on the environment and business efficiency, encouraging the development of responsible management decisions.
4. Cultivate critical thinking skills and apply operations management concepts and methodologies to address and solve specific operational problems.

MGMT 345V. Quality and Competitiveness: An International Perspective
3 Credits (3)
Quality management and competitiveness are studied in manufacturing, services, and the public sector with an international perspective. Topics include: global history of quality, foreign competition and its impact on quality and productivity, quality management and continuous improvement, international operations management, quality assessment, and a review of the emergence of quality and competitiveness in government, education and health care. May be repeated up to 3 credits.
Learning Outcomes
1. Developing critical thinking skills through challenging material and assignments.
2. Foster intelligent inquiry through assignments, participative lectures, team projects.
3. Develop an integration and synthesis of knowledge through applications to case studies and individual assignments.
4. Promote a breadth of knowledge on international developments in quality and competitiveness with a holistic view of quality and its impact on businesses, organizations, nations and individuals.

MGMT 347. Management Functions and Processes
3 Credits (3)
Planning, organizing, directing, and controlling operating units in an organization. Applications to a variety of types of organizations.

Learning Outcomes

1. Understand and explain the theory and role of planning and organizing in today's organizations or operating units.
2. Understand and explain the theory and role of leading and directing today's organizations or operating units.
3. Understand and explain the concept and role of control in today's organizations.

MGMT 351. Supply Chain Management
3 Credits (3)

Acquisition and control and delivery of materials, parts, equipment, and services for end use in the organization. Applications to service and manufacturing industries, nonprofit, and governmental institutions.

Learning Outcomes

1. Acquire an understanding of supply chain management (SCM) topics, including integration and management of supply chain processes, strategic purchasing management, accurate demand forecasting, customer relationship management, and supply chain performance measurement.
2. Recognize the strategic significance of effective supply chain design, planning, and operations for business success.
3. Learn to leverage key supply chain performance drivers at conceptual and practical levels to enhance supply chain efficiency, employing analytical methodologies for in-depth supply chain analysis.
4. Explore using digital technologies to enhance supply chain transparency, visibility, and efficiency, including implementing IoT, blockchain, and AI solutions to streamline operations and improve supply chain resilience.

MGMT 361. Small Business Management
3 Credits (3)

Principles and practice of managing a small enterprise with emphasis on growth and performance.

Learning Outcomes

1. Understand the small business environment and operations.
2. Understand various strategies and processes unique to small business, including forms of ownership, sustainability issues, strategic planning, alternative forms of business, and succession issues.
3. Analyze the financial reporting, financial performance, and risks associated with small businesses.

MGMT 388V. Leadership and Ethics
3 Credits (3)

Exploration of the multifaceted nature of leadership and principal-based ethics in modern society through readings, cases, and seminar discussion.

Learning Outcomes

1. Provide students with a critical and multi-perspectival and leadership understanding of business ethics and the social responsibilities of businesses today.
2. Understand how to apply this knowledge to actual cases and especially to students' own experiences and understandings of ethics in organizations.
3. Develop more complex moral reasoning and understand important principles of ethics (integrity, trust, accountability, transparency, fairness, respect, rule of law and viability) and how to apply and practice them.

MGMT 391. Management Internship and Cooperative Education I
1,3 Credits

Application of management skills to the work environment. Open only to students majoring or minoring in management. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not by the work experience. May be repeated up to 3 credits.

Prerequisite: MGMT 309.

Learning Outcomes

1. Student learning outcomes will vary for each student.

MGMT 449. Strategic Management
3 Credits (3)

Integrative approach to envisioning the future and shaping strategies for business success.

Prerequisite: BCIS 338 or BCIS 350; BLAW 316; BFIN 341; MGMT 309; MKTG 303; and one of the following: MGMT 344 or MGMT 470 or BCIS 485.

Learning Outcomes

1. Apply strategic management ideas, frameworks, and concepts to analyze situations and identify strategic management issues.
2. Create and evaluate alternative courses of action.
3. Communicate and support conclusions to others using strategic analysis tools, and in writing and speech.
4. Think in a critical, analytic, integrative, and ultimately strategic manner.

MGMT 450. Business Process Improvement
3 Credits (3)

Identify, design, and implement process change techniques to create efficient and effective processes in various business context. Student must be in final academic year before graduation or have consent of instructor.

Learning Outcomes

1. Describe the benefits and steps of process improvement.
2. Provide examples of resources and tools to support process improvement.
3. Demonstrate an ability to utilize practice improvement tools such as process mapping and PDSA (Plan-Do-Study-Act) cycles.

MGMT 451. Strategic Talent Management
3 Credits (3)

Staffing and talent management processes for organizational selection, promotion, and retention. Use of selection methods and measurement of work behavior for the evaluation of employee performance.

Prerequisite: MGMT 332 or instructor permission.

Learning Outcomes

1. Understand the legal and regulatory environment surrounding the human resources functions of selection, placement, and evaluation.
2. Understand how to select, develop and implement reliable, valid, and cost-effective employee selection and evaluation procedures, specific to job analysis, job application and resume screening, various employment tests, role of virtual mediums, and structured interviews.

MGMT 458. International Business Management
3 Credits (3)

Cultural influences on management are examined in a global business environment with a particular emphasis on human behavior and people management in multinational organizations. Same as I B 458.

Learning Outcomes

1. Understand the global business environment as it relates to HR and people management, including the economic, social, political, cultural, and legal environments of different countries.

2. Develop a capacity to think about business and human behavior in a global context, and how to adapt to cultural differences.
3. Assess the risks and opportunities of doing business in different countries.
4. Understand the ethical considerations and decision-making differences of doing business in a global context.

MGMT 459. Transportation Optimization
3 Credits (3)
Equip students with a deep understanding of logistics network design, transportation planning, and cost optimization strategies while exploring emerging technologies such as AI, IoT, and blockchain. This course will develop the analytical and strategic skills needed to enhance efficiency, resilience, and sustainability in modern global supply chains.
Prerequisite: MGMT 344, MGMT 351.
Learning Outcomes
1. Develop an ability to critically analyze transportation data and logistics to make informed decisions that optimize operational efficiency and reduce costs.
2. Learn how to strategize and plan transportation routes and schedules that meet business objectives while considering budget, time, and environmental impact constraints.
3. Develop and apply optimization models to solve real-world transportation problems, utilizing linear programming, network design, and routing algorithms.
4. Gain experiential learning with advanced transportation technologies and software, including GIS (Geographic Information Systems), GPS (Global Positioning System), and real-time data analytics platforms and leverage these technologies to enhance route planning, fleet management, and overall transportation system performance.

MGMT 460. Compensation Management
3 Credits (3)
An overview of wage and salary administration, including job evaluation, wage and salary surveys, program administration, legal aspects of pay systems, and benefits administration.
Prerequisite: MGMT 332 or consent of instructor.
Learning Outcomes
1. Understand and design effective compensation systems within an organization that seek to define and measure employee work performance.
2. Understand foundational concepts such as the different compensation philosophies, components of a total compensation package, and market competitiveness analysis.
3. Understand relevant employment laws and ethical principles that impact compensation.

MGMT 461. Entrepreneurial Decision Making
3 Credits (3)
Explore the fundamentals of lean startup methodologies and customer discovery in this hands-on course. Students will learn to develop and test business ideas using the Lean Canvas, conduct effective customer interviews, and apply continuous feedback to iterate on their concepts. By the end of the course, students will be equipped to make strategic decisions and validate their business models with real-world insights. Crosslisted with: MKTG 461.
Prerequisite: Students in final year or consent of instructor.
Learning Outcomes
1. Explore the fundamentals of lean startup methodologies.
2. Develop skills to conduct effective customer interviews and apply continuous feedback in concept development.
3. Possess competency to make strategic decisions and validate business models with real-world insight.
4. Learn to develop and test business ideas through customer discovery.

MGMT 465. Contemporary Issues in Human Resources Management
3 Credits (3)
Integrative course in human resources management, emphasizing the application of advanced contemporary concepts to complex personnel cases and strategic human resource initiatives.
Prerequisite: MGMT 332.
Learning Outcomes
1. Develop increased understanding of current trends in Human Resource Management.
2. Understand how HR trends can be used to optimize HR strategy in the 21st century.
3. Develop critical thinking skills and communication skills.

MGMT 470. Project Management in Organizations
3 Credits (3)
Roles, responsibilities, and techniques of project managers in managing projects effectively. Preparation for professional certification.
Learning Outcomes
1. Develop an understanding of a project manager's roles and responsibilities.
2. Develop knowledge of the skills and abilities needed to manage a project effectively, to include effective communication, leadership, time management, problem-solving, adaptability, and decision-making.
3. Gain an ability to develop the foundations of a project plan, implement and control the project, and terminate a project effectively.
4. Provide a foundation for preparation for project management certification.

MGMT 490. Selected Topics
1-18 Credits (1-18)
Seminars in selected current topics in the various areas of management and administration. Prerequisites vary according to the seminar being offered.

MGMT 491. Management Internship and Cooperative Education II
1-3 Credits
Covers the application of management skills to the work environment. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not be the work experience. May be repeated for a maximum of 3 credits. Restricted to majors and minors.
Prerequisite: MGMT 309 and consent of instructor.

MGMT 498. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.
Prerequisites: junior or above standing and consent of instructor.

MGMT 502. Operations Management
3 Credits (3)
Systems and specialized models applied to the management of production facilities and service operations, including physical and human resources.
Learning Outcomes
1. Explain the elements of design, operation and improvement of productive systems that creates the firm's products and services.

2. Develop working knowledge of operations principles and techniques that will increase customer satisfaction and value to the firm.

MGMT 503. Organizational Behavior and Management Processes
3 Credits (3)
Covers the theory and practice related to the successful management of human capital in organizations operating within a dynamic global environment. Course goals include developing alternative frameworks for analyzing issues related to human behavior, management science, and organizational structure and theory.
Learning Outcomes
1. Discern, analyze, and evaluate issues at the individual, group, and organizational levels of analysis, understanding these levels are both separate and interrelated forces in need of alignment.
2. Understand how effective leaders communicate, influence, motivate, negotiate, and build and manage teams.
3. Apply problem solving methods and develop action plans and recommendations to optimize, resolve, or mitigate complex problems or opportunities.
4. Recognize, describe, compare, and contrast the central concepts and theories of organizational behavior, including organizational culture, change, and social and political processes, team dynamics, individual and team decision making, and leadership.

MGMT 510. AI and Machine Learning for Supply Chain Decision-Making
3 Credits (3)
This course provides an understanding of the use of artificial intelligence (AI) and machine learning (ML) in supply chain operations, focusing on data-driven decision-making. Students will apply predictive and prescriptive models to address challenges in forecasting, inventory management, customer segmentation, and sourcing, among others.
Prerequisite: Programming Foundations (either CSCI 4525 or CSCI 4520), AI Foundations (CSCI 5405, CSCI 5420 or EE 565).
Learning Outcomes
1. Understand the most common supply chain management challenges and the potential for AI to address them.
2. Apply traditional AI and ML techniques such as regression and clustering to solve supply chain problems.
3. Assess model performance in the context of the supply chain.
4. Compare customer and supplier segmentation models.
5. Develop basic AI-driven supply chain decision support tools.
6. Reflect on the ethical implications of AI/ML applications in the supply chain.
7. Understand the implications of data management on developing AI decision support tools.

MGMT 520. Advanced Supply Chain Intelligence: Optimization and Generative AI
3 Credits (3)
This advanced course is complementary to MGMT/BCIS 510. It equips students to design and optimize emerging intelligent supply chain systems using mathematical optimization, simulation, and generative AI technologies, including large language models (LLMs) and generative adversarial networks (GANs). Students will develop planning, risk management, and automation models using system development platforms such as Nvidia Developer or Llama through hands-on projects like digital twinning or agentic decision tools, while critically evaluating their strategic and ethical implications in supply chain operations. Students will collaborate to bridge technical and business knowledge.
Prerequisite: MGMT 510 or BCIS 510.
Learning Outcomes
1. Formulate and solve supply chain optimization problems using Nvidia Developer or Llama.
2. Design and evaluate simulation models for decision-making under uncertainty.
3. Utilize large language models (LLMs) for supply chain documentation and automation.
4. Generate synthetic data for risk analysis and what-if scenarios using generative AI.
5. Design basic AI-driven agents for supply chain automation.
6. Critically assess generative AI's operational, strategic, and ethical implications in supply chains.
7. Integrate technical and strategic perspectives to develop AI-driven supply chain solutions.
8. Develop vector databases for customer sentiment analysis and update LLMs with current supply chain information.

MGMT 548. Small Business Consulting
3 Credits (3)
Study, analysis, and presentation of recommendations for solving significant problems confronting small businesses. Same as MGMT 448 with differentiated assignments for graduate students.
Prerequisite(s): Graduate standing.

MGMT 550. Small Business Consulting
3 Credits (3)
Study, analysis, and presentation of recommendations for solving significant problems confronting small businesses. Same as MGMT 450 with differentiated assignments for graduate students.
Learning Outcomes
1. Understand financials and other indicators of firm health.
2. Understand how to analyze a firm's market and competitive environment.
3. Identify warning signs that a business turnaround may be needed.
4. Formulate a recovery plan for a troubled company.

MGMT 590. Strategic Management
3 Credits (3)
Covers the integration of functional, human, technological, and environmental aspects of business within the framework of management policy and strategy formulation. Formulate, implement, evaluate and control the various functions of the organization from a systems perspective. Understand the external environment and its impact on the organization. Restricted to majors.
Prerequisite: M.B.A. student in his or her final semester.

MGMT 591. Seminar in Entrepreneurship
3 Credits (3)
For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Same as MGT 461 with differentiated assignments for graduate students. Crosslisted with: MKTG 591.
Prerequisite(s): Graduate standing.

MGMT 598. Special Research Programs
1-3 Credits
Individual investigations either analytical or experimental. A maximum of 6 credits may be earned.
Prerequisite: consent of instructor.

MGMT 600. Doctoral Research
1-15 Credits (1-15)

This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination. Restricted to management majors. May be repeated up to 88 credits.

MGMT 601. Research in Management
1 Credit (1)
Ph.D. course provides opportunities for significant interaction between Management faculty and Management Ph.D. students. The course also provides opportunities for development of professional scholarly standards, ethics, and critiques, as well as insight into current research areas and topics supported by the Management Department and other relevant disciplinary areas. May be repeated for a maximum of 6 credits. Restricted to Ph.D. students. Graded S/U.

MGMT 645. Seminar in Human Resources Management
3 Credits (3)
Seminar will address current issues in human resources management. Focus on research related to the selection, development, and effective use of human resources. Restricted to doctoral students. May be repeated up to 3 credits.

MGMT 650. Seminar in Organizational Behavior
3 Credits (3)
Seminar will include specific organizational behavior topics; motivation, leadership, group and inter-group relations, and attitude theory. Focus on current research and theory. Restricted to doctoral students. May be repeated up to 3 credits.
Learning Outcomes
1. Varies

MGMT 655. Seminar in Organizational Systems and Theory
3 Credits (3)
Analysis of organizations from a macro perspective. Topics include organizational theory, organizational design, organizational environment, and sociotechnical systems. Restricted to doctoral students. May be repeated up to 3 credits.

MGMT 660. Research Design and Methodology
3 Credits (3)
Topics will include philosophy of science, theory building, and research methods applicable to the study of organizational behavior. Restricted to doctoral students. May be repeated up to 3 credits.
Learning Outcomes
1. Varies

MGMT 661. Qualitative Research Methods
3 Credits (3)
In-depth coverage of selected topics in research methodology, including theory and logic of scientific investigation, grounded theory, action research, and ethnomethodology. Restricted to doctoral students. May be repeated up to 3 credits.

MGMT 670. Seminar in Operations Management
3 Credits (3)
Seminar examines the major problem areas, research findings, and research methodologies of operations management. Focus on the critical evaluation of current theory and methodology. Restricted to Doctoral students. May be repeated up to 3 credits.

MGMT 675. Seminar in Strategic Management
3 Credits (3)
Survey of current and classical readings in strategy. Introduces the doctoral level student to strategic issues, strategic topics for research, and publication venues. Restricted to doctoral students. May be repeated up to 3 credits.

MGMT 685. Story Consulting to Organizations
3 Credits (3)
Apply various qualitative story and narrative research methods (plot analysis, script analysis, life history, and restoring) to action research consulting project. Students will conduct story assessment and (propose or enact)intervention with a local consenting organization. Restricted to doctoral students.

MGMT 690. Special Topics
3 Credits (3)
Seminars in selected current topics in the various areas of management. May be repeated for unlimited credit. Restricted to doctoral students.
Prerequisite(s): Vary according to seminar being offered.

MGMT 698. Special Topics
1-3 Credits
Prerequisite: consent of instructor.

MGMT 700. Doctoral Dissertation
1-15 Credits (1-15)
May be repeated up to 88 credits.
Prerequisite: advancement to candidacy.

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General Business - Bachelor of Business Administration

Students must complete all University degree requirements, which include General Education requirements, Viewing a Wider World requirements, and elective credits, totaling at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count toward the degree requirements or elective credits, but may be required to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grade of C- or better are required in general education communication courses		
Area I: Communications		
English Composition - Level 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
English Composition - Level 2		*3*
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		*3*

MATH 1220G	College Algebra [1]	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
Area III: Laboratory Sciences Course (4 credits) [2]		
ECON 2110G	Macroeconomic Principles (C- or better)	
ECON 2120G	Principles of Microeconomics Honors (C- or better)	
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		*3*
MATH 1430G	Applications of Calculus I [1]	
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
Business Core: Lower Division (minimum grades of C- required)		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
MGMT 344	Production and Operations Management	3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		6
Major Courses		
Major requirements (upper division business courses)		24
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Choose the following (grade of C- or better required):		3
A ST 311	Statistical Applications	
Second Language: (not required)		
Electives, to bring the total credits to 120		**16**
Total Credits		**120**

1 Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

2 See the General Education (p. 262) Section of the catalog for a full list of courses

3 See the Viewing a Wider World (p. 266) Section of the catalog for a full list of courses

4 **No more than 9 credits may be taken in any one prefix**

- Accounting (ACCT)
- Business Administration (B A)
- Business Computer Information Systems (BCIS)
- Business Law (BLAW)
- Economics (ECON)
- Entrepreneurship (ENTR)
- Finance (FIN)
- International Business (I B)
- Management (MGT)
- Marketing (MKTG)

5 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Note: The general business option is offered through a 2+2 Online Distance Education Degree Completion Program as well. Program information is available on the College of Business website: http://business.nmsu.edu/academics/undergraduate/online-programs (https://business.nmsu.edu/online/)

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
MATH 1220G	College Algebra (C- or better) [1]	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose from one of the following: [1]		4
ENGL 1110G	Composition I (C- or better) [1]	
ENGL 1110H	Composition I Honors (C- or better) [1]	
ENGL 1110M	Composition I (for multicultural/international students only and a C- or better) [1]	
Area V: Humanities Course [2]		3
Elective Course		3
	Credits	**16**
Semester 2		
COMM 1115G	Introduction to Communication (C- or better)	3
MATH 1430G	Applications of Calculus I [1]	3
BUSA 1110	Intro to Business (C- or better)	3
Area III: Laboratory Science Course [2]		4
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Second Year		
Semester 1		
ENGL 2210G	Professional and Technical Communication (C- or better) [1]	3
ECON 2110G	Macroeconomic Principles (C- or better)	3
ACCT 2110	Principles of Accounting I (C- or better)	3
A ST 311	Statistical Applications	3
Elective Courses		3
	Credits	**15**
Semester 2		
ECON 2120G	Principles of Microeconomics Honors (C- or better)	3
ACCT 2120	Principles of Accounting II (C- or better)	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3

VWW: Viewing a Wider World Course [3]		3
	Credits	**15**
Third Year		
Semester 1		
BCIS 338	Business Information Systems I [1]	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets [1]	3
Any Upper-Division Business Elective Course (excluding A ST 311) [4]		3
Any Upper-Division Business Elective Course (excluding A ST 311) [4]		3
	Credits	**15**
Semester 2		
MGMT 344	Production and Operations Management [1]	
Any Upper-Division Business Elective Course (excluding A ST 311) [4]		3
Any Upper-Division Business Elective Course (excluding A ST 311) [4]		3
VWW: Viewing a Wider World Course [3]		3
Elective Course		6
	Credits	**15**
Fourth Year		
Semester 1		
Any Upper-Division Business Elective Course (excluding A ST 311) [4]		3
Any Upper-Division Business Elective Course (excluding A ST 311) [4]		3
Any Upper-Division Business Elective Course (excluding A ST 311) [4]		6
Elective Course		3
	Credits	**15**
Semester 2		
MGMT 449	Strategic Management [1]	3
Any Upper-Division Business Elective Course (excluding A ST 311) [4]		3
Any Upper-Division Business Elective Course (excluding A ST 311) [4]		3
Elective Course(s)		4
	Credits	**13**
	Total Credits	**120**

1 These courses have prerequisites, and it is the student's responsibility to check and fulfill all course prerequisites listed for these courses.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 **No more than 9 credits may be taken in any one prefix**

- Accounting (ACCT)
- Business Administration (B A)
- Business Computer Information Systems (BCIS)
- Business Law (BLAW)
- Economics (ECON)
- Entrepreneurship (ENTR)
- Finance (FIN)
- International Business (I B)
- Management (MGT)
- Marketing (MKTG)

General Business (Entrepreneurship) - Bachelor of Business Administration

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses		
Area I: Communications		
English Composition - Level 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		*3*
MATH 1220G	College Algebra [1]	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
Area III: Laboratory Sciences Course (4 credits) [2]		
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		*3*
MATH 1430G	Applications of Calculus I [1]	
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
Business Core: Lower Division (minimum grades of C- required)		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
MGMT 344	Production and Operations Management	3

Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, BFIN, I B, MGMT, MKTG (excluding A ST 311)		6
Major Courses		
MGMT 332	Human Resources Management	3
MGMT 361	Small Business Management	3
MGMT 461	Entrepreneurial Decision Making	3
MGMT 448	Business Process Improvement	3
Major requirements (upper division) [4]		12
Non-Departmental Requireents (in addition to Gen.Ed/VWW)		
(grade of C- or better required):		
A ST 311	Statistical Applications	3
Second Language: (not required)		
Electives, to bring the total credits to 120 [5]		**16**
Total Credits		**120**

1. Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or fulfills the general education requirement in math.
2. See the General Education (p. 262) Section of the catalog for a full list of courses
3. See the Viewing a Wider World (p. 266) Section of the catalog for a full list of courses
4. **Of the remaining 12 credits for the entrepreneurship concentration, no more than 9 credits may be taken in any one prefix**
   - Accounting (ACCT)
   - Business Administration (B A)
   - Business Computer Information Systems (BCIS)
   - Business Law (BLAW)
   - Economics (ECON)
   - Entrepreneurship (ENTR)
   - Finance (FIN)
   - International Business (I B)
   - Management (MGT)
   - Marketing (MKTG)
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
MATH 1220G	College Algebra (C- or better) [1]	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose from one of the following: [1]		4
ENGL 1110G	Composition I (C- or better) [1]	
ENGL 1110H	Composition I Honors (C- or better) [1]	
ENGL 1110M	Composition I (C- or better) [1]	
Area V: Humanities Course [2]		3
Elective Course		3
	Credits	**16**
Semester 2		
COMM 1115G	Introduction to Communication (C- or better)	3
MATH 1430G	Applications of Calculus I (C- or better) [1]	3
BUSA 1110	Intro to Business (C- or better)	3
Area III: Laboratory Science [2]		4
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Second Year		
Semester 1		
ENGL 2210G	Professional and Technical Communication (C- or better) [1]	3
ECON 2110G	Macroeconomic Principles (C- or better)	3
ACCT 2110	Principles of Accounting I (C- or better)	3
Elective Course		3
	Credits	**12**
Semester 2		
ECON 2120G	Principles of Microeconomics Honors (C- or better)	3
ACCT 2120	Principles of Accounting II (C- or better)	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
VWW: Viewing a Wider World Course [3]		3
	Credits	**15**
Third Year		
Semester 1		
BCIS 338	Business Information Systems I [1]	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets [1]	3
MGMT 332	Human Resources Management	3
Any Upper-Division Business Elective Course (excluding A ST 311) [4]		3
	Credits	**15**
Semester 2		
Choose from any of the following:		3
MGMT 344	Production and Operations Management [1]	3
Any Upper-Division Business Elective Course (excluding A ST 311) [4]		3
Any Upper-Division Business Elective Course (excluding A ST 311) [4]		3
VWW: Viewing a Wider World Course [3]		3
Elective Course		3
	Credits	**18**
Fourth Year		
Semester 1		
MGMT 361	Small Business Management	3
ECON Upper-Division Elective Course		3
Any Upper-Division Business Elective Course (excluding A ST 311) [4]		3
Any Upper-Division Business Elective Course (excluding A ST 311) [4]		3

Elective Course		3
	Credits	**15**
Semester 2		
MGMT 449	Strategic Management [1]	3
MGMT 448	Business Process Improvement	3
MGMT 461	Entrepreneurial Decision Making	3
Elective Course(s)		4
	Credits	**13**
	Total Credits	**120**

1 These courses have prerequisites and it is the student's responsibility for checking and fulfilling all course prerequisites listed for these courses.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

4 **Of the remaining 12 credits for the entrepreneurship concentration, no more than 9 credits may be taken in any one prefix**

- Accounting (ACCT)
- Business Administration (B A)
- Business Computer Information Systems (BCIS)
- Business Law (BLAW)
- Economics (ECON)
- Entrepreneurship (ENTR)
- Finance (FIN)
- International Business (I B)
- Management (MGT)
- Marketing (MKTG)

Management (Human Resource Management) - Bachelor of Business Administration

Every candidate for this major must fulfill the following requirements in addition to the general education common core, College of Business foundation and the business core, Viewing a Wider World requirements and general electives. Students will choose one or more of the four options that follow.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Course Requirements

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses.		
Area I: Communications		
English Composition - Level 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
or ENGL 2210M	Professional and Technical Communication for Multilingual Students	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra (Foundation Requirement) [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
ECON 2110G	Macroeconomic Principles (C- or better)	
ECON 2120G	Principles of Microeconomics Honors (C- or better)	
Area III: Laboratory Sciences Course (4 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1430G	Applications of Calculus I (Foundation Requirement)	3
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
A ST 311	Statistical Applications (minimum grade of C- required))	3
Business Core: Lower Division (minimum grades of C- required)		
ACCT 2110	Principles of Accounting I (not recommended for freshman year)	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
MGMT 344	Production and Operations Management	3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		6
Major Courses		
MGMT 332	Human Resources Management	3
MGMT 333	Training and Development	3
MGMT 451	Strategic Talent Management	3
MGMT 460	Compensation Management	3
BCIS 461	Business Analytics I	3
or BCIS 485	Enterprise Resource Planning	
MGMT Upper Division Electives		*9*
Second Language: (not required)		

Electives, to bring the total credits to 120 [5]	**16**
Total Credits	**120**

1. Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses and how to fulfill this requirement.
4. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
MATH 1220G	College Algebra (C- or better) [1]	3
BCIS 1110	Introduction to Information Systems	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) [1]	
ENGL 1110H	Composition I Honors (C- or better) [1]	
ENGL 1110M	Composition I (C- or better) [1]	
Area V: Humanities Course [2]		3
Elective Course [3]		3
	Credits	**16**
Spring		
MATH 1430G	Applications of Calculus I [1]	3
BUSA 1110	Intro to Business	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors (C- or better)	
Area III: Laboratory Science Course [2]		4
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Second Year		
Fall		
Elective Course [3]		3
ECON 2110G	Macroeconomic Principles (counts towards Area IV, Gen.Ed) [1]	3
ACCT 2110	Principles of Accounting I	3
ENGL 2210G	Professional and Technical Communication (C- or better) [1]	3
Elective Course [3]		3
	Credits	**15**
Spring		
A ST 311	Statistical Applications [1]	
ECON 2120G	Principles of Microeconomics Honors (counts towards Area IV, Gen. Ed) [1]	3
ACCT 2120	Principles of Accounting II [1]	3
Elective Course [3]		4
VWW - Viewing a Wider World Course [4]		3
	Credits	**13**
Third Year		
Fall		
MGMT 332	Human Resources Management	3
BCIS 338	Business Information Systems I [1]	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
MGT Upper Division Elective Course		3
	Credits	**15**
Spring		
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGT Upper Division Elective Course		3
MGT Upper Division Elective Course		3
VWW - Viewing a Wider World [4]		3
	Credits	**15**
Fourth Year		
Fall		
BCIS 461	Business Analytics I (typically offered in Fall only) [1]	3
MGMT 451	Strategic Talent Management (typically offered in Fall only) [1]	3
MGMT Upper Division Elective Course		3
MGMT 333	Training and Development (typically offered in Fall only)	
MGMT 344	Production and Operations Management [1]	3
	Credits	**12**
Spring		
MGMT 460	Compensation Management (typically offered in Spring only) [1]	3
MGMT Upper Division Elective Course		3
MGMT 465	Contemporary Issues in Human Resources Management (typically offered in Spring only) [1]	3
MGMT 449	Strategic Management [1]	3
Two Business Upper-Division Elective Course (excluding A ST 311)		6
	Credits	**18**
	Total Credits	**120**

1. These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However

students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

4 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

5 Students who choose to take MGMT 333 Training and Development during Year 4-Fall will take a 3-credit MGT upper-division elective in Year 4-Spring.
Students who choose to take a 3-credit MGMT upper-division elective during Year 4-Fall will take MGMT 465 Contemporary Issues in Human Resources Management during Year 4-Spring.

Management (Project & Supply Chain Management) - Bachelor of Business Administration

Every candidate for this major must fulfill the following requirements in addition to the general education common core, College of Business foundation and the business core, Viewing a Wider World requirements and general electives. Students will choose one or more of the four options that follow.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Course Requirements

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses.		
Area I: Communications		
English Composition - Level 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
or ENGL 2210M	Professional and Technical Communication for Multilingual Students	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra (Foundation Requirement) [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
ECON 2110G	Macroeconomic Principles (C- or better)	
ECON 2120G	Principles of Microeconomics Honors (C- or better)	
Area III: Laboratory Sciences Course (4 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1430G	Applications of Calculus I (Foundation Requirement (Majors in Economics and International Business must earn a grade of at least C-))	3
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
Foundation Requirements [4]		
(grade of C- or better required):		
A ST 311	Statistical Applications (Foundation Requirement - doesn't count as Gen.Ed)	3
Business Core: Lower Division (minimum grades of C- required)		
ACCT 2110	Principles of Accounting I (not recommended for freshman year)	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
BCIS 485	Enterprise Resource Planning (counts as a major course also)	3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		6
Major Courses		
MGMT 450	Business Process Improvement (offered in Fall only)	3
or MGMT 345V	Quality and Competitiveness: An International Perspective	
MGMT 344	Production and Operations Management	3
MGMT 459	Transportation Optimization (offered in Spring only)	3
MGMT 351	Supply Chain Management	3
BCIS 461	Business Analytics I	3
MGMT 470	Project Management in Organizations	3
MGMT Upper Division Electives		*6*
Second Language: (not required)		
Electives, to bring the total credits to 120 [5]		**16**
Total Credits		**120**

1 Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses and how to fulfill this requirement.

4 All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics

course satisfies the Area II General Education course: MATH 1220G, MATH 1430G andA ST 311 must be completed.

5 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
MATH 1220G	College Algebra (C- or better) [1]	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) [1]	
ENGL 1110H	Composition I Honors (C- or better) [1]	
ENGL 1110M	Composition I (C- or better) [1]	
Area V: Humanities Course [2]		3
Elective Course [3]		3
	Credits	**16**
Spring		
MATH 1430G	Applications of Calculus I [1]	3
BUSA 1110	Intro to Business (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors (C- or better)	
Area III: Laboratory Science Course [2]		4
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Second Year		
Fall		
Elective Course [3]		3
ECON 2110G	Macroeconomic Principles (counts towards Area IV, Gen.Ed and C- or better) [1]	3
ACCT 2110	Principles of Accounting I (C- or better)	3
ENGL 2210G	Professional and Technical Communication (C- or better) [1]	3
Elective Course [3]		3
	Credits	**15**
Spring		
A ST 311	Statistical Applications (C- or better) [1]	3
ECON 2120G	Principles of Microeconomics Honors (counts towards Area IV, Gen. Ed, and C- or better) [1]	3
ACCT 2120	Principles of Accounting II (C- or better) [1]	3
Elective Course [3]		4
VWW - Viewing a Wider World Course [4]		3
	Credits	**16**
Third Year		
Fall		
MGMT 344	Production and Operations Management	3
MGT Upper Division Elective Course		3
BCIS 338	Business Information Systems I [1]	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
	Credits	**15**
Spring		
MGMT 351	Supply Chain Management	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets [1]	3
MGMT Upper-Division Elective Course		3
VWW - Viewing a Wider World [4]		3
	Credits	**15**
Fourth Year		
Fall		
MGMT 450 or MGMT 345V	Business Process Improvement or Quality and Competitiveness: An International Perspective	3
BCIS 461	Business Analytics I (typically offered in Fall only) [1]	3
BCIS 485	Enterprise Resource Planning [1]	3
Any Business Upper-Division Elective Course (excluding A ST 311)		3
Elective Course [3]		3
	Credits	**15**
Spring		
MGMT 459	Transportation Optimization	3
MGMT 470	Project Management in Organizations	3
MGMT 449	Strategic Management [1]	3
Any Business Upper-Division Elective Course (excluding A ST 311)		3
	Credits	**12**
	Total Credits	**120**

1 These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

4 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Management (Small Business Management & Entrepreneurship) - Bachelor of Business Administration

Every candidate for this major must fulfill the following requirements in addition to the general education common core, College of Business foundation and the business core, Viewing a Wider World requirements and general electives. Students will choose one or more of the four options that follow.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Course Requirements

Prefix	Title	Credits
General Education		
Grades of C- or better are required in general education communications courses.		
Area I: Communications		
English Composition - Level 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
ENGL 1110M	Composition I	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
or ENGL 2210M	Professional and Technical Communication for Multilingual Students	
Oral Communication		
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra (Foundation Requirement) [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
ECON 2110G	Macroeconomic Principles (C- or better)	
ECON 2120G	Principles of Microeconomics Honors (C- or better)	
Area III: Laboratory Sciences Course (4 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1430G	Applications of Calculus I (Foundation Requirement)	3
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
A ST 311	Statistical Applications (minimum grade of C- required)	3
Business Core: Lower Division (minimum grades of C- required)		
ACCT 2110	Principles of Accounting I (not recommended for freshman year)	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
MGMT 344	Production and Operations Management	3
Two Upper Division Business electives from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		6
Major Courses		
MGMT 332	Human Resources Management	3
MGMT 310V	Entrepreneurial Mindset	3
MGMT 361	Small Business Management	3
MGMT 448	Business Process Improvement	3
or MGMT 461	Entrepreneurial Decision Making	
MGMT 470	Project Management in Organizations	3
BLAW 330	Entrepreneurship Law	3
MKTG 324	Product/Service Development	3
or MKTG 357	Digital Marketing Strategy	
MGMT Upper Division Elective		*3*
Second Language: (not required)		
Electives, to bring the total credits to 120 [5]		**16**
Total Credits		**120**

1. Students may be required to take MATH 1215 Intermediate Algebra, depending on their math placement. MATH 1220G College Algebra or MATH 1430G Applications of Calculus I or MATH 1350G Introduction to Statistics fulfills the general education requirement in math.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses and how to fulfill this requirement.
4. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
MATH 1220G	College Algebra (C- or better) [1]	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Choose one from the following:		4
ENGL 1110G	Composition I (C- or better) [1]	
ENGL 1110H	Composition I Honors (C- or better) [1]	
ENGL 1110M	Composition I (C- or better) [1]	
Area V: Humanities Course [2]		3
Elective Course [3]		3
	Credits	**16**
Spring		
MATH 1430G	Applications of Calculus I [1]	3
BUSA 1110	Intro to Business (C- or better)	3
Choose one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture (C- or better)	
COMM 1115G	Introduction to Communication (C- or better)	
COMM 1130G	Public Speaking (C- or better)	
HNRS 2175G	Introduction to Communication Honors (C- or better)	
Area III: Laboratory Science Course [2]		4
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Second Year		
Fall		
Elective Course [3]		3
ECON 2110G	Macroeconomic Principles (counts towards Area IV, Gen.Ed and C- or better) [1]	3
ACCT 2110	Principles of Accounting I (C- or better)	3
ENGL 2210G	Professional and Technical Communication (C- or better) [1]	3
Elective Course [3]		3
	Credits	**15**
Spring		
A ST 311	Statistical Applications (C- or better) [1]	3
ECON 2120G	Principles of Microeconomics Honors (counts towards Area IV, Gen. Ed, and C- or better) [1]	3
ACCT 2120	Principles of Accounting II (C- or better) [1]	3
Elective Course [3]		4
VWW - Viewing a Wider World Course [4]		3
	Credits	**16**
Third Year		
Fall		
MGMT 332	Human Resources Management	3
MKTG 324 or MKTG 357	Product/Service Development or Digital Marketing Strategy	3
BCIS 338	Business Information Systems I [1]	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
	Credits	**15**
Spring		
MGMT 361	Small Business Management	3
MGMT 310V	Entrepreneurial Mindset	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets [1]	3
VWW - Viewing a Wider World [4]		3
	Credits	**15**
Fourth Year		
Fall		
MGMT 448 or MGMT 461	Business Process Improvement (only offered in Fall semester) [1] or Entrepreneurial Decision Making	3
BLAW 330	Entrepreneurship Law	3
MGMT 344	Production and Operations Management [1]	
Elective Course [3]		6
	Credits	**12**
Spring		
MGMT 470	Project Management in Organizations	3
MGMT 449	Strategic Management [1]	3
MGMT Upper-Division Elective Course		3
Any Two Business Upper-Division Elective Course (excluding A ST 311)		6
	Credits	**15**
	Total Credits	**120**

1. These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Human Resource Management - Undergraduate Minor

The management minor requires 18 upper-division credits in management.

Prefix	Title	Credits
MGMT 332	Human Resources Management	3
Select two of the following courses:		*6*
MGMT 333	Training and Development	
MGMT 451	Strategic Talent Management	
MGMT 460	Compensation Management	
Select three (3) other upper-division Management courses [1] *course (3 credits) can be an upper-level College of Business course*		*9*
Total Credits		**18**

At least 12 credits for the minor must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

To obtain a Human Resource Management minor, a grade of C- or better must be attained in the courses required.

Management - Undergraduate Minor

The management minor requires 18 upper division credits in management. Business majors must take any six upper-division management courses (3 credits each). The management minor for non-business majors consists of:

Prefix	Title	Credits
MGMT 309	Human Behavior in Organizations	3
Select five other upper division Management courses [1]		15
Total Credits		**18**

[1] One 3-credit upper division course in the College of Business may substitute for one of the required five management courses.

At least 12 credits for the minor must be completed at NMSU. This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

To obtain a Management minor, a grade of C- or better must be attained in the courses required.

Marketing

Undergraduate Program Information

Marketing majors learn skills and knowledge relevant to the co-creation of goods, services, and ideas that uniquely meet the needs and wants of global customer markets and society at large. Career opportunities exist in marketing management, advertising, market research, promotion management, sales and sales management, social media, distribution management, and retailing. The major is designed to allow a great deal of choice so students may emphasize any combinations of these areas.

Most marketing majors enter into careers in business firms, although some find job opportunities in governmental and other nonprofit organizations. Still others become involved in owning and managing their own companies. Opportunities in entrepreneurship and small business are expanding at a rapid pace.

Graduate Program Information

The College offers a program leading to a Ph.D. degree (Doctor of Philosophy in Business Administration) (p. 209). The faculty of the Ph.D. Program in Business Administration is committed to training researchers and educators who will shape business scholarship, practice, and pedagogy. The program emphasizes preparing candidates to understand the complexities of modern business while they develop a specialized area of expertise in marketing or management. The Ph.D. in Business Administration provides graduates with the opportunity to pursue a variety of career paths within academia and within industry. Currently a concentration is offered in marketing.

Degrees for the Department

Bachelor Degree(s)

- Marketing (Advertising) - Bachelor of Business Administration (p. 1042)
- Marketing (PGA Golf Management) - Bachelor of Business Administration (p. 1043)
- Marketing (Professional Selling) - Bachelor of Business Administration (p. 1045)
- Marketing (Strategic Marketing) - Bachelor of Business Administration (p. 1047)
- Marketing - Bachelor of Business Administration (Online) (https://catalogs.nmsu.edu/global/nmsu-global/marketing-bba-online/)

Doctoral Degree(s)

- Business Administration (Marketing) - Doctor of Philosophy (p. 209)

Minors for the Department

- Advertising - Undergraduate Minor (p. 1049)
- Marketing - Undergraduate Minor (p. 1049)
- Professional Selling - Undergraduate Minor (p. 1049)

Department Head : Kevin Trainor (Professor)

Faculty:

Aguilar, Richard (College Assistant Professor)

Blaugrund, Erin (College Professor)

Bhattarai, Ashok (Assistant Professor)

Hueller, Christoph (Assistant Professor)

Jasso, Michelle (Professor)

Manis, K.T. (Assistant Professor)

Niculescu, Mihai (Professor)

Salmon, Joshua (College Assistant Professor / PGM Director)

Shabazz, Siddeeq (College Assistant Professor)

Yun, Jin Ho (Assistant Professor)

Marketing Courses

MKTG 1111. Level 1, PGA's PGM Education Program (Part 1)
3 Credits (3)
Level 1 Part 1 of the PGA PGM Education Program. Introduction to the Policies and Procedures of the PGA Golf Mgt. Program and the PGA of America. Students will complete the PGA Qualifying Level, Facility Management 1A (Tournament Ops A, Rules of Golf B, and Career Enhancement B), and the corresponding Work Experience Activities. Additional course fee required.
Learning Outcomes

1. Knows the career opportunities, challenges, and benefits of PGA.
2. Can distinguish significant differences between Teaching and Player Development and the Facility Operations Management pathways to PGA membership.
3. Understands the structure and requirements of the PGM Program.
4. Knows how to maintain acceptable progress.
5. Knows the courses at each level of the PGM Program.
6. Knows how to access resources that facilitate progress through the PGM Program.
7. Discuss how the PGA of America began and evolved and be familiar with key milestones in PGA history.
8. State the mission of the PGA of America and the structure of the PGA Constitution, Bylaws and Regulation.

9. Describe how the PGA of America is organized, including its Officers, Board of Directors, The Chief Executive Officer and headquarters staff. 1
10. Describe the role of Sections and Districts, the PGA Officers and Board of Directors, The Chief Executive Officer and headquarters staff. 1
11. Recognize the requirements for PGA Recognized Golf Facilities and employment definitions. 1
12. Describe the importance of the PGA of America's dedication to professionalism and ethical practices, what constitutes a Code of Ethics violation, and the procedures for processing Code of Ethics violations. 1
13. Identify eligibility requirements for apprentices and members, the rights of membership, the different membership classifications, how to maintain active status, and the process for appealing to the Board of Control on membership issues. 1
14. Review the organization of The Rules of Golf. 1
15. Understand proper etiquette of the game of golf. 1
16. Review the history and development of the Rules. 1
17. Understand how the Rules are maintained and changed. 1
18. Prepare a professional resume and cover letter for an employment interview.

MKTG 1112. Level 1, PGA's PGM Education Program (Part 2)
3 Credits (3)
Level 1 Part 2 of the PGA PGM Education Program. This class will focus on Teaching and Coaching 1, the corresponding PGA Work Experience Activities, and PGA Teaching Seminars. Additional course fee required.
Learning Outcomes

1. Know how students learn and process golf knowledge and skills, and identify the implications for teaching.
2. Know how to define and distinguish between learning and performance.
3. Understand how juniors learn golf knowledge and skills, and identify implications for teaching.
4. Conduct a physical evaluation of a junior golfer and create developmentally appropriate exercise and training programs.
5. Establish student/teacher relationships that promote greater student learning and enjoyment.
6. Develop a communication style that fits the student and increases instructional effectiveness.
7. Analyze student's instructional needs and set clear, purposeful learning and practice goals.
8. Know the format for an effective golf lesson.
9. Deliver effective explanations and demonstrations during a golf lesson. 1
10. Engage in self-assessment of teaching skills and competencies. 1
11. Recognize the appropriate clubhead path and clubface position information to improve a golfer's performance. 1
12. Conduct appropriate assessments to determine the short game skill level of the golfer. 1
13. Gain understanding of the short game elements to help lower scores and improve the player. 1
14. Define club performance terms and specifications, including lie angle and clubface angle or position, and describe their effect on ball flight and player performance: Define what information is require to properly assess a player's golf equipment. 1
15. Define club performance terms and specifications, including lie angle and clubface angle or position, and describe their effect on ball flight and player performance: Observe a player's swinging motion, ball flight, and equipment to evaluate the effectiveness of their equipment.

MKTG 1210. Advertising
3 Credits (3)
A survey of currently available advertising media. A psychological approach to consumer persuasion; applied techniques in media selection, layout mechanics, production methods, and campaign structures.
Prerequisite: MKTG 2110.
Learning Outcomes

1. Define advertising and the relevant application of psychology in delivering the message.
2. Explain the importance of various advertising media in the marketing mix.
3. Identify and explain the social, ethical and legal issues advertisers must consider.
4. Describe the significance of the marketing function in business.
5. Explain the importance of advertising and other marketing communication tools.
6. Demonstrate application of the planning process as it applies to marketing and advertising.
7. Describe the factors that are weighted when considering the use of radio and television in the creative advertising mix.
8. Describe the relationship between market segment, consumer behavior and selection of advertising campaign types.
9. List the alternative means of reaching a target market and the technical challenges of each.

MKTG 1220. Small Business Marketing
3 Credits (3)
An overview of public relations principles, practices and purposes as applied to small business. Topics include basics of news release writing, media awareness, development and maintenance of a positive public image, branding, ethical marketing, and the relationships of public relations with advertising and marketing. Methods and practices used in small business are explored.
Prerequisite/Corequisite: MKTG 2110.
Learning Outcomes

1. Explain the importance of creating and sustaining a positive public awareness and image.
2. Identify public relations practices as they relate to the management and marketing processes.
3. Define branding and discuss its importance for small business.
4. Describe the value of business event management and promotion for small business.
5. Discuss how media relations, public relations, advertising and marketing efforts are interrelated and the importance of each.

MKTG 180. Level 1, PGA's PGM Education Program (Part 1)
3 Credits (3)
Level 1 Part 1 of the PGA PGM Education Program. Introduction to the Policies and Procedures of the PGA Golf Mgt. Program and the PGA of America. Students will complete the PGA Qualifying Level,Facility Management 1A (Tournament Ops A, Rules of Golf B, and Career Enhancement B), and the corresponding Work Experience Activities. Additional course fee required. Consent of Instructor required. Restricted to: MKTG majors.

MKTG 181. Level 1, PGA's PGM Education Program (Part 2)
3 Credits (3)
Level 1 Part 2 of the PGA PGM Education Program. This class will focus on Teaching and Coaching 1, the corresponding PGA Work Experience Activities, and PGA Teaching Seminars. Additional course fee required. Consent of Instructor required. Restricted to: MKTG majors.

Learning Outcomes

1. Know how students learn and process golf knowledge and skills, and identify the implications for teaching
2. Know how to define and distinguish between learning and performance
3. Understand how juniors learn golf knowledge and skills, and identify implications for teaching
4. Conduct a physical evaluation of a junior golfer and create developmentally appropriate exercise and training programs
5. Establish student/teacher relationships that promote greater student learning and enjoyment
6. Develop a communication style that fits the student and increases instructional effectiveness
7. Analyze student's instructional needs and set clear, purposeful learning and practice goals
8. Know the format for an effective golf lesson
9. Deliver effective explanations and demonstrations during a golf lesson 1
10. Engage in self-assessment of teaching skills and competencies 1
11. Recognize the appropriate clubhead path and clubface position information to improve a golfer's performance 1
12. Conduct appropriate assessments to determine the short game skill level of the golfer 1
13. Gain understanding of the short game elements to help lower scores and improve the player 1
14. Define club performance terms and specifications, including lie angle and clubface angle or position, and describe their effect on ball flight and player performance: Define what information is require to properly assess a player's golf equipment 1
15. Define club performance terms and specifications, including lie angle and clubface angle or position, and describe their effect on ball flight and player performance: Observe a player's swinging motion, ball flight, and equipment to evaluate the effectiveness of their equipment

MKTG 2110. Principles of Marketing
3 Credits (3)
Survey of modern marketing concepts and practices focusing on the marketing mix: product, pricing, promotion, and distribution strategies. Topics include: the marketing environment, consumer behavior, marketing research, target marketing, and the ethical and social responsibilities of marketers. May be repeated up to 6 credits.
Prerequisite: BUSA 1110.

Learning Outcomes

1. Describe the professional, ethical, and social responsibilities of marketers.
2. Explain the role of the product in the marketing mix, including the product life cycle, the relevance of product innovation, and product classifications.
3. Illustrate the role of promotion in the marketing mix, including the communication process and the promotional mix.
4. Explain the role of price in the marketing mix, including pricing objectives, pricing policies, and pricing methods.
5. Describe the operation of channels of distribution and supply chains, including functions of intermediaries and degrees of coverage.
6. Define the concepts of target markets and market segmentation with respect to elements of the marketing mix.
7. Explain the importance of market research and information systems in supporting marketing decision making.
8. Describe the dynamic environment(s) in which marketing decisions must be made.

MKTG 2111. Level 1, PGA's PGM Education Program (Part 3)
3 Credits (3)
Level 1 Part 3 of the PGA PGM Education Program. This class will focus on Facility Management 1B (Business Planning A, Customer Relations A, Golf Car A, Merchandising A, Turfgrass A), Level 1 Checkpoint Exams, and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required.

Learning Outcomes

1. Understand the PGA Business Planning Model.
2. Use case studies to apply business planning concepts.
3. Define the business at the facility in terms of vision, core values, facility characteristics, and mission.
4. Assess the current state of the business by conducting a SWOT analysis.
5. Develop appropriate business goals and objectives.
6. Develop strategies to achieve goals and objectives.
7. Analyze financial history to create a financial forecast and operating budget.
8. Monitor performance and make necessary modifications to the plan.
9. Utilize the PGA PGM Work Experience Portfolio to display relevant training and experience. 1
10. Describe the golf industry job market and the knowledge and skills required to succeed. 1
11. Access PGA employment resources and participate in professional growth and development. 1
12. Utilize negotiation strategies for a compensation package. 1
13. Understand the major components of an employment agreement or contract. 1
14. Understand the business value of customer relations. 1
15. Describe the components of the PGA Customer Relations Model. 1
16. Utilize the four Interaction Strategies in a variety of routine and challenging customer situations. 1
17. Utilize the seven Interpersonal Skills in a variety of routine and challenging customer situations. 1
18. Initiate the PGA Experience using a systematic engagement routine. 1
19. Understand the importance of the golf car to the customer, the golf professional, and the facility. 2
20. Know the characteristics of a well-managed golf car fleet. 2
21. Utilize policies and procedures necessary for the operation of a safe and efficient golf car program. 2
22. Evaluate the components and potential benefits of an effective maintenance program and a proper storage facility. 2
23. Determine golf car needs in order to acquire a fleet that supports the facility's mission, customers, and physical characteristics. 2
24. Project fleet revenue, costs, and profit, and identify how budgeting changes impact the bottom line. 2

25. Evaluate the advantages and disadvantages of lease-purchase options. 2
26. Determine optimal rental fees. 2
27. Define key terms used in the Rules of Golf. 2
28. Locate and apply Rules to frequently encountered situations. 2
29. Encourage the use of the Rules and etiquette at your facility. 3
30. Understand how to define, assess, and develop tournament business at a facility. 3
31. Identify and define a tournament's purpose to develop an event that meets the needs of the customer and the facility. 3
32. Know how golf courses and facilities prepare for an event. 3
33. Define staff requirements for tournament operations. 3
34. Understand and communicate tasks required for tournament execution. 3
35. Manage situations and make rulings during events. 3
36. Review tournaments and suggest improvements for future events.

MKTG 2112. Level 2, PGA's PGM Education Program (Part 1)
3 Credits (3)
Level 2 Part 1 of the PGA PGM Education Program. This class will focus on Teaching and Coaching 2, Teaching and Coaching Seminars, and the corresponding PGA Work Experience Activities. Additional course fee required.

Learning Outcomes

1. Explain how students learn golf knowledge and skills, and identify the implications for teaching.
2. Explain how students process information when learning golf skills.
3. Identify and explain the principles of effective practice.
4. Explain how juniors learn golf knowledge and skills, and identify the implications for teaching.
5. Structure an effective golf lesson.
6. Analyze student's instructional needs and set clear, purposeful learning and practice goals.
7. Deliver effective explanations and demonstrations during a golf lesson.
8. Engage in self-assessment of teaching skills and competencies.
9. Recognize and apply the appropriate clubhead path and clubface position information to improve a golfer's performance. 1
10. Conduct appropriate assessments to determine the skill level of the golfer. 1
11. Demonstrate basic knowledge of anatomy and physiology, and conduct a physical observation to identify movement capabilities and limitations that may affect a golfer's performance. 1
12. Define club performance terms and specifications, and describe their effect on ball flight and player performance.

MKTG 2220. Digital Marketing
3 Credits (3)
This course focuses on planning to create and market a website. Internal marketing topics such as registering with search engines, increasing traffic, segmenting and targeting markets, establishing an online presence, developing a marketing plan and reshaping business for the Web market are covered.
Prerequisite: MKTG 2110.

Learning Outcomes

1. Describe how search engines work. (Use knowledge to make recommendations to a website on how it can improve its organic search rankings - perform search engine optimization).
2. Describe the various methods of online display advertising.
3. Determine the appropriate key performance indicators (KPIs) for any type of website.
4. Describe and implement best practices in marketing to a database of current and potential customers via email.
5. Utilize knowledge of social media tactics to design an effective social media campaign.
6. Implement online reputation management tactics to improve the online reputation of a brand.
7. Develop and present a digital marketing plan for a small, local business.

MKTG 280. Level 1, PGA's PGM Education Program (Part 3)
3 Credits (3)
Level 1 Part 3 of the PGA PGM Education Program. This class will focus on Facility Management 1B (Business Planning A, Customer Relations A, Golf Car A, Merchandising A, Turfgrass A), Level 1 Checkpoint Exams, and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required. Consent of Instructor required. Restricted to: MKTG majors.

MKTG 281. Level 2, PGA's PGM Education Program (Part 1)
3 Credits (3)
Level 2 Part 1 of the PGA PGM Education Program. This class will focus on Teaching and Coaching 2, Teaching and Coaching Seminars, and the corresponding PGA Work Experience Activities. Additional course fee required. Consent of Instructor required. Restricted to: MKTG majors.

Learning Outcomes

1. Explain how students learn golf knowledge and skills, and identify the implications for teaching
2. Explain how students process information when learning golf skills
3. Identify and explain the principles of effective practice
4. Explain how juniors learn golf knowledge and skills, and identify the implications for teaching
5. Structure an effective golf lesson
6. Analyze student's instructional needs and set clear, purposeful learning and practice goals
7. Deliver effective explanations and demonstrations during a golf lesson
8. Engage in self-assessment of teaching skills and competencies
9. Recognize and apply the appropriate clubhead path and clubface position information to improve a golfer's performance 1
10. Conduct appropriate assessments to determine the skill level of the golfer 1
11. Demonstrate basic knowledge of anatomy and physiology, and conduct a physical observation to identify movement capabilities and limitations that may affect a golfer's performance 1
12. Define club performance terms and specifications, and describe their effect on ball flight and player performance

MKTG 303. Principles of Marketing
3 Credits (3)
Process, functions, and principles in the current marketing system.

Learning Outcomes

1. Understand primary and changing perspectives on marketing and strategic management.
2. Understand the fundamental principles and theories of marketing.
3. Develop the capacity to obtain and process relevant information and analytical skills.

4. Evaluate the impact of interactive media on marketing management.
5. Apply relevant marketing concepts and analytical tools, identify viable alternatives, make informed choices, and recommend marketing implementation plans.
6. Develop skills in organizing more effective strategic marketing and in implementing the market planning process.
7. Develop, evaluate, and implement marketing management strategies in complex environments through recent, popular case study analyses.
8. Formulate marketing management strategies on critical issues, problems, and business opportunities.
9. Broaden perspectives of ethics and social responsibility, keep abreast of global developments, and adapt to changing environments.

MKTG 305. Marketing and Food Agricultural Products
3 Credits (3)
This course provides a review of marketing principles and techniques used throughout the food and fiber supply chain. The course introduces a broad variety of marketing topics including marketing strategy, consumer behavior, market segmentation, market research, competitive analysis, and the marketing mix. The course serves as a foundation for advanced courses in agricultural marketing. May be repeated up to 3 credits.
Prerequisite: ECON 1110G or ECON 2120G.
Learning Outcomes
1. Articulate how agricultural commodities move through the food and fiber supply chain.
2. Understand the importance of strategic marketing and how organizations within the food and fiber supply chain identify consumers and their preferences
3. Understand key marketing concepts used by agribusiness marketers, including SWOT analysis, the marketing mix, advertising and public relations
4. Know the basic outline and components of a marketing plan

MKTG 310. Marketing Research
3 Credits (3)
Design, collection analysis, and presentation of research data.
Prerequisite: MATH 1350G or A ST 311 and C- or better in MKTG 303, or consent of instructor.
Learning Outcomes
1. Translate a marketing problem into a feasible research question.
2. Recognize marketing research as a process that involves a sequence of activities, each compatible with the preceding activities.
3. Compare and contrast alternative research designs.
4. Identify the sources of marketing information and the various means for gathering such information.
5. Recognize the biases and limitations of marketing data and basic data analysis.
6. Interpret univariate and basic bivariate data analysis techniques (i.e., should be able to decide when a technique is appropriate and recognize the managerial implications of analytical results).
7. Design and execute a basic survey research project.
8. Assess ethical issues associated with various research approaches.

MKTG 311V. Consumer Behavior
3 Credits (3)
The different aspects of consumer behavior and the variables affecting consumer decisions. Analysis of current concepts and models.
Learning Outcomes
1. Know the consumer behavior concepts by integrating and adapting theories developed in disciplines such as psychology, sociology, anthropology, and economics.
2. Use specific tools to tackle and analyze customer issues.
3. Develop the ability to apply consumer behavior concepts from the perspective of marketing managers and public policy makers.
4. Increase the awareness of and enhance the ability to make ethical decisions in consumer-related issues.

MKTG 312. Personal Selling
3 Credits (3)
Implementation of the promotion process through interpersonal communications between salesperson and prospects. Serving customers by sales representatives.
Learning Outcomes
1. Demonstrate how personal selling can strategically enhance interpersonal communication skills, career management, personal productivity.
2. Identify key issues and trends such as opportunities or threats, for evolving emerging sales approaches platforms.

MKTG 313. Retail Management
3 Credits (3)
Investigates retail business operations and focuses on the strategic profit model, store location, layout, display, merchandising, operations, and personnel.
Learning Outcomes
1. Analyze the role of retailing in society and basic retailing principles, ideas, and concepts as they relate to an understanding of our market-driven system
2. Compare and contrast segmentation and target market selection relative to a specific population product/service for different markets and retailing opportunities
3. Apply the concepts of the marketing mix to the formulation and evaluation of retailing strategies relative to particular target markets, environments (economic, technological and competitive), and desired positions in market places (both local and global)
4. Areas to be addressed include communication strategy, branding, packaging, pricing, product/service design, methods of delivery and the product life cycle
5. Relate the concepts of marketing and retailing research, consumer behavior and strategy and their interrelationships
6. Compare and contrast analysis techniques and judgment that are useful to managers in acting with integrity to make decisions and taking action

MKTG 314. Advertising Strategy
3 Credits (3)
Utilization of advertising as a business administration function; communication with consumers as a means of attaining marketing goals.
Learning Outcomes
1. Analyze advertising from a consumer perspective
2. Compare advertising strategy theories and concepts
3. Evaluate advertising critically and creatively

MKTG 317. International Marketing
3 Credits (3)

Focuses on decisions relating to entering markets, market segmentation, marketing strategies, and tactics in the international arena. Same as I B 317.

Learning Outcomes

1. Develop understanding about what is involved in making international marketing decisions, including product, price, promotion, and place decisions to create a marketing mix.
2. Acquire an overview on the contemporary issues in global marketing and the unique challenges faced by marketing managers in the dynamic global environment.
3. Develop insights into how differences in global economic, cultural, social, political, and legal environments can affect marketing decisions.
4. Develop strategic thinking in the context of complex problems and challenges faced by the contemporary global executives and managers.
5. Develop ability to integrate the important global societal dimensions of diversity, environmental concerns, ethics, and technological change into their thinking.
6. Develop knowledge and skills to analyze cross-cultural variables and their impact on international marketing.
7. Discover sources of information for researching and evaluating international markets.
8. Communicate effectively about marketing issues in group discussions, oral presentations and written reports.
9. Work effectively as a team member in analyzing marketing issues. 1
10. Develop leadership skills necessary to deal with the uncertainty and changes faced by today's global marketers.

MKTG 324. Product/Service Development
3 Credits (3)

Covers product innovation, development, commercialization and resource recovery, price determination and administration strategies, and complementing planning processes.

Learning Outcomes

1. Understand the product/service development process.
2. Identify market opportunities for new products.
3. Use structured methods to evaluate and test product concepts.
4. Apply tools learned in class to develop new products/services.
5. Plan the launch of a product and evaluate its impact on the market.
6. Efficiently work with and communicate ideas to team members.

MKTG 354. Sports Marketing
3 Credits (3)

The application of marketing concepts to the sports industry. Topics include fans/customers, products, and promotions across a range of sports.

Learning Outcomes

1. Discuss the domain of sports marketing
2. Apply basic marketing tools (e.g., research, segmentation) to sports marketing contexts
3. Recognize, evaluate, and accommodate the perspectives of participants and spectators as sports consumers
4. Identify appropriate marketing mix options for sports products
5. Appraise recent sports marketing trends
6. Plan a career in sports marketing

MKTG 357. Digital Marketing Strategy
3 Credits (3)

This course explores how organizations plan, execute, and evaluate marketing strategies in digital environments. Emphasis is placed on strategic frameworks and decision-making approaches that adapt to evolving technologies and market conditions.

Learning Outcomes

1. Apply the concepts of the marketing mix to the formulation/evaluation of marketing strategies relative to Social Media policies that combine business objectives with appropriate use of Social Media channels and content.
2. Compare and contrast the history of Social Media and recognize the various platforms of Social Media.
3. Select/defend segmentation and target market selection relative to a specific population product/service that engages target audiences with a marketing message.
4. Analyze business objectives and connect to appropriate Social Media tactics.
5. Evaluate Social Media marketing content to shape the way we connect to and build relationships with users, consumers and businesses.
6. Relate the concepts of marketing research to establish metrics for measuring Social Media marketing success.

MKTG 380. Level 2, PGA's PGM Education Program (Part 2)
3 Credits (3)

Level 2 Part 2 of the PGA PGM Education Program. This class will focus on Facility Managment 2 and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGA Golf Management majors.

Learning Outcomes

1. Define the business at the facility level in terms of vision, core values, facility characteristics and mission.
2. Utilize the four Interaction Strategies in a variety of routine and challenging customer situations.
3. Identify core business areas that support a customer-focused environment
4. Know the characteristics of a merchandising operation that align with a facility's business plan
5. Understand how to define, assess, and develop tournament business at a facility.

MKTG 381. Level 3, PGA's PGM Education Program (Part 1)
3 Credits (3)

Level 3 Part 1 of the PGA's PGM Education Program. This class will focus on Teaching and Coaching 3, Teaching and Coaching Seminars, and the corresponding PGA Work Experience Activities. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGA Golf Management

Learning Outcomes

1. Explain how various types of feedback function to influence learning
2. Define the major variables that influence learning and explain how they operate with implications for practice, learning, and teaching
3. Provide effective instructional feedback after students' practice and performance
4. Explain how the form, precision, timing, frequency, and regulation of augmented feedback influence learning with implications for teaching and practice conditions
5. Explain how the key practice factors influence learning with implication for designing practice conditions

6. Establish relationships that promote greater student learning and enjoyment
7. Plan long-term developmental programs for beginning and intermediate players
8. Communicate effectively with students
9. Develop a communication style that increases instructional effectiveness 1
10. Effectively determine and design an appropriate practice routine to the benefit of the golfer 1
11. Effectively determine and assign the appropriate drill or drill with an aid to improve the swing shape of the golfer 1
12. Use relevant technology to promote student learning 1
13. Effectively demonstrate and apply the appropriate specialty shot information to the benefit of the golfer 1
14. Demonstrate basic knowledge of current swing methodologies of noted instructors 1
15. Physical development of junior golfers 1
16. Assess the physical capabilities of adult golfer, describe implications for performance, and provide potential physical adjustments 1
17. Describe how to use bench skills, tools, and technologies for measuring and altering club performance 1
18. Perform analyses and make appropriate alterations to change ball flight, players performance, and teacher effectiveness

MKTG 400. Marketing Internship/Field Experience
3 Credits (3)
Internship of field experience in application of marketing principles. The student must accept an internship before being allowed to enroll in the course. Consent of instructor required. Restricted to MKTG majors.

MKTG 440. Sales, Negotiations, and Customer Relationship Management
3 Credits (3)
This course focuses on addressing the issues, processes and strategies related to professional selling and sales management. This is a comprehensive course in the art of selling, focusing on relationship building, negotiating, and sales management. Various techniques will be explored, including prospecting, lead management, product introduction, negotiation, closing strategies, and relationship management.
Learning Outcomes
1. Understand concepts and frameworks that help you analyze each negotiation situation.
2. Develop a strategic plan and preparation documents in advance of each negotiation.
3. Master a toolkit of useful negotiation skills, strategies and tactics.
4. Improve your ability to predict and understand the other party's behavior during negotiations
5. Gain valuable experience and confidence in your own negotiating skills.
6. Improve future outcomes whenever you enter into a negotiation or are engaged in a dispute.

MKTG 449. Promotion Management
3 Credits (3)
Covers concepts and problems in the use of advertising, internet marketing, social media marketing, personal selling, publicity, and other forms of promotion; planning, coordination, control, and evaluation of effectiveness.
Learning Outcomes
1. Analyze the role of advertising and promotion in society and basic marketing principles, ideas, and concepts as they relate to an understanding of our market-driven system
2. Compare and contrast segmentation and target market selection relative to a specific population product/service for different markets and promotional opportunities
3. Apply the concepts of the marketing mix to the formulation and evaluation of promotional strategies relative to particular target markets, environments (economic, technological and competitive), and desired positions in market places (both local and global)
4. Areas to be addressed include communication strategy, branding, pricing, product/service design, and e-commerce
5. Relate the concepts of marketing and advertising research, consumer behavior and strategy and their interrelationships
6. Compare and contrast analysis techniques and judgment that are useful to managers in acting with integrity to make decisions and taking action in the promotional environment

MKTG 450. Sales, Negotiations, and Customer Relationship Management
3 Credits (3)
This course focuses on addressing negotiations and strategies related to professional selling and sales management. This is a comprehensive course in the art of selling, focusing on relationship building, negotiating, and sales management. Various techniques will be explored, including prospecting, lead management, product introduction, negotiation, closing strategies, and relationship management.
Learning Outcomes
1. Understand concepts and frameworks that help you analyze each negotiation situation.
2. Develop a strategic plan and preparation documents in advance of each negotiation.
3. Master a toolkit of useful negotiation skills, strategies and tactics.
4. Improve your ability to predict and understand the other party's behavior during negotiations.
5. Gain valuable experience and confidence in your own negotiating skills.
6. Improve future outcomes whenever you enter into a negotiation or are engaged in a dispute.

MKTG 451. Food and Agribusiness Market Assessment
3 Credits (3)
This course is an application course in which self-managed teams develop and present marketing plans for agribusiness firms. Emphasis on integrating the marketing mix, particularly promotional elements. May be repeated up to 3 credits. Crosslisted with: AEEC 4510.
Prerequisite(s): AEEC 3210 or MKTG 305 or consent of instructor.
Learning Outcomes
1. Identify, organize ad conduct market research specific to the project.
2. Develop an understanding of primary and secondary research collection and analysis.
3. Exhibit enhanced relationship management, communication skills, and team building.
4. Develop written communication with final deliverable for implementation into the business world.

MKTG 453. Sales Management
3 Credits (3)
The nature of the sales management function in industry. Focuses on intra and interdepartmental sales management activities.

Prerequisite: MKTG 312.

Learning Outcomes

1. Examined the linkage between personal selling, as a basket of activities, and the management of those marketing personnel who do selling (i.e., salespeople).
2. Examined the role of the sales force in the achievement of a firm's marketing objectives.
3. Undertaken numerous case-based analyses of typical sales management issues, including the hiring, firing, training, motivation, compensation, deployment, and evaluation of the firm's sales personnel.
4. Developed decision-making skills and analytic capabilities in the development and management of both sales programs and salespeople.

MKTG 461. Entrepreneurial Decision Making
3 Credits (3)

Explore the fundamentals of lean startup methodologies and customer discovery in this hands-on course. Students will learn to develop and test business ideas using the Lean Canvas, conduct effective customer interviews, and apply continuous feedback to iterate on their concepts. By the end of the course, students will be equipped to make strategic decisions and validate their business models with real-world insights. Crosslisted with: MGMT 461.

Prerequisite: Students in final year or consent of instructor.

Learning Outcomes

1. Explore the fundamentals of lean startup methodologies.
2. Develop skills to conduct effective customer interviews and apply continuous feedback in concept development.
3. Possess competency to make strategic decisions and validate business models with real-world insight.
4. Learn to develop and test business ideas through customer discovery.

MKTG 462. Advanced Sales
3 Credits (3)

Advanced instruction and skill development in interpersonal communication skills to broaden understanding of the professional sales role (especially in team selling situation), career management, personal productivity, negotiation, and coordination with other functional areas.

Prerequisite: MKTG 312.

Learning Outcomes

1. Students will learn "how" to sell (i.e., the behaviors and planning associated with selling today).
2. Analyze the concept of what/how is perhaps equally important but not nearly as obvious, how and why buyers "buy".
3. The course focus will be particularly on so-called "business-to-business" (B2B) sales jobs, as that is where many of the most interesting – and lucrative – sales positions reside.

MKTG 480. Level 3, PGA's PGM Education Program (Part 2)
3 Credits (3)

Level 3 Part 2 of the PGA's PGM Education Program. This class will focus on Facility Management 3, the Business Simulation Seminars, and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGA Golf Management Majors

Learning Outcomes

1. Assess the current state of the business by conducting a SWOT Analysis
2. Describe the golf industry job market and the knowledge and skills required to succeed
3. Identify areas where food services and golf operations should coordinate efforts
4. Determine golf car needs in order to acquire a fleet that supports the facility's mission, customers, and physical characteristics
5. Describe the organizational structure, key departments, reporting relationships, and job descriptions of a facility
6. Utilize industry-proven pricing strategies to meet business objectives
7. Describe the Performance System for supervising and delegating
8. Describe practices that improve the golf course and protect the environment

MKTG 481. PGA Golf Management Final Experience
1 Credit (1)

The following are requirements for successful completion of this senior level PGA Golf Management capstone course: 16 months of internship, completion of the Qualifying Level, Level 1, Level 2, and Level 3 of the PGA's PGM Education Program and successful completion of the PGA's Playing Ability Test. Consent of Instructor required. Restricted to: MKTG/PGA Golf Management majors.

Learning Outcomes

1. Describe the golf industry job market and the knowledge and skills required to succeed
2. Access PGA employment resources and participate in professional growth and development

MKTG 489. Strategy and Policy
3 Credits (3)

Techniques and analysis of marketing strategy and policy planning and formulation. Restricted registration to senior standing or by consent of instructor.

Prerequisite: C- or better in MKTG 310.

Learning Outcomes

1. Relate marketing strategy to the environmental constraints and opportunities with which managers must deal.
2. Compare marketing strategy theories and concepts.
3. Evaluate appropriate strategic marketing decisions in various situations.

MKTG 490. Selected Topics
1-18 Credits (1-18)

Covers materials and subjects not offered in regular Marketing courses. Students can take 18 credit hours of MKTG 490 if each class is a different subtitle. A maximum of 18 credit hours can be earned through MKTG 490.

MKTG 498. Independent Study
1-3 Credits

Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.

Prerequisites: junior or above standing and consent of instructor.

MKTG 503. Marketing Management
3 Credits (3)

Analysis of marketing problems and the integration of organizational resources as well as behavioral and quantitative techniques into the development and implementation of solutions.

Learning Outcomes

1. Identify the fundamental principles and theories of marketing
2. Outline primary and changing perspectives on marketing and strategic management

3. Apply relevant marketing concepts and analytical tools
4. Develop capacity to obtain and process relevant information with enhanced analytical skills
5. Identify viable alternative to make informed choices and recommend marketing implementation plans
6. Evaluate the impact of interactive media on marketing management
7. Develop skills in organizing more effective strategic marketing and implementing the market planning process
8. Practice implementing marketing management strategies in complex environments through case study analyses
9. Formulate marketing management strategies on critical issues, problems, and business opportunities 1
10. Synthesize perspectives of ethics and social responsibility in adapting to changing environments

MKTG 591. Seminar in Entrepreneurship
3 Credits (3)
For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Same as MKTG 461 with differentiated assignments for graduate students. Crosslisted with: MGMT 591.
Prerequisite(s): Graduate standing.

MKTG 601. Marketing Management
3 Credits (3)
Covers the conceptual foundations of contemporary marketing management research, concepts, and literature. Fundamental to the understanding of contemporary marketing and the breadth of the field of marketing study.
Learning Outcomes
1. Identify the contemporary principles and theories of marketing strategy research
2. Outline primary guidelines and trendy directions of marketing strategic research
3. Improve theoretical foundation for research development in marketing strategy
4. Develop capacity of analytical and quantitative skills required for empirics
5. Apply relevant marketing theories, concepts and analytical methodology in research development
6. Formulate research ideas pertinent to marketing strategies on critical issues, problems, and phenomena
7. Practice complex research design, theoretical development and empirical operationalization
8. Synthesize perspectives of ethics and social responsibility in scholarly research

MKTG 620. Contemporary Marketing Readings
3 Credits (3)
Theoretical and methodological issues involved in translating a theory into a research study. Prepares Ph.D. students to undertake dissertation research. Consent of instructor required. May be repeated up to 3 credits.
Learning Outcomes
1. Students will be able to apply theory that they have learned to the process of doing research.

MKTG 625. Consumer Behavior
3 Credits (3)
Extensive reading of seminal and contemporary articles on consumer behavior and developing original research to explore cross-disciplinary issues relevant to the study of marketing. May be repeated up to 3 credits.
Learning Outcomes
1. Students will be able to develop theories and frameworks.
2. Students will be able to discuss the latest research topics related to consumer behavior.
3. Students will be able to generate research ideas (interesting questions about consumer behavior and research hypotheses).
4. Students will be able to design experiments to test their research ideas and hypotheses.

MKTG 640. Measurement and Structural Equation Modeling
3 Credits (3)
Explores theories of measurement that underlie all quantitative analysis, including the use of structural equation models. Contrasts classical test theory with item response theory and generalizability theory. Covers PRELIS and LISREL, and critiquing structural equation models by other researchers. May be repeated up to 3 credits.
Prerequisite(s): A ST 505.

MKTG 670. Marketing Theory
3 Credits (3)
The evolution, development, construction, and evaluation of the major theoretical perspectives of marketing. Fundamental to the understanding of contemporary marketing and preparation for investigations into the nature and role of theory in marketing. May be repeated up to 3 credits.
Learning Outcomes
1. Students will be able to identify the contemporary principles and theories of marketing strategy research.
2. Students will be able to outline primary guidelines and trendy directions of marketing strategic research.
3. Students will be able to improve theoretical foundation for research development in marketing strategy.
4. Students will be able to develop capacity of analytical and quantitative skills required for empirics.
5. Students will be able to apply relevant marketing theories, concepts and analytical methodology in research development.
6. Students will be able to formulate research ideas pertinent to marketing strategies on critical issues, problems, and phenomena.
7. Students will be able to immplement complex research design, theoretical development, and empirical operationalization.
8. Students will be able to synthesize perspectives of ethics and social responsibility in scholarly research.

MKTG 690. Special Topics in Marketing
3 Credits (3)
A seminar on special topics in marketing. The topic of the course will vary according to the needs of the students in the program and the instructor. Ph.D. students may repeat this course up to three times for a maximum total of 9 credits.

MKTG 698. Selected Topics
1-9 Credits (1-9)
Materials and subjects not offered in regular marketing courses. May be repeated for a maximum of 18 credits under different subtitles.

MKTG 700. Doctoral Dissertation
1-15 Credits (1-15)
May be repeated up to 88 credits.
Prerequisite: advancement to candidacy.

Marketing Department

Name: Department Head - Kevin Trainor

Office Location: BC Suite 212

Phone: (575) 646-3341

Website: https://business.nmsu.edu/academic-departments/marketing/ (https://business.nmsu.edu/academic-departments/marketing/)

PGA Golf Management Program

Name: ***Director*** Josh Salmon; ***Assistant Director*** Henry Stetina

Office Location: BC Suite 212

Phone: (575) 646-2814

Website: https://business.nmsu.edu/pga (https://business.nmsu.edu/pga/)

Marketing (Advertising) - Bachelor of Business Administration

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Note: A more general marketing major is offered through an Online Distance Education Degree Completion Program. Program information is available on the College of Business website: https://business.nmsu.edu/online/

Prefix	Title	Credits
General Education		
Area I: Communications		
Grades of C- or better are required in general education communications courses.		
English Composition - Level 1 [1]		*4*
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication [1]		*3*
Area II: Mathematics		
MATH 1220G	College Algebra [2,3]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
Area III: Laboratory Sciences Course (4 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1430G	Applications of Calculus I (Foundation Requirement, must earn a grade of at least C-) [3]	3
Viewing A Wider World [4]		**6**
Departmental/College Requirements		
Foundation Requirements		
A ST 311	Statistical Applications (minimum grade of C- required)	3
Business Core: Lower Division (minimum grade of C- required)		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
MGMT 344	Production and Operations Management	3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		6
Major Courses		
Major Core Classes (minimum grade of C- required)		
MKTG 310	Marketing Research	3
MKTG 489	Strategy and Policy	3
Concentration Courses		
MKTG 311V	Consumer Behavior	3
MKTG 314	Advertising Strategy	3
MKTG 357	Digital Marketing Strategy	3
MKTG 449	Promotion Management	3
Major electives		
Choose two from the following:		6
MKTG 313	Retail Management	
MKTG 317	International Marketing	
MKTG 324	Product/Service Development	
MKTG 354	Sports Marketing	
MKTG 400	Marketing Internship/Field Experience	
Electives, to bring the total credits to 120 [5]		**16**
Total Credits		**120**

1. See the General Education (p. 262) of the catalog for a full list of courses.
2. MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.
3. All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G College Algebra, MATH 1430G Applications of Calculus I, and A ST 311 Statistical Applications must be completed.
4. See the Viewing a Wider World (p. 266) of the catalog for a full list of courses.
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in Mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from Fall to Spring semesters and is subject to modification or change. Online availability and enrollment may be limited.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I (C- or better) [1] or Composition I Honors	4
MATH 1220G	College Algebra (C- or better) [1]	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Area V: Humanities Course [2]		3
Elective Course		3
	Credits	**16**
Semester 2		
COMM 1115G or HNRS 2175G	Introduction to Communication (C- or better) or Introduction to Communication Honors	3
BUSA 1110	Intro to Business (C- or better)	3
MATH 1430G	Applications of Calculus I [1]	3
Area III: Laboratory Science Course [2]		4
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Second Year		
Semester 1		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication (C- or better) [1] or Professional and Technical Communication	3
ECON 2110G	Macroeconomic Principles (C- or better)	3
ACCT 2110	Principles of Accounting I (C- or better)	3
A ST 311	Statistical Applications	3
Elective Course		3
	Credits	**15**
Semester 2		
ECON 2120G	Principles of Microeconomics Honors (C- or better)	3
ACCT 2120	Principles of Accounting II (C- or better) [1]	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
VWW: Viewing a Wider World Course (excluding MKTG 311V) [3]		3
	Credits	**15**
Third Year		
Semester 1		
MKTG 311V	Consumer Behavior	3
MKTG Upper-Division Elective		3
BCIS 338	Business Information Systems I [1]	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets [1]	3
	Credits	**15**
Semester 2		
MKTG 310	Marketing Research (Usually delivered face to face in Fall and Spring; delivered online in Spring only. Must earn a grade of at least C-.) [1]	3
MKTG 314	Advertising Strategy (usually delivered face to face in Fall and Spring; delivered online in Spring only) [1]	3
MGMT 344	Production and Operations Management [1]	3
VWW: Viewing a Wider World Course (excluding MKTG 311V) [3]		3
Elective Course		3
	Credits	**15**
Fourth Year		
Semester 1		
MKTG 357	Digital Marketing Strategy	3
MKTG 449	Promotion Management	3
Any Upper-Division Business Elective Course (excluding A ST 311)		3
Any Upper-Division Business Elective Course (excluding A ST 311)		3
Elective Course		3
	Credits	**15**
Semester 2		
MKTG 489	Strategy and Policy (Usually delivered face to face in Fall and Spring; delivered online in Summer only. Must earn a grade of at least C-.) [1]	3
MKTG Upper-Division Elective		3
MGMT 449	Strategic Management [1]	3
Elective Course(s)		4
	Credits	**13**
	Total Credits	**120**

1. These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. While this course can *currently* be substituted for by other upper-division MKTG courses, it is likely to be required in future catalogs and taking it is strongly encouraged.

Marketing (PGA Golf Management) - Bachelor of Business Administration

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120.5 credits with 58.5 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Note: Students must apply separately to the PGA Golf Management Program for acceptance. Acceptance is limited to the fall of every year.

Prefix	Title	Credits
General Education		
Area I: Communications		
Grades of C- or better are required in general education communications courses.		
English Composition - Level 1 [1]		*4*
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3

or ENGL 2210H	Professional and Technical Communication	
Oral Communication [1]		*3*
Area II: Mathematics		
MATH 1220G	College Algebra [2,3]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
Area III: Laboratory Sciences Course (4 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1430G	Applications of Calculus I (Foundation Requirement, must earn a grade of at least C-) [3]	3
Viewing A Wider World [4]		**6**
Departmental/College Requirements		
Foundation Requirements		
A ST 311	Statistical Applications	3
Business Core: Lower Division (minimum grade of C- required)		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
MGMT 344	Production and Operations Management	3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		6
Major Courses		
MKTG 1111	Level 1, PGA's PGM Education Program (Part 1)	3
MKTG 1112	Level 1, PGA's PGM Education Program (Part 2)	3
MKTG 2111	Level 1, PGA's PGM Education Program (Part 3)	3
MKTG 2112	Level 2, PGA's PGM Education Program (Part 1)	3
MKTG 310	Marketing Research (Must earn a grade of at least C-.)	3
MKTG 380	Level 2, PGA's PGM Education Program (Part 2)	3
MKTG 381	Level 3, PGA's PGM Education Program (Part 1)	3
MKTG 480	Level 3, PGA's PGM Education Program (Part 2)	3
MKTG 481	PGA Golf Management Final Experience	1
MKTG 489	Strategy and Policy (Must earn a grade of at least C-.)	3
Elective in Marketing, upper division		9
Electives, to bring the total credits to 120 [5]		**3**
Total Credits		**120**

1. See the General Education (p. 262) of the catalog for a full list of courses.
2. MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.
3. All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G College Algebra, MATH 1430G Applications of Calculus I, and A ST 311 Statistical Applications must be completed.
4. See the Viewing a World (p. 266) of the catalog for a full list of courses.
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120.5 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in Mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from Fall to Spring semesters and is subject to modification or change. Online availability and enrollment may be limited.[4]

First Year		
Fall		**Credits**
MATH 1215	Intermediate Algebra	3
BCIS 1110	Introduction to Information Systems	3
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
Area V: Humanities [1]		3
MKTG 1111	Level 1, PGA's PGM Education Program (Part 1)	3
(Q-Level/Facility MGT 1A) Complete PGA's Qualifying Level, Facility Management 1A (Tournament Ops A, Rules of Golf B, and Career Enhancement B), W.E. Activities If you haven't passed PAT => Attempt Playing Ability Test (PAT)		
	Credits	**16**
Spring		
MATH 1220G	College Algebra [2,3]	3
BUSA 1110	Intro to Business	3
Area III: Laboratory Science Course [1]		4
COMM 1115G or HNRS 2175G	Introduction to Communication [1] or Introduction to Communication Honors	3
MKTG 1112	Level 1, PGA's PGM Education Program (Part 2)	3
(Teaching and Coaching 1) (Teaching Seminar 2 Days) Complete Teaching and Coaching 1, W.E. Activities, Teaching and Coaching Seminars. If you haven't passed PAT => Attempt Playing Ability Test (PAT)		
	Credits	**16**
Summer		
Summer Internship 1 (3 Months)		
If you haven't passed PAT => Attempt Playing Ability Test (PAT)		
	Credits	**0**
Second Year		
Fall		
MATH 1430G	Applications of Calculus I (Foundation Requirement, must earn a grad of at least C-) [3]	3
ECON 2110G	Macroeconomic Principles (Satisfies 1st Social/Behavioral Science)	3
ACCT 2110	Principles of Accounting I	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3

MKTG 2111	Level 1, PGA's PGM Education Program (Part 3)	3
(Facility MGT 1B) Complete Facility Management 1 B (Business Planning A, Customer Relations A, Golf Car A, Merchandising A, Turfgrass A), W.E. Activities, Level 1 Exams. If you haven't passed PAT => Attempt Playing Ability Test (PAT)		
	Credits	**15**
Spring		
ECON 2120G	Principles of Microeconomics Honors	3
Statistics Requirement [3]		3
A ST 311	Statistical Applications	
Area VI: Creative and Fine Arts Course [1]		3
ACCT 2120	Principles of Accounting II	3
MKTG 2112	Level 2, PGA's PGM Education Program (Part 1)	3
(Teaching and Coaching 2) (Teaching Seminar 3 Days) Complete Teaching and Coaching 2, W.E. Activities, Teaching and Coaching Seminars. If you haven't passed PAT => Attempt Playing Ability Test (PAT)		
	Credits	**15**
Summer		
Summer Internship 2 (3 Months)		
If you haven't passed PAT => Attempt Playing Ability Test (PAT)		
	Credits	**0**
Third Year		
Fall		
MKTG 313	Retail Management While MKTG 313 is recommended, any upper-division Marketing course can be substituted as an elective.	3
BCIS 338	Business Information Systems I	3
MKTG 303	Principles of Marketing	3
MKTG 310	Marketing Research (Must earn a grade of at least C-.)	3
MKTG 380	Level 2, PGA's PGM Education Program (Part 2)	3
(Facility MGT 2) Complete Facility MGT 2 & Business Planning B, Customer Relations B, golf Ops A, Merchandising B, Tournament Ops B), W.E. Activities. Level 2 Exams. If you haven't passed PAT => Attempt Playing Ability Test (PAT)		
	Credits	**15**
Spring		
MKTG Upper Level Elective		3
MGMT 309	Human Behavior in Organizations	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MKTG 381	Level 3, PGA's PGM Education Program (Part 1)	3
(Teaching and Coaching 3) (Teaching Seminar 2 Days) Complete Teaching and Coaching 3, W.E. Activities, Teaching and Coaching Seminars. If you haven't passed PAT => Attempt Playing Ability Test (PAT)		
	Credits	**15**
Summer		
Summer Internship 3 (3 Months)		
If you haven't passed PAT => Attempt Playing Ability Test (PAT)		
	Credits	**0**
Fourth Year		
Fall		
MKTG Upper Level Elective		3
MGMT 344	Production and Operations Management	3
Upper Level Elective in any Business Class		3
Viewing the Wider World (VWW) [4]		3
MKTG 480	Level 3, PGA's PGM Education Program (Part 2)	3
(Facility MGT 3) (Business Simulations 1 Day) Complete Facility MGT 3 (Business Planning C, Golf Ops B, Merchandising C, Golf Car Fleet B, Supervising and Delegating A, Turfgrass B, Food and Bev A, Career Enhancement C), W.E. Activities, Level 3 Exams, Business Simulations. If you haven't passed PAT => Attempt Playing Ability Test (PAT)		
	Credits	**15**
Spring		
MGMT 449	Strategic Management	3
MKTG 489	Strategy and Policy (Must earn a grade of at least C-.)	3
Upper Level Elective in any Business Class		3
Viewing the Wider World (VWW) [4]		3
If you haven't passed PAT => Attempt Playing Ability Test (PAT)		
	Credits	**12**
Summer		
Summer Internship 4 (7 Months)		
If you haven't passed PAT => Attempt Playing Ability Test (PAT)		
	Credits	**0**
Fifth Year		
Fall		
MKTG 481	PGA Golf Management Final Experience	1
If you haven't passed PAT => Attempt Playing Ability Test (PAT)		
	Credits	**1**
	Total Credits	**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.
3. All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G College Algebra, MATH 1430G Applications of Calculus I, and A ST 311 Statistical Applications must be completed.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Marketing (Professional Selling) - Bachelor of Business Administration

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Note: A more general marketing *major is offered through an Online Distance Education Degree Completion Program. Program information is available on the College of Business website:* https://business.nmsu.edu/undergraduate-programs

Prefix	Title	Credits
General Education		
Area I: Communications		
Grades of C- or better are required in general education communications courses.		
English Composition - Level 1 [1]		*4*

English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication [1]		*3*
Area II: Mathematics		
MATH 1220G	College Algebra [2,3]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
Area III: Laboratory Sciences Course (4 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1430G	Applications of Calculus I (Foundation Requirement, must earn a grade of at least C-) [3]	3
Viewing A Wider World [4]		**6**
Departmental/College Requirements		
Foundation Requirements		
A ST 311	Statistical Applications	3
Business Core: Lower Division (minimum grade of C- required)		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
MGMT 344	Production and Operations Management	3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		6
Major Courses		
Major Core Classes (minimum grade of C- required)		
MKTG 310	Marketing Research	3
MKTG 489	Strategy and Policy	3
Concentration Courses		
MKTG 311V	Consumer Behavior	3
MKTG 312	Personal Selling	3
MKTG 453	Sales Management	3
MKTG 462	Advanced Sales	3
Major electives		*6*
Choose two from the following:		
MKTG 313	Retail Management	
MKTG 354	Sports Marketing	
MKTG 357	Digital Marketing Strategy	
MKTG 400	Marketing Internship/Field Experience	
MKTG 449	Promotion Management	
MKTG 450	Sales, Negotiations, and Customer Relationship Management	
Electives, to bring the total credits to 120 [5]		**16**
Total Credits		**120**

1. See the General Education (p. 262) of the catalog for a full list of courses.
2. MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.
3. All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G College Algebra, MATH 1430G Applications of Calculus I, and A ST 311 Statistical Applications must be completed.
4. See the Viewing a Wider World (p. 266) of the catalog for a full list of courses.
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in Mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from Fall to Spring semesters and is subject to modification or change. Online availability and enrollment may be limited.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I (C- or better) [1] or Composition I Honors	4
MATH 1220G	College Algebra (C- or better) [1]	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Area V: Humanities Course [2]		3
Elective Course		3
	Credits	**16**
Semester 2		
COMM 1115G or HNRS 2175G	Introduction to Communication (C- or better) or Introduction to Communication Honors	3
BUSA 1110	Intro to Business (C- or better)	3
MATH 1430G	Applications of Calculus I [1]	3
Area III: Laboratory Science Course [2]		4
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Second Year		
Semester 1		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication (C- or better) [1] or Professional and Technical Communication	3
ECON 2110G	Macroeconomic Principles (C- or better)	3
ACCT 2110	Principles of Accounting I (C- or better)	3
A ST 311	Statistical Applications	3
Elective Course		3
	Credits	**15**

Semester 2		
ECON 2120G	Principles of Microeconomics Honors (C- or better)	3
ACCT 2120	Principles of Accounting II (C- or better) [1]	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
VWW: Viewing a Wider World Course (excluding MKTG 311V) [3]		3
	Credits	**15**
Third Year		
Semester 1		
MKTG 311V	Consumer Behavior	3
MKTG 312	Personal Selling	3
BCIS 338	Business Information Systems I [1]	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets [1]	3
	Credits	**15**
Semester 2		
MKTG 310	Marketing Research (Usually delivered face to face in Fall and Spring; delivered online in Spring only. Must earn a grade of at least C-.) [1]	3
MKTG Upper-Division Elective		3
MGMT 344	Production and Operations Management [1]	3
VWW: Viewing a Wider World Course (excluding MKTG 311V) [3]		3
Elective Course		3
	Credits	**15**
Fourth Year		
Semester 1		
MKTG 453	Sales Management	3
MKTG Upper-Division Elective		3
Any Upper-Division Business Elective Course (excluding A ST 311)		3
Any Upper-Division Business Elective Course (excluding A ST 311)		3
Elective Course		3
	Credits	**15**
Semester 2		
MKTG 489	Strategy and Policy (Usually delivered face to face in Fall and Spring; delivered online in Summer only. Must earn a grade of at least C-.) [1]	3
MKTG 462	Advanced Sales	3
MGMT 449	Strategic Management [1]	3
Elective Course(s)		4
	Credits	**13**
	Total Credits	**120**

1. These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. While this course can *currently* be substituted for by other upper-division MKTG courses, it is likely to be required in future catalogs and taking it is strongly encouraged.

Marketing (Strategic Marketing) - Bachelor of Business Administration

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Note: A more general marketing *major is offered through an Online Distance Education Degree Completion Program. Program information is available on the College of Business website:* https://business.nmsu.edu/undergraduate-programs/

Prefix	Title	Credits
General Education		
Area I: Communications		
	Grades of C- or better are required in general education communications courses.	
English Composition - Level 1 [1]		*4*
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication [1]		*3*
Area II: Mathematics		
MATH 1220G	College Algebra [2,3]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
Area III: Laboratory Sciences Course (4 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1430G	Applications of Calculus I (Foundation Requirement, must earn a grade of at least C-) [3]	3
Viewing A Wider World [4]		**6**
Departmental/College Requirements		
Foundation Requirements		
A ST 311	Statistical Applications	3
Business Core: Lower Division (minimum grade of C- required)		
ACCT 2110	Principles of Accounting I	3
ACCT 2120	Principles of Accounting II	3
BCIS 1110	Introduction to Information Systems	3
BUSA 1110	Intro to Business	3
Business Core: Upper Division		
BCIS 338	Business Information Systems I	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets	3
MGMT 309	Human Behavior in Organizations	3
MGMT 449	Strategic Management	3
MKTG 303	Principles of Marketing	3
MGMT 344	Production and Operations Management	3
Upper Division Business elective from the following prefixes: A ST, ACCT, B A, BCIS, BLAW, ECON, ENTR, BFIN, I B, MGMT, MKTG (excluding A ST 311)		6

Major Courses		
Major Core Classes (minimum grade of C- required)		
MKTG 310	Marketing Research	3
MKTG 489	Strategy and Policy	3
Concentration Courses		
MKTG 311V	Consumer Behavior	3
MKTG 312	Personal Selling	3
MKTG 313	Retail Management	3
MKTG 314	Advertising Strategy	3
Major electives		*6*
Choose two from the following:		
MKTG 317	International Marketing	
MKTG 324	Product/Service Development	
MKTG 354	Sports Marketing	
MKTG 400	Marketing Internship/Field Experience	
MKTG 449	Promotion Management	
MKTG 450	Sales, Negotiations, and Customer Relationship Management	
Electives, to bring the total credits to 120 [5]		**16**
Total Credits		**120**

1. See the General Education (p. 262) of the catalog for a full list of courses.
2. MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.
3. All Foundation Requirement Courses must be taken, or satisfied with transfer credits, regardless of which Mathematics or Statistics course satisfies the Area II General Education course: MATH 1220G College Algebra, MATH 1430G Applications of Calculus I, and A ST 311 Statistical Applications must be completed.
4. See the Viewing a Wider World (p. 266) of the catalog for a full list of courses.
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in Mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from Fall to Spring semesters and is subject to modification or change. Online availability and enrollment may be limited.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I (C- or better) [1] or Composition I Honors	4
MATH 1220G	College Algebra (C- or better) [1]	3
BCIS 1110	Introduction to Information Systems (C- or better)	3
Area V: Humanities Course [2]		3
Elective Course		3
	Credits	**16**
Semester 2		
COMM 1115G or HNRS 2175G	Introduction to Communication (C- or better) or Introduction to Communication Honors	3
BUSA 1110	Intro to Business (C- or better)	3
MATH 1430G	Applications of Calculus I [1]	3
Area III: Laboratory Science Course [2]		4
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Second Year		
Semester 1		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication (C- or better) [1] or Professional and Technical Communication	3
ECON 2110G	Macroeconomic Principles (C- or better)	3
ACCT 2110	Principles of Accounting I (C- or better)	3
A ST 311	Statistical Applications	3
Elective Course		3
	Credits	**15**
Semester 2		
ECON 2120G	Principles of Microeconomics Honors (C- or better)	3
ACCT 2120	Principles of Accounting II (C- or better) [1]	3
MKTG 303	Principles of Marketing	3
MGMT 309	Human Behavior in Organizations	3
VWW: Viewing a Wider World Course (excluding MKTG 311V) [3]		3
	Credits	**15**
Third Year		
Semester 1		
MKTG 311V	Consumer Behavior	3
MKTG 312	Personal Selling	3
BCIS 338	Business Information Systems I [1]	3
BLAW 316	Legal Environment of Business	3
BFIN 341	Financial Analysis and Markets [1]	3
	Credits	**15**
Semester 2		
MKTG 310	Marketing Research (Usually delivered face to face in Fall and Spring; delivered online in Spring only. Must earn a grade of at least C-.) [1]	3
MKTG 314	Advertising Strategy	3
MGMT 344	Production and Operations Management [1]	3
VWW: Viewing a Wider World Course (excluding MKTG 311V) [3]		3
Elective Course		3
	Credits	**15**
Fourth Year		
Semester 1		
MKTG 313	Retail Management	3
MKTG Upper-Division Elective		3
Any Upper-Division Business Elective Course (excluding A ST 311)		3
Any Upper-Division Business Elective Course (excluding A ST 311)		3
Elective Course		3
	Credits	**15**
Semester 2		
MKTG 489	Strategy and Policy (Usually delivered face to face in Fall and Spring; delivered online in Summer only. Must earn a grade of at least C-.) [1]	3
MKTG Upper-Division Elective		3

MGMT 449	Strategic Management [1]	3
Elective Course(s)		4
	Credits	**13**
	Total Credits	**120**

1. These courses have prerequisites and it is the students responsibility for checking and fulfilling all course prerequisites listed for these courses.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. While this course can *currently* be substituted for by other upper-division MKTG courses, it is likely to be required in future catalogs and taking it is strongly encouraged.

Advertising - Undergraduate Minor

If you are considering the Minor in Advertising, please visit the Department of Marketing, Business Complex, room 209 to arrange a consultation with a Marketing Faculty member for guidance and a suggested Plan of Study for the minor, etc. Students must have a cumulative grade point average of 2.0 in the 18 credits in order to earn the Minor in Advertising. Also, at least twelve credits for the minor must be completed at NMSU.

This minor is not open to majors in the Bachelor of Individualized Studies and the Bachelor of Applied Studies.

Requirements: 18 or more Credit Hours in an approved plan of study.

Prefix	Title	Credits
Requirements		
MKTG 303	Principles of Marketing	3
MKTG 311V	Consumer Behavior	3
MKTG 314	Advertising Strategy	3
MKTG 449	Promotion Management	3
Additional credits from any upper-division Marketing courses [1]		6
Total Credits		**18**

1. All courses must be upper-division (300 level or above) and have a prefix of MKTG.

Marketing - Undergraduate Minor

If you are considering the Minor in Marketing, please visit the Department of Marketing to arrange a consultation with a Marketing faculty member for guidance, a suggested Plan of Study, or possible course substitutions. Students must have a cumulative grade point average of 2.0 for the 18 credits taken in the minor. At least 12 credits for the minor must be completed at NMSU.

This minor is not available to majors in Individualized Studies or Applied Studies.

Requirements: 18 or more Credit Hours in an approved plan of study.

Prefix	Title	Credits
Requirements		
MKTG courses [1]		18
Total Credits		**18**

1. HRTM 3210 Hotel, Restaurant, and Tourism Marketing may be substituted. All courses must be upper-division (300 level or above).

Professional Selling - Undergraduate Minor

If you are considering the Minor in Professional Selling, please visit the Department of Marketing to arrange a consultation with a Marketing faculty member for guidance, a suggested Plan of Study, or possible course substitutions. Students must have a cumulative grade point average of 2.0 for the 18 credits in taken in the minor. At least 12 credits for the minor must be completed at NMSU.

This minor is not available to majors in Individualized Studies or Applied Studies.

Requirements: 18 or more Credit Hours in an approved plan of study.

Prefix	Title	Credits
Required Courses		
MKTG 303	Principles of Marketing	3
MKTG 312	Personal Selling	3
MKTG 462	Advanced Sales	3
Must complete 9 credits from the following:		*9*
MKTG 453	Sales Management	
MKTG 461	Seminar in Entrepreneurship	
MKTG 400	Marketing Internship/Field Experience	
MGMT 310V	Entrepreneurial Mindset	
BCIS 461	Business Analytics I	
HRTM 4140	Hotel Revenue and Sales Management	
Total Credits		**18**

College of Engineering

Dean (Interim) - David Jáuregui*, Ph.D., P.E.*

Acting Associate Dean (Academics) - *Gabe Garcia, Ph.D.*

Associate Dean (Research) - *Satyajayant Misra, Ph.D.*

Associate Dean (Outreach and Recruitment) - *Patricia Sullivan, Ph.D.*

Assistant Dean (Student Success and Experiential Learning) - *Gabe Garcia, Ph.D.*

The College of Engineering comprises six departments:

- Chemical and Materials Engineering (p. 1055);
- Civil and Environmental Engineering (p. 1073);
- Electrical and Computer Engineering (p. 1087);
- Engineering Technology and Surveying Engineering (p. 1149);
- Industrial Engineering (p. 1199); and
- Mechanical and Aerospace Engineering (p. 1213).

Mission of the College of Engineering

The College of Engineering will uphold the land grant mission of NMSU through nationally recognized programs in education, research and professional and public service.

With respect to our undergraduate programs, we will accomplish our mission by focusing on the following goals:

1. To be nationally and internationally recognized for academic and research programs in engineering and engineering technology.
2. Provide world-class engineers and engineering technologists for industrial, government, and academic constituents of the College of Engineering.
3. To be the University of Choice for undergraduate engineering and engineering technology education in the region.
4. To serve as an engine for economic development in New Mexico through the advancement of engineering and technology.

Furthermore, graduates receiving baccalaureate degrees will demonstrate:

- an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- an ability to communicate effectively with a range of audiences
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
- an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
- an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Undergraduate Student Advisement

Students entering the College of Engineering for the first time will be advised by the Center for Academic Advising and Student Support (CAASS) during their first year of enrollment. CAASS is located in Educational Services, Suite 200. Students may also change majors when they meet with CAASS or on the CAASS webpages. Students uncertain about choosing a major may list themselves as undeclared in the College of Engineering and be advised by the CAASS. Undeclared students will be asked to choose a major after two semesters in the college. Students are encouraged to consult with departmental mentors on subjects related to course offerings, student organizations, internships, research opportunities, graduate education, and career options. Students must have a declared major in order to graduate.

Undergraduate General Education

With the exception of math and science, the college accepts all coursework approved for inclusion in the New Mexico General Education Common Core. Calculus I, General Chemistry I and Engineering Physics I are required to satisfy Areas II and III of the common core.

S/U Coursework

The college requires most degree requirements to be taken with traditional grading. Students may take selected humanities and social science courses under the S/U option. Other exceptions are specifically noted in the program descriptions later in this catalog.

Undergraduate Math Placement

Entering freshmen are placed into an appropriate math course based upon the results of the Math Placement Exam administered regularly by the NMSU mathematics department. Students with advanced placement or transfer credit for mathematics will be placed accordingly.

Minors

Minors are available from most departments within the College of Engineering, and are outlined in the individual program descriptions.

Undergraduate Co-op / Internship Experience

After two semesters of satisfactory academic work (2.0 GPA or higher), an engineering student may go on a work phase with one of the many companies or governmental agencies with which the university has co-op/internship agreements. The experience obtained through alternating periods of academic and field work greatly contributes to the preparation of a student for professional life. Work phases are considered to be a vital part of the educational process, and students are counseled in the selection of co-op/internship positions that will lead to progressive learning experiences. Earnings while on work phase provide a source of financial assistance to meet educational expenses.

A significant number of undergraduate engineering students are in the cooperative education program. Students may, with the approval of their Department Head, earn credit while participating in a co-op work phase. Co-op credits do not normally count toward the degree requirements, but are displayed on the transcript.

Undergraduate General Academic Requirements

For regular admission to the university and the College of Engineering, incoming freshman and transfer applicants must meet the university's qualifications for regular admission as stated in the undergraduate catalog in effect at the time of application. Students admitted to the College of Engineering will be classified by the college as a PRE-[major] until the standard requirements described below for admission to the program major are met.

PRE-[major] students will be admitted into their respective programs once they have earned a minimum grade of C- in all of the following courses:

Prefix	Title	Credits
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
or CHEM 1120G (engineering technology)		
ENGL 1110G/1110H/1110M	Composition I	4
MATH 1511G	Calculus and Analytic Geometry I	4
or MATH 1430G (engineering technology)		

PHYS 1310G	Calculus -Based Physics I	3
or PHYS 1230G (engineering technology)		

Any of the above courses with earned AP credit (minimum score of 3) is exempt from the list. Transfer students may meet this criteria with determined passing credit of equivalent courses. PRE-[major] students will be advised by their EG-[major] department.

NMSU College of Engineering reserves the right to independently test any student's English proficiency upon arrival, including those who have earned scores satisfying minimum admission criteria. If the demonstrated level of English proficiency is not sufficient for academic success as determined by university regulations, support classes may be required to improve proficiency.

Students must earn a minimum cumulative GPA of 2.0 before enrolling in engineering courses numbered 300 or above. Students seeking to continue in engineering upper division courses with a GPA below 2.0 need to meet with the Associate Dean of Academics to create a course plan designed to increase their GPA and meet this criteria.

Students must earn a grade of C- or better in all engineering, technology, math and science courses (including associated prerequisite courses) required for the degree and also courses taken to satisfy the general education requirements for Area I-Communications, Area II-Mathematics, and Area III-Laboratory Sciences. If a grade lower than C- is earned in any of these courses, the student is required to retake the course immediately the next semester it is offered. Students who earn a grade less than a C- the first time will be contacted by the department and/or academic advising center and advised about this policy and resources to help in their academic success. If the student fails to achieve a C- or better in any of these courses a second time, then the student must submit a written request to the Associate Dean of Academics in the College of Engineering to enroll in the course a third time. The student should explain the circumstances impacting their grade and the actions planned to improve their performance.

Digital Badges

Learning a knowledge-based skill by spending a concentrated, short period of time can lead to the awarding of a competency in the form of a digital badge. Digital badges can be combined or a longer skill-based instructional path can be used to secure a micro-credential which may lead to college credit. Skills leading to digital badges and micro-credentials can be acquired in various ways including workshops, online classes, and focused courses through NMSU OnDemand or outside of NMSU.

The College of Engineering encourages students to engage in experiential and focused learning that leads to knowledge-based skills relevant in industry including specific software, project management, leadership, quality, entrepreneurship, and critical thinking. Digital badge and micro-credential earners can also benefit by having the ability to combine classroom knowledge with acquired skills, especially in design classes.

Other benefits of digital badges include: being able to choose what knowledge-based skills you want to develop; strategically combining several badges to form an overarching micro-credential; and sharing your achievements online with others including prospective employers.

Badges and micro-credentials recognized by the College of Engineering are those that are validated by assessment, supported by evidence, and relevant to the practice of engineering.

Students in the College of Engineering have been earning digital badges and micro-credentials independently or through sponsored projects. Starting with this catalog, the College of Engineering degree programs are providing recommendations to students on what skills can enhance their learning and when in the curricular path would digital badges and overarching micro-credential be most beneficial. Specific information on digital badges and micro-credentials can be found on the degree program pages of the catalog.

Engineering Transfer Policy

NMSU Administrative Rules and Procedures, Section 4.61, Transfer Credit states the following: PART 3A, Student. "It is the student's responsibility to provide the necessary materials for consideration by Departmental Faculty of their requests for transfer credit" and PART 3B, Departmental Faculty. "Departmental Faculty review and decide requests for transfer credit". Policy for engineering majors enrolling in courses at other institutions to meet College of Engineering Departmental Core Requirements[1] includes:

1. NMSU main campus engineering majors may request to take core classes at other institutions of higher education to meet NMSU College of Engineering Departmental Core in the following situations: (1) if the NMSU core course cannot accommodate any more eligible students and (2) the course is not offered during a given semester of the academic year.
2. The following conditions and restrictions apply to any course not taken on the NMSU main campus.
    - The department must approve the course prior to enrollment.
    - The course must be a class in a program that is accredited by an accreditation commission of ABET, Inc. and cannot be graded in the S/U grade mode.
    - The course must be substantially the same as the equivalent NMSU class and the student must have satisfied all NMSU prerequisite requirements.
    - The student shall provide a corresponding course syllabus and any other documentation required.
    - If NMSU prerequisite requirements are not satisfied, credit will be denied regardless of a passing grade for the course at the other institution.
    - Exams must be Proctored[2] for any on-line course not taken from the NMSU main campus.

[1] Core requirements are defined as required departmental, discipline-related courses within the major.

[2] The student may choose to have NMSU proctored exams.

For more information about transferring to New Mexico State University from another accredited institution, visit the NMSU Transfer Center.

Requirements for Graduation

The minimum requirements for undergraduate degrees are:

1. Satisfaction of the university requirements as previously outlined in the Regulations (p. 31) section of this catalog.
2. Satisfaction of the college requirements as outlined under General Academic Requirements, above.

3. Satisfaction of the departmental rules and course requirements as outlined in the individual program descriptions.

NOTE: In order to maintain quality, remain current, and satisfy changes in accreditation criteria, requirements which have been published may be changed. Any such changes will be announced and will not be retroactive. Always consult an academic advisor from your department before registering for classes.

Master's Accelerated Program

Students who have a minimum GPA of 2.75 are eligible for the Masters Accelerated Program (MAP) in engineering. The MAP allows a student to earn both a bachelor's and master's degree in as little as five years.

A master's degree is increasingly becoming the professional degree of choice for engineering practice. Many employers encourage, or even require, their employees to seek the degree during their early career, and master's holders often experience increased upward mobility and earn substantially greater salaries as a result.

General requirements:

- It takes 30 to 32 credit hours to complete a master's degree.
- Up to 12 credits of your undergraduate coursework 450 and above may be counted toward the master's degree.
- It's possible to complete the master's degree in 2-3 semesters after graduation with a bachelor's degree.

Visit the Master's Accelerated Program (MAP) (https://engr.nmsu.edu/students/Fifth-page.html) page for more information.

Undergraduate and Graduate Degrees

Undergraduate and Graduate study is available in

- Aerospace Engineering (p. 1214),
- Chemical Engineering (p. 1056),
- Civil Engineering (p. 1073),
- Electrical Engineering (p. 1090),
- Environmental Engineering (p. 1073),
- Industrial Engineering (p. 1200),
- Information Technology (https://catalogs.nmsu.edu/nmsu/engineering/engineering-technology-surveying/#degreestext), and
- Mechanical Engineering (p. 1214).

A multi-disciplinary graduate degree with concentration in Advanced Manufacturing (p. 1053) is also available. See individual program descriptions for degree requirements.

Bachelor Degrees

A

- Aerospace Engineering - Bachelor of Science in Aerospace Engineering (p. 1224)

C

- Chemical Engineering - Bachelor of Science in Chemical Engineering (p. 1070)
- Civil Engineering - Bachelor of Science in Civil Engineering (p. 1084)
- Civil Engineering Technology (Renewable Energy Technologies) - Bachelor of Science in Engineering Technology (p. 1175)
- Civil Engineering Technology (Transportation Technology) - Bachelor of Science in Engineering Technology (p. 1177)
- Civil Engineering Technology - Bachelor of Science in Engineering Technology (p. 1173)
- Civil Engineering Technology - Bachelor of Science in Engineering Technology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/civil-engineering-technology-bachelor-science-engineering-technology-online/)
- Computer Engineering - Bachelor of Science in Computer Engineering (p. 1106)

E

- Electrical Engineering (Artificial Intelligence, Machine Learning, & Data Science) - Bachelor of Science in Electrical Engineering (p. 1111)
- Electrical Engineering (Communications and Signal Processing) - Bachelor of Science in Electrical Engineering (p. 1114)
- Electrical Engineering (Computers and Microelectronics) - Bachelor of Science in Electrical Engineering (p. 1116)
- Electrical Engineering (Controls & Robotics) - Bachelor of Science in Electrical Engineering (p. 1119)
- Electrical Engineering (Electromagnetics and Photonics) - Bachelor of Science in Electrical Engineering (p. 1121)
- Electrical Engineering (Power) - Bachelor of Science in Electrical Engineering (p. 1124)
- Electrical Engineering (Space Systems Engineering) - Bachelor of Science in Electrical Engineering (p. 1127)
- Electrical Engineering - Bachelor of Science in Electrical Engineering (p. 1109)
- Electrical Engineering Technology - Bachelor of Science in Engineering Technology (p. 1178)
- Engineering Physics (Aerospace Engineering) - Bachelor of Science in Engineering Physics (p. 1141)
- Engineering Physics (Chemical Engineering) - Bachelor of Science in Engineering Physics (p. 1143)
- Engineering Physics (Electrical Engineering) - Bachelor of Science in Engineering Physics (p. 1145)
- Engineering Physics (Mechanical Engineering) - Bachelor of Science in Engineering Physics (p. 1147)

G

- Geomatics - Bachelor of Science in Geomatics (p. 1180)
- Geomatics - Bachelor of Science in Geomatics (Online) (https://catalogs.nmsu.edu/global/nmsu-global/geomatics-bs-geomatics-online/)

I

- Industrial Engineering - Bachelor of Science in Industrial Engineering (p. 1209)
- Information and Communication Technology (Cyber Defense) - Bachelor of Information and Communication Technology (p. 1185)
- Information and Communication Technology (Cyber Defense) - Bachelor of Information and Communication Technology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/information-communication-technology-cyber-defense-bict-online/)
- Information and Communication Technology (Network Technologies) - Bachelor of Information and Communication Technology (p. 1189)

- Information and Communication Technology (Network Technologies) - Bachelor of Information and Communication Technology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/information-communication-technology-network-technologies-bict-online/)
- Information and Communication Technology (Software Development) - Bachelor of Information and Communication Technology (p. 1192)
- Information and Communication Technology (Software Development) - Bachelor of Information and Communication Technology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/information-communication-technology-software-development-bict-online/)
- Information and Communication Technology - Bachelor of Information and Communication Technology (p. 1182)
- Information and Communication Technology - Bachelor of Information and Communication Technology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/information-communication-technology-bict-online/)

M

- Mechanical Engineering - Bachelor of Science in Mechanical Engineering (p. 1226)
- Mechanical Engineering Technology - Bachelor of Science in Engineering Technology (p. 1195)

Masters Degrees

The College of Engineering offers three types of Master's curriculum: thesis, project or coursework-only. Students interested in research and a career in R&D may prefer the M.S. thesis option, while students who select the M.E. or M-IT degrees may be more interested in acquiring knowledge and applying it in their professional workplace.

- The Master of Science (M.S.) degree is completed either with a thesis or a project.
- The Master of Engineering (M.E.) degree is completed without the preparation of a formal research thesis or project and is based only on coursework.
- The Master of Information Technology (M-IT) degree is completed without the preparation of a formal research thesis or project and is based only on coursework.

A

- Aerospace Engineering - Master of Engineering in Aerospace Engineering (p. 95)
- Aerospace Engineering - Master of Engineering in Aerospace Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/aerospace-engineering-meae-online/)
- Aerospace Engineering - Master of Science (p. 96)

C

- Chemical Engineering - Master of Engineering in Chemical Engineering (p. 124)
- Chemical Engineering - Master of Engineering in Chemical Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/chemical-engineering-master-engineering-chemical-engineering-online/)
- Chemical Engineering - Master of Science in Chemical Engineering (p. 126)
- Civil Engineering - Master of Engineering in Civil Engineering (p. 128)
- Civil Engineering - Master of Engineering in Civil Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/civil-engineering-mece-online/)
- Civil Engineering - Master of Science in Civil Engineering (p. 130)

E

- Electrical Engineering - Master of Engineering in Electrical Engineering (p. 151)
- Electrical Engineering - Master of Engineering in Electrical Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/electrical-engineering-meee-online/)
- Electrical Engineering - Master of Science in Electrical Engineering (p. 153)
- Electrical Engineering - Master of Science in Electrical Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/electrical-engineering-msee-online/)
- Engineering Management - Master of Engineering in Engineering Management (Online) (https://catalogs.nmsu.edu/global/nmsu-global/engineering-management-meem-online/)
- Environmental Engineering - Master of Science in Environmental Engineering (p. 158)

I

- Industrial Engineering (Systems Engineering) - Master of Engineering in Industrial Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/industrial-engineering-systems-engineering-meie-online/)
- Industrial Engineering - Master of Engineering in Industrial Engineering (p. 169)
- Industrial Engineering - Master of Engineering in Industrial Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/industrial-engineering-meie-online/)
- Industrial Engineering - Master of Science in Industrial Engineering (p. 170)
- Industrial Engineering - Master of Science in Industrial Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/industrial-engineering-msie-online/)
- Information Technology (Cyber Defense) - Master of Information Technology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/information-technology-cyber-defense-master-information-technology-online/)
- Information Technology (IT Enterprise Management) - Master of Information Technology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/information-technology-it-enterprise-management-master-information-technology-online/)
- Information Technology - Master of Information Technology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/information-technology-mit-online/)

M

- Mechanical Engineering - Master of Engineering in Mechanical Engineering (p. 173)
- Mechanical Engineering - Master of Science in Mechanical Engineering (p. 174)

Advanced Manufacturing - Concentration

The graduate concentration in advanced manufacturing educates students and creates a skilled workforce for the growing needs of new technologies and advanced products in the 21st century. The program provides hands-on experience on designing, adapting, and building parts using advanced materials by including new processes, changing the supply chain, and adapting business models. It also includes the design optimization, materials selection and characterization, process parameter mapping, data analytics, software development, and final part inspection among other concepts. This concentration is maintained by the College of Engineering but is open to any Master's level major/degree.

Prefix	Title	Credits
Required Courses		
I E 575	Advanced Manufacturing Processes	3
I E 571	Advanced Quality Control	3
C E 510	Introduction to Nondestructive Testing	3
CHME 564	Polymer Science & Engineering	3
CHME 491/AGRO 450	Undergraduate Special Topics (AGRO 450 CHME 491 Development of Agricultural Technologies)	3
Electives		
5 Electives (Select 500 Level Courses from EE, CHME, IE, CE, or MAE) [1]		15
Total Credits		**30**

[1] With Approval of the advisor and instructor

Selection of Advisor

Newly admitted graduate students will be assigned a temporary advisor for the first semester, but they must select a degree option and permanent advisor before registering for the second semester.

In considering a decision about option and advisor, the student should arrange to meet with several members of the graduate faculty during the first six weeks of study to discuss specific educational objectives. The student can use these meetings to become familiar with faculty interests and research projects currently in progress. The faculty member must agree (in writing) to serve as the student's advisor.

Although there is no oral exam, students will be required to complete an exit-interview with one of Advanced Manufacturing concentration and one graduate faculty member from the master of engineering they select to study.

Doctoral Degree

A

- Aerospace Engineering - Doctor of Philosophy (p. 200)

E

- Engineering (Chemical Engineering) - Doctor of Philosophy (p. 219)
- Engineering (Civil Engineering) - Doctor of Philosophy (p. 220)
- Engineering (Electrical Engineering) - Doctor of Philosophy (p. 221)
- Engineering (Industrial Engineering) - Doctor of Philosophy (p. 223)
- Engineering (Mechanical Engineering) - Doctor of Philosophy (p. 224)

Graduate Certificates

- Digital Communications - Graduate Certificate (https://catalogs.nmsu.edu/nmsu/graduate-school/digital-communications-graduate-certificate/)
- Digital Communications - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/digital-communications-graduate-certificate-online/)
- Digital Signal Processing - Graduate Certificate (https://catalogs.nmsu.edu/nmsu/graduate-school/digital-signal-processing-graduate-certificate/)
- Digital Signal Processing - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/digital-signal-processing-graduate-certificate-online/)
- Electric Energy Systems - Graduate Certificate (https://catalogs.nmsu.edu/nmsu/graduate-school/electric-energy-systems-graduate-certificate/)
- Electric Energy Systems - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/electric-energy-systems-graduate-certificate-online/)
- Systems Engineering - Graduate Certificate (p. 252)
- Systems Engineering - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/systems-engineering-gr-certificate-online/)
- Telemetry - Graduate Certificate (https://catalogs.nmsu.edu/nmsu/graduate-school/telemetry-graduate-certificate/)
- Telemetry - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/telemetry-graduate-certificate-online/)

Undergraduate Minors

- Aerospace Engineering - Undergraduate Minor (p. 1228)
- Agricultural Engineering - Undergraduate Minor (p. 1086)
- Biomedical Engineering - Undergraduate Minor (p. 1072)
- Brewery Engineering- Undergraduate Minor (p. 1072)
- Computational Engineering- Undergraduate Minor (p. 1072)
- Computer Engineering - Undergraduate Minor (p. 1129)
- Computer Engineering Technology - Undergraduate Minor (p. 1197)
- Digital Forensics - Undergraduate Minor (p. 1197)
- Electrical Engineering - Undergraduate Minor (p. 1130)
- Entrepreneurship - Undergraduate Minor (p. 1211)
- Environmental Engineering - Undergraduate Minor (p. 1086)
- Geomatics - Undergraduate Minor (p. 1198)
- Geotechnical Engineering - Undergraduate Minor (p. 1086)
- Information Security Technology - Undergraduate Minor (p. 1198)
- Lean Manufacturing and Analytics - Undergraduate Minor (p. 1211)
- Manufacturing - Undergraduate Minor (p. 1198)
- Materials Engineering - Undergraduate Minor (p. 1072)
- Mechanical Engineering - Undergraduate Minor (p. 1228)
- Nuclear Chemical Engineering - Undergraduate Minor (p. 1073)
- Pre-Law in Intellectual Property - Undergraduate Minor (p. 1073)
- Pre-Medicine Studies- Undergraduate Minor (p. 1073)
- Renewable Energy Technologies - Undergraduate Minor (p. 1199)
- Structural Engineering - Undergraduate Minor (p. 1087)
- Supply Chain and Operations Research Analytics - Undergraduate Minor (p. 1212)

- Systems Engineering - Undergraduate Minor (p. 1212)
- Water Resource Engineering - Undergraduate Minor (p. 1087)

Graduate Minor

- Advanced Manufacturing - Graduate Minor (p. 253)
- Materials Engineering - Graduate Minor (p. 259)

Accreditation

The following programs are accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org/.

- Aerospace Engineering
- Chemical Engineering
- Civil Engineering
- Electrical Engineering
- Engineering Physics
- Industrial Engineering
- Mechanical Engineering

The following programs are accredited by the Engineering Technology Accreditation Commission of ABET, https://www.abet.org/.

- Civil Engineering Technology
- Electronics and Computer Engineering Technology
- Mechanical Engineering Technology

The following program is accredited by the Applied and Natural Science Accreditation Commission of ABET, https://www.abet.org/.

- Geomatics

The college is a member of the American Society for Engineering Education (ASEE).

Other programs under the College of Engineering, such as Information and Communications Technology, are accredited under the Higher Learning Commission (HLC) institutional accreditation.

New Mexico State University has been accredited by The Higher Learning Commission (HLC) since 1926. The HLC may be contacted at:

The Higher Learning Commission
230 North LaSalle St., Suite 7-500
Chicago, IL 60604-1411
Phone: (800) 621-7440

Chemical & Materials Engineering

Mission

The New Mexico State University Chemical & Materials Engineering (CHME) Department strives to prepare Chemical Engineering Bachelor of Science graduates to successfully and safely practice the chemical engineering profession, to engage in life-long personal and professional development, and to contribute to the betterment of their community and society. The undergraduate chemical engineering program of the CHME Department is accredited by the Engineering Accreditation Commission of ABET, Inc. Completion of an ABET accredited degree is required for licensure in New Mexico.

Undergraduate Program Information

Chemical engineers solve problems by combining the fundamentals of physical sciences (chemistry and physics) and life sciences (biology, microbiology, biochemistry) with the principles of engineering analysis, mathematics, and economics. The curriculum of study leading to the BSCHE continuously builds on prerequisite knowledge. The capstone course requires completion of a series of seven prerequisite courses, each having its own prerequisites. In this manner, the BSCHE produces graduates with highly developed problem-solving capabilities, strong communication and interpersonal skills, and an ability to seek out and assimilate knowledge beyond the classroom. Graduates apply these competencies to solve problems across a wide range of industries in the private and public sectors.

The work of a chemical engineer typically leads to the development of processes that convert raw materials (chemicals) into more useful or valuable products. Chemical engineers are pioneers of modern materials and associated processes that are essential to the fields of:

- nanotechnology;
- fuel cells;
- computer chip manufacture;
- environmental restoration and pollution prevention;
- biomedical, biotechnology and bioengineering;
- pharmaceutical manufacturing;
- food production;
- transportation (automotive and aerospace);
- advanced materials;
- petrochemical and refining;
- chemical synthesis and production; and
- power & energy (including the nuclear industry).

Graduates are also well-prepared to continue the study of law, medicine or advanced engineering topics at the graduate level.

Undergraduate Program Educational Objectives

The Chemical & Materials Engineering Department at New Mexico State University strives to produce undergraduates who will:

1. apply their problem-solving and communication skills to chemical engineering industries, government research labs, academia, and related fields;
2. implement safety practices in their work;
3. be on the path to leadership; and
4. build new skills sets through continuing education and professional development.

These Program Educational Objectives (PEOs), which are modified based on input from our constituencies, are consistent with the missions of NMSU, the College of Engineering and the Department of Chemical & Materials Engineering.

Graduate Program Information

The Department of Chemical and Materials Engineering offers graduate study leading to the M.E., M.S. and Ph.D. degrees with an emphasis in chemical engineering. Admission to the program is in accord with the general regulations of the Graduate School. The Graduate Record

Examination (GRE) General Test is required for applicants for the M.S. and Ph.D. programs. All graduate students are required to pass all graduate engineering courses with a minimum grade of B-.

All M.S. and Ph.D. graduate students must select a thesis or dissertation advisor by the end of their first semester in the chemical engineering graduate program. In addition, doctoral students must complete their Program of Study and Committee form by the end of their first semester. Masters students must complete their Program of Study form by the end of their first semester. Thesis/dissertation may be pursued in absentia at various industrial sites by special arrangement.

Graduate teaching and research assistantships, fellowships and traineeships are available. For consideration for financial assistance, completed applicants must be received by March 1. All support is contingent upon availability, eligibility and satisfactory progress toward the degree.

Each student admitted to the CHME grad program who has an undergraduate degree in a discipline other than chemical engineering must schedule a meeting with the CHME Department Head to identify undergraduate course deficiencies that the student must take to obtain a graduate degree in chemical engineering.

Graduate Program Outcomes

To achieve the graduate program educational objectives, CHME graduate students must demonstrate the following abilities based on degree program. Objectives are intended to allow for broad interpretation.

Doctor of Philosophy

- Conduct a critical literature review on a disciplinary topic that incorporates application of concepts from coursework
- Articulate the state-of-the-knowledge in a disciplinary research area and how their research advances the field
- Carry out original research using the scientific method at a level that demonstrates independent thinking:
  - Form hypotheses
  - Design experiments or simulations to test hypotheses
  - Collect experimental or simulation data
  - Develop and/or apply appropriate models to evaluate collected data
  - Use models and collected data to inform that state of the knowledge
  - Ensure research is conducted in a safe and responsible manner
- Communicate (both in written and oral form) clearly and effectively through preparing and defending a dissertation
- Present original research to a variety of audiences in appropriate formats
- Give and receive constructive feedback in a professional manner
- Demonstrate professional leadership through experiences, such as:
  - Supervise and mentor earlier-career (high school, undergraduate, graduate) student researchers
  - Design and conduct disciplinary teaching and/or training
  - Lead an outreach event or activity

As part of the above, students are also expected to complete the following:

- Publish a dissertation
- Complete two peer reviewed journal articles
- Deliver a conference presentation (regional, national, or international)
- Deliver two seminars at the:
  - Group meeting level
  - Department wide level.

Masters of Science

- Conduct a critical review of the literature: Incorporates application of concepts from coursework
- Articulate the state-of-the-art-knowledge in the field: Shows how their research advances the field
- Carry out Original Research: Show use of the Scientific Method
  - Design experiments/simulations to test hypotheses or model a system
  - Collect experimental or simulation data and evaluate using appropriate models
  - Use models and collected data to inform the state of the knowledge
  - Ensure research is conducted in a safe and responsible manner
- Academic Discourse: Accept and provide constructive feedback in a professional manner.
- Leadership: Demonstrate professional leadership.

As part of the above, students are also expected to complete the following:

- Deliver a department wide presentation.

Masters of Engineering

- As part of graduation, the student will write 250 to 500 words, describing how the ME program contributed to growth in their desired area of education related to chemical engineering.

Degrees for the Department

Bachelor Degree(s)

- Chemical Engineering - Bachelor of Science in Chemical Engineering (p. 1070)

Master Degree(s)

- Chemical Engineering - Master of Engineering in Chemical Engineering (p. 124)
- Chemical Engineering - Master of Engineering in Chemical Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/chemical-engineering-master-engineering-chemical-engineering-online/)
- Chemical Engineering - Master of Science in Chemical Engineering (p. 126)

Doctoral Degree(s)

- Engineering (Chemical Engineering) - Doctor of Philosophy (p. 219)

Minors for the Department

- Biomedical Engineering - Undergraduate Minor (p. 1072)
- Brewery Engineering- Undergraduate Minor (p. 1072)
- Computational Engineering- Undergraduate Minor (p. 1072)
- Materials Engineering - Graduate Minor (p. 259)
- Materials Engineering - Undergraduate Minor (p. 1072)

- Nuclear Chemical Engineering - Undergraduate Minor (p. 1073)
- Pre-Law in Intellectual Property - Undergraduate Minor (p. 1073)
- Pre-Medicine Studies- Undergraduate Minor (p. 1073)

Department Head: Joseph H. Holles[1]

Associate Department Head: Paul K. Andersen

Professors Brewer, Holles[1], Houston, Luo, ***Associate Professors*** Andersen, Manz, Martinez-Monteagudo, Zhou ***Assistant Professors*** Gallegos, Li ***Emeritus Professors*** Ghassemi, Mitchell, Rockstraw[1] ***Professors of Practice*** Taylor

Research Interests:

P.K. Andersen (Ph.D., University of California, Berkeley) physicochemical hydrodynamics, nuclear chemical engineering, modeling and simulation, education and training*; C.E. Brewer* (Ph.D., Iowa State) biomass thermochemical processing, sustainable agriculture, biorenewable resources, brewery engineering; *A.A. Gallegos* (Ph.D., University of California Riverside) computational modeling of soft matter, molecular thermodynamics, polymer physics; *J.H. Holles*[1] (Ph.D., Virginia) heterogeneous catalysis, structure/property relationships in catalysis, pseudomorphic overlayer bimetallic catalysts, research preparation for undergraduate and graduate students*; J. P. Houston* (Ph.D., Texas A&M) biomedical engineering, biophotonics, flow cytometry*; H. Li* (Ph.D., Washington State) heterogeneous catalysis, sustainable technologies, waste valorization;*H. Luo* (Ph.D., Tulane) nanostructured materials, thin films, photovoltaics, batteries, electrocatalysts, photocatalysts*; T.A. Manz* (Ph.D., Purdue) quantum chemistry simulations of materials, catalysis, and space physics*; S. Martinez-Monteagudo* (Ph.D., University of Alberta, Canada) food engineering, valorization of byproduct streams, synthesis of sweeteners, and green extraction methods*; S. Taylor* (Ph.D., Clemson) synthesis and characterization of materials, brewing, food processing*; M. Zhou* (Ph.D., New Mexico State) hydrogen production, CO_2 reduction, fuel cell and solar cell.

[1] Registered Professional Engineer

Chemical Engineering Courses

CHME 101. Introduction to Chemical Engineering Calculations
2 Credits (2)
Introduction to the discipline of chemical engineering, including: an overview of the curriculum; career opportunities; units and conversions; process variables; basic data treatments; and computing techniques including use of spreadsheets.
Prerequisite/Corequisite: MATH 1220G, or MATH 1250G, or MATH 1511G, or MATH1511H.
Learning Outcomes
1. Describe career opportunities available to holders of a BSCHE degree.
2. Find and use learning and advising resources within CHME and Engineering.
3. Create a course registration plan for future semesters that meets the degree and prerequisite requirements for the BSCHE in the timeliest manner.
4. Diagram a process with unit operations and material and energy flows.
5. Perform unit analysis and unit conversions accurately and efficiently.
6. Validate calculated results using estimation techniques.
7. Apply the concept of significant figures to numerical answers.
8. Identify and describe process variable measurements using engineering vocabulary.
9. Express and convert concentrations using mass, mole, and volume bases. 1
10. Convert between absolute and relative pressure and temperature scales. 1
11. Perform calculations in Excel using built-in and custom functions. 1
12. Generate 2-D plots of data and functions in Excel. 1
13. Perform a regression of data to a mathematical model.

CHME 102. Material Balances
2 Credits (2)
Perform material balances in single- and multi-phase, reacting and non-reacting systems under isothermal conditions.
Prerequisite: MATH 1220G, or MATH 1250G, or MATH 1511G, or MATH 1511H.
Learning Outcomes
1. Analyze data using trendlines, linearize when necessary.
2. Use unit conversions when solving problems.
3. Turn a verbal or written problem statement into a diagram and a mathematical form.
4. Write and solve material balances on single and multi-unit processes, for both nonreactive and reactive processes.
5. Identify what phase a substance is in and then be able to use the correct equations to relate volume to mass and moles.
6. Use Raoult's and Henry's law when solving mass balances.

CHME 201. Energy Balances & Basic Thermodynamics
3 Credits (3)
Chemical Engineering energy balances; combined energy and material balances including those with chemical reaction, purge and recycle; thermochemistry; application to unit operations. Introduction to the first and second laws of thermodynamics and their applications. May be repeated up to 3 credits.
Prerequisite: CHME 102 and MATH 1250G or MATH 1511G or MATH 1511H.
Prerequisite/Corequisite: CHEM 1216 or CHEM 1215G.
Learning Outcomes
1. Correctly implement unit conversions (outcome (a) an ability to apply knowledge of mathematics, science, and engineering).
2. Analyze and solve elementary material balances on single and multi-unit process, for both nonreactive and reactive processes.
3. Apply the first law of thermodynamics to batch and flow processes.
4. Locate thermophysical property data in the literature and estimate properties when data are not available.
5. Conduct combined material and energy balances around continuous multi-unit processes with and without chemical reaction.
6. Perform process calculations using psychrometric charts, enthalpy concentration diagrams and steam tables.
7. Derive and solve differential equations for transient heat and material balances on dynamic systems.
8. Determine individual learning style and describe how learners of that style can help themselves.
9. Use modern engineering tools (example, Excel) to solve material and energy balance problems.

CHME 303. Chemical Engineering Thermodynamics
4 Credits (4)

Applications of the First Law and Second Law to chemical process systems, especially phase and chemical equilibria and the behavior of real fluids. Development of fundamental thermodynamic property relations and complete energy and entropy balances. Modeling of physical properties for use in energy and entropy balances, heat and mass transfer, separations, reactor design, and process control.
Prerequisite: CHME 201.
Prerequisite/Corequisite: MATH 1511G or MATH 1511H.
Learning Outcomes

1. Use an engineering approach to solve a problem (identify scope, create diagram, determine knowns and unknowns, apply appropriate equations, calculate solutions and evaluate reasonableness of the solution).
2. Solve engineering problems using material, energy and entropy balances.
3. Compile appropriate property data for chemical compounds and mixtures.
4. Choose and solve appropriate equations of state.
5. Use equilibrium relationships to solve chemical engineering problems.
6. Acquire and apply new knowledge as needed, using appropriate learning strategies (maps to ABET Student Outcome seven) by analyzing a current environmental issue in chemical engineering.

CHME 305. Transport Operations I: Fluid Flow
3 Credits (3)
Theory of momentum transport. Unified treatment via equations of change. Shell balance solution to 1-D problems in viscous flow. Analysis of chemical engineering unit operations involving fluid flow. General design and operation of fluid flow equipment and piping networks.
Prerequisite: CHME 201.
Prerequisite/Corequisite: MATH 1521G or MATH 1521H.
Learning Outcomes

1. Mathematical Solutions: solve applied math problems involving linear ordinary differential equations with boundary conditions; solve partial differential equations that can be analytically solved with boundary conditions; identify how coordinate systems are used with ODEs and PDEs; simplify second order PDEs with assumptions; identify when an analytical solution to a PDE is possible and when numerical methods are required.
2. Basic Fluid Concepts and Calculations: identify the properties of fluids, calculate problems that involve pressure measurements, fluid statics, and fluid kinematics; describe physical phenomena of fluid flow; define and explain viscosity, density, specific gravity, surface forces, velocity fields, Newtonian vs. Non-Newtonian, laminar flow, turbulent flow, Reynold's number, and other fluid motion topics.
3. Bernoulli and Energy Equations: apply the Bernoulli equation to sets of fluid problems; solve energy balances in the context of fluids and fluid motion, distinguish between approximations of and appropriate models for Bernoulli's Equation (i.e friction losses, x, pumps, compressors, turbines, surface forces, gas-liquid flow, non-Newtonian fluids, and the Moody diagram).
4. Momentum Analysis: apply momentum balances using the governing equations of momentum to solve one dimensional velocity profile problems of external or internal viscous fluid flow; interpret the different approximations of the momentum balance; classify differential vs. integral forms of momentum analysis; and calculate problems using the Navier Stoke's Equations.
5. Special topics: identify different turbo- and fluid-machinery; explain why computational fluid dynamics is important; solve problems using external flow with applications: boundary layers, lift, drag; and calculate problems with dimensional analysis methods.

CHME 306. Transport Operations II: Heat and Mass Transfer
4 Credits (4)
Theory of heat and mass transport. Unified treatment via equations of change. Analogies between heat and mass transfer. Shell balance solution to 1-D problems in heat and mass transfer. Analysis of chemical engineering unit operations involving heat transfer. Design principles for mass transfer equipment.
Prerequisite: CHME 305.
Prerequisite/Corequisite: MATH 3160.
Learning Outcomes

1. Adopt a systematic problem solving approach, consistently and effectively.
2. Diagram heat flows for conductive, convective, and radiative processes.
3. Find and use material property values.
4. Convert and use appropriate units of energy, power, flux, etc.
5. Write conservation equations for planar, cylindrical, and spherical systems.
6. Apply assumptions such as steady state, number of dimensions, order of magnitude, and/or constant properties to simplify conservation equations.
7. Solve the energy conservation equation for the temperature distribution using appropriate boundary and/or temporal conditions.
8. Calculate heat fluxes into and out of a control volume.
9. Draw resistance circuits and calculate the overall heat transfer coefficient, U, for compound systems. 1
10. Calculate the temperature distribution, heat flux, efficiency, and effectiveness of extended surfaces such as fins. 1
11. Use lumped capacitance and exact solution models to solve transient heat transfer problems. 1
12. Calculate transport dimensionless numbers and explain what they represent. 1
13. Use fluid velocity profiles to calculate boundary layer shapes and thicknesses. 1
14. Calculate convection heat transfer coefficient, h, for external and internal flows using formulas and graphs of experimental results. 1
15. Explain the causes and relative magnitudes of free convection. 1
16. Calculate free convection coefficients using equations and experimental results. 1
17. Label key regimes and heat transfer features of boiling and condensation curves. 1
18. Compare and contrast parallel, cross, and countercurrent flow in heat exchangers. 1
19. Determine the needed surface areas and/or fluid flow rates for heat exchangers given unit operation or process energy needs. 2
20. Calculate and explain heat exchanger efficiency. 2
21. Predict likelihood and account for consequences of fouling. 2
22. Define radiation terminology such as blackbody, grey surface, emissivity, etc. 2
23. Relate surface temperature to radiation wavelength and energy. 2
24. Calculate the view factor between two surfaces and use it to calculate heat transfer. 2
25. Write and solve the mass and molar forms of the one-D mass conservation equations. 2

26. Calculate absolute and relative species velocities and fluxes. 2
27. Use heat transfer relationships and analogous equations to solve diffusion and advection mass transfer problems. 2
28. Predict which kind(s) of heat transfer will be relevant for a given situation. 2
29. Describe implications of problem solutions and perform additional "what if" calculations to understand patterns in the bigger picture.

CHME 307. Transport Operations III: Staged Operations
3 Credits (3)
Theory of mass transport. Mass transfer coefficients. Analysis of chemical engineering unit operations involving mass transfer and separations. Equilibrium stage concept. General design and operation of mass-transfer equipment and separation sequences. Restricted to Chemical Engineering Majors. May be repeated up to 3 credits.
Prerequisite: CHME 303, CHME 306.
Prerequisite/Corequisite: CHEM 313.
Learning Outcomes
1. Determine which kind of separation (e.g., distillation, adsorption, membrane, etc.) is best suited to separate a particular mixture.
2. Design various kinds of separation units to achieve a target flow rate and purity.
3. Evaluate the cost effectiveness and energy requirements of a separation.
4. Perform McCabe-Theile analysis.
5. Include efficiencies and mass transfer effects in the design of separation units.

CHME 323 L. Transport Operations and Instrumentation Laboratory
2 Credits (6P)
Laboratory experiments demonstrate the principles of process measurement and instrumentation through the determination of thermodynamic properties, transport phenomena properties, heat transfer, and material physical properties. Treatment of data includes regression techniques, analysis of error, and statistical analysis. Restricted to: Chemical Engineering majors. May be repeated up to 2 credits.
Prerequisite: I E 311.
Prerequisite/Corequisite: CHME 306.
Learning Outcomes
1. Introduce students to practical skills needed to be able to apply the scientific and engineering concepts acquired in earlier coursework and to achieve the following.
2. Organize and carry out experimental design and actual hands-on experiments.
3. Understand safety regulations and safe operation procedures in the Chemical Engineering laboratory.
4. Be able to analyze and interpret experimental data with theories learned in previous courses.
5. Write organized and cohesive technical and reports.
6. Organize and prepare standard operating procedures.
7. Work effectively in a team environment.
8. Prepare and present technical works and answer questions.

CHME 341. Chemical Kinetics and Reactor Engineering
3 Credits (3)
Analysis and interpretation of kinetic data and catalytic phenomena. Applied reaction kinetics; ideal reactor modeling; non-ideal flow models. Mass transfer accompanied by chemical reaction. Application of basic engineering principles to design, operation, and analysis of industrial reactors. Restricted to:CHME,CMEG,CH E majors. May be repeated up to 3 credits.
Prerequisite: CHME 303, CHME 306.
Learning Outcomes
1. Perform mole balances in systems involving reactions.
2. Calculate conversion in batch and flow systems.
3. Size single and staged continuous-stirred tank, and plug flow reactors.
4. Develop rate laws from mechanisms and experimental data.
5. Calculate pressure drops and the effect on kinetics in packed-bed PFRs.
6. Apply the differential and integral methods of kinetic data analysis.
7. Maximize product selectivity for systems involving multiple reactions.
8. Understand effects of non-isothermal operation and unsteady-state behavior.
9. Apply rate limiting step and quantify performance in catalytic systems. 1
10. Quantify mass transfer limitations on heterogeneous systems. 1
11. Understand the idea of a residence time distribution,and the effect on reactor ideality.

CHME 352 L. Simulation of Unit Operations
2 Credits (2P)
Definition, specification, and convergence of basic unit operations in a process simulator. Course will cover how to access variables, define and converge design specifications and converge tear/recycle streams. Restricted to:CHME majors. May be repeated up to 2 credits.
Prerequisite/Corequisite: CHME 307, CHME 341.
Learning Outcomes
1. Apply Aspen Plus programming solutions to specify and converge unit operations involving: non-rigorous balance units (RSTOIC, SEP, MIX, FSPLIT, SSPLIT DUPL); pressure changers (PUMP , COMPR, VALVE); pipe networks (PIPE, PIPELINE); heat exchangers (HEATER, HEATX); reactors and kinetic models (RPLUG, RCSTR, BATCH, REQUIL, RGIBBS);flash drums and decanters (FLASHII, DECANTER); distillation columns (DSTWU, intro to RADFRAC)

CHME 361. Engineering Materials
3 Credits (3)
Bonding and crystal structure of simple materials. Electrical and mechanical properties of materials. Phase diagrams and heat treatment. Corrosion and environmental effects. Application of concepts to metal alloys, ceramics, polymers, and composites. Selection of materials for engineering design. May be repeated up to 3 credits.
Prerequisite: CHEM 1215G or CHEM 1216.
Learning Outcomes
1. Explain the effects of composition, bonding, structure, and defects on material properties.
2. Compute the response of materials to external influences.
3. Predict rates of materials failures.
4. Select materials for applications.

CHME 370V. Discovery and Use of Radioactive Materials
3 Credits (3)
History, properties and uses of common radionuclides, including applications in fire safety, energy production, medicine, science, industry, and warfare. Impacts of radioactive materials extraction, processing, research, testing, and disposal in the Southwest. Perspectives about radioactive materials within different cultures. Management of radioactive materials by different countries.

Learning Outcomes

1. Give examples of common radionuclides and their uses.
2. Compare radioactive decay processes.
3. Describe the social, economic, and environmental impacts of radioactive materials in state, national, and global history.
4. Complete a written or creative art project that represents the attributes of a common radionuclide.
5. Present the contexts that influence the treatment and perspectives of radioactive materials within different cultures.

CHME 391. Industrial Employment
1-3 Credits (1-3)
Employment in chemical, petroleum, food, biotechnology, materials, environmental, pharmaceutical, or other industry relevant to the discipline, with opportunity for professional experience and training in chemical engineering. Requires written report covering work period approved by employer. Consent of Instructor required. Students must complete the NMSU Cooperative Education and Internship Learning Agreement. May be repeated up to 6 credits.
Learning Outcomes

1. Gain educational and work experiences that are directly related to the BSCHE curriculum and the student's career goals.
2. Develop an understanding of the demands, responsibilities, and opportunities of professional employment.
3. Be provided an opportunity to apply principles and techniques learned in the CHME curriculum to real life problem-solving situations.
4. Gain a better understanding of decision-making and implementation processes.
5. Criterion three Student Outcomes specifically addressed by this course are found in a mapping of outcomes against all CHME courses in the curriculum.

CHME 392. Numerical Methods in Engineering
3 Credits (3)
Study and application of numerical methods in solving problems commonly encountered in engineering. MATLAB will be used as the working environment for implementing and performing the numerical methods in computers.
Prerequisite/Corequisite: MATH 1521G or MATH 1521H.
Learning Outcomes

1. Use MATLAB as a tool to solve chemical engineering problems.
2. Import and graph data using MATLAB.
3. Write and use script M-files and function M-files.
4. Understand the differences between script M-files and function M-files and why they are used in different situations.
5. Be able to translate algebraic equations into matrices, and use MATLAB to solve systems of linear algebraic equations.
6. Fit equations to data, obtain parameters, and determine the goodness of fit.
7. Linearize non-linear equations and obtain parameters for the nonlinear equations.
8. Use MATLAB to symbolically and numerically integrate one-dimensional integrals.
9. Solve systems of ordinary differential equations analytically (by hand). 1
10. Solve systems of ordinary differential equations numerically and analytically using MATLAB. 1
11. Criterion three Student Outcomes specifically addressed by this course are found in a mapping of outcomes against all CHME courses in the curriculum.

CHME 395V. Brewing Science and Society
3 Credits (3)
An overview of the science of brewing and the interrelationships between society, technology, business, and the evolution of the current beer market. Topics covered are history of brewing and the interrelationships between societal attitudes, technology, and cultural preferences; beer styles and evaluation techniques; production and characteristics of ingredients used in brewing; brewing unit operations; biochemistry of malting, mashing, and fermentation; engineering in the brewery; homebrewing; and societal and health issues related to beer and alcohol. Students must be at least 21 years of age by the first day of instruction of the semester to enroll in this course. May be repeated up to 3 credits.
Learning Outcomes

1. Provide the undergraduate student with a broad perspective of beer and the brewing industry as well as technical knowledge about the brewing process.

CHME 412. Process Dynamics and Control
3 Credits (3)
Process modeling, dynamics, and feedback control. Linear control theory and simulation languages. Application of Laplace transforms and frequency response to the analysis of open-loop and closed-loop process dynamics. Dynamic response characteristics of processes. Stability analysis and gain/phase margins. Design and tuning of systems for control of level, flow, and temperature. May be repeated up to 3 credits.
Prerequisite: CHME 341.
Learning Outcomes

1. Mathematical Solutions: solve applied math problems involving linear ordinary differential equations, integration by parts, perform partial fraction expansion; use the Laplace Transform to solve differential equations; Laplace Transform look-up tables, solve inverse Laplace Transform problems.
2. Model-based Control: use MATLAB, Simulink, and/or visual basic simulator to computationally model process control, to make simple mathematic calculations, to solve differential equations, to take the Laplace Transform of a function, to plot curves representing response of a control loop, and to implement other simulation-based actions covered in class.
3. Basic Process Control Concepts and Calculations: draw and use block diagrams of open and closed-loop transfer functions for control problems; identify control system instrumentation (sensors, transmitters, transducer, final control elements); use process control techniques to address safety concerns; use process control vocabulary appropriately; choose a control strategy for a process; formulate control objectives; identify, formulate and solve linear chemical process dynamics problems; formulate and solve an approximate linear model to a nonlinear process; analyze the stability of a dynamic system.
4. PID Control Concepts: tune a P, PI, or PID controller using control theory; choose the appropriate control action (P, PI, PID) for a particular process,
5. Other topics: develop process models of non-steady-state process dynamics; Identify appropriate loop pairings for multivariable control; identify and implement feedforward and feedback control strategies; implement single-variable controllers (temperature, pressure,

concentration, flow, level); and identify advanced control strategies and apply them in appropriate situations (cascade, ratio, pH).

CHME 423 L. Unit Operations Laboratory
2 Credits (6P)
Experiments with chemical engineering unit operations including the use of computer data acquisition. Covers control systems with closed-loop process control, instrumentation and development of empirical models from process data. Includes written and oral reports. May be repeated up to 2 credits.
Prerequisite: CHME 307, CHME 341.
Prerequisite/Corequisite: CHME 412.
Learning Outcomes
1. Understand and apply engineering experimentation techniques and safety procedures common to the chemical industry.
2. Apply principles developed in chemical engineering courses to the analysis of chemical engineering processes and unit operations.
3. Know the materials characterization methods.
4. Improve skills necessary for group work—interpersonal skills, coordination of the efforts of several persons, leader and subordinate roles, etc. Introduce students to practical skills needed to be able to apply the scientific and engineering concepts acquired in earlier coursework.

CHME 448. Industrial Safety
3 Credits (3)
An introduction to the fundamentals of chemical process safety, including toxicology, industrial hygiene, source models, fires and explosions, relief systems, hazard identification, risk assessment, environmental fate and transport, hazardous waste generation, pollution prevention, and regulatory requirements.
Prerequisite(s)/Corequisite(s): CHME 323 L.
Learning Outcomes
1. Demonstrate a knowledge and understanding of the elements of process safety management.
2. Be able to pro-actively identify and analyze safety hazards.
3. Demonstrate knowledge and understanding of risk management tools, programs and processes associated with process safety.
4. Understand the OSHA PSM requirements.
5. Understand and appreciate the need for professional integrity and ethical decision making in the professional practice of engineering.
6. Demonstrate an understanding of issues encountered including business, environmental, health, safety and public interest issues.

CHME 451. Intellectual Property for Engineers and Scientists
3 Credits (3)
An overview of intellectual property with an emphasis on patents. Terminology, patentability requirements, invention disclosures, inventorship, scope of claims, patent application content and the patent prosecution process, and post-allowance matters including infringement and enforcement. May be repeated up to 3 credits.
Learning Outcomes
1. Assess what kind of protection – patent, trade secret, copyright, trademark – is appropriate for particular intellectual property.
2. Describe relevant subject matter and standards for protection under patent, trade secret, copyright, and trademark.
3. Differentiate inventorship, authorship and ownership in an intellectual property context.
4. Devise search strategies to assess 'prior art' and public information that may affect availability of intellectual property protection.
5. Generate sample content for a patent application (including claims) and a trademark application.
6. Analyze office actions and propose solutions for issues raised during patent prosecution and trademark prosecution.
7. Compare and contrast the procedures for obtaining a patent, securing a trademark, registering a copyright and establishing trade secret protection.
8. Describe basic considerations relating to enforcement and infringement of intellectual property.

CHME 452. Chemical Process Design & Economic Evaluation
3 Credits (3)
Concepts in chemical engineering process design, including: capital and manufacture cost estimation; discounted cash flows; interest; taxes; depreciation; profitability analysis; project specifications. May be repeated up to 3 credits.
Prerequisite: CHME 307, CHME 341.
Learning Outcomes
1. Write and explain the meanings of the basic equations related to engineering economic analysis.
2. Formulate mathematical models and solve problems involving process design and economic analysis.
3. Discuss the environmental, social, and economic implications of process design.
4. Criterion three Student Outcomes specifically addressed by this course are found in a mapping of outcomes against all CHME courses in the curriculum.

CHME 455. Chemical Plant Design
3 Credits (3)
Design and analysis of integrated process plants. Consideration given to optimizing performance, operability, reliability, safety, control, energy integration, and cost effectiveness. Requires written report covering solution of a capstone design problem. Restricted to: CHME majors.
Prerequisite: CHME 452.
Corequisite: CHME 455 L.
Learning Outcomes
1. Understand government regulation of chemical processes.
2. Be knowledgeable of process safety analysis procedures.
3. Understand "normal" process conditions vs. those of concern.
4. Be able to perform a process optimization (topological vs. parametric).
5. Be able to perform a heat integration analysis through pinch technology.
6. Use heuristics to confirm the suitability of a process design.
7. Understand how to perform a base case analysis.
8. Be able to complete an analysis of a chemical plant design that includes: base case development and justification; process simulation; topological and parametric optimizations; societal impact assessment; and economic evaluation; including making recommendations based on their findings.

CHME 455 L. Chemical Plant Simulation
1 Credit (1P)
Construction, convergence, and optimization of chemical processes in a process simulator. Dynamic process simulation and control. Taken concurrently with CHME 455. May be repeated up to 1 credit.
Prerequisite: CHME 412, CHME 352 L.

Learning Outcomes

1. Understand how to input from the Aspen Plus Graphical User Interface (GUI).
2. How to specify unit operations in Aspen Plus.
3. Be able to perform a sensitivity analysis and an optimization.
4. Understand how to apply a design specification in Aspen Plus.
5. Understand how to use Calculator Blocks such as Fortran or Excel.
6. Be able to specify a catalytic reactor with LH kinetics.
7. Be able to optimize a RADFRAC distillation column on an economic basis.
8. Be able to converge complex multicomponent RADFRAC distillations.
9. Be able to use the economics analyzer package in conjunction with a simulation.

CHME 461. Calculation of Material and Molecular Properties
3 Credits (3)

The aim is to describe and apply techniques for computing common properties of materials and molecules: optimized geometries, transition states, vibrational spectra, energies (electronic, internal energy, enthalpy, and Gibbs free energy), heat capacities, net atomic charges, atomic spin moments, and effective bond orders. These techniques allow one to estimate the thermodynamic properties of a chemical, as well as to compute the mechanisms and energy barriers for chemical reactions and catalytic processes, and to quantify the electronic, magnetic, and chemical ordering in materials. The theory behind these techniques will be described and students will perform hands-on computer exercises using common computational chemistry programs. Taught with CHME 561. May be repeated up to 3 credits.

Prerequisite: CHEM 1216 or CHEM 1226, MATH 1521G or MATH 1521H, (PHYS 2140 or PHYS 1320G).

Learning Outcomes

1. Basic concepts of computational chemistry.
2. Calculating the energies and geometries of reactants and products for chemical reactions.
3. Finding the transition state of a chemical reaction: determining the reaction pathway, transition state geometry, and the energy barrier. Meaning of the energetic span for a catalytic cycle.
4. Quantifying whether the transition state is closer to the reactant (early transition state) or closer to the product (late transition state). Postulates related to transition state lateness.
5. Computing vibrational spectra.
6. Using the harmonic approximation to estimate thermodynamics properties: internal energy, enthalpy, Gibbs free energy, and heat capacities.
7. Computing net atomic charges, atomic spin moments, and effective bond orders to determine the electronic, magnetic, and chemical ordering of materials.

CHME 464. Polymer Science & Engineering
3 Credits (3)

This course covers concepts in science and engineering of macromolecules, such as synthesis and chemistry, characterization of molecular weight, morphology, rheology, and mechanical behavior, structure and property relationships, and polymer processing. Taught with CHME 564. May be repeated up to 3 credits.

Prerequisite: CHEM 313 or CHEM 2115.

Learning Outcomes

1. Describe the fundamental concepts in polymer science and engineering;
2. Analyze the microstructure and molecular weight of polymers;
3. Discuss the chemistry, importance and applications of natural polymers;
4. Interpret different synthesis methods of polymers;
5. Analyze the kinetics of polymerization;
6. Discuss the polymer rheology and viscoelastic behavior of polymers;
7. Explain the characterization and processing of polymers; and
8. Argue the selection of polymer and/or design a specific polymer for specific applications (through final project).
9. Criterion three Student Outcomes specifically addressed by this course are found in a mapping of outcomes against all CHME courses in the curriculum.

CHME 467. Nanoscience and Nanotechnology
3 Credits (3)

This is a lecture/laboratory course designed to present the basic concepts, the techniques and the tools to synthesize and characterize nanometer scale materials, and the latest achievements in current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics and energy. It is intended for a multidisciplinary audience with a variety of backgrounds. This course should be suitable for graduate students as well as advanced undergraduates. Topics covered will include: nanoscience and nanotechnology, nanofabrication, self-assembly, colloidal chemistry, sol-gel, carbon nanotubes, graphene, thin film, lithography, physical vapor deposition, chemical vapor deposition, quantum dots, lithium batteries, X-ray diffraction, scanning electron microscopy, transmission electron microscopy, nanoelectronics, nanophotonics and nanomagnetics, etc. Students must also have completed (EH&S Safety training to include the courses: (1) Employee & Hazard Communication Safety (HazCom); (2) Hazardous Waste Management; and (3) Laboratory Standard) trainings to enroll. Crosslisted with: PHYS 520 . May be repeated up to 3 credits.

Prerequisite: (CHEM 1216 or CHEM 1226), (PHYS 1230G or PHYS 1310G).

Learning Outcomes

1. Understand the basic and state-of-art synthesis methods and applications in nanoscience and nanotechnology (Student outcome (a) an ability to apply knowledge of mathematics, science, and engineering).
2. Do lab work to use tools and analyze data (Student outcome (b) an ability to design and conduct experiments, as well as to analyze and interpret data).
3. Form a team for lab work and lab report (Student outcome (d) an ability to function on multidisciplinary teams).
4. Present literature review and ask questions (Student outcome (g) an ability to communicate effectively).

CHME 470. Introduction to Nuclear Energy
3 Credits (3)

Atomic and nuclear structure, nuclear stability and radioactivity, nuclear reactions, detection and measurement of radiation, interaction of radiation with matter, radiation doses and hazard assessment, principles of nuclear reactors, and applications of nuclear technology. Taught with CHME 570. May be repeated up to 3 credits.

Prerequisite: CHEM 1215G or CHEM 1225G, MATH 1521G or MATH 1521H.

Learning Outcomes

1. Basic Concepts. Write and explain the meanings of the basic balances and equations of nuclear science and engineering.

2. Problem Solving. Solve problems involving radioactive decay rates, radiation interactions, rates of nuclear reactions, energies of nuclear transformations, and applications.
3. Model Building. Given a verbal or pictorial description, create useful mathematical models of nuclear engineering systems, such as radiation shields, radiation detectors, nuclear reactors, and energy converters.
4. Social and Economic Effects. Discuss the global environmental, social, and economic effects of nuclear technology.

CHME 471. Health Physics
3 Credits (3)
Introduction to radiation protection, radiation/radioactivity, radioactive decay/fission, interactions of radiation and matter, biological effects of radiation, radiation measurement and statistics, sampling for radiation protection, radiation dosimetry, environmental transport, radiation protection guidance, external and internal radiation protection, and hazards analysis. Taught with CHME 571.
Prerequisite(s): MATH 1521G or MATH 1521H, CHME 470.
Learning Outcomes
1. Develop the ability to solve problems using the equations to calculate: a. Atomic Structure and Atomic Radiation: binding and ionization energies, atomic densities, characteristic X-rays and Auger electrons. b. The Nucleus and Nuclear Radiation: nuclear binding energies, alpha particle energy and recoil nucleus energy in an interaction, calculate Q of beta particle, antineutrino, recoil nucleus, orbital electron, internal conversion electron, and internal conversion coefficient. c. Interaction of heavy charged particles, beta and gamma radiation with matter: maximum energy transfer, stopping power, mean excitation energies, range and slowing down time. collisional stopping power, radiative stopping power, radiation yield, range, slowing-down time. Photon threshold energy, energy of the scattered photon and the Compton shift in wavelength, momentum of the scattered photon, average kinetic energy of Compton Recoil electrons, linear and mass attenuation coefficients, threshold energy and atomic cross section for the photodisintegration of a radionuclide, rate of energy absorption per unit mass. d. Statistics Know the concepts of Statistics of radioactive disintegration, the Binomial Poisson Normal distributions, error and error propagation, counting rates, Criteria for Radiobioassay. Calculate Minimum Significant Measured Activity, Type-I Errors, Minimum Detectable True Activity, Type-II Errors. e. Radiation Dosimetry: Know and calculate the units of exposure, absorbed dose, dose equivalent, kerma, specific energy, lineal energy; alpha and low-energy beta emitters distributed in tissue, charged-particle beams, point source of gamma rays, neutrons; measurement of exposure, absorbed dose, X- and Gamma-Ray, neutron dose.
2. Know the concepts of: a. Radiation Detection and measurements methods: Ionization in gases, Ionization current, W values, Ionization pulses, Gas-filled detectors, Ionization in semiconductors, Band theory of solids, semiconductors, Radiation measuring devices; Scintillators, Organic and Inorganic scintillation detectors; Photographic Film; Thermoluminescence, Optically stimulated luminescence, Radiophotoluminescence, Chemical dosimeters, Calorimetry, Cerenkov detectors, Neutron Detection: Slow, Intermediate and Fast Neutrons. b. Chemical and Biological Effects of Radiation: Radiation effects time frame, physical and prechemical chances in irradiated water, chemical yields in water; Sources of Human Data biological effects: The life span study, medical radiation, radium-dial painters, uranium miners, accidents, acute radiation syndrome; Delayed somatic effects: Cancer, life shortening cataracts; Dose–response relationships, factors affecting dose response, relative biological effectiveness, dose rate, oxygen enhancement ratio, chemical modifiers. c. Radiation-Protection Criteria and Exposure Limits: Become knowledgeable about objectives of radiation protection, elements of radiation-protection programs, The NCRP and ICRP; NCRP/ICRP Dosimetric Quantities: Equivalent dose, Effective dose, Committed equivalent dose, Committed effective dose ,Limits on intake; Risk estimates for radiation protection; Current exposure limits of the NCRP and ICRP. Occupational limits, Non-occupational limits Exposure of individuals under 18 Years of age; Occupational limits in the Dose-Equivalent System -The "2007 ICRP Recommendations". d. Internal Dosimetry and Radiation Protection: ICRP-30 Dosimetric Model for the Respiratory System and Gastrointestinal Tract, ICRP-66 Human Respiratory Tract Model, ICRP-30 Dosimetric Model for the Organ Activities as Functions of Time, for Submersion in a Radioactive Gas Cloud , Metabolic Data for Reference Man, ICRP Publication 89, Specific Absorbed Fraction, Specific Effective Energy, and Committed Quantities; Number of Transformations in Source Organs over 50 Y. e. External Radiation Protection: Design concepts of distance, time, and shielding for radiation protection, primary and secondary protective barriers; shielding of Gamma-Ray, X-rays, beta and neutron radiation, ICRP Report.
3. Hands on experience with background radiation and contamination measurement, concepts of statistical variation of radiation measurement.
4. Term Paper group interaction, writing manuscript, and personal presentation.

CHME 474. Power Plant Design
3 Credits (3)
Principles of electric power generation. Review of DC and AC systems, energy sources, and prime movers. Analysis of hydroelectric, fossil fuel, nuclear, and alternative power systems. Environmental and economic considerations. Taught with CHME 574.
Prerequisite: MATH 1511G or MATH 1511H, CHEM 1215G or CHEM 1216G.
Learning Outcomes
1. Write and explain the meanings of the basic concepts and equations related to electric power generation.
2. Formulate mathematical models and solve problems involving electric power generation.
3. Summarize the economic, environmental, and regulatory issues involving electric power generation.

CHME 476. Nuclear Fuel Cycles
3 Credits (3)
Physical and chemical processes in the conventional nuclear fuel cycle: uranium mining and milling, conversion, enrichment, fuel fabrication, reactor operations, interim storage, reprocessing and recycling, waste treatment and disposal. Alternative fuel cycles and future prospects. Taught with CHME 576. May be repeated up to 3 credits.
Prerequisite: CHME 470.
Learning Outcomes
1. Write and explain the basic principles and equations related to the conventional nuclear fuel cycle.
2. Solve problems involving chemical and nuclear processes in the conventional nuclear fuel cycle.
3. Given a verbal or pictorial description, create useful mathematical models of chemical engineering systems in the nuclear fuel cycle.

4. Discuss the global environmental, social, and economic implications of nuclear fuel cycles.

CHME 478. Electrochemistry: Basics & Applications
3 Credits (3)
Theory and application of electrochemical devices. Topical information related to electrochemistry are concepts, principles, and examples of energy storage, mechanisms responsible for electrochemical devices, and current progress and problems. Relevant devices covered include the lithium ion battery, supercapacitor, fuel cell, solar cell and electrolyzer.
Learning Outcomes
1. Understand the mechanisms responsible for electrochemical device.
2. Realize the current progress in electrochemistry.
3. Identify the problems and hurdles for electrochemical device practical applications.

CHME 479. Corrosion and Degradation of Materials
3 Credits (3)
Failure of engineering materials in aggressive environments. Chemical and electrochemical mechanisms of corrosion. Influence of chemical composition and microstucture on corrosion behavior. Types of corrosion and chemical attack, including uniform corrosion, galvanic corrosion, pitting and other forms of localized corrosion, stress corrosion cracking, and corrosion fatigue. Methods of corrosion mitigation including cathodic protection, coatings, passivation, and corrosion inhibitors. Corrosion in nuclear reactors and nuclear waste repositories. May be repeated up to 3 credits.
Prerequisite: CHME 361.
Learning Outcomes
1. Basic Concepts: Explain the basic principles related to the corrosion and degradation of materials.
2. Problem Solving: Solve problems involving mechanical, chemical and electrochemical processes in materials exposed to harsh environments.
3. Mitigation: Discuss methods for preventing the degradation and failure of materials.

CHME 481. Biomedical Engineering and Engineering Healthcare
3 Credits (3)
Orientation to solving human and world health issues with biological engineering systems, tools, and analysis methods. Introduces general concepts including applied biology for engineers, biophotonics, biosensing, bioinstrumentation, tissue and biomaterials engineering, biomedical engineering research practices, and physical bioanalytical methods. May be repeated up to 3 credits.
Prerequisite: CHEM 1215 or CHEM 1225.
Learning Outcomes
1. Solve problems related to the design of biomedical instruments.
2. Apply basic mathematics, biology concepts, and laws of physics and chemistry to solve biomedical engineering type problems.
3. Explain differences in biomedical research and industries.
4. Identify the current challenges in the field of biomedical engineering and predict what investigators and industries are doing to tackle such problems.
5. Critique biomedical engineering research through interpretation of peer-reviewed literature, formal presentations and formal reports.
6. Design a solution to a current biomedical engineering problem by computational modeling, experimental design, and/or researching a specific subject in biomedical engineering (i.e. reading peer-reviewed research articles/manuscripts/textbooks).
7. Engage in hands-on learning of biomedical devices such as the building of a simple flow-cytometer.

CHME 486. Biofuels
3 Credits (3)
Introduction to the fundamentals and applications of biofuels and bioenergy production; biomass resources and their composition; types of biofuels; conversion technologies (thermochemical and biochemical conversion processes); biodiesel production, algae to biofuels; economic and environmental assessments; term paper of selected topics relevant to biofuels. May be repeated up to 3 credits.
Prerequisite: CHEM 313 or consent of instructor.
Learning Outcomes
1. Understand basic concepts about biomass derived energy;
2. Identify potential biomass feedstocks including energy crops;
3. Understand the concept of 1st generation, 2nd generation and advance biofuels;
4. Understand terminologies related to biomass conversion and biofuel production;
5. Have an understanding of the existing and emerging biomass to energy technologies;
6. Understand and apply mass and energy balances in biomass conversion;
7. Apply engineering thermodynamics, organic chemistry, chemistry of plant materials;
8. Familiarize with characterization of biomass feedstocks;
9. Understand the unit processes/ unit operations involved in biofuel/ bioenergy production; 1
10. Be able to do the basic engineering calculations related to biofuel production; 1
11. Understand the concept of a biorefinery system and be able to develop major unit operations of an integrated biorefinery; 1
12. Describe techno-economic analyses of biofuel conversion technologies; 1
13. Have an understanding of environmental implications; and 1
14. Apply biomass-derived energy in different applications.

CHME 490. Senior Seminar
1 Credit (1)
Research seminar attended by graduate students is open to CHME undergraduates who are research active May be repeated up to 2 credits. Students must be in Senior Standing to enroll in this course.
Prerequisite(s)/Corequisite(s): CHME 498.
Learning Outcomes
1. Expose students to the breadth and depth of research in chemical engineering and related fields.

CHME 491. Undergraduate Special Topics
3 Credits (3)
Lecture and/or laboratory instruction on special topics in chemical engineering. May be repeated up to 6 credits.
Learning Outcomes
1. Gain exposure to, knowledge of, and practice solving problems in a variety of CHME topics that are directly related to broadening the BSCHE curriculum and the student's career goals.
2. Topics will vary by years and section depending on current topics of interest in CHME and availability of instructors.

3. be provided an opportunity to apply principles and techniques learned in the CHME curriculum to real life problem-solving situations in specialized topics.

CHME 495. Brewing Science & Engineering
3 Credits (3)
Details of beer production, fermentation science, brewery operation, and process design & economics. Engineering considerations including process safety, fermentation kinetics, unit operations, and economies of scale. Beer styles, recipe formulation, product quantification for tax purposes, and brew analytical methods will also be discussed. Students must be 21 years old to enroll. Crosslisted with: FSTE 430.
Learning Outcomes
1. To provide the undergraduate student with a broad perspective of beer and the brewing industry as well as technical knowledge about the brewing process.

CHME 495 L. Brewing Science & Technology Lab
1 Credit (3P)
Brewing and brewing operations in a one-barrel brewery. Topics addressed will include brewery safety, characteristics and handling of brewing ingredients, recipe formulation, water treatment, wort preparation, fermentation, waste disposal, and packaging.
Prerequisite/Corequisite: CHME 495.
Learning Outcomes
1. Demonstrate a working 1-barrel brewery and its unit operations, from recipe formulation to brewing and fermentation to cleaning and sanitizing.

CHME 497. Undergraduate Special Projects
1-3 Credits (1-3)
Provides an opportunity for undergraduate students to work on special projects under the direction of a faculty member. Written report covering work is required. May be repeated up to 6 credits.
Learning Outcomes
1. Prepare a written project report conforming to the format of the CHME writing standard.
2. Articulate a clear project question or problem.
3. Define, articulate, and use appropriate terminology and concepts.
4. Use library and other tools to search for existing body of information relevant to their project.
5. Identify and practice appropriate engineering ethics.
6. Know and apply problem solving skills to constructively address setbacks.
7. Work collaboratively with others, using listening and communication skills.
8. Work autonomously in an effective manner, setting and meeting deadlines.
9. Reflect on own project outcomes, identifying lessons learned, strengths, and ways to improve. 1
10. Communicate confidently and constructively with students, faculty, and project sponsor (as required). 1
11. Explain project to others in the field and to broader audiences through presentations. 1
12. Articulate the relevance of their project to their coursework and professional future, synthesizing their project, academic, and professional interests and goals.

CHME 498. Undergraduate Research
1-3 Credits (1-3P)
Provides an opportunity for undergraduate students to work in research studies under the direction of a faculty member. Consent of Instructor required. May be repeated up to 6 credits.
Learning Outcomes
1. Prepare a written research report conforming to the format of the CHME writing standard.
2. Articulate a clear research question or problem and formulate a hypothesis.
3. Identify and demonstrate appropriate research methodologies.
4. Define, articulate, and use appropriate terminology, concepts, and theory.
5. Use library and other tools to search for existing body of research relevant to their topic.
6. Know existing body of research relevant to their topic and explain how their project fits.
7. Identify and practice research ethics and responsible conduct in research.
8. Know and apply problem solving skills to constructively address research setbacks.
9. Work collaboratively with other researchers, using listening and communication skills. 1
10. Work autonomously in an effective manner, setting and meeting deadlines. 1
11. Reflect on own research, identifying lessons learned, strengths, and ways to improve. 1
12. Communicate confidently and constructively with graduate students, other researchers, and faculty. 1
13. Explain research to others in the field and to broader audiences through presentations. 1
14. Articulate the relevance of their research to their coursework and professional future, synthesizing their research, academic, and professional interests and goals. 1
15. Criterion Three Student Outcomes specifically addressed by this course are NOT found in a mapping of outcomes against all CHME courses in the curriculum as this is a technical elective, not a required core course.

CHME 501. Graduate Thermodynamics for Chemical Engineers
3 Credits (3)
Advanced applications of the first and second law to chemical process systems. The calculus of thermodynamics, equilibrium and stability criteria. Properties relationships for real fluids, both pure materials and mixtures. An introduction to molecular thermodynamics and statistical mechanics.
Learning Outcomes
1. Solve problems using the energy balance appropriate for a system (the First Law of Thermodynamics).
2. Solve problems using the entropy balance appropriate for a system (the Second Law of Thermodynamics).
3. Evaluate, manipulate, and use thermodynamic partial derivatives.
4. Correctly use thermodynamic property charts, steam tables, and other relations to determine the thermodynamic properties of real substances and mixtures.
5. Determine whether a system is at equilibrium and whether it is stable.
6. Use the thermodynamic relationships governing phase changes.
7. Apply the basic relations of statistical thermodynamics and how to apply them.

CHME 506. Graduate Transport Phenomena(s)
3 Credits (3)
Covers the analysis of simultaneous momentum, energy, and mass transport. Development of integral and local balance equations in vector-tensor form. Application of vector-tensor analysis to transport equations. Boundary layer theory and turbulence. May be repeated up to 3 credits.
Learning Outcomes
1. Perform vector and tensor analysis.
2. Formulate momentum, heat, and mass transport equations.
3. Analyze and solve macroscopic momentum, heat, and mass balances for steady and quasi-steady-state problems.
4. Formulate the transport phenomena in boundary layer.
5. Compare the difference in between laminar and turbulent flows.
6. Differentiate polymeric and non-Newtonian fluids.
7. Demonstrate the analogies between momentum, heat and mass transfer problems.

CHME 516. Graduate Numerical Methods in Chemical Engineering
3 Credits (3)
Survey of numerical methods for solving problems commonly encountered in heat and mass transfer, fluid mechanics, and chemical reaction engineering. May be repeated up to 3 credits.
Learning Outcomes
1. Understand criteria to evaluate and compare the performance of different numeric methods.
2. Solve linear and nonlinear systems of equations for several unknown variables.
3. Numerically solve ordinary and partial differential equations to solve both initial and boundary value problems.
4. Numerically optimize functions to find zeros, minima, and maxima.
5. Use and understand the key differences between different numerical methods.
6. Solve basic problems in statistics and data regression for model parameter estimation.
7. Prepare Matlab programs using user-defined functions and scripting files.
8. Use Matlab to manipulate data plots.
9. Use Matlab to perform both symbolic and numeric integration of mathematical functions. 1
10. Apply these numerical methods to the solution of Chemical Engineering problems, including batch reaction kinetics, heat transfer, mass transfer, and vapor-liquid equilibria calculations. 1
11. Understand and use Matlab control structures, including iterative loops and " IF … THEN" blocks.

CHME 542. Graduate Reactor Analysis and Design (s)
3 Credits (3)
Application and analysis of equations of continuity to multicomponent reaction systems. Introduction to homogeneous and heterogeneous catalysis, single-phase combustion, and shock reaction systems. May be repeated up to 3 credits.
Learning Outcomes
1. Perform mole balances in systems involving chemical reaction.
2. Calculate conversion in batch and flow systems.
3. Size single and staged continuous-stirred tank, and plug flow reactors.
4. Develop rate laws from mechanisms and experimental data.
5. Calculate pressure drops and the effect on kinetics in packed-bed PFRs.
6. Apply the differential and integral methods of kinetic data analysis.
7. Maximize product selectivity for systems involving multiple reactions.
8. Understand effects of non-isothermal operation and unsteady-state behavior.
9. Apply rate limiting step and quantify performance in catalytic systems. 1
10. Quantify mass transfer limitations on heterogeneous systems. 1
11. Understand the idea of a residence time distribution, and the effect on reactor ideality.

CHME 548. Industrial Safety
3 Credits (3)
Same as CHME 448 with graduate-level projects.
Prerequisite: CHEM 1216 or CHEM 1215G.
Learning Outcomes
1. Demonstrate a knowledge and understanding of the elements of process safety management.
2. Pro-actively identify and analyze safety hazards.
3. Demonstrate knowledge and understanding of risk management tools, programs and processes associated with process safety.
4. Understand the OSHA PSM requirements.
5. Understand and appreciate the need for professional integrity and ethical decision making in the professional practice of engineering.
6. Demonstrate an understanding of issues encountered including business, environmental, health, safety and public interest issues.
7. Analyze scenarios for a mock chemical plants and prepare risk analysis presentations both individually and as a group project.
8. Apply the above to a research environment.

CHME 564. Polymer Science & Engineering
3 Credits (3)
Synthesis, structure, property relationships of synthetic polymers. Taught with CHME 464. May be repeated up to 3 credits.
Prerequisite: CHME 201, CHEM 314.
Learning Outcomes
1. Describe the fundamental concepts in polymer science and engineering.
2. Analyze the microstructure and molecular weight of polymers.
3. Discuss the chemistry, importance and applications of natural polymers.
4. Interpret different synthesis methods of polymers.
5. Analyze the kinetics of polymerization.
6. Discuss the polymer rheology and viscoelastic behavior of polymers.
7. Explain the characterization and processing of polymers.
8. Argue the selection of polymer and/or design a specific polymer for specific applications (through final project).

CHME 565. Rheology and Viscoelasticity
3 Credits (3)
This course is an introduction to rheology and viscoelasticity. In particular, the flow behavior of Non-Newtonian Fluids and Viscoelastic Fluids will be covered. Rheometry, the technique for characterization of fluids, will be discussed. Most of the course is quantitative and uses mathematical modeling. Taught with CHME 465.
Prerequisite: CHME 306.

Learning Outcomes

1. Apply linear viscoelastic models to characterize fluids.
2. Evaluate the viscoelastic behavior of fluids with respect to their chemical structure and molecular weight.
3. Apply nonlinear viscoelastic methods to characterize complex fluids.
4. Design a rheological toolbox to characterize the behavior of complex fluids.

CHME 567. Nanoscience and Nanotechnology
3 Credits (3)

This is a lecture/laboratory course designed to present the basic concepts, the techniques and the tools to synthesize and characterize nanometer scale materials, and the latest achievements in current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics and energy. It is intended for a multidisciplinary audience with a variety of backgrounds. This course should be suitable for graduate students as well as advanced undergraduates. Topics covered will include: nanoscience and nanotechnology, nanofabrication, self-assembly, colloidal chemistry, sol-gel, carbon nanotubes, graphene, thin film, lithography, physical vapor deposition, chemical vapor deposition, quantum dots, lithium batteries, X-ray diffraction, scanning electron microscopy, transmission electron microscopy, nanoelectronics, nanophotonics and nanomagnetics, etc. Taught with CHME 467. May be repeated up to 3 credits.
Prerequisite: (CHEM 1225G or CHEM 1226) and (PHYS 1230G or PHYS 1310G).

Learning Outcomes

1. Understand the basic and state-of-art synthesis methods and applications in nanoscience and nanotechnology (student outcome (a) an ability to apply knowledge of mathematics, science, and engineering).
2. Do lab work to use tools and analyze data (Student outcome (b) an ability to design and conduct experiments, as well as to analyze and interpret data).
3. Form a team for lab work and lab report (Student outcome (d) an ability to function on multidisciplinary teams).
4. Present literature review and ask questions (Student outcome (g) an ability to communicate effectively).

CHME 570. Introduction to Nuclear Energy
3 Credits (3)

Atomic and nuclear structure, nuclear stability and radioactivity, nuclear reactions, detection and measurement of radiation, interaction of radiation with matter, radiation doses and hazard assessment, principles of nuclear reactors, and applications of nuclear technology. Taught with CHME 470. May be repeated up to 3 credits.

Learning Outcomes

1. Basic Concepts. Write and explain the meanings of the basic balances and equations of nuclear science and engineering.
2. Problem Solving. Solve problems involving radioactive decay rates, radiation interactions, rates of nuclear reactions, energies of nuclear transformations, and applications.
3. Model Building. Given a verbal or pictorial description, create useful mathematical models of nuclear engineering systems, such as radiation shields, radiation detectors, nuclear reactors, and energy converters.
4. Social and Economic Effects. Discuss the global environmental, social, and economic effects of nuclear technology.

CHME 571. Health Physics
3 Credits (3)

Introduction to radiation protection, radiation/radioactivity, radioactive decay/fission, interactions of radiation and matter, biological effects of radiation, radiation measurement and statistics, sampling for radiation protection, radiation dosimetry, environmental transport, radiation protection guidance, external and internal radiation protection, and hazards analysis. Taught with CHME 471.
Prerequisite: MATH 1521G or MATH 1521H, CHME 470 or CHME 570.

Learning Outcomes

1. Develop the ability to solve problems using the equations to calculate: a. Atomic Structure and Atomic Radiation: binding and ionization energies, atomic densities, characteristic X-rays and Auger electrons. b. The Nucleus and Nuclear Radiation: nuclear binding energies, alpha particle energy and recoil nucleus energy in an interaction, calculate Q of beta particle, antineutrino, recoil nucleus, orbital electron, internal conversion electron, and internal conversion coefficient. c. Interaction of heavy charged particles, beta and gamma radiation with matter: maximum energy transfer, stopping power, mean excitation energies, range and slowing down time. collisional stopping power, radiative stopping power, radiation yield, range, slowing-down time. Photon threshold energy, energy of the scattered photon and the Compton shift in wavelength, momentum of the scattered photon, average kinetic energy of Compton Recoil electrons, linear and mass attenuation coefficients, threshold energy and atomic cross section for the photodisintegration of a radionuclide, rate of energy absorption per unit mass. d. Statistics Know the concepts of Statistics of radioactive disintegration, the Binomial Poisson Normal distributions, error and error propagation, counting rates, Criteria for Radiobioassay. Calculate Minimum Significant Measured Activity, Type-I Errors, Minimum Detectable True Activity, Type-II Errors. e. Radiation Dosimetry: Know and calculate the units of exposure, absorbed dose, dose equivalent, kerma, specific energy, lineal energy; alpha and low-energy beta emitters distributed in tissue, charged-particle beams, point source of gamma rays, neutrons; measurement of exposure, absorbed dose, X- and Gamma-Ray, neutron dose.
2. Know the concepts of: a. Radiation Detection and measurements methods: Ionization in gases, Ionization current, W values, Ionization pulses, Gas-filled detectors, Ionization in semiconductors, Band theory of solids, semiconductors, Radiation measuring devices; Scintillators, Organic and Inorganic scintillation detectors; Photographic Film; Thermoluminescence, Optically stimulated luminescence, Radiophotoluminescence, Chemical dosimeters, Calorimetry, Cerenkov detectors, Neutron Detection: Slow, Intermediate and Fast Neutrons. b. Chemical and Biological Effects of Radiation: Radiation effects time frame, physical and prechemical chances in irradiated water, chemical yields in water; Sources of Human Data biological effects: The life span study, medical radiation, radium-dial painters, uranium miners, accidents, acute radiation syndrome; Delayed somatic effects: Cancer, life shortening cataracts; Dose-response relationships, factors affecting dose response, relative biological effectiveness, dose rate, oxygen enhancement ratio, chemical modifiers. c. Radiation-Protection Criteria and Exposure Limits: Become knowledgeable about objectives of radiation protection, elements of radiation-protection programs, The NCRP and ICRP; NCRP/ICRP Dosimetric Quantities: Equivalent dose, Effective dose, Committed equivalent dose, Committed effective dose ,Limits on intake; Risk estimates for radiation protection; Current exposure limits of the NCRP and ICRP. Occupational limits, Non-occupational limits Exposure of individuals under 18 Years of age; Occupational limits in the Dose-Equivalent System -The 2007 ICRP Recommendations. d. Internal Dosimetry and Radiation Protection: ICRP-30 Dosimetric Model for the Respiratory System

and Gastrointestinal Tract, ICRP-66 Human Respiratory Tract Model, ICRP-30 Dosimetric Model for the Organ Activities as Functions of Time, for Submersion in a Radioactive Gas Cloud , Metabolic Data for Reference Man, ICRP Publication 89, Specific Absorbed Fraction, Specific Effective Energy, and Committed Quantities; Number of Transformations in Source Organs over 50 Y. e. External Radiation Protection: Design concepts of distance, time, and shielding for radiation protection, primary and secondary protective barriers; shielding of Gamma-Ray, X-rays, beta and neutron radiation, ICRP Report.

3. Hands on experience with background radiation and contamination measurement, concepts of statistical variation of radiation measurement.
4. Term Paper group interaction, writing manuscript, and personal presentation.

CHME 574. Power Plant Design
3 Credits (3)
Principles of electric power generation. Review of DC and AC systems, energy sources, and prime movers. Analysis of hydroelectric, fossil fuel, nuclear, and alternative power systems. Environmental and economic considerations. Taught with CHME 474. May be repeated up to 3 credits.
Learning Outcomes
1. Write and explain the meanings of the basic concepts and equations related to electric power generation.
2. Formulate mathematical models and solve problems involving electric power generation.
3. Summarize the economic, environmental, and regulatory issues involving electric power generation.

CHME 576. Nuclear Fuel Cycles
3 Credits (3)
Physical and chemical processes in the conventional nuclear fuel cycle: uranium mining and milling, conversion, enrichment, fuel fabrication, reactor operations, interim storage, reprocessing and recycling, waste treatment and disposal. Alternative fuel cycles and future prospects. Taught with CHME 476. May be repeated up to 3 credits.
Learning Outcomes
1. Write and explain the basic principles and equations related to the conventional nuclear fuel cycle.
2. Solve problems involving chemical and nuclear processes in the conventional nuclear fuel cycle.
3. Given a verbal or pictorial description, create useful mathematical models of chemical engineering systems in the nuclear fuel cycle.
4. Discuss the global environmental, social, and economic implications of nuclear fuel cycles.

CHME 578. Electrochemistry: Basics & Applications
3 Credits (3)
Theory and application of electrochemical devices. Topical information related to electrochemistry are concepts, principles, and examples of energy storage, mechanisms responsible for electrochemical devices, and current progress and problems. Relevant devices covered include the lithium ion battery, supercapacitor, fuel cell, solar cell and electrolyzer.
Prerequisite: CHEM 1215G or CHEM 1216.
Learning Outcomes
1. Understand the mechanisms responsible for electrochemical devices, realize the current progress and identify the problems that challenge the practical applications.

CHME 590. Graduate Seminar
1 Credit (1)
Presentations on topics of professional interest in chemical engineering. Includes seminars by faculty, graduate students, and invited speakers from academia, government, and industry. May be repeated up to 6 credits.
Learning Outcomes
1. Expose students to the breadth and depth of research in chemical engineering and related fields.

CHME 591. Graduate Special Topics
1-3 Credits (1-3)
Lecture and/or laboratory instruction on special topics in chemical engineering. May be repeated up to 12 credits.
Learning Outcomes
1. Gain exposure to, knowledge of, and practice solving problems in a variety of CHME topics that are directly related to broadening the MSCHE, MECPI, and PHDCHE curriculum and the student's career goals.
2. Topics will vary by years and section depending on current topics of interest in CHME and availability of instructors.
3. Be provided an opportunity to apply principles and techniques learned in the CHME curriculum to real life problem-solving situations in specialized topics.

CHME 593. Graduate Special Projects
1-3 Credits (1-3)
Provides an opportunity for graduate students to work on special projects under the direction of a faculty member. Written report covering work is required. May be repeated up to 6 credits.
Learning Outcomes
1. Prepare a written project report conforming to the format of the CHME writing standard.
2. Articulate a clear project question or problem.
3. Define, articulate, and use appropriate terminology and concepts.
4. Use library and other tools to search for existing body of information relevant to their project.
5. Identify and practice appropriate engineering ethics.
6. Know and apply problem solving skills to constructively address setbacks.
7. Work collaboratively with others, using listening and communication skills.
8. Work autonomously in an effective manner, setting and meeting deadlines.
9. Reflect on own project outcomes, identifying lessons learned, strengths, and ways to improve. 1
10. Communicate confidently and constructively with students, faculty, and project sponsor (as required). 1
11. Explain project to others in the field and to broader audiences through presentations. 1
12. Articulate the relevance of their project to their coursework and professional future, synthesizing their project, academic, and professional interests and goals.

CHME 594. Professional Communication in Chemical Engineering
2 Credits (2)
Connections between interpersonal relationships and the effective communication of information. Strategies for formal and informal written and verbal communication in the context of presentations, interviews, reports and publications. Factors affecting non-verbal communication.

Special focus will be given to understanding and adapting to the audience's perspective. 2 credits. Open to chemical engineering graduate students or by permission of instructor. This class will prepare you to communicate technical information effectively within a variety of contexts and to a variety of audiences. Class assignments will be partially based on current student needs such as preparing presentations for professional conferences, giving research progress reports, and writing research manuscripts.

Learning Outcomes

1. Describe why and how interpersonal relationships affect communication of information, even within technical contexts.
2. Describe and implement methods for improving interpersonal relationships; introduce themselves to others, implement strategies for dealing with conflicts.
3. Assess the rhetorical situation for a given communication.
4. Display evidence and reasoning as well as convey credibility.
5. Understand different stakeholder audiences, and how to communicate with them differently.
6. Analyze the consequences of actions and ethical principles.
7. Design documents for users, including dividing content into manageable units.
8. Write a manuscript for the research community, including appropriate citations; manage time to allow for revisions and peer evaluation, provide useful feedback to peers during the revision process, find, understand and follow directions for manuscript and proposal preparation, locate relevant peer-reviewed journal articles using library and web resources.
9. Choose precise, accurate and concise language, and eliminate jargon, prepare effective graphs, illustrations, tables and equations. 1
10. Prepare, rehearse and deliver a research presentation.

CHME 595. Chemical Process Design and Business Analysis
3 Credits (3)

Graduate chemical process design principles, emphasizing literature review, patent search, heuristics application, process simulation assistance to process creation, synthesis of reactor and separator trains, second-law analysis, heat and power integration, process equipment mechanical design specifications, process design optimization, cost accounting and capital estimation, annual costs, earnings, and profitability analysis.

Prerequisite: CHME 452, CHME 455 L or equivalent.
Prerequisite/Corequisite: CHME 506, CHME 516, CHME 542.

Learning Outcomes

1. Make a definitive estimate or project control.
2. Perform research on the process.
3. Identify the equipment, instrumentation needed.
4. Summarize the safety aspects.
5. Identify the environmental impact.
6. List local/state/federal regulations.
7. Provide a cost estimate from vendor costs.
8. Provide sketches and drawings for the plant or system (e.g. PIDs, plot plans, evaluation diagrams, energy balances, and final PFDs with stream tables/mass balances).
9. Provide final cohesive report.

CHME 596. Chemical Process Industries Research
1 Credit (1)

Independent graduate-level chemical process design project development, literature search, and proposal/defense.

Prerequisite: CHME 595.

Learning Outcomes

1. Information about the entire process, the equipment, the instrumentation (background).
2. Information about safety aspects (even if this is existing and not new).
3. Environmental control, local/state/federal regulations, etc.
4. Prepare and defend a comprehensive report.

CHME 597. Advanced Chemical Process Industry Analysis
2 Credits (2)

In-depth analysis and defense of a timely commercially-relevant chemical process design.

Prerequisite: CHME 596.

Learning Outcomes

1. Prepare a final report that is comprehensive.
2. Data collected, an analysis related to yield, or anything else that would be appropriate as a final discussion/conclusions/recommendations about the process.
3. Add figures/graphs/tables as well as sketches and drawings for the plant PIDs, plot plans, elevation diagrams, energy balances, final PFDs with stream tables/mass balances.

CHME 599. Master's Thesis
1-15 Credits (1-15)

Thesis. May be repeated up to 88 credits.

Learning Outcomes

1. Varies, to make progress toward a Master of Science degree.

CHME 690. Graduate Seminar
1 Credit (1)

Presentations on topics of professional interest in chemical engineering. Includes seminars by faculty, graduate students, and invited speakers from academia, government, and industry. Required each semester for every Ph.D. student. All candidates for graduate degrees required to give seminar. May be repeated up to 8 credits.

Learning Outcomes

1. Expose students to the breadth and depth of research in chemical engineering and related fields.

CHME 698. Ph.D. Research
1-9 Credits (1-9P)

Advanced topics for current research. Course subtitled in the Schedule of Classes. May be repeated up to 99 credits.

Learning Outcomes

1. To make progress toward a PhD degree.

CHME 700. Doctoral Dissertation
1-9 Credits (1-9)

Individual research in selected topics of current interest in chemical engineering. May be repeated up to 88 credits.

Learning Outcomes

1. Demonstrate skills in the (a) design of experiments or simulations, (b) collection of experimental/simulated data, (c) development of appropriate models, and (d) make appropriate use of those models;
2. Complete an independent research project, resulting in at least a thesis/dissertation and peer-reviewed journal article(s);
3. Defend original research in front of a panel of peers and experts;
4. Be knowledgeable of the contemporary issues that are relevant to their chosen area of research.

Office Location: Jett Hall 268 (https://map.nmsu.edu/?ct/)

Phone: (575) 646-1214

Website: http://chme.nmsu.edu/ (http://chme.nmsu.edu)

Chemical Engineering - Bachelor of Science in Chemical Engineering

The BS Chemical Engineering program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org.

Requirements (Total Credits 124)

In addition to satisfying the requirements of New Mexico State University and the College of Engineering, CHME majors must pass departmental courses with a grade of C- or better.

Students having completed MATH 1521G Calculus and Analytic Geometry II or MATH 1521H Calculus and Analytic Geometry II Honors may enroll in CHME 101 Introduction to Chemical Engineering Calculations and CHME 201 Energy Balances & Basic Thermodynamics simultaneously. CHME majors must have completed CHME 201 Energy Balances & Basic Thermodynamics prior to taking any 400-level CHME elective courses.

Degree requirements can also be found summarized in flow diagrams found on the CHME website (https://chme.nmsu.edu/academics/undergrad/chme-flow-diagrams/).

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 124 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I [1]	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
COMM 1115G	Introduction to Communication	3
or HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [2]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World [3]		**3**
Departmental/College Requirements		
CHME 101	Introduction to Chemical Engineering Calculations	2
CHME 102	Material Balances	2
CHME 201	Energy Balances & Basic Thermodynamics	3
CHME 303	Chemical Engineering Thermodynamics	4
CHME 305	Transport Operations I: Fluid Flow	3
CHME 306	Transport Operations II: Heat and Mass Transfer	4
CHME 307	Transport Operations III: Staged Operations	3
CHME 323 L	Transport Operations and Instrumentation Laboratory	2
CHME 341	Chemical Kinetics and Reactor Engineering	3
CHME 352 L	Simulation of Unit Operations	2
CHME 361	Engineering Materials	3
CHME 392	Numerical Methods in Engineering	3
CHME 412	Process Dynamics and Control	3
CHME 423 L	Unit Operations Laboratory	2
CHME 448	Industrial Safety	3
CHME 452	Chemical Process Design & Economic Evaluation	3
CHME 455	Chemical Plant Design	3
CHME 455 L	Chemical Plant Simulation	1
CHME Electives [4]		6
Non-Departmental Requirements		
Mathematics		
MATH 2530G	Calculus III	3
MATH 3160	Introduction to Ordinary Differential Equations	3
Natural Science		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
CHEM 313	Organic Chemistry I	3
CHEM 314	Organic Chemistry II	3
CHEM 315	Organic Chemistry Laboratory	2
CHEM 433	Physical Chemistry I	3
Engineering		
I E 311	Engineering Data Analysis	3
I E 365	Quality Control	3
Second Language: (not required)		
Electives, to bring the total credits to 124		**0**
Total Credits		**124**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. MATH 1511G Calculus and Analytic Geometry I or MATH 1511H Calculus and Analytic Geometry I Honors is required for the degree but students may need to take any prerequisites needed to enter

MATH 1511G Calculus and Analytic Geometry I or MATH 1511H Calculus and Analytic Geometry I Honors first.

[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
Also see the 9-credit hour rule at the bottom of the page. CHMEs meet the 9-credit hour rule through the sequence CHEM 313/314/433, and thus only need to complete 3 credits of VWW.

[4] chme.nmsu.edu/academics/syllabi/#CHME_Elective_Courses (https://chme.nmsu.edu/academics/Syllabi.html#CHME_Elective_Courses)

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I or MATH 1511H Calculus and Analytic Geometry I Honors and ENGL 1110G Composition I or ENGL 1110H Composition I Honors. The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
CHME 101	Introduction to Chemical Engineering Calculations	2
CHEM 1215G or CHEM 1216	General Chemistry I Lecture and Laboratory for STEM Majors or General Chemistry I Lecture and Laboratory for CHEM Majors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**17**
Spring		
CHME 102	Material Balances	2
CHEM 1225G or CHEM 1226	General Chemistry II Lecture and Laboratory for STEM Majors or General Chemistry II Lecture and Laboratory for CHEM Majors	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
	Credits	**17**
Second Year		
Fall		
CHME 201	Energy Balances & Basic Thermodynamics	3
CHEM 313	Organic Chemistry I	3
MATH 2530G	Calculus III	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
	Credits	**16**
Spring		
CHME 303	Chemical Engineering Thermodynamics	4
CHME 305	Transport Operations I: Fluid Flow	3
I E 311	Engineering Data Analysis	3
CHEM 314	Organic Chemistry II	3
MATH 3160	Introduction to Ordinary Differential Equations	3
	Credits	**16**
Third Year		
Fall		
CHME 306	Transport Operations II: Heat and Mass Transfer	4
CHME 323 L	Transport Operations and Instrumentation Laboratory [5]	2
CHME 361	Engineering Materials	3
CHME 392	Numerical Methods in Engineering	3
CHEM 433	Physical Chemistry I	3
CHEM 315	Organic Chemistry Laboratory	2
	Credits	**17**
Spring		
CHME 307	Transport Operations III: Staged Operations	3
CHME 341	Chemical Kinetics and Reactor Engineering	3
CHME 352 L	Simulation of Unit Operations	2
Area IV: Social/Behavioral Sciences Course [2]		3
CHME Elective [4]		3
	Credits	**14**
Fourth Year		
Fall		
CHME 412	Process Dynamics and Control	3
CHME 423 L	Unit Operations Laboratory [5]	2
CHME 448	Industrial Safety	3
CHME 452	Chemical Process Design & Economic Evaluation	3
I E 365	Quality Control	3
	Credits	**14**
Spring		
CHME 455	Chemical Plant Design	3
CHME 455 L	Chemical Plant Simulation	1
CHME Elective [4]		3
Area V: Humanitites Course [2]		3
Viewing a Wider World Course [3]		3
	Credits	**13**
	Total Credits	**124**

[1] MATH 1511G Calculus and Analytic Geometry I or MATH 1511H Calculus and Analytic Geometry I Honors is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I or MATH 1521H Calculus and Analytic Geometry II Honors first.

[2] See the General Education (p. 262) section of the catalog for a full list of courses. For Area IV,V, and VI courses, students may take them at any time their schedule allows.

[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
Also see the 9-credit hour rule at the bottom of the page. CHMEs meet the 9-credit hour rule through the sequence CHEM 313/314/433, and thus only need to complete 3 credits of VWW.

[4] chme.nmsu.edu/academics/syllabi/#CHME_Elective_Courses (https://chme.nmsu.edu/academics/Syllabi.html#CHME_Elective_Courses)

[5] CHME 323L and CHME 423L are generally offered fall and spring semesters. Students can take them either semester.

Biomedical Engineering - Undergraduate Minor

The Biomedical Engineering minor-of-study is a 20-credit hour program of study designed to accomplish two objectives:

1. Require courses in basic biology, anatomy, physiology to provide students a basic understanding of life and the design and mechanics/dynamics of the human body. Also required is the only biomedical engineering course taught on the NMSU campus.
2. Permit students to select from a wide range of elective courses (https://chme.nmsu.edu/academics/minors/biomedical-engineering/) (https://chme.nmsu.edu/academics/minors/biomedical-engineering/) numbered above 400 that emphasize engineering topics with application to the design and development of medical devices.

Prefix	Title	Credits
Required Courses		
CHME 481	Biomedical Engineering and Engineering Healthcare	3
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
BIOL 353	Pre-Professional Human Anatomy	4
or SPMD 2210/2210L	Anatomy and Physiology I	
or BIOL 2210	Human Anatomy and Physiology I	
BIOL 354	Physiology of Humans	3
or SPMD 2225	Anatomy and Physiology II	
or BIOL 2225	Human Anatomy and Physiology II	
Electives		6
Total Credits		**20**

Brewery Engineering- Undergraduate Minor

It has long been recognized that the study of chemical engineering is appropriate to the understanding of a vast range of concepts associated with the brewing industry. In 1935, an article by M. B. Donald described many of the fundamental process steps for which the Bachelor of Science degree in Chemical Engineering prepares a student to begin work in the industry. The following 18 credit hour minor of study is designed to prepare CHME students for careers in the brewing industry or as a craft brew entrepreneur as per the 4-year curriculum suggestions by the Master Brewer's Association of the Americas. Note that BIOL 311 General Microbiology requires BIOL 2110G Principles of Biology: Cellular and Molecular Biology as a pre-requisite and FSTE 4110 Food Microbiology requires BIOL 2110G Principles of Biology: Cellular and Molecular Biology/ BIOL 2110L Principles of Biology: Cellular and Molecular Biology Laboratory as pre-requisites. Elective courses are to be selected from the lists and guidelines maintained on the Brewery Engineering minor of study webpage (https://chme.nmsu.edu/academics/minors/brewery-engineering/).

Prefix	Title	Credits
CHME 395V	Brewing Science and Society	3
CHME 495	Brewing Science & Engineering	3
CHME 495 L	Brewing Science & Technology Lab	1
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory	5
or FSTE 4110	Food Microbiology	
BCHE 395	Biochemistry I	3
Electives (to bring total to at least 18)		4-3
Total Credits		**19-18**

Computational Engineering- Undergraduate Minor

The minor in Computational Engineering is designed to provide students with a concentration in the broad spectrum of computations in engineering, including experience with an object-oriented programming language, a background in computational math techniques, and a number of courses that develop or apply engineering software across a broad base of engineering design problems.

Electives must be taken from the list maintained on the Computational Engineering minor webpage (https://chme.nmsu.edu/academics/minors/computational-engineering/)

Prefix	Title	Credits
CHME 392	Numerical Methods in Engineering	3
or M E 261	Numerical Methods	
Choose one from the following:		3
I E 311	Engineering Data Analysis	
STAT 3110	Statistics for Engineers and Scientists	
Choose one from the following:		3
CSCI 1240	C++ Programming I	
CSCI 1220	Computer Programming Fundamentals: Python	
CSCI 1210	Computer Programming Fundamentals	
CSCI 1235	R Programming I	
ENGR 140	Introduction to Programming and Embedded Systems	
ICT 152	Java Programming	
An equivalent pre-approved object-oriented programming course		
Electives		9
Total Credits		**18**

Materials Engineering - Undergraduate Minor

The Materials Engineering minor at New Mexico State University is part of a materials education program that addresses the growing demand for engineers and scientists with understanding of the wide range of materials, their properties and means of characterization. A student must pass 18 credits of courses with a grade C- or better. The minor elective courses are chosen from list available on the Chemical and Materials Engineering website (http://chme.nmsu.edu/academics/minors/materials-engineering/). No courses may be taken S/U. All prerequisites for the classes must be met or consent of the instructor obtained before enrolling in class.

Prefix	Title	Credits
Required Courses		
CHME 361	Engineering Materials	3
Electives [1]		15
Total Credits		**18**

Nuclear Chemical Engineering - Undergraduate Minor

The Nuclear Chemical Engineering minor at New Mexico State University is part of a nuclear education program that addresses the growing demand for engineers and scientists with background in the nuclear industry. A student must pass 18 credits of elective courses with a grade C- or better. The courses are upper division courses. Three elective courses must be selected from the list maintained on the CHME website (http://chme.nmsu.edu/academics/minors/nuclear-chemeng/ (https://chme.nmsu.edu/academics/minors/nuclear-chemeng/)). No courses may be taken S/U. All prerequisites for the classes must be met or consent of the instructor obtained before enrolling in class.

Prefix	Title	Credits
Required Courses		
CHME 470	Introduction to Nuclear Energy	3
CHME 476	Nuclear Fuel Cycles	3
Electives		12
Total Credits		**18**

Pre-Law in Intellectual Property - Undergraduate Minor

The Pre-Law Intellectual Property minor at New Mexico State University is part of a pre-law education program that addresses the growing demand for lawyers with a strong understanding of a broad cross-section of STEM subjects. A student must pass 18 credits of courses with a grade C- or better chosen from Pre-Law Intellectual Property minor (https://chme.nmsu.edu/academics/minors/pre-law-intellectual-property-minor/) page available on the Chemical and Materials Engineering website. No courses may be taken S/U. All prerequisites for the classes must be met or consent of the instructor obtained before enrolling in class.

Prefix	Title	Credits
Required Courses		
CHME 451	Intellectual Property for Engineers and Scientists	3
COMM 3120	Persuasion Theory and Practice	3
BLAW 316	Legal Environment of Business	3
PHIL 1145G	Philosophy, Law, and Ethics	3
POLS 391	Constitutional Law	3
POLS 394	Judicial Process	3
Total Credits		**18**

Pre-Medicine Studies- Undergraduate Minor

The Pre-Medical School minor at New Mexico State University is part of a pre-medicine education program that addresses the growing demand for doctors, surgeons, and biomedical researchers with a strong understanding of a broad cross-section of STEM subjects and who model the human body as a series of interacting chemical process units. This minor of study is designed for students seeking a strong pre-med background (for both MCAT prep and program entry prerequisite completion) or who may be targeting a graduate degree in biomedical engineering. A student must pass 21-22 credits of courses with a grade C- or better. The minor includes 18-19 credit hours of required courses, and 3 credit hours of elective courses. No courses may be taken S/U. All prerequisites for the classes must be met or consent of the instructor obtained before enrolling in class.

Prefix	Title	Credits
CHME 305	Transport Operations I: Fluid Flow	3
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
Choose one course and lab combination below:		4-5
BIOL 353 & 353 L	Pre-Professional Human Anatomy and Pre-Professional Human Anatomy Laboratory	
SPMD 2210 & 2210L	Anatomy and Physiology I and Anatomy and Physiology Laboratory	
Choose one course and lab combination below:		4
BIOL 354 & 354 L	Physiology of Humans and Laboratory of Human Physiology	
SPMD 2225 & 2225L	Anatomy and Physiology II and Anatomy and Physiology II Lab	
BCHE 395	Biochemistry I	3
Elective		3
Total Credits		**21-22**

Civil and Environmental Engineering

Undergraduate Program Information

Mission Statement

The mission of the Civil Engineering Department for the undergraduate program is to offer a high-quality accredited Bachelor of Science (B.S.) degree that prepares our graduates for professional licensure leading to successful civil engineering careers in the industry and government, and for success in graduate education. Toward this end, the Civil Engineering Department will recruit and retain qualified and diverse faculty that are committed to student learning and development, and serve as role models to the undergraduate students.

Continued excellence in our undergraduate program is paramount to our mission by providing a strong technical foundation to our graduates for engineering design and problem solving; preparing quality graduates for licensure and professional careers in civil engineering; implementing modern and effective learning methods; maintaining close student-faculty learning interactions; and instilling life-long learning skills and goals for professional growth after graduation.

Program Educational Objectives

Within a few years after graduation, graduates of the Civil Engineering undergraduate program will:

1. Be successfully employed in civil engineering or related careers.
2. Be pursuing professional licensure, appropriate certifications, graduate degrees, and/or professional development activities by fostering life-long learning skills and strategies.

3. Be building on fundamental knowledge and applying technical skills across disciplines in civil engineering and related fields to make data-driven decisions using engineering judgement.
4. Be progressing as independent thinkers, ethical leaders, effective communicators, and collaborative professionals.

Program Criteria

The Civil Engineering curriculum is developed based on the program criteria established collaboratively by the Engineering Accreditation Commission (EAC) of ABET Inc. and the American Society of Civil Engineers (ASCE). The curriculum specifically prepares civil engineering students at the baccalaureate level to graduate with the ability to:

1. Apply:
   a. mathematics through differential equations, probability and statistics, calculus-based physics, chemistry, and either computer science, data science, or an additional area of basic science.
   b. engineering mechanics, materials science, and numerical methods relevant to civil engineering.
   c. principals of sustainability, risk, resilience, diversity, equity, and inclusion to civil engineering problems.
   d. the engineering design process in at least two civil engineering contexts.
   e. an engineering code of ethics to ethical dilemmas.
2. Solve complex engineering problems in at least four specialty areas appropriate to civil engineering.
3. Conduct experiments in at least two civil engineering contexts, as well as analyze and interpret the collected data and report the results.
4. Explain:
   a. concepts and principles in project management and engineering economics.
   b. professional attitudes and responsibilities of a civil engineer, including licensure and safety.

In accordance with the program criteria of ABET and ASCE, the Civil Engineering faculty responsible for teaching design-oriented courses are qualified in their respective professional areas by means of professional licensure, or a combination of education and design experience. Furthermore, the faculty are given responsibility and sufficient authority to define, revise, implement, and achieve program objectives.

Graduate Program Information

Mission Statement

The mission of the Civil Engineering Department regarding graduate education is to provide research-based and practice-oriented post-baccalaureate programs leading to Master of Science (M. S.), Master of Engineering (M. E.), and PhD degrees for students in the areas of environmental, geotechnical, structural, transportation, and water resources engineering. Toward this end, the Civil Engineering Department will recruit and retain qualified and diverse faculty that are committed to student learning and development, scholastic and research excellence, and professional service.

Continued excellence in our graduate program is paramount to our mission by providing advanced academic and technical foundations to our graduates; providing interdisciplinary and collaborative research opportunities and teaching experiences; implementing learning methods that promote critical-thinking and problem-solving; seeking external funding to support innovative research and graduate assistantships; and fostering an intellectual and creative environment that values diversity (of people, research and interests) and research ethics.

The Civil Engineering Department offers excellent opportunities for advanced study and professional training in several fields leading to the M.E. in Civil Engineering, M.S. in Civil Engineering, M.S. in Environmental Engineering, and Ph.D. degrees. Students work closely with the faculty on contemporary issues including, but not limited to, applications of machine / deep learning, bio-geotechnologies, evapotranspiration monitoring of crops and riparian vegetation, ground stabilization, groundwater recharge, high performance materials, non-destructive testing and evaluation, remote sensing, renewable energy, resilient infrastructure, reservoir evaporation monitoring, riparian rehabilitation, structural health monitoring, sustainable construction, and water treatment and reuse.

The department has excellent facilities for teaching and research purposes including laboratories for mechanical, chemical and biological research. In addition, the department conducts research at various field sites located throughout New Mexico in collaboration with local, state, and federal agencies. Noteworthy features of the graduate programs are the energetic, highly motivated faculty and the low student-faculty ratio. The department regularly has several ongoing research projects of various size and scope employing graduate and undergraduate students. Teaching and research assistantships are available to qualified students and office space is normally provided to M.S. thesis and PhD students.

Students enrolling for graduate studies in civil engineering must have received a bachelor's degree in engineering or one of the allied fields. A candidate for the M.S. in Civil Engineering or M.S. in Environmental Engineering degree may choose either a thesis or a non-thesis track. The M.E. in Civil Engineering degree requires only coursework. When a student enrolls for the Ph.D. program, a doctoral committee is formed to assist the student in planning a program appropriate to the student's background and goals and to administer the required examinations. All Ph.D. candidates in civil engineering must have a demonstrated proficiency in English and two research tools. Mutual understanding between the Ph.D. candidate and his or her doctoral committee on the final nature of these two research tools will be on an individual basis.

Master's Accelerated Program

The Master's Accelerated Program (MAP) option provides students the opportunity to complete a B.S. in Civil Engineering and a master's degree (M.E. in Civil Engineering, M.S. in Civil Engineering or M.S. in Environmental Engineering) with 144 to 150 credit hours; the non-accelerated path requires 156 credit hours (B.S. requires 126 credit hours plus the M.E. or M.S. which require 30 credit hours each). Students accepted into this program will follow the normal path of the Civil Engineering undergraduate curriculum, of which up to 12 credit hours comprised of senior-level (> 450) and/or graduate-level (> 500) courses will be counted towards the master's degree; the MAP courses must be approved by the department head and completed with a grade of B or better. When students receive their bachelor's degree in Civil Engineering, there are 18 to 24 credit hours left for the master's degree which can be completed in 2 to 3 semesters for full-time students. Students must apply for admission during the final semester of their junior year and obtain prior approval by the department head to pursue the MAP option.

Degrees for the Department

Bachelor Degree(s)

- Civil Engineering - Bachelor of Science in Civil Engineering (p. 1084)

Master Degree(s)

- Civil Engineering - Master of Engineering (p. 128)
- Civil Engineering - Master of Science in Civil Engineering (p. 130)
- Environmental Engineering - Master of Science in Environmental Engineering (p. 158)

Doctoral Degree(s)

- Engineering (Civil Engineering) - Doctor of Philosophy (p. 220)

Minors for the Department

- Agricultural Engineering - Undergraduate Minor (p. 1086)
- Environmental Engineering - Undergraduate Minor (p. 1086)
- Geotechnical Engineering - Undergraduate Minor (p. 1086)
- Structural Engineering - Undergraduate Minor (p. 1087)
- Water Resource Engineering - Undergraduate Minor (p. 1087)

Department Faculty Members

Professors Bandini[1], Jáuregui[1] (Interim Dean of Engineering), Khandan[1] (Emeritus) Newtson (Department Head), Papelis (Director of Carlsbad Environmental Monitoring & Research Center), Reddi[1] (Interim Provost), Samani[1] (Emeritus), White[1] (Emeritus), Xu; **Associate Professors** Bawazir (Assoc. Department Head), Cho[1], Cortes, Wang, Y. Zhang[2] ; **Assistant Professors** Choe[1], Ingol Blanco, Li, Wan[1], Q. Zhang; **Professors of Practice** Al Aqtash, Mousavinezhad

U. Al Aqtash, Ph.D. (New Mexico State) – geotechnical engineering; P. Bandini, Ph.D. (Purdue) – geotechnical engineering; A. S. Bawazir, Ph.D. (New Mexico State) – agricultural/water resources engineering; H. Cho, Ph.D. (Texas A&M) – water resources engineering; D. Choe, Ph.D. (Texas A&M) – structural engineering; D. Cortes, Ph.D. (Georgia Tech) – geotechnical engineering; E. Ingol Blanco, Ph.D. (Texas-Austin) – water resources engineering; D. V. Jáuregui, Ph.D. (Texas-Austin) – structural engineering; N. N. Khandan, Ph.D. (Drexel) – environmental engineering; R. Li, Ph.D. (Florida State) – environmental engineering; S. Mousavinezhad, Ph.D. (New Mexico State) - structural engineering; C. Newtson, Ph.D. (Washington) – structural engineering; L. Papelis, Ph.D. (Stanford) – environmental engineering; L. N. Reddi, Ph.D. (Ohio State) – geotechnical engineering; Z. Samani, Ph.D. (Utah State) - water resources engineering; Z. Wan, Ph.D. (Pittsburgh) – structural engineering; H. Wang, Ph.D. (Lanzhou-China) – environmental/materials engineering; K. R. White, Ph.D. (Texas Tech) – structural engineering; P. Xu, Ph.D. (ENGREF, Paris, France) – environmental engineering; Q. Zhang, Ph.D. (Pittsburgh) – structural engineering; Y. Zhang, Ph.D. (Missouri-Columbia) – environmental engineering.

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- [1]Professional Engineer (PE) in United States
  [2]Professional Engineer (PEng) in Canada

Agricultural Engineering Courses

A EN 459. Groundwater, Wells & Pumps
3 Credits (3)
Occurrence and movement of groundwater; design of water wells; selection and specification of pumps and power units. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 382 or consent of instructor.
Learning Outcomes
1. Understand the occurrence and movement of groundwater in aquifers, and extraction of it.
2. Ability to interpret pump specifications and data.
3. Select and detail power units for pumping systems.

A EN 478. Irrigation and Drainage Engineering
3 Credits (2+3P)
Design and operation of surface and sprinkler irrigation systems; pumping and conveyances; introduction to principles and practices of drainage systems and wells. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 382 or consent of instructor.
Learning Outcomes
1. Students will be able analyze and design irrigation systems.

A EN 498. Special Topics
1-3 Credits
Special topics in agricultural engineering. May be repeated up to 3 credits.
Prerequisite: consent of instructor.
Learning Outcomes
1. Students will develop knowledge related to the specific agricultural engineering special topic selected for study.

Civil Engineering Courses

C E 109. Computer Drafting Fundamentals
3 Credits (2+2P)
Introduction to principles and fundamentals of drafting using both manual drawing techniques and computer-aided drafting (CAD) applications. Crosslisted with: DRFT 109 and E T 109. May be repeated up to 3 credits.
Learning Outcomes
1. Describe related career options/pathways.
2. Explain and apply common drafting terms, concepts, and conventions.
3. Utilize various AutoCAD commands and Coordinate Entry methods to produce accurate and precise Two-Dimensional drawings.
4. Setup AutoCAD working environment, drawings, styles, and applicable settings.
5. Navigate the AutoCAD user interface efficiently.
6. Apply different drafting methods, strategies, and processes.
7. Utilize AutoCAD to produce basic 2D CAD working drawings.
8. Measure utilizing scales accurately.
9. Create drawings with different scales and units. 1
10. Plot drawings produced in AutoCAD at various scales and on various sheet sizes. 1
11. Utilize the two Drawing Environments: Paper Space and Model Space. 1
12. Manage AutoCAD drawing files.

C E 151. Introduction to Civil Engineering
3 Credits (3)
Problem solving and use of computer software for civil engineering applications. May be repeated up to 3 credits.
Prerequisite/Corequisite: MATH 1220G.
Learning Outcomes
1. Understand the Civil Engineering profession and curriculum.
2. Develop software skills for use in Civil Engineering education and professional practice.
3. Understand and apply the basics of professional and academic ethics.

C E 198. Special Topics
1-3 Credits
Special topics in civil engineering. May be repeated up to 6 credits.
Prerequisite: consent of department head.
Learning Outcomes
1. Students will develop knowledge related to the specific civil engineering special topic selected for study.

C E 233. Mechanics-Statics
3 Credits (3)
Engineering mechanics using vector methods. May be repeated up to 3 credits.
Prerequisite: C- or better grade in MATH 1521G or MATH 1521H, C- or better grade in PHYS 1310G and cumulative GPA of 2.0.
Learning Outcomes
1. Student will be able to apply concepts of equilibrium.

C E 234. Mechanics-Dynamics
3 Credits (3)
Kinematics and dynamic behavior of solid bodies utilizing vector methods. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better grade in the following: C E 233 and PHYS 1310G and MATH 1521G or MATH 1521H.
Learning Outcomes
1. Student will be able to apply concepts of kinematics and accelerated motion.

C E 256. Environmental Engineering and Science
3 Credits (3)
Principles in environmental engineering and science: physical chemical systems and biological processes as applied to pollution control. Crosslisted with: ENVS 2111.
Prerequisite: (C- or better grade in CHEM 1215G) and (C- or better grade in MATH 1511G or ENGR 190).

C E 256 L. Environmental Science Laboratory
1 Credit (1P)
Laboratory experiments associated with the material presented in C E 256. May be repeated up to 1 credit. Same as ENVS 2111L.
Corequisite: C E 256.
Learning Outcomes
1. An understanding of experimental analyses related to environmental science

C E 298. Special Topics
1-3 Credits
Special topics in civil engineering. May be repeated up to 6 credits.
Prerequisite: consent of department head.
Learning Outcomes
1. Students will develop knowledge related to the specific civil engineering special topic selected for study.

C E 301. Mechanics of Materials
3 Credits (3)
Stress, strain, and elasticity of materials. May be repeated up to 3 credits.
Prerequisite: C- or better grade in ENGR 233.
Learning Outcomes
1. Calculate deformations, stresses, and strains of various types of members under loading.
2. Calculate principal stresses and strains.
3. Perform two-dimensional stress and strain transformation.
4. Analyze statically indeterminate structures using the method of consistent deformations.
5. Construct shear and moment diagrams for beam type structures.
6. Calculate beam deflections and rotations using various methods.
7. Determine buckling loads for elastic columns.

C E 311. Civil Engineering Materials
3 Credits (2+3P)
Introduction to the structure, physical properties, testing and mechanical behavior of civil engineering materials and components made from these materials. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 301.
Learning Outcomes
1. Students will understand the structure, properties, and roles of steel, aggregates, concrete, masonry, wood, and asphalt in civil engineering.

C E 315. Structural Analysis
4 Credits (3+3P)
Classical analysis of determinate and indeterminate structures; introduction to modern methods of structural analysis using computer programs. May be repeated up to 4 credits.
Prerequisite: C- or better grade in C E 301.
Learning Outcomes
1. Students will be able to compute internal resultants and deflections for trusses, beams, and frames.
2. Students will be able to analyze statically determinate and statically indeterminate structures.

C E 331. Fluid Mechanics and Hydraulics
3 Credits (3)
Fluid Mechanics and Hydraulics. Fundamentals and theory of fluid mechanics, compressible fluids, flow of incompressible fluids in open and closed conduits.
Prerequisite: C- or better grade in PHYS 1310G, C- or better grade in ENGR 233 or C E 233.
Learning Outcomes
1. Students learn how to read and interpret problem statements related to fluid mechanics and hydraulics, how to work in teams as well as apply critical thinking skills to solve problems.
2. Students develop an understanding of the theories and principles of hydraulics to understand hydraulic engineering components and subsystems.

C E 331 L. Fluid Mechanics and Hydraulics Laboratory
1 Credit (1P)
Fundamentals and Theory of Fluid Mechanic, compressible and incompressible flow of fluids in open and closed conduits.
Prerequisite/Corequisite: C E 331. Restricted to: C E majors.
Learning Outcomes
1. An understanding of fluid statics and dynamics as demonstrated by a series of hydraulic experiments.

C E 355V. Technology and the Global Environment
3 Credits (3)
A scientific basis for understanding changes in the global environment that result through the complex interactions of natural phenomena and the impacts of the activities of man. May be repeated up to 3 credits.
Prerequisite: junior or senior standing, and the general education requirements for math and natural sciences.
Learning Outcomes
1. An understanding of the natural and man-made factors that influence changes in the global environment.

C E 356. Fundamentals of Environmental Engineering
3 Credits (3)
Introduction to water treatment and water pollution and the analysis and design of selected treatment processes. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 256.
Learning Outcomes
1. Students will understand water treatment processes.
2. Students will understand wastewater treatment processes.

C E 357. Soil Mechanics
3 Credits (2+3P)
Engineering properties of soils, consolidation settlement, compaction, water flow through soils, geostatic stresses, soil shear strength, lateral earth pressure, and soil laboratory testing.
Prerequisite: GEOL 1110G and C E 301.
Learning Outcomes
1. The course covers the basic principles governing the mechanical behavior of soils.
2. Students will develop an understanding of soil mechanics, flow through porous media, and mass-volume relationships, as well as the laboratory methods for measuring the mechanical and index properties of soils.
3. Students will be able to interpret and use the laboratory test results for soil classification and for solving simple geotechnical engineering problems.

C E 382. Hydraulic and Hydrologic Engineering
3 Credits (3)
Analysis and design of hydraulic systems, including pipe networks, open channels, regulating structures, and pumping systems. Surface water and groundwater hydrology, analysis and design. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 331, C E 331 L.
Learning Outcomes
1. Student will be able to analyze hydraulic systems such as pipes, pumps, and open channels.

C E 398. Special Topics
1-3 Credits
Special topics in civil engineering. May be repeated up to 6 credits.
Prerequisite: consent of department head.
Learning Outcomes
1. Students will develop knowledge related to the specific civil engineering special topic selected for study.

C E 435. Technical Communication for Engineers
3 Credits (3)
The course addresses the fundamentals of communicating technical information that is clear, concise, and concrete to a wide variety of stakeholder types.
Learning Outcomes
1. Ability to write in a way that is clear.
2. Ability to write in a way that is concise.
3. Ability to write in a way that is concrete.

C E 444. Elements of Steel Design
3 Credits (3)
Analysis and design of tension members, beams, columns, and bolted and welded connections. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 315.
Prerequisite/Corequisite: C E 311.
Learning Outcomes
1. Students will be able to design structural steel elements (compression, tension, and flexural members) and connections.

C E 445. Reinforced Concrete Design
3 Credits (3)
Design and mechanics of structural reinforced concrete members. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 315.
Prerequisite/Corequisite: C E 311.
Learning Outcomes
1. Students will be able to analyze and design reinforced concrete structural elements subjected to loads.
2. Students will be able compute development lengths of reinforcing steel.
3. Students will understand the importance of meeting code requirements in their designs.

C E 452. Geohydrology
3-4 Credits (3+1P)
Origin, occurrence, and movement of fluids in porous media and assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. Crosslisted with: ENVS 452 and GEOL 452.
Prerequisite(s): Junior or Senior.
Learning Outcomes
1. An understanding of the movement of water in porous media and its effects on aquifers.
2. An understanding of the development and conservation of ground water resources.

C E 454. Wood Design
3 Credits (3)
Theory and design of wood structural members and systems subjected to gravity and lateral loads. Taught every other year, alternates with C E 455, Masonry Design. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 315.
Prerequisite/Corequisite: C E 311.
Learning Outcomes
1. Students will have a working knowledge of wood materials commonly used in structural applications.
2. Students will be able to design wood structural members and components.
3. Students will be able design basic connections between wood structural members.

C E 455. Masonry Design
3 Credits (3)
Theory and design of masonry structural members and systems subjected to gravity and lateral loads. Taught every other year, alternates with C E 454.
Prerequisite: C- or better grade in C E 315.
Prerequisite/Corequisite: C E 311.
Learning Outcomes
1. Introduce students to topics in masonry design that are commonly encountered in structural engineering.
2. Provide the background needed to understand the code requirements applicable to problems in masonry design.

C E 457. Foundation Design
3 Credits (2+3P)

Application of principles of classical soil mechanics to the design of shallow and deep foundations, and the fundamentals of geotechnical site investigation. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 357.
Learning Outcomes
1. Students will be able to apply geotechnical engineering principles to the analysis and design of shallow and deep foundations.
2. Students will be able to compute foundation settlement.

C E 460. Site Investigation
3 Credits (2+2P)
Investigation and characterization of surficial and subsurface geologic materials and ground water for civil engineering projects. Includes exploration program, drilling and sampling, rock and soil classification and logging, groundwater monitoring, profiles, and preparation of geotechnical reports.
Prerequisite: C- or better grade in C E 357.
Prerequisite/Corequisite: C E 457.
Learning Outcomes
1. Develop approach to scoping and conducting a subsurface investigation.
2. Develop an understanding of geotechnical complexity and how to use the graded approach.
3. Use soil mechanics and foundation design skills to perform geotechnical analyses and develop recommendations needed by the project team to provide client(s) with needed facilities.
4. Understand field and laboratory tools and techniques used to develop suitable data for subsurface analyses and geotechnical report recommendations.
5. Understand the observational approach, how to use it, and how to avoid its misuse.
6. Develop skills needed to prepare geotechnical letter reports and complete geotechnical investigation reports.

C E 469. Structural Systems
3 Credits (3)
Design of structural systems for buildings and bridges. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 444 or C E 445.
Learning Outcomes
1. Students will understand the scope of structural design projects.
2. Students will understand how a structural design project, representative of entry-level work in practice, is performed.

C E 470. Design of Municipal and Hazardous Waste Landfills
3 Credits (3)
Solid waste and application of geotechnical engineering principles and methods to the site selection and design of municipal and hazardous waste landfills. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 357 and C E 452, or consent of instructor.
Learning Outcomes
1. Students will understand the importance of site selection for municipal and hazardous waste landfills.
2. Students will understand the elements of design for municipal and hazardous waste landfills.

C E 471. Transportation Engineering
3 Credits (3)
Highway and traffic design and systems. Students must be in junior or senior standing to enroll. May be repeated up to 3 credits.
Prerequisite: C- or better in MATH 1521G.
Learning Outcomes
1. Provide understanding of the principles of transportation engineering with a focus on highway engineering and traffic analysis.
2. Provide basic skill set that will allow a student to address most of the transportation problems that are likely to appear in professional practice and on the Fundamentals of Engineering exam (FE) and the Principles and Practice of Engineering exam (PE).
3. Provide foundation for future coursework in transportation should a student wish to pursue further coursework in the fields.

C E 477. Engineering Economics and Construction Management
3 Credits (3)
Engineering economics, construction and project management. May be repeated up to 3 credits.
Prerequisite/Corequisite: C- or better grade in C E 357.
Learning Outcomes
1. Understand time value of money and be able to perform economic analyses on engineering problems to determine whether a given project is worthwhile or to prioritize multiple alternatives based on present worth.
2. Understand the mathematical and ethical implications of benefit/cost and internal rate of return analyses
3. Estimate durations and requirements of individual construction tasks.
4. Develop construction schedules using Critical Path Method (CPM) Analysis.
5. Understand the legal and ethical concerns involved in economic analysis and construction engineering.

C E 479. Pavement Analysis and Design
3 Credits (3)
Covers stresses and deflections in pavement layers, material characterization, flexible and rigid pavement design by AASHTO, and rehabilitation concepts. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 357.
Learning Outcomes
1. Students will be able to analyze and design flexible and rigid pavements.

C E 481. Civil Engineering Capstone Design
3 Credits (3)
Culminating multidisciplinary project-oriented capstone design. Ethics, professional development, global issues. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 356, C- or better grade in C E 382, and a C- or better grade in either C E 444 or C E 445.
Prerequisite/Corequisite: C E 457, C E 471, C E 477.
Learning Outcomes
1. Students will understand the scope of civil engineering design projects.
2. Students will understand how a civil engineering project, representative of entry-level work in practice, is performed.

C E 482. Hydraulic Structures
3 Credits (3)
Engineering design of water-regulating structures. Capstone design course. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 382.
Prerequisite/Corequisite: C E 477.
Learning Outcomes
1. Students will understand the scope of interdisciplinary civil engineering design projects.

2. Students will understand how a hydraulic design project, representative of entry-level work in practice, is performed.

C E 483. Surface Water Hydrology
3 Credits (3)
Hydrologic cycle and relationships between rainfall and surface water runoff. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 331 or consent of instructor.
Learning Outcomes
1. Students will understand the hydrologic cycle and basic principles of hydrology.

C E 485. Design of Earth Dams
3 Credits (3)
Engineering design applied to site selection, foundation inspection and treatment, hydrology and hydraulics, stability, and seepage analysis. Economic and environmental factors.
Prerequisite: C E 357, C E 382.
Learning Outcomes
1. Course introduces the students to small earthen dam siting, design and construction based on the knowledge and skills acquired in earlier coursework.
2. Course incorporates engineering standards and realistic constraints and prepares students for entry-level work.
3. Students work in teams to design a small earthen dam.

C E 490. Introduction to Artificial Intelligence for Civil Engineers
3 Credits (3)
Introduces various machine learning methods for solving various civil engineering problems. Topics include: supervised & unsupervised machine learning; classification and linear regressions; K-nearest neighbor; decision tree, bagging, & boosting; random forest; and support-vector machines.
Prerequisite: C- or better grade in STAT 371.
Learning Outcomes
1. Identify appropriate data analysis methods for various civil engineering problems.
2. Perform various Machine Learning (ML) analyses to solve civil engineering problems.
3. Evaluate various forms of Machine Learning (ML) analysis results.

C E 497. Senior Seminar
1 Credit (1)
Selected topics on the civil engineering profession and orientation for professional practice. Preparation for the FE exam. Students must be able to submit their application for degree while enrolled in this course.
Learning Outcomes
1. Prepare students for professional and ethical aspects of employment or graduate studies.

C E 498. Special Topics
1-3 Credits
Special topics in civil engineering. May be repeated up to 9 credits.
Prerequisite: consent of department head.
Learning Outcomes
1. Students will develop knowledge related to the specific civil engineering special topic selected for study.

C E 501. Advanced Mechanics of Materials
3 Credits (3)
Study of stress and strain in two and three dimensions, theories of failure, stress concentrations, unsymmetrical bending, curved beams, beams on elastic foundations, column theories, torsion, thick-wall cylinders. May be repeated up to 3 credits. Same as M E 501.
Prerequisite: C E 301, MATH 392.
Learning Outcomes
1. Students will understand the three-dimensional stress and strain, constitutive relationships, and yield criteria in the field of theoretical mechanics.
2. Students will understand the mechanics of torsion, non-symmetric bending, curved beams, and column buckling.
3. Students will have a basic understanding of stress concentrations, fracture mechanics, and plate behavior.

C E 502. Advanced Mechanics of Steel Structures
3 Credits (3)
Advanced structural mechanics applicable to steel structures. Includes inelastic behavior, plastic analysis, column and frame stability and torsion.
Prerequisite: C E 444.
Learning Outcomes
1. Introduce students to advanced topics in structural mechanics of steel structures that are commonly encountered in structural engineering
2. Provide the background needed to understand the code requirements applicable to problems in plastic design of steel structures

C E 503. Special Design and Analysis Program
3-6 Credits
Design and analysis covering subject matter of an approved 450 undergraduate departmental course plus an additional report or project. Course may be subtitled in the Schedule of Classes. May be repeated up to 6 credits.
Prerequisite: consent of instructor/committee.
Learning Outcomes
1. Students will develop knowledge related to the specific civil engineering design or analysis topic selected for study.

C E 504. Advanced Engineering Design
3 Credits (3)
Advanced engineering design covering subject matter of a selected capstone undergraduate design course plus an additional report or project. May be subtitled. May be repeated up to 3 credits.
Prerequisite: consent of instructor/committee.
Learning Outcomes
1. Students will develop knowledge related to the specific civil engineering design topic selected for study.

C E 507. Design of Earth Retaining Structures
3 Credits (3)
Lateral earth pressure theory, soil-reinforcement interaction, and analysis and design of rigid and flexible earth retaining structures for support of fills and excavations, including retaining walls, mechanically stabilized earth (MSE) walls, sheet pile walls, anchored walls, tiebacks and soil nailing. May be repeated up to 3 credits.
Prerequisite: C E 357.
Prerequisite/Corequisite: C E 457.
Learning Outcomes
1. Students will be able to design retaining walls and other earth retaining structures.

C E 508. Advanced Soil Behavior
3 Credits (3)

The course covers particle-scale phenomena that govern the macro-scale behavior of soils. Topics covered in the class include classical concepts as well as contemporary advances in soil mechanics. The students will develop a fundamental understanding of soil-water interaction, theories of contact level deformation, and mass and energy transport through granular media. Consent of Instructor required. May be repeated up to 3 credits.
Prerequisite: C E 357 or Instructor Consent.
Learning Outcomes
1. Students will develop an in-depth understanding of advanced soil mechanics topics.

C E 509. Deep Foundations
3 Credits (3)
Behavior, analysis and design of pile and pier foundations subjected to axial and lateral loads. May be repeated up to 3 credits.
Prerequisite: C E 457 or consent of instructor.
Learning Outcomes
1. Students will be able to analyze and design pile and pier foundations.

C E 510. Introduction to Nondestructive Testing
3 Credits (3)
This course explores the application of different Nondestructive Testing (NDT) methods in material characterization and product qualification.
Prerequisite: C E 311 or CHME 361 or Consent of Instructor.
Learning Outcomes
1. Students will develop a working knowledge of non-destructive test methods that utilize acoustic, electrical, and/or imaging principles.

C E 514. Numerical Methods in Civil Engineering
3 Credits (3)
Mathematical, numerical, and programming foundations of applied numerical methods with a focus on Civil and Environmental Engineering applications using MATLAB.
Learning Outcomes
1. To provide necessary background and skills to use MATLAB as a programing language for engineering problem solving.
2. To introduce classical and some modern methods for civil engineering numerical problem solving.
3. Develop numerical algorithms and programs for solving civil engineering problems involving: (1) multi-dimensional integration, (2) multivariate differentiation, (3) ordinary differential equations, (4) partial differential equations, (5) optimization (6) parameter estimation methods such as linear and nonlinear least square methods.

C E 515. Finite Element Methods
3 Credits (3)
Introduces the finite element method. Topics may include beam, frame, plane stress, plane strain, axisymmetric, and 3-D stress elements. Includes static and dynamic analysis. Uses readily available finite-element software. May be repeated up to 3 credits.
Prerequisite: graduate standing or consent of instructor.
Learning Outcomes
1. Students will be able to formulate and use the finite element method to solve problems in solid mechanics.

C E 531. Open Channel Hydraulics
3 Credits (3)
Theoretical and applied hydraulics of open channels, with emphasis on nonuniform flow, rapidly varied flow, and wave formation. May be repeated up to 3 credits.
Prerequisite: C E 382 or consent of instructor.
Learning Outcomes
1. Students will have in-depth knowledge of advanced topics related to open channel hydraulics.

C E 535. Technical Communication for Engineers
3 Credits (3)
The course addresses the fundamentals of communicating technical information that is clear, concise, and concrete to a wide variety of stakeholder types. Same as C E 435 with differentiated assignments for graduate students.
Learning Outcomes
1. Ability to write in a way that is clear
2. Ability to write in a way that is concise
3. Ability to write in a way that is concrete

C E 544. Advanced Design of Steel Structures
3 Credits (3)
Connection design; beam-column analysis and design; composite construction; and plate girder design.
Prerequisite: C E 444.
Learning Outcomes
1. Introduce students to advanced topics in steel design that are commonly encountered in structural engineering
2. Provide the background needed to practice structural steel design
3. Provide the background needed to understand the code requirements applicable to difficult problems in structural steel design

C E 545. Advanced Concrete Design
3 Credits (3)
Advanced topics in ultimate strength design of reinforced concrete that include: concrete footings, retaining structures, short and long columns, torsion members, deep beams and shear walls, two-way slabs, and shear and moment transfer at slab-column connections.
Prerequisites: C E 445.
Learning Outcomes
1. Introduce students to advanced topics in reinforced concrete design that are commonly encountered in structural engineering
2. Provide the background needed to practice structural concrete design
3. Provide the background needed to understand the code requirements applicable to difficult problems in structural concrete design

C E 547. Bridge Engineering
3 Credits (3)
Topics related to prestressed concrete, reinforced concrete and steel bridge design according to the AASHTO specifications; bridge analysis and evaluation.
Prerequisite: C E 444 or C E 445.
Learning Outcomes
1. Introduce students to topics in bridge design that are commonly encountered in structural engineering
2. Provide the background needed to understand the code requirements applicable to problems in bridge design

C E 554. Wood Design
3 Credits (3)
Theory and design of wood structural members and systems subjected to gravity and lateral loads. Design project required. Taught every other year, alternates with C E 555 - Masonry Design. May be repeated up to 3 credits.

Learning Outcomes

1. Students will have a working knowledge of be able to design wood materials commonly used in structural applications members and components.
2. Students will be able to design wood structural members and components.
3. Students will be able design basic connections between wood structural members.

C E 555. Masonry Design
3 Credits (3)
Theory and design of masonry structural members and systems subject to gravity and lateral loads. Design project required. Taught every other year, alternates with C E 554.
Learning Outcomes

1. Introduce students to advanced topics in masonry design that are commonly encountered in structural engineering.
2. Provide the background needed to practice masonry design.
3. Provide the background needed to understand the code requirements applicable to difficult problems in masonry design.

C E 557. Water Resources Development
3 Credits (3)
Students function as members of a consulting panel and prepare reports on major water resources development problems. Political, financial, and social aspects of water resources development are considered as well as scientific and technical details. May be repeated up to 3 credits.
Learning Outcomes

1. Students will have a working knowledge of important topics related to development of water resources.

C E 571. Structural Dynamics
3 Credits (3)
Response of elastic structure to dynamic loading. Moving load, earthquake and blast loading.
Prerequisite: ENGR 234 and C E 315.
Learning Outcomes

1. Introduce students to topics in structural dynamics that are commonly encountered in structural engineering
2. Provide the background needed to understand the code requirements applicable to problems in seismic and blast-resistant design

C E 579. Ground Improvement
3 Credits (3)
The objective of this course is to introduce common ground improvement techniques, including mechanical (compaction, soil reinforcement, preloading and accelerated consolidation) and chemical (cementing, ion-replacement, polymer bonding) stabilization methods, as well as seepage and dewatering. Emphasis will be placed on developing an understanding of the underlying physical and chemical processes involved in each case. May be repeated up to 3 credits.
Prerequisite: C E 357.
Learning Outcomes

1. Students will understand a wide variety of ground improvement techniques and the physical and chemical principles involved with each technique.

C E 581. Ground Water Hydrology
3 Credits (3)
Mathematical treatment of water flow in porous media. Emphasis on hydraulics of water movement, including pumping and recharge wells, drainage, and water quality. May be repeated up to 3 credits.
Prerequisite: MATH 392, G EN 452, and C E 382, or consent of instructor.
Learning Outcomes

1. Students will understand advanced topics related to flow in porous media and other issues related to ground water hydrology.

C E 582. Statistical Hydrology
3 Credits (3)
Application of statistical techniques to hydrologic data, including distributions, hypothesis testing, linear models, non-parametrics, and time-series and stochastic models. May be repeated up to 3 credits.
Learning Outcomes

1. Students will understand applications of statistical methods within the field of hydrology.

C E 585. Slope Stability Analysis and Design
3 Credits (3)
Design of earth slopes, causes of instability, limit equilibrium methods, slope reinforcement (geosynthetics soil nailing, tiebacks), seismic analysis, rock slope stability. Consent of instructor required.
Learning Outcomes

1. Be familiar with the implications of drainage conditions and pore water pressure in the soil as they relate to soil shear strength and slope stability.
2. Be able to recognize the differences between short-term and long-term analyses (total versus effective stress analyses) applied to slope stability.
3. Be able to perform hand calculations of slope stability for very simple cases.
4. Be familiar with the set of input data usually required to perform stability analyses using software.
5. Be able to design soil slopes with various soil profiles and geometry and reinforcement using slope stability software.
6. Recognize and understand the effects of geologic and groundwater conditions on the stability of soil slopes.
7. Understand the mechanisms by which the most common methods of slope stabilization work (tie-backs, soil nailing, geosynthetics).

C E 590. Advanced Artificial Intelligence for Civil Engineers
3 Credits (3)
Deep learning methods for solving civil engineering problems. Topics include: introduction, backpropagation, training, regulations, and techniques of Neural Networks (NN); image processing using Convolutional Neural Networks (CNN); time-series data analysis using Recurrent Neural Networks (RNN); Gated Recurrent Units; and introduction to Transfer Learning.
Prerequisite: STAT 371 and MATH 392.
Learning Outcomes

1. Identify appropriate data analysis methods and utilize mathematical formulations of Deep Learning (DL) for various civil engineering problems.
2. Perform various Deep Learning (DL) analyses to solve civil engineering problems.
3. Evaluate various forms of Deep Learning (DL) analysis results.

C E 596. Special Topics
1-3 Credits
Graduate level special topics in civil engineering. May be repeated up to 6 credits.
Prerequisite: consent of department head.

Learning Outcomes

1. Students will develop knowledge related to the specific civil engineering special topic selected for study.

C E 598. Special Research Programs
1-3 Credits
Individual investigations either analytical or experimental. May be subtitled. Maximum of 3 credits per semester. May be repeated up to 99 credits.
Learning Outcomes

1. Students will develop knowledge related to the specific civil engineering research topic selected for investigation.

C E 599. Master's Thesis
1-15 Credits
Thesis. May be repeated up to 88 credits.
Learning Outcomes

1. Students will progress toward completion of a research thesis.

C E 600. Doctoral Research
1-15 Credits
Research. May be repeated up to 88 credits.
Learning Outcomes

1. Students will progress toward completion of their doctoral research.

C E 604. Advanced Engineering Topics
3 Credits (3)
In depth study of a topic at the forefront of civil or environmental engineering. Journal papers will be critically reviewed and students will be asked to write an analysis of the topic and present their thoughts orally. May be repeated up to 3 credits.
Learning Outcomes

1. Students will develop knowledge related to the specific civil engineering special topic selected for study.

C E 614. Advanced Numerical Methods in Civil Engineering
3 Credits (3)
Advanced mathematical, numerical, and programming for applied numerical methods with a focus on Civil and Environmental Engineering applications using MATLAB. Same as C E 514 with differentiated material and assignments for C E 614 students.
Learning Outcomes

1. To provide necessary background and skills to use MATLAB as a programing language for engineering problem solving.
2. To introduce classical and some modern methods for civil engineering numerical problem solving.
3. Develop numerical algorithms and programs for solving civil engineering problems involving: (1) multi-dimensional integration, (2) multivariate differentiation, (3) ordinary differential equations, (4) partial differential equations, (5) optimization (6) parameter estimation methods such as linear and nonlinear least square methods, and (7) time series analysis such as Fourier transform, wavelet, and basic filtering.

C E 682. Topics in Hydrodynamics II
3 Credits (3)
Selected topics in hydrometeorology, including the transfer of water and energy between the land surface and the lower atmosphere.
Learning Outcomes

1. This course helps lay the foundation for theoretical concepts useful in measurement, analysis and estimation of evaporation/evapotranspiration. Students learn some of the theoretical concepts and relationships useful in the phenomenon of evaporation as well as gain some field experience on measurement of evapotranspiration and open water evaporation.

C E 698. Special Research Programs
1-3 Credits
May be subtitled. May be repeated up to 9 credits.
Learning Outcomes

1. Students will gain knowledge related to the research topic selected for study.

C E 700. Doctoral Dissertation
1-15 Credits
Dissertation. May be repeated up to 88 credits.
Learning Outcomes

1. Students will progress toward completion of a research dissertation.

Environmental Engineering Courses

ENVE 450. Aquatic Chemistry
3 Credits (3)
Theoretical aspects of physical chemistry applied to the solution of environmental engineering problems. Emphasis on acid-base reactions, precipitation-dissolution reactions, complexation, and redox reactions. Same as ENVE 550.
Prerequisite: C- or better grade in C E 256.
Learning Outcomes

1. Students will be able to use fundamental principles of physical chemistry as applied to acid-base, precipitation-dissolution, complexation, and redox reactions to determine the composition of waters, including natural waters and waters encountered in water and wastewater treatment processes.

ENVE 451. Unit Processes/Operation of Water Treatment
3 Credits (3)
Theory and applications of unit processes in environmental engineering. Physical and chemical water treatment methods are emphasized. Crosslisted with: ENVE 551.
Prerequisite: C- or better grade in C E 356.
Learning Outcomes

1. Students will be able to use fundamental reactor design principles to design unit operations for water treatment, including sedimentation, coagulation, flocculation, filtration, and disinfection.

ENVE 452. Unit Processes/Operation of Wastewater Treatment
3 Credits (3)
Theory and applications of unit processes in environmental engineering. Biological wastewater treatment methods are emphasized. Crosslisted with: ENVE 552.
Prerequisite: C- or better grade in C E 356.
Learning Outcomes

1. Students will be able to use fundamental reactor design principles to design unit operations for wastewater treatment, including sedimentation, aerobic and anaerobic microbial treatment, and disinfection.

ENVE 456. Environmental Engineering Design
3 Credits (3)
Design of chemical, physical, and biological operations and processes involved in water and wastewater treatment. Student can also be a graduate student to enroll if they have not completed C E 356.
Prerequisite: C- or better grade in C E 356.

Learning Outcomes

1. Students will be able to incorporate knowledge from previously taken engineering design and economics courses to complete an environmental design and solve a real world problem.
2. Students will be able to communicate and explain their solution approach to a variety of audiences using different communication methods.

ENVE 459. Environmental Microbiology
3 Credits (3)
An introduction to the diverse roles of microorganisms in natural and engineered environments. The topics include cellular architecture, energetics, and growth; population and community dynamics; water and soil microbiology; biogeochemical cycling; and microorganisms in biodegradation and bioremediation of contaminants. Students must be a Senior or in Graduate Standing to enroll.
Learning Outcomes

1. Students will be able to demonstrate the significance of microbial processes in natural and engineered processes.

ENVE 487. Air Pollution Control Systems Design
3 Credits (3)
An introduction to sources and nature of air pollution, regulations, and risk analysis. Detailed study of air pollution control technologies and design of air pollution control equipment. Students must be a Senior or in graduate standing to enroll.
Learning Outcomes

1. Students will be able to explain the source and nature of air pollution.
2. Students will be able to relate air pollution to regulations using a risk analysis approach.
3. Students will be able to design air pollution control systems.

ENVE 504. Advanced Environmental Engineering Design
3 Credits (3)
Advanced engineering design covering the subject matter of the Environmental Engineering capstone undergraduate design course plus an additional report or project. May be subtitled. Consent of instructor required.
Learning Outcomes

1. Students will be able to incorporate knowledge from previously taken engineering design and economics courses to complete an environmental design and solve a real world problem.
2. Students will be able to communicate and explain their solution approach to a variety of audiences using different communication methods.

ENVE 550. Aquatic Chemistry
3 Credits (3)
Theoretical aspects of physical chemistry applied to the solution of environmental engineering problems. Emphasis on carbonate equilibria solubility, buffering and redox conditions. May be repeated up to 3 credits. Consent of Instructor required. Crosslisted with: ENVE 450.
Prerequisite(s): C E 256.

ENVE 551. Unit Processes/Operation of Water Treatment
3 Credits (3)
Theory and applications with unit processes in environmental engineering. Physical / chemical treatment methods emphasized. May be repeated up to 3 credits. Crosslisted with: ENVE 451.
Prerequisite(s): C E 356.

ENVE 552. Unit Processes/Operation of Wastewater Treatment
3 Credits (3)
Theory and applications with unit processes in environmental engineering. Biological treatment methods emphasized. May be repeated up to 3 credits. Crosslisted with: ENVE 452.
Prerequisite(s): Consent of instructor.

ENVE 556. Advanced Water Treatment and Reuse
3 Credits (3)
Overview of both the theoretical and practical aspects of advanced water treatment technologies and water reuse applications. Basic design features of the processes are presented, with emphasis on the underlying principles, including why and how a process works, what the significant variables are, and what the limitations of the process are. Problem solving skills and technical communication skills are emphasized.
Prerequisite: ENVE 551.
Learning Outcomes

1. Students will be able to design advanced water treatment processes, including membrane filtration, electrodialysis, ion exchange, advanced oxidation, photolysis, and distillation.
2. Students will gain knowledge in water reuse applications including water quality criteria, regulations, and implementation issues.

ENVE 557. Surface Water Quality Modeling
3 Credits (3)
Modeling the impacts of waste disposal practices on surface waters. Emphasis on fate and transport of bacteria, dissolved oxygen, nutrients, and toxicants in rivers, lakes, and tidal waters. Students must be in Graduate standing to enroll.
Learning Outcomes

1. The students will be able to use mathematical models to model the transport of constituents important for water quality, such as bacteria, viruses, nutrients, contaminants, and oxygen, in aqueous environments.

ENVE 598. Special Research Programs
1-3 Credits
Individual investigations either analytical or experimental. May be repeated up to 6 credits.
Learning Outcomes

1. Students will develop knowledge related to the specific environmental engineering special topic selected for research.

ENVE 599. Master's Thesis
15 Credits
Thesis. May be repeated up to 88 credits.
Learning Outcomes

1. Students will progress toward completion of their research thesis.

ENVE 630. Fate and Transport of Environmental Contaminants
3 Credits (3)
Modeling of transport phenomena in natural and engineered systems for predicting the fate of contaminants in the air, soil, sediment, and water compartments of the ecosystem.
Prerequisite: ENVE 557.
Learning Outcomes

1. The students will be able to use mathematical models to model the transport of contaminants in gas, aqueous, and soil environments.

Department Contact Information

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Civil Engineering - Bachelor of Science in Civil Engineering

Requirements (126 Credits)

In addition to the university requirements for graduation, all students including transfers must satisfy the requirements contained in the academic policies for the NMSU College of Engineering. Students must have a 2.0 grade-point average in all departmental courses and all prerequisites and co-requisites must be taken as required. If a student takes a class and a co-requisite for that class at the same time and does not achieve a grade of C- or better in the co-requisite, the student may take no further classes for which the course or the co-requisite are prerequisite. A student who completes a class three times without achieving a grade of C- or better will be dismissed from the Civil Engineering program, and not allowed to take any Civil Engineering courses from the department.

Students must complete all University degree requirements, which include the following: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 126 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements or elective credits, but may be needed for enrollment in the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communications		
COMM 1115G	Introduction to Communication	3
or HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [2]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
ECON 2110G	Macroeconomic Principles	3
or ECON 2120G	Principles of Microeconomics Honors	
or ECON 2110H	Principles of Macroeconomics Honors	
or ECON 2120H	Principles of Microeconomics Honors	
Area V: Humanities [1]		3
Area VI: Creative and Fine Arts [1]		3
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II (Departmental/College Requirement)	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
Mathematics		
MATH 2530G	Calculus III	3
MATH 3160	Introduction to Ordinary Differential Equations	3
STAT 3110	Statistics for Engineers and Scientists	3
or I E 311	Engineering Data Analysis	
Natural Science		
GEOL 1110G	Physical Geology	4
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
or CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
Technical		
ENGR 190	Introduction to Engineering Mathematics	4
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
E T 109	Computer Drafting Fundamentals	3
SUR 222	Introduction to Geomatics	3
Civil Engineering		
C E 151	Introduction to Civil Engineering	3
C E 256 & 256 L	Environmental Engineering and Science and Environmental Science Laboratory	4
C E 301	Mechanics of Materials	3
C E 311	Civil Engineering Materials	3
C E 315	Structural Analysis	4
C E 331 & 331 L	Fluid Mechanics and Hydraulics and Fluid Mechanics and Hydraulics Laboratory	4
C E 356	Fundamentals of Environmental Engineering	3
C E 357	Soil Mechanics	3
C E 382	Hydraulic and Hydrologic Engineering	3
C E 445	Reinforced Concrete Design	3
C E 457	Foundation Design	3
C E 471	Transportation Engineering	3
C E 477	Engineering Economics and Construction Management	3
C E 497	Senior Seminar	1
Elective Courses		
Choose two from the following:		6
A EN 459	Groundwater, Wells & Pumps	
A EN 478	Irrigation and Drainage Engineering	
C E 444	Elements of Steel Design	
C E 452	Geohydrology	
C E 454	Wood Design	
C E 455	Masonry Design	
C E 460	Site Investigation	
C E 469	Structural Systems	
C E 470	Design of Municipal and Hazardous Waste Landfills	
C E 479	Pavement Analysis and Design	

C E 482	Hydraulic Structures	
C E 483	Surface Water Hydrology	
C E 485	Design of Earth Dams	
C E 510	Introduction to Nondestructive Testing	
C E 544	Advanced Design of Steel Structures	
C E 545	Advanced Concrete Design	
ENVE 450	Aquatic Chemistry	
ENVE 451	Unit Processes/Operation of Water Treatment	
ENVE 452	Unit Processes/Operation of Wastewater Treatment	
ENVE 456	Environmental Engineering Design	
ENVE 487	Air Pollution Control Systems Design	
Capstone Design Course		
C E 481	Civil Engineering Capstone Design	3
Second Language: (not required)		
Electives, to bring the total credits to 126		**0**
Total Credits		**126**

1 See the General Education (p. 262) section of the catalog for a full list of courses.

2 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to complete prerequisite(s) prior to enrolling in this course depending on math placement.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I or MATH 1511H Calculus and Analytic Geometry I Honors and ENGL 1110G Composition I or ENGL 1110H Composition I Honors. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
C E 151	Introduction to Civil Engineering [1]	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [2]	4
ENGL 1110G or ENGL 1110H	Composition I [2] or Composition I Honors	4
ENGR 190	Introduction to Engineering Mathematics [3]	4
	Credits	**15**
Spring		
E T 109	Computer Drafting Fundamentals [4]	3
GEOL 1110G	Physical Geology [3]	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [2, 5] or Calculus and Analytic Geometry I Honors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab [2]	4
	Credits	**15**
Second Year		
Fall		
COMM 1115G or HNRS 2175G	Introduction to Communication [2] or Introduction to Communication Honors	3
ECON 2110G or ECON 2120G or ECON 2110H or ECON 2120H	Macroeconomic Principles [2] or Principles of Microeconomics Honors or Principles of Macroeconomics Honors or Principles of Microeconomics Honors	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [2] or Professional and Technical Communication	3
ENGR 233	Engineering Mechanics I [2]	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [2] or Calculus and Analytic Geometry II Honors	4
	Credits	**16**
Spring		
C E 256 & 256 L	Environmental Engineering and Science and Environmental Science Laboratory [3]	4
C E 301	Mechanics of Materials [2]	3
C E 331	Fluid Mechanics and Hydraulics	3
C E 331 L	Fluid Mechanics and Hydraulics Laboratory	1
MATH 2530G	Calculus III [2]	3
SUR 222	Introduction to Geomatics [3]	3
	Credits	**17**
Third Year		
Fall		
C E 315	Structural Analysis [3]	4
C E 356	Fundamentals of Environmental Engineering [3]	3
ENGR 234	Engineering Mechanics II	3
STAT 3110 or I E 311	Statistics for Engineers and Scientists [3] or Engineering Data Analysis	3
Select a General Education Area V (Humanities) Course [1, 5]		3
	Credits	**16**
Spring		
C E 311	Civil Engineering Materials [3]	3
C E 357	Soil Mechanics [3]	3
C E 382	Hydraulic and Hydrologic Engineering [3]	3
PHYS 1320G & PHYS 1320L or CHEM 1225G	Calculus -Based Physics II [2] or General Chemistry II Lecture and Laboratory for STEM Majors	4
Select a General Education Area VI (Creative and Fine Arts) Course [1, 6]		3
	Credits	**16**
Fourth Year		
Fall		
C E 445	Reinforced Concrete Design [3]	3
C E 477	Engineering Economics and Construction Management [7]	3
MATH 3160	Introduction to Ordinary Differential Equations [2]	3
Select a A EN, C E, or ENVE Elective Course [3, 8]		3
Select a Viewing a Wider World (VWW) Course [1, 9]		3
	Credits	**15**
Spring		
C E 457	Foundation Design [10]	3
C E 471	Transportation Engineering [10]	3
C E 481	Civil Engineering Capstone Design	3
C E 497	Senior Seminar [3]	1
Select a A EN, C E, or ENVE Elective Course [3, 8]		3
Select a Viewing a Wider World (VWW) Course [1, 9]		3
	Credits	**16**
	Total Credits	**126**

[1] Courses are typically taught in the Fall semester.
[2] Courses are typically taught in the Fall, Spring and Summer semesters.
[3] Courses are typically taught in the Fall and Spring semesters.
[4] See the Viewing a Wider World (p. 266) section of the catalog to see a full list of courses.
[5] Math Placement: MATH 1511G Calculus and Analytic Geometry I is the starting Math course for the degree but students may need to complete any prerequisites prior to enrolling in this course depending on math placement.
[6] See the General Education (p. 262) section of the catalog for a full list of courses
[7] Courses are typically taught in the Fall and Summer semesters.
[8] See your advisor for more detailed information about selecting elective courses that are approved to fulfill this requirement.
[9] Courses are typically taught in the Spring semester.

Agricultural Engineering - Undergraduate Minor

Prefix	Title	Credits
Soil Science		
Select one from the following:		3-4
SOIL 472	Soil Morphology and Classification	
SOIL 476	Soil Microbiology	
SOIL 477	Environmental Soil Physics	
SOIL 479	Environmental Soil Chemistry	
Plant and Animal Science		
ANSC 351V	Agricultural Animals of the World	3
or HORT 365	Principles of Crop Production	
Institutions/Economics		
Select one from the following:		3
AEEC 2130G	Survey of Food and Agricultural Issues	
AEEC 3110V	World Agriculture and Food Problems	
AEEC 3120V	Natural Resource Economics	
AEEC 3130V	Water Resource Economics	
Irrigation		
A EN 478	Irrigation and Drainage Engineering	3
or A EN 498	Special Topics	
Design		
A EN 459	Groundwater, Wells & Pumps	3
Total Credits		**15-16**

Environmental Engineering - Undergraduate Minor

This minor will build upon existing B.S. degree programs at NMSU in engineering and environmental science, and provides further preparation in modern and emerging technologies for upgrading the Nation's ageing utilities and infrastructure in the water, energy, and environment sectors. It includes 3 required courses (9 credits) from civil and environmental engineering, and 3 elective courses (9-10 credits) from civil engineering, environmental engineering, environmental science, and/or engineering technology.

Prefix	Title	Credits
Required courses (3 courses)		**9**
C E 256	Environmental Engineering and Science [1]	
C E 356	Fundamentals of Environmental Engineering	
ENVE 456	Environmental Engineering Design	
Elective courses (3 courses) [2]		**9-10**
To be selected from the following list of courses (numbered 300-499) [3]		
Upper level courses in Civil Engineering		
C E 355V	Technology and the Global Environment	
ENVE 450	Aquatic Chemistry	
ENVE 451	Unit Processes/Operation of Water Treatment	
ENVE 452	Unit Processes/Operation of Wastewater Treatment	
ENVE 459	Environmental Microbiology	
ENVE 487	Air Pollution Control Systems Design	
Upper level courses in Environmental Science		
ENVS 452	Geohydrology [4]	
ENVS 462	Sampling and Analysis of Environmental Contaminants	
ENVS 470	Environmental Impacts of Land Use and Contaminant Remediation	
Upper level courses in Engineering Technology		
E T 381	Renewable Energy Technologies	
E T 382	Solar Energy Technologies	
E T 384	Wind and Water Energy Technologies	
E T 386	Sustainable Construction and Green Building Design	
Total Credits		**18-19**

[1] Cross-listed with ENVS 2111 Environmental Engineering and Science
[2] May all be taken in same department or different departments
[3] Courses numbered 450 and above may be used to satisfy course requirements for the accelerated master's degree program (requires department head approval and maximum of 6 credits)
[4] Cross-listed with C E 452 Geohydrology

Geotechnical Engineering - Undergraduate Minor

This minor builds upon existing B.S. degree programs at NMSU in analysis, construction, and design of geotechnical components of civil infrastructure.

Prefix	Title	Credits
Core courses (3 courses)		
C E 301	Mechanics of Materials	3
or E T 310	Applied Strength of Materials	
C E 357	Soil Mechanics	3
or E T 354	Soil and Foundation Technology	
C E 457	Foundation Design	3
Elective courses (3 courses) [1]		**9-10**
To be selected from the following list of courses (numbered 300-499) [2]		
Upper level courses in Civil Engineering		
C E 452	Geohydrology	
C E 470	Design of Municipal and Hazardous Waste Landfills	
C E 479	Pavement Analysis and Design	
C E 485	Design of Earth Dams	
C E 498	Special Topics [3]	
Upper level courses in Engineering Technology		

E T 355	Site/Land Development and Layout	
Total Credits		**18-19**

1 elective courses may be taken in the same department or different departments

2 courses numbered 450 and above may be used to satisfy course requirements for the accelerated master's degree program (requires department head approval)

3 special topics in Civil Engineering include advanced soil mechanics, advanced soil behavior, ground improvement, design of earth retaining structures, deep foundations, and slope stability analysis (requires consent of department head and instructor)

Structural Engineering - Undergraduate Minor

This minor builds upon existing B.S. degree programs at NMSU in analysis, construction, and design of civil, mechanical, and aerospace structures. It includes 3 required courses (10 credits) from civil engineering and 3 elective courses (9-10 credits) from civil engineering, aerospace/mechanical engineering, and/or engineering technology.

Prefix	Title	Credits
Required courses (3 courses)		**10**
C E 301	Mechanics of Materials	
or E T 310	Applied Strength of Materials	
C E 315	Structural Analysis	
C E 444	Elements of Steel Design	
Elective courses (3 courses) [1]		**9-10**
To be selected from the following list of courses (numbered 300-499) [2]		
Upper level courses in Civil Engineering		
C E 445	Reinforced Concrete Design	
C E 469	Structural Systems	
C E 498	Special Topics [3]	
Upper level courses in Aerospace/Mechanical Engineering		
A E 363	Aerospace Structures	
A E 451	Aircraft Design	
M E 331	Intermediate Strength of Materials	
M E 332	Vibrations	
M E 425	Design of Machine Elements	
M E 456	Experimental Modal Analysis	
M E 460	Applied Finite Elements	
Upper level courses in Engineering Technology		
E T 332	Applied Design of Structures I	
E T 432	Applied Design of Structures II	
Total Credits		**19-20**

1 elective courses may be taken in same department or different departments

2 courses numbered 450 and above may be used to satisfy course requirements for the accelerated master's degree program (requires department head approval)

3 special topics in Civil Engineering include advanced mechanics of materials, advanced mechanics of steel structures, advanced mechanics of concrete, finite element methods, non-destructive testing, and bridge engineering (requires department head approval and may be repeated for maximum of 6 credits)

Water Resource Engineering - Undergraduate Minor

This minor will build upon existing BS degree programs in civil engineering and engineering technology at NMSU in the analysis, design, construction, and mitigation (flood and urban planning) of water infrastructures and waterways.

Prefix	Title	Credits
Core Courses (2 courses)		
C E 331	Fluid Mechanics and Hydraulics	3
or E T 308	Fluid Technology	
C E 331 L	Fluid Mechanics and Hydraulics Laboratory	1
or E T 308 L	Fluid Technology Lab	
C E 382	Hydraulic and Hydrologic Engineering	3
Elective Courses (4 courses) [1]		**12**
To be selected from the following list of courses (numbered 300-499) [2]		
Upper level courses in Civil / Agricultural Engineering		
C E 452	Geohydrology	
A EN 459	Groundwater, Wells & Pumps	
A EN 478	Irrigation and Drainage Engineering	
C E 482	Hydraulic Structures	
C E 483	Surface Water Hydrology	
C E 485	Design of Earth Dams	
Upper level courses in Engineering Technology		
E T 418	Applied Hydraulics	
Total Credits		**19**

1 elective courses may be taken in the same department or different departments

2 courses numbered 450 and above may be used to satisfy course requirements for the accelerated master's degree program (requires department head approval)

Electrical and Computer Engineering

Undergraduate Program Information

Overview

The undergraduate electrical engineering program of the Klipsch School is accredited by the Engineering Accreditation Commission of ABET, Inc., and stresses the development of analytical tools and physical concepts required to prepare students for immediate employment or graduate study. The program is flexible, allowing students to choose elective coursework towards concentrations in:

- artificial intelligence, machine learning, and data science,
- communications and signal processing,
- computers and microelectronics,
- controls and robotics,
- electromagnetics and photonics,
- power, or
- space systems.

Alternatively, students can select "no concentration" for the greatest flexibility in course selection.

Undergraduate Electrical Engineering Program Educational Objectives

The Klipsch School is dedicated to providing a quality, hands-on, educational experience for our students. Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduates during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Related Areas of Study

Electrical and computer engineering students wishing to broaden their educational experience may elect to earn additional bachelor's degrees in

- Engineering Physics
- Computer Science
- Mathematics
- Physics

Klipsch School students may also choose to earn a minor in one or more of the following fields:

- Computer Engineering
- Computer Science
- Mathematics
- Physics

Students must consult with an academic advisor in the offering department for specific requirements related to additional degrees and minors.

Transfer Credit

Credit earned at other institutions is generally accepted; however the following restrictions apply to transfer credits:

- Engineering credit must be earned at an ABET accredited school.
- Physics must be calculus based.
- If the NMSU requirement includes a lab, the transfer credit must include a lab.
- A grade of C-, or better, must have been earned.
- E E Courses numbered 300 or higher, Cornerstone and Capstone courses may not be transferred.
- Transfer credits for courses above 300 level are NOT ACCEPTED.

Master's Accelerated (BS/MS) Program (MAP)

Undergraduate students may apply for acceptance to the Master's Accelerated Program (MAP) after completing 60 semester hours of undergraduate coursework of which a minimum of 25 credit hours must be completed at NMSU. The GPA must be 2.75 or above for admission to the MAP program. The students must meet all other requirements as specified by the BSEE and MSEE programs. The MAP program allows up to 12 credits of NMSU coursework (450 level or higher) taken during the undergraduate years to be counted toward the master's program of study. Students must receive a grade of B or higher in the courses to be counted for the graduate degree. The courses must logically fit into the master's program. EE courses that are approved for the MAP are those EE courses at the 500 level.:

Prefix	Title	Credits
E E 502	Electricity Markets	3
E E 503	Numerical Computational Methods for Smart Grid	3
E E 504	Smart Grid Technologies	3
E E 505	Application of Optimization Techniques in Power Systems	3
E E 506	Quantum Computing	3
E E 507	Data Analytics and AI for the Smart Grid	3
E E 510	Introduction to Analog and Digital VLSI	3
E E 512	ASIC Design	3
E E 521	Microwave Engineering	3
E E 523	Analog VLSI Design	3
E E 528	Fundamentals of Photonics	4
E E 533	Power System Operation	3
E E 534	Power System Relaying	3
E E 537	Power Electronics	3
E E 540	Photovoltaic Devices and Systems	3
E E 541	Antennas and Radiation	4
E E 542	Power System Analysis	3
E E 543	Power System Faults and Stability	3
E E 544	Distribution Systems	3
E E 545	Digital Signal Processing II	3
E E 548	Introduction to Radar	3
E E 549	Smart Antennas	3
E E 551	Control Systems Synthesis	3
E E 553	Noncooperative Game Theory	3
E E 556	Hardware & Software Codesign	3
E E 558	Hardware Security and Trust	3
E E 562	Computer Systems Architecture	3
E E 563	Computer Performance Analysis I	3
E E 564	Architectural Concepts II	3
E E 565	Machine Learning I	3
E E 567	ARM SOC Design	3
E E 571	Random Signal Analysis	3
E E 572	Modern Coding Theory	3
E E 573	Signal Compression	3
E E 576	Geometric Algebra	3
E E 577	Fourier Methods in Electro-Optics	3
E E 578	Optical System Design	3
E E 581	Digital Communication Systems I	3
E E 583	Wireless Communications	3
E E 586	Information Theory	3
E E 587	Deep Learning for Image Processing	3
E E 588	Advanced Image Processing	3
E E 596	Digital Image Processing	3
E E 597	Neural Signal Processing	3

For the most up to date listing of elective courses, please see the course listing in the most recent catalog. More information and the application for the MAP program can be found at: https://gradschool.nmsu.edu/current-students/masters-accelerated-program.html.

Graduate Program Information

Overview

The Klipsch School of Electrical and Computer Engineering offers graduate work leading to the Master of Science and Doctor of Philosophy degrees. Areas of emphasis for masters and doctoral students are:

- communications,
- computer engineering,
- controls,
- digital signal processing,
- electromagnetics,
- electric energy systems,
- photonics, and
- microelectronics/VLSI.

Research in the above areas currently being conducted by the faculty ensures that doctoral candidates will work on the frontier of knowledge in these areas. The graduate programs are intended to provide broad graduate-level training in electrical engineering. In addition, appropriate courses in computer science, industrial engineering, mathematics, physics, business management, and other areas may be integrated into a graduate student's program of study (see the list of permitted course prefixes in program description for EE graduate degrees).

Students desiring to work toward an advanced degree in electrical engineering must have completed undergraduate preparation substantially equivalent to that required for the Bachelor of Science in Electrical Engineering degree at this institution. For students with undergraduate degrees in other disciplines, see below. For further information on the Klipsch School of Electrical and Computer Engineering, please consult the web page http://www.ece.nmsu.edu/ (http://ece.nmsu.edu).

Faculty Research Interests

- **Communications**: Wireless and Digital Communications, Optical Communications, Error Control Coding, Data Compression, Information Theory, Physical Layer Security, Localization and Navigation.
- **Computer Architecture, Performance, And Security**: Performance Modeling and Simulation, Micro-Architecture Power Optimization, Performance Analysis and Optimization Of Large-Scale Scientific Applications, Heterogeneous HPC Computing for Field-Deployable Systems, Hardware Security and Trust, Hardware Software Co-Design, Embedded System Security, Machine Learning and Artificial Intelligence Security.
- **Digital Signal Processing**: Processing and Analysis Of EEG Signals, Time-Frequency Analysis, and Speech Processing.
- **Electromagnetics**: Propagation Through Dispersive Media (Soil, Seawater, Foliage, Biological Tissues), UWB and Synthetic Aperture Radar Systems, Antennas, Digital Beamforming, Microwave Engineering, Electromagnetic Interference and Compatibility, and Nondestructive Evaluation.
- **Electric Energy Systems**: Renewable Energy Integration, Protection, Advanced Control and Optimization, and Customer Driven Microgrids, Public Utilities Regulation and Management.
- **Machine Learning**: Image Processing and Application Of Machine Learning and Deep Learning To Image Analysis, Focusing on Astronomy And Biomedical Image Analysis, Health Care, and Defense.
- **Microelectronics And VLSI**: Micro Integrated Circuits, Sensors, Wireless Communication With IOT Devices, Signal Processing, Robotics, Analog and Mixed-Signal VLSI Design, Integrated Power Management Circuits, and Micro-Controller Sensor Systems.
- **Photonics**: Optical Wave Propagation through Atmospheric Turbulence, Free Space Optical Communications, Optical Remote Sensing involving Spectral and Polarization Sensing Techniques, and Astronomical Instrumentation Development.
- **Space Systems**: Research in Space Weather, High-Energy Astrophysics, Autonomous Proximity Operations, and Docking Of Small Satellites.

Support for Graduate Students

A number of teaching assistantships, research assistantships and fellowships are available. Teaching assistants are recommended by individual faculty for selection by the ECE Department's Graduate Studies Committee. International students must pass university screening prior to being eligible for selection as a TA. Nominations for new TAs are made by the advisor after a student is admitted. Research assistants are hired directly by the faculty member who has received a contract or grant for research.

The College of Engineering awards graduate scholarships and fellowships on behalf of Electrical and Computer Engineering. These include:

- the MIT/Lincoln Laboratory Fellowship,
- the Paul and Valerie Klipsch Grad Scholarship,
- the Admiral Paul Arthur Grad Scholarship, and
- the Barry Neil Rappaport Grad Scholarship.

Applications can be completed on-line at https://scholarships.nmsu.edu/. The priority deadline for the Scholar Dollar$ is March 1st. The Electrical Utility Management Program has a limited number of fellowships for students interested in pursuing master's degrees in electrical energy systems.

Admission

Prospective graduate students for the Master of Science or Doctor of Philosophy in Electrical Engineering must first meet the entrance requirements of the Graduate School. The prospective US graduate student should make formal application to the Graduate Student Services office (http://gradschool.nmsu.edu (http://gradschool.nmsu.edu/)). International graduate students must start with the Admissions Office (https://isss.nmsu.edu/#admissions). Official transcripts from all undergraduate and graduate institutions must be sent directly to the Graduate School. International students must also submit their TOEFL (Test of English as a Foreign Language) scores. If the applicant meets the Graduate School's minimum requirements, the application is sent to the Klipsch School's Graduate Studies Committee for review. U.S. residents are given every chance of being successful in the pursuit of a graduate degree. If they do not meet the requirements of the Klipsch School, they can enter the Graduate School as "undeclared" where they must demonstrate competence in two or more graduate-level E E courses before they re-apply.

Requirements for Students Without BSEE Degree or Equivalent

Students without a BSEE degree or equivalent preparation will be expected to take classes covering the core knowledge required in our BSEE program. This includes mathematics through differential equations and basic engineering physics. The student's graduate advisor will prepare an individualized deficiency schedule, based on the student's academic background and work experience.

The following courses from our undergraduate program will be considered deficiencies for students without a BSEE

Prefix	Title	Credits
ENGR 120	DC Circuit Analysis	4
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 230	AC Circuit Analysis	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
E E 240	Multivariate and Vector Calculus Applications	3
E E 317	Semiconductor Devices and Electronics I	4
E E 320	Signals and Systems I	3
E E 325	Signals and Systems II	4
E E 340	Fields and Waves	4
E E 362	Introduction to Computer Organization	4

Degrees for the Department

Bachelor Degree(s)

- Computer Engineering - Bachelor of Science in Computer Engineering (p. 1106)
- Electrical Engineering (Artificial Intelligence, Machine Learning, & Data Science) - Bachelor of Science in Electrical Engineering (p. 1111)
- Electrical Engineering (Communications and Signal Processing) - Bachelor of Science in Electrical Engineering (p. 1114)
- Electrical Engineering (Computers and Microelectronics) - Bachelor of Science in Electrical Engineering (p. 1116)
- Electrical Engineering (Controls & Robotics) - Bachelor of Science in Electrical Engineering (p. 1119)
- Electrical Engineering (Electromagnetics and Photonics) - Bachelor of Science in Electrical Engineering (p. 1121)
- Electrical Engineering (Power) - Bachelor of Science in Electrical Engineering (p. 1124)
- Electrical Engineering (Space Systems Engineering) - Bachelor of Science in Electrical Engineering (p. 1127)
- Electrical Engineering - Bachelor of Science in Electrical Engineering (p. 1109)

Master Degree(s)

- Electrical Engineering - Master of Engineering in Electrical Engineering (p. 151)
- Electrical Engineering - Master of Engineering in Electrical Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/electrical-engineering-meee-online/)
- Electrical Engineering - Master of Science in Electrical Engineering (p. 153)
- Electrical Engineering - Master of Science in Electrical Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/electrical-engineering-msee-online/)

Doctoral Degree(s)

- Engineering (Electrical Engineering) - Doctor of Philosophy (p. 221)

Minors for the Department

- Computer Engineering - Undergraduate Minor (p. 1129)
- Electrical Engineering - Undergraduate Minor (p. 1130)

Graduate Certificates in the Department

- Digital Communications - Graduate Certificate (https://catalogs.nmsu.edu/nmsu/graduate-school/digital-communications-graduate-certificate/)
- Digital Communications - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/digital-communications-graduate-certificate-online/)
- Digital Signal Processing - Graduate Certificate (https://catalogs.nmsu.edu/nmsu/graduate-school/digital-signal-processing-graduate-certificate/)
- Digital Signal Processing - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/digital-signal-processing-graduate-certificate-online/)
- Electric Energy Systems - Graduate Certificate (https://catalogs.nmsu.edu/nmsu/graduate-school/electric-energy-systems-graduate-certificate/)
- Electric Energy Systems - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/electric-energy-systems-graduate-certificate-online/)
- Telemetry - Graduate Certificate (https://catalogs.nmsu.edu/nmsu/graduate-school/telemetry-graduate-certificate/)
- Telemetry - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/telemetry-graduate-certificate-online/)

Department Head Steve Stochaj

Professors Borah, Boucheron, Creusere, Dawood, Lavrova, Stochaj, Tang

Associate Professors Mitchell, Sandoval, Shi

Assistant Professors Renteria Piñon, van Iersel, Wang

Professors of Practice

Emeritus Professors Carden, Castillo, Giles, Sheila Horan, Stephen Horan, Johnson[1], Jordan, Kersting, Ludeman, Merrill, Petersen, Ranade, Reinfelds, Smolleck[1], Steelman[1], Taylor, Voelz

[1] Registered Professional Engineer (NM)

Electrical Engineering Courses

E E 200. Linear Algebra, Probability and Statistics Applications
4 Credits (3+3P)
The theory of linear algebra (vectors and matrices) and probability (random variables and random processes) with application to electrical engineering. Computer programming to solve problems in linear algebra and probability.
Prerequisite: C- or better in (ENGR 140 or CSCI 2210) and (MATH 1521G or MATH 1521H or ENGR 190).
Learning Outcomes

1. Perform vector and matrix operations, including matrix inversion, eigen analysis, finding basis and dimension of vector spaces and rank of a matrix, and solving a set of linear equations.
2. Calculate probabilities using probability mass, density, and cumulative distribution functions for single and multiple, discrete

and continuous random variables, and relate them to electrical engineering applications.
3. Perform simple parameter estimation, such as finding sample mean and variance, and relate to confidence intervals.
4. Describe random processes in the context of signal processing and communications systems problems.
5. Use MATLAB to solve problems involving linear algebra and probability, including designing and performing simple numerical experiments.

E E 240. Multivariate and Vector Calculus Applications
3 Credits (3)
Vector algebra, cylindrical and spherical coordinates, partial derivatives, multiple integrals. Calculus of vector functions through electrostatic applications. Divergence, gradient, curl, divergence theorem, Stokes's theorem, Coulomb's Law, Gauss's Law, electric field, electric potential. Applications in Matlab.
Prerequisite: C- or better in (MATH 1521G or MATH 1521H or ENGR 190) and ENGR 140.
Learning Outcomes
1. Students will demonstrate conceptual understanding of the fundamental principles and theories in vector calculus
2. Students will analyze and solve problems using vector calculus in three coordinate systems

E E 300. Cornerstone Design
2 Credits (1+3P)
Application and realization of engineering principles to a guided team-based design project. Formulation and implementation of test procedures, evaluation of alternate solutions and oral and written communication of the design and test results.
Prerequisite: C- or better in ENGR 140 and ENGR 230 and E E 200.
Learning Outcomes
1. Formulate and implement test procedures for validation of requirements.
2. Evaluate alternative design solutions.
3. Document test procedures and design solutions.
4. Implement design to include a printed-circuit board, electronics and coding.
5. Communicate the design and validation both orally and in writing to a wide range of target audiences.
6. Work in teams.

E E 317. Semiconductor Devices and Electronics I
4 Credits (3+3P)
Analysis and design of opamp circuits, diode circuits and single-transistor MOS and BJT amplifiers. Introduction to solid-slate semiconductor devices.
Prerequisite: C- or better in ENGR 230 and CHEM 1215G.
Learning Outcomes
1. Analysis and design of single time-constant circuits, op-amp circuits, and linear power supplies.
2. Understanding of solid-state devices.
3. Biasing and small-signal analysis of MOS and BJT single transistor amplifiers.
4. Using computer tools to simulate electronic circuits.
5. Testing electronic circuits using power supplies, function generators, digital multi-meters, and oscilloscopes.
6. Writing and documenting laboratory results.

E E 320. Signals and Systems I
3 Credits (3)
Introduction to the modeling and analysis of continuous- and discrete-time signals and systems using time- and frequency-domain methods suitable for both mathematical approaches and computer-aided simulations.
Prerequisite: C- or better in (ENGR 190 or MATH 1521G or MATH 1521H).
Learning Outcomes
1. Understand different types of signals (continuous-time, discrete-time, periodic, etc.) and how these signals are represented mathematically and in a computer.
2. Understand systems representations (e.g., impulse responses), implementations (e.g., convolution and difference/differential equations), and properties (e.g., linearity).
3. Gain insight into transform-domain analysis for signals and systems.
4. Develop the ability to apply transform domain and LTI analysis to simple applications in signal processing, communications, and controls using Matlab.

E E 325. Signals and Systems II
4 Credits (3+3P)
Introduction to communication systems including amplitude and frequency modulation. Introduction to control systems including linear feedback systems, root-locus analysis, and graphical representations. Introduction to digital signal processing including sampling, digital filtering, and spectral analysis.
Prerequisite: C- or better in E E 200 and E E 320.
Learning Outcomes
1. To model, analyze, simulate, and perform calculations with continuous- and discrete-time systems.
2. To develop an understanding of basic modulations in communication systems.
3. To gain insight into the basics of control systems.
4. To develop insight into filtering and analysis of digital signals.
5. To learn how to use MATLAB and SIMULINK to perform analysis, design, and simulation of communication, control, and signal processing systems.

E E 333. AC Circuit Analysis and Introduction to Power Systems
3 Credits (2+3P)
Steady-state analysis of AC circuits, three-phase circuits, and an introduction to power systems.
Prerequisite: C- or better in ENGR 230.
Learning Outcomes
1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession which will establish background for further studies in power systems.
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system

6. To understand measurement, analysis, simulation and design techniques, through laboratory exercises involving hardware and software.

E E 340. Fields and Waves
4 Credits (3+3P)
Static electromagnetic field. Maxwell's equation and time-varying electromagnetic fields. Generalized plane wave propagation, reflection, transmission, superposition and polarization. Transmission line theory. Extensions to optical wave propagation. Applications including Time Domain Reflectrometry (TDR) and fiber optic transmission. Laboratory experience with RF/microwave test equipment and optical apparatus.
Prerequisite: C- or better in ENGR 230 and E E 240.
Learning Outcomes
1. Students will demonstrate an understanding of the fundamental principles, theories, and equations (such as Maxwell's) governing transmission lines, static and time-varying fields, propagation, reflection and transmission of plane waves, waveguides, and antennas.
2. Students will analyze and solve electromagnetic-related problems by applying fundamental principles, theories, and equations (such as Maxwell's equations).
3. Students will demonstrate effective team work.
4. Students will demonstrate the use of RF/microwave test equipment to perform basic RF circuit measurements.

E E 362. Introduction to Computer Organization
4 Credits (3+3P)
Concepts of modern computer organization, CPU control, pipelining, memory hierarchies, memory mapping, hardware-software interface, and operating systems.
Prerequisite: C- or better in ENGR 120 and ENGR 130 and ENGR 140 and MATH 1250G.
Learning Outcomes
1. Be conversant with fundamental concepts of computer organization.
2. Compare and contrast organizational features of different computer.
3. Understand the use of microprocessors and peripheral devices in practical applications.

E E 400. Undergraduate Research
1-3 Credits
Directed undergraduate research. May be repeated for a maximum of 9 credits.
Prerequisite: consent of the department head.

E E 403. Geometric Algebra
3 Credits (3)
Geometric algebra provides a common mathematical language for many areas of physics (classical and quantum mechanics, electrodynamics, special and general relativity), computer science (graphics, robotics, computer vision), engineering, and other fields. Topics include: the geometric product and multivectors; Euclidean, Lorentzian, Galilean, and Projective Geometries; Complex, Hyperbolic, and Dual Numbers; Quaternions and Rotations. Taught with E E 576.
Prerequisite: C- or better in E E 320.
Learning Outcomes
1. Formulate and solve problems related to multivectors and the geometric product while building geometric intuition.
2. Formulate and solve problems related to complex, hyperbolic, and dual numbers as well as quaternions.
3. Formulate and solve problems related to non-Euclidean spaces including Lorentzian, Galilean, and projective geometries.

E E 405. Electricity Markets
3 Credits (3)
Power systems operation in regulated and competitive environments. Topics include: basics of microeconomics; linear programming, duality; electricity market pricing and settlement; RTO operation. Taught with E E 502.
Prerequisite: C- or better in E E 431.
Learning Outcomes
1. Understand basic microeconomic principles, basics of market power, Cournot equilibrium
2. Understand basics of linear programming, the primal dual problems, economic interpretation of dual variables, basics of mixed integer programming
3. Understand dispatch optimization problems in the electric energy markets including economic dispatch, unit commitment
4. Understand motivation and objectives of market design, including uniform vs. pay-as-bid pricing, locational marginal prices (LMPs), dual of the DCOPF and the various terms (load payment, congestion rent, etc.), pricing issues in non-convex markets, financial transmission rights, ancillary services market

E E 406. Quantum Computing
3 Credits (3)
This course is an introduction to quantum computing (QC), emphasizing the underlying theory. Topics covered include single and multiple qubit systems, state transformations, algorithms, subsystems, and error correction. The course is intended to be accessible to a wide audience of engineers, mathematicians, and scientists; no previous exposure to quantum physics is required. It is highly recommended that students have completed a college-level linear algebra course. Taught concurrently with E E 506.
Learning Outcomes
1. Explain the quantum computing paradigm.
2. Apply the principles of quantum mechanics for computation.
3. Analyze quantum algorithms and evaluate possible quantum speedups.
4. Describe the framework of quantum error correction codes.

E E 408. Noncooperative Game Theory
3 Credits (3)
The purpose of this course is to teach students to formulate problems as mathematical games and provide the basic tools to solve them. The course covers: Static games, starting with two-player zero-sum games and eventually building up to n-player non-zero sum games. Saddle-points and Nash equilibria will be covered. Dynamic optimization (dynamic programming) for discrete and continuous time. Dynamic games, both open and closed-loop policies. The intended audience includes (but is not restricted to) students in engineering and computer science. The class is heavily project-oriented and the students are strongly encouraged to choose a project that is relevant to their own area of research. Taught with E E 553.
Prerequisite: C- or better in E E 200 or ((MATH 2415 or MATH 480) and (STAT 371 or STAT470) and (CSCI 1720 or CSCI 2210)) or equivalent.
Learning Outcomes
1. Comprehend the key principles of noncooperative game theory.
2. Apply the Minimax Theorem and evaluating mixed saddle-point equilibria.

3. Analyze stochastic policies for games in extensive form, and apply them to the existence and computation of saddle-point equilibria.
4. Comprehend games with N-players.
5. Analyze potential games and evaluate Nash equilibria for potential games.
6. Analyze dynamic games: the optimal control of a dynamical system.
7. Evaluate the saddle-point equilibria of zero-sum discrete-time and continuous-time dynamic games in state-feedback policies.

E E 409. Hardware & Software Codesign
3 Credits (3)
This course introduces the concept and techniques of designing electronic systems that integrates both hardware and software components. Topics include nature of hardware and software, dataflow modeling, software and hardware implementations of dataflows, analysis of control flows and dataflows, FSM with Datapath, microprogramming, embedded cores, and trade-offs between hardware and software components, etc. Students gain experience in implementing hardware and software co-design solutions for solving real-world problems through hands-on laboratory/project on a programmable System-on-Chip (SoC) platform that integrates a dual-core ARM Cortex-A9 processor and FPGA fabrics. Students develop a fundamental understanding of state-of-the-art practices in developing codesign solutions to problems that prepare them well for industrial and academic careers in this field. Taught with E E 556.
Prerequisite: C- or better in ENGR 140 and ENGR 130 and (E E 362 or C S 473).
Learning Outcomes
1. Formulate and solve problems related to basic concepts and methodologies in hardware/software co-design.
2. Analyze concurrent specification of an algorithm to be partitioned into software (C code) and hardware (HDL) components.
3. Design and implement both the software and hardware components integration as a solution to real-world problems to achieve optimal performance, power and cost.
4. Descrbe various types of system architectures regarding their attributes including speed, energy, design complexity, design cost, etc.
5. Experience working with commercially available Computer-Aided Design (CAD) development tools such as Xilinx Vivado
6. Experience working in translation between C code and HDL of practical problems and verify/test the solution on FPGA SoC architecture

E E 412. ASIC Design
3 Credits (3)
This course provides students with experiential knowledge of modern application specific integrated circuits. Topics include ASIC packaging and testing, I/O pads and ESD, Verilog programming and simulation, FPGA verification, Register-transfer level synthesis, timing and area optimization, floorplanning and routing, digital interfaces, full custom and standard cell design, post-layout simulation, and PCB schematics and layout. Taught with E E 512.
Prerequisite: C - or better in E E 480.
Learning Outcomes
1. Cadence ASIC design tools and design flow
2. Verilog programming, simulation, and FPGA verification
3. Padring, I/O, and ESD for ASIC
4. CMOS standard cell library for large scale digital circuit
5. MOSIS Tapeout options and ASIC package selections
6. Typical digital interfaces
7. Allegro PCB schematic and layout, ASIC testing
8. Digital Signal Processing Circuits implementation in ASIC

E E 431. Power System Analysis
3 Credits (3)
Analysis of a power system in the steady-state. Includes the development of models and analysis procedures for major power system components and for power networks. Taught with E E 542.
Prerequisite: C- or better in E E 333.
Learning Outcomes
1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession.
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system.
6. To convey to the student a thorough understanding of both the theory and the mechanics involved in the modeling and analysis of power system components and networks.
7. To study how such modeling and analysis is used in the design/planning of power systems.
8. To establish background for further studies in power systems.

E E 432. Power Electronics
3 Credits (2+3P)
Basic principles of power electronics and its applications to power supplies, electric machine control, and power systems. Taught with E E 537.
Prerequisite: C- or better in E E 317 and E E 333.
Learning Outcomes
1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession. To establish background for further studies in power systems
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To convey to the student a thorough understanding of both the theory and the mechanics involved in the modeling and analysis of power system components and networks
7. To study how such modeling and analysis is used in the design/planning of power systems

E E 433. Power System Operation
3 Credits (3)
Basics of power system operation; linear programming, economic dispatch, mixed integer programing, power system security and contingency analysis; RTO operation; generation control; renewable integration.
Prerequisite: C- or better in E E 431.
Learning Outcomes
1. Understand basic microeconomic principles, basics of market power, Cournot equilibrium.
2. Understand basics of linear programming and can use software to solve simple linear programming problems.
3. Understand the different between AC and DC power flow. Understand dispatch optimization problems in the electric energy markets including economic dispatch, unit commitment.
4. Understand the control schemes in power system, including governor repose, automatic generation control.
5. Understand the power system security including N-I criteria, contingency analysis, and security constraints.

E E 434. Numerical Computational Methods for Smart Grid
3 Credits (3)
This course reviews modeling of power system and provides a comprehensive study of the various computational methods and software packages that form the basis of many analytical studies of power systems. It presents the analytical background of the algorithms used in many commercially available software packages, thereby enabling the student to make more informed decisions in their use of the software and correctly interpret their results. The course provides a balanced discussion of the theory and applications of the algorithms. Taught with EE 503.
Prerequisite: C- or better in E E 493.
Learning Outcomes
1. Review models of power system components and formulate popular problems for the applications of computational tools to be studied.
2. Acquaint students with various computational tools used in solving many advanced problems in power systems and other research areas.
3. Demonstrate knowledge in the strengths and weaknesses of the various computational tools by selecting and using the appropriate method to solve a given problem.
4. Demonstrate problem-solving skills in successfully addressing a complicated numerical problem relating to the student's research area.

E E 435. Smart Grid Technologies
3 Credits (3)
Technical concepts of smart grid and microgrid devices, operation principles and methodologies. Taught with EE 504.
Prerequisite: C- or better in E E 493.
Learning Outcomes
1. Review models of power system components and formulate problems and challenges of transitioning of a traditional power grid to a smart grid concept.
2. Be familiar with various current research topics and problems in modern power systems and other research areas.
3. Demonstrate knowledge in the strengths and weaknesses of the various technologies in modern power systems.
4. Demonstrate problem-solving skills in successfully addressing a complicated numerical problem relating to the student's research area, as applicable to power systems.

E E 440. Photovoltaic Devices and Systems
3 Credits (3)
Technical concepts of photovoltaics, with primary focus on solar cell technology. Solar cell device level operation, packaging, and manufacturing. Design of photovoltaic systems for stand-alone or grid-tied operation. Business-case analysis using real-life scenarios of photovoltaic system solutions. Taught with E E 540.
Prerequisite: C- or better in E E 317.
Learning Outcomes
1. Name at least three different types of photovoltaic materials and cells;
2. Derive equations governing operation of photovoltaic cells;
3. Design and create electrical engineering drawings for photovoltaic systems of different nameplate capacity;
4. Describe principles of operation of the "balance of the system" (BOS) components of the photovoltaic system.

E E 444. Advanced Image Processing
3 Credits (3)
Advanced topics in image processing including segmentation, feature extraction, object recognition, image understanding, big data, and applications. Taught with E E 588.
Prerequisite: C- or better in (E E 446 or E E 596).
Learning Outcomes
1. Implement and analyze segmentation of color and grayscale images.
2. Implement and analyze morphological analysis of binary images
3. Implement and analyze compression of images
4. Implement and analyze feature extraction and classification of images
5. Implement and analyze convolutional neural networks (CNNs) for classification of images

E E 446. Digital Image Processing
3 Credits (3)
Two-dimensional transform theory, color images, image enhancement, restoration, segmentation, compression and understanding. Taught with E E 596.
Prerequisite: C- or better in E E 325.
Learning Outcomes
1. Analyze human visual perception and the implications to science and society
2. Formulate and analyze problems that utilize the mathematics behind multidimensional image processing
3. Formulate and analyze problems involving multidimensional transformation transform-domain processing
4. Formulate and analyze problems related to color image acquisition, processing, and display
5. Implementing image processing algorithms on computers in Matlab or python

E E 447. Neural Signal Processing
3 Credits (3)
Cross-disciplinary course focused on the acquisition and processing of neural signals. Students in this class will be learn about basic brain structure, different brain signal acquisition techniques (fMRI, EEG, MEG, etc.), neural modeling, and EEG signal processing. To perform EEG

signal processing, students will learn and use Matlab along with an EEG analysis package. Taught with E E 597.
Prerequisite: C- or better in E E 325.
Learning Outcomes
1. Demonstrate understanding and skill in the Structure and basic operation of the human brain
2. Demonstrate understanding and skill in processing of EEG brain signals using Matlab and EEGLAB
3. Demonstrate understanding and skill in EEG-related neural modeling
4. Demonstrate understanding and skill in brain signal types and acquisition

E E 448. Signal Compression
3 Credits (3)
Fundamentals of information source encoding and decoding. Includes information theory bounds on source coding, lossless coding algorithms, scalar quantizing and vector quantizing. Taught with E E 573.
Prerequisite: C- or better in E E 200.
Learning Outcomes
1. Formulate and analyze problems related to rate-distortion tradeoffs in compression
2. Formulate and analyze problems related to scalar and vector quantization
3. Formulate and analyze problems related to transform coding
4. Formulate and analyze problems related to entropy coding (Huffman arithmetic)
5. Formulate and analyze problems related to standardized codecs, including MPEG, JPEG, MP3
6. Formulate and analyze problems related to compressive sensing/sampling

E E 449. Smart Antennas
3 Credits (3)
Smart antenna and adaptive array concepts and fundamentals, uniform and plannar arrays, optimum array processing. Adaptive beamforming algorithms and architectures: gradient-based algorithms, sample matrix inversion, least mean square, recursive least mean square, sidelobes cancellers, direction of arrival estimations, effects of mutual coupling and its mitigation. Taught with E E 549.
Prerequisite: C- or better in E E 325 and E E 340.
Learning Outcomes
1. Antenna and Array fundamentals.
2. Smart Antenna and Adaptive Array concepts: Uniform and Planar Arrays; Array steering; Array performance criteria; Error effects on beamforming.
3. Adaptive Beamforming Algorithms and Architectures: gradient-based algorithms, Sample Matrix Inversion; Least Mean Square; Recursive Least Mean Square; Sidelobes cancellers; Direction of Arrival estimations; Effects of mutual coupling and its mitigation.
4. Applications: Angle of arrival estimation; Diversity combining; Nulling for jammer suppression and clutter cancellation, etc.

E E 452. Introduction to Radar
3 Credits (3)
Basic concepts of radar. Radar equation; detection theory. AM, FM, and CW radars. Analysis of tracking, search, MTI, and imaging radar. Recommended foundation: E E 496. Taught with E E 548.
Prerequisite: C- or better in E E 325 and E E 340.
Learning Outcomes
1. Students will demonstrate an understanding of fundamental principles of various types of radar systems and their applications.
2. Students will learn to analyze a given radar system.
3. Students will learn to use simulation techniques to design a radar system that will yield desired characteristics.
4. Students will experience working in groups/teams.

E E 453. Microwave Engineering
3 Credits (3)
Techniques for microwave measurements and communication system design, including transmissions lines, waveguides, and components. Microwave network analysis and active device design. Taught with E E 521.
Prerequisite: C- or better in E E 340.
Learning Outcomes
1. Students will demonstrate an understanding of fundamental principles and theories related to microwave systems, components, and devices.
2. Students will analyze and solve microwave engineering-related problems using the fundamental microwave engineering theories and principles.
3. Students will demonstrate the use of microwave engineering design tools.
4. Students will demonstrate effective team work.
5. Students will demonstrate an understanding the impact of engineering solutions in a global, economic, environmental, and societal context.
6. Students will demonstrate an understanding of the knowledge of contemporary professional, societal and global issues.

E E 454. Antennas and Radiation
4 Credits (3+3P)
Basic antenna analysis and design. Fundamental antenna concepts and radiation integrals. Study of wire antennas, aperture antennas, arrays, reflectors, and broadband antennas. Taught with E E 541.
Prerequisite: C- or better in E E 340.
Learning Outcomes
1. Students will demonstrate an understanding of the fundamental principles, theories, and equations governing antenna radiation, antenna arrays, and matching, etc.
2. Students will analyze and solve the antenna-related radiation problems, antenna structures.
3. Students will demonstrate the use of antenna synthesis techniques and simulation software to solve antenna related problems.
4. Students will demonstrate effective team work.
5. Students will demonstrate an understanding the impact of engineering solutions in a global, economic, environmental, and societal context.
6. Students will demonstrate an understanding of the knowledge of contemporary professional, societal and global issues.

E E 458. Hardware Security and Trust
3 Credits (3)
This course introduces and investigates recent technology development for the design and evaluation of secure and trustworthy hardware and embedded systems. Topics include IoT security, cryptography, hardware security primitives, authentication and key generation, invasive and non-invasive attacks and countermeasures, IC piracy and intellectual property protection, hardware trojans, and secure boot. Taught with E E 558.

Prerequisite: C- or better in E E 362.

Learning Outcomes

1. Understand the security goals of information security.
2. Understand cryptography basics and their applications.
3. Formulate and analyze problems related to security threats in integrated circuits, electronic devices and semiconductor supply chain.
4. Formulate and analyze problems related to security countermeasures to the threats of integrated circuits and electronic devices.
5. Use metrics to measure and assess the security level of security mechanisms or primitives in hardware security applications.
6. Analyze and assess potential security vulnerabilities in hardware and embedded systems.
7. Learn state-of-art security mechanisms and research topics in the hardware and embedded security area.

E E 460. Space System Mission Design and Analysis

3 Credits (3)

Satellite system design, including development, fabrication, launch, and operations. A systems engineering approach to concepts, methodologies, models, and tools for space systems. Students must be in junior standing to enroll.

Learning Outcomes

1. Apply knowledge from science, math and engineering to satellite design.
2. Experience the "system engineering" of satellite design through the design of a space mission.
3. Understand the professional and ethical responsibilities related to satellite design.
4. Understand the impact of satellite related engineering solutions in a global, economic, environmental, and societal context.
5. Maintain a knowledge of contemporary professional, societal and global issues as they relate to satellites.

E E 462. Computer Systems Architecture

3 Credits (3)

The course covers uniprocessors, caches, memory systems, virtual memory, storage systems, with introduction to multiprocessor and distributed computer architectures; models of parallel computation; processing element and interconnection network structures, and nontraditional architectures. Taught with E E 562.

Prerequisite: C- or better in E E 362 and (CSCI 1240 or CSCI 4510 or CSCI 1210 or CSCI 4505 or CSCI 1720 or CSCI 2210).

Learning Outcomes

1. Recognize the basic principles and current practices of computer architectures of processors, memory systems, interconnects, and input/output systems.
2. Reason about the issues that influence the architectures of processors, memory systems, interconnects, and input/output systems.
3. Evaluate and improve computer system performance through analysis and computer simulation.
4. Solve and implement a small research problem in computer architecture.

E E 465. Machine Learning I

3 Credits (3)

An undergraduate-level introduction to machine learning algorithms, including supervised and unsupervised learning methods. Topics covered include clustering, linear regression models, linear discriminant functions, feed-forward neural networks, statistical pattern classification and regression, maximum likelihood, naive Bayes, non-parametric density estimation, mixture models, decision trees, and ensemble learning. Taught with E E 565.

Prerequisite: C- or better in E E 200.

Learning Outcomes

1. Formulate and solve problems related to the basic concepts and mathematical techniques of machine learning.
2. Gain an understanding of machine learning algorithms/methods by solving problems using software.
3. Gain experience doing independent study and research.
4. Formulate and solve problems related to the basics of regression, classification, and unsupervised learning.
5. Gain practical experience through project-based assignments and technical report writing.

E E 467. ARM SOC Design

3 Credits (3)

The course aims to produce students who are capable of developing ARM-based SoCs from high level functional specifications to design, implementation and testing on real FPGA hardware using standard hardware description and software programming languages. Taught with E E 567.

Prerequisite: C- or better in E E 362 and E E 317.

Learning Outcomes

1. Formulate and solve problems requiring knowledge and understanding of ARM processor architectures and ARM-based SoCs.
2. Capture the design of ARM-based SoCs in a standard hardware description language.
3. Conduct low-level software design for ARM-based SoCs and high-level application development.
4. Demonstrate the ability to use and choose between different techniques for digital system design and capture.
5. Evaluate implementation results (speed, area, power) and correlate them with the corresponding high level design and capture.
6. Demonstrate the ability to use a commercial tools to develop ARM-based SoCs.

E E 473. Introduction to Optics

3 Credits (3)

The nature of light, geometrical optics, basic optical instruments, wave optics, aberrations, polarization, and diffraction. Elements of optical radiometry, lasers and fiber optics. Crosslisted with: PHYS 473.

Prerequisite(s): C- or better in PHYS 1320G or PHYS 2120.

Learning Outcomes

1. Conduct computations and designs using concepts of geometrical optics, including reflection, refraction, imaging, and thin lens models.
2. Conduct computations and designs using concepts of optical instrumentation, including stops, pupils, prisms, aberrations, cameras, magnifiers, microscopes, and telescopes.
3. Apply wave equations including harmonic waves, complex waves, plane waves, spherical waves, electromagnetic waves, and superposition of waves.
4. Apply properties of lasers to computations and designs including quantization of light, black bodies, EM radiation, and light-matter interaction.
5. Use properties of interference, interferometry, coherence, and diffraction in computations and designs.

E E 475. Control Systems Synthesis
3 Credits (3)
An advanced perspective of linear modern control system analysis and design, including the essential algebraic, structural, and numerical properties of linear dynamical systems. Computer-aided solution of real-world design problems. Taught with E E 551.
Prerequisite: C- or better in E E 407.
Learning Outcomes
1. Understand the concepts of Model Identification and Parameter Estimation (least-square identification of a auto-regressive model; nonparametric identification in the time domain; and nonparametric identification in the frequency domain).
2. Understand Robust Control techniques (Nyquist-plots, small-gain, and passivity).
3. Understand Optimal control techniques (LQR/LQG for state-space systems and time-optimal controller for the positioning of a mass using force actuation).
4. Understand Nonlinear control techniques (Lyapunov's stability method; feedback linearization controller for a fully actuated 2nd order mechanical system; backstepping for triangular nonlinear systems; actuator limitations).

E E 478. Fundamentals of Photonics
4 Credits (3+3P)
Ray, wave and guided optics, lasers and thermal sources, radiometry, photon detection and signal-to-noise ratio. Elements of photonic crystals, polarization, acousto-optics, electro-optics, and optical nanostructures. Recommended foundation: E E 473 /PHYS 473. Taught with E E 528.
Prerequisite: C- or better in PHYS 1320G or PHYS 2120.
Learning Outcomes
1. Understand the fundamentals of the different theories of light including ray, wave, electromagnetic (vector) and photon optics, and how these theories are represented mathematically and on a computer.
2. Develop the ability to perform calculations for the different theories (ray tracing, wave interference, polarization calculus, photon detection) to determine the propagation characteristics and describe the manipulation of light.
3. Gain insight and experience with materials and devices for manipulating and detecting light (glass, mirrors, lenses, fiber optics, polarization elements, liquid crystals, semiconductors, and photodiodes).
4. Apply the theoretical, mathematical, and practical understanding of optics to describe real-world applications of light technology with supporting analysis and calculations.

E E 480. Introduction to Analog and Digital VLSI
3 Credits (3)
Introduction to analog and digital VLSI circuits implemented in CMOS technology. Design of differential amplifiers, opamps, CMOS logic, flip-flops, and adders. Introduction to VLSI fabrication process. Taught with E E 510.
Prerequisite: C- or better in E E 317.
Learning Outcomes
1. Explain the basic concepts of CMOS VLSI system design.
2. Formulate and solve problems related to pseudo ideal operation of MOS transistors as switches and implementation with transistors of basic and complex Boolean functions.
3. Use modern software tools to simulate integrated circuits.
4. Formulate and solve problems related to operation and design of basic analog building blocks.
5. Formulate and solve problems related to operation and design of basic digital building blocks.
6. Formulate and solve problems related to key aspects of performance characteristics (speed, power dissipation, Silicon area) of VLSI systems and how to size transistors in order to achieve desired performance specifications.

E E 485. Analog VLSI Design
3 Credits (2+3P)
Analysis, design, simulation, layout and verification of CMOS analog building blocks, including references, opamps, switches and comparators. Teams implement a complex analog IC. Taught with E E 523.
Prerequisite: C- or better in E E 320 and E E 480.
Learning Outcomes
1. Analysis, design, simulation, and layout of current mirrors, current sources, and voltage references.
2. Analysis, design, simulation, and layout of differential and operational amplifiers.
3. Analysis, design, simulation, and layout of switched-capacitor circuits.
4. Using VLSI CAD tools for simulating and laying out analog integrated circuits.
5. Writing laboratory reports and project documentation.

E E 490. Selected Topics
1-3 Credits
Selected topics. Subtitled courses will have varied topics and learning outcomes and will be listed in the course schedule. Non subtitled courses may be used as independent study with the approval and oversight of a faculty member. May be repeated up to 9 credits.
Learning Outcomes
1. Varies and dependent on subject matter taught under this selected topics course.

E E 492. Introduction to Control Systems
3 Credits (3)
This course provides an introduction to the analysis of control systems. The main focus will be on techniques in classical control theory. System dynamics and modeling techniques in both the frequency domain and the time domain will be covered. Students will learn how to transform linear dynamical systems between state-space and frequency domains, and evaluate conditions for stability in each domain. Students will analyze and characterize both the transient and steady-state response, and examine root locus, Bode, and Nyquist plots. Concepts of robust control, including tradeoffs between sensitivity and performance, will be emphasized throughout. Applications will range across electrical, mechanical, chemical, biomedical, and biological systems. Laboratory activities include modeling, analysis and simulation of physical processes.
Prerequisite: C- or better in E E 325 and MATH 392.
Learning Outcomes
1. Obtain mathematical models of electrical and mechanical systems from their idealized elements.
2. Derive the transfer function of a control system.
3. Apply their mathematical knowledge to determine the response of a linear system to various types of inputs.

4. Develop familiarity and confidence with analyzing transient and steady state responses of a linear system.
5. Apply their mathematical knowledge to understand the concept of stability.
6. Develop familiarity and confidence with controller design based on Routh-Hurwitz, Root locus and P, PI, PID modes of control.
7. Develop proficiency in systems simulation using MATLAB and SIMULINK.

E E 493. Power System Faults and Stability
3 Credits (3)
Analysis of a power system under abnormal operating conditions. Topics include symmetrical three-phase faults, theory of symmetrical components, unsymmetrical faults, system protection, and power system stability. Taught with E E 543.
Prerequisite: C- or better in E E 431.
Learning Outcomes
1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession.
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system.
6. To understand measurement, analysis, simulation and design techniques, through laboratory exercises involving hardware and software.
7. To establish background for further studies in power systems.

E E 495. Introduction to Digital Signal Processing
3 Credits (3)
Undergraduate treatment of sampling/reconstruction, quantization, discrete-time systems, digital filtering, z-transforms, transfer functions, digital filter realizations, discrete Fourier transform (DFT) and fast Fourier transform (FFT), finite impulse response (FIR) and infinite impulse response (IIR) filter design, and digital signal processing (DSP) applications.
Prerequisite: C- or better in E E 325.
Learning Outcomes
1. The student should be comfortable with the theory and practice of digital signal processing including sampling and reconstruction and quantization effects.
2. The student should be comfortable with the theory and practice of digital signal processing including discrete-time systems, digital filtering, and digital filter realizations.
3. The student should be comfortable with the theory and practice of digital signal processing including z-transform analysis.
4. The student should be comfortable with the theory and practice of digital signal processing including discrete Fourier transform (DFT) and fast Fourier transform (FFT).
5. The student should be comfortable with the theory and practice of digital signal processing including finite impulse response (FIR) and infinite impulse response (IIR) filter design.

E E 496. Introduction to Communication Systems
3 Credits (3)
Introduction to the analysis of signals in the frequency and time domains. A study of baseband digital transmission systems and digital/analog RF transmission systems. Introduction to telecom systems as well as satellite systems.
Prerequisite: C- or better in E E 325.
Learning Outcomes
1. To analyze signals in time and frequency domains.
2. To mathematically describe analog modulation and demodulation techniques and relate these through electronic subsystems to form communications transmitters and receivers.
3. To apply basic digital communication operations and solve numerical problems on introductory digital communications principles.
4. To identify and explain the roles of basic communication blocks in a few practical systems, and to discuss contemporary issues, impact of the solutions and professional and ethical aspects.

E E 497. Digital Communication Systems I
3 Credits (3)
Techniques for transmitting digital data over commercial networks. Topics include baseband and bandpass data transmission and synchronization techniques. Recommended foundation: E E 496. Taught with: E E 581.
Prerequisite: C- or better in E E 325.
Learning Outcomes
1. Analyze bandwidth and error performance of baseband and bandpass signals through mathematical explanations and simulated experimental data.
2. Evaluate channel code structures and their performance.
3. Analyze communication system issues involving link budgets, synchronization and resource allocations.
4. Develop a wider perspective recognizing contemporary technologies, impact of the solutions and professional and ethical responsibilities.

E E 501. Research Topics in Electrical and Computer Engineering
1 Credit (1)
Ethics and methods of engineering research; contemporary research topics in electrical and computer engineering.

E E 502. Electricity Markets
3 Credits (3)
Power systems operation in regulated and competitive environments. Topics include: basics of microeconomics; linear programming, duality; electricity market pricing and settlement; RTO operation. Recommended foundation: E E 431. Taught with: E E 405.
Learning Outcomes
1. Understand basic microeconomic principles, basics of market power, Cournot equilibrium
2. Understand basics of linear programming, the primal dual problems, economic interpretation of dual variables, basics of mixed integer programming
3. Understand dispatch optimization problems in the electric energy markets including economic dispatch, unit commitment
4. Understand motivation and objectives of market design, including uniform vs. pay-as-bid pricing, locational marginal prices (LMPs), dual of the DCOPF and the various terms (load payment, congestion rent, etc.), pricing issues in non-convex markets, financial transmission rights, ancillary services market

E E 503. Numerical Computational Methods for Smart Grid
3 Credits
This course reviews modeling of power system and provides a comprehensive study of the various computational methods and software packages that form the basis of many analytical studies of power systems. It presents the analytical background of the algorithms used in many commercially available software packages, thereby enabling the student to make more informed decisions in their use of the software and correctly interpret their results. The course provides a balanced discussion of the theory and applications of the algorithms. Taught with EE434.
Prerequisite: C- or better in EE493 or EE543 or equivalent.
Learning Outcomes
1. Review models of power system components and formulate popular problems for the applications of computational tools to be studied.
2. Acquaint students with various computational tools used in solving many advanced problems in power systems and other research areas.
3. Demonstrate knowledge in the strengths and weaknesses of the various computational tools by selecting and using the appropriate method to solve a given problem.
4. Demonstrate problem-solving skills in successfully addressing a complicated numerical problem relating to the student's research area.

E E 504. Smart Grid Technologies
3 Credits
Technical concepts of smart grid and microgrid devices, operation principles and methodologies. Taught with EE 435.
Prerequisite: C- or better in E E 493 or E E 543 or equivalent.
Learning Outcomes
1. Review models of power system components and formulate problems and challenges of transitioning of a traditional power grid to a smart grid concept.
2. Be familiar with various current research topics and problems in modern power systems and other research areas.
3. Demonstrate knowledge in the strengths and weaknesses of the various technologies in modern power systems.
4. Demonstrate problem-solving skills in successfully addressing a complicated numerical problem relating to the student's research area, as applicable to power systems.

E E 505. Application of Optimization Techniques in Power Systems
3 Credits
This course explores the dynamic intersection of optimization methods and the real-world application in power systems. will gain an in-depth understanding of how to formulate and solve complex optimization challenges in power generation, transmission, and distribution. This course covers primal and dual problems, mixed integer programming, and solving techniques such as branch and bound. Students. Additionally, the course covers decomposition algorithms, such as Benders decomposition and Lagrangian relaxation, facet defining valid inequalities, resolution theorems, certificates of unboundedness and infeasibility, as well as the application of stochastic programming and robust optimization to navigate the uncertainties inherent in the energy sector. By the end of this course, students will be equipped to address pressing issues in power system operation, planning, and decision-making using advanced optimization techniques.
Prerequisite: C- or better in E E 431 or E E 542 or equivalent.
Learning Outcomes
1. Understand basics of linear programming and can use software to solve simple linear programming problems.
2. Understand stochastic programming and can use Benders decomposition techniques to solve stochastic programming problems in parallel.
3. Understand robust optimization and can use robust optimization in unit commitment and planning.

E E 506. Quantum Computing
3 Credits (3)
This course is an introduction to quantum computing (QC), emphasizing the underlying theory. Topics covered include single and multiple qubit systems, state transformations, algorithms, subsystems, and error correction. The course is intended to be accessible to a wide audience of engineers, mathematicians, and scientists; no previous exposure to quantum physics is required. It is highly recommended that students have completed a college-level linear algebra course. Taught with E E 406.
Learning Outcomes
1. Explain the quantum computing paradigm.
2. Apply the principles of quantum mechanics for computation.
3. Analyze quantum algorithms and evaluate possible quantum speedups.
4. Describe the framework of quantum error correction codes.

E E 507. Data Analytics and AI for the Smart Grid
3 Credits
This course explores the application of data analytics and artificial intelligence in enhancing smart grid operations. This course equips students with the skills to analyze smart grid data, implement AI strategies for grid optimization, and innovate solutions for real-world challenges. Through a mix of theoretical understanding and practical exercises, students will learn to make effective decisions, forecast loads, and integrate renewable energy resources. Recommended foundation: C S 453 or equivalent or proficiency in python programming.
Prerequisite: C- or better in E E 431 or E E 542 or equivalent.
Learning Outcomes
1. Grasp the core principles of smart grid technology, data analytics, and AI, and how these technologies can help enhance power grid operation and control.
2. Gain proficiency in applying various data analytics methods to real-world smart grid data, enabling effective decision-making and problem-solving in grid management.
3. Develop the capability to design and implement AI algorithms and machine learning models that optimize smart grid operations, including load forecasting and renewable energy integration.
4. Cultivate the skills to critically analyze and interpret complex datasets, drawing meaningful insights pertinent to smart grid operations and maintenance.
5. Encourage innovation and application of learned concepts to address real-world challenges in the smart grid sector, fostering a mindset of continuous improvement and adaptation to emerging technologies.
6. Enhance teamwork and communication skills, essential for collaborative problem-solving in multi-disciplinary environments typical of the smart grid ecosystem.
7. Stay abreast of the latest trends and developments in the field of smart grids, data analytics, and AI, preparing students for a future of ongoing learning and adaptation in a rapidly evolving sector.

E E 510. Introduction to Analog and Digital VLSI
3 Credits (3)
Introduction to analog and digital VLSI circuits implemented in CMOS technology. Design of differential amplifiers, opamps, CMOS logic, flip-flops, and adders. Introduction to VLSI fabrication process. Recommended foundation: E E 362 and E E 317 Taught with E E 480.
Learning Outcomes
1. Explain the basic concepts of CMOS VLSI system design
2. Formulate and solve problems related to pseudo ideal operation of MOS transistors as switches and implementation with transistors of basic and complex Boolean functions
3. Use modern software tools to simulate integrated circuits
4. Formulate and solve problems related to operation and design of basic analog building blocks
5. Formulate and solve problems related to operation and design of basic digital building blocks
6. Formulate and solve problems related to key aspects of performance characteristics (speed, power dissipation, Silicon area..) of VLSI systems and how to size transistors in order to achieve desired performance specifications.

E E 512. ASIC Design
3 Credits (3)
This course provides students with experiential knowledge of modern application specific integrated circuits. Topics include ASIC packaging and testing, I/O pads and ESD, Verilog programming and simulation, FPGA verification, Register-transfer level synthesis, timing and area optimization, floorplanning and routing, digital interfaces, full custom and standard cell design, post-layout simulation, and PCB schematics and layout. Recommended foundation: E E 480. Taught with E E 412.
Learning Outcomes
1. Cadence ASIC design tools and design flow
2. Verilog programming, simulation, and FPGA verification
3. Padring, I/O, and ESD for ASIC
4. CMOS standard cell library for large scale digital circuit
5. MOSIS Tapeout options and ASIC package selections
6. Typical digital interfaces
7. Allegro PCB schematic and layout, ASIC testing
8. Digital Signal Processing Circuits implementation in ASIC

E E 521. Microwave Engineering
3 Credits (3)
Techniques for microwave measurements and communication system design, including transmission lines, waveguides, and components. Microwave network analysis and active device design. Recommended foundation: E E 340. Taught with: E E 453.
Learning Outcomes
1. Students will demonstrate an understanding of fundamental principles and theories related to microwave systems, components, and devices.
2. Students will analyze and solve microwave engineering-related problems using the fundamental microwave engineering theories and principles.
3. Students will demonstrate the use of microwave engineering design tools.
4. Students will demonstrate effective team work.
5. Students will demonstrate an understanding the impact of engineering solutions in a global, economic, environmental, and societal context.
6. Students will demonstrate an understanding of the knowledge of contemporary professional, societal and global issues.

E E 523. Analog VLSI Design
3 Credits (2+3P)
Analysis, design, simulation, layout and verification of CMOS analog building blocks, including references, opamps, switches and comparators. Teams implement a complex analog IC. Recommended foundation: E E 320 and E E 480. Taught with: E E 485.
Learning Outcomes
1. Students completing the course with a grade of C or better will perform satisfactorily on analysis, design, simulation, and layout of current mirrors, current sources, and voltage references.
2. Students completing the course with a grade of C or better will perform satisfactorily on analysis, design, simulation, and layout of differential and operational amplifiers.
3. Students completing the course with a grade of C or better will perform satisfactorily on analysis, design, simulation, and layout of switched-capacitor circuits.
4. Students completing the course with a grade of C or better will perform satisfactorily on using VLSI CAD tools for simulating and laying out analog integrated circuits.
5. Students completing the course with a grade of C or better will perform satisfactorily on writing laboratory reports and project documentation.

E E 528. Fundamentals of Photonics
4 Credits (3+3P)
Ray, wave and guided optics, lasers and thermal sources, radiometry, photon detection and signal-to-noise ratio. Elements of photonic crystals, polarization, acousto-optics, electro-optics, and optical nanostructures. Recommended foundation (PHYS 1320G or PHYS2120) and (E E 473 or PHYS 473), Taught with E E 478. Crosslisted with PHYS 528.
Learning Outcomes
1. Describe the fundamental properties of light.
2. Formulate the concepts of ray, wave, and photon optics mathematically.
3. Represent and incorporate basic elements of an optical system.
4. Perform an analysis of a simple photonic/optical system mathematically by hand and with computer tools such as MATLAB.
5. Discuss ethical, societal, and professional issues related to photonics and optics.

E E 533. Power System Operation
3 Credits (3)
Basics of power system operation; linear programming, economic dispatch, mixed integer programing, power system security and contingency analysis; RTO operation; generation control; renewable integration. Taught concurrently with E E 433.
Prerequisite: C- or better in E E 431 or E E 542 or equivalent.
Learning Outcomes
1. Understand basic microeconomic principles, basics of market power, Cournot equilibrium.
2. Understand basics of linear programming and can use software to solve simple linear programming problems.
3. Understand the different between AC and DC power flow. Understand dispatch optimization problems in the electric energy markets including economic dispatch, unit commitment.
4. Understand the control schemes in power system, including governor repose, automatic generation control.

5. Understand the power system security including N-1 criteria, contingency analysis, and security constraints.

E E 534. Power System Relaying
3 Credits (3)
Fundamental relay operating principles and characteristics. Current, voltage, directional, differential relays; distance relays; pilot relaying schemes. Standard protective schemes for system protection. Operating principles and overview of digital relays. Recommended foundation: E E 493.
Learning Outcomes
1. Identify and explain the function of commonly used relay elements and relaying schemes.
2. Set up and use Fault, Powerflow and Stability studies to synthesize data for relay schemes and settings for typical problems.
3. Apply analysis and design principles to design protection systems.

E E 537. Power Electronics
3 Credits (2+3P)
Basic principles of power electronics and its applications to power supplies, electric machine control, and power systems. Recommended foundation: E E 317 and E E 333. Taught with: E E 432.
Learning Outcomes
1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession. To establish background for further studies in power systems
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To convey to the student a thorough understanding of both the theory and the mechanics involved in the modeling and analysis of power system components and networks
7. To study how such modeling and analysis is used in the design/planning of power systems

E E 540. Photovoltaic Devices and Systems
3 Credits (3)
Technical concepts of photovoltaics, with primary focus on solar cell technology. Solar cell device level operation, packaging, and manufacturing. Design of photovoltaic systems for stand-alone or grid-tied operation. Business-case analysis using real-life scenarios of photovoltaic system solutions. Recommended foundation: E E 317. Taught with: E E 440.
Learning Outcomes
1. Name at least three different types of photovoltaic materials and cells.
2. Derive equations governing operation of photovoltaic cells.
3. Design and create electrical engineering drawings for photovoltaic systems of different nameplate capacity.
4. Describe principles of operation of the “balance of the system” (BOS) components of the photovoltaic system.

E E 541. Antennas and Radiation
4 Credits (3+3P)
Basic antenna analysis and design. Fundamental antenna concepts and radiation integrals. Study of wire antennas, aperture antennas, arrays, reflectors, and broadband antennas. Recommended foundation is E E 340. Taught with E E 454.
Learning Outcomes
1. Students will demonstrate an understanding of the fundamental principles, theories, and equations governing antenna radiation, antenna arrays, and matching, etc.
2. Students will analyze and solve the antenna-related radiation problems, antenna structures.
3. Students will demonstrate the use of antenna synthesis techniques and simulation software to solve antenna related problems
4. Students will demonstrate effective team work
5. Students will demonstrate an understanding the impact of engineering solutions in a global, economic, environmental, and societal context
6. Students will demonstrate an understanding of the knowledge of contemporary professional, societal and global issues

E E 542. Power System Analysis
3 Credits (3)
Analysis of a power system in the steady-state. Includes the development of models and analysis procedures for major power system components and for power networks. Recommended foundation: E E 333. Taught with E E 431.
Learning Outcomes
1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession.
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system.
6. To convey to the student a thorough understanding of both the theory and the mechanics involved in the modeling and analysis of power system components and networks.
7. To study how such modeling and analysis is used in the design/planning of power systems.
8. To establish background for further studies in power systems.

E E 543. Power System Faults and Stability
3 Credits (3)
Analysis of a power system under abnormal operating conditions. Topics include symmetrical three-phase faults, theory of symmetrical components, unsymmetrical faults, system protection, and power system stability. Recommended foundation: E E 431 or E E 542 or equivalent. Taught with: E E 493.
Learning Outcomes
1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession.

2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system.
6. To understand measurement, analysis, simulation and design techniques, through laboratory exercises involving hardware and software.
7. To establish background for further studies in power systems.

E E 544. Distribution Systems
3 Credits (3)
Concepts and techniques associated with the design and operation of electrical distribution systems. Recommended foundation: E E 542 and E E 543.
Learning Outcomes
1. Describe how distribution systems evolve as a function of load growth; identify traditional and modern distribution components and architectures.
2. Develop proper models and analytical methods to study distribution.
3. Use standard tools for distribution system analysis and design.
4. Assess issues in Resource integration and identify engineering solutions.

E E 545. Digital Signal Processing II
3 Credits (3)
Non-ideal sampling and reconstruction, oversampling and noise shaping in A/D and D/A, finite word length effects, random signals, spectral analysis, multirate filter banks and wavelets, and applications. Recommended foundation: E E 395.
Learning Outcomes
1. The student should be comfortable with the theory and practice of data compressing including quantization: Scalar, differential, and vector.
2. The student should be comfortable with the theory and practice of data compressing including transform coding: DCT, Wavelet.
3. The student should be comfortable with the theory and practice of data compressing including entropy Coding (Huffman Arithmetic).
4. The student should be comfortable with the theory and practice of data compressing including standardized codecs, including MPEG, JPEG, MP3s.

E E 548. Introduction to Radar
3 Credits (3)
Basic concepts of radar. Radar equation; detection theory, AM, FM, and CW radars. Analysis of tracking, search, MTI, and image radar. Recommended foundation: E E 325, E E 340 and E E 496. Taught with: E E 452.
Learning Outcomes
1. Students will demonstrate an understanding of fundamental principles of various types of radar systems and their applications.
2. Students will learn to analyze a given radar system.
3. Students will learn to use simulation techniques to design a radar system that will yield desired characteristics.
4. Students will experience working in groups/teams.

E E 549. Smart Antennas
3 Credits (3)
Smart antenna and adaptive array concepts and fundamentals, uniform and plannar arrays, optimum array processing. Adaptive beamforming algorithms and architectures: gradient-based algorithms, sample matrix inversion, least mean square, recursive least mean square, sidelobes cancellers, direction of arrival estimations, effects of mutual coupling and its mitigation. Recommended foundation: E E 325 and E E 340. Crosslisted with: E E 449.
Learning Outcomes
1. Antenna and Array fundamentals.
2. Smart Antenna and Adaptive Array concepts: Uniform and Planar Arrays; Array steering; Array performance criteria; Error effects on beamforming.
3. Adaptive Beamforming Algorithms and Architectures: gradient-based algorithms, Sample Matrix Inversion; Least Mean Square; Recursive Least Mean Square; Sidelobes cancellers; Direction of Arrival estimations; Effects of mutual coupling and its mitigation.
4. Applications: Angle of arrival estimation; Diversity combining; Nulling for jammer suppression and clutter cancellation, etc.

E E 551. Control Systems Synthesis
3 Credits (3)
An advanced perspective of linear modern control system analysis and design, including the essential algebraic, structural, and numerical properties of linear dynamical systems. Computer-aided solution of real-world design problems. Recommended foundation: E E 407. Taught with E E 475.
Learning Outcomes
1. Understand the concepts of Model Identification and Parameter Estimation (least-square identification of an auto-regressive model; nonparametric identification in the time domain; and nonparametric identification in the frequency domain).
2. Understand Robust Control techniques (Nyquist-plots, small-gain, and passivity).
3. Understand Optimal control techniques (LQR/LQG for state-space systems and time-optimal controller for the positioning of a mass using force actuation).
4. Understand Nonlinear control techniques (Lyapunov's stability method; feedback linearization controller for a fully actuated 2nd order mechanical system; backstepping for triangular nonlinear systems; actuator limitations).

E E 553. Noncooperative Game Theory
3 Credits (3)
The purpose of this course is to teach students to formulate problems as mathematical games and provide the basic tools to solve them. The course covers: Static games, starting with two-player zero-sum games and eventually building up to n-player non-zero sum games. Saddle-points and Nash equilibria will be covered. Dynamic optimization (dynamic programming) for discrete and continuous time. Dynamic games, both open and closed-loop policies. The intended audience includes (but is not restricted to) students in engineering and computer science. The class is heavily project-oriented and the students are strongly encouraged to choose a project that is relevant to their own area of research. Recommended foundation: undergraduate linear algebra and probability. Taught with E E 408.

Learning Outcomes

1. Comprehend the key principles of noncooperative game theory.
2. Apply the Minimax Theorem and evaluating mixed saddle-point equilibria.
3. Analyze stochastic policies for games in extensive form, and apply them to the existence and computation of saddle-point equilibria.
4. Comprehend games with N-players.
5. Analyze potential games and evaluate Nash equilibria for potential games.
6. Analyze dynamic games: the optimal control of a dynamical system.
7. Evaluate the saddle-point equilibria of zero-sum discrete-time and continuous-time dynamic games in state-feedback policies.

E E 556. Hardware & Software Codesign
3 Credits (3)

This course introduces the concept and techniques of designing electronic systems that integrates both hardware and software components. Topics include nature of hardware and software, dataflow modeling, software and hardware implementations of dataflows, analysis of control flows and dataflows, FSM with Datapath, microprogramming, embedded cores, and trade-offs between hardware and software components, etc. Students gain experience in implementing hardware and software co-design solutions for solving real-world problems through hands-on laboratory/project on a programmable System-on-Chip (SoC) platform that integrates a dual-core ARM Cortex-A9 processor and FPGA fabrics. Students develop a fundamental understanding of state-of-the-art practices in developing codesign solutions to problems that prepare them well for industrial and academic careers in this field. Recommended foundation ENGR 140, ENGR 130, (E E 362 or C S 473). Taught with E E 409.

Learning Outcomes

1. Formulate and solve problems related to basic concepts and methodologies in hardware/software co-design.
2. Analyze concurrent specification of an algorithm to be partitioned into software (C code) and hardware (HDL) components.
3. Design and implement both the software and hardware components integration as a solution to real-world problems to achieve optimal performance, power and cost.
4. Descrbe various types of system architectures regarding their attributes including speed, energy, design complexity, design cost, etc.
5. Experience working with commercially available Computer-Aided Design (CAD) development tools such as Xilinx Vivado.
6. Experience working in translation between C code and HDL of practical problems and verify/test the solution on FPGA SoC architecture.

E E 558. Hardware Security and Trust
3 Credits (3)

This course introduces and investigates recent technology development for the design and evaluation of secure and trustworthy hardware and embedded systems. Topics include IoT security, cryptography, hardware security primitives, authentication and key generation, invasive and non-invasive attacks and countermeasures, IC piracy and intellectual property protection, hardware trojans, and secure boot. Recommended foundation: E E 362. Taught with: E E 458.

Learning Outcomes

1. Students completing the course with a grade of C or better will perform satisfactorily on understanding of security goals of information security.
2. Students completing the course with a grade of C or better will perform satisfactorily on understanding of Cryptography basics and their applications.
3. Students completing the course with a grade of C or better will perform satisfactorily on security threats in integrated circuits, electronic devices and semiconductor supply chain.
4. Students completing the course with a grade of C or better will perform satisfactorily on security countermeasures to the threats of integrated circuits and electronic devices.
5. Students completing the course with a grade of C or better will perform satisfactorily on metrics used to measure and assess the security level of security mechanisms or primitives in hardware security applications.
6. Students completing the course with a grade of C or better will perform satisfactorily on analysis and assessment of potential security vulnerabilities in hardware and embedded systems.
7. Students completing the course with a grade of C or better will perform satisfactorily on state-of-art security mechanisms and research topics in the hardware and embedded security area.

E E 562. Computer Systems Architecture
3 Credits (3)

The course covers uniprocessors, caches, memory systems, virtual memory, storage systems, with introduction to multiprocessor and distributed computer architectures; models of parallel computation; processing element and interconnection network structures, and nontraditional architectures. Recommended foundation is E E 362. Taught with: E E 462.

Learning Outcomes

1. Recognize the basic principles and current practices of computer architectures of processors, memory systems, interconnects, and input/output systems.
2. Reason about the issues that influence the architectures of processors, memory systems, interconnects, and input/output systems.
3. Evaluate and improve computer system performance through analysis and computer simulation.
4. Solve and implement a small research problem in computer architecture.

E E 563. Computer Performance Analysis I
3 Credits (3)

Issues involved and techniques used to analyze performance of a computer system. Topics covered include computer system workloads; statistical analysis techniques such as principal component analysis, confidence interval, and linear regression; design and analysis of experiments; queuing system analysis; computer system simulation; and random number generation. Recommended foundation: E E 200 and E E 462.

Learning Outcomes

1. Specify performance requirements for computing systems.
2. Evaluate design alternatives for computing systems.
3. Compare two or more computing systems.
4. Determine the optimal value of a parameter (tuning) for computing systems.
5. Find performance bottlenecks in computing systems.
6. Characterize the load on the system (workload characterization).
7. Predict the performance at future workloads (forecasting).

E E 564. Architectural Concepts II
3 Credits (3)
Advanced topics related to computer architecture, guided by the current literature. Students are expected to have knowledge of computer architectures equivalent to C S 473 and of operating systems equivalent to C S 474.
Learning Outcomes
1. Be able to explain the features in a modern multicore CPU architecture
2. Be able to utilize hardware counter features of a CPU in performance evaluation
3. Be able to explain the architecture of GPUs and their capabilities and drawbacks
4. Be able to evaluate novel cutting-edge architectural features and designs
5. Be able to present a research paper to an advanced audience

E E 565. Machine Learning I
3 Credits (3)
A graduate-level introduction to machine learning algorithms, including supervised and unsupervised learning methods. Topics covered include clustering, linear regression models, linear discriminant functions, feed-forward neural networks, statistical pattern classification and regression, maximum likelihood, naive Bayes, non-parametric density estimation, mixture models, decision trees, and ensemble learning. Recommended foundation: E E 200, E E 571, and MATH 480. Taught with: E E 465.
Learning Outcomes
1. Formulate and solve problems related to the basic concepts and mathematical techniques of machine learning.
2. Gain an understanding of machine learning algorithms/methods by solving problems using software.
3. Gain experience doing independent study and research.
4. Formulate and solve problems related to the basics of regression, classification, and unsupervised learning.
5. Gain practical experience through project-based assignments and technical report writing.

E E 567. ARM SOC Design
3 Credits (3)
The course aims to produce students who are capable of developing ARM-based SoCs from high level functional specifications to design, implementation and testing on real FPGA hardware using standard hardware description and software programming languages. Recommended foundation E E 362 and E E 317. Taught with: E E 467.
Learning Outcomes
1. Formulate and solve problems requiring knowledge and understanding of ARM processor architectures and ARM-based SoCs.
2. Capture the design of ARM-based SoCs in a standard hardware description language.
3. Conduct low-level software design for ARM-based SoCs and high-level application development.
4. Demonstrate the ability to use and choose between different techniques for digital system design and capture.
5. Evaluate implementation results (e.g. speed, area, power) and correlate them with the corresponding high level design and capture.
6. Demonstrate the ability to use a commercial tools to develop ARM-based SoCs.

E E 571. Random Signal Analysis
3 Credits (3)
Application of probability and random variables to problems in communication systems, analysis of random signal and noise in linear and nonlinear systems. Recommended foundation E E 200 and E E 240. May be repeated up to 3 credits.
Learning Outcomes
1. To specify sample space and solve problems requiring probability computations based on axioms of probabilities and basic properties of event probabilities.
2. To characterize discrete and continuous random variables through various functions, example distributions, and moment calculations. To describe and compute probabilities involving multiple random variables in electrical engineering problems.
3. To analyze different notions of convergence, limit theorems, and specify their significance in communication system applications.
4. To describe and characterize random processes relevant to electrical engineering in general, and communications systems in particular. To perform differentiation and integration of random processes and to analyze specific classes of random processes including random walk, Gaussian processes, and AR processes.
5. To relate the significance of random processes to problems in electrical engineering, and solve problems involving power spectral density and transfer functions.

E E 572. Modern Coding Theory
3 Credits (3)
Error control techniques for digital transmission and storage systems. Introduction to basic coding bounds, linear and cyclic block codes, Reed-Solomon codes, convolutional codes, maximum likelihood decoding, maximum a posteriori probability decoding, factor graphs, low density parity check codes, turbo codes, iterative decoding. Applications to data networks, space and satellite transmission, and data modems. Recommended foundation: E E 200 and E E 496.
Learning Outcomes
1. Describe components of a digital communications/storage system. Characterize different modulation schemes and channel models.
2. Construct linear codes and describe them by generator and parity-check matrices, determine important code parameters such as minimum distance and rate, and prove code properties using basic algebra.
3. Describe and characterize important classical linear block and convolutional codes, including their encoding and decoding algorithms.
4. Derive and compute analytical performance bounds for coded systems.
5. Explain the characteristics and properties of modern turbo and LDPC codes. Analyze and implement their iterative decoding algorithms for various channel models.

E E 573. Signal Compression
3 Credits (3)
Fundamentals of information source encoding and decoding. Includes information theory bounds on source coding, lossless coding algorithms, scalar quantizing and vector quantizing. Recommended foundation E E 200. Taught with E E 448.
Learning Outcomes
1. Formulate and analyze problems related to rate-distortion tradeoffs in compression
2. Formulate and analyze problems related to scalar and vector quantization
3. Formulate and analyze problems related to transform coding

4. Formulate and analyze problems related to entropy coding (Huffman arithmetic)
5. Formulate and analyze problems related to standardized codecs, including MPEG, JPEG, MP3
6. Formulate and analyze problems related to compressive sensing/ sampling

E E 576. Geometric Algebra
3 Credits (3)
Geometric algebra provides a common mathematical language for many areas of physics (classical and quantum mechanics, electrodynamics, special and general relativity), computer science (graphics, robotics, computer vision), engineering, and other fields. Topics include: the geometric product and multivectors; Euclidean, Lorentzian, Galilean, and Projective Geometries; Complex, Hyperbolic, and Dual Numbers; Quaternions and Rotations. Recommended foundation E E 320. Taught with E E 403.
Learning Outcomes
1. Formulate and solve problems related to multivectors and the geometric product while building geometric intuition.
2. Formulate and solve problems related to complex, hyperbolic, and dual numbers as well as quaternions.
3. Formulate and solve problems related to non-Euclidean spaces including Lorentzian, Galilean, and projective geometries.

E E 577. Fourier Methods in Electro-Optics
3 Credits (3)
Linear systems theory, convolution and Fourier transformation are applied to one-dimensional and two dimensional signals encountered in electro-optical systems. Applications in diffraction, coherent and incoherent imaging, and optical signal processing. Recommended foundation: E E 320 and E E 528. Crosslisted with: PHYS 577.
Learning Outcomes
1. Describe the mathematical properties of the two-dimensional Fourier transform and apply the transform to the analysis of linear optical systems.
2. Explain the basic concepts of scalar diffraction theory.
3. Apply the Fresnel and Fraunhofer approximations to calculate optical propagation characteristics and diffraction patterns for common optical applications.
4. Apply Fourier methods to model and analyze the performance of basic optical imaging systems.
5. Discuss ethical, societal, and professional issues related to photonics and optics.

E E 578. Optical System Design
3 Credits (3)
Optical design software is used to study optical systems involving lenses, mirrors, windows and relay optics. Systems considered include camera lenses, microscopes and telescopes. Recommended foundation: E E/ PHYS 473, E E/PHYS 528 and E E/PHYS 577. Taught with: PHYS 578.
Learning Outcomes
1. Apply basic geometrical optics design concepts for lenses, mirrors and simple optical systems.
2. Model sequential optical systems in Zemax OpticStudio.
3. Apply merit functions to optimize optical system performance.
4. Discuss ethical, societal, and professional issues related to optics and photonics.

E E 581. Digital Communication Systems I
3 Credits (3)
Techniques for transmitting digital data over commercial networks. Topics include baseband and bandpass data transmission and synchronization techniques. Recommended foundation: E E 200, E E 325, and E E 496. Crosslisted with: E E 497.
Learning Outcomes
1. Analyze bandwidth and error performance of baseband and bandpass signals through mathematical explanations and simulated experimental data.
2. Evaluate channel code structures and their performance.
3. Analyze communication system issues involving link budgets, synchronization and resource allocations.
4. Develop a wider perspective recognizing contemporary technologies, impact of the solutions and professional and ethical responsibilities.

E E 583. Wireless Communications
3 Credits (3)
Cellular networks, wireless channels and channel models, modulation and demodulation, MIMO, diversity and multiplexing, OFDM, wireless standards including LTE and WiMAX. Recommended foundation: E E 571 and E E 325.
Learning Outcomes
1. Analyze mobile radio propagation.
2. Evaluate various modulations, multiple access and fading channel mitigation techniques.
3. Discuss concepts and issues related to cellular systems.
4. Discuss wireless standards and current topics.

E E 586. Information Theory
3 Credits (3)
This class is a study of Shannon's measure of information and discusses mutual information, entropy, and channel capacity, the noiseless source coding theorem, the noisy channel coding theorem, channel coding and random coding bounds, rate-distortion theory, and data compression. Restricted to: Main campus only. Crosslisted with: MATH 509
Prerequisite(s): E E 571 or MATH 515.
Learning Outcomes
1. Quantify information using random variables and solve problems regarding entropy, mutual information, and relative entropy.
2. Characterize source coding techniques for a single random variable: employ standard techniques such as Shannon, Fano, and Huffman coding; describe universal source coding and Lempel-Ziv coding.
3. Describe coding for sources with memory and compare lossy and lossless source coding.
4. Describe the problem of channel coding. Use Fano's inequality, define and determine channel capacity, compute error exponents.
5. Characterize the Gaussian channel. Explain the characteristics and properties of channel codes, including convolutional and polar codes.

E E 587. Deep Learning for Image Processing
3 Credits (3)
Implementation and analysis of deep learning architectures for image processing. Specific projects will be adjusted according to current state-of-the-art research, but may include such topics as networks for: segmentation of images, captioning of images, understanding of images at a human interpretable level, visualization of network behavior, incorporation of temporal information from image sequences.
Prerequisite: E E 446 or E E 596.

Learning Outcomes

1. Read, synthesize, and discuss academic research papers describing deep learning architectures for image processing.
2. Install, run, modify, and analyze results from third-party software (e.g., from github) implementing deep learning architectures for image processing.
3. Present project results orally.
4. Present project results in a written report following the conventions expected of technical writing in engineering disciplines.

E E 588. Advanced Image Processing
3 Credits (3)
Advanced topics in image processing including segmentation, feature extraction, object recognition, image understanding, big data, and applications. Taught with: E E 444.
Prerequisite: C- or better in E E 446 or E E 596 or equivalent.
Learning Outcomes

1. Analyze human visual perception and the implications to science and society.
2. Formulate and analyze problems that utilize the mathematics behind multidimensional image processing.
3. Formulate and analyze problems involving multidimensional transformation transform-domain processing.
4. Formulate and analyze problems related to color image acquisition, processing, and display.
5. Implementing image processing algorithms on computers in Matlab or python.

E E 590. Selected Topics
1-9 Credits
May be repeated for a maximum of 18 credits.

E E 596. Digital Image Processing
3 Credits (3)
Two-dimensional transform theory, color images, image enhancement, restoration, segmentation, compression and understanding. Recommended foundation E E 325. Taught with: E E 446.
Learning Outcomes

1. Analyze human visual perception and the implications to science and society.
2. Formulate and analyze problems that utilize the mathematics behind multidimensional image processing.
3. Formulate and analyze problems involving multidimensional transformation transform-domain processing.
4. Formulate and analyze problems related to color image acquisition, processing, and display.
5. Implementing image processing algorithms on computers in Matlab or python.

E E 597. Neural Signal Processing
3 Credits (3)
Cross-disciplinary course focused on the acquisition and processing of neural signals. Students in this class will be learn about basic brain structure, different brain signal acquisition techniques (fMRI, EEG, MEG, etc.), neural modeling, and EEG signal processing. To perform EEG signal processing, students will learn and use Matlab along with an EEG analysis package. Recommended foundation E E 325. Taught with: E E 447.
Learning Outcomes

1. Demonstrate understanding and skill in the Structure and basic operation of the human brain.
2. Demonstrate understanding and skill in processing of EEG brain signals using Matlab and EEGLAB.
3. Demonstrate understanding and skill in EEG-related neural modeling.
4. Demonstrate understanding and skill in brain signal types and acquisition.

E E 598. Master's Technical Report
1-9 Credits (1-9)
Individual investigation, either analytical or experimental, culminating in a technical report. May be repeated up to 18 credits.
Learning Outcomes

1. Varies.

E E 599. Master's Thesis
1-15 Credits (1-15)
Thesis. May be repeated up to 88 credits.
Learning Outcomes

1. Varies.

E E 600. Doctoral Research
1-15 Credits
Research. May be repeated up to 88 credits.
Learning Outcomes

1. Varies.

E E 690. Selected Topics
1-9 Credits
Selected topics. Subtitled courses will have varied topics and learning outcomes and will be listed in the course schedule. Not subtitled courses may be used as independent study with the approval and oversight of a faculty member. May be repeated up to 9 credits.
Learning Outcomes

1. Varies, dependent on subject matter taught under this selected topics course.

E E 700. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation. May be repeated up to 88 credits.
Learning Outcomes

1. Varies.

Name: **The Klipsch School of Electrical and Computer Engineering**

Office Location: **Thomas and Brown Hall, Rm 106**

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Las Cruces, NM 88003

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Computer Engineering - Bachelor of Science in Computer Engineering

Overview

This particular program gives students the opportunity to explore more deeply the area of **computer Engineering**.

Electrical Engineering Program Educational Objectives

Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Transfer Credit Guidelines for Electrical Engineering Degrees

Credit earned at other institutions are generally accepted; however, the following restrictions apply to transfer credits:

- Engineering credit must be earned at an ABET accredited school.
- Physics coursework must be calculus based.
- If the NMSU required course includes a lab, the transfer credit must include a lab.
- A grade of C- or better, must have been earned for transfer coursework.
- E E Courses numbered 300/3000 or higher, Cornerstone and Capstone courses may not be transferred for credit.
- Transfer credits for courses above 300/3000 level are not accepted.

Requirements (128-131 credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 128 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Students must earn a grade of C- or better in all engineering, technology, math and science courses (including associated prerequisite courses) required for the degree. If a grade lower than C- is earned in any of these courses, the student is required to retake the course immediately the next semester it is offered. Students who earn a grade less than a C- the first time will be contacted by the department and/or academic advising center and advised about this policy and resources to help in their academic success. If the student fails to achieve a C- or better in any of these courses a second time, then the student must submit a written request to the Associate Dean of Academics in the College of Engineering to enroll in the course a third time. The student should explain the circumstances impacting their grade and the actions planned to improve their performance.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		*4*
ENGL 1110G	Composition I	
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
English Composition - Level 2 [1]		*3*
Oral Communication [1]		*3*
Area II: Mathematics		*4*
MATH 1511G	Calculus and Analytic Geometry I [2]	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III: Laboratory Sciences		*8*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: Social/Behavioral Sciences [1]		*3*
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		*4*
MATH 1521G	Calculus and Analytic Geometry II (Required Mathematics and Natural Science)	
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Departmental/College Requirements		
Program Specific Requirements		
Mathematics and Natural Science		*16*
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
ENGR 190	Introduction to Engineering Mathematics	
E E 200	Linear Algebra, Probability and Statistics Applications	
CSCI 2310	Discrete Mathematics for Computer Science	
STEM		*3*
Choose one STEM Elective [3]		
Required Courses (Electrical and Computer Engineering & Computer Science)		*53*
ENGR 120	DC Circuit Analysis	
ENGR 130	Digital Logic	
ENGR 140	Introduction to Programming and Embedded Systems	
ENGR 230	AC Circuit Analysis	
E E 300	Cornerstone Design	
E E 317	Semiconductor Devices and Electronics I	
E E 320	Signals and Systems I	
E E 362	Introduction to Computer Organization	
E E 462	Computer Systems Architecture	
E E 480	Introduction to Analog and Digital VLSI	
ENGR 401	Engineering Capstone I [4]	
ENGR 402	Engineering Capstone II	
CSCI 1720	Computer Science I	
CSCI 2210	Object-Oriented Programming	
CSCI 2220	Introduction to Data Structures and Algorithms	
Computer Engineering Electives: Choose five courses from the following (two must be ECE courses): [5]		*15-18*
E E 409	Hardware & Software Codesign	
E E 412	ASIC Design	
E E 458	Hardware Security and Trust	
E E 465	Machine Learning I	
E E 467	ARM SOC Design	
E E 406	Quantum Computing	
E E 490	Selected Topics (Applications of Parallel Computing XSEDE Collaborative Course)	
CHME 467	Nanoscience and Nanotechnology	
CSCI 3790	Algorithm Design & Implementation	
CSCI 3730	Compilers and Automata Theory	
CSCI 3710	Software Development	
CSCI 3720	Data Structures and Algorithms	
CSCI 4105	Programming Language Structure I	
CSCI 4120	Operating Systems I	
CSCI 4205	Computer Security	

CSCI 4140	Database Management Systems I	
CSCI 4245	Computer Networks I	
CSCI 4420	Applied Machine Learning I	
CSCI 4215	Parallel Programming	
CSCI 4590	Algorithm Design and Implementation	
CSCI 4220	Cloud and Edge Computing	
MATH 3140	Introduction to Numerical Methods	
Non-Departmental Requirements (in addition to Gen.Ed)		
Viewing a Wider World Electives [6]		6
Second Language Requirement (none required)		
Electives to bring total credits to 128		
Total Credits		**128-131**

1 See the General Education (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/) section of the catalog for a full list of courses.

2 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

3 STEM Elective: Course at the 300/3000 level or above from E E or CSCI that is not used to satisfy any other program specific requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E or CSCI course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).

4 The prerequisite for ENGR 401 Engineering Capstone I for computer engineering students is E E 300 Cornerstone Design.

5 Some of these elective courses may have additional prerequisites.

6 See the Viewing a Wider World (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section of the catalog for a full list of courses.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G and ENGL 1110G . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
ENGR 190	Introduction to Engineering Mathematics	4
ENGL 1110G or ENGL 1110H or ENGL 1110M	Composition I or Composition I Honors or Composition I	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 120	DC Circuit Analysis	4
	Credits	**16**
Spring		
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
CSCI 1720	Computer Science I	4
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
	Credits	**16**
Second Year		
Fall		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
ENGR 230	AC Circuit Analysis	4
	Credits	**16**
Spring		
CSCI 2310	Discrete Mathematics for Computer Science	4
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
CSCI 2210	Object-Oriented Programming	4
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**18**
Third Year		
Fall		
E E 300	Cornerstone Design	2
E E 317	Semiconductor Devices and Electronics I	4
CSCI 2220	Introduction to Data Structures and Algorithms	4
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**16**
Spring		
E E 320	Signals and Systems I	3
E E 362	Introduction to Computer Organization	4
General Education Course [2]		3
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
STEM Elective [3,4]		3
	Credits	**16**
Fourth Year		
Fall		
ENGR 401	Engineering Capstone I	3
E E 462	Computer Systems Architecture	3
E E 480	Introduction to Analog and Digital VLSI	3
Comp Engineering Elective [3,5]		3
Comp Engineering Elective [3,5]		3-4
	Credits	**15-16**
Spring		
ENGR 402	Engineering Capstone II	3
Comp Engineering Elective [3,5]		3
Comp Engineering Elective [3,5]		3-4
Comp Engineering Elective [3,5]		3-4
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15-17**
	Total Credits	**128-131**

1 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 Depending on availability of specific courses in the fall or spring semester, students may need to reorganize the Comp Engineering Electives, STEM electives, and/or Gen Ed electives in their junior and

senior year. Students are strongly advised to consult with their ECE Faculty Mentor for assistance in planning their final year.

4 STEM Elective: Course at the 300/3000 level or above from E E or CSCI that is not used to satisfy any other program specific requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E or CSCI course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).

5 At least two computer engineering electives must be from the E E prefix. See Computer Engineering Electives in the Degree Requirements section above.

Electrical Engineering - Bachelor of Science in Electrical Engineering

Overview

The Bachelor of Science in Electrical Engineering program is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Electrical, Computer, Communications, Telecommunication(s), and Similarly Named Engineering Programs. This particular option of the Bachelor of Science in Electrical Engineering program has "no concentration," giving students the greatest flexibility in course selection.

Electrical Engineering Program Educational Objectives

Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Transfer Credit Guidelines for Electrical Engineering Degrees

Credit earned at other institutions are generally accepted; however, the following restrictions apply to transfer credits:

- Engineering credit must be earned at an ABET accredited school.
- Physics coursework must be calculus based.
- If the NMSU required course includes a lab, the transfer credit must include a lab.
- A grade of C- or better, must have been earned for transfer coursework.
- E E Courses numbered 300/3000 or higher, Cornerstone and Capstone courses may not be transferred for credit.
- Transfer credits for courses above 300/3000 level are not accepted.

Requirements (123-125 credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 123 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Bachelor of Science in Electrical Engineering students must earn a grade of C- or better in all engineering, technology, math and science courses (including associated prerequisite courses) required for the degree. If a grade lower than C- is earned in any of these courses, the student is required to retake the course immediately the next semester it is offered. Students who earn a grade less than a C- the first time will be contacted by the department and/or academic advising center and advised about this policy and resources to help in their academic success. If the student fails to achieve a C- or better in any of these courses a second time, then the student must submit a written request to the Associate Dean of Academics in the College of Engineering to enroll in the course a third time. The student should explain the circumstances impacting their grade and the actions planned to improve their performance.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		*4*
ENGL 1110G	Composition I	
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
English Composition - Level 2 [1]		*3*
Oral Communication [1]		*3*
Area II: Mathematics		*4*
MATH 1511G	Calculus and Analytic Geometry I [2]	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III: Laboratory Sciences		*8*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: Social/Behavioral Sciences [1]		*3*
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		*4*
MATH 1521G	Calculus and Analytic Geometry II	
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Departmental/College Requirements		
Program Specific Requirements		
Mathematics and Natural Science		*18*
MATH 3160	Introduction to Ordinary Differential Equations	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
ENGR 190	Introduction to Engineering Mathematics	
E E 200	Linear Algebra, Probability and Statistics Applications	
E E 240	Multivariate and Vector Calculus Applications	
STEM		*9*
Choose three STEM Electives [3]		
Electrical and Computer Engineering		*43*
ENGR 120	DC Circuit Analysis	
ENGR 130	Digital Logic	
ENGR 140	Introduction to Programming and Embedded Systems	
ENGR 230	AC Circuit Analysis	
E E 300	Cornerstone Design	
E E 317	Semiconductor Devices and Electronics I	
E E 320	Signals and Systems I	
E E 325	Signals and Systems II	
E E 340	Fields and Waves	
E E 362	Introduction to Computer Organization	

ENGR 401	Engineering Capstone I [4]	
ENGR 402	Engineering Capstone II	
E E Concentration Courses		*9-10*
Choose three courses, from three concentrations, from the following: [5]		
Communications & Signal Processing:		
E E 495	Introduction to Digital Signal Processing	
or E E 496	Introduction to Communication Systems	
Computers & Microelectronics:		
E E 462	Computer Systems Architecture	
or E E 562	Computer Systems Architecture	
or E E 480	Introduction to Analog and Digital VLSI	
or E E 510	Introduction to Analog and Digital VLSI	
Power:		
E E 333	AC Circuit Analysis and Introduction to Power Systems	
or E E 431	Power System Analysis	
or E E 542	Power System Analysis	
or E E 475	Control Systems Synthesis	
or E E 551	Control Systems Synthesis	
Electromagnetics & Photonics:		
E E 473	Introduction to Optics	
or E E 454	Antennas and Radiation	
or E E 541	Antennas and Radiation	
or E E 452	Introduction to Radar	
or E E 548	Introduction to Radar	
Space Systems:		
E E 460	Space System Mission Design and Analysis	
Controls & Robotics		
E E 407	Introduction to Control Systems	
or E E 475	Control Systems Synthesis	
or E E 551	Control Systems Synthesis	
Artificial Intelligence, Machine Learning, & Data Science		
E E 495	Introduction to Digital Signal Processing	
or E E 465	Machine Learning I	
or E E 565	Machine Learning I	
Non-Departmental Requirements (in addition to Gen.Ed)		
Viewing a Wider World Electives [6]		6
Programming Elective		*3-4*
Select one course from the following (3 or 4 cr):		
CSCI 1240	C++ Programming I [7]	
or CSCI 4510	C++ Programming	
CSCI 1210	Java Programming [7]	
or CSCI 4505	Java Programming	
CSCI 1220	Computer Programming Fundamentals: Python [7]	
or CSCI 4520	Python Programming I	
CSCI 1225	Python Programming II [7]	
or CSCI 4525	Python Programming II	
CSCI 1720	Computer Science I	
or CSCI 4525	Python Programming II	
CSCI 2210	Object-Oriented Programming	
Second Language: (not required)		
Electives, to bring the total credits to 123		**0**
Total Credits		**123-125**

1 See the General Education (p. 262) section of the catalog for a full list of courses.

2 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

3 STEM Elective: Course at the 300/3000 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300/3000 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, CSCI, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).

4 The prerequisite for ENGR 401 Engineering Capstone I for BSEE students is E E 300 Cornerstone Design.

5 A single course may count as satisfying one and only one concentration area. Some courses may have additional prerequisites.

6 See the Viewing a Wider World (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section of the catalog for a full list of courses.

7 Only one of the 100/1000-level or the 400/4000-level course may be taken to satisfy degree requirements. Students may not take the 100/1000-level of a course to satisfy the programming elective requirement and the 400/4000-level of the same course to satisfy other degree requirements.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
ENGR 190	Introduction to Engineering Mathematics	4
ENGL 1110G or ENGL 1110H or ENGL 1110M	Composition I or Composition I Honors or Composition I	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 120	DC Circuit Analysis	4
	Credits	**16**
Spring		
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
	Credits	**15**
Second Year		
Fall		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
ENGR 230	AC Circuit Analysis	4
	Credits	**16**

Spring		
MATH 3160	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
Choose one Programming course from the following:		3-4
CSCI 1240 or CSCI 4510	C++ Programming I or C++ Programming	
CSCI 1210 or CSCI 4505	Java Programming or Java Programming	
CSCI 1220 or CSCI 4520	Computer Programming Fundamentals: Python or Python Programming I	
CSCI 1225 or CSCI 4525	Python Programming II or Python Programming II	
CSCI 1720	Computer Science I	
CSCI 2210	Object-Oriented Programming	
E E 240	Multivariate and Vector Calculus Applications	3
	Credits	**16-17**
Third Year		
Fall		
E E 300	Cornerstone Design	2
E E 320	Signals and Systems I	3
E E 340	Fields and Waves	4
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15**
Spring		
E E 317	Semiconductor Devices and Electronics I	4
E E 325	Signals and Systems II	4
E E 362	Introduction to Computer Organization	4
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15**
Fourth Year		
Fall		
ENGR 401	Engineering Capstone I	3
Between zero and three E E Concentration Courses from the following: [3,4]		0-9
E E 395 or E E 496	Introduction to Digital Signal Processing or Introduction to Communication Systems	
E E 462 or E E 562 or E E 480 or E E 510	Computer Systems Architecture or Computer Systems Architecture or Introduction to Analog and Digital VLSI or Introduction to Analog and Digital VLSI	
E E 333	AC Circuit Analysis and Introduction to Power Systems	
E E 407	Introduction to Control Systems	
E E 395 or E E 465 or E E 565	Introduction to Digital Signal Processing or Machine Learning I or Machine Learning I	
E E 454 or E E 541 or E E 452 or E E 548	Antennas and Radiation or Antennas and Radiation or Introduction to Radar or Introduction to Radar	
Between zero and three STEM Electives [4,5]		9 - 0
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15**
Spring		
ENGR 402	Engineering Capstone II	3
Between zero and three E E Concentration Course from one of the following: [3,4]		0-10
E E 473	Introduction to Optics	
E E 460	Space System Mission Design and Analysis	
E E 431 or E E 475	Power System Analysis or Control Systems Synthesis	
Between zero and three STEM Electives [4,5]		9-0
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15-16**
	Total Credits	**123-125**

1. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. Students must choose one course from three different concentration areas. See list of concentration courses in the Course Requirements section above. A single course may count as satisfying one and only one concentration area. Some concentration courses may have additional prerequisites.
4. Depending on availability of specific courses in the fall or spring semester, students may need to reorganize the ECE Electives, STEM electives, and/or Gen Ed electives in their final year. Students are strongly advised to consult with their ECE Faculty Mentor for assistance in planning their final year.
5. STEM Elective: Course at the 300/3000 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300/300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, CSCI, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).

Electrical Engineering (Artificial Intelligence, Machine Learning, & Data Science) - Bachelor of Science in Electrical Engineering

Overview

The Electrical Engineering BS program is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Electrical, Computer, Communications, Telecommunication(s), and Similarly Named Engineering Programs. This particular concentration in the B.S. EE program gives students the opportunity to explore more deeply the area of **communications and signal processing**.

Electrical Engineering Program Educational Objectives

Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Transfer Credit Guidelines for Electrical Engineering Degrees

Credit earned at other institutions are generally accepted; however, the following restrictions apply to transfer credits:

- Engineering credit must be earned at an ABET accredited school.
- Physics coursework must be calculus based.
- If the NMSU required course includes a lab, the transfer credit must include a lab.
- A grade of C- or better, must have been earned for transfer coursework.
- E E Courses numbered 300/3000 or higher, Cornerstone and Capstone courses may not be transferred for credit.
- Transfer credits for courses above 300/3000 level are not accepted.

Requirements (123-124 credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 123 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

BSEE students must earn a grade of C- or better in all engineering, technology, math and science courses (including associated prerequisite courses) required for the degree. A student may attempt any of these courses no more than three times to earn a passing grade of C- or better. Students who earn a grade less than a C- will be contacted by the department head or academic advising center and advised about this policy and resources to help in their academic success. If the student fails to pass any of these courses after three attempts, then the student will not be able to continue as an electrical engineering major and will be counseled on other degree options. Students may request an exception to this policy through written appeal to the Associate Dean for Academics in the College of Engineering.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		*4*
ENGL 1110G	Composition I	
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
English Composition - Level 2 [1]		*3*
Oral Communications [1]		*3*
Area II: Mathematics		*4*
MATH 1511G	Calculus and Analytic Geometry I [2]	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III: Laboratory Sciences		*8*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: Social/Behavioral Sciences [1]		*3*
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		*4*
MATH 1521G	Calculus and Analytic Geometry II	
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Departmental/College Requirements		
Program Specific Requirements		
Mathematics and Natural Science		*18*
MATH 3160	Introduction to Ordinary Differential Equations	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
ENGR 190	Introduction to Engineering Mathematics	
E E 200	Linear Algebra, Probability and Statistics Applications	
E E 240	Multivariate and Vector Calculus Applications	
STEM		*6*
Choose two STEM Electives [3]		
Electrical and Computer Engineering		*43*
ENGR 120	DC Circuit Analysis	
ENGR 130	Digital Logic	
ENGR 140	Introduction to Programming and Embedded Systems	
ENGR 230	AC Circuit Analysis	
E E 300	Cornerstone Design	
E E 317	Semiconductor Devices and Electronics I	
E E 320	Signals and Systems I	
E E 325	Signals and Systems II	
E E 340	Fields and Waves	
E E 362	Introduction to Computer Organization	
ENGR 401	Engineering Capstone I [4]	
ENGR 402	Engineering Capstone II	
E E Concentration Required Courses		*6*
E E 495	Introduction to Digital Signal Processing [5]	
E E 465	Machine Learning I [5]	
E E Concentration Electives: Choose two courses from the following (one must be an E E course): [6]		*6-7*
E E 406	Quantum Computing	
E E 444	Advanced Image Processing	
E E 446	Digital Image Processing	
E E 447	Neural Signal Processing	
CSCI 3790	Algorithm Design & Implementation	
CSCI 3720	Data Structures and Algorithms	
CSCI 4425	Introduction to Deep Learning	
CSCI 4430	Graph Data Mining	
CSCI 4405	Artificial Intelligence I	
CSCI 4305	Bioinformatics	
CSCI 4415	Introduction to Data Mining	
CSCI 4215	Parallel Programming	
MATH 3120	Introduction to Analysis	
MATH 3130	Introduction to Geometry	
MATH 3140	Introduction to Numerical Methods	
MATH 4310	Introduction to Topology	
MATH 4230	Applied Linear Algebra	
MATH 4350	Advanced Linear Algebra	
Non-Departmental Requirements (in addition to Gen.Ed)		
Viewing a Wider World Electives [7]		6
Programming Elective		
Select one course from the following:		3
CSCI 1220	Computer Programming Fundamentals: Python [8]	

or CSCI 4520	Python Programming I	
CSCI 1225	Python Programming II [8]	
or CSCI 4525	Python Programming II	
Second Language: (not required)		
Electives, to bring the total credits to 123		**0**
Total Credits		**123-124**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
3. STEM Elective: Course at the 300/3000 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300/3000 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, CSCI, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).
4. The prerequisite for ENGR 401 Engineering Capstone I for BSEE students is E E 300 Cornerstone Design.
5. Students must take both E E 495 Introduction to Digital Signal Processing and E E 465 Machine Learning I, both of which are offered in the Fall semester.
6. Some of these elective courses may have additional prerequisites.
7. See the Viewing a Wider World (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section of the catalog for a full list of courses.
8. Only one of the 100-level xor the 400-level course may be taken to satisfy degree requirements. Students may not take the 100-level of a course to satisfy the programming elective requirement and the 400-level of the same course to satisfy other degree requirements.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
ENGR 190	Introduction to Engineering Mathematics	4
ENGL 1110G or ENGL 1110H or ENGL 1110M	Composition I or Composition I Honors or Composition I	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 120	DC Circuit Analysis	4
	Credits	**16**
Spring		
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
	Credits	**15**
Second Year		
Fall		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
ENGR 230	AC Circuit Analysis	4
	Credits	**16**
Spring		
MATH 3160	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
E E 240	Multivariate and Vector Calculus Applications	3
Choose one Programming course from the following:		3
CSCI 1220 or CSCI 4520	Computer Programming Fundamentals: Python or Python Programming I	
CSCI 1225 or CSCI 4525	Python Programming II or Python Programming II	
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**16**
Third Year		
Fall		
E E 300	Cornerstone Design	2
E E 320	Signals and Systems I	3
E E 340	Fields and Waves	4
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15**
Spring		
E E 317	Semiconductor Devices and Electronics I	4
E E 325	Signals and Systems II	4
E E 362	Introduction to Computer Organization	4
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15**
Fourth Year		
Fall		
ENGR 401	Engineering Capstone I	3
E E 495	Introduction to Digital Signal Processing [3]	3
E E 465	Machine Learning I [3]	3
STEM Elective [4,5]		3
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15**
Spring		
ENGR 402	Engineering Capstone II	3
EE Concentration Elective [5,6]		3-4
EE Concentration Elective [5,6]		3
STEM Elective [4,5]		3
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15-16**
	Total Credits	**123-124**

[1] MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

[2] See the General Education and Viewing a Wider World (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/) section of the catalog for a full list of courses.

[3] Students must take both E E 495 Introduction to Digital Signal Processing and E E 465 Machine Learning I, both of which are offered in the Fall semester.

[4] STEM Elective: Course at the 300/3000 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300/3000 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, CSCI, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).

[5] Depending on availability of specific courses in the fall or spring semester, students may need to reorganize the ECE Electives, STEM electives, and/or Gen Ed electives in their final year. Students are strongly advised to consult with their ECE Faculty Mentor for assistance in planning their final year.

[6] At least one EE Concentration Elective Course must be from the E E Prefix. See E E Concentration Electives in the Degree Requirements section above.

Electrical Engineering (Communications and Signal Processing) - Bachelor of Science in Electrical Engineering

Overview

The Bachelor of Science in Electrical Engineering program is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Electrical, Computer, Communications, Telecommunication(s), and Similarly Named Engineering Programs. This particular concentration in the Bachelor of Science in Electrical Engineering program gives students the opportunity to explore more deeply the area of **communications and signal processing**.

Electrical Engineering Program Educational Objectives

Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Transfer Credit Guidelines for Electrical Engineering Degrees

Credit earned at other institutions are generally accepted; however, the following restrictions apply to transfer credits:

- Engineering credit must be earned at an ABET accredited school.
- Physics coursework must be calculus based.
- If the NMSU required course includes a lab, the transfer credit must include a lab.
- A grade of C- or better, must have been earned for transfer coursework.
- E E Courses numbered 300/3000 or higher, Cornerstone and Capstone courses may not be transferred for credit.
- Transfer credits for courses above 300/3000 level are not accepted.

Requirements (123-125 credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 123 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Bachelor of Science in Electrical Engineering students must earn a grade of C- or better in all engineering, technology, math and science courses (including associated prerequisite courses) required for the degree and also courses taken to satisfy the general education requirements for Area I-Communications, Area II-Mathematics, and Area III-Laboratory Sciences. If a grade lower than C- is earned in any of these courses, the student is required to retake the course immediately the next semester it is offered. Students who earn a grade less than a C- the first time will be contacted by the department and/or academic advising center and advised about this policy and resources to help in their academic success. If the student fails to achieve a C- or better in any of these courses a second time, then the student must submit a written request to the Associate Dean of Academics in the College of Engineering to enroll in the course a third time. The student should explain the circumstances impacting their grade and the actions planned to improve their performance.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		*4*
ENGL 1110G	Composition I	
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
English Composition - Level 2 [1]		*3*
Oral Communications [1]		*3*
Area II: Mathematics		*4*
MATH 1511G	Calculus and Analytic Geometry I [2]	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III: Laboratory Sciences		*8*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: Social/Behavioral Sciences [1]		*3*
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		*4*
MATH 1521G	Calculus and Analytic Geometry II	
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Departmental/College Requirements		
Program Specific Requirements		
Mathematics and Natural Science		*18*
MATH 3160	Introduction to Ordinary Differential Equations	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	

ENGR 190	Introduction to Engineering Mathematics	
E E 200	Linear Algebra, Probability and Statistics Applications	
E E 240	Multivariate and Vector Calculus Applications	
STEM		*6*
Choose two STEM Electives [3]		
Electrical and Computer Engineering		*43*
ENGR 120	DC Circuit Analysis	
ENGR 130	Digital Logic	
ENGR 140	Introduction to Programming and Embedded Systems	
ENGR 230	AC Circuit Analysis	
E E 300	Cornerstone Design	
E E 317	Semiconductor Devices and Electronics I	
E E 320	Signals and Systems I	
E E 325	Signals and Systems II	
E E 340	Fields and Waves	
E E 362	Introduction to Computer Organization	
ENGR 401	Engineering Capstone I [4]	
ENGR 402	Engineering Capstone II	
E E Concentration Required Courses		*6*
E E 495	Introduction to Digital Signal Processing [5]	
E E 496	Introduction to Communication Systems [5]	
E E Concentration Electives: Choose two courses from the following (one must be an E E course): [6]		*6-7*
E E 403	Geometric Algebra	
or E E 576	Geometric Algebra	
E E 444	Advanced Image Processing	
or E E 588	Advanced Image Processing	
E E 446	Digital Image Processing	
or E E 596	Digital Image Processing	
E E 447	Neural Signal Processing	
or E E 597	Neural Signal Processing	
E E 448	Signal Compression	
or E E 573	Signal Compression	
E E 460	Space System Mission Design and Analysis	
E E 465	Machine Learning I	
or E E 565	Machine Learning I	
E E 490	Selected Topics (Wireless Communications)	
E E 497	Digital Communication Systems I	
or E E 581	Digital Communication Systems I	
CSCI 3790	Algorithm Design & Implementation	
CSCI 3720	Data Structures and Algorithms	
CSCI 4520	Python Programming I [7,8]	
CSCI 4405	Artificial Intelligence I	
CSCI 4410	Computer Graphics I	
CSCI 4255	Digital Game Design	
CSCI 4205	Computer Security	
CSCI 4305	Bioinformatics	
MATH 4210	Complex Variables	
MATH 4220	Fourier Series and Boundary Value Problems	
MATH 4230	Applied Linear Algebra	
MATH 4350	Advanced Linear Algebra	
MATH 4360	Introduction to Real Analysis I	
STAT 4210	Probability: Theory and Applications	
Non-Departmental Requirements (in addition to Gen.Ed)		
Programming Elective		
Viewing a Wider World Electives		6
Select one course from the following:		3-4
CSCI 1240	C++ Programming I [8]	
or CSCI 4510	C++ Programming	
CSCI 1210	Computer Programming Fundamentals [8]	
or CSCI 4505	Java Programming	
CSCI 1220	Computer Programming Fundamentals: Python [8]	
or CSCI 4520	Python Programming I	
CSCI 1225	Python Programming II [8]	
or CSCI 4525	Python Programming II	
CSCI 1720	Computer Science I	
CSCI 2210	Object-Oriented Programming	
Second Language: (not required)		
Electives, to bring the total credits to 123		**0**
Total Credits		**123-125**

1 See the General Education (p. 262) section of the catalog for a full list of courses.

2 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

3 STEM Elective: Course at the 300/3000 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300/3000 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, CSCI, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).

4 The prerequisite for ENGR 401 Engineering Capstone I for BSEE students is E E 300 Cornerstone Design.

5 Students must take both E E 495 Introduction to Digital Signal Processing and E E 496 Introduction to Communication Systems, both of which are currently offered in the Fall semester.

6 Some of these elective courses may have additional prerequisites.

7 Students may count CSCI 4520 Python Programming I toward their Programming Elective or toward their E E Concentration Electives, but may not use the course to count toward both.

8 Only one of the 100/1000-level or the 400/4000-level course may be taken to satisfy degree requirements. Students may not take the 100/1000-level of a course to satisfy the programming elective requirement and the 400/4000-level of the same course to satisfy other degree requirements.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		**Credits**
ENGR 190	Introduction to Engineering Mathematics	4
ENGL 1110G or ENGL 1110H or ENGL 1110M	Composition I or Composition I Honors or Composition I	4

CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 120	DC Circuit Analysis	4
	Credits	**16**
Spring		
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
General Education Course [2]		3
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
	Credits	**15**
Second Year		
Fall		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
ENGR 230	AC Circuit Analysis	4
	Credits	**16**
Spring		
MATH 3160	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
E E 240	Multivariate and Vector Calculus Applications	3
Choose one Programming course from the following:		3-4
CSCI 1240 or CSCI 4510	C++ Programming I or C++ Programming	
CSCI 1210 or CSCI 4505	Computer Programming Fundamentals or Java Programming	
CSCI 1220 or CSCI 4520	Computer Programming Fundamentals: Python or Python Programming I	
CSCI 1225 or CSCI 4525	Python Programming II or Python Programming II	
CSCI 1720	Computer Science I	
CSCI 2210	Object-Oriented Programming	
General Education Course [2]		3
	Credits	**16-17**
Third Year		
Fall		
E E 300	Cornerstone Design	2
E E 320	Signals and Systems I	3
E E 340	Fields and Waves	4
General Education Course [2]		3
General Education Course [2]		3
	Credits	**15**
Spring		
E E 317	Semiconductor Devices and Electronics I	4
E E 325	Signals and Systems II	4
E E 362	Introduction to Computer Organization	4
General Education Course [2]		3
	Credits	**15**
Fourth Year		
Fall		
ENGR 401	Engineering Capstone I	3
E E 495	Introduction to Digital Signal Processing [3]	3
E E 496	Introduction to Communication Systems [3]	3
STEM Elective [4,5]		3
General Education Course [2]		3
	Credits	**15**
Spring		
ENGR 402	Engineering Capstone II	3
Communications & Signal Processing Elective [5,6]		3-4
Communications & Signal Processing Elective [5,6]		3
STEM Elective [4,5]		3
General Education Course [2]		3
	Credits	**15-16**
	Total Credits	**123-125**

1. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. Students must take both E E 495 Introduction to Digital Signal Processing and E E 496 Introduction to Communication Systems, both of which are currently offered in the Fall semester.
4. STEM Elective: Course at the 300/3000 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300/3000 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, CSCI, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).
5. Depending on availability of specific courses in the fall or spring semester, students may need to reorganize the ECE Electives, STEM electives, and/or Gen Ed electives in their final year. Students are strongly advised to consult with their ECE Faculty Mentor for assistance in planning their final year.
6. At least one Communications & Signal Processing Elective Course must be from the E E Prefix. See E E Concentration Electives in the Degree Requirements section above.

Electrical Engineering (Computers and Microelectronics) - Bachelor of Science in Electrical Engineering

Overview

The Electrical Engineering Bachelor of Science program is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Electrical, Computer, Communications, Telecommunication(s), and Similarly Named Engineering Programs. This particular concentration in the B.S. EE program gives students the opportunity to explore more deeply the area of **computers and microelectronics**.

Electrical Engineering Program Educational Objectives

Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.

2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Transfer Credit Guidelines for Electrical Engineering Degrees

Credit earned at other institutions are generally accepted; however, the following restrictions apply to transfer credits:

- Engineering credit must be earned at an ABET accredited school.
- Physics coursework must be calculus based.
- If the NMSU required course includes a lab, the transfer credit must include a lab.
- A grade of C- or better, must have been earned for transfer coursework.
- E E Courses numbered 300/3000 or higher, Cornerstone and Capstone courses may not be transferred for credit.
- Transfer credits for courses above 300/3000 level are not accepted.

Requirements (123-125 credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 129 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Bachelor of Science in Electrical Engineering students must earn a grade of C- or better in all engineering, technology, math and science courses (including associated prerequisite courses) required for the degree. If a grade lower than C- is earned in any of these courses, the student is required to retake the course immediately the next semester it is offered. Students who earn a grade less than a C- the first time will be contacted by the department and/or academic advising center and advised about this policy and resources to help in their academic success. If the student fails to achieve a C- or better in any of these courses a second time, then the student must submit a written request to the Associate Dean of Academics in the College of Engineering to enroll in the course a third time. The student should explain the circumstances impacting their grade and the actions planned to improve their performance.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		*4*
ENGL 1110G	Composition I	
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
English Composition - Level 2 [1]		*3*
Oral Communication [1]		*3*
Area II: Mathematics		*4*
MATH 1511G	Calculus and Analytic Geometry I [2]	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III: Laboratory Sciences		*8*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: Social/Behavioral Sciences [1]		*3*
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*4*
MATH 1521G	Calculus and Analytic Geometry II	
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World		6
Departmental/College Requirements		
Program Specific Requirements		
Mathematics and Natural Science		*18*
MATH 3160	Introduction to Ordinary Differential Equations	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
ENGR 190	Introduction to Engineering Mathematics	
E E 200	Linear Algebra, Probability and Statistics Applications	
E E 240	Multivariate and Vector Calculus Applications	
STEM		*6*
Choose two STEM electives [3]		
Electrical and Computer Engineering		*43*
ENGR 120	DC Circuit Analysis	
ENGR 130	Digital Logic	
ENGR 140	Introduction to Programming and Embedded Systems	
ENGR 230	AC Circuit Analysis	
E E 300	Cornerstone Design	
E E 317	Semiconductor Devices and Electronics I	
E E 320	Signals and Systems I	
E E 325	Signals and Systems II	
E E 340	Fields and Waves	
E E 362	Introduction to Computer Organization	
ENGR 401	Engineering Capstone I [4]	
ENGR 402	Engineering Capstone II	
E E Concentration Required Courses		*6*
E E 462	Computer Systems Architecture [5]	
or E E 562	Computer Systems Architecture	
E E 480	Introduction to Analog and Digital VLSI [5]	
or E E 510	Introduction to Analog and Digital VLSI	
E E Concentration Electives: Choose two courses from the following (one must be an E E course): [6]		*6-7*
E E 409	Hardware & Software Codesign	
or E E 556	Hardware & Software Codesign	
E E 412	ASIC Design	
or E E 512	ASIC Design	
E E 458	Hardware Security and Trust	
or E E 558	Hardware Security and Trust	
E E 467	ARM SOC Design	
or E E 567	ARM SOC Design	
E E 485	Analog VLSI Design	
or E E 523	Analog VLSI Design	
E E 490	Selected Topics (Applications of Parallel Computing XSEDE Collaborative Course)	
CSCI 3790	Algorithm Design & Implementation	
CSCI 3730	Compilers and Automata Theory	
CSCI 3710	Software Development	
CSCI 3720	Data Structures and Algorithms	
CSCI 4120	Operating Systems I	
CSCI 4205	Computer Security	
CSCI 4140	Database Management Systems I	
Non-Departmental Requirements (in addition to Gen.Ed)		

Programming Elective		
Select one course from the following:		3-4
CSCI 1240	C++ Programming I [7]	
or CSCI 4510	C++ Programming	
CSCI 1210	Computer Programming Fundamentals [7]	
or CSCI 4505	Java Programming	
CSCI 1720	Computer Science I	
CSCI 2210	Object-Oriented Programming	
Second Language: (not required)		
Elective, to bring the total credits to 123		**0**
Total Credits		**123-125**

1 See the General Education (p. 262) section of the catalog for a full list of courses.

2 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

3 STEM Elective: Course at the 300/3000 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300/3000 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, CSCI, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).

4 The prequisite for ENGR 401 Engineering Capstone I for BSEE students is E E 300 Cornerstone Design.

5 Students must take both (E E 462 Computer Systems Architecture or E E 562 Computer Systems Architecture) and (E E 480 Introduction to Analog and Digital VLSI or E E 510 Introduction to Analog and Digital VLSI), both of which are currently offered in the Fall semester.

6 Some of these elective courses may have additional prerequisites.

7 Only one of the 100/1000-level or the 400/4000-level course may be taken to satisfy degree requirements. Students may not take the 100/1000-level of a course to satisfy the programming elective requirement and the 400/4000-level of the same course to satisfy other degree requirements.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G and ENGL 1110G . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
ENGR 190	Introduction to Engineering Mathematics	4
ENGL 1110G or ENGL 1110H or ENGL 1110M	Composition I or Composition I Honors or Composition I	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 120	DC Circuit Analysis	4
	Credits	**16**
Spring		
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
General Education Course [2]		3
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
	Credits	**15**
Second Year		
Fall		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
ENGR 230	AC Circuit Analysis	4
	Credits	**16**
Spring		
MATH 3160	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
General Education Course [2]		3
E E 240	Multivariate and Vector Calculus Applications	3
Choose one Programming course from the following:		3-4
CSCI 1240 or CSCI 4510	C++ Programming I or C++ Programming	
CSCI 1210 or CSCI 4505	Computer Programming Fundamentals or Java Programming	
CSCI 1720	Computer Science I	
CSCI 2210	Object-Oriented Programming	
	Credits	**16-17**
Third Year		
Fall		
E E 300	Cornerstone Design	2
E E 320	Signals and Systems I	3
E E 340	Fields and Waves	4
General Education Course [2]		3
General Education Course [2]		3
	Credits	**15**
Spring		
E E 317	Semiconductor Devices and Electronics I	4
E E 325	Signals and Systems II	4
E E 362	Introduction to Computer Organization	4
General Education Course [2]		3
	Credits	**15**
Fourth Year		
Fall		
ENGR 401	Engineering Capstone I	3
E E 462 or E E 562	Computer Systems Architecture [3] or Computer Systems Architecture	3
E E 480 or E E 510	Introduction to Analog and Digital VLSI [3] or Introduction to Analog and Digital VLSI	3
STEM Elective [4,5]		3
General Education Course [2]		3
	Credits	**15**
Spring		
ENGR 402	Engineering Capstone II	3
Computers & Microelectronics Elective [5,6]		3-4
Computers & Microelectronics Elective [5,6]		3
STEM Elective [4,5]		3

General Education Course [2]	3
Credits	**15-16**
Total Credits	**123-125**

1. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. Students must take both (E E 462 Computer Systems Architecture or E E 562 Computer Systems Architecture) and (E E 480 Introduction to Analog and Digital VLSI or E E 510 Introduction to Analog and Digital VLSI), both of which are currently offered in the Fall semester.
4. STEM Elective: Course at the 300/3000 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300/3000 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, CSCI, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).
5. Depending on availability of specific courses in the fall or spring semester, students may need to reorganize the ECE Electives, STEM electives, and/or Gen Ed electives in their final year. Students are strongly advised to consult with their ECE Faculty Mentor for assistance in planning their final year.
6. One Computers & Microelectronics Elective Course must be from the E E Prefix. See E E Concentration Electives in the Degree Requirements section above.

Electrical Engineering (Controls & Robotics) - Bachelor of Science in Electrical Engineering

Overview

The Electrical Engineering BS program is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Electrical, Computer, Communications, Telecommunication(s), and Similarly Named Engineering Programs. This particular concentration in the BSEE program gives students the opportunity to explore more deeply the area of **controls and robotics**.

Electrical Engineering Program Educational Objectives

Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Transfer Credit Guidelines for Electrical Engineering Degrees

Credit earned at other institutions are generally accepted; however, the following restrictions apply to transfer credits:

- Engineering credit must be earned at an ABET accredited school.
- Physics coursework must be calculus based.
- If the NMSU required course includes a lab, the transfer credit must include a lab.
- A grade of C- or better, must have been earned for transfer coursework.
- E E Courses numbered 300/3000 or higher, Cornerstone and Capstone courses may not be transferred for credit.
- Transfer credits for courses above 300/3000 level are not accepted.

Requirements (123-124 credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 123 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

BSEE students must earn a grade of C- or better in all engineering, technology, math and science courses (including associated prerequisite courses) required for the degree. A student may attempt any of these courses no more than three times to earn a passing grade of C- or better. Students who earn a grade less than a C- will be contacted by the department head or academic advising center and advised about this policy and resources to help in their academic success. If the student fails to pass any of these courses after three attempts, then the student will not be able to continue as an electrical engineering major and will be counseled on other degree options. Students may request an exception to this policy through written appeal to the Associate Dean for Academics in the College of Engineering.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		*4*
ENGL 1110G	Composition I	
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
English Composition - Level 2 [1]		*3*
Oral Communication [1]		*3*
Area II: Mathematics		*4*
MATH 1511G	Calculus and Analytic Geometry I [2]	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III: Laboratory Sciences		*8*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: Social/Behavioral Sciences (3 credits) [1]		*3*
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		*4*
MATH 1521G	Calculus and Analytic Geometry II	
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Departmental/College Requirements		
Program Specific Requirements		
Mathematics and Natural Science		*18*
MATH 3160	Introduction to Ordinary Differential Equations	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
ENGR 190	Introduction to Engineering Mathematics	

E E 200	Linear Algebra, Probability and Statistics Applications	
E E 240	Multivariate and Vector Calculus Applications	
STEM		*6*
Choose two STEM Electives [3]		
Electrical and Computer Engineering		*43*
ENGR 120	DC Circuit Analysis	
ENGR 130	Digital Logic	
ENGR 140	Introduction to Programming and Embedded Systems	
ENGR 230	AC Circuit Analysis	
E E 300	Cornerstone Design	
E E 317	Semiconductor Devices and Electronics I	
E E 320	Signals and Systems I	
E E 325	Signals and Systems II	
E E 340	Fields and Waves	
E E 362	Introduction to Computer Organization	
ENGR 401	Engineering Capstone I [4]	
ENGR 402	Engineering Capstone II	
E E Concentration Required Courses		*6*
E E 407	Introduction to Control Systems [5]	
E E 475	Control Systems Synthesis [5]	
or E E 551	Control Systems Synthesis	
E E Concentration Electives: Choose two courses from the following (one must be an E E course): [6]		*6*
E E 495	Introduction to Digital Signal Processing	
E E 403	Geometric Algebra	
or E E 576	Geometric Algebra	
E E 408	Noncooperative Game Theory	
or E E 553	Noncooperative Game Theory	
E E 444	Advanced Image Processing	
or E E 588	Advanced Image Processing	
E E 446	Digital Image Processing	
or E E 596	Digital Image Processing	
E E 460	Space System Mission Design and Analysis	
E E 465	Machine Learning I	
or E E 565	Machine Learning I	
E E 496	Introduction to Communication Systems	
ENGR 234	Engineering Mechanics II	
M E 452	Control System Design	
M E 486	Introduction to Robotics	
M E 487	Mechatronics	
CSCI 4405	Artificial Intelligence I	
CSCI 4520	Python Programming I	
CSCI 4245	Computer Networks I	
MATH 4230	Applied Linear Algebra	
MATH 4350	Advanced Linear Algebra	
MATH 4360	Introduction to Real Analysis I	
STAT 4210	Probability: Theory and Applications	
Non-Departmental Requirements (in addition to Gen.Ed)		
Viewing a Wider World Electives [7]		6
Programming Elective		
Select one course from the following:		3-4
CSCI 1240	C++ Programming I [8]	
or CSCI 4510	C++ Programming	
CSCI 1210	Computer Programming Fundamentals [8]	
or CSCI 4505	Java Programming	
CSCI 1220	Computer Programming Fundamentals: Python [8]	
or CSCI 4520	Python Programming I	
CSCI 1225	Python Programming II [8]	
or CSCI 4525	Python Programming II	
CSCI 1720	Computer Science I	
CSCI 2210	Object-Oriented Programming	
Second Language: (not required)		
Electives, to bring the total credits to 123		**0**
Total Credits		**123-124**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
3. STEM Elective: Course at the 300/3000 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300/3000 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, CSCI, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).
4. The prerequisite for ENGR 401 Engineering Capstone I for BSEE students is E E 300 Cornerstone Design.
5. Students must take both E E 407 Introduction to Control Systems which is currently offered in the Fall semester and (E E 475 Control Systems Synthesis or E E 551 Control Systems Synthesis) which is currently offered in the Spring semester. Note also that E E 407 Introduction to Control Systems is a prerequisite for E E 475 Control Systems Synthesis/E E 551 Control Systems Synthesis .
6. Some of these elective courses may have additional prerequisites.
7. See the Viewing a Wider World (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section of the catalog for a full list of courses.
8. Only one of the 1000-level or the 4000-level course may be taken to satisfy degree requirements. Students may not take the 1000-level of a course to satisfy the programming elective requirement and the 4000-level of the same course to satisfy other degree requirements. Students may count CSCI 4520 Python Programming I toward their Programming Elective **or** toward their E E Concentration Electives, but may not use the course to count toward both.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
ENGR 190	Introduction to Engineering Mathematics	4
ENGL 1110G or ENGL 1110H or ENGL 1110M	Composition I or Composition I Honors or Composition I	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4

ENGR 120	DC Circuit Analysis	4
	Credits	**16**
Spring		
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
General Education Course [2]		3
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
	Credits	**15**
Second Year		
Fall		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
ENGR 230	AC Circuit Analysis	4
	Credits	**16**
Spring		
MATH 3160	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
E E 240	Multivariate and Vector Calculus Applications	3
Choose one Programming course from the following:		3-4
CSCI 1240 or CSCI 4510	C++ Programming I or C++ Programming	
CSCI 1210 or CSCI 4505	Computer Programming Fundamentals or Java Programming	
CSCI 1220 or CSCI 4520	Computer Programming Fundamentals: Python or Python Programming I	
CSCI 1225 or CSCI 4525	Python Programming II or Python Programming II	
CSCI 1720	Computer Science I	
CSCI 2210	Object-Oriented Programming	
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**16-17**
Third Year		
Fall		
E E 300	Cornerstone Design	2
E E 320	Signals and Systems I	3
E E 340	Fields and Waves	4
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15**
Spring		
E E 317	Semiconductor Devices and Electronics I	4
E E 325	Signals and Systems II	4
E E 362	Introduction to Computer Organization	4
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15**
Fourth Year		
Fall		
ENGR 401	Engineering Capstone I	3
E E 407	Introduction to Control Systems [3]	3
Controls & Robotics Elective [5,6]		3
STEM Elective [4,5]		3
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15**
Spring		
ENGR 402	Engineering Capstone II	3
E E 475 or E E 551	Control Systems Synthesis or Control Systems Synthesis	3
Controls & Robotics Elective [5,6]		3
STEM Elective [4,5]		3
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15**
	Total Credits	**123-124**

1. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. Students must take both E E 407 Introduction to Control Systems which is currently offered in the Fall semester and (E E 475 Control Systems Synthesis or E E 551 Control Systems Synthesis) which is currently offered in the Spring semester. Note also that E E 407 Introduction to Control Systems is a prerequisite for E E 475 Control Systems Synthesis.
4. STEM Elective: Course at the 300 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, CSCI, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).
5. Depending on availability of specific courses in the fall or spring semester, students may need to reorganize the ECE Electives, STEM electives, and/or Gen Ed electives in their final year. Students are strongly advised to consult with their ECE Faculty Mentor for assistance in planning their final year.
6. At least one Controls & Robotics Elective Course must be from the E E prefix. See E E Concentration Electives in the Degree Requirements section above.

Electrical Engineering (Electromagnetics and Photonics) - Bachelor of Science in Electrical Engineering

Overview

The Electrical Engineering Bachelor of Science program is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Electrical, Computer, Communications, Telecommunication(s), and Similarly Named Engineering Programs. This particular concentration in the B.S. EE program gives students the opportunity to explore more deeply the area of **electromagnetics and photonics**.

Electrical Engineering Program Educational Objectives

Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Transfer Credit Guidelines for Electrical Engineering Degrees

Credit earned at other institutions are generally accepted; however, the following restrictions apply to transfer credits:

- Engineering credit must be earned at an ABET accredited school.
- Physics coursework must be calculus based.
- If the NMSU required course includes a lab, the transfer credit must include a lab.
- A grade of C- or better, must have been earned for transfer coursework.
- E E Courses numbered 300/3000 or higher, Cornerstone and Capstone courses may not be transferred for credit.
- Transfer credits for courses above 300/3000 level are not accepted.

Requirements (123-127 credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 124 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Bachelor of Science in Electrical Engineering students must earn a grade of C- or better in all engineering, technology, math and science courses (including associated prerequisite courses) required for the degree. If a grade lower than C- is earned in any of these courses, the student is required to retake the course immediately the next semester it is offered. Students who earn a grade less than a C- the first time will be contacted by the department and/or academic advising center and advised about this policy and resources to help in their academic success. If the student fails to achieve a C- or better in any of these courses a second time, then the student must submit a written request to the Associate Dean of Academics in the College of Engineering to enroll in the course a third time. The student should explain the circumstances impacting their grade and the actions planned to improve their performance.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		*4*
ENGL 1110G	Composition I	
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
English Composition - Level 2 [1]		*3*
Oral Communication [1]		*3*
Area II: Mathematics		*4*
MATH 1511G	Calculus and Analytic Geometry I [2]	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III: Laboratory Sciences		*8*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: Social/Behavioral Sciences [1]		*3*
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		*4*
MATH 1521G	Calculus and Analytic Geometry II	
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Departmental/College Requirements		
Program Specific Requirements		
Mathematics and Natural Science		*18*
MATH 3160	Introduction to Ordinary Differential Equations	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
ENGR 190	Introduction to Engineering Mathematics	
E E 200	Linear Algebra, Probability and Statistics Applications	
E E 240	Multivariate and Vector Calculus Applications	
STEM		*6*
Choose two STEM Electives [3]		
Electrical and Computer Engineering		*43*
ENGR 120	DC Circuit Analysis	
ENGR 130	Digital Logic	
ENGR 140	Introduction to Programming and Embedded Systems	
ENGR 230	AC Circuit Analysis	
E E 300	Cornerstone Design	
E E 317	Semiconductor Devices and Electronics I	
E E 320	Signals and Systems I	
E E 325	Signals and Systems II	
E E 340	Fields and Waves	
E E 362	Introduction to Computer Organization	
ENGR 401	Engineering Capstone I [4]	
ENGR 402	Engineering Capstone II	
E E Concentration Required Courses		*6-7*
E E 454	Antennas and Radiation [5]	
or E E 541	Antennas and Radiation	
or E E 452	Introduction to Radar	
or E E 548	Introduction to Radar	
E E 473	Introduction to Optics [5]	
E E Concentration Electives: Choose two courses from the following (one must be an E E course): [6]		*6-8*
E E 449	Smart Antennas	
or E E 549	Smart Antennas	
E E 452	Introduction to Radar [7]	
or E E 548	Introduction to Radar	
E E 453	Microwave Engineering	
or E E 521	Microwave Engineering	
E E 454	Antennas and Radiation [7]	
or E E 541	Antennas and Radiation	
E E 478	Fundamentals of Photonics	
or E E 528	Fundamentals of Photonics	
CHME 467	Nanoscience and Nanotechnology	
M E 328	Engineering Analysis II	
ASTR 402	Astronomical Observations and Techniques	
MATH 4210	Complex Variables	

MATH 4220	Fourier Series and Boundary Value Problems	
MATH 4230	Applied Linear Algebra	
PHYS 315	Modern Physics	
PHYS 471	Modern Experimental Optics	
Non-Departmental Requirements (in addition to Gen.Ed)		
Viewing a Wider World Electives [8]		6
Programming Elective		
Select one course from the following:		3-4
CSCI 1240	C++ Programming I [9]	
or CSCI 4510	C++ Programming	
CSCI 1210	Computer Programming Fundamentals [9]	
or CSCI 4505	Java Programming	
CSCI 1220	Computer Programming Fundamentals: Python [9]	
or CSCI 4520	Python Programming I	
CSCI 1225	Python Programming II [9]	
or CSCI 4525	Python Programming II	
CSCI 1720	Computer Science I	
CSCI 2210	Object-Oriented Programming	
Second Language: (not required)		
Electives, to bring the total credits to 123		**0**
Total Credits		**123-127**

1 See the General Education (p. 262) section of the catalog for a full list of courses.

2 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

3 STEM Elective: Course at the 300/3000 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300/3000 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, CSCI, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).

4 The prerequisite for ENGR 401 Engineering Capstone I for BSEE students is E E 300 Cornerstone Design.

5 Students must take (E E 454 Antennas and Radiation or E E 541 Antennas and Radiation or E E 452 Introduction to Radar or E E 548 Introduction to Radar) which are currently offered in the Fall semester and E E 473 Introduction to Optics which is currently offered in the Spring semester

6 Some of these elective courses may have additional prerequisites.

7 This course can satisfy either an E E Concentration Required Course or an E E Concentration Elective, but not both.

8 See the Viewing a Wider World (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section of the catalog for a full list of courses.

9 Only one of the 100/1000-level or the 400/4000-level course may be taken to satisfy degree requirements. Students may not take the 100/1000-level of a course to satisfy the programming elective requirement and the 400/4000-level of the same course to satisfy other degree requirements.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
ENGR 190	Introduction to Engineering Mathematics	4
ENGL 1110G or ENGL 1110H or ENGL 1110M	Composition I or Composition I Honors or Composition I	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 120	DC Circuit Analysis	4
	Credits	**16**
Spring		
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
General Education Course [2]		3
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
	Credits	**15**
Second Year		
Fall		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
ENGR 230	AC Circuit Analysis	4
	Credits	**16**
Spring		
MATH 3160	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
General Education Course [2]		3
Choose one Programming course from the following:		3-4
CSCI 1240 or CSCI 4510	C++ Programming I or C++ Programming	
CSCI 1210 or CSCI 4505	Computer Programming Fundamentals or Java Programming	
CSCI 1220 or CSCI 4520	Computer Programming Fundamentals: Python or Python Programming I	
CSCI 1225 or CSCI 4525	Python Programming II or Python Programming II	
CSCI 1720	Computer Science I	
CSCI 2210	Object-Oriented Programming	
E E 240	Multivariate and Vector Calculus Applications	3
	Credits	**16-17**
Third Year		
Fall		
E E 300	Cornerstone Design	2
E E 320	Signals and Systems I	3
E E 340	Fields and Waves	4
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15**

Spring		
E E 325	Signals and Systems II	4
E E 317	Semiconductor Devices and Electronics I	4
E E 362	Introduction to Computer Organization	4
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15**
Fourth Year		
Fall		
ENGR 401	Engineering Capstone I	3
Electromagnetics & Photonics Elective [5,6]		3-4
E E 454	Antennas and Radiation [3]	3-4
or E E 541	or Antennas and Radiation	
or E E 452	or Introduction to Radar	
or E E 548	or Introduction to Radar	
STEM Elective [4,5]		3
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15-17**
Spring		
ENGR 402	Engineering Capstone II	3
E E 473	Introduction to Optics [3]	3
Electromagnetics & Photonics Elective [5,6]		3-4
STEM Elective [4,5]		3
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15-16**
	Total Credits	**123-127**

1. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
2. See the General Education (p. 266) section of the catalog for a full list of courses.
3. Students must take (E E 454 Antennas and Radiation or E E 541 Antennas and Radiation or E E 452 Introduction to Radar or E E 548 Introduction to Radar) which are currently offered in the Fall semester and E E 473 Introduction to Optics which is currently offered in the Spring semester.
4. STEM Elective: Course at the 300/3000 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300/3000 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, CSCI, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).
5. Depending on availability of specific courses in the fall or spring semester, students may need to reorganize the ECE Electives, STEM electives, and/or General Education electives in their final year. Students are strongly advised to consult with their ECE Faculty Mentor for assistance in planning their final year.
6. At least one Electromagnetics & Photonics Elective Course must be from the E E Prefix. See E E Concentration Electives in the Degree Requirements section above.

Electrical Engineering (Power) - Bachelor of Science in Electrical Engineering

Overview

The Electrical Engineering BS program is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Electrical, Computer, Communications, Telecommunication(s), and Similarly Named Engineering Programs. This particular concentration in the B.S. EE program gives students the opportunity to explore more deeply the area of **power systems**.

Electrical Engineering Program Educational Objectives

Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Transfer Credit Guidelines for Electrical Engineering Degrees

Credit earned at other institutions are generally accepted; however, the following restrictions apply to transfer credits:

- Engineering credit must be earned at an ABET accredited school.
- Physics coursework must be calculus based.
- If the NMSU required course includes a lab, the transfer credit must include a lab.
- A grade of C- or better, must have been earned for transfer coursework.
- E E Courses numbered 300/3000 or higher, Cornerstone and Capstone courses may not be transferred for credit.
- Transfer credits for courses above 300/3000 level are not accepted.

Requirements (123-124 credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 129 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

BSEE students must earn a grade of C- or better in all engineering, technology, math and science courses (including associated prerequisite courses) required for the degree. If a grade lower than C- is earned in any of these courses, the student is required to retake the course immediately the next semester it is offered. Students who earn a grade less than a C- the first time will be contacted by the department and/or academic advising center and advised about this policy and resources to help in their academic success. If the student fails to achieve a C- or better in any of these courses a second time, then the student must submit a written request to the Associate Dean of Academics in the College of Engineering to enroll in the course a third time. The student should explain the circumstances impacting their grade and the actions planned to improve their performance.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		*4*
ENGL 1110G	Composition I	
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
English Composition - Level 2 [1]		*3*
Oral Communication [1]		*3*
Area II: Mathematics		*4*
MATH 1511G	Calculus and Analytic Geometry I [2]	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III: Laboratory Sciences		*8*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: Social/Behavioral Sciences [1]		*3*
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		*4*
MATH 1521G	Calculus and Analytic Geometry II	
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World		6
Departmental/College Requirements		
Program Specific Requirements		
Mathematics and Natural Science		*18*
MATH 3160	Introduction to Ordinary Differential Equations	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
ENGR 190	Introduction to Engineering Mathematics	
E E 200	Linear Algebra, Probability and Statistics Applications	
E E 240	Multivariate and Vector Calculus Applications	
STEM		*6*
Choose two STEM Electives [3]		
Electrical and Computer Engineering		*43*
ENGR 120	DC Circuit Analysis	
ENGR 130	Digital Logic	
ENGR 140	Introduction to Programming and Embedded Systems	
ENGR 230	AC Circuit Analysis	
E E 300	Cornerstone Design	
E E 317	Semiconductor Devices and Electronics I	
E E 320	Signals and Systems I	
E E 325	Signals and Systems II	
E E 340	Fields and Waves	
E E 362	Introduction to Computer Organization	
ENGR 401	Engineering Capstone I [4]	
ENGR 402	Engineering Capstone II	
E E Concentration Required Courses		*6*
E E 333	AC Circuit Analysis and Introduction to Power Systems [5]	
E E 431	Power System Analysis [5]	
or E E 542	Power System Analysis	
or E E 475	Control Systems Synthesis	
or E E 551	Control Systems Synthesis	
E E Concentration Electives: Choose two courses from the following (one must be an E E course): [6]		*6*
E E 405	Electricity Markets	
or E E 502	Electricity Markets	
E E 431	Power System Analysis [7]	
or E E 542	Power System Analysis	
E E 432	Power Electronics	
or E E 537	Power Electronics	
E E 433	Power System Operation	
or E E 533	Power System Operation	
E E 434	Numerical Computational Methods for Smart Grid	
or E E 503	Numerical Computational Methods for Smart Grid	
E E 435	Smart Grid Technologies	
or E E 504	Smart Grid Technologies	
E E 440	Photovoltaic Devices and Systems	
or E E 540	Photovoltaic Devices and Systems	
E E 475	Control Systems Synthesis [7]	
or E E 551	Control Systems Synthesis	
E E 493	Power System Faults and Stability	
or E E 543	Power System Faults and Stability	
CSCI 3790	Algorithm Design & Implementation	
MATH 4230	Applied Linear Algebra	
Non-Departmental Requirements (in addition to Gen.Ed)		
Programming Elective		
Select one course from the following:		3-4
CSCI 1240	C++ Programming I [8]	
or CSCI 4510	C++ Programming	
CSCI 1210	Computer Programming Fundamentals [8]	
or CSCI 4505	Java Programming	
CSCI 1220	Computer Programming Fundamentals: Python [8]	
or CSCI 4520	Python Programming I	
CSCI 1225	Python Programming II	
or CSCI 4525	Python Programming II	
CSCI 1720	Computer Science I	
CSCI 2210	Object-Oriented Programming	
Second Language: (not required)		
Electives, to bring the total credits to 123		**0**
Total Credits		**123-124**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
3. STEM Elective: Course at the 300/3000 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300/3000 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, CSCI, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).
4. The prerequisite for ENGR 401 Engineering Capstone I for BSEE students is E E 300 Cornerstone Design.
5. Students must take E E 333 AC Circuit Analysis and Introduction to Power Systems which is currently offered in the Fall semester and (E E 431 Power System Analysis or E E 542 Power System Analysis which is currently offered in the Spring semester or E E 475 Control

Systems Synthesis or E E 551 Control Systems Synthesis which is currently offered in the Spring semester). Please also note that E E 333 AC Circuit Analysis and Introduction to Power Systems is a prerequisite to E E 431 Power System Analysis/E E 542 Power System Analysis and E E 407 Introduction to Control Systems is a prerequisite to E E 475 Control Systems Synthesis/E E 551 Control Systems Synthesis .

6 Some of these elective courses may have additional prerequisites.

7 This course can satisfy either an E E Concentration Required Course or an E E Concentration Elective, but not both.

8 Only one of the 1000-level or the 4000-level course may be taken to satisfy degree requirements. Students may not take the 1000-level of a course to satisfy the programming elective requirement and the 4000-level of the same course to satisfy other degree requirements.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
ENGR 190	Introduction to Engineering Mathematics	4
ENGL 1110G or ENGL 1110H or ENGL 1110M	Composition I or Composition I Honors or Composition I	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 120	DC Circuit Analysis	4
	Credits	**16**
Spring		
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
General Education Course [2]		3
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
	Credits	**15**
Second Year		
Fall		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
ENGR 230	AC Circuit Analysis	4
	Credits	**16**
Spring		
MATH 3160	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4
E E 240	Multivariate and Vector Calculus Applications	3
Choose one Programming course from the following:		3-4
CSCI 1240 or CSCI 4510	C++ Programming I or C++ Programming	
CSCI 1210 or CSCI 4505	Computer Programming Fundamentals or Java Programming	
CSCI 1220 or CSCI 4520	Computer Programming Fundamentals: Python or Python Programming I	
CSCI 1225 or CSCI 4525	Python Programming II or Python Programming II	
CSCI 1720	Computer Science I	
CSCI 2210	Object-Oriented Programming	
General Education Course [2]		3
	Credits	**16-17**
Third Year		
Fall		
E E 300	Cornerstone Design	2
E E 320	Signals and Systems I	3
E E 340	Fields and Waves	4
General Education Course [2]		3
General Education Course [2]		3
	Credits	**15**
Spring		
E E 317	Semiconductor Devices and Electronics I	4
E E 325	Signals and Systems II	4
E E 362	Introduction to Computer Organization	4
General Education Course [2]		3
	Credits	**15**
Fourth Year		
Fall		
ENGR 401	Engineering Capstone I	3
E E 333	AC Circuit Analysis and Introduction to Power Systems	3
Power Elective [5,6]		3
STEM Elective [4,5]		3
General Education Course [2]		3
	Credits	**15**
Spring		
ENGR 402	Engineering Capstone II	3
Choose one of the following:		3
E E 431 or E E 542 or E E 475 or E E 551	Power System Analysis or Power System Analysis or Control Systems Synthesis or Control Systems Synthesis	
Power Elective [5,6]		3
STEM Elective [4,5]		3
General Education Course [2]		3
	Credits	**15**
	Total Credits	**123-124**

1 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 Students must take both E E 333 AC Circuit Analysis and Introduction to Power Systems which is currently offered in the Fall semester and (E E 431 Power System Analysis or E E 542 Power System Analysis or E E 475 Control Systems Synthesis or E E 551 Control Systems Synthesis) which are currently offered in the Spring semester.

4 STEM Elective: Course at the 300/3000 level or above from E E that is not used to satisfy any other E E program requirement or courses at

the 300/3000 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, CSCI, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).

5 Depending on availability of specific courses in the fall or spring semester, students may need to reorganize the ECE Electives, STEM electives, and/or Gen Ed electives in their final year. Students are strongly advised to consult with their ECE Faculty Mentor for assistance in planning their final year.

6 One Control & Power Elective Course must be from the E E Prefix. See E E Concentration Electives in the Degree Requirements section above.

Electrical Engineering (Space Systems Engineering) - Bachelor of Science in Electrical Engineering

Overview

The Electrical Engineering Bachelor of Science program is accredited by the Engineering Accreditation Commission of ABET, https://www.abet.org (https://www.abet.org,), under the commission's General Criteria and Program Criteria for Electrical, Computer, Communications, Telecommunication(s), and Similarly Named Engineering Programs. This particular concentration in the Bachelor of Science in Electrical Engineering program gives students the opportunity to explore more deeply the area of **space systems**.

Electrical Engineering Program Educational Objectives

Below are the program educational objectives (PEOs) that describe the expected accomplishments of graduate during their first few years after graduation.

1. Our graduates will obtain relevant, productive employment in the private sector, government and/or pursue an advanced degree.
2. Our graduates will be using their engineering foundation to innovate solutions to the problems of the real world.

Transfer Credit Guidelines for Electrical Engineering Degrees

Credit earned at other institutions are generally accepted; however, the following restrictions apply to transfer credits:

- Engineering credit must be earned at an ABET accredited school.
- Physics coursework must be calculus based.
- If the NMSU required course includes a lab, the transfer credit must include a lab.
- A grade of C- or better, must have been earned for transfer coursework.
- E E Courses numbered 300/3000 or higher, Cornerstone and Capstone courses may not be transferred for credit.
- Transfer credits for courses above 300/3000 level are not accepted.

Requirements (123-126 credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 123 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Bachelor of Science in Electrical Engineering students must earn a grade of C- or better in all engineering, technology, math and science courses (including associated prerequisite courses) required for the degree. If a grade lower than C- is earned in any of these courses, the student is required to retake the course immediately the next semester it is offered. Students who earn a grade less than a C- the first time will be contacted by the department and/or academic advising center and advised about this policy and resources to help in their academic success. If the student fails to achieve a C- or better in any of these courses a second time, then the student must submit a written request to the Associate Dean of Academics in the College of Engineering to enroll in the course a third time. The student should explain the circumstances impacting their grade and the actions planned to improve their performance.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		*4*
ENGL 1110G	Composition I	
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
English Composition - Level 2 [1]		*3*
Oral Communication [1]		*3*
Area II: Mathematics		*4*
MATH 1511G	Calculus and Analytic Geometry I [2]	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III: Laboratory Sciences		*8*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: Social/Behavioral Sciences [1]		*3*
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		*4*
MATH 1521G	Calculus and Analytic Geometry II	
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Departmental/College Requirements		
Program Specific Requirements		
Mathematics and Natural Science		*18*
MATH 3160	Introduction to Ordinary Differential Equations	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
ENGR 190	Introduction to Engineering Mathematics	
E E 200	Linear Algebra, Probability and Statistics Applications	
E E 240	Multivariate and Vector Calculus Applications	
STEM		*6*
Choose two STEM Electives [3]		
Electrical and Computer Engineering		*43*
ENGR 120	DC Circuit Analysis	
ENGR 130	Digital Logic	
ENGR 140	Introduction to Programming and Embedded Systems	
ENGR 230	AC Circuit Analysis	
E E 300	Cornerstone Design	

E E 317	Semiconductor Devices and Electronics I	
E E 320	Signals and Systems I	
E E 325	Signals and Systems II	
E E 340	Fields and Waves	
E E 362	Introduction to Computer Organization	
ENGR 401	Engineering Capstone I [4]	
ENGR 402	Engineering Capstone II	
E E Concentration Required Courses		*6*
E E 460	Space System Mission Design and Analysis [5]	
ASTR 402	Astronomical Observations and Techniques [5]	
or ASTR 401	Topics in Modern Astrophysics	
or A E 362	Orbital Mechanics	
E E Concentration Electives: Choose two courses from the following (one must be an E E course): [6]		*6-8*
E E 495	Introduction to Digital Signal Processing	
E E 454	Antennas and Radiation	
or E E 541	Antennas and Radiation	
E E 473	Introduction to Optics	
E E 478	Fundamentals of Photonics	
or E E 528	Fundamentals of Photonics	
E E 496	Introduction to Communication Systems	
A E 362	Orbital Mechanics [7]	
ASTR 401	Topics in Modern Astrophysics [7]	
ASTR 402	Astronomical Observations and Techniques [7]	
Non-Departmental Requirements (in addition to Gen.Ed)		
Viewing a Wider World Electives [8]		6
Programming Elective		
Select one course from the following:		3-4
CSCI 1240	C++ Programming I [9]	
or CSCI 4510	C++ Programming	
CSCI 1210	Computer Programming Fundamentals [9]	
or CSCI 4510	C++ Programming	
CSCI 1220	Computer Programming Fundamentals: Python [9]	
or CSCI 4520	Python Programming I	
CSCI 1225	Python Programming II [9]	
or CSCI 4520	Python Programming I	
CSCI 1720	Computer Science I	
CSCI 2210	Object-Oriented Programming	
Second Language: (not required)		
Electives, to bring the total credits to 123		**0**
Total Credits		**123-126**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
3. STEM Elective: Course at the 300/3000 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300/3000 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, CSCI, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).
4. The prerequisite for ENGR 401 Engineering Capstone I for BSEE students is E E 300 Cornerstone Design.
5. Students must take E E 460 Space System Mission Design and Analysis which is currently offered in the Spring semester and (ASTR 401 Topics in Modern Astrophysics or ASTR 402 Astronomical Observations and Techniques which are currently offered in the Spring semester or A E 362 Orbital Mechanics which is currently offered in the Fall semester).
6. Some of these elective courses may have additional prerequisites.
7. This course can satisfy either an E E Concentration Required Course or an E E Concentration Elective, but not both.
8. See the Viewing a Wider World (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section of the catalog for a full list of courses.
9. Only one of the 100/1000-level or the 400/4000-level course may be taken to satisfy degree requirements. Students may not take the 100/1000-level of a course to satisfy the programming elective requirement and the 400/4000-level of the same course to satisfy other degree requirements.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Intermediate Algebra and ENGL 1110G Rhetoric and Composition. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
ENGR 190	Introduction to Engineering Mathematics	4
ENGL 1110G or ENGL 1110H or ENGL 1110M	Composition I or Composition I Honors or Composition I	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 120	DC Circuit Analysis	4
	Credits	**16**
Spring		
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
General Education Course [2]		3
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
	Credits	**15**
Second Year		
Fall		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
ENGR 230	AC Circuit Analysis	4
	Credits	**16**
Spring		
MATH 3160	Introduction to Ordinary Differential Equations	3
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	4

General Education Course [2]		3
Choose one Programming course from the following:		3-4
CSCI 1240 or CSCI 4510	C++ Programming I or C++ Programming	
CSCI 1210 or CSCI 4505	Computer Programming Fundamentals or Java Programming	
CSCI 1220 or CSCI 4520	Computer Programming Fundamentals: Python or Python Programming I	
CSCI 1225 or CSCI 4525	Python Programming II or Python Programming II	
CSCI 1720	Computer Science I	
CSCI 2210	Object-Oriented Programming	
E E 240	Multivariate and Vector Calculus Applications	3
	Credits	**16-17**
Third Year		
Fall		
E E 300	Cornerstone Design	2
E E 320	Signals and Systems I	3
E E 340	Fields and Waves	4
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15**
Spring		
E E 317	Semiconductor Devices and Electronics I	4
E E 325	Signals and Systems II	4
E E 362	Introduction to Computer Organization	4
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15**
Fourth Year		
Fall		
ENGR 401	Engineering Capstone I	3
Space Systems Elective [5,6]		3-4
Choose one of the following:		3-4
Space Systems Elective [5,6]		
A E 362	Orbital Mechanics	
STEM Elective [4,5]		3
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
	Credits	**15-17**
Spring		
ENGR 402	Engineering Capstone II	3
E E 460	Space System Mission Design and Analysis	3
ASTR 402 or ASTR 401 or A E 362	Astronomical Observations and Techniques or Topics in Modern Astrophysics or Orbital Mechanics	3
General Education Requirement (Area I, IV, V, VI or VWW) [2]		3
STEM Elective [4,5]		3
	Credits	**15**
	Total Credits	**123-126**

1 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.

2 See the General Education (p. 266) section of the catalog for a full list of courses.

3 Students must take E E 460 Space System Mission Design and Analysis which is currently offered in the Spring semester and (ASTR 401 Topics in Modern Astrophysics or ASTR 402 Astronomical Observations and Techniques which are currently offered in the Spring semester or A E 362 Orbital Mechanics which is currently offered in the Fall semester).

4 STEM Elective: Course at the 300/3000 level or above from E E that is not used to satisfy any other E E program requirement or courses at the 300/3000 level or above from A E, C E, CHME, I E, M E, ASTR, BIOL, CHEM, CSCI, MATH, PHYS and STAT. Excluded courses include VWW courses and those which are substantially equivalent to an E E course. Click to view a list of excluded STEM Electives (https://ece.nmsu.edu/undergrad-study/BSEE-STEM-electives.html).

5 Depending on availability of specific courses in the fall or spring semester, students may need to reorganize the ECE Electives, STEM electives, and/or Gen Ed electives in their final year. Students are strongly advised to consult with their ECE Faculty Mentor for assistance in planning their final year.

6 At least one Space Systems Elective must be from the E E Prefix. See E E Concentration Electives in the Degree Requirements section above.

Computer Engineering - Undergraduate Minor

(26-27 Credits)

Prefix	Title	Credits
Prerequisites (All may be transferred)		
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I Calculus and Analytic Geometry I Honors	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II Calculus and Analytic Geometry II Honors	4
Lower Division (all may be transferred)		
ENGR 120	DC Circuit Analysis	4
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
CSCI 2210	Object-Oriented Programming	4
Upper Division (no transfer credits accepted)		
E E 362	Introduction to Computer Organization	4
E E 462	Computer Systems Architecture	3
Computer Engineering Elective (Select one of the following) [1]		3-4
CSCI 3790	Algorithm Design & Implementation	
CSCI 3730	Compilers and Automata Theory	
CSCI 3710	Software Development	
CSCI 3720	Data Structures and Algorithms	
CSCI 4120	Operating Systems I	
CSCI 4205	Computer Security	
CSCI 4140	Database Management Systems I	
E E 480	Introduction to Analog and Digital VLSI	
E E 490	Selected Topics (Applications of Parallel Computing XSEDE Collaborative Course)	
Total Credits		**26-27**

1 Some of these electives may have additional prerequisites

Electrical Engineering - Undergraduate Minor

(21-24 Credits)

The Electrical Engineering minor is not available to students majoring in Electrical Engineering.

Prefix	Title	Credits
Prerequisites (all may be transferred)		
MATH 1511G	Calculus and Analytic Geometry I	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Lower Division (all may be transferred)		
ENGR 120	DC Circuit Analysis	4
ENGR 130	Digital Logic	4
ENGR 230	AC Circuit Analysis	4
Upper Division (no transfer credit accepted)		
E E Elective (Select three of the following) [1]		*9-12*
E E 317	Semiconductor Devices and Electronics I	
E E 320	Signals and Systems I	
E E 325	Signals and Systems II	
E E 333	AC Circuit Analysis and Introduction to Power Systems	
E E 340	Fields and Waves	
E E 362	Introduction to Computer Organization	
Any 400-level E E course		
Total Credits		**21-24**

[1] Some of the E E Electives have additional pre-requisites

Engineering Physics

Undergraduate Program Information

The Engineering Physics program is offered jointly by the Department of Physics and the College of Engineering. The faculty is drawn from the Departments of Physics, Chemical and Materials Engineering, Electrical and Computer Engineering, and Mechanical & Aerospace Engineering. The mission of the Engineering Physics program at New Mexico State University is to offer an accredited degree that combines high-quality engineering and physics programs to best prepare our graduating students for careers in state-of-the-art industry or to move on to advanced study in engineering physics.

The B.S. in Engineering Physics confers an engineering credential. Students in the program complete an engineering core curriculum, as well as a rigorous course of study in physics and mathematics. A strong laboratory component prepares students in experimental techniques and technology using state-of-the-art equipment. The program has the following educational objectives:

1. **Competitiveness.** Graduates are competitive in internationally recognized academic, government and industrial environments.
2. **Adaptability.** Graduates exhibit success in solving complex technical problems in a broad range of disciplines subject to quality engineering processes.
3. **Collaboration/Teamwork and Leadership.** Graduates have a proven ability to function as part of and/or lead interdisciplinary teams.

The Engineering Physics B.S. program is accredited by the Engineering Accreditation Commission (EAC) of ABET, https://www.abet.org, under the General Criteria and the Program Criteria for Engineering, General Engineering, Engineering Physics, Engineering Science, and Similarly Named Engineering Programs.

The student must choose one of four concentrations in

- Aerospace Engineering,
- Chemical Engineering,
- Electrical Engineering, or
- Mechanical Engineering.

Degrees for the Department

- Engineering Physics (Aerospace Engineering) - Bachelor of Science in Engineering Physics (p. 1141)
- Engineering Physics (Chemical Engineering) - Bachelor of Science in Engineering Physics (p. 1143)
- Engineering Physics (Electrical Engineering) - Bachelor of Science in Engineering Physics (p. 1145)
- Engineering Physics (Mechanical Engineering) - Bachelor of Science in Engineering Physics (p. 1147)

Professor, Stefan Zollner, Department Head

Professor, Boris Kiefer, Engineering Physics Program Head

Physics Courses

PHYS 1110. Explorations in Physics
1 Credit (1)
This course will introduce students to university resources, pre-professional student societies, learning strategies to help strengthen academic performance, and will explore career paths for graduates. Students will also discuss the roles of physicists in society, physics research being performed at and nearby NMSU, and what the latest discoveries in physics tell us about nature and the universe.
Learning Outcomes

1. Describe effective learning strategies for science/engineering classes.
2. Give examples of impactful scientists from groups underrepresented in physics and describe their career paths.
3. Research examples of positions open to physics majors.
4. Identify critical components of an effective resume.
5. Write a professional cover letter for an internship/undergraduate research application.
6. Discuss the boundaries of ethical science and give an example of an accidental breach of ethics.
7. Describe the societal impact of misinformation about scientific results or research.
8. Explore ways scientists can engage with the general public to shape the discourse of knowledge or the ways scientists are perceived.
9. List some of the burning questions current physicists are trying to answer. 1
10. Establish a sense of community within the department, the university, and the greater physics world. 1

11. Discover useful resources to help with academic success and avoid pitfalls while pursuing a physics degree. 1
12. Better understand the value of a physics degree, and what can be expected entering the workforce or academia. 1
13. Understand and discuss how the field of physics connects with the issues and problems facing society today.

PHYS 1111. Introductory Computational Physics
3 Credits (2+2P)
Introduction to computational techniques for the solution of physics-related problems.
Prerequisite: a C- or better in MATH 1220G or MATH 1250G or MATH 1511G.
Learning Outcomes
1. Use computers for visualizing and analyzing data.
2. Apply techniques of structured programming and software development.
3. Trouble shoot and debug programs.

PHYS 1112. Introductory Physics for the Health Sciences
3 Credits (3)
Algebra-level introduction to topics required for the Health Sciences including basic mechanics (including sound, mechanical waves and fluids), heat and thermodynamics, electricity and magnetism, optics and electromagnetic waves, atomic and nuclear physics and applications to medical imaging. Restricted to Community Colleges campuses only.
Prerequisite(s): MATH 1215 or Equivalent.
Learning Outcomes
1. The objective of the course is to familiarize the student with the concepts and methods used in the underlying physics associated with various Health Science disciplines.
2. The course will demonstrate how the basic principles of mechanics, thermodynamics, electricity, magnetism, electromagnetic waves and optics can be applied to solve particular problems in Health Sciences applications. Introduces the student to selected topics in modern physics including quantum physics, atomic and nuclear physics.

PHYS 1115G. Survey of Physics with Lab
4 Credits (3+3P)
Overview of the concepts and basic phenomena of physics. This course provides a largely descriptive and qualitative treatment with a minimum use of elementary mathematics to solve problems. No previous knowledge of physics is assumed. Includes laboratory.
Learning Outcomes
1. Apply concepts of classical mechanics (such as velocity, acceleration, force, inertia, momentum, torque, work, energy) to simple static and dynamic systems.
2. Apply concepts of thermodynamics (such as heat, temperature, internal energy, entropy) to simple processes.
3. Apply concepts of electricity and magnetism (such as fields, potential, charge conservation, static and dynamic induction) to simple circuits, motors, and other simple contrivances.
4. Apply simple geometric and wave optics in simple situations.
5. Test ideas using modern laboratory equipment.
6. Estimate experimental uncertainties.
7. Use computers to analyze and report laboratory results.
8. Draw appropriate conclusions from quantitative scientific observations.
9. Accurately and clearly communicate the results of scientific experiments.

PHYS 1125G. Physics of Music
4 Credits (3+2P)
Introduction for non-science majors to basic concepts, laws, and skills in physics, in the context of a study of sound, acoustics, and music.
Learning Outcomes
1. Demonstrate converting units and other aspects of dimensional analysis in the working of numerical problems.
2. Apply basic classical mechanics to static and dynamic fluids, including Archimedes'principle and Bernoulli's principle.
3. Apply the general properties of waves to simple models of musical instruments.
4. Demonstrate knowledge of basic operating principles of wind, string, and percussion instruments.
5. Demonstrate knowledge of how objectively measurable properties of sound waves correspond to the perceptions of pitch, loudness, and timbre.
6. Demonstrate understanding of the description of vibrations and waves in terms of Fourier's Theorem and normal modes.
7. Demonstrate understanding of vocalization in terms of physical principles such as resonance and fluid dynamics.
8. Demonstrate understanding of how the ear works.

PHYS 1230G. Algebra-Based Physics I
3 Credits (3)
An algebra-based treatment of Newtonian mechanics. Topics include kinematics and dynamics in one and two dimensions, conservation of energy and momentum, rotational motion, equilibrium, and fluids.
Learning Outcomes
1. Demonstrate converting units and other aspects of dimensional analysis in the working of numerical problems.
2. Apply principles of Newtonian mechanics to predict and account for simple phenomena modeled by the motion of particles in one and two dimensions.
3. Apply principles of Newtonian mechanics to predict and account for simple phenomena modeled by the motion of a rigid body in two dimensions.
4. Apply Newton's theory of gravitation to circular orbits and demonstrate understanding of how Kepler's laws of planetary motion provide the empirical foundation for Newton's theory.
5. Apply the mathematics of vectors to the principles of Newtonian mechanics.
6. Apply principles of Newtonian mechanics to the case of static and dynamic incompressible fluids, including Archimedes'and Bernoulli's principles.

PHYS 1230L. Algebra-Based Physics I Lab
1 Credit (3P)
A series of laboratory experiments associated with the material presented in PHYS 1230G. May be repeated up to 3 credits.
Prerequisite/Corequisite: PHYS 1230G.
Learning Outcomes
1. Explain the scientific method.
2. Test ideas using modern laboratory equipment.
3. Estimate experimental uncertainties using statistical methods.
4. Use computers to analyze and report laboratory results.

5. Draw appropriate conclusions from quantitative scientific observations.
6. Accurately and clearly communicate the results of scientific experiments.

PHYS 1240G. Algebra-Based Physics II
3 Credits (3)
The second half of a two semester algebra-based introduction to Physics. This course covers electricity, magnetism and optics.
Prerequisite(s): a C- or better in PHYS 1230G or PHYS 2230G.
Learning Outcomes
1. Be able to state Coulomb's Law and Gauss's laws and apply them.
2. Apply the concepts of electric charge, electric field and electric potential to solve problems.
3. Analyze simple DC and AC circuits.
4. Apply the Lorentz force to solve problems.
5. Apply Faraday's law of induction (and Lenz's law) to solve problems.
6. Apply ray optics to practical lens systems such as microscopes and corrective lenses.
7. Apply the wave nature of light to the phenomena of reflection, refraction, and diffraction.

PHYS 1240L. Algebra-Based Physics II Lab
1 Credit (3P)
A series of laboratory experiments associated with the material presented in PHYS 1240 May be repeated up to 3 credits.
Prerequisite/Corequisite: PHYS 1240G.
Learning Outcomes
1. Explain the scientific method.
2. Test ideas using modern laboratory equipment.
3. Estimate experimental uncertainties using statistical methods.
4. Use computers to analyze and report laboratory results.
5. Draw appropriate conclusions from quantitative scientific observations.
6. Accurately and clearly communicate the results of scientific experiments.

PHYS 1310G. Calculus -Based Physics I
3 Credits (3)
A calculus level treatment of classical mechanics and waves, which is concerned with the physical motion concepts, forces, energy concepts, momentum, rotational motion, angular momentum, gravity, and static equilibrium.
Prerequisite: a C- or better in ENGR 190 or MATH 1511G or higher.
Learning Outcomes
1. Describe the relationships among position, velocity, and acceleration as functions of time.
2. Use the equations of kinematics to describe motion under constant acceleration.
3. Analyze linear motion using Newton's laws, force, and linear momentum.
4. Analyze rotational motion using torque and angular momentum.
5. Analyze motion using work and energy.

PHYS 1310L. Calculus -Based Physics I Lab
1 Credit (3P)
A series of laboratory experiments associated with the material presented in Calculus-based Physics I. Students will apply the principles and concepts highlighting the main objectives covered in coursework for Calculus-based Physics I.
Prerequisite(s)/Corequisite(s): PHYS 1310G.
Learning Outcomes
1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Experience the relationship between theory and experiment.

PHYS 1311. Problems in Calculus-Based Physics I
0.5-1 Credits (.5-1)
This is a supplemental course for Calculus-based Physics I. May be repeated up to 1 credits.
Corequisite(s): PHYS 1310G.

PHYS 1320G. Calculus -Based Physics II
3 Credits (3)
A calculus level treatment of classical electricity and magnetism. It is strongly recommended that this course is taken at the same time as Calculus-based Physics II laboratory.
Prerequisite: a C- or better in (PHYS 2110 or PHYS 1310G) and (ENGR 190 or MATH 1521G or higher).
Learning Outcomes
1. Apply the concepts of electric charge, electric field and electric potential to solve problems.
2. Sketch the electric field in the vicinity of point, line, sheet, and spherical distributions of static electric charge.
3. Sketch the magnetic field in the vicinity of line, ring, sheet, and solenoid distributions of steady current.
4. Describe the relationship between electric field and electric potential.
5. Calculate the Lorentz force on a moving charge for simple geometries of the fields and use it to analyze the motion of charged particles.
6. Apply the integral forms of Maxwell's equations.
7. Calculate the energy of electromagnetic fields.
8. Analyze DC circuits.

PHYS 1320L. Calculus -Based Physics II Lab
1 Credit (3P)
A series of Laboratory experiments associated with the material presented in Calculus-Based Physics II. Students will apply the principles and concepts highlighting the main objectives covered in coursework for Calculus-Based Physics II.
Prerequisite(s)/Corequisite(s): PHYS 1320G. Prerequisite(s): A C- or better in PHYS 2110L or PHYS 1310L.
Learning Outcomes
1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.

6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Experience the relationship between theory and experiment

PHYS 1321. Problems in Calculus-Based Physics II
0.5-1 Credits (.5-1)
This is a supplemental course for Calculus-based Physics II.
Corequisite(s): PHYS 1320G.

PHYS 2110. Mechanics
3 Credits (3)
Newtonian mechanics.
Prerequisite/Corequisite: MATH 1511G or higher.
Learning Outcomes
1. Describe matter as particles or extended objects, analyze forces or torques acting on it, and apply Newton's laws to determine if the object is in equilibrium or predict any change in the motion of such an object.
2. Apply vector algebra to predict motion or analyze interactions in one or two dimensions.
3. Apply techniques of conservation laws (linear momentum, energy, angular momentum) to determine the effect of interactions that are internal or external to the system studied.
4. Analyze systems in simple harmonic motion and explain qualitatively under what condition a driven oscillating system shows the phenomenon of resonance.
5. Use multiple representations to build, interpret and communicate a model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
6. Given two or more cases, perform a ranking task by evaluating the similarities (comparison) or differences (contrast) in the cases and applying physics principles.
7. Self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
8. Analyze real-world phenomena by defining and formulating the question or problem, constructing simplified idealized models(and stating their limitations), and applying appropriate mathematical reasoning to make predictions or explain a phenomenon or function.
9. Communicate effectively with audiences of different scientific backgrounds by recognizing their needs and making the communication relevant and impactful. 1
10. Work collegially and collaboratively in diverse teams both as a leader and as a member in pursuing a common goal.

PHYS 2110L. Experimental Mechanics
1 Credit (3P)
Laboratory experiments associated with the material presented in PHYS 2110. Science majors.
Prerequisite/Corequisite: PHYS 2110.
Learning Outcomes
1. Test scientific questions or ideas using appropriate laboratory equipment.
2. Collect experimental data and evaluate the outcomes of an experiment qualitatively and quantitatively.
3. Estimate measurement uncertainty.
4. Apply appropriate methods of analysis to raw data, including graphical or statistical methods, and computer-based tools.
5. Draw appropriate conclusions from quantitative scientific data.
6. Communicate the process and the outcomes of an experiment and reflect on possible revisions in the procedure.
7. Work effectively as part of a team.
8. Demonstrate professional responsibility.

PHYS 2111. Supplemental Instruction to PHYS 2110
1 Credit (1)
This Optional workshop as a supplement to PHYS 2110. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credit.
Corequisite: PHYS 2110.
Learning Outcomes
1. Analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. In the contexts of concepts and physical laws discussed in PHYS 2110, apply quantitative analysis to solve problems, including the use of scientific notation, unit conversion and vector algebra.
4. Self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. Develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2120. Heat, Light, and Sound
3 Credits (3)
Calculus-level treatment of thermodynamics, geometrical and physical optics, and sound.
Prerequisite: a C- or better in PHYS 2110 or PHYS 1310G, and MATH 1511G or higher.
Learning Outcomes
1. Analyze real world phenomena that meet specific needs and use scientific judgement to draw conclusions.
2. Use multiple representations to build, interpret and communicate scientific models, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. Analyze oscillations and wave phenomena.
4. Analyze properties of sound waves.
5. Analyze properties of light using interference and diffraction.
6. Analyze light propagation through media using index of refraction and optical apparatus.
7. Analyze optical systems using light propagation.
8. Analyze the laws of thermodynamics and use them to describe processes in gases and other states of matter.

PHYS 2120L. Heat, Light, and Sound Laboratory
1 Credit (3P)
Laboratory experiments associated with the material presented in PHYS 2120. Science majors.
Prerequisite: a C- or better in PHYS 2110L or PHYS 1310L.
Prerequisite/Corequisite: PHYS 2120.
Learning Outcomes
1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.

5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Understand the relationship between theory and experiment.

PHYS 2121. Supplemental Instruction to PHYS 2120
1 Credit (1)
This optional workshop supplements PHYS 2120 "Heat, Light, and Sound". Students actively apply concepts and methods introduced in PHYS 2120 to problem solving and quantitative analysis. May be repeated up to 1 credit.
Corequisite: PHYS 2120.
Learning Outcomes
1. Analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. In the contexts of concepts and physical laws discussed in PHYS 2121, apply quantitative analysis to solve problems involving wave propagation and interference, geometric optics, heat transfer and thermodynamics.
4. Self-checkreasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. Develop learning strategies and use metacognition to promote thinking in the discipline

PHYS 2140. Electricity and Magnetism
3 Credits (3)
Charges and matter, the electric field, Gauss law, the electric potential, the magnetic field, Ampere's law, Faraday's law, electric circuits, alternating currents, Maxwell's equations, and electromagnetic waves.
Prerequisite: a C- or better in PHYS 2110 or PHYS 1310G, and MATH 1511G or higher.
Prerequisite/Corequisite: MATH 1521G.
Learning Outcomes
1. Analyze real-world phenomena by deciding what information is relevant and constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomenon or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. Use a physics problem-solving strategy: i. Identify relevant concepts. ii. Introduce and study simplified models. iii. Use symmetry arguments. iv. Establish the relation between known and unknown quantities. v. Calculate a quantitative result using appropriate mathematical methods. vi. Self-check reasonableness of assumptions and solutions.
4. Analyze/predict the interaction of charged particles, dipoles, or conductors with electric or magnetic fields. Apply concepts of force, work, or energy.
5. Describe sources of electric fields or magnetic fields and calculate field vectors for a point in space.
6. Apply Gauss's law to calculate electric fields for symmetric charge distributions or to determine surface charges on conductors in electrostatic equilibrium.
7. Apply Ampere's law and the Law of Biot-Savart to calculate magnetic fields.
8. Evaluate if magnetic flux changes and if an electric field or electric current is induced. Determine the direction of the induced current or the non-Coulomb electric field by applying Lenz's law. Apply Faraday's law to relate the rate of change of magnetic flux with the magnitude of emf induced.
9. Calculate and discuss properties of electric circuits (dc) with resistors, capacitors, and inductors applying Kirchhoff's rules or Ohm's law. 1
10. Discuss how the presence of a capacitor or an inductor modifies the behavior of a (dc) circuit and determine the time dependence of the current. 1
11. For a series RLC-circuit (or RC, LC, RL) with an ac-voltage source apply the concept of impedance or reactance to calculate the current through or voltages across each of the circuit elements, especially in the low-frequency limit, high-frequency limit, or at the resonant frequency.

PHYS 2140L. Electricity & Magnetism Laboratory
1 Credit (3P)
Laboratory experiments associated with the material presented in PHYS 2140.
Prerequisite: a C- or better in PHYS 2110 or PHYS 1310G.
Prerequisite/Corequisite: PHYS 2140.
Learning Outcomes
1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Understand the relationship between theory and experiment.

PHYS 2141. Supplemental Instruction to PHYS 2140
1 Credit (1)
Optional workshop as a supplement to PHYS 2140. The tutorial sessions focus on reasoning and hands-on problem solving.
Corequisite: PHYS 2140.
Learning Outcomes
1. Analyze real-world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomenon or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. In the contexts of concepts and physical laws discussed in PHYS 2140, apply quantitative analysis to solve problems, including the use of symmetry to study electric and magnetic fields. Practice concepts of calculus applied to charge and current distributions.
4. Self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. Develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2230G. General Physics for Life Science I
3 Credits (3)
This algebra-based introduction to general physics covers mechanics, waves, sound, and heat. Special emphasis is given to applications in the life sciences. This course is recommended for students in the life sciences and those preparing for the physics part of the MCAT.
Prerequisite: A C- or better in MATH 1220G or higher.
Learning Outcomes
1. Modeling: analyze real-world phenomena by deciding what information is relevant and constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain phenomena or function; use multiple representations to build, interpret and communicate the model,including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text; critique assumptions and determine how to test the validity of a model and use the comparison of experimental data and prediction to refine the model.
2. Conceptual understanding: describe the motion of any object in terms of displacement, velocity, and acceleration; analyze external forces acting on an object and determine if a system is in equilibrium or relate the net force to changes in motion; predict or analyze motion using conservation laws for energy and momentum; analyze forces and torques fora rigid object in static equilibrium; for a static fluid determine pressure and the buoyant force; apply idealized models of fluid flow to the circulatory system; describe the properties of pressure waves known as sound, apply the model of standing waves to musical instruments and discuss how sound is used to sense the environment; predict qualitative changes in the internal energy of a thermodynamic system when energy has been transferred due to work or heat and justify those predictions using conservation of energy (First law of thermodynamics). Identify which heat transfer processes occur in a described situation.
3. Quantitative reasoning: use a physics problem-solving strategy (Identify relevant concepts; Introduce and study simplified models; Use symmetry arguments; Establish the relation between known and unknown quantities; Calculate a quantitative result using appropriate mathematical methods; Self-check reasonableness of assumptions and solutions); use scientific notation accurately and convert units if necessary.
4. Communicating scientific information: interpret or generate graphs or other visual representations and be able to switch between various representations including text,mathematical description, or diagrams.

PHYS 2230L. Laboratory to General Physics for Life Science I
1 Credit (1)
Laboratory experiments in topics associated with material presented in PHYS 2230G.
Prerequisite(s)/Corequisite(s): PHYS 2230G. Restricted to Las Cruces campus only.

PHYS 2231. Supplemental Instruction to General Physics for Life Sciences I
1 Credit (1)
This optional workshop supplements Physics for Life Sciences I. The tutorial sessions focus on reasoning and hands-on problem solving.
Corequisite: PHYS 2230G.
Learning Outcomes
1. analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. in the contexts of concepts and physical laws discussed in PHYS 2230, apply quantitative analysis to solve problems, including the use of scientific notation, unit conversion and vector algebra.
4. self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2240G. General Physics for Life Science II
3 Credits (3)
This algebra-based course covers electricity, magnetism, light, atomic physics, and radioactivity. Special emphasis is given to applications in the life sciences This course is recommended for students in the life sciences and those preparing for the physics part of the MCAT.
Prerequisite: a C- or better in PHYS 1230G or PHYS 2230G, and MATH 1220G or higher.
Learning Outcomes
1. Modeling: analyze real world phenomena by constructing simplified idealized models (an abstract description) that allow making predictions or explaining a phenomena or function; use multiple representations to build and communicate the model, including sketches, mathematical expressions, diagrams or graphs; decide what information is relevant and critique assumptions and models of others; determine how to test the validity of a model and use comparison of experimental data and prediction to refine the model.
2. Conceptual understanding: electric or magnetic fields can be used to describe interactions of objects that contain charges with their surroundings; changes that occur as a result of interactions are constrained by conservation laws (such as conservation of energy, conservation of charge or conservation of nucleon number); many macroscopic properties of materials can be described using microscopic models or related to their geometry; electromagnetic radiation can be modeled as a wave or as fundamental particles (photons); the direction of propagation of a wave may change when it encounters a boundary surface between two media of different properties (reflection or refraction); the spontaneous radioactive decay of nuclei is described by probability.
3. Quantitative reasoning: apply quantitative analysis and appropriate mathematical reasoning to describe or explain phenomena; use scientific notation accurately and convert units if necessary.
4. Communicating scientific information: interpretor generate graphs or other visual representations (e.g. field lines, equipotential lines) and be able to switch between various representations including text, mathematical description, or diagrams.

PHYS 2240L. Laboratory to General Physics for Life Science II
1 Credit (1)
Laboratory experiments in topics associated with material presented in PHYS 2240.
Prerequisite(s)/Corequisite(s): PHYS 2240G. Restricted to Las Cruces campus only.

PHYS 2241. Supplemental Instruction to General Physics for Life Sciences II
1 Credit (1)
This optional workshop is a supplement to Physics for Life Science II. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credits.
Corequisite(s): PHYS 2240G.

Learning Outcomes

1. analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. in the contexts of concepts and physical laws discussed in PHYS 2240, apply quantitative analysis to solve problems, including the use of scientific notation, unit conversion and vector algebra.
4. self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2996. Special Topics
1,4 Credits
Topics to be announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes

1. Varies.

PHYS 2997. Independent Study
1-3 Credits
Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.
Learning Outcomes

1. Varies

PHYS 303V. Energy and Society in the New Millennium
3 Credits (3)
Traditional and alternative sources of energy. Contemporary areas of concern such as the state of depletion of fossil fuels; nuclear energy, solar energy, and other energy sources; environmental effects; nuclear weapons; and health effects of radiation. Discussion of physical principles and impact on society. Focus on scientific questions involved in making decisions in these areas. No physics background required.

PHYS 304. Forensic Physics
4 Credits (3+3P)
Theories, laboratory, and field techniques in the area of forensic physics.

PHYS 305V. The Search for Water in the Solar System
3 Credits (3)
Examines the formation, abundance and ubiquity of water in our Solar System stemming from comets, Martian and Lunar poles, Earth's interior and into the outer reaches of the Solar System. Topics will include nuclear synthesis, Solar System formation, remote sensing, as well as past, present and future NASA missions for water.
Learning Outcomes

1. Learn how to apply scientific reasoning for understanding the evolution of the universe.
2. Learn the location of possible water resources in the solar system and beyond.
3. Learn how to use remote sensing to identify water in distant stellar objects and their atmospheres.
4. Acquire the ability to apply knowledge of mathematics, science and applied sciences (scientific expertise).
5. Recognize the need for an ability to engage in life-long learning (Life-long learning).

PHYS 315. Modern Physics
3 Credits (3)
An introduction to relativity and quantum mechanics, with applications to atoms molecules, solids, nuclei, and elementary particles.
Prerequisite: a C- or better in MATH 2530G and PHYS 2140 or PHYS 1320G.
Learning Outcomes

1. Communication: an ability to communicate effectively with a range of audiences.
2. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 316. Supplemental Instructions to PHYS 315
1 Credit (1)
This optional workshop supplements PHYS 315 "Modern Physics". Students actively apply concepts and methods introduced in PHYS 315 to problem solving and quantitative analysis.
Corequisite(s): PHYS 315.

PHYS 325. Intermediate Experimental Physics
3 Credits (1+6P)
An exploration of a variety of experimental techniques in physics with an emphasis on the proper determination of statistical and systematic uncertainties. Students will work in teams and prepare professional written and oral reports of their work. This course cannot be used to replace M E 345 for students majoring in engineering.
Prerequisite(s)/Corequisite(s): PHYS 315. Prerequisite(s): a C- or better in PHYS 2140L or PHYS 1320L.
Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, Analyze, and Interpret Data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 350. Special Topics
1-3 Credits
Lectures, demonstrations, and discussions on such topics as lasers and holography, energy sources, clouds, and biophysics. May be repeated for a maximum of 12 credits under different subtitles.

PHYS 380. Individual Study
1-3 Credits

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

PHYS 395. Intermediate Mathematical Methods of Physics
3 Credits (3)
Introduction to the mathematics used in intermediate-level physics courses. Topics include vector calculus, curvilinear coordinates, matrices, linear algebra, function spaces, partial differential equations, and special functions. This course cannot be used to replace M E 228 or M E 328 for students majoring in engineering. May be repeated up to 3 credits.
Prerequisite(s)/Corequisite(s): MATH 3160. Prerequisite(s): a C- or better in MATH 2530G.
Learning Outcomes
1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 400. Undergraduate Research
1-3 Credits
May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

PHYS 420. Capstone Project I
3 Credits (3P)
Application of engineering physics principles to a significant design project. Includes teamwork, written and oral communication and realistic technical, economic and public safety requirements.

PHYS 421. Capstone Project II
3 Credits (3P)
Continuation of PHYS 420.

PHYS 450. Selected Topics
1-3 Credits
Readings, lectures or laboratory studies in selected areas of physics. May be repeated for a maximum of 12 credits.

PHYS 451. Intermediate Mechanics I
3 Credits (3)
Newtonian mechanics, including an introduction to the Lagrangian formulation. Topics include central force motion, rigid body motion, noninertial reference frames, oscillating systems, and classical scattering.
Prerequisite(s)/Corequisite(s): MATH 3160. Prerequisite(s): a C- or better in PHYS 2110 or PHYS 1310G, and MATH 2530G.
Learning Outcomes
1. Set up equations of motion for classical mechanical systems and solve them.
2. Identify conserved quantities and understand the circumstances under which they arise (symmetries); in particular, know how to use conservation of energy, momentum, angular momentum to solve problems.
3. Fluently use three-dimensional calculus as a language to do the above; be able to use spherical and cylindrical coordinates.
4. Understand the paradigmatic examples of the harmonic oscillator, central force (in particular, gravitational) motion and rigid body motion, which serve as starting points for investigating more complicated realistic problems.

PHYS 454. Intermediate Modern Physics I
3 Credits (3)
Introduction to quantum mechanics, focusing on the role of angular momentum and symmetries, with application to many atomic and subatomic systems. Specific topics include intrinsic spin, matrix representation of wave functions and observables, time evolution, and motion in one dimension.
Prerequisite: a C- or better in PHYS 315.
Prerequisite/Corequisite: MATH 3160 and PHYS 395.
Learning Outcomes
1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 455. Intermediate Modern Physics II
3 Credits (3)
Continuation of subject matter of PHYS 454. Specific topics include rotation and translation in three dimensions, solution of central potential problems, perturbation theory, physics of identical particles, scattering theory, and the interaction between photons and atoms.
Prerequisite: a C- or better in PHYS 454, MATH 3160, and PHYS 395.
Learning Outcomes
1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 461. Intermediate Electricity and Magnetism I
3 Credits (3)
The first part of a two-course sequence in classical electrodynamics. Covered topics include static electric and magnetic fields, Laplace's and Poisson's equations, electromagnetic work and energy, Lorentz force, Gauss's, Biot-Savart, and Ampere's laws, Maxwell's equations, as well as electric and magnetic fields in matter.
Prerequisite: a C- or better in PHYS 2140 or PHYS 1320G or equivalent and a C- or better in MATH 2530G.
Prerequisite/Corequisite: MATH 3160 and PHYS 395.
Learning Outcomes
1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 462. Intermediate Electricity and Magnetism II
3 Credits (3)
Continuation of subject matter of PHYS 461. Covered topics include Maxwell's equations and their applications, electromagnetic waves, reflection, refraction, dispersion, radiating systems, interference and diffraction, as well as Lorentz transformations and relativistic electrodynamics.
Prerequisite: a C- or better in PHYS 461, MATH 3160, and PHYS 395.
Learning Outcomes
1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 468. Intermediate X-ray Diffraction
3 Credits (3)

Introduction to x-ray diffraction and reflectivity spectra. Topics include X-ray sources and detectors, atomic spectra, characteristic x-rays, thermionic emission, synchrotron radiation, instrument components, and beam conditioners. Prerequisite(s): a C- or better in PHYS 315 and PHYS 325

Learning Outcomes

1. Knowledge of structural properties of materials
2. Experimental x-ray characterization techniques
3. Presentation and writing skills in the discipline
4. Ethics, teamwork, and career opportunities

PHYS 471. Modern Experimental Optics
3 Credits (1+6P)

Cumulative experience course in experimental optics.
Prerequisite: a C- or better in PHYS 315 and PHYS 325.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and professional responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 475. Advanced Laboratory Practices for Materials
3 Credits (1+6P)

Cumulative experience course in advanced laboratory practices involving experiments in atomic, molecular, and condensed matter physics.
Prerequisite: a C- or better in PHYS 315 and PHYS 325.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, Analyze, and Interpret Data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 476. Computational Physics
3 Credits (3)

Scientific visualization, numerical differentiation and interpolation, numerical integration, root finding, linear algebra, eigensystems, ODE's, Boundary value problems, PDE's, Monte-Carlo calculations, data description and analysis, Fast Fourier Transforms, and applications to advanced physics problems. Recommended is the knowledge of a programming language.
Prerequisite: a C- or better in PHYS 1111 or equivalent and MATH 3160.

Learning Outcomes

1. learn how to use computers for solving problems in the physical sciences,
2. obtain skills to implement numerical simulation and modeling strategies,
3. learn how to monitor and analyze data graphically, during and after computation,
4. obtain workflow organization skills needed for the solution of complicated systems.

PHYS 480. Thermodynamics
3 Credits (3)

Thermodynamics and statistical mechanics. Basic concepts of temperature, heat, entropy, equilibrium, reversible and irreversible processes. Applications to solids, liquids, and gases.
Prerequisite: a C- or better in PHYS 2120, PHYS 315, and MATH 2530G.

Learning Outcomes

1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 485. Independent Study
1-3 Credits

Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

PHYS 488. Introduction to Condensed Matter Physics
3 Credits (3)

Crystal structure, X-ray diffraction, energy band theory, phonons, cohesive energy, conductivities, specific heats, p-n junctions, defects, surfaces, and magnetic, optical, and low-temperature properties.
Prerequisite: a C- or better in PHYS 315.

Learning Outcomes

1. Learn the fundamental concepts of solid-state physics: classification of solids, crystal structure, band structure of solids, lattice vibrations, optical and magnetic properties of solids.
2. Develop an ability to formulate and solve complex problems in solid state physics by applying the fundamental principles of physics and mathematics.
3. Develop and ability to acquire and apply new knowledge using appropriate learning strategies.

PHYS 489. Introduction to Modern Materials
3 Credits (3)

Structure and mechanical, thermal, electric, and magnetic properties of materials. Modern experimental techniques for the study of material properties.
Prerequisite: a C- or better in PHYS 315.

Learning Outcomes

1. Learn the fundamental concepts of the physics of modern materials, such as crystal structure, properties of materials, and experimental techniques.
2. Develop an ability to formulate and solve complex problems in the area of physics of modern materials by applying the principles of physics and mathematics.
3. Develop an ability to acquire and apply new knowledge using appropriate learning strategies.

PHYS 493. Experimental Nuclear Physics
3 Credits (1+6P)
Cumulative experience course in nuclear physics such as measurement of radioactivity, absorption of radiation, nuclear spectrometry.
Prerequisite: a C- or better in PHYS 315 and PHYS 325.
Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communications: an ability to communicate effectively with a range of audiences.
3. Ethical and professional responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 495. Mathematical Methods of Physics I
3 Credits (3)
Applications of mathematics to experimental and theoretical physics. Topics include vector analysis, Fourier series and transforms, Green's functions, special functions, complex variables, tensor algebra and analysis.
Prerequisite: a C- or better in MATH 3160 and PHYS 395.
Learning Outcomes

1. Deploy the tools of vector analysis and expansion into complete sets of functions to treat problems arising, e.g., in electrodynamics.
2. Understand the elements of functional analysis underpinning, e.g., quantum mechanics, such as representations, operators and their inverses and spectra.
3. Evaluate integrals of analytic functions using the calculus of residues.
4. Take advantage of the transformation behavior, under symmetry operations, of representations of physical quantities, by casting physical relations in tensor language.

PHYS 500. Special Topics Seminar
1-2 Credits
Treatment of topics not covered by regular courses. Graded S/U. May be repeated.

PHYS 511. Mathematical Methods of Physics I
3 Credits (3)
Applications of mathematics to experimental and theoretical physics. Topics include vector analysis, Fourier series and transforms, Green's functions, special functions, complex variables, tensor algebra and analysis.
Learning Outcomes

1. Deploy the tools of vector analysis and expansion into complete sets of functions to treat problems arising, e.g., in electrodynamics.
2. Understand the elements of functional analysis underpinning, e.g., quantum mechanics, such as representations, operators and their inverses and spectra.
3. Evaluate integrals of analytic functions using the calculus of residues.
4. Take advantage of the transformation behavior, under symmetry operations, of representations of physical quantities, by casting physical relations in tensor language.

PHYS 520. Selected Topics
1-3 Credits
This is a lecture/laboratory course designed to present the basic concepts, the techniques and the tools to synthesize and characterize nanometer scale materials, and the latest achievements in current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics and energy. It is intended for a multidisciplinary audience with a variety of backgrounds. This course should be suitable for graduate students as well as advanced undergraduates. Topics covered will include: nanoscience and nanotechnology, nanofabrication, self-assembly, colloidal chemistry, sol-gel, carbon nanotubes, graphene, thin film, lithography, physical vapor deposition, chemical vapor deposition, quantum dots, lithium batteries, X-ray diffraction, scanning electron microscopy, transmission electron microscopy, nanoelectronics, nanophotonics and nanomagnetics, etc. Students must also have completed (EH&S Safety training to include the courses: (1) Employee & Hazard Communication Safety (HazCom); (2) Hazardous Waste Management; and (3) Laboratory Standard) trainings to enroll. Crosslisted with: CHME 467 . May be repeated up to 3 credits.
Prerequisite: (CHEM 1226 or CHEM 1215G), (PHYS 1230G or PHYS 1310G).

PHYS 521. Individual Study
1-3 Credits
Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.
Prerequisites: graduate standing, consent of instructor, and selection of a specific topic prior to registration.

PHYS 528. Fundamentals of Photonics
4 Credits (3+3P)
Ray, wave and guided optics, lasers and thermal sources, radiometry, photon detection and signal-to-noise ratio. Elements of photonic crystals, polarization, acousto-optics, electro-optics, and optical nanostructures. Recommended foundation (PHYS 1320G or PHYS2120) and (E E 473 or PHYS 473), Taught with E E 478. Crosslisted with E E 528.
Learning Outcomes

1. Describe the fundamental properties of light.
2. Formulate the concepts of ray, wave, and photon optics mathematically.
3. Represent and incorporate basic elements of an optical system.
4. Perform an analysis of a simple photonic/optical system mathematically by hand and with computer tools such as MATLAB.
5. Discuss ethical, societal, and professional issues related to photonics and optics.

PHYS 551. Classical Mechanics
3 Credits (3)
Lagrangian and Hamiltonian formulation of dynamics. Advanced treatments of most topics listed under PHYS 451, plus canonical transformations and Hamilton-Jacobi theory. PHYS 451 strongly recommended.

PHYS 554. Quantum Mechanics I
3 Credits (3)
Wave function, indeterminacy, classical limit. Schrodinger equation. Atomic and nuclear systems. Angular momentum, intrinsic spin, identical particles. Scattering theory. Mathematical formalism, symmetry and conserved quantities. Perturbation theory. Dirac theory, introduction to quantized fields. PHYS 451 and PHYS 454 strongly recommended.

PHYS 555. Quantum Mechanics II
3 Credits (3)
Continuation of topics in PHYS 554.
Prerequisites: PHYS 554 or consent of instructor.

PHYS 561. Electromagnetic Theory I
3 Credits (3)
Detailed advanced treatments of most topics listed under PHYS 461, PHYS 462, plus multipole radiation, collisions of charged particles and bremsstrahlung, scattering, and radiation reaction. PHYS 461 and PHYS 462 strongly recommended.

PHYS 562. Electromagnetic Theory II
3 Credits (3)
Continuation of topics in PHYS 561.
Prerequisites: PHYS 561 or consent of instructor.

PHYS 568. Elements of X-ray Diffraction
3 Credits (3)
Same as PHYS 468, but additional work required. Crosslisted with: CHME 588.

PHYS 571. Advanced Experimental Optics
3 Credits (1+6P)
Taught with PHYS 471 with additional work required at the graduate level.
Learning Outcomes
1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and professional responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 575. Advanced Physics Laboratory
3 Credits (1+6P)
Selected experiments in atomic, molecular, nuclear and condensed-matter physics.
Learning Outcomes
1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 576. Advanced Computational Physics I
3 Credits (3)
Advanced treatment of topics listed under PHYS 476 plus additional work. Applications of numerical methods to advanced physics problems. Recommended is the knowledge of a programming language.
Learning Outcomes
1. learn to numerically solve problems that require higher mathematical and theoretical analysis,
2. experience how graduate research will be advanced and accelerated by the use of scientific computing skills.

PHYS 584. Statistical Mechanics
3 Credits (3)
Thermodynamics review. Probability, entropy, equilibrium. Canonical and grand canonical ensembles. Classical and quantum statistics. Degenerate and classical gases. Application to the equilibrium properties of solids, liquids, and gases. Kinetic theory and transport processes.

PHYS 589. Modern Materials
3 Credits (3)
Same as PHYS 489 with differentiated assignments for graduate students. PHYS 554 recommended.
Learning Outcomes
1. Learn the fundamental concepts of the physics of modern materials, such as crystal structure, properties of materials, and experimental techniques.
2. Develop an ability to formulate and solve complex problems in the area of physics of modern materials by applying the principles of physics and mathematics.
3. Develop an ability to acquire and apply new knowledge using appropriate learning strategies.

PHYS 591. Advanced High-Energy Physics I
3 Credits (3)
Taught with PHYS 491 with additional work required at the graduate level.
Prerequisite(s): PHYS 555 or consent of instructor.

PHYS 593. Advanced Experimental Nuclear Physics
3 Credits (1+6P)
Advanced experimental investigation of topics such as measurement of radioactivity, absorption of radiation, and nuclear spectrometry.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 597. Space Plasma Physics
3 Credits (3)
Same as PHYS 497 but with added requirements.

PHYS 599. Master's Thesis
1-15 Credits (1-15)
Thesis.

PHYS 600. Research
1-15 Credits
Doctoral research. May be repeated.

PHYS 620. Advanced Topics in Physics
1-3 Credits
Advanced formal treatment of topics not covered in regular courses. May be repeated for a maximum of 9 credits.
Prerequisite: consent of instructor.

PHYS 650. General Relativity I
3 Credits (3)
Basic foundations and principles of general relativity, derivation of the Einstein field equations and their consequences, the linearized theory, the Bel-Petrov classification of the curvature tensor, derivation of the Schwarzschild solution and the four basic tests of general relativity.
Prerequisite(s): PHYS 511 or PHYS 561 or consent of instructor.

PHYS 680. Independent Study
1-3 Credits
Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.
Prerequisite: graduate standing or consent of instructor.

PHYS 688. Advanced Condensed Matter Physics
3 Credits (3)
Continuation of the advanced condensed matter physics presented in PHYS 588. Topics include electronic structure methods, optical, magnetic, and transport properties of solids, semiconductors, crystalline defects, nanostructures, and noncrystalline solids. PHYS 588 strongly recommended.
Learning Outcomes

1. Learn the fundamental concepts of advanced condensed state physics: band theory of solids, electronic structure methods, optical and magnetic properties of solids, bulk semiconductors, and properties of nano-structured materials.
2. Develop an ability to formulate and solve complex problems in advanced condensed matter physics.
3. Develop an ability to to study independently and acquire new knowledge using appropriate learning strategies.

PHYS 689. Advanced Modern Materials
3 Credits (3)
Advanced topics in the physics of modern materials, such as crystalline, amorphous, polymeric, nanocrystalline, layered, and composite materials and their surfaces and interfaces. PHYS 555, PHYS 588, and PHYS 589 recommended.
Learning Outcomes

1. Learn the fundamental concepts of the physics of modern materials, such as crystalline, amorphous, polymeric, nanostructured, layered, and composite materials.
2. Develop an ability to formulate and solve complex problems in the area of advanced physics of modern materials.
3. Develop an ability to to study independently and acquire new knowledge using appropriate learning strategies.

PHYS 691. Quantum Field Theory I
3 Credits (3)
Path integrals, gauge invariance, relativistic quantum mechanics, canonical quantization, relativistic quantum field theory, introduction to QED.
Prerequisites: PHYS 555 and PHYS 562, or consent of instructor.

PHYS 692. Quantum Field Theory II
3 Credits (3)
QED, running coupling constant, QCD, electroweak theory, asymptotic freedom, deep inelastic scattering, basic QCD phenomenology, path integrals in quantum field theory, lattice QCD.
Prerequisite: PHYS 691 or consent of instructor.

PHYS 700. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation.

Phone: (575) 646-3831

Website: http://engineeringphysics.nmsu.edu/ (http://engineeringphysics.nmsu.edu)

Engineering Physics (Aerospace Engineering) - Bachelor of Science in Engineering Physics

A strong grasp of underlying physical principles behind the development of new technologies is necessary to keep up with new developments in a high-tech world. The Bachelor of Science (B.S.) in Engineering Physics degree program is designed to provide quality education to students for immediate employment with technical jobs in private industries (especially high-tech industries), research laboratories and public sectors. The program trains students with a combination of engineering knowledge, physics principles, mathematical background, problem-solving strategies and effective communication skills. The B.S. in Engineering Physics also provides an excellent preparation for graduate studies in either physics or an engineering discipline.

The requirements for the Aerospace concentration is listed below. Students must earn a C- or better in all required courses.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 121 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2 [1]		*3*
Oral Communication [1]		*3*
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [2]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
Select one seuqence from the following for four credits:		
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics [3]	
Select one seuqence from the following for four credits:		
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [3]	
Area IV: Social and Behavioral Sciences (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World		
Viewing a Wider World Electives [4]		6
Departmental/College Requirements		
Program Specific Requirements		
Mathematics		
MATH 2530G	Calculus III	3
MATH 3160	Introduction to Ordinary Differential Equations	3
Natural Science		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
Physics		
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory	4
PHYS 395	Intermediate Mathematical Methods of Physics	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
Physics with Engineering Component		
PHYS 315	Modern Physics	3
PHYS 325	Intermediate Experimental Physics	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 462	Intermediate Electricity and Magnetism II	3
Engineering		
A E 339	Aerodynamics I	3
A E 362	Orbital Mechanics	3
A E 363	Aerospace Structures	3
A E 364	Flight Dynamics and Controls	3
A E 419	Propulsion	3
A E 424	Aerospace Systems Engineering	3
A E 439	Aerodynamics II	3
A E 447	Aerofluids Laboratory	3
C E 301	Mechanics of Materials	3
M E 240	Thermodynamics	3
M E 261	Numerical Methods	3
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
Second Language: (not required)		
Electives, to bring the total credits to 121		**0**
Total Credits		**121**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
3. PHYS 2110 Mechanics/PHYS 2110L Experimental Mechanics and PHYS 2140 Electricity and Magnetism/PHYS 2140L Electricity & Magnetism Laboratory will not automatically count towards the Area III: Laboratory Science requirement, an exception will be made if students elect to take these courses.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses. See Alternatives for meeting VWW requirements (nine-credit rule).

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Full-time students are usually required to take at least 15 credits per semester. This requirement could be satisfied for example by taking a one-credit supplemental instruction course.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics [1,2]	4
Area IV: Social and Behavioral Science Course [3]		3
	Credits	**15**
Semester 2		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [1] or Calculus and Analytic Geometry II Honors	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [1]	4

PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [1,2]	4
M E 240	Thermodynamics [1]	3
	Credits	**15**
Second Year		
Semester 1		
MATH 2530G	Calculus III [1]	3
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory [1]	4
ENGR 233	Engineering Mechanics I	3
M E 261	Numerical Methods [1]	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	3
	Credits	**16**
Semester 2		
MATH 3160	Introduction to Ordinary Differential Equations [1]	3
PHYS 315	Modern Physics [1]	3
PHYS 325	Intermediate Experimental Physics	3
ENGR 234	Engineering Mechanics II	3
C E 301	Mechanics of Materials [1]	3
	Credits	**15**
Third Year		
Semester 1		
PHYS 395	Intermediate Mathematical Methods of Physics [1]	3
PHYS 454	Intermediate Modern Physics I	3
A E 339	Aerodynamics I [1]	3
A E 362	Orbital Mechanics [1]	3
A E 364	Flight Dynamics and Controls [1]	3
	Credits	**15**
Semester 2		
PHYS 455	Intermediate Modern Physics II	3
A E 363	Aerospace Structures [1]	3
A E 424	Aerospace Systems Engineering	3
A E 439	Aerodynamics II [1]	3
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
	Credits	**15**
Fourth Year		
Semester 1		
PHYS 461	Intermediate Electricity and Magnetism I	3
A E 419	Propulsion [1]	3
A E 447	Aerofluids Laboratory [1]	3
ENGR 401	Engineering Capstone I	3
Area V: Humanities Course [3]		3
	Credits	**15**
Semester 2		
PHYS 462	Intermediate Electricity and Magnetism II	3
ENGR 402	Engineering Capstone II [1]	3
VWW: Viewing a Wider World Course [4]		3
VWW: Viewing a Wider World Course [4]		3
Area VI: Creative and Fine Arts Course [3]		3
	Credits	**15**
	Total Credits	**121**

1. These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
2. PHYS 2110 Mechanics/PHYS 2110L Experimental Mechanics and PHYS 2140 Electricity and Magnetism/PHYS 2140L Electricity & Magnetism Laboratory will not automatically count towards the Area III: Laboratory Science requirement, an exception will be made if students elect to take these courses.
3. See the General Education (p. 262) section of the catalog for a full list of courses.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Engineering Physics (Chemical Engineering) - Bachelor of Science in Engineering Physics

A strong grasp of underlying physical principles behind the development of new technologies is necessary to keep up with new developments in a high-tech world. The Bachelor of Science (B.S.) in Engineering Physics program is designed to provide quality education to students for immediate employment with technical jobs in private industries (especially high-tech industries), research laboratories and public sectors. The program trains students with a combination of engineering knowledge, physics principles, mathematical background, problem-solving strategies and effective communication skills. The B.S. in Engineering Physics also provides an excellent preparation for graduate studies in either physics or an engineering discipline.

The requirements for the Chemical concentration are listed below. Students must earn a C- or better in all required courses.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 124 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G or ENGL 1110H	Composition I Composition I Honors	4
English Composition - Level 2 [1]		*3*
Oral Communication [1]		*3*
Area II: Mathematics		
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [2] Calculus and Analytic Geometry I Honors	4
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
Select one seuqence from the following for four credits:		
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics [3]	
Select one seuqence from the following for four credits:		

PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [3]	
Area IV: Social and Behavioral Sciences (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World		
Viewing a Wider World Electives [4]		6
Departmental/College Requirements		
Program Specific Requirements		
Mathematics		
MATH 2530G	Calculus III	3
MATH 3160	Introduction to Ordinary Differential Equations	3
Natural Science		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
CHEM 313	Organic Chemistry I	3
Electives		
Technical Elective [5]		3
Physics		
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory	4
PHYS 395	Intermediate Mathematical Methods of Physics	3
PHYS 451	Intermediate Mechanics I	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
Physics with Engineering Component		
PHYS 315	Modern Physics	3
PHYS 325	Intermediate Experimental Physics	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 462	Intermediate Electricity and Magnetism II	3
Engineering		
CHME 101	Introduction to Chemical Engineering Calculations	2
CHME 102	Material Balances	2
CHME 201	Energy Balances & Basic Thermodynamics	3
CHME 303	Chemical Engineering Thermodynamics	4
CHME 305	Transport Operations I: Fluid Flow	3
CHME 306	Transport Operations II: Heat and Mass Transfer	4
CHME 307	Transport Operations III: Staged Operations	3
CHME 352 L	Simulation of Unit Operations	2
CHME 361	Engineering Materials	3
CHME 341	Chemical Kinetics and Reactor Engineering	3
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
Second Language: (not required)		
Electives, to bring the total credits to 124		**0**
Total Credits		**124**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
3. PHYS 2110 Mechanics/PHYS 2110L Experimental Mechanics and PHYS 2140 Electricity and Magnetism/PHYS 2140L Electricity & Magnetism Laboratory will not automatically count towards the Area III: Laboratory Science requirement, an exception will be made if students elect to take these courses.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses. See Alternatives for meeting VWW requirements (nine-credit rule).
5. Approved technical electives are decided by Engineering Physics Advisors.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Full-time students are usually required to take at least 15 credits per semester. This requirement could be satisfied for example by taking a one-credit supplemental instruction course.

First Year		
Semester 1		**Credits**
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics [1,2]	4
CHME 101	Introduction to Chemical Engineering Calculations [1]	2
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [1]	4
	Credits	**14**
Semester 2		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [1] or Calculus and Analytic Geometry II Honors	4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [1,2]	4
CHME 102	Material Balances [1]	2
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [1]	4
	Credits	**14**
Second Year		
Semester 1		
MATH 2530G	Calculus III [1]	3
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory [1]	4
CHME 201	Energy Balances & Basic Thermodynamics [1]	3
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
Area IV: Creative and Fine Arts Course [3]		3
	Credits	**17**

Semester 2		
MATH 3160	Introduction to Ordinary Differential Equations [1]	3
PHYS 315	Modern Physics [1]	3
PHYS 325	Intermediate Experimental Physics	3
CHME 303	Chemical Engineering Thermodynamics [1]	4
CHME 305	Transport Operations I: Fluid Flow [1]	3
	Credits	**16**
Third Year		
Semester 1		
PHYS 395	Intermediate Mathematical Methods of Physics [1]	3
PHYS 461	Intermediate Electricity and Magnetism I [1]	3
CHME 306	Transport Operations II: Heat and Mass Transfer [1]	4
CHEM 313	Organic Chemistry I [1]	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
	Credits	**16**
Semester 2		
PHYS 462	Intermediate Electricity and Magnetism II [1]	3
CHME 307	Transport Operations III: Staged Operations [1]	3
CHME 352 L	Simulation of Unit Operations [1]	2
CHME 361	Engineering Materials [1]	3
CHME 341	Chemical Kinetics and Reactor Engineering	3
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
	Credits	**17**
Fourth Year		
Semester 1		
PHYS 451	Intermediate Mechanics I [1]	3
PHYS 454	Intermediate Modern Physics I [1]	3
ENGR 401	Engineering Capstone I	3
VWW: Viewing a Wider World Course [4]		3
Technical Elective Course [5]		3
	Credits	**15**
Semester 2		
PHYS 455	Intermediate Modern Physics II [1]	3
ENGR 402	Engineering Capstone II [1]	3
VWW: Viewing a Wider World Course [4]		3
Area IV: Social and Behavioral Science Course [3]		3
Area V: Humanities Course [3]		3
	Credits	**15**
	Total Credits	**124**

1. These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
2. PHYS 2110 Mechanics/PHYS 2110L Experimental Mechanics and PHYS 2140 Electricity and Magnetism/PHYS 2140L Electricity & Magnetism Laboratory will not automatically count towards the Area III: Laboratory Science requirement, an exception will be made if students elect to take these courses.
3. See the General Education (p. 262) section of the catalog for a full list of courses.
4. See the Viewing a Wider World (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext) section of the catalog for a full list of courses.
5. Approved technical electives are decided by Engineering Physics advisors

Engineering Physics (Electrical Engineering) - Bachelor of Science in Engineering Physics

A strong grasp of underlying physical principles behind the development of new technologies is necessary to keep up with new developments in a high-tech world. The Bachelor of Science (B.S.) in Engineering Physics program is designed to provide quality education to students for immediate employment with technical jobs in private industries (especially high-tech industries), research laboratories and public sectors. The program trains students with a combination of engineering knowledge, physics principles, mathematical background, problem-solving strategies and effective communication skills. The B.S. in Engineering Physics also provides an excellent preparation for graduate studies in either physics or an engineering discipline.

The requirements for the Electrical concentration are listed below. Students must earn a C- or better in all required courses.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 121-122 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G or ENGL 1110H	Composition I Composition I Honors	4
English Composition - Level 2 [1]		*3*
Oral Communication [1]		*3*
Area II: Mathematics		
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [2] Calculus and Analytic Geometry I Honors	4
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
Select one sequence from the following for four credits:		
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics [3]	
Select one sequence from the following for four credits:		
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [3]	
Area IV: Social and Behavioral Sciences (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4

or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World		
Viewing a Wider World Electives [4]		6
Departmental/College Requirements		
Program Specific Requirements		
Mathematics		
MATH 2530G	Calculus III	3
MATH 3160	Introduction to Ordinary Differential Equations	3
Natural Science		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
Electives		
Technical Elective [5]		3
Select one of the following:		3-4
PHYS 462	Intermediate Electricity and Magnetism II	
E E 340	Fields and Waves	
Physics		
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory	4
PHYS 395	Intermediate Mathematical Methods of Physics	3
PHYS 451	Intermediate Mechanics I	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
Physics with Engineering Component		
PHYS 315	Modern Physics	3
PHYS 325	Intermediate Experimental Physics	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 475	Advanced Laboratory Practices for Materials	3
or PHYS 471	Modern Experimental Optics	
or PHYS 493	Experimental Nuclear Physics	
PHYS 480	Thermodynamics	3
Engineering		
ENGR 120	DC Circuit Analysis	4
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 230	AC Circuit Analysis	4
E E 200	Linear Algebra, Probability and Statistics Applications	4
E E 317	Semiconductor Devices and Electronics I	4
E E 320	Signals and Systems I	3
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
Second Language: (not required)		
Electives, to bring the total credits to 121-122		**0**
Total Credits		**121-122**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
3. PHYS 2110 Mechanics/PHYS 2110L Experimental Mechanics and PHYS 2140 Electricity and Magnetism/PHYS 2140L Electricity & Magnetism Laboratory will not automatically count towards the Area III: Laboratory Science requirement, an exception will be made if students elect to take these courses.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses. See Alternatives for meeting VWW requirements (nine-credit rule).
5. Approved technical electives are decided by Engineering Physics Advisors.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Full-time students are usually required to take at least 15 credits per semester. This requirement could be satisfied for example by taking a one-credit supplemental instruction course.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
ENGR 120	DC Circuit Analysis	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics [1,2]	4
	Credits	**16**
Semester 2		
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [1] or Calculus and Analytic Geometry II Honors	4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [1,2]	4
	Credits	**16**
Second Year		
Semester 1		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 230	AC Circuit Analysis	4
MATH 2530G	Calculus III [1]	3
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory [1]	4
	Credits	**15**
Semester 2		
E E 200	Linear Algebra, Probability and Statistics Applications [1]	4
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
MATH 3160	Introduction to Ordinary Differential Equations [1]	3
PHYS 315	Modern Physics [1]	3
PHYS 325	Intermediate Experimental Physics	3
	Credits	**16**

Third Year		
Semester 1		
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
PHYS 395	Intermediate Mathematical Methods of Physics [1]	3
PHYS 451	Intermediate Mechanics I [1]	3
PHYS 461	Intermediate Electricity and Magnetism I [1]	3
Area V: Humanities Course [3]		3
	Credits	**15**
Semester 2		
E E 317	Semiconductor Devices and Electronics I [1]	4
Choose from one of the following:		3-4
PHYS 462	Intermediate Electricity and Magnetism II [1]	
E E 340	Fields and Waves [1]	
Choose from one of the following:		3
PHYS 475	Advanced Laboratory Practices for Materials [1]	
PHYS 493	Experimental Nuclear Physics [1]	
PHYS 471	Modern Experimental Optics [1]	
Area IV: Social and Behavioral Science Course [3]		3
	Credits	**13-14**
Fourth Year		
Semester 1		
PHYS 454	Intermediate Modern Physics I [1]	3
E E 320	Signals and Systems I	3
ENGR 401	Engineering Capstone I	3
VWW: Viewing a Wider World Course [4]		3
Technical Elective Course [5]		3
	Credits	**15**
Semester 2		
PHYS 455	Intermediate Modern Physics II [1]	3
PHYS 480	Thermodynamics	3
ENGR 402	Engineering Capstone II [1]	3
Area VI: Creative and Fine Arts Course [3]		3
VWW: Viewing a Wider World Course [4]		3
	Credits	**15**
	Total Credits	**121-122**

1. These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
2. PHYS 2110 Mechanics/PHYS 2110L Experimental Mechanics and PHYS 2140 Electricity and Magnetism/PHYS 2140L Electricity & Magnetism Laboratory will not automatically count towards the Area III: Laboratory Science requirement, an exception will be made if students elect to take these courses.
3. See the General Education (p. 262) section of the catalog for a full list of courses.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. Technical electives are approved by the Engineering Physics advisors

Engineering Physics (Mechanical Engineering) - Bachelor of Science in Engineering Physics

A strong grasp of underlying physical principles behind the development of new technologies is necessary to keep up with new developments in a high-tech world. The Bachelor of Science (B.S.) in Engineering Physics program is designed to provide quality education to students for immediate employment with technical jobs in private industries (especially high-tech industries), research laboratories and public sectors. The program trains students with a combination of engineering knowledge, physics principles, mathematical background, problem-solving strategies and effective communication skills. The B.S. in Engineering Physics also provides an excellent preparation for graduate studies in either physics or an engineering discipline.

The requirements for the Mechanical concentration are listed below. Students must earn a C- or better in all required courses.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
English Composition - Level 2 [1]		*3*
Oral Communication [1]		*3*
Area II: Mathematics		
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [2] or Calculus and Analytic Geometry I Honors	4
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
Select one seuqence from the following for four credits:		
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics [3]	
Select one seuqence from the following for four credits:		
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [3]	
Area IV: Social and Behavioral Sciences (3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
Viewing A Wider World		
Viewing a Wider World Electives [4]		6
Departmental/College Requirements		
Program Specific Requirements		

Mathematics		
MATH 2530G	Calculus III	3
MATH 3160	Introduction to Ordinary Differential Equations	3
Natural Science		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
Electives		
Technical Elective [5]		3
Physics		
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory	4
PHYS 395	Intermediate Mathematical Methods of Physics	3
PHYS 451	Intermediate Mechanics I	3
PHYS 454	Intermediate Modern Physics I	3
PHYS 455	Intermediate Modern Physics II	3
Physics with Engineering Component		
PHYS 315	Modern Physics	3
PHYS 325	Intermediate Experimental Physics	3
PHYS 461	Intermediate Electricity and Magnetism I	3
PHYS 462	Intermediate Electricity and Magnetism II	3
Engineering		
C E 301	Mechanics of Materials	3
M E 240	Thermodynamics	3
M E 261	Numerical Methods	3
M E 326	Mechanical Design	3
M E 338	Fluid Mechanics	3
M E 341	Heat Transfer	3
M E 425	Design of Machine Elements	3
ENGR 110	Introduction to Engineering Design	3
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
Second Language: (not required)		
Electives, to bring the total credits to 120		**2**
Total Credits		**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses.
2. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
3. PHYS 2110 Mechanics/PHYS 2110L Experimental Mechanics and PHYS 2140 Electricity and Magnetism/PHYS 2140L Electricity & Magnetism Laboratory will not automatically count towards the Area III: Laboratory Science requirement, an exception will be made if students elect to take these courses.
4. See the Viewing a Wider World (p. 262) section of the catalog for a full list of courses. See Alternatives for meeting VWW requirements (nine-credit rule).
5. Approved technical electives are decided by Engineering Physics Advisors.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Full-time students are usually required to take at least 15 credits per semester. This requirement could be satisfied for example by taking a one-credit supplemental instruction course.

First Year		
Semester 1		**Credits**
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics [1,2]	4
ENGR 110	Introduction to Engineering Design	3
	Credits	**15**
Semester 2		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [1] or Calculus and Analytic Geometry II Honors	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [1]	4
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory [1,2]	4
M E 240	Thermodynamics [1]	3
	Credits	**15**
Second Year		
Semester 1		
MATH 2530G	Calculus III [1]	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	3
PHYS 2120 & 2120L	Heat, Light, and Sound and Heat, Light, and Sound Laboratory [1]	4
ENGR 233	Engineering Mechanics I	3
Area IV: Social and Behavioral Science Course [3]		3
	Credits	**16**
Semester 2		
MATH 3160	Introduction to Ordinary Differential Equations [1]	3
C E 301	Mechanics of Materials [1]	3
PHYS 315	Modern Physics [1]	3
PHYS 325	Intermediate Experimental Physics	3
ENGR 234	Engineering Mechanics II	3
	Credits	**15**
Third Year		
Semester 1		
PHYS 395	Intermediate Mathematical Methods of Physics [1]	3
PHYS 454	Intermediate Modern Physics I	3
M E 261	Numerical Methods	3
M E 326	Mechanical Design [1]	3
M E 338	Fluid Mechanics [1]	3
	Credits	**15**
Semester 2		
PHYS 455	Intermediate Modern Physics II	3
M E 425	Design of Machine Elements [1]	3
Area V: Humanities Course [3]		3
VWW: Viewing a Wider World Course [4]		3

VWW: Viewing a Wider World Course [4]		3
	Credits	**15**
Fourth Year		
Semester 1		
PHYS 451	Intermediate Mechanics I [1]	3
PHYS 461	Intermediate Electricity and Magnetism I	3
ENGR 401	Engineering Capstone I	3
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
Area VI: Creative and Fine Arts Course [3]		3
	Credits	**15**
Semester 2		
PHYS 462	Intermediate Electricity and Magnetism II	3
M E 341	Heat Transfer	3
ENGR 402	Engineering Capstone II [1]	3
Technical Elective Course [5]		3
Elective Course		2
	Credits	**14**
	Total Credits	**120**

1 These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements

2 PHYS 2110 Mechanics/PHYS 2110L Experimental Mechanics and PHYS 2140 Electricity and Magnetism/PHYS 2140L Electricity & Magnetism Laboratory will not automatically count towards the Area III: Laboratory Science requirement, an exception will be made if students elect to take these courses.

3 See the General Education (p. 262) section of the catalog for a full list of courses.

4 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

5 Technical electives are approved by Engineering Physics advisors

Engineering Technology and Surveying Engineering

Undergraduate Program Information

Mission Statement

The mission of the Department of Engineering Technology and Survey Engineering (https://et.nmsu.edu/) (ETSE) is to provide a student-centric education through experiential learning to prepare students for a rewarding career. In particular,

- faculty work closely with students and each other to foster a family-like environment;
- unlike traditional engineering, core courses that emphasize real-world applications and hands-on learning experiences; and
- graduates advance to enhanced career opportunities with competitive compensation.

We aim to help students from diverse backgrounds reach their full potential and become successful engineers, technologists, and leaders in the region and nationwide.

Programs Overview

Under the motto of "linking theory and application," the ETSE curriculum emphasizes the practical, hands-on application of engineering principles and methods. ETSE students learn about designing, building, and testing systems through in-class exercises, hands-on laboratory projects, and teamwork. This approach provides ETSE students with a holistic view of their fields and prepares them to be effective real-world problem solvers. A wide variety of majors, concentrations, and minors are offered by the ETSE Department, including:

Bachelor's Degrees with majors and concentrations in:

- **Civil Engineering Technology (CET)**
  - Renewable Energy Technologies
  - Transportation Technology
- **Electrical Engineering Technology (EET)**
- **Geomatics (GMAT)** hybrid/online options
- **Information and Communication Technology (ICT)** - online
  - Cyber Defense
  - Network Technologies
  - Software Development
- **Mechanical Engineering Technology (MET)**
  - Manufacturing
  - Renewable Energy Technologies

The *Bachelor of Science* curricula are developed based on the program criteria established collaboratively by their **ABET** accreditation commissions (*Engineering Technology Association Commission* and the *Applied and Natural Science Accreditation Commission*, respectively) and the programs' Industrial Advisory Committees (IAC). Visit the ETSE website (https://et.nmsu.edu/) for further information on ABET accreditation and program criteria.

The Information and Communication Technology (ICT) program is accredited by the Computing Accreditation Commission (CAC) of ABET. The program has also been validated by the National Security Agency (NSA) as a recognized Program of Study, affirming its alignment with nationally recognized cybersecurity and information assurance education standards. Additional information regarding accreditation and program recognition is available at https://et.nmsu.edu/accrediation/information-communication-technology/ict.html.

Students enrolled in the Geomatics and ICT programs at NMSU will have the option to complete their coursework online or in-person. The ETSE online programs provide flexibility, allowing students to complete their undergraduate education remotely, engage with faculty virtually, and access online resources at any time. Students in the main campus programs will have in-person courses, with some courses offered online.

Graduate Program Information

Mission Statement

The mission of the Engineering Technology and Surveying Engineering Department regarding graduate education is to provide a 100% online, asynchronous, professional post-baccalaureate education focused on providing graduates with advanced knowledge and skills that will augment career opportunities. The ETSE department fosters educational excellence and provides working professionals and traditional technology students opportunities to increase their knowledge and skillsets.

Program Overview

The ETSE Department offers the Professional Masters of Information Technology (M-IT) (https://nmsu-preview.courseleaf.com/global/nmsu-global/information-technology-mit-online/), designed for working IT professionals and students interested in pursuing an advanced technology degree. Topics include system architecture, computer networking, development and application of software tools, cybersecurity, and virtual systems in enterprise IT decision-making.

The M-IT program's vision is to provide an advanced Information Technology education that is contemporary and relevant to recent IT graduates and long-time IT professionals. The program strives to be accessible in delivery and flexible in the curriculum.

The requirements for enrollment into the Professional Master of Information Technology program are as follows:

- Bachelor's degree in Information Technology or a closely related field (must submit transcripts)
- Undergraduate GPA of 3.0/4.0 or higher
- Statement of purpose — One page describing your experiences and background, professional goals, and your reason for applying to the M-IT program
- Contact information for one recommendation
- Applicants with an undergraduate GPA greater than 2.5/4.0 but less than 3.0/4.0 may be accepted provisionally on a case-by-case basis.
- Applicants who do not have a Bachelor's degree in Information Technology or a closely related field but have relevant IT experience may apply. If accepted, the graduate advisor will design a plan of study that may include appropriate leveling courses.
- GRE scores are not required for applicants who have earned their undergraduate degree from an accredited US University.

Master's Accelerated Program

The Master's Accelerated Program (MAP) option combines some of the baccalaureate degree requirements in IET or ICT and the professional Master of Information Technology. Visit the Masters Accelerated Program (MAP) (https://engr.nmsu.edu/students/Fifth-page.html) website for further details. This option will add a pre-application process as detailed below:

Pre-Application Process: Students will submit a "pre-application" to the ETSE department to receive approval for the accelerated professional Master's program. Students interested in completing the MAP must submit the pre-application within approximately 12 credits of earning a Bachelor's degree in an IET or BICT; the ETSE department website will include an application form. Qualification for the Bachelor + Masters of IT (B+M-IT) program will be based on the cumulative grade point average in courses taken to that point and recommendations by faculty members listed on the departmental application. Students having a grade point average below 3.0 may be admitted on a case-by-case basis, depending on faculty recommendations and evaluations of the individual's academic and professional history. Additional factors might be considered when available (e.g., TOEFL/IELTS scores).

Once the ETSE department has reviewed the pre-application, accepted, and notified the applicant of acceptance in the accelerated program, the applicant must formally apply to the graduate school for formal admission into the M-IT program. Students must apply to the NMSU Graduate School during the final semester of their undergraduate program education.

Note: The student must apply to the B+M-IT accelerated program **before** taking any 450 (and above) level courses.

Degrees for the Department

Bachelor Degree(s)

- Civil Engineering Technology (Renewable Energy Technologies) - Bachelor of Science in Engineering Technology (p. 1175)
- Civil Engineering Technology (Transportation Technology) - Bachelor of Science in Engineering Technology (p. 1177)
- Civil Engineering Technology - Bachelor of Science in Engineering Technology (p. 1173)
- Civil Engineering Technology - Bachelor of Science in Engineering Technology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/civil-engineering-technology-bachelor-science-engineering-technology-online/)
- Electrical Engineering Technology - Bachelor of Science in Engineering Technology (p. 1178)
- Geomatics - Bachelor of Science in Geomatics (p. 1180)
- Geomatics - Bachelor of Science in Geomatics (Online) (https://catalogs.nmsu.edu/global/nmsu-global/geomatics-bs-geomatics-online/)
- Information and Communication Technology (Cyber Defense) - Bachelor of Information and Communication Technology (p. 1185)
- Information and Communication Technology (Cyber Defense) - Bachelor of Information and Communication Technology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/information-communication-technology-cyber-defense-bict-online/)
- Information and Communication Technology (Network Technologies) - Bachelor of Information and Communication Technology (p. 1189)
- Information and Communication Technology (Network Technologies) - Bachelor of Information and Communication Technology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/information-communication-technology-network-technologies-bict-online/)
- Information and Communication Technology (Software Development) - Bachelor of Information and Communication Technology (p. 1192)
- Information and Communication Technology (Software Development) - Bachelor of Information and Communication Technology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/information-communication-technology-software-development-bict-online/)
- Information and Communication Technology - Bachelor of Information and Communication Technology (p. 1182)
- Information and Communication Technology - Bachelor of Information and Communication Technology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/information-communication-technology-bict-online/)
- Mechanical Engineering Technology - Bachelor of Science in Engineering Technology (p. 1195)

Master Degree(s)

- Information Technology (Cyber Defense) - Master of Information Technology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/information-technology-cyber-defense-master-information-technology-online/)
- Information Technology (IT Enterprise Management) - Master of Information Technology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/information-technology-it-enterprise-management-master-information-technology-online/)

- Information Technology - Master of Information Technology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/information-technology-mit-online/)

Minors for the Department

- Computer Engineering Technology - Undergraduate Minor (p. 1197)
- Digital Forensics - Undergraduate Minor (p. 1197)
- Electrical Engineering Technology - Bachelor of Science in Engineering Technology (p. 1178)
- Geomatics - Undergraduate Minor (p. 1198)
- Information Security Technology - Undergraduate Minor (p. 1198)
- Manufacturing - Undergraduate Minor (p. 1198)
- Renewable Energy Technologies - Undergraduate Minor (p. 1199)

Department Faculty Members

Professor Bárbara A. Gamillo, Interim Department Head

Professor Samah Ben Ayed, Ph.D. , Interim Associate Department Head

Professors Ben Ayed, Elaksher[1,2], Furth, Garcia, B. Gamillo, Jiang[1], Nogales, Sassenfeld; ***Associate Professors*** Braker, Elshinawy, E. Gamillo, Tapia; ***Assistant Professors*** Bello, Calkins; ***Associate Professors of Practice*** Lawrence, Villegas Arguelles; ***Assistant Professors of Practice*** Kanaan, Montgomery, Salas, Schaub, Thurow; ***Emeritus Faculty*** Alexander, Burkholder[1,2], Cameron, Cooper[1], Hyde, Kelly, Reilly[2], Ricketts, Rico, Stevens[1].

[1] Registered Professional Engineer (NM).

[2] Licensed Professional Surveyor (NM).

Engineering Technology Courses

E T 101. Introduction to Engineering Technology and Geomatics
1 Credit (1)
An introduction to geomatics and the various engineering technology disciplines, the engineering approach to problem solving, and the design process. Projects emphasize the importance of teamwork, written & oral communication skills, as well as ethical responsibilities.
Learning Outcomes
1. Develop a basic understanding of all programs in the Engineering Technology and Surveying Engineering Department.
2. Create a solid curriculum plan for their degree program.
3. Describe the Engineering Design Process.
4. Define and visit campus support programs and student engineering programs.
5. Describe and discuss communication skills in the engineering profession.

E T 104. Soldering Techniques
1 Credit (3P)
Fundamentals of soldering, desoldering, and quality inspection of printed circuit boards.

E T 109. Computer Drafting Fundamentals
3 Credits (2+2P)
Introduction to principles and fundamentals of drafting using both manual drawing techniques and computer-aided drafting (CAD) applications. Crosslisted with: DRFT 109 and C E 109. May be repeated up to 3 credits.
Learning Outcomes
1. Describe related career options/pathways.
2. Explain and apply common drafting terms, concepts, and conventions.
3. Utilize various AutoCAD commands and Coordinate Entry methods to produce accurate and precise Two-Dimensional drawings.
4. Setup AutoCAD working environment, drawings, styles, and applicable settings.
5. Navigate the AutoCAD user interface efficiently.
6. Apply different drafting methods, strategies, and processes.
7. Utilize AutoCAD to produce basic 2D CAD working drawings.
8. Measure utilizing scales accurately.
9. Create drawings with different scales and units. 1
10. Plot drawings produced in AutoCAD at various scales and on various sheet sizes. 1
11. Utilize the two Drawing Environments: Paper Space and Model Space. 1
12. Manage AutoCAD drawing files.

E T 110. Introduction to 3-D Modeling (Solid Works)
3 Credits (2+3P)
Introduction to SolidWorks, a 3-D modeling software. The foundation for designing mechanical parts and assemblies.

E T 120. Computation Software
2-3 Credits (2-3)
The use of spreadsheet software in the field of engineering technology.

E T 125. Introduction to Renewable Energy
3 Credits (3)
Renewable energy systems, including topics in thermal-solar photovoltaic, wind, geothermal systems, and other current topics. Theory, practical applications, safety considerations and the economics of alternative renewable energy systems compared to conventional systems.

E T 143. Civil Drafting Fundamentals
3 Credits (2+2P)
Introduction to drafting in the field of Civil Engineering. Drawings, projects, and terminologies related to topographic, contour drawings, plan and profiles, and street/highway layout. Restricted to Community Colleges only. Taught with DRFT 143 and SUR 143.
Prerequisite: DRFT 109.
Learning Outcomes
1. Use appropriate drafting/technical terminology.
2. Identify of the different types of Civil Engineering work drawing plan sets.
3. Understanding and the use of the terminologies used in the industry.
4. Use AutoCAD Civil 3D.
5. Enter appropriate data into AutoCAD software in order to retrieve necessary outcomes.
6. Plot/Print different types of civil engineering working plans.
7. Read, interpret and understand engineering drawings.
8. Define and understand the different types of engineering drawings.

E T 153. Fundamentals of Networking Communications
3 Credits (3)
Introduction to networking basics, including computer hardware and software, electricity, networking terminology, protocols, LANs, WANs, OSI model, IP addressing, and design and documentation of basic network and structure cabling.

Learning Outcomes

1. Students will identify network types/protocols utilizing the OSI reference model and compute numbering system network problems.
2. Students will explain issues related to managing and documenting network environments.
3. Students will list, compare, and discuss industry standards for addressing computers on a network.
4. Students will list and distinguish between computer networking historical milestones.
5. Students will identify, compare, and evaluate networking data transport techniques.
6. Students will identify and compare network transmission media and build/evaluate network cabling.
7. Students will discuss IT industry certifications and summarize current technology trends.

E T 154. Construction Methods and Communications
3 Credits (3)
Blueprint reading, specifications, and introduction to materials used in construction. May be repeated up to 3 credits.
Learning Outcomes

1. Students will develop a basic knowledge of AutoCad Civil Three-Dimensional software as they relate to the civil drafting process.
2. Students will become familiar with a basic understanding of computers, drafting, and trigonometry as required.
3. Use of long-term projects will be utilized to simulate real-world work environments to aid the understanding and applying vocabulary on surveying drafting plans.
4. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology.

E T 155. Network Operating Systems I
3 Credits (3+1P)
Introduction to a computer network operating system. May not be used as part of an E T degree program on main campus. Restricted to: Community Colleges only.
Prerequisite(s): E T 120 or E T 122.

E T 156. Introduction to Information Security
2 Credits (2)
This course introduces information security terminology, historical evolution of digital security, types of PC and network system vulnerabilities and types of information loss. In addition, methods of information protection and integrity, intrusion detection, and recovery of data are introduced.
Prerequisite(s)/Corequisite(s): E T 120. Restricted to Community Colleges campuses only.

E T 160. Windows Fundamentals for IET
3 Credits (3)
Fundamental review of the Windows operating system including installation and upgrades as well as managing applications, files, folders, devices and maintenance.
Learning Outcomes

1. Properly deploy the Windows OS.
2. Manage Windows OS data and devices.
3. Apply network and connection configurations.
4. Provide Windows OS maintenance.

E T 182. Introduction to Digital Logic
2 Credits (1.5+1.5P)
An introduction to logic design and the basic building blocks of digital systems. Topics include numbering systems, Boolean algebra, digital logic theory, combinational logic, and applications such as adders. Includes hands-on laboratory
Prerequisite: A grade of C- or better in MATH 1220G or higher.
Learning Outcomes

1. Demonstrate ability to convert numerical values to commonly-used digital representations and their use for arithmetic and logical functions.
2. Demonstrate understanding of Boolean logic functions and truth tables.
3. Demonstrate ability to simplify logic expressions.
4. Demonstrate understanding of combinational logic functions, and the ability to build digital circuits using breadboards.

E T 183. Applied DC Circuits
3 Credits (2+2P)
Application of Ohm's law, Kirchhoff's laws, Thevenin's, and Norton's theorems to the analysis of DC passive circuits. Embedded Lab.
Prerequisite(s)/Corequisite(s): MATH 1220G.

E T 183 L. Applied DC Circuits Lab
1 Credit (2P)
DC applied circuits lab.
Corequisite(s): E T 183.

E T 184. Applied AC Circuits
2-3 Credits (1-2+2P)
Application of circuit laws and theorems to analysis of AC passive circuits. Resonant circuit, polyphase circuit and magnetic circuit topics are introduced. Embedded Lab.
Prerequisite: A grade of C- or better in ENGR 120.
Learning Outcomes

1. Analyze and design AC circuits, including ideal op-amps, using concepts of voltage, current, power, Kirchhoff's laws, and network theorems.
2. Design simple systems involving AC circuits.

E T 190. Applied Circuits
4 Credits (3+2P)
Application of Ohm's law, Kirchhoff's laws, and Thevenin's theorems to the analysis of AC and DC passive circuits. Electronic circuit topics are introduced. Embedded lab. May be repeated up to 4 credits.
Prerequisite/Corequisite: MATH 1250G or higher.
Learning Outcomes

1. Analyze and design DC and AC circuits, including ideal op-amps, using concepts of voltage, current, power, Kirchhoff's laws, and network theorems.
2. Design simple systems involving DC and AC circuits.

E T 191. Applied Circuits Laboratory
1 Credit (2P)
Applied Circuits Lab

E T 200. Special Topics
1-3 Credits
Directed study or project. May be repeated for a maximum of 6 credits.
Prerequisite: consent of department head.

E T 210. Advanced 3-D Modeling (Solid Works)
3 Credits (3)
Advanced 3-D modeling techniques to prepare for the Certification of SolidWorks Associate (CSWA) exam.
Prerequisite: A grade of C- or better in ENGR 110.

Learning Outcomes

1. Properly operate a CAD system in the most efficient manner.
2. Generate and easily update Part models.
3. Ability to create complex assembly models.
4. Create usable production drawings from Three-Dimensional CAD models.
5. Understand the basic fundamentals of available add-in software compatible with SolidWorks (FEA, CAM, PDM).
6. Work in a group and operate effectively on a team.
7. Use creative and technical thinking skills in design.

E T 217. Manufacturing Processes
3 Credits (2+3P)
Introduction to manufacturing and processing, including: casting, forming, and machining. Emphasis on creating products with the appropriate techniques. Crosslisted with: I E 217.
Prerequisite(s): A grade of C- or better in either E T 110 or ENGR 110 and C- or better in MATH 1220G.
Learning Outcomes

1. Identify the different manufacturing processes and their applications.
2. Use, set up, and calibrate measuring tools.
3. Apply geometric tolerances to engineering drawings.
4. Demonstrate basic knowledge of materials and material properties.
5. Demonstrate basic knowledge of GM codes and their application.
6. Proficiently use CAM packages such as SolidWorks CAM.
7. Identify different tooling, their use, and manufacturing application.

E T 217 L. Manufacturing Processes Lab
1 Credit (3P)
Hands-on laboratory in machine shop to apply topics from E T 217, including: casting, forming, and machining.
Corequisite: E T 217.
Learning Outcomes

1. Various

E T 220. Internship
1-6 Credits
Internship requiring an approved number of hours of varied and progressive experience in the field of study. The scope and other requirements of the internship are stated in an individualized syllabus and through a memorandum of understanding between the faculty mentor and the industry partner. May be repeated up to 6 credits. Consent of Instructor required.
Prerequisite(s): E T 283.

E T 240. Applied Statics
3 Credits (3)
Fundamental topics of applied statics, including force system analysis, equilibrium, free body diagrams, methods of joints and sections, distributed loads, friction, centroids, area moments, and shear and moment diagrams.
Prerequisite(s)/Corequisite(s): MATH 1430G or MATH 1511G. Prerequisite(s): PHYS 1230G or PHYS 1310G.

E T 241. Applied Dynamics
3 Credits (3)
The foundation for understanding particles and bodies in motion and the forces involved, including: projectile motion, Newton's Laws of Motion, conservation of energy, and impulse and momentum.
Prerequisite: A grade of C- or better in either E T 240 or ENGR 233.
Prerequisite/Corequisite: (MATH 1440 or MATH 1521G or MATH 1521H).
Learning Outcomes

1. Various

E T 246. Electronic Devices I
4 Credits (3+3P)
Solid-state devices including diodes, bipolar-transistors, and field effect transistors. Use of these devices in rectifier circuits, small signal and power amplifiers.
Prerequisite: A grade of C- or better in one of the following: E T 190 or E T 183 or ENGR 120.
Prerequisite/Corequisite: E T 184 or ENGR 230.
Learning Outcomes

1. Describe semiconductor devices and their properties.
2. Apply the characteristics of diodes to analyze diode rectifier and regulator circuits.
3. Apply the characteristics of bipolar junction transistors (BJTs) to analyze BJT amplifier circuits.
4. Apply the characteristics of metal-oxide-semiconductor field-effect transistors (MOSFETs) to analyze MOSFET amplifier circuits.
5. Describe and analyze complementary MOS (CMOS) digital circuits.
6. Learn to solder and layout printed-circuit boards (PCBs).
7. Design, simulate, and test diode and transistor-amplifier circuits.

E T 253. Networking Operating Systems II
3 Credits (3+1P)
Introduction to a computer network operating system. May not be used as part of an E T degree program on main campus. Restricted to Community Colleges campuses only.
Prerequisite: E T 120 and E T 153.
Learning Outcomes

1. Identify Linux utilities and terminology.
2. Use the Linux filesystem.
3. Install, administer, and manage a Linux system.
4. Utilize Linux user/group management.
5. Install software packages.
6. Apply data management skills.

E T 254. Concrete Technology
3 Credits (2+2P)
Fundamentals of aggregates, Portland cement, and asphalt used in design and construction. May be repeated up to 3 credits.
Learning Outcomes

1. Define the fundamentals of aggregates and their use in construction including concrete and asphalt.
2. Define the types of concrete and their uses.
3. Prepare and test concrete mix designs.
4. Executing tests for AASHTO Certification.

E T 255. Linux System Administration
3 Credits (3)
Operating systems applications and interfacing with an introduction to systems administration. Topics include Shell Programming, Programming Tools, Database Management, System Backups, Security, Setup and Maintenance of Linux Servers.
Learning Outcomes

1. Describe the key features of the Linux operating system.
2. Plan the Linux Filesystem to match system requirements.
3. Design BASH scripts to optimize common Linux operations.

4. Interpret Linux performance data to solve hardware and software issues.
5. Students will demonstrate the Core Linux System Administration.
6. Students will be able to link the use of shell commands to managing Linux server daemons and software.
7. Students will apply these concepts to build application servers running Linux, Apache, MySQL, and PHP (LAMP); Tomcat, CUPS print servers; and create backup solutions.
8. Students will apply problem analysis, object-oriented structured logic, and development concepts.
9. Students will demonstrate an understanding of theory and hands-on experience administrating a Linux Based server.

E T 256. Networking Operating Systems III
3 Credits (3+1P)
Introduction to a computer network operating system. May not be used as part of an E T degree program on main campus. Restricted to Community Colleges campuses only.
Prerequisite(s): E T 253.

E T 262. Software Technology I
3 Credits (2+2P)
An introduction to computer programming concepts as applied to engineering technology. Includes basic logic design, algorithm development, debugging and documentation. History and use of computers and their impact on society.
Prerequisite/Corequisite: (E T 182 or ENGR 130) or (MATH 1250G or MATH 1430G).
Learning Outcomes
1. Set up and use a rich programming environment for programming with C
2. Analyze existing code
3. Employ effective use of basic programming and basic troubleshooting
4. Write, debug and test code given software requirements
5. Apply testing and documentation best practices
6. Transfer programming knowledge and apply coding knowledge

E T 272. Electronic Devices II
4 Credits (3+3P)
Operational amplifiers, positive and negative feedback, computer aided circuit analysis. In addition circuits include integrator, differentiators and phase shift networks.
Prerequisite: A grade of C- or better in E T 246.
Learning Outcomes
1. Design ideal operational amplifier (opamp) circuits.
2. Determine the frequency response of BJT and MOSFET amplifier circuits.
3. Predict the impact of non-ideal properties of opamps on opamp circuits.
4. Design opamp integrator and differentiator circuits.
5. Implement electronic wave-generating and wave-shaping circuits.
6. Solder and layout surface-mount printed-circuit boards (PCBs).
7. Simulate and test opamp and transistor-amplifier circuits.

E T 273. Advanced Networking Communications
4 Credits (2+4P)
Explores advanced networking communications to include Wireless Networking, Virtualization and Cloud Computing, Subnets and VLANs, Network Risk Management, Network Security Design, Network Performance, and WANS. The course covers the examination objectives and detailed preparation for students to take the CompTIA Network+ exam.
Prerequisite: E T 153.
Learning Outcomes
1. Identify, describe, and apply wireless transmission characteristics and standards.
2. Explain the benefits of cloud virtualization and cloud computing.
3. Explain the purpose of network segmentation and describe how VLANs work and how they are used.
4. Identify basic concepts of network risk management and configure devices for increased security.
5. Identify network design security features and discuss options in network access control.
6. Use tools to evaluate network performance and discuss best practices for incident response and disaster recovery.
7. Explain characteristics of WAN technology and troubleshoot connection methods.

E T 276. Electronic Communications
3 Credits (2+2P)
Antennas, transmission devices, A-M and F-M transmission and detection, pulse systems, microwave systems.
Prerequisite(s): E T 246.

E T 280. Web Design and Multimedia
3 Credits (3)
Introduction to front-end web development including webpage design, structure, layout, positioning, responsiveness, and foundational layers of how the web works. Video, audio, and other digital presentation tools are covered.
Learning Outcomes
1. Create multiple frontend development micro-components.
2. Create single and multi-page websites.
3. Use flexbox, grid, and media queries and different design patterns.
4. Employ effective use of web development and basic troubleshooting.
5. Build small web site projects.

E T 282. Digital Electronics
4 Credits (3+3P)
Applications of digital integrated circuits, multiplexers, counters, arithmetic circuits, and microprocessors.
Prerequisite(s)/Corequisite(s): (E T 190 or E T 184). Prerequisite(s): E T 182.

E T 283. Hardware PC Maintenance
3 Credits (3+1P)
Installing, configuring, troubleshooting, and maintaining personal computer hardware components.
Prerequisite(s): E T 120 or E T 122.

E T 284. Software PC Maintenance
3 Credits (3+1P)
Installing, configuring, troubleshooting, and maintaining personal computer operating systems.
Prerequisite(s): E T 120 or E T 122.

E T 285. Advanced Information Security
3 Credits (3)
The course covers detailed analysis of network security, including security operations and policy adherence; internal and external vulnerabilities; methods of identifying, controlling and managing system access, and the protection of system information.

Prerequisite(s)/Corequisite(s): E T 283. Prerequisite(s): E T 156.

E T 286. Information Security Certification Preparation
4 Credits (4)
The course covers the examination objectives and detailed preparation for a certification in information security.
Prerequisite(s): E T 285.

E T 291. PC Forensics and Investigation
3 Credits (3)
Introduction to computer forensics and investigative fundamentals. Topics include understanding computer forensic and investigation law and requirements, processing crime and incident scenes, and the extraction, preservation, analysis and presentation of computer-related evidence.
Prerequisite(s): E T 120 or E T 122.

E T 300. Special Topics
1-3 Credits
Directed study or project. May be repeated for a maximum of 6 credits.
Prerequisite: consent of department head.

E T 305. Introduction to Product Design
3 Credits (2+3P)
The process of designing an innovative product for a real customer. Working through ideas, prototypes, 3-D models, concept validation, and entrepreneurship.
Prerequisite: A grade of C- or better in (COMM 1115G or COMM 1130G or AXED 2120G or HNRS 2175G) or consent of instructor for non-MET majors.
Prerequisite/Corequisite: E T 210 and E T 217.
Learning Outcomes
1. Learn and follow design process.
2. Develop experience working in a team to solve a design problem.
3. Develop experience presenting ideas and concepts orally.
4. Learn and apply creative problem-solving techniques.
5. Perform interviews with customer.
6. Translate customer needs into product specifications.
7. Design novel product for customer.
8. Build low-resolution prototype of product.
9. Develop a recognition of the importance of innovation and entrepreneurship.

E T 306. Thermodynamics and Laboratory Applications
4 Credits (3+3P)
Fundamentals of thermodynamics, including the first and second laws, properties of substances, and thermodynamic cycles, with a focus on power generation and refrigeration, application of thermodynamic principles to laboratory-scale systems, testing, instrumentation, and data collection, energy conversion assessment and system performance.
Prerequisite: A grade of C- or better in the following: CHEM 1120G and ENGR 233 and (PHYS 1240G or PHYS 1320G) and (PHYS 1240L or PHYS 1320L).
Prerequisite/Corequisite: ENGR 140 and (ENGR 190 or MATH 1521G or MATH 1521H).
Learning Outcomes
1. Explain and apply fundamental and applied thermodynamics (including laws, substance properties, and cycles in power generation and refrigeration).
2. Solve real-world problems using thermodynamic theory in energy systems.
3. Utilize tools and methods to analyze and solve applied thermodynamics problems, including instrumentation and data analysis.
4. Collect, analyze, and interpret experimental data to determine thermodynamic properties.
5. Communicate results effectively through written reports and presentations.
6. Assess the performance of thermodynamic systems, including refrigeration cycles, heat engines, and power plants.

E T 306 L. Thermodynamics Lab
1 Credit (3P)
Applications of thermodynamic theory to lab devices. Practice in testing, instrumentation, and data collection.
Prerequisite: A grade of C- or better in the following: CHEM 1120G and ENGR 233 and (PHYS 1240G or PHYS 1320G) and (PHYS 1240L or PHYS 1320L).
Prerequisite/Corequisite: (E T 306 or pre-approved equivalent) and ENGR 140 and (ENGR 190 or MATH 1521G or MATH 1521H).
Learning Outcomes
1. Effectively communicate results of laboratory work and in-class studies in written formal technical reports.
2. Present one lab experiment through a PowerPoint presentation.
3. Find thermodynamic properties through lab experiments.
4. Describe performance indicators of a laboratory refrigeration cycle and a heat engine.
5. Describe power plant operation.

E T 308. Fluid Technology
3 Credits (3)
Application of basic principles of fluid mechanics to practical applied problems.
Prerequisite: A grade of C- or better in both, (ENGR 190 or MATH 1511G or MATH 1511H) and (E T 240 or ENGR 233).
Corequisite: E T 308 L.
Learning Outcomes
1. Solve hydrostatic problems.
2. Describe and measure physical properties of a fluid.
3. Describe the motion of fluids.
4. Apply conservation equations.
5. Design pipeline and pump systems.

E T 308 L. Fluid Technology Lab
1 Credit (3P)
Measurements in fluid statics, dynamics, and hydraulic systems.
Corequisite: E T 308.
Learning Outcomes
1. Effectively communicate results of laboratory work and in-class studies in written formal memoranda.
2. Experimentally find properties of fluids.
3. Experiment head losses in pipe flows.
4. Analyze pipeline systems and open channel flows.
5. Analyze flow regimes and equipment selection.

E T 309V. Manufacturing: History and Technology
3 Credits (3)
The history of manufacturing, the technology on which it is based, and its impact on society.

E T 310. Applied Strength of Materials
3 Credits (3)
Application of principles of strength of materials to practical design and analysis problems.
Prerequisite: A grade of C- or better in E T 240 or ENGR 233.
Corequisite: E T 310 L.
Prerequisite/Corequisite: ENGR 190 or MATH 1521G or MATH 1521H.
Learning Outcomes
1. To obtain knowledge of basic engineering materials and their use in civil and mechanical construction.
2. To perform basic structural analysis, stress, strain and deformation calculations as they apply to current engineering practices.
3. To conduct appropriate experiments in the laboratory as they apply to straight of materials and be able to interpret the results.
4. To effectively communicate results of laboratory work and in-class studies in written memoranda, business letters, and formal technical reports.
5. To recognize that the field of engineering materials is constantly changing and therefore, needs to be studied throughout one's career.

E T 310 L. Applied Strength of Materials Lab
1 Credit (3P)
Testing and analyzing the physical properties of materials. Cursory review of Excel, PowerPoint, FEA, Instron machine, and testing standards.
Corequisite: E T 310.
Learning Outcomes
1. Effectively communicate results of laboratory work and in-class studies in written formal memoranda.
2. Demonstrate an understanding of the tensile, compressive, shear, torsional and buckling properties of basic materials through hands-on testing per ASTM Standards.
3. Evaluate the results of the hands-on laboratory testing through modeling exercises using SOLIDWORKS simulations.
4. Effectively communicate industry practices through oral presentations of ASTM standards.

E T 314. Communications Systems I
3 Credits (3)
Circuits and devices used for transmission, reception, and processing of RF signals. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better in both, E T 246 and (MATH 1250G or higher).
Learning Outcomes
1. Analyze analog and digital communication systems.
2. Apply the fundamental communication concepts of AM and FM techniques.
3. Build an AM/FM communication system.
4. Apply basic antenna theory and satellite communication theory.

E T 317. Advanced Manufacturing and Design
3 Credits (3)
Advanced 3-D modeling with current engineering design practices. Students will use SolidWorks add-ins such as CAMWorks, Product Data Mangement (PDM), and Model-Based Definition in congunction with Geometric Dimensioning and Tolerancing (GD&T) practices. Students will have the opportunity to take the Certification SolidWorks Profesional Exam (CSWP).
Prerequisite: A grade of C- or better in both, E T 210 and E T 217 or ENGR 217.
Learning Outcomes
1. Create manufacturing drawing packages in accordance with ANSI.
2. Relate design data using proper geometric dimensioning and tolerancing practices.
3. Knowledge of advanced manufacturing processes.
4. Knowledge of requirements design for manufacturability (DFM).
5. Write and understand G-Code toolpaths.
6. Use CAD/CAM systems to create toolpaths.
7. Operate and setup CNC machining center.
8. Work in a group and operate effectively on a team.
9. Use creative and technical thinking skills in design.

E T 324. Signal Processing and Filtering
4 Credits (3+3P)
Application of digital and analog signal conversion models. Discrete time signals and systems. Time and frequency domain concepts. Presentation of Fourier and Z transforms. Application of analog and digital signal filtering with and without feedback.
Prerequisite: A grade of C- or better in E T 272, and ENGR 140, and (ENGR 190 or (MATH 1521G or MATH 1521H, or higher)).
Prerequisite/Corequisite: (PHYS 1240G or PHYS 1320G) and (PHYS 1240L or PHYS 1320L).
Learning Outcomes
1. Analyze signals and systems and differentiate between discrete and continuous-time signals and systems.
2. Determine the impulse response of a differential or difference equation.
3. Apply the convolution theorem for continuous-time signals to determine the response of linear systems.
4. Evaluate the Fourier series of periodic signals.
5. Apply bilateral Laplace transforms for continuous signals and Z transforms for discrete signals.
6. Apply the Sampling theorem, reconstruction, aliasing, and Nyquist's theorem to represent continuous-time signals in discrete time.
7. Design and analyze signals and systems using the programming language MATLAB and /or Simulink.

E T 328. Kinematics of Machines
3 Credits (2+3P)
Kinematic analysis of machine elements using linkages, cams, and gears. Applied design of mechanical systems using SolidWorks simulation and Excel modeling.
Prerequisite: A grade of C- or better in both, E T 210 and (E T 241 or ENGR 234).
Prerequisite/Corequisite: E T 305.
Learning Outcomes
1. Design mechanical device with specific points of motion to solve engineering problem.
2. Develop experience working in a team to solve a design problem.
3. Develop experience presenting technical concepts in writing and orally.
4. Develop understanding of classic four bar mechanisms, including crank-rocker, crank-crank, double-rocker, and crank-slider.
5. Using algebra and trigonometry, analyze points of motion for displacement, velocity, and acceleration.
6. Using SolidWorks Motion Analysis, analyze points of motion for displacement, velocity, and acceleration.
7. Reverse-engineer a Franz Rouleaux mechanism.

E T 332. Applied Design of Structures I
4 Credits (3+3P)
An introduction to structural analysis and design. Use of various building codes for development of allowable and factored loads on structures. Allowable stress and strength design concepts for structural components using concrete and steel. Required use of computer software such as spreadsheets, databases, and self-developed programs and design aids.
Prerequisite: A grade of C- or better in both, E T 310 and (ENGR 190 or MATH 1521G or higher).
Learning Outcomes
1. Demonstrate mastery of the knowledge, techniques, skills and use of modern tools of their disciplines.
2. Design structural components of a system, component, or process to meet desired needs.
3. Identify, formulate, and solve structural analysis problems.
4. Describe professional and ethical responsibility.
5. Communicate effectively with peers and faculty.

E T 339. Introduction to Digital Forensics and Incident Response
3 Credits (2+3P)
Introduction to the skills required to perform digital forensics and incident response on Windows operating systems. Topics include: live response, evidence acquisition, Windows operating system artifacts, documentation and reporting.
Prerequisite: A grade of C- or better in both, E T 255 and E T 160.
Learning Outcomes
1. To understand Digital Forensics terms and definitions and why digital forensics is needed.
2. To study what is required and how to perform digital forensics.
3. To become familiar and aware of the hindrances/obstacles that affects effective digital/computer forensic operations.
4. To learn about the tools and procedures for how deleted data is recovered during digital forensic operations.
5. To use forensic tools and procedures to perform digital forensic operations on Windows operating systems, Emails, Mobile devices, and Communication networks (Computer, wireless, cellular networks).
6. To learn about incident response and procedures.

E T 344. Microprocessor Systems
3 Credits (2+3P)
Microcomputer and/or microcontroller systems, applications and architectures with an emphasis on software using high-level and assembly programming languages. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better in both, (E T 182 or ENGR 130) and (MATH 1250G or higher).
Prerequisite/Corequisite: E T 362.
Learning Outcomes
1. Compare and contrast microprocessor architectures and their characteristics.
2. Configure a Nios II microprocessor architecture core on an FPGA.
3. Write programs in assembly language targeting the Nios II microprocessor.
4. Write programs in C targeting the Nios II microprocessor.
5. Present, demonstrate and document a team project.

E T 354. Soil and Foundation Technology
4 Credits (3+3P)
Fundamentals of investigation of soil properties and their importance in design, construction, and testing as related to buildings, roads, dams, and other structures. Design of foundations considering slope stability, bearing capacity and settlement.
Prerequisite: A grade of C- or better in E T 254.
Prerequisite/Corequisite: E T 310.
Learning Outcomes
1. Demonstrate an understanding of the basic soil types and the accepted soil classification systems: USCS, AASHTO, USDA.
2. Demonstrate an understanding of the various engineering properties of soils and how they apply to the built environment: compaction, permeability, consolidation, shear strength and stress distribution.
3. Perform advance calculations on lateral earth pressure, retaining structures and slope stability.
4. Perform basic designs of shallow foundations and pile structures.
5. Demonstrate an ability to perform laboratory tests: soil classification, Atterburg Limits, compaction (proctors), permeability, shear strength, and compression. Confirm these abilities through completion of the NMDOT soil testing certification program.

E T 355. Site/Land Development and Layout
3 Credits (3)
Techniques, methods, and takeoffs for infrastructure layout, site plan design, grading, earthwork, utilities, road construction. Students must be in Junior or Senior standing to enroll.
Prerequisite: A grade of C- or better in E T 143 or DRFT 143 or DRFT 153.
Learning Outcomes
1. Describe the purpose of Land Development and its process.
2. Define Feasibility and Programming (Environmental policy, Environmental Site Feasibility, Engineering Feasibility) for land development.
3. Base Map Preparation (Control Surveys, Boundary Surveys Topographic Surveys).
4. Examine Flood Plain Studies (FEMA) and Preliminary Hydrological Analysis.
5. Compute the TOC/Intensity of rainfall on a property, runoff for pre/post-development, and peak flow.
6. Implement types of Grading - Earthwork (end section method)/ production estimations/Preliminary layout/Grading work Grid Method).
7. Analyze asphalt designs for different types of cross-sections.

E T 356. Applied Power Technologies
4 Credits (3+3P)
Basic elements of modern power systems, energy sources, substation configuration, load cycles, and three-phase circuits. Students will gain experience in power factor correction, transmission line configurations and impedance, voltage regulation of transformers, and the per-unit system. Study of load flow, fault analysis, and economic operations is included. Students must be in junior or senior standing in order to enroll.
Prerequisite: A grade of C- or better in the following: (ENGR 190 or MATH 1511G or MATH 1511H) and E T 272 and ((PHYS 1240G and PHYS 1240L) or (PHYS 1320 and PHYS 1320L)).
Learning Outcomes
1. To apply concepts of electronics, magnetism and induction.
2. To solve single and three phase transformers circuits.
3. To understand different operations of DC machines and generators.
4. To analyze single phase and three phase power circuits in per-unit analysis.
5. To analyze transmission lines for power loss and power efficiency.

6. To understand power flow, fault analysis and economic operations of the power system generation and transmission.
7. To describe modern power systems, energy sources and substation configurations.

E T 360V. Technology in Business and Society
3 Credits (3)
Examination of how technology affects business and society with specific attention to understanding the role of technical personnel and their interaction with nontechnical personnel. May be repeated up to 3 credits.
Learning Outcomes
1. Understand the impact of technology on business and society.
2. Understand the importance of technical personnel in implementing technology within businesses.

E T 362. Applied Software Development with Python
3 Credits (3)
This course explores various real-world applications of Python in modern software development. Students will engage in hands-on projects, including web applications, database-driven solutions, selected hardware-based applications, and other emerging technologies, while applying object-oriented programming (OOP) principles. The curriculum is designed to adapt to evolving industry needs.
Prerequisite: A grade of C- or better in ENGR 140.
Prerequisite/Corequisite: MATH 1250G or Higher.
Learning Outcomes
1. Configure and utilize various programming environments to meet real-world application needs.
2. Analyze and modify existing codebases.
3. Develop and troubleshoot Python applications.
4. Implement Object-Oriented Programming (OOP) principles.
5. Apply testing, debugging, and documentation best practices.

E T 377. Computer Networking I
3 Credits (2+2P)
Topics include the principles and structure of the OSI model, IP addressing, media, LANs, TCP/IP networks, routing protocols (RIPv2, EIGRP, OSPF) and their advanced functionality, as well as VLANs and inter-VLAN communication. This course focuses on the architecture of networks, the configuration of devices, how to identify and resolve common issues, and troubleshooting (from physical to transport layers).
Prerequisite: A grade of C- or better in both, (E T 182 or ENGR 130) and (MATH 1250G or Higher).
Learning Outcomes
1. Define and distinguish the role of a network administrator (from other roles in the IT world)
2. Identify the OSI model, its layers, and relationship to TCP/IP model
3. Identify different cable media and networking devices and their use
4. Design, configure, and troubleshoot basic networks.
5. Identify MAC, IPv4, and IPv6 addressing
6. Apply different techniques for IP allocation and subnet design (IPv4)
7. Use Cisco IOS software for basic switch and router configurations
8. Configure and troubleshoot basic setup for static and dynamic routing protocols

E T 381. Renewable Energy Technologies
3 Credits (3)
Renewable energy systems, including topics in thermal-solar, photovoltaic, wind, geothermal systems, and other current topics. Theory, practical applications, safety considerations and the economics of alternative renewable energy systems compared to conventional systems.
Prerequisite: A grade of C- or better in MATH 1220G or higher.
Learning Outcomes
1. Define renewable energy sources.
2. Understand the current state of the art of renewable energy technologies and performance improvements. This includes solar, wind, hydro, ocean, biomass, and geothermal energies.
3. Understand the benefits and disadvantages of using renewable resources.
4. Research or design a renewable energy system as a class project.

E T 382. Solar Energy Technologies
3 Credits (2+3P)
Solar energy technologies, including topics in passive, solar thermal, and photovoltaic systems. Theory, practical applications, safety considerations and the economics of solar renewable energy systems compared to conventional systems.
Prerequisite: A grade of C- or better in MATH 1220G.
Learning Outcomes
1. Define renewable energy sources.
2. Understand the current state of the art of photovoltaic and solar thermal energy technologies and performance improvements.
3. Evaluate the economics of implementing a solar system.
4. Design and size a PV or solar thermal energy system as a class project.

E T 384. Wind and Water Energy Technologies
3 Credits (3)
Wind and Water energy technologies, including topics in small and large scale systems. Theory, practical applications, safety considerations and the economics of wind and water renewable energy systems compared to conventional systems.
Prerequisite: A grade of C- or better in MATH 1220G or higher.
Learning Outcomes
1. Define renewable energy sources.
2. Understand the current state of the art of wind and water energy technologies and performance improvements.
3. Evaluate the economics of implementing wind or water systems.
4. Design and size a wind or water energy system as a class project.

E T 386. Sustainable Construction and Green Building Design
3 Credits (3)
Sustainable Building materials, methods, and techniques including green architecture and design, codes, standards and specifications.
Prerequisite: A grade of C- or better in MATH 1220G or higher.
Learning Outcomes
1. Demonstrate an understanding of the basic principles of Green Building: sustainability, life-cycle costing, triple bottom line, return periods and unintended consequences.
2. Interpret the various categories present in the LEED certification process and other green certification systems commonly used.
3. Evaluate different “green” technologies as they apply to the student’s area of interest.
4. Evaluate energy efficiency scenarios and resulting cost analyses using RETScreen and RESCheck softwares.
5. Navigate the various certification opportunities as they apply to the Green Building industry.

E T 396. Heat Transfer and Applications
3 Credits (2+3P)
Fundamentals of conduction, convection, and radiation heat transfer. Application of heat transfer, thermodynamics, and fluid mechanics principles to thermal system analysis and design.
Prerequisite: A grade of C- or better in both E T 306 and E T 308.
Learning Outcomes
1. Understand the concepts and basic principles of fundamental and applied heat transfer.
2. Model and solve engineering problems involving one, two, or three heat transfer modes: conduction, convection, and radiation.
3. Analyze the performance of industrial equipment like heat exchangers.
4. Validate theoretical concepts through heat transfer lab experiments.

E T 398. Digital Systems
4 Credits (3+3P)
Analysis, design, implementation, and testing of digital systems, including microprocessor blocks, using state machine logic, FPGAs, and hardware description language programming. May be repeated up to 4 credits.
Prerequisite: A grade of C- or better in both (E T 282 or ENGR 130) and (MATH 1250G or higher).
Prerequisite/Corequisite: E T 362.
Learning Outcomes
1. Apply design, synthesis, and analysis methods for digital systems that incorporate programmable logic devices (FPGAs).
2. Utilize CAD tools such as Altera Quartus II to design digital systems.
3. Evaluate and apply methods to analyze the timing behavior and to detect timing hazards in digital circuits.
4. Apply methods for analysis and design of sequential digital circuits with feedback.
5. Design complex circuits using VHSIC Hardware Description Language (VHDL) for programming FGPA systems.

E T 400. Special Topics
1-3 Credits
Directed study or project. May be repeated for a maximum of 6 credits.
Prerequisite: consent of department head.

E T 402. Instrumentation
3 Credits (2+3P)
Sensors/transducers, signal conditioning and transmission for measurement and control systems. Student project in an area of instrumentation and/or control is required.
Prerequisite/Corequisite: E T 396 or E T 398.
Learning Outcomes
1. Apply physical concepts, operational principles, and components of basic instrumentation and control in industrial process systems.
2. Learn relevant problem-solving methods and aspects of good practice.
3. Use LabView data acquisition systems, PLC ladder logic, and basic Arduino controllers.
4. Prototype a control system through a class project.

E T 410. Senior Seminar
1 Credit (1)
Transition from academics to business and industry. Students must be senior standing in E T majors to enroll. May be repeated up to 1 credit.
Learning Outcomes
1. Explain the path to professional licensure (CET, ECET, MET).
2. Implement a plan to test and pass the fundamental exam (CET, ECET, MET).
3. Identify and work towards completing different certifications used in industry, and work towards (IET).

E T 412. Highway Technology
3 Credits (3)
Road-vehicle performance, geometric alignment, traffic analysis, highway materials, pavement design, and plan and profile development.
Prerequisite: A grade of C- or better in E T 354.
Learning Outcomes
1. Design of a roadway including geometric design, materials selection, pavement design, and drainage.
2. Develop an understanding of design criteria based on traffic characteristics.
3. Interpret the purpose of course requirements, gather correct resources, present criteria, study alternatives, and finally develop a design.

E T 414. Communications Systems
3 Credits (3)
Circuits and devices used for transmission, reception, and processing of RF signals.
Prerequisite: A grade of C- or better in both, E T 246 and (MATH 1250G or higher).
Learning Outcomes
1. Analyze analog and digital communication systems.
2. Apply the fundamental communication concepts of AM and FM techniques.
3. Build an AM/FM communication system.
4. Apply basic antenna theory and satellite communication theory.

E T 418. Applied Hydraulics
3 Credits (3)
Introduction to hydrology, hydraulic equations, hydraulic cross-sections, control structures, and collection and distribution of water, wastewater, and storm runoff using closed conduit and open channel flow. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better in E T 308.
Learning Outcomes
1. Perform basic rainfall/runoff calculations using the Rational Method, TR-fifty-five and the Unit Hydrograph method.
2. Design hydraulic conveyance structures using Manning's equation and basic culvert equations, both by hand and various software packages.
3. Perform advanced calculations of pipe flow and head loss, both by hand and various software packages.
4. Evaluate pumping scenarios and pumping design, both by hand and various software packages.
5. Demonstrate an understanding of basic groundwater hydraulics.

E T 420. Senior Internship
1-6 Credits
Internship requiring an approved number of hours of varied and progressive experience in the field of study. The scope and other requirements of the internship are stated in an individualized syllabus and through a memorandum of understanding between the faculty mentor and the industry partner. Taken in the senior year of program.

Prerequisites: Senior standing in E T.

E T 421. Senior Project
3 Credits (3)
Project in an area of civil engineering technology conducted under the direction of civil engineering technology faculty member. Project must be one that can be completed within a semester and of sufficient complexity for 3 credits. Taken last semester of program. May be repeated up to 3 credits.

Learning Outcomes
1. Write a transmittal letter in a format consistent with industry practices.
2. Develop a scheduling table delineating the various project stages.
3. Develop a table of contents to organize all work documents.
4. Use the knowledge learned in CET courses to develop/design a project and prepare a professionally written report.
5. Communicate effectively with the faculty advisor and industry mentor.
6. Develop skills to work independently or in teams on a self-paced project.

E T 426. Analysis and Design of Machine Elements
3 Credits (2+3P)
Analysis and design of power transmission components, including: gears, sprockets, belts, chains, bearings, and shafts. Experiential design project using SolidWorks and Excel modeling.
Prerequisite: A grade of C- or better in both ENGR 234 and E T 310.
Prerequisite/Corequisite: E T 305.

Learning Outcomes
1. Design mechanical device with specific machine elements to solve engineering problem.
2. Develop experience working in a team to solve design problems.
3. Develop experience presenting technical concepts in writing and orally.
4. Apply strength of materials concepts to design machine elements.
5. Learn about various types of machine elements, including shafts, sheaves, gears, sprockets, bearings, fasteners, retaining rings, o-rings, and motors.
6. Analyze the performance of various types of machine elements, including shafts, sheaves, gears, sprockets, and bearings.
7. Using SolidWorks Simulation, design and analyze machine elements and mechanical systems.
8. Conduct FEA simulation and validate results mathematically.

E T 432. Applied Design of Structures II
4 Credits (3+3P)
Continuation of E T 332. Design of structural systems and study of their responses. Wood and masonry systems included.
Prerequisite: A grade of C- or better in E T 332.

Learning Outcomes
1. Demonstrate mastery of the knowledge, techniques, skills and use of modern tools of their disciplines.
2. Design a system, component, or process to meet desired needs.
3. To effectively function as a member of a team while designing, constructing and testing structural scale model.
4. To identify, formulate, and solve engineering problems including material selection and cost analysis.
5. Recognize of professional and ethical responsibility.

E T 435. Senior Project
3 Credits (2+3P)
Capstone course. Practical application of student's cumulative knowledge to an assigned design projects. Design principles, teamwork, and project management skills are stressed. Demonstration of written and oral communication skills via project documentation and presentation of results. Must be graduating senior. Consent of Instructor required.

Learning Outcomes
1. Demonstrate an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the discipline.
2. Demonstrate an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline.
3. Demonstrate an ability to apply written, oral, and graphical communication in broadly-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature.
4. Demonstrate an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes.
5. Demonstrate an ability to function effectively as a member as well as a leader on technical teams.

E T 439. Advanced Digital Forensics and Incident Response
3 Credits (3)
Advanced topics in digital forensics and incident response. Topics include network analysis and advanced cybersecurity concepts.
Prerequisite: A grade of C- or better in both, E T 339 and E T 377.

Learning Outcomes
1. Students will become familiar with tools and processes to analyze and detect memory resident processes that include malware, rootkits, and user recoverable data.
2. Students will also have exposure to methods and processes used by hackers to penetrate and compromise targets.

E T 444. Computer Hardware Senior Design
3 Credits (2+3P)
The design, development, implementation, documentation, and formal demonstration of a computer hardware system. Emphasis on interfacing FPGA to peripheral devices using VHDL. A student project is required. Students must be in senior standing to enroll. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better in both, E T 362 and E T 398.

Learning Outcomes
1. To design, analyze and simplify digital logic circuits for practical problems.
2. To understand basic and complex digital logic circuits, such as memory, registers, and other arithmetic circuits.
3. To design sequential digital circuits using basic digital gates in Moore and Mealy model.
4. To design Finite State Machines and implement them on an FPGA board.
5. To interface different sensors and user inputs in VHDL and implement them on an FPGA board.
6. To complete a design project, working in teams, solving a real-life problem, and demonstrate their practical solution.

E T 452. Advanced Automated Control Systems
3 Credits (2+3P)
This course introduces students to the fundamentals of automated control systems used in industrial, manufacturing, and process environments. Emphasis is placed on control theory, programmable logic controllers (PLCs), human-machine interfaces (HMIs), SCADA systems, panel hardware, and industrial networking. Students will engage in hands-on labs and simulations to design, program, and integrate automated systems that reflect real-world industry standards.
Prerequisite: A grade of C- or better in E T 402.
Learning Outcomes
1. Design and implement automated control systems using foundational principles of control logic and industrial system architecture.
2. Program programmable logic controllers (PLCs) using ladder logic and apply them to real-world automation tasks involving digital and analog inputs and outputs.
3. Develop and configure human-machine interfaces (HMIs) that enable effective operator control, process visualization, and system monitoring.
4. Integrate PLCs and HMIs with supervisory control and data acquisition (SCADA) systems for centralized control, data logging, and alarm management.
5. Apply data acquisition techniques using sensors and signal processing to monitor and analyze process performance.
6. Configure and troubleshoot industrial networking systems, ensuring reliable communication between PLCs, HMIs, SCADA, and robotic systems.
7. Understand and apply robotics principles in automation, including basic programming, simulation, and integration of robotic tasks into larger control systems.
8. Demonstrate safety, documentation, and system organization standards relevant to hardware interfacing, device selection, and industrial protocols.
9. Collaborate in teams to design and present a fully integrated automated system, incorporating PLC logic, HMI screens, SCADA functionality, DAQ elements, and optional robotics.

E T 455. Cost Estimating and Scheduling
3 Credits (3)
Methods and techniques in construction estimating including final bid preparation, construction planning and scheduling using various network methods and other techniques.
Prerequisite: junior or senior standing in E T.

E T 456. Applied Power Technologies II
3 Credits (2+3P)
This course focuses on fault analysis, protective systems, transient stability, and economic operation of power systems. Students apply analytical techniques and simulation tools to assess and optimize power system performance under dynamic conditions.
Prerequisite: A grade of C- or better in E T 356.
Learning Outcomes
1. Perform symmetrical and unsymmetrical fault analyses.
2. Interpret sequence networks and analyze faulted systems.
3. Understand protective relay schemes and coordination.
4. Analyze rotor angle and frequency stability.
5. Apply methods for economic dispatch and system optimization.

E T 458. Web Development and Database Applications
3 Credits (3)
Design, planning, and building of interactive and dynamic web applications which are customizable and contain real-time information. Topics include relational databases, object oriented programming, secure-coding practices and web security, user authentication and personalization, as well as front-end and back-end technology integration.
Prerequisite: A grade of C- or better in both, E T 362 and E T 280.
Learning Outcomes
1. Setting up a development server
2. Read, design, and write code for backend web dev.
3. Design, create, and access databases that support web applications.
4. Implement effective security and authentication on Web applications

E T 459. Construction Technology and Management
3 Credits (3)
This is a Technical Specialty course that builds on topics presented in the construction sequence thus far: E T 154, E T 254, E T 354, and E T 355. The course introduces students to the different civil engineering approach to construction and management, including planning, construction estimating & scheduling, foundations, formwork, concrete work, steel fabrication and erection installation, equipment basics, quality control, and safety. Methods and techniques involved in construction including use of Primavera Project Management® software.
Prerequisite/Corequisite: E T 354 and E T 355.
Learning Outcomes
1. Understand the basic concepts of construction planning, cost estimation, scheduling, and types of project management
2. Obtain basic knowledge on techniques to construct structures based on site condition
3. Develop work breakdown system and quantity take-offs
4. Develop project cost estimation for different construction projects
5. Prepare work schedule for construction project
6. Identify and implement the suitable method and equipment to construct various structures.

E T 463. Enterprise Linux Administration
3 Credits (3)
Advanced Linux Includes an advanced look at the use of Coding repositories, Linux-based containers, virtual machines, and scripting tools including Dockerfiles, Vagrantfiles, and Ansible.
Prerequisite: A grade of C- or better in both, E T 255 and E T 362.
Learning Outcomes
1. Demonstrate the ability to use Software Versioning systems using Windows and Linux.
2. Apply best practices with versioning repositories when creating software.
3. Deploy single and clustered microservice containers to support a web application.
4. Use script-based code to deploy and configure a full stack web server.
5. Use infrustructure management software to deploy defined roles in multiple environments.

E T 464. Windows Enterprise Administration
3 Credits (3)
Installation, configuration, and maintenance of Windows Enterprise services which includes Active Directory, distributed file systems, SQL Server, Web Server, Authentication Procedures, and enterprise elasticity. Topics covered include: Server Maintenance and Troubleshooting Methodologies.
Prerequisite: A grade of C- or better in E T 160 and (E T 262 or ENGR 140 or C S 172).

Learning Outcomes

1. Set up and use a Windows Enterprise environment with Active Directory.
2. Use best practices to design an organizational Structure and define AD DS Objects.
3. Deploy an AD DS embedded DHCP server with IPvfour and IPvsix.
4. Analyze existing cmd shell and PowerShell code for process automation.
5. Deploy security and user settings using Group Policy.
6. Apply version updates and establish an intra-domain trust relationship.
7. Employ effective use of the WDS service to deploy template images.

E T 471. Transportation Engineering and Technology
3 Credits (3)

Learn the principles of transportation engineering and technology with a focus on highway engineering and traffic analysis. Provide a basic skill set that will allow a student to address most of the transportation problems. Provide a foundation for future coursework in transportation should a student wish to pursue further coursework in the field.
Prerequisite: A grade of C- or better in E T 354.
Learning Outcomes

1. To introduce students to techniques for designing a roadway including geometric design, materials selection, pavement design, and drainage.
2. To help students develop an understanding of design criteria based on traffic characteristics.
3. Assess student's ability to: interpret the purpose of course requirements, gather correct resources, present criteria, study alternatives, and finally develop a design.

E T 472. Intelligent Transportation Systems (ITS)
3 Credits (3)

Traffic flow theory, telecommunication and information technology application in transportation, system architecture and standards, transportation management, incident and emergency management, corridor management, dynamic route guidance, in-vehicle systems, and traffic signal timing. Consent of instructor required. May be repeated up to 3 credits.
Learning Outcomes

1. Demonstrate traffic flow theory, telecommunication, and information technology applications in transportation.
2. Discover Intelligent Transportation System (ITS) architecture and standards, transportation management, incident and emergency management, corridor management, dynamic route guidance and in-vehicle systems, and traffic signal timing.
3. Apply knowledge of the ITS to select traffic engineering as a career path or apply the knowledge in their engineering or engineering technology career.

E T 475. Special Topics in Information Technology
3 Credits (3)

Contemporary topics in Information Technology.
Prerequisite: A grade of C- or better in both, ((E T 362 or ICT 362) and (E T 377 or ICT 377)), or Consent of Instructor.
Learning Outcomes

1. Students will learn two way Bluetooth, Wi-Fi, and NFC communication technologies
2. The student will practice building and programming IOT prototype devices
3. The student will develop customer value proposition and perform one round of customer discovery
4. The student will prototype their IOT device
5. The student will demonstrate their IOT device
6. The student will learn to integrate IOT devices into IT architecture

E T 477. Computer Networking II
3 Credits (2+2P)

Advanced concepts in computer network design and applications including managing the campus network infrastructure (LANs and virtual LANs), network services (DNS and DHCP), network security and firewall, network monitoring and forensics, wireless networks, high-speed optical networks and Internet.
Prerequisite: A grade of C- or better in E T 377.
Learning Outcomes

1. Demonstrate an understanding of key fundamental concepts of networking.
2. Apply networking concepts to design networks for real-life application scenarios using applicable software.
3. Configure network hardware such as computers, switches, and routers.
4. Troubleshoot, analyze, and solve network problems with applicable software.

E T 480. Innovation and Product Development
3 Credits (3)

Experiential product design and development. Students will learn about different types of innovation, business models, and methods for developing products. Students will apply the scientific method to develop a product idea of their own. Students will propose ideas, develop hypotheses, test hypotheses, and iterate until they have validated their product idea or identified a need to pivot.
Learning Outcomes

1. The student will be able to apply the scientific method to design a product.
2. The student will be able to develop a plan to learn about the Product-Market-Fit of their innovation.
3. The student will be able to describe the basics of Business Models and Product-Market-Fit.

E T 483. Mobile App Programming and Development
3 Credits (3)

Planning and creation of mobile device applications. Programming tools and technical design considerations. Entrepreneurship and App development.
Prerequisite: A grade of C- or better in both, ICT 152 and (E T 377 or ICT 377)), or Consent of Instructor.
Learning Outcomes

1. The student will learn to create a modern and flexible mobile device User Interface using Java
2. The student will develop a high functioning prototype their mobile app
3. The student will implement a business model canvas including development of a customer value proposition and a minimum of one round of customer discovery
4. The student will implement database and information storage using a mobile device

5. The student will implement the developer's dashboard for their mobile app
6. Student will publish and monetize their mobile app

E T 485. White Hat System Testing
3 Credits (3)
System penetration testing and repair. Review of methods utilized to gain access to unprotected systems. Testing system repairs and fixes for future prevention. Test documentation.
Prerequisite: A grade of C- or better in both, ((E T 362 or ICT 362) and (E T 377 or ICT 377)), or Consent of Instructor.
Learning Outcomes
1. The student will practice modern methods for penetration testing
2. The student will demonstrate advanced ethical hacking methods
3. The student will evaluate in-place security systems
4. The student will run-through simulated attacks and system break-ins
5. The student will learn to prepare detailed reports on system vulnerabilities and weaknesses

E T 490. Selected Topics
1-3 Credits
Selected topics in engineering technology and related areas.
Prerequisite: consent of instructor.

E T 505. Special Topics in Information Technology
3 Credits (3)
Contemporary topics in Information Technology Restricted to: M-IT majors. May be repeated up to 9 credits.
Learning Outcomes
1. Various

E T 513. AI Data Center Designs and Technologies
3 Credits (3)
A study of current Artificial Intelligence Data Center Designs and related Networking Technologies. Data Center Architecture designs for optimization of Artificial Intelligence/Machine Learning clusters and networks. Graduate standing or consent of instructor.
Learning Outcomes
1. Apply AI/ML Workloads and Architecture Designs.
2. Evaluate AI/ML Cluster Design Scalability.
3. Create AI Front-end and Back-end Network Designs.
4. Leverage IP Fabric Designs for Dynamic Data Load Balancing.

E T 515. AI and Cybersecurity Risk in Critical Infrastructure Systems
3 Credits (3)
This course explores the role of artificial intelligence in managing cybersecurity risk within critical infrastructure systems, including energy, transportation, manufacturing, and water systems. Students will study how machine learning models can help identify vulnerabilities, detect anomalies, and forecast failure or attack events across complex, distributed OT environments.
Prerequisite: Graduate standing or consent of instructor.
Learning Outcomes
1. Design AI-based monitoring systems for detecting and managing cyber risk in critical infrastructure.
2. Apply ML models to ICS data to identify anomalies, forecast threats, and guide mitigation.
3. Incorporate AI tools into compliance-driven cyber risk management strategies.
4. Critically assess the use of AI in environments where human safety and system availability are paramount.

E T 520. From IT Tech to IT Manager
3 Credits (3)
This course provides the essential knowledge and skills to move from IT technician role to an IT manager role. This course will provide IT management basics and how tech skills are utilized in an IT administrative role.
Learning Outcomes
1. Understand: Explain the key principles and methodologies of IT Management.
2. Apply: IT Strategies and development roadmaps.
3. Analyze: Operations and capacity management.
4. Create: A corporate design for a comprehensive IT staff management plan.

E T 539. Advanced Enterprise Security
3 Credits (3)
This course provides the student with an overview of enterprise cybersecurity and a foundation for understanding the critical issues of protecting digital and information assets. Restricted to: M-IT majors.
Learning Outcomes
1. Demonstrate an understanding of information security concepts and risk management.
2. Demonstrate an understanding of Intrusion Detection and Prevention Systems and Other Security Tools.
3. Demonstrate an understanding of cryptographic techniques.
4. Demonstrate an understanding of authentication methods.
5. Demonstrate an understanding of access control systems.
6. Demonstrate an understanding of various network security controls.
7. Demonstrate an understanding of the legal, ethical, and professional issues in information security.

E T 540. Risk Management for IT Managers
3 Credits (3)
This course provides a comprehensive framework for designing, developing, and implementing an effective cyber risk management program. Students will explore the key principles and practices necessary to manage cyber risks in today's dynamic and challenging environment.
Learning Outcomes
1. Understand: Explain the key principles and methodologies of cyber risk management.
2. Apply: Implement practical insights and real-world examples to manage and mitigate cyber risks.
3. Analyze: Evaluate modern cyber threats and challenges to develop effective risk management strategies.
4. Create: Design a comprehensive cyber risk management plan to establish trust and ensure organizational compliance.

E T 550. AI: Ethics, Privacy, and Governance
3 Credits (3)
This course explores the ethical and privacy challenges that arise when artificial intelligence is applied in scientific research, engineering systems, and real-world decision-making. As AI technologies are increasingly embedded into tools, platforms, and infrastructures across disciplines—from biomedical research and environmental modeling to manufacturing and social systems—the implications for human autonomy, fairness, data protection, and accountability become critically important.

Prerequisite: Graduate standing or consent of instructor.

Learning Outcomes

1. Critically analyze the ethical and privacy implications of AI use in scientific and engineering contexts.
2. Identify and mitigate algorithmic bias, privacy risks, and governance gaps in AI-driven systems.
3. Apply ethical reasoning and privacy-aware design principles to their own research or professional work.
4. Interpret and operationalize regulatory requirements for data use in AI-enabled projects.

E T 551. Enterprise Architecture I

3 Credits (3)

A study of current enterprise architecture methodologies, tools, and techniques. Restricted to: M-IT majors.

Learning Outcomes

1. Demonstrate the ability to utilize and develop architectural enterprise artifacts.
2. Assess multiple enterprise architecture methodologies.
3. Demonstrate IT architecture landscaping capability.
4. Assess integrating IT initiatives utilizing the enterprise architecture processes.

E T 552. Enterprise Architecture II

3 Credits (3)

Advanced topics in enterprise architecture including availability, access, and architecture map development. Restricted to: M-IT majors.

Prerequisite: A grade of C- or better in E T 551.

Learning Outcomes

1. Demonstrate the differences and similarities in multiple enterprise architectures.
2. Demonstrate the ability for independent research on enterprise architectures.
3. Assess architectural artifacts for impact on IT planning and implementation.

E T 555. Virtualization

3 Credits (3)

An analysis and review of system and IT virtualization techniques. Restricted to: M-IT majors.

Learning Outcomes

1. Demonstrate a basic knowledge of the use of Virtual Environments in Information Technology.
2. Demonstrate knowledge in current software used to manage virtual environments.
3. Demonstrate the ability to architect virtual system networks and topology.
4. Students will be exposed to emerging technologies used in complex virtual network design.
5. Students will have the tools to select and deploy need based virtual environments.

E T 560. Strategic Leadership for IT Managers

3 Credits (3)

This course explores the role of IT leaders in shaping and executing business strategy.

Learning Outcomes

1. Analyze the roles and responsibilities of IT leaders to understand their impact on organizational success.
2. Evaluate Strategic IT Governance frameworks and integrate IT initiatives with strategic planning to align with organizational goals.
3. Critically assess case studies and real-world projects to develop practical skills in leading IT departments and managing projects effectively.
4. Design strategies that leverage IT to optimize systems and processes, and manage business relationships to enhance organizational efficiency.

E T 562. Development and Operations

3 Credits (3)

Software development including Python scripting. Operations programming. Restricted to: M-IT majors.

Learning Outcomes

1. Demonstrate a basic knowledge of Operations Management and it's relationship to DevOps.
2. Demonstrate knowledge in current software used in DevOps.
3. Apply DevOps practices to a software deployment workflow.
4. Demonstrate the ability to define a Continuous Integration pipeline with automated testing.
5. Students will apply the continuous feedback principles to project monitoring.
6. Apply best practices to build security into DevOp projects.

E T 577. Advanced Computer Networking

3 Credits (3)

Advanced networking design and analysis. Modernization of infrastructures. Restricted to: M-IT majors.

Learning Outcomes

1. Identify and classify communication network problems.
2. Devise and propose solutions to real-life problems that require communication network technology.
3. Capture network traffic with Wireshark protocol Analyzer.
4. Analyze network traffic with Wireshark protocol Analyzer.
5. Troubleshoot basic network issues.
6. Identify, differentiate, and use IPv4 and IPv6 schemes for address allocation in network design.
7. Apply different techniques to mitigate Quality of Service (QoS) issues in Communication networks.
8. Describe and discuss the evolution of communication network concepts and state of the art in modern communication networks such as Network Virtualization, Software Defined Networks, Cloud computing, Internet of Things, and 5G.

E T 580. IT Innovation and Product Development

3 Credits (3)

Experiential product design and development in information technology. Students will learn about different types of innovation, business models, and methods for developing products. Students will apply the scientific method to develop a product idea of their own related to their field of study. Students will propose ideas, develop hypotheses, test hypotheses, and iterate until they have validated their product idea or identified a need to pivot. Experience in industry and student perspectives are discussed to support the development of their innovations.

Learning Outcomes

1. The student will be able to apply the scientific method to design a product, software, or service.
2. The student will be able to develop a plan to learn about the Product-Market-Fit of their innovation.

3. The student will be able to describe the basics of Business Models and Product-Market-Fit.
4. The student will be able to explain how course concepts relate to the field of information technology.

E T 583. Mobile App Programming and Development
3 Credits (3)
Planning and creation of mobile device applications. Programming tools and technical design considerations. Entrepreneurship and App development. Restricted to: M-IT majors.
Learning Outcomes
1. Demonstrate a basic knowledge of Mobile App development architecture and planning.
2. Demonstrate knowledge in current software used in the creation and maintenance of Mobile Apps.
3. Apply Mobile App software deployment workflow best practices.
4. Demonstrate the ability to create automated multi-form factor user interfaces.
5. Apply best practices to mobile device UI design interfaces.

E T 584. Cyber Threat Intelligence
3 Credits (3)
This course explores the identification, analysis, and application of cyber threat intelligence to enhance security operations. Students will examine threat actors, attack techniques, and intelligence frameworks while learning to collect, assess, and communicate actionable threat data. Through hands-on exercises and case studies, students will develop proactive defense strategies and integrate intelligence into cybersecurity decision-making.
Learning Outcomes
1. Analyze cyber threats, threat actors, and attack techniques to assess risk and potential impact.
2. Utilize cyber threat intelligence frameworks and methodologies to collect, process, and analyze threat data.
3. Develop intelligence reports that provide actionable insights for security operations and decision-making.
4. Evaluate the effectiveness of various threat intelligence sources, tools, and platforms in real-world security applications.
5. Design proactive defense strategies that integrate cyber threat intelligence to enhance an organization's security posture.

E T 585. White Hat System Testing
3 Credits (3)
System penetration testing and repair. Review of methods utilized to gain access to unprotected systems. Testing system repairs and fixes for future prevention. Test documentation. Restricted to: M-IT majors.
Learning Outcomes
1. Describe cryptology.
2. Identify common information-gathering tools and techniques.
3. Perform system hacking, and web and database attacks.
4. Analyze vulnerabilities exploited by hackers.
5. Identify common types of malware and the threats they pose.
6. Perform network traffic analysis and sniffing by using appropriate tools.
7. Identify security controls and defensive technologies.

E T 595. Capstone Projects in Information Technology
3 Credits (3)
Capstone course. Practical application of student's cumulative Information Technology knowledge to an assigned design projects. Project management skills.
Learning Outcomes
1. Demonstrate ability to manage complex work-related IT technical projects.
2. Demonstrate the ability to create an IT engineering project timeline.
3. Demonstrate the ability to self-motivate and organize project timeline.
4. Demonstrate the ability to work in teams and execute project.
5. Demonstrate advanced project goal setting, skills assessment, and weekly updates.

Information and Communication Technology Courses

ICT 141. IT Essentials I: A+ Certification Training Focused on the Hardware Exam
3 Credits (3)
Installing, configuring, troubleshooting, and maintaining personal computer hardware components and will assist in preparation for the CompTIA A+ Hardware certification.
Learning Outcomes
1. Configure and support PC, mobile, and IoT device hardware.
2. Perform basic computer diagnostic and maintenance operations.
3. Implement basic data backup and recovery methods.
4. Apply basic hardware maintenance best practices.
5. Demonstrate baseline security practices for hardware.

ICT 145. Network Essentials: N+ Certification Training
3 Credits (3)
Focuses on the installation and administration of network communication systems and will assist in preparation for the CompTIA N + Network certification.
Learning Outcomes
1. Explain basic networking concepts including network services, physical connections, topologies, and architecture.
2. Explain security concepts and network attacks in order to harden networks against threats.
3. Explain routing technologies and networking devices; deploy Ethernet solutions and configure wireless technologies.
4. Troubleshoot common cable, connectivity, and software issues related to networking.
5. Monitor and optimize networks to ensure business continuity.

ICT 152. Java Programming
3 Credits (3)
Programming in the Java language.
Learning Outcomes
1. Set up a rich programming environment.
2. Analyze existing code.
3. Create/modify/debug/test programs.
4. Employ software documentation and programming best practices.

ICT 161. IT Essentials II: A+ Certification Training focused on the Software exam
3 Credits (3)
Installing, configuring, troubleshooting, and maintaining personal computer operating systems and will assist in preparation for the CompTIA A+ Software certification.

Prerequisite: A grade of C- or better in ICT 141.

Learning Outcomes

1. Configure device operating systems, including Windows, Mac, Linux, Chrome OS, Android, and iOS.
2. Administer client-based and cloud-based software.
3. Troubleshoot and problem-solve core service and support challenges.
4. Apply best practices for documentation, change management, and scripting.
5. Support basic IT infrastructure and networking.

ICT 220. Discrete Math and Its Relationship to Information Technology
3 Credits (3)

Focuses on developing software coding skills using a programming language and its application to discrete mathematics, the use discrete structures in computer science. Topics included are logic, sets, relations, functions, methods of proof, recursion, combinatorics, graph theory, and algorithms

Prerequisite: A grade of C- or better in MATH 1220G or higher.
Corequisite: ICT 152.

Learning Outcomes

1. Explain the relationship between discrete math sets and coded arrays, finite and infinite, subsets, intersection, unions, and other set operations.
2. Explain binary Trees and know how to use demonstrate them using code.
3. Demonstrate the use of code applied to group and subgroup theory.
4. Demonstrate the use of code to create functions and algorithms.
5. Identify and explain logical operations and their application in coding.
6. Demonstrate the use of Probability Theory in code to predict random outcomes.

ICT 267. Information Security+ Certification Preparation
3 Credits (3)

The course covers the Sec+ exam objectives and detailed preparation for certification in information security.

Prerequisite: A grade of C- or better in both, ICT 141 and ICT 145.

Learning Outcomes

1. The student will select appropriate mitigation and deterrent techniques to address network attacks and vulnerabilities.
2. The student will examine how access control, identity management, and cryptography can secure a network and manage risk.
3. The student will identify privacy and policy issues.
4. The student will apply activities that an Information Systems Security specialist would normally carry out in the performance of his/her duties.

ICT 280. Introduction to Web Development
3 Credits (3)

Introduction to front-end web development including webpage design, structure, layout, positioning, responsiveness, and foundational layers of how the web works.

Learning Outcomes

1. Explain the Document Object Model of HTML5 web pages.
2. Organize web page contents with Lists, figures, and organizational elements.
3. Develop web page layout templates.
4. Implement style application inline, via style blocks, and using external resources.
5. Develop and apply javascript event-driven programming to web pages.
6. Explain the difference between client and server-side scripting and data processing.

ICT 300. Special Topics
3 Credits (3)

Directed study or project. Students must be in Junior standing and have the consent of department head to enroll. May be repeated up to 3 credits.

Learning Outcomes

1. Various.

ICT 320. Introduction to Internet Protocols
3 Credits (3)

Present a overview of Internet Protocols Applications. Students must be in Junior or Senior standing only.

Learning Outcomes

1. Students will apply an understanding of basic Networking.
2. Students will employ effective use of Packet analysis software to troubleshoot network issues.
3. Explain the RFC process for developing network protocols.
4. Explain network protocol security implications.

ICT 339. Introduction to Digital Forensics and Incident Response
3 Credits (3)

Introduction to the skills required to perform digital forensics and incident response on Windows operating systems. Topics include: live response, evidence acquisition, Windows operating system artifacts, documentation and reporting.

Prerequisite: A grade of C- or better in ICT 141 or ICT 161.

Learning Outcomes

1. To understand Digital Forensics terms and definitions and why digital forensics is needed.
2. To study what is required and how to perform digital forensics.
3. To become familiar and aware of the hindrances/obstacles that affects effective digital/computer forensic operations.
4. To learn about the tools and procedures for how deleted data is recovered during digital forensic operations.
5. To use forensic tools and procedures to perform digital forensic operations on Windows operating systems, Emails, Mobile devices, and Communication networks (Computer, wireless, cellular networks).
6. To learn about incident response and procedures.

ICT 350V. Introduction to Personal Computer Security and Privacy
3 Credits (3)

Introduction to Information Security and Privacy – Have you ever wondered what happens to all of your browsing history or data you fill out on websites go? Who has this data? What do they do with this data? How do you stop sharing your private information? This class will answer those questions and provide steps to make your online presence more secure.

Learning Outcomes

1. Classify security issues
2. Classify Privacy protections
3. Evaluate threats and countermeasures based on personal security breaches.
4. Formulate a real-time privacy response

5. Assess international privacy protections through a multicultural focus.

ICT 352. Software Technology I
3 Credits (3)
This course focuses on reading, writing, debugging, testing, and documenting computer programs. May be repeated up to 3 credits.
Learning Outcomes
1. Set up a rich programming environment
2. Analyze existing code
3. Create/modify/debug/test programs
4. Employ software documentation and programming best practices

ICT 355. Linux System Administration
3 Credits (3)
Operating systems applications and interfacing with an introduction to systems administration. Topics include Shell Programming, Programming Tools, Database Management, System Backups, Security, Setup, and Maintenance of Linux Servers.
Learning Outcomes
1. Create a virtual environment on a host system using VirtualBox.
2. Develop single and multiple Linux Operating Systems within The VirtualBox Virtual Environment.
3. Select applications on production Linux Operating systems.
4. Support the operation of the Linux Operating system using System Administration Techniques.

ICT 360. Operating Systems for ICT
3 Credits (3)
Fundamentals of operating systems with Windows and Linux including installation and configuration using the GUI as well as the command line, text editors, file systems, scripting and operating system management.
Learning Outcomes
1. Create a virtual environment on a host system using VirtualBox.
2. Create multiple Operating Systems in a Virtual Environment.
3. Manage error codes in Virtual Machines.
4. Support the operation of the CentOS GUI and Windows Operating Systems.

ICT 362. Software Technology II
3 Credits (3)
Topics include problem analysis, object-oriented programming (OOP), structured logic, and development concepts. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better in ICT 152 or ICT 352 or E T 262 or OECS 195 or C S 152 or C S 172.
Learning Outcomes
1. Set up and use a rich programming environment for programming with Python.
2. Analyze existing code.
3. Employ effective use of basic programming and basic troubleshooting.
4. Employ effective use of Object-Oriented Programming (OOP) and troubleshooting.
5. Apply testing and documentation best practices.

ICT 364. Windows Enterprise Administration
3 Credits (3)
Installation, configuration, and maintenance of Windows Enterprise services which includes Active Directory, distributed file systems, SQL Server, Web Server, Authentication Procedures, and enterprise elasticity. Topics covered include: Server Maintenance and Troubleshooting Methodologies.
Prerequisite: A grade of C- or better in ICT 152.
Learning Outcomes
1. Set up and use a Windows Enterprise environment with Active Directory.
2. Use best practices to design an organizational structure and define AD DS Objects.
3. Deploy an AD DS embedded DHCP server with IPv4, IPv6, and Failover.
4. Analyze and use PowerShell code for process automation.
5. Deploy security and user settings using Group Policy.
6. Apply version updates and establish an intra-forest trust relationship.

ICT 372. Software Engineering and Design
3 Credits (3)
Topics include the software development lifecycle, problem analysis, and implementing software testing routines to improve the quality, integrity, and security of code.
Prerequisite: A grade of C- or better in ICT 362.
Learning Outcomes
1. Identify, explain, and apply the phases of the SDLC.
2. Identify different Agile methodologies and practices for software project management.
3. Use different development tools and apply best practices.
4. Apply best practices in the creation of business objects, data storage and access, testing, and debugging.
5. Configuring, handling, testing, and deploying services.

ICT 377. Computer Networking I
3 Credits (3)
Computer network design and applications for LAN, TCP/IP networks, routing and switching technologies, VLANs, and the OSI layers from physical to transport.
Prerequisite/Corequisite: A grade of C- or better MATH 1220G or higher.
Learning Outcomes
1. Define and distinguish the role of a network administrator (from other roles in the IT world).
2. Identify the OSI model, its layers, and the relationship to the TCP/IP model.
3. Identify different cable media and networking devices and their use.
4. Design, configure and troubleshoot basic networks.
5. Identify MAC, IPvfour, and IPvsix addressing.
6. Apply different techniques for IP allocation and subnet design (IPvfour).
7. Use the Cisco IOS software for basic switch and router configurations.
8. Configure and troubleshoot basic setup for static and dynamic routing protocols.

ICT 380. Web Design and Multimedia
3 Credits (3)
Introduction to front-end web development including webpage design, structure, layout, positioning, responsiveness, and foundational layers of how the web works. Video, audio, and other digital presentation tools are covered.

Learning Outcomes

1. Create multiple front-end development micro-components.
2. Create single and multi-page websites.
3. Use flexbox, grid, and media queries and different design patterns.
4. Employ effective use of web development and basic troubleshooting.
5. Build small web site projects.

ICT 400. Special Topics
1-3 Credits (1-3)
Directed study or project. Students must be in Senior standing and have the consent of department head to enroll. May be repeated up to 6 credits.
Learning Outcomes

1. Various.

ICT 435. Senior Project
3 Credits (3)
Capstone course. Practical application of student's cumulative knowledge to an assigned design project. Design principles, teamwork, and project management skills are stressed. Demonstration of written and oral communication skills via project documentation and presentation of results. Must be graduating senior. Consent of Instructor required. Restricted to ICT Majors.
Prerequisite: A grade of C- or better in the following: ICT 364 and ICT 377 and (ICT 462 or ICT 355).
Learning Outcomes

1. Demonstrate ability to manage a complex technical project.
2. Demonstrate the ability to create an engineering project timeline.
3. Demonstrate the ability to self-motivate and organize project.
4. Demonstrate the ability to work in teams and execute project.
5. Goal setting, skills assessment and portfolio development included.

ICT 439. Advanced Digital Forensics and Incident Response
3 Credits (3)
Advanced topics in digital forensics and incident response. Topics include network analysis and advanced cybersecurity concepts.
Prerequisite: A grade of C- or better in both, (E T 339 or ICT 339 or ICT 450) and (E T 377 or ICT 377).
Learning Outcomes

1. Demonstrate the use of forensic tools and procedures to perform digital forensic operations on Windows operating systems, Emails, Mobile devices, and Communication networks (Computer, wireless, cellular networks).
2. Demonstrate proper incident response procedures and proper chain of custody when handling digital evidence.
3. Students will become familiar with tools and processes to analyze and detect memory resident processes that include malware, rootkits, and user recoverable data.
4. Students will also have exposure to methods and processes used by hackers to penetrate and compromise targets.

ICT 450. Ethical Hacking
3 Credits (3)
Ethical Hacking and Penetration testing techniques. Students must be in senior standing to enroll.
Prerequisite: A grade of C- or better in ICT 350V.
Learning Outcomes

1. Analyze networking concepts as they relate to hacking vulnerabilities.
2. Define contract requirements necessary to avoid legal liability during Ethical Hacking.
3. Employ tools and techniques to scan and do reconnaissance on potential targets.
4. Demonstrate use of vulnerability testing tools to identify vulnerabilities and exploits.
5. Identify the role of sniffers and session Hijacking in Ethical Hacking.
6. Demonstrate the use of Social Engineering tools and techniques used in Ethical Hacking.

ICT 457. Information Security Principles
3 Credits (3)
This course provides an overview of security challenges and strategies of countermeasure in the information systems environment. Topics include definition of terms, concepts, elements, and goals incorporating industry standards and practices with a focus on availability, vulnerability, integrity and confidentiality aspects of information systems.
Prerequisite: A grade of C- or better in ICT 350V.
Learning Outcomes

1. Demonstrate an understanding of the information security concepts.
2. Demonstrate an understanding of the diversity of potential attacks against an organization.
3. Demonstrate an understanding of cryptographic techniques.
4. Demonstrate an understanding of authentication methods.
5. Demonstrate an understanding of access control systems.
6. Demonstrate an understanding of various network security controls.
7. Demonstrate an understanding of the legal, ethical, and professional issues in information security.

ICT 458. Web Development and Database Applications
3 Credits (3)
Design, plan, and build interactive and dynamic web applications. Topics include relational databases, object-oriented programming, and the application of backend frameworks.
Prerequisite/Corequisite: A grade of C- or better in ICT 362.
Learning Outcomes

1. Build knowledge of Web Servers.
2. Plan, design, and create code for backend web development.
3. Design, create, and access databases that support web applications.
4. Implement adequate security and authentication for the deployment of Web applications.

ICT 460. Advanced Software Development Concepts
3 Credits (3)
This course focuses on advanced software development concepts to help embed security into code, protecting software applications.
Prerequisite: A grade of C- or better in ICT 362.
Learning Outcomes

1. Application of best practices against software vulnerabilities.
2. Identification of code defects, bugs, and logic flaws.
3. Assessment and testing of code.
4. Utilization of secure code alternatives.
5. Code refactoring to improve design and structure and prevent vulnerabilities.

ICT 462. Linux System Administration
3 Credits (3)
Operating system applications and interfacing with an introduction to systems administration. Topics include Shell Programming, Programming Tools, Database Management, System Backups, Security, Setup and Maintenance of Linux Servers.

Learning Outcomes

1. Create a virtual environment on a host system using VirtualBox.
2. Develop single and multiple Linux Operating Systems within The VirtualBox Virtual Environment.
3. Select applications on production Linux Operating systems.
4. Support the operation of the Linux Operating system using System Administration Techniques.

ICT 463. Enterprise Linux Network Administration Tools
3 Credits (3)
Advanced methods and tools used to deploy, manage, and administer networked devices.
Prerequisite: A grade of C- or better in ICT 377.
Learning Outcomes

1. Demonstrate the ability to use Software Versioning systems using Windows and Linux.
2. Apply best practices with versioning repositories when creating software.
3. Deploy single and clustered microservice containers to support a web application.
4. Use script-based code to deploy and configure a full stack web server.
5. Use infrastructure management software to deploy defined roles in multiple environments.

ICT 467. Communication Network Security
3 Credits (3)
The course provides a technical perspective on maintaining the security of communication network systems. It covers a wide range of technical issues, including wired, wireless and Internet communication fundamentals, communication network security mechanisms and configuration, standards and protocols, vulnerabilities, attacks and countermeasures.
Prerequisite: A grade of C- or better in both, ICT 320 and ICT 377.
Learning Outcomes

1. Demonstrate an understanding of key and basic communication network security concepts, terminologies, standards, issues, and policies.
2. Apply the principles of network security techniques such as Cryptography, Cryptanalysis, Biometrics, Watermarking, and Stenography.
3. Implement security techniques with commonly available network security software.
4. Examine the fundamentals of Wired and Wireless communication network systems including Cellular, Bluetooth, Wi-Fi, Internet, Cloud Networking, and the Internet of Things.
5. Explain the TCP/IP security protocols that pertain to communication network systems.
6. Explain the security attacks, threats, risks, mechanisms, and tools associated with and used for securing network devices especially mobile devices.
7. Demonstrate an understanding of the operation and countermeasures against Malwares in network systems and the implementation of intrusion detection and prevention, and firewall technologies.

ICT 477. Computer Networking II
3 Credits (3)
Advanced concepts in computer network design and applications including managing the campus network infrastructure (LANs and virtual LANs), network services (DNS and DHCP), network security as well as network monitoring.
Prerequisite: A grade of C- or better in either ICT 377 or E T 377 or CTEC 285.
Learning Outcomes

1. VLSM, Summarization, and the TCP/IP model.
2. Understanding of IPvsix basics
3. Configuration of routing protocols using IPvsix
4. Configuration of advanced router configurations
5. Configuration of route redistribution, DHCP, DNS, NAT and PAT
6. Configure network security and Access Control Lists (ACLs)
7. Perform basic analysis of network data traffic
8. Create, test and troubleshoot software simulations (Cisco Packet Tracer)

ICT 487. Data Security
3 Credits (3)
Delving into the realm of advanced data security is the essence of this senior-level undergraduate course. Students will immerse themselves in the intricacies of safeguarding digital information by covering an array of topics, from encryption to secure data transmission, and extending to secure data storage and data security in use. The course takes a comprehensive approach, encompassing three key domains of data security: data in motion, data at rest, and data in use. Throughout the journey, students will grasp the technical and theoretical underpinnings of data security and cultivate practical, hands-on expertise in fortifying data against vulnerabilities.
Prerequisite: A grade of C- or better in both, ICT 320 and ICT 360.
Learning Outcomes

1. Understand the fundamental concepts of data security, including data in motion, data at rest, and data in use.
2. Explore encryption algorithms and their applications in data security.
3. Evaluate the importance of secure communication protocols in data transmission.
4. Develop skills in secure data storage and backup techniques.
5. Analyze various security architectures, such as network security, cloud security, and mobile security.

Surveying Engineering (Geomatics) Courses

SUR 143. Civil Drafting Fundamentals
3 Credits (2+2P)
Introduction to drafting in the field of Civil Engineering. Drawings, projects, and terminologies related to topographic, contour drawings, plan and profiles, and street/highway layout. Restricted to Community Colleges only. Taught with E T 143 and DRFT 143.
Prerequisite: DRFT 109.
Learning Outcomes

1. Use appropriate drafting/technical terminology.
2. Identify of the different types of Civil Engineering work drawing plan sets.
3. Understanding and the use of the terminologies used in the industry.
4. Use AutoCAD Civil 3D.
5. Enter appropriate data into AutoCAD software in order to retrieve necessary outcomes.
6. Plot/Print different types of civil engineering working plans.

7. Read, interpret and understand engineering drawings.
8. Define and understand the different types of engineering drawings.

SUR 222. Introduction to Geomatics
3 Credits (2+3P)
Theory and practice of geomatics as applied to plane surveying in the areas of linear measurements, angle measurements, area determination, differential and trigonometric leveling, and topographic mapping.
Prerequisite: A grade of C- or better in both, E T 109 and (MATH 1250G or higher).
Learning Outcomes
1. Perform basic distance and angular measurements.
2. Evaluate the quality of collected measurements.
3. Utilize a measuring tape.
4. Determine a plumb line.
5. Set up a level line.
6. Set up a tripod and total station.
7. Utilize a plumb rod.
8. Understand the role of surveying in civil engineering and construction-related fields.
9. Understand new technologies is surveying.

SUR 285. Precise Digital Mapping
3 Credits (3)
Photogrammetric Mapping Principles, digital sensor including optical cameras, terrestrial, surveying control, IMU & GPS integration, stereo photography, analytical triangulation, orthorectification, precision and accuracy of measurement systems, sUAS (Small Unmanned Aerial Vehicles) data collection project fight/pre planning, introduction to laser scanning systems.
Learning Outcomes
1. Understand the basic principles of photogrammetry.
2. Perform photo measurements and computation.
3. Be able to design aerial surveying projects.
4. Define the basic principles of analytical photogrammetry.
5. Explain the different steps in aerial triangulation.

SUR 292. Legal Principles and Boundary Law I
3 Credits (3)
Fundamentals of real property law; principles of land description; survey evidence and procedure in boundary determination, order of importance of conflicting elements; liability, ethical and professional principles in boundary surveying; NM professional practice act; NM Minimum Standards, contemporary issues in boundary determination.
Prerequisite: C- or better in SUR 222.
Learning Outcomes
1. Demonstrate an understanding of surveying boundary laws.
2. Describe procedures for locating real property boundaries.
3. Read, interpret, and write legal descriptions of real property.
4. Perform legal research of case and statutory law.
5. Communicate research findings through written and oral presentations.

SUR 312. Public Land Survey System Boundaries
3 Credits (3)
Fundamentals of the U.S. Public Land Survey System; rules for the survey of the public lands, field surveys; the rectangular system, corners, monuments, evidence; dependent and independent resurveys, corner restoration; plats and field notes, patents.
Prerequisite: A grade of C- or better in SUR 222.
Learning Outcomes
1. Understand how the USPLSS was developed and used.
2. Develop the ability to locate and identify USPLSS survey monuments.
3. Recognize the need for restoring lost corners and apply proportionate methods.
4. Perform computations for simple PLSS section subdivisions.
5. Demonstrate an ability to read, write and interpret USPLSS legal descriptions.

SUR 315. Advanced Mapping Technologies
2 Credits (2)
Advanced applications of airborne sUAS (Small Unmanned Aerial Vehicles) in 3D data acquisition, sensor specifications, selection, and platform compatibility. Principles of lidar data collection, airborne and terrestrial. LiDAR data processing including registration, modeling, and analysis. Point cloud principles, processing, and applications. DEMs principles, processing and analysis. Principles and applications of GPR in surveying.
Prerequisite: SUR 285 and Junior Standing.
Corequisite: SUR 315L.
Learning Outcomes
1. Identify the basic principles and applications of advanced mapping technologies.
2. Compare and contrast different UAS-based aerial surveying techniques for 3D data acquisition principles and applications of Ground Penetrating Radar (GPR).
3. Process, analyze, and interpret point clouds and DEMs.
4. Recognize the principles of terrestrial LiDAR data collection.
5. Explain the principles and applications of Ground Penetrating Radar (GPR).

SUR 315L. Advanced Mapping Technologies Lab
1 Credit (1P)
Hands-on application of using optical and LiDAR UASs in surveying and mapping. Design and conduct UAV surveys, including flight planning and pre-planning with an understanding of sensor limitations, control point configuration, and FAA regulations and restrictions. Applications of terrestrial scanners in collecting accurate 3D models. Process, analyze, and visualize different types of point clouds.
Prerequisite: SUR 285.
Corequisite: SUR 315.
Learning Outcomes
1. Identify lab safety, workflow overview, and liability considerations.
2. Apply UAS technologies in surveying and mapping projects through hands-on flight operations.
3. Develop 3D point clouds for surveying, engineering, and mapping applications.

SUR 328. Construction Surveying & Automation Technologies
3 Credits (2+3P)
Construction Surveying Principles: conventional and machine controlled. Layout alignments, grades, various infrastructure, buildings. Understand error identification, common quality control checks and blunder identification. Alignments and station/off set, types of construction layout of infrastructure: roads, bridges, utilities (including subsurface), buildings, industrial; reading and interpreting construction plans, data management, horizontal, vertical and spiral curves, slope staking, machine control basics, applications and data managements. Use of electronic files and liability issues. Layout alignments, grades, various

infrastructure, buildings. Ability to understand data integration in automated machine control, work flow processes.
Prerequisite: A grade of C- or better in both, (SUR 222 or DRFT 222) and (ENGR 190 or MATH 1511G or MATH 1511H).
Learning Outcomes
1. Acquire the ability to answer test questions on professional surveying exams.
2. Develop the ability to appropriately collect, analyze, interpret and apply surveying and surveying-related data.
3. Develop the ability to recognize, analyze, and solve surveying and surveying-related problems.
4. Develop the ability to work on teams.

SUR 328L. Construction Surveying & Automation Technologies Lab
1 Credit (1P)
Hands-on application of surveying equipment such as GNSS and total stations to perform construction stakeout for different types of construction layouts, including buildings, horizontal and vertical alignments. Reading and interpreting construction plans. Integrating machine-controlled surveys in different applications.
Prerequisite: A grade of C- or better in both, (SUR 222 or DRFT 222) and (ENGR 190 or MATH 1511G or MATH 1511H).
Corequisite: SUR 328.
Learning Outcomes
1. Identify lab safety, workflow overview, and liability considerations.
2. Apply surveying technologies in construction stakeout.
3. Recognize different forms of construction plans.

SUR 351. Spatial Data Adjustment I
3 Credits (3)
Theory of random error in observations/measurements. Use of statistics in spatial data analysis, statistical testing, advanced data structures. Emphasis on computer based problem solving and programming to solve spatial data problems.
Prerequisite: A grade of C- or better in the following: (SUR 222 or DRFT 222) and (A ST 311G or MATH 1350G) and (ENGR 190 or MATH 1511G or MATH 1511H).
Learning Outcomes
1. Acquire the ability to answer questions on professional surveying exams.
2. Acquire a sound and fundamental understanding of the mathematical principles underlying surveying measurements and computations.
3. Develop the ability to appropriately analyze, interpret, and apply survey and survey-related data.
4. Develop the ability to recognize, analyze, and solve survey and survey-related problems.

SUR 361. Geodesy/Geodetic Control Surveying
3 Credits (3)
Horizontal and vertical control network design and consideration. Understand ellipsoid, geoid, horizontal and vertical datum, coordinates, precise leveling, astronomic, establishment of state plane zones, understanding reporting. Transform data between geodetic Latitude/Longitude, state plane, ground data, perform geodetic computations, ability to design GPS networks utilizing CORS stations, network adjustments. Perform a control survey, process data, adjust network, and prepare control report with Meta-data.
Prerequisite: A grade of C- or better in the following: (SUR 222 or DRFT 222) and (ENGR 190 or MATH 1511G or MATH 1511H).
Learning Outcomes
1. Define the different coordinate systems and geometric models used to represent the shape of the Earth.
2. Be able to perform surveying computations on the sphere and ellipsoid.
3. Distinguish between the different map projections systems.
4. Explain the effects of gravity in survey measurements, especially in precise leveling.
5. Outline how earth motions affect surveying measurements and the different time systems.
6. Explicitly indicate which of the student outcomes listed in Criterion III or any other outcomes are addressed by the course.

SUR 401. Ethics and Professionalism in Surveying and Mapping
3 Credits (3)
Ethics as applied to the surveying profession. Includes case studies and problems. May be repeated up to 3 credits.
Learning Outcomes
1. An ability to communicate effectively with a range of audiences.
2. An ability to understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts.

SUR 412. Advanced Topics in Boundary Surveying
3 Credits (2+3P)
Advanced land boundary topics including water boundaries, mineral claims, Spanish and Mexican land grants, state and national boundaries. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better in SUR 312.
Learning Outcomes
1. Identify land boundary topics

SUR 440. Geomatics Laboratories
2 Credits (6P)
Layout alignments, grades, various infrastructure, buildings. Performing GNSS surveys including RTK, rapid-static, static data collection and processing. Laser scanning and photogrammetric data collection and processing. Surveying applications in the U.S. Public Land Survey System (PLSS).
Prerequisite: A grade of C- or better in, SUR361, (SUR 222 or DRFT 222) and (MATH 1435 or MATH 1511G).
Prerequisite/Corequisite: SUR 328 and SUR 461.
Learning Outcomes
1. An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.
2. An ability to communicate effectively with a range of audiences.
3. An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.

SUR 450. Senior Project
3 Credits (3)
Research project prepared by student. Includes class presentation. Students will learn how to research after the end of their formal education. Students must be in Senior Standing to enroll.
Learning Outcomes
1. An ability to identify, formulate, and solve broadly defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to the discipline.
2. An ability to formulate or design a system, process, procedure or program to meet desired needs.

3. An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.
4. An ability to communicate effectively with a range of audiences.

SUR 451. Spatial Data Adjustment II
3 Credits (3)
Rigorous analysis of the theory of observations as applied to spatial data, application of least squares adjustments, ability to perform statistical analysis to determine accuracy of final product, constrained/free geospatial data integration, error ellipses, and pre-analysis of spatial data acquisition procedures.
Prerequisite: A grade of C- or better in SUR 351.
Learning Outcomes
1. Understand the theory of least squares as applied to survey measurements
2. Understand the relevance of weighting survey observations
3. Be able to adjust vertical, horizontal and 3D networks by least squares
4. Be able to transform coordinates between similar coordinate systems
5. Be able to analyze survey errors and detect survey blunders

SUR 452. Surveying Practicum
3 Credits (3)
Surveying practice under the direction of a licensed, professional land surveyor requiring an approved number of hours. Planned work between the student and the surveyor should be designed to be part of a project that integrates spatial data. An individualized syllabus should be developed collaboratively with the industrial partner and approved by the geomatics faculty. The final deliverable must be certified by the licensed professional land surveyor. A written report by the student is required. Credit is given to past work experience in cases where students can demonstrate that requirements for the practicum are met and should be approved by geomatics faculty.
Learning Outcomes
1. Demonstrate a level of technical competency, based upon completing the requirements of a geomatics technology curriculum.
2. Students are expected to successfully and professional complete a "real" project. Additionally, student work is employed to assess most of the program's outcomes for program assess.

SUR 461. GNSS Positioning
2 Credits (2)
Logistics of GNSS data collection, the GPS signal, codes and biases, error sources, differences between relative and autonomous GNSS positioning, code phase carrier phase, DGPS static and RTK surveys. Geodetic and GPS standards and specifications GNSS data processing, network adjustments, and evaluation of spatial data accuracy practical applications of GNSS.
Prerequisite: A grade of C- or better in SUR 361.
Corequisite: SUR 461L.
Learning Outcomes
1. Outline the relationship of geodesy to satellite positioning systems.
2. Describe the procedure of GNSS surveys.
3. Differentiate between different GNSS surveying techniques.
4. Identify GPS standards and specifications.

SUR 461L. GNSS Positioning Lab
1 Credit (1P)
Hands-on experience using different types of surveying-grade GNSS equipment in collected geospatial data for surveying and engineering applications. Mastering field procedures, understanding equipment functionality, and learning to process and evaluate real-world GNSS data. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better in SUR 361.
Corequisite: SUR 461.
Learning Outcomes
1. Identify lab safety, workflow overview, and liability considerations.
2. Conduct different types of GNSS surveys for mapping and engineering applications.
3. Assess the quality and reliability of spatial data collected by different GNSS surveying techniques.

SUR 464. Legal Principles and Boundary Law II
3 Credits (3)
Advanced boundary determination, evaluation of written and field evidence. Advanced application of PLSS subdivision, special surveys (water, mineral, and reservations), NM Standards, and laws. Preparation of boundary survey plats and reports. ALTA/NSPS Surveys and Standards.
Prerequisite: A grade of C- or better in both, SUR 292 and SUR 312.
Learning Outcomes
1. Application of the rules of evidence as concerning to boundary surveys.
2. Demonstrate understanding between original, resurveys, and retracements.
3. Acquire the ability to perform advanced section subdivisions.
4. Understand the issues of professional liability and ethical practice.

SUR 485. Emerging Techniques in Geospatial Technologies
3 Credits (3)
Hydrographic, Altimetry, Space borne Imaging Systems, Mobile Mapping Systems, Mining and Agriculture Surveying Principles, Ranging technologies and applications such as LiDAR, SAR, and Bathymetry. Principles of terrestrial & airborne laser scanning, point cloud data management & extraction, scan registration and processing, and advanced ranging data acquisition systems. Consent of Instructor required.
Prerequisite(s): Senior standing.
Learning Outcomes
1. Outline the different techniques in mapping seabed.
2. Describe the procedure of LIDAR mapping.
3. Outline the remote sensing technologies used in mapping.
4. Recognize the UAV mapping technologies.
5. Produce surveying products from new technologies in geomatics.

Department Contact Information

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Civil Engineering Technology - Bachelor of Science in Engineering Technology

The **Civil Engineering Technology** (CET) program at NMSU will prepare graduates with the technical and managerial skills necessary to enter careers in planning, designing, constructing, and operating the built environment and global infrastructure. Graduates with the baccalaureate degree have strengths in their knowledge of design, construction, testing, and operation of buildings and infrastructure with the ability to produce and utilize construction documents, analyze and design systems, specify project methods and materials, perform cost estimates and analyses, and manage technical activities in support of civil projects. Graduates from our ABET-accredited CET program can pursue professional licensure and become professional engineers.

The **Civil Engineering Technology** program is accredited by the Engineering Technology Accreditation Commission of ABET, https://www.abet.org (https://www.abet.org/), under the commission's General Criteria and Program Criteria for *Civil Engineering Technology and Similarly Named Programs*.

Concentrations

- Renewable Energy Technologies (https://catalogs.nmsu.edu/nmsu/engineering/engineering-technology-surveying/engineering-technology-civil-renewable-energy-tech-bachelor-science-engineering-technology/)
- Transportation Technology (https://catalogs.nmsu.edu/nmsu/engineering/engineering-technology-surveying/engineering-technology-civil-transportation-tech-bachelor-science-engineering-technology/)

Minors

- Renewable energy (p. 1199)
- Geomatics (p. 1198)

Types of jobs that graduates pursue in this field

- Civil Engineer
- Construction Manager
- Project Engineer
- Project Manager
- Design Engineer
- Construction Inspector
- Owner
- Estimator
- Distribution and Sales

Civil Engineering Technology- (No Concentration)

Students must complete all University degree requirements, which include General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		*4*
ENGL 1110G	Composition I	
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		*3*
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		*3*
COMM 1115G	Introduction to Communication	
or HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		*4*
MATH 1511G	Calculus and Analytic Geometry I [1]	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III: Laboratory Sciences		*8*
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
or GEOL 1110G	Physical Geology	
Choose one sequence from the following for four credits:		
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
or PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: Social/Behavioral Sciences [2]		*3*
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II [1]	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World [3,4]		**6**
Departmental/College Requirements		
A ST 311	Statistical Applications	3
or MATH 1350G	Introduction to Statistics	
E T 101	Introduction to Engineering Technology and Geomatics	1
E T 109	Computer Drafting Fundamentals	3
E T 143	Civil/Survey Drafting I	3
E T 154	Construction Methods and Communications	3
E T 254	Concrete Technology	3
E T 308	Fluid Technology	3
E T 308 L	Fluid Technology Lab	1
E T 310	Applied Strength of Materials	3
E T 310 L	Applied Strength of Materials Lab	1
E T 332	Applied Design of Structures I	4
E T 354	Soil and Foundation Technology	4
E T 355	Site/Land Development and Layout	3

E T 410	Senior Seminar	1
E T 412	Highway Technology	3
E T 418	Applied Hydraulics	3
E T 421	Senior Project	3
E T 432	Applied Design of Structures II	4
E T 459	Construction Technology and Management	3
ENGR 120	DC Circuit Analysis	3-4
or PHYS 1240G	Algebra-Based Physics II	
or PHYS 1320G	Calculus -Based Physics II	
ENGR 190	Introduction to Engineering Mathematics	4
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
I E 451	Engineering Economy	3
SUR 222	Introduction to Geomatics	3
Geomatics/Surveying Elective (choose 1 course from the list below)		*3*
SUR 328 & 328L	Construction Surveying & Automation Technologies and Construction Surveying & Automation Technologies Lab	
SUR 351	Spatial Data Adjustment I	
SUR 361	Geodesy/Geodetic Control Surveying	
Technical Electives (choose 2 courses from the list below) [4]		*6*
E T 381	Renewable Energy Technologies	
E T 382	Solar Energy Technologies	
E T 384	Wind and Water Energy Technologies	
E T 386	Sustainable Construction and Green Building Design	
E T 420	Engineering Internship [5]	
E T 472	Intelligent Transportation Systems (ITS)	
ENGR 400	Special Topics (Choose three 1-credit courses related to the field) [5]	
Second Language: (not required)		
Electives, to bring the total credits to 120		**0**
Total Credits		**121-122**

1. Students may need to take any prerequisites needed before enrolling in MATH 1511G Calculus and Analytic Geometry I or MATH 1521G Calculus and Analytic Geometry II. These courses satisfy both the Area II and General Education Elective requirements.
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4. Concentrations are *"optional"* educational sequences that students may chose to focus on particular areas related to CET. Concentrations may often be done without additional credits by judicious use of electives and other optional course requirements.
5. Verify with your faculty advisor for pre-approval of ENGR 400 Special Topics that are related to the field and for discussion of E T 420 Engineering Internship limitations and specifications.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
E T 101	Introduction to Engineering Technology and Geomatics	1
E T 154	Construction Methods and Communications	3
ENGR 120 or PHYS 1240G or PHYS 1320G	DC Circuit Analysis or Algebra-Based Physics II or Calculus -Based Physics II	3-4
ENGR 190	Introduction to Engineering Mathematics	4
	Credits	**15-16**
Spring		
E T 109	Computer Drafting Fundamentals	3
CHEM 1120G or GEOL 1110G	Introduction to Chemistry Lecture and Laboratory (non majors) or Physical Geology	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
Area III: Lab Sciences (Choose one)		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
	Credits	**15**
Second Year		
Fall		
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
E T 143	Civil/Survey Drafting I	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
ENGR 233	Engineering Mechanics I	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [1] or Calculus and Analytic Geometry II Honors	4
	Credits	**16**
Spring		
Area IV: Social Behavior Sciences [2]		3
E T 254	Concrete Technology	3
E T 308	Fluid Technology	3
E T 308 L	Fluid Technology Lab	1
ENGR 234	Engineering Mechanics II	3
SUR 222	Introduction to Geomatics	3
	Credits	**16**
Third Year		
Fall		
Area V: Humanities [2]		3
E T 310	Applied Strength of Materials	3
E T 310 L	Applied Strength of Materials Lab	1
E T 354	Soil and Foundation Technology	4
Viewing a Wider World [3]		3
	Credits	**14**
Spring		
Area VI: Creative and Fine Arts [2]		3
E T 332	Applied Design of Structures I	4

E T 355	Site/Land Development and Layout	3
Surveying Elective Course (from pre-approved list) [4]		3
Technical Elective Course (from pre-approved list) [5]		3
	Credits	**16**
Fourth Year		
Fall		
A ST 311 or MATH 1350G	Statistical Applications or Introduction to Statistics	3
E T 432	Applied Design of Structures II	4
E T 459	Construction Technology and Management	3
I E 451	Engineering Economy	3
Technical Elective Course (from pre-approved list) [5]		3
	Credits	**16**
Spring		
E T 410	Senior Seminar	1
E T 412	Highway Technology	3
E T 418	Applied Hydraulics	3
E T 421	Senior Project	3
Viewing a Wider World [3]		3
	Credits	**13**
	Total Credits	**121-122**

1. Students may need to take any prerequisites needed before enrolling in MATH 1511G Calculus and Analytic Geometry I or MATH 1521G Calculus and Analytic Geometry II. These courses satisfy both the Area II and General Education Elective requirements.
2. See the General Education (p. 262) section of this catalog for a full list of courses
3. See the Viewing a Wider World (p. 266) section of this catalog for a full list of courses
4. **Surveying Electives:** SUR 328 Construction Surveying & Automation Technologies, SUR 351 Spatial Data Adjustment I, or SUR 361 Geodesy/Geodetic Control Surveying
5. **Technical Elective Courses:** Select from the list or any SUR 300+ (in addition to the required Surveying Elective), ENGR 400 Special Topics that are related to the field, and E T 420 Engineering Internship, subject to faculty advisor pre-approval.

Civil Engineering Technology (Renewable Energy Technologies) - Bachelor of Science in Engineering Technology

Students must complete all university degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G or ENGL 1110H	Composition I Composition I Honors	4
English Composition - Level 2		
ENGL 2210G or ENGL 2210H	Professional and Technical Communication Professional and Technical Communication	3
Oral Communication		*3*
COMM 1115G or HNRS 2175G	Introduction to Communication Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] Calculus and Analytic Geometry I Honors	4
Area III: Laboratory Sciences		*8*
CHEM 1120G or GEOL 1110G	Introduction to Chemistry Lecture and Laboratory (non majors) Physical Geology	
Choose one sequence from the following for four credits:		
PHYS 1230G & PHYS 1230L or PHYS 1310G & PHYS 1310L	Algebra-Based Physics I and Algebra-Based Physics I Lab Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: Social/Behavioral Sciences [2]		*3*
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [1] Calculus and Analytic Geometry II Honors	4
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
E T 101	Introduction to Engineering Technology	1
E T 109	Computer Drafting Fundamentals	3
E T 143	Civil/Survey Drafting I	3
E T 154	Construction Methods and Communications	3
E T 254	Concrete Technology	3
E T 308	Fluid Technology	3
E T 308 L	Fluid Technology Lab	1
E T 310	Applied Strength of Materials	3
E T 310 L	Applied Strength of Materials Lab	1
E T 332	Applied Design of Structures I	4
E T 354	Soil and Foundation Technology	4
E T 355	Site/Land Development and Layout	3
E T 410	Senior Seminar	1
E T 412	Highway Technology	3
E T 418	Applied Hydraulics	3
E T 421	Senior Project	3
E T 432	Applied Design of Structures II	4
E T 459	Construction Technology and Management	3
SUR 222 or DRFT 222	Introduction to Geomatics Introduction to Geomatics	3
ENGR 120 or PHYS 1240G or PHYS 1320G	DC Circuit Analysis Algebra-Based Physics II Calculus -Based Physics II	3-4
ENGR 190	Introduction to Engineering Mathematics	4
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
I E 451	Engineering Economy	3
A ST 311 or MATH 1350G	Statistical Applications Introduction to Statistics	3
Concentration Coursework [4]		
E T 381	Renewable Energy Technologies	3

E T 382	Solar Energy Technologies	3
E T 384	Wind and Water Energy Technologies	3
SUR 328 & 328L	Construction Surveying & Automation Technologies and Construction Surveying & Automation Technologies Lab	3
Second Language: (not required)		
Electives, to bring the total credits to 120		**0**
Total Credits		**124-125**

1 Students may need to take any prerequisites needed before enrolling in MATH 1511G Calculus and Analytic Geometry I or MATH 1521G Calculus and Analytic Geometry II. These courses satisfy both the Area II and General Education Elective requirements.

2 See the General Education (p. 262) section of the catalog for a full list of courses

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

4 Concentration-specific coursework. These twelve credits add three credits to the No-Concentration CET program option.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
E T 101	Introduction to Engineering Technology	1
E T 154	Construction Methods and Communications	3
ENGR 120 or PHYS 1240G or PHYS 1320G	DC Circuit Analysis [5] or Algebra-Based Physics II or Calculus -Based Physics II	3-4
ENGR 190	Introduction to Engineering Mathematics	4
	Credits	**15-16**
Spring		
E T 109	Computer Drafting Fundamentals	3
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
CHEM 1120G or GEOL 1110G	Introduction to Chemistry Lecture and Laboratory (non majors) or Physical Geology	4
PHYS 1230G & PHYS 1230L or PHYS 1310G ***and*** PHYS 1310L	Algebra-Based Physics I or Calculus -Based Physics I ***and*** Calculus - Based Physics I Lab	4
	Credits	**15**
Second Year		
Fall		
E T 143	Civil/Survey Drafting I	3
ENGR 233	Engineering Mechanics I	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [1] or Calculus and Analytic Geometry II Honors	4
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
	Credits	**16**
Spring		
E T 254	Concrete Technology	3
E T 308	Fluid Technology	3
E T 308 L	Fluid Technology Lab	1
SUR 222	Introduction to Geomatics	3
ENGR 234	Engineering Mechanics II	3
Area IV: Social Behavior Sciences [2]		3
	Credits	**16**
Third Year		
Fall		
E T 310	Applied Strength of Materials	3
E T 310 L	Applied Strength of Materials Lab	1
E T 354	Soil and Foundation Technology	4
Viewing a Wider World [3]		3
Area V: Humanities [2]		3
	Credits	**14**
Spring		
E T 332	Applied Design of Structures I	4
E T 355	Site/Land Development and Layout	3
E T 382	Solar Energy Technologies [4]	3
SUR 328 & 328L	Construction Surveying & Automation Technologies and Construction Surveying & Automation Technologies Lab [4]	3
Area VI: Creative and Fine Arts [2]		3
	Credits	**16**
Fourth Year		
Fall		
E T 432	Applied Design of Structures II	4
E T 381	Renewable Energy Technologies [4]	3
E T 384	Wind and Water Energy Technologies [4]	3
E T 459	Construction Technology and Management	3
I E 451	Engineering Economy	3
	Credits	**16**
Spring		
A ST 311 or MATH 1350G	Statistical Applications or Introduction to Statistics	3
E T 410	Senior Seminar	1
E T 412	Highway Technology	3
E T 418	Applied Hydraulics	3
E T 421	Senior Project	3
Viewing a Wider World [3]		3
	Credits	**16**
	Total Credits	**124-125**

1 Students may need to take any prerequisites needed before enrolling in MATH 1511G Calculus and Analytic Geometry I or MATH 1521G Calculus and Analytic Geometry II. These courses satisfy both the Area II and General Education Elective requirements.

2 See the General Education (p. 262) section of this catalog for a full list of courses

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

[4] Concentration-specific coursework. These twelve credits add three credits to the No-Concentration CET program option.

[5] The ENGR 120 DC Circuit Analysis requirement can be met by taking three credits of Physics II, such as PHYS 1240G Algebra-Based Physics II, or PHYS 1320G Calculus -Based Physics II

Civil Engineering Technology (Transportation Technology) - Bachelor of Science in Engineering Technology

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		*3*
ENGL 2210G	Professional and Technical Communication (Recommended)	
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		*3*
COMM 1115G	Introduction to Communication (Either Recommended)	
or HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [1]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III: Laboratory Sciences		*8*
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
or GEOL 1110G	Physical Geology	
Choose one sequence from the following for four credits:		
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
or PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: Social/Behavioral Sciences [2]		3
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II [1]	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
E T 101	Introduction to Engineering Technology	1
E T 109	Computer Drafting Fundamentals	3
E T 143	Civil/Survey Drafting I	3
E T 154	Construction Methods and Communications	3
E T 254	Concrete Technology	3
E T 308	Fluid Technology	3
E T 308 L	Fluid Technology Lab	1
E T 310	Applied Strength of Materials	3
E T 310 L	Applied Strength of Materials Lab	1
E T 332	Applied Design of Structures I	4
E T 354	Soil and Foundation Technology	4
E T 355	Site/Land Development and Layout	3
E T 410	Senior Seminar	1
E T 412	Highway Technology	3
E T 418	Applied Hydraulics	3
E T 421	Senior Project	3
E T 432	Applied Design of Structures II	4
E T 459	Construction Technology and Management	3
SUR 222	Introduction to Geomatics	3
or DRFT 222	Introduction to Geomatics	
ENGR 120	DC Circuit Analysis	3-4
or PHYS 1240G	Algebra-Based Physics II	
or PHYS 1320G	Calculus -Based Physics II	
ENGR 190	Introduction to Engineering Mathematics	4
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
I E 451	Engineering Economy	3
A ST 311	Statistical Applications	3
or MATH 1350G	Introduction to Statistics	
Concentration Coursework [4]		
C E 479	Pavement Analysis and Design	3
E T 455	Cost Estimating and Scheduling	3
E T 472	Intelligent Transportation Systems (ITS)	3
SUR 328 & 328L	Construction Surveying & Automation Technologies and Construction Surveying & Automation Technologies Lab	3
Second Language: (not required)		
Electives, to bring the total credits to 120		**0**
Total Credits		**124-125**

[1] Students may need to take any prerequisites needed before enrolling inMATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II. These courses satisfy both the Area II and General Education Elective requirements.

[2] See the General Education (p. 262) section of the catalog for a full list of courses

[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

[4] Concentration-specific coursework. These twelve credits add three credits to the No-Concentration CET program option.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
E T 101	Introduction to Engineering Technology	1
E T 154	Construction Methods and Communications	3
ENGR 120	DC Circuit Analysis [5]	4
ENGR 190	Introduction to Engineering Mathematics	4
	Credits	**16**
Spring		
E T 109	Computer Drafting Fundamentals	3
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
CHEM 1120G or GEOL 1110G	Introduction to Chemistry Lecture and Laboratory (non majors) or Physical Geology	4
PHYS 1230G & PHYS 1230L or PHYS 1310G ***and*** PHYS 1310L	Algebra-Based Physics I or Calculus -Based Physics I ***and*** Calculus - Based Physics I Lab	4
	Credits	**15**
Second Year		
Fall		
E T 143	Civil/Survey Drafting I	3
ENGR 233	Engineering Mechanics I	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [1] or Calculus and Analytic Geometry II Honors	4
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
	Credits	**16**
Spring		
E T 254	Concrete Technology	3
E T 308	Fluid Technology	3
E T 308 L	Fluid Technology Lab	1
SUR 222	Introduction to Geomatics	3
ENGR 234	Engineering Mechanics II	3
Area IV: Social Behavior Sciences [2]		3
	Credits	**16**
Third Year		
Fall		
E T 310	Applied Strength of Materials	3
E T 310 L	Applied Strength of Materials Lab	1
E T 354	Soil and Foundation Technology	4
Viewing a Wider World [3]		3
Area V. Humanities [2]		3
	Credits	**14**
Spring		
E T 332	Applied Design of Structures I	4
E T 355	Site/Land Development and Layout	3
SUR 328 & 328L	Construction Surveying & Automation Technologies and Construction Surveying & Automation Technologies Lab [4]	3
E T 472	Intelligent Transportation Systems (ITS) [4]	3
Area VI: Creative and Fine Arts [2]		3
	Credits	**16**
Fourth Year		
Fall		
A ST 311 or MATH 1350G	Statistical Applications or Introduction to Statistics	3
I E 451	Engineering Economy	3
E T 432	Applied Design of Structures II	4
E T 455	Cost Estimating and Scheduling [4]	3
E T 459	Construction Technology and Management	3
	Credits	**16**
Spring		
E T 410	Senior Seminar	1
E T 412	Highway Technology	3
E T 418	Applied Hydraulics	3
E T 421	Senior Project	3
C E 479	Pavement Analysis and Design [4]	3
Viewing a Wider World [3]		3
	Credits	**16**
	Total Credits	**125**

1. Students may need to take any prerequisites needed before enrolling inMATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II. These courses satisfy both the Area II and General Education Elective requirements.
2. See the General Education (p. 262) section of this catalog for a full list of courses
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4. Concentration-specific coursework. These twelve credits add three credits to the No-Concentration CET program option.
5. The ENGR 120 DC Circuit Analysis requirement can be met by taking three credits of Physics II, such as PHYS 1240G Algebra-Based Physics II or PHYS 1320G Calculus -Based Physics II in a later semester.

Electrical Engineering Technology - Bachelor of Science in Engineering Technology

The Electrical Engineering Technology (https://et.nmsu.edu/) (EET) program combines engineering theory and real-world industrial knowledge for the design, implementing, and testing of a wide range of innovative electrical and electronic circuits and systems. The EET program includes courses in analog electronics, digital systems, computer programming, embedded systems, renewable energy, power systems, instrumentation, automated control systems, microprocessors, computer networking, signal processing, and communications.

Our hands-on program places special emphasis on power technologies and automated manufacturing. EET graduates place into challenging positions in industry, as project engineers, applications engineers, field engineers, test engineers, control engineers, and more!

For ABET accreditation information on this program, refer to: https://et.nmsu.edu/.

Electrical Engineering Technology (No Concentration)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48

credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication (Recommended) [2]	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
COMM 1115G	Introduction to Communication	3
or HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [1]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III: Laboratory Sciences		*8*
Choose a sequence from the following for eight credits: [3]		
Algebra-Based Sequence		
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
Calculus-Based Sequence		
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Area IV: Social/Behavioral Sciences [2]		*3*
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II [1]	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World [2, 4]		**6**
Departmental/College Requirements		
A ST 311	Statistical Applications	3
E T 101	Introduction to Engineering Technology	1
E T 246	Electronic Devices I	4
E T 272	Electronic Devices II	4
E T 324	Signal Processing and Filtering	4
E T 344	Microprocessor Systems	3
E T 356	Applied Power Technologies I	4
E T 377	Computer Networking I	3
E T 381	Renewable Energy Technologies	3
E T 398	Digital Systems	4
E T 402	Introduction to Automated Control Systems	3
E T 414	Communications Systems	3
ENGR 120	DC Circuit Analysis	4
E T 452	Advanced Automated Control Systems	3
E T 456	Applied Power Technologies II	3
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 190	Introduction to Engineering Mathematics	4
ENGR 230	AC Circuit Analysis	4
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
Technical Electives (choose 3 courses from the list below) [4]		*9*
E T 305	Introduction to Product Design	
E T 382	Solar Energy Technologies	
E T 384	Wind and Water Energy Technologies	
E T 386	Sustainable Construction and Green Building Design	
E T 420	Engineering Internship [5]	
ICT 477	Computer Networking II	
E T 480	Innovation and Product Development	
E T 483	Mobile App Programming and Development	
ICT 457	Information Security Principles	
ENGR 400	Special Topics (Choose three 1 credit courses related to the field) [5]	
Second Language: (not required)		
Electives, to bring the total credits to 120		
Total Credits		**121**

1 Students may need to take any prerequisites needed before enrolling inMATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II. These courses satisfy both the Area II and General Education Elective requirements.

2 See the General Education (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#associatesbachelorsgetext) section of the catalog for a full list of courses. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses, rules, and alternative options.

3 Students must select one of the two PHYS course sequences, from the following, in order to meet the 8 credits of the Area III: Laboratory Sciences requirement.

Algebra-Based Sequence

- PHYS 1230G Algebra-Based Physics I/PHYS 1230L Algebra-Based Physics I Lab
- PHYS 1240G Algebra-Based Physics II/PHYS 1240L Algebra-Based Physics II Lab

Calculus-Based Sequence

- PHYS 1310G Calculus -Based Physics I/PHYS 1310L Calculus -Based Physics I Lab
- PHYS 1320G Calculus -Based Physics II/PHYS 1320L Calculus -Based Physics II Lab

4 Electives offer students the flexibility to explore specialized interests within or beyond their major. By selecting electives strategically, students may also be able to complete a minor with little or no additional coursework beyond degree requirements.

5 Verify with your faculty advisor for pre-approval of ENGR 400 Special Topics that are related to the field and for discussion of E T 420 Engineering Internship limitations and specifications.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for

students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
COMM 1115G or HNRS 2175G	Introduction to Communication [2] or Introduction to Communication Honors	3
E T 101	Introduction to Engineering Technology	1
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
ENGR 120	DC Circuit Analysis	4
ENGR 190	Introduction to Engineering Mathematics	4
	Credits	**16**
Spring		
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
	Credits	**15**
Second Year		
Fall		
E T 246	Electronic Devices I	4
ENGR 230	AC Circuit Analysis	4
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [1] or Calculus and Analytic Geometry II Honors	4
Physics I with Lab (Area III: Lab Sciences, Choose one) [3]		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab [3]	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab [3]	
	Credits	**16**
Spring		
Area IV: Social Behavior Sciences [2]		3
E T 272	Electronic Devices II	4
E T 398	Digital Systems	4
Physics II with Lab (Area III: Lab Sciences, from the chosen sequence) [3]		4
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab [3]	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab [3]	
	Credits	**15**
Third Year		
Fall		
Area V: Humanities [2]		3
E T 324	Signal Processing and Filtering	4
E T 377	Computer Networking I	3
E T 381	Renewable Energy Technologies	3
Technical Elective Course (from pre-approved list) [4]		3
	Credits	**16**
Spring		
A ST 311	Statistical Applications	3
E T 344	Microprocessor Systems	3
E T 356	Applied Power Technologies I	4
Technical Elective Course (from pre-approved list) [4]		3
Viewing a Wider World [2, 4]		3
	Credits	**16**
Fourth Year		
Fall		
Area VI: Creative and Fine Arts [2]		3
Viewing a Wider World [2, 4]		3
E T 402	Introduction to Automated Control Systems	3
E T 456	Applied Power Technologies II	3
ENGR 401	Engineering Capstone I	3
	Credits	**15**
Spring		
E T 414	Communications Systems	3
ENGR 402	Engineering Capstone II	3
Technical Elective Course (from pre-approved list) [4]		3
E T 452	Advanced Automated Control Systems	3
	Credits	**12**
	Total Credits	**121**

1. Students may need to take any prerequisites needed before enrolling inMATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II. These courses satisfy both the Area II and General Education Elective requirements.
2. See the General Education (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#associatesbachelorsgetext) section of the catalog for a full list of courses. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses, rules, and alternative options.
3. Students must select one of the two PHYS course sequences, from the following, in order to meet the 8 credits of the Area III: Laboratory Sciences requirement.

   Algebra-Based Sequence
   - PHYS 1230G Algebra-Based Physics I/PHYS 1230L Algebra-Based Physics I Lab
   - PHYS 1240G Algebra-Based Physics II/PHYS 1240L Algebra-Based Physics II Lab

   Calculus-Based Sequence
   - PHYS 1310G Calculus -Based Physics I/PHYS 1310L Calculus -Based Physics I Lab
   - PHYS 1320G Calculus -Based Physics II/PHYS 1320L Calculus -Based Physics II Lab
4. Electives offer students the flexibility to explore specialized interests within or beyond their major. By selecting electives strategically, students may also be able to complete a minor with little or no additional coursework beyond degree requirements.

Geomatics - Bachelor of Science in Geomatics

Geomatics is a rapidly developing engineering discipline that focuses on acquiring and analyzing precise spatial information. Geomatics engineers use a variety of technologies such as Unmanned Aerial Vehicles, Global Navigation Satellite Systems, High-Definition 3D Laser scanners, High-resolution satellite images, and Geographic Information Systems. They measure terrestrial and three-dimensional positions of points on, above, and below the earth's surface and the distance and angles between them at a high level of precision. Geomatics engineers aid in the design

of infrastructure including roads, bridges and legal boundaries for ownership. They provide precise data for natural resource managers, subdivision developers, and coastal monitoring systems.

The program is designed to provide cutting-edge industrial needs as well as to meet the educational requirements for registration as a Professional Land Surveyor in different states.

Requirements (120 Credits)

Students must complete all University degree requirements, which include General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed to take the necessary English and Mathematics coursework.

Students must also take the Fundamentals of Surveying examination before graduation.

Prefix	Title	Credits
General Education		
Area I: Communications [1]		*10*
English Composition - Level 1		
English Composition - Level 2		
Oral Communication		
Area II: Mathematics [1]		*4*
MATH 1511G	Calculus and Analytic Geometry I [2]	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III: Laboratory Sciences [1]		*8*
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
or PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
One additional Area III: Laboratory Sciences for 4 credits [1]		
Area IV: Social and Behavioral Sciences [1]		*3*
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*4*
MATH 1521G	Calculus and Analytic Geometry II [2]	
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World [1]		*6*
Departmental/College Requirements		
Students can start as freshmen or transfer into the Geomatics program. Technical transferrable and non-transferrable courses are listed below. [3, 4]		
Subject-Matter Courses [3, 4]		*21-24*
Computer Drafting (such as E T 109)		
Computer Programming (such as ICT 152 or CSCI 1720)		
Two Courses on Geographic Information Systems (such as GEOG 381 and GEOG 481)		
Plane Surveying (such as SUR 222)		
Statistics (level 200 or above, such as A ST 311)		
Surveying/Civil Drafting (such as E T 143)		
Required Courses		*51*
BLAW 316	Legal Environment of Business	
or BLAW 325	Real Estate Principles and Law I	
E T 355	Site/Land Development and Layout	
I E 451	Engineering Economy	
SUR 285	Precise Digital Mapping	
SUR 292	Legal Principles and Boundary Law I	
SUR 312	Public Land Survey System Boundaries	
SUR 315 & 315L	Advanced Mapping Technologies and Advanced Mapping Technologies Lab	
SUR 328 & 328L	Construction Surveying & Automation Technologies and Construction Surveying & Automation Technologies Lab	
SUR 351	Spatial Data Adjustment I	
SUR 361	Geodesy/Geodetic Control Surveying	
SUR 401	Ethics and Professionalism in Surveying and Mapping	
SUR 450	Senior Project	
SUR 451	Spatial Data Adjustment II	
SUR 452	Surveying Practicum	
SUR 461 & 461L	GNSS Positioning and GNSS Positioning Lab	
SUR 464	Legal Principles and Boundary Law II	
SUR 485	Emerging Techniques in Geospatial Technologies	
Second Language: (not required)		
Electives, to bring the total credits to 120		**7-4**
Total Credits		**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses. See the Viewing a Wider World (p. 266) section of this catalog for a full list of courses.
2. Mathematics courses require math placement or taking prerequisites before enrollment.
3. Transfer students must complete college-level work that includes General Education Area I, IV, V, and VI (19 credit: see the **General Education (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext)** section of this catalog for a full list of courses), Calculus I and II (6-8 credits), Physics I (4 credits), elective science with lab (4 credits), computer drafting (3 credits), statistics (3 credits, 200-level of above), computer programming (3-4 credits),plane surveying (3 credits), introduction to GIS (6-8 credits), surveying/civil drafting (3 credits), and approved electives to bring total transfer credits to 66.
4. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their academic advisor.

A Suggested Plan of Study for Students

The contents and order of this roadmap may vary depending on the students' transfer credits, some courses may need to be completed in addition to the ones listed below. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year	Credits
Transfer 33 Credits [1, 2, 3, 4]	33
Credits	**33**

Second Year		
Transfer 30 Credits [1, 2, 3, 4]		30
	Credits	**30**
Third Year		
Fall		
BLAW 316 or BLAW 325	Legal Environment of Business or Real Estate Principles and Law I	3
I E 451	Engineering Economy	3
SUR 292	Legal Principles and Boundary Law I	3
SUR 361	Geodesy/Geodetic Control Surveying	3
Viewing a Wider World [1]		3
	Credits	**15**
Spring		
E T 355	Site/Land Development and Layout	3
SUR 285	Precise Digital Mapping	3
SUR 312	Public Land Survey System Boundaries	3
SUR 328 & 328L	Construction Surveying & Automation Technologies and Construction Surveying & Automation Technologies Lab	3
SUR 351	Spatial Data Adjustment I	3
	Credits	**15**
Fourth Year		
Fall		
SUR 315 & 315L	Advanced Mapping Technologies and Advanced Mapping Technologies Lab	3
SUR 401	Ethics and Professionalism in Surveying and Mapping	3
SUR 451	Spatial Data Adjustment II	3
SUR 464	Legal Principles and Boundary Law II	3
SUR 485	Emerging Techniques in Geospatial Technologies	3
	Credits	**15**
Spring		
SUR 450	Senior Project	3
SUR 452	Surveying Practicum	3
SUR 461 & 461L	GNSS Positioning and GNSS Positioning Lab	3
Viewing a Wider World [1]		3
	Credits	**12**
	Total Credits	**120**

1. See the General Education (p. 266) section of this catalog for a full list of courses. See the Viewing a Wider World (p. 266) section of this catalog for a full list of courses.
2. Mathematics courses require math placement or taking prerequisites before enrollment.
3. Transfer students must complete college-level work that includes General Education Area I, IV, V, and VI (19 credits: see the **General Education (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/#viewingawiderworldtext)** section of this catalog for a full list of courses), Calculus I and II (6-8 credit), Physics I (4 credits), elective science with lab (4 credits), computer drafting (3 credits), statistics (3 credits, 200-level or above), computer programming (3-4 credits), plane surveying (3 credits), introduction to GIS (6-8 credits), surveying/civil drafting (3 credits), and approved electives to bring total transfer credits to 66.
4. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their academic advisor.

Information and Communication Technology - Bachelor of Information and Communication Technology

The Bachelor of Information and Communication Technology (ICT) degree focuses on designing, implementing, and managing various information systems. The curriculum includes the fundamentals of operating systems, system integration, computer networking, software development, security, cloud technologies, and project management practices. Advanced Information Technology topics are also included and differently emphasized according to the selected degree concentration:

- **No Concentration (this option)** - provides the ability to choose from various advanced courses on Cyber Defense, Network Technologies, and Software Development topics.
- **Cyber Defense Concentration** - focused on cyber security and defense, including ethical hacking and digital forensics;
- **Network Technologies Concentration** - focused on computer network design, configuration, and security;
- **Software Development Concentration** - focused on the design, application, deployment, and maintenance of software;

The ICT program is a distance education program and does not require on-campus visits. Students who are successful in distance education programs typically are self-motivated, do not rely heavily on face-to-face instruction, work independently, and can remain on schedule. Students must have familiarity with and access to:

- a high-speed Internet connection,
- a sound card, 12G of RAM minimum,
- a microphone/Webcam,
- Microsoft Operating System 8.1 or newer and Office ®.

The ICT program is accredited under NMSU's umbrella accreditation by the Higher Learning Commission (https://accreditation.nmsu.edu/) of the North Central Association of Colleges and Schools. Students must complete all university degree requirements, including General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Requirements may be met with transfer credits from any previous program or institution.

Pathway: 4-year Bachelor's Degree

This pathway is designed with the traditional student in mind. Students have the flexibility to pursue the degree as a main campus student, or they may choose to complete the degree online.

Prefix	Title	Credits
General Education [1]		
Area I: Communications [1]		*10*
English Composition - Level 1		
English Composition - Level 2		

Oral Communications		
Area II: Mathematics		*3 - 4*
MATH 1220G	College Algebra (Equivalent or Higher) [1]	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences [1]		*10-11*
Area III: Laboratory Science Course (4 credits)		
Area IV: Social/Behavioral Sciences Course (3 credits)		
Either an Area III: Laboratory Sciences of Area IV: Social/Behavioral Sciences Course (3-4 credits)		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [2]		**6**
Departmental/College Requirements		
Program-Specific Requirements		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 145	Network Essentials: N+ Certification Training	3
ICT 152	Java Programming	3
ICT 161	IT Essentials II: A+ Certification Training focused on the Software exam	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 267	Information Security+ Certification Preparation	3
ICT 280	Introduction to Web Development	3
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy [2]	3
ICT 355	Linux System Administration	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Enterprise Administration	3
ICT 377	Computer Networking I	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 457	Information Security Principles	3
Technical Elective (Choose 4 courses from the following) [3]		*12*
E T 483	Mobile App Programming and Development	
ICT 339	Introduction to Digital Forensics and Incident Response	
ICT 372	Software Engineering and Design	
ICT 439	Advanced Digital Forensics and Incident Response	
ICT 458	Web Development and Database Applications	
ICT 460	Advanced Software Development Concepts	
ICT 463	Enterprise Linux Network Administration Tools	
ICT 467	Communication Network Security	
ICT 477	Computer Networking II	
ICT 487	Data Security	
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**19-16**
Total Credits		**120**

1. See the **General Education (p. 266)** section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.
2. The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 266) Requirements (6 credits). Visit the catalog's Viewing a Wider World (p. 266) section for a complete list of Viewing a Wider World (p. 266) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.
3. The **judicious selection of Technical Electives** may lead to an ICT concentration on Cyber Defense, Network Technologies, or Software Development without the need for additional credits. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list is provided in this catalog.
4. **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 2+2 Bachelor's Completion Degree

Prefix	Title	Credits
General Education [1]		
Area I: Communications [1]		*10*
English Composition - Level 1		
English Composition - Level 2		
Oral Communications		
Area II: Mathematics		*3 - 4*
MATH 1220G	College Algebra (Equivalent or Higher) [1]	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences [1]		*10-11*
Area III: Laboratory Science Course (4 credits)		
Area IV: Social/Behavioral Sciences Course (3 credits)		
Either an Area III: Laboratory Sciences of Area IV: Social/Behavioral Sciences Course (3-4 credits)		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [2]		**6**
Departmental/College Requirements		
Subject-Matter Courses		*12*
Introduction to Computer Networking (such as ICT 145)		
Introduction to Information Technology (such as ICT 161)		
Introduction to Information Security (such as ICT 267)		
Introduction to Web Development (such as ICT 280)		
Required Courses		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy [2]	3
ICT 355	Linux System Administration	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Enterprise Administration	3
ICT 377	Computer Networking I	3
ICT 435	Senior Project	3

ICT 450	Ethical Hacking	3
ICT 457	Information Security Principles	3
Technical Elective (Choose 4 courses from the following) [3]		*12*
E T 483	Mobile App Programming and Development	
ICT 339	Introduction to Digital Forensics and Incident Response	
ICT 372	Software Engineering and Design	
ICT 439	Advanced Digital Forensics and Incident Response	
ICT 458	Web Development and Database Applications	
ICT 460	Advanced Software Development Concepts	
ICT 463	Enterprise Linux Network Administration Tools	
ICT 467	Communication Network Security	
ICT 477	Computer Networking II	
ICT 487	Data Security	
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**19-16**
Total Credits		**120**

1. See the **General Education (p. 266)** section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.
2. The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 266) Requirements (6 credits). Visit the catalog's Viewing a Wider World (p. 266) section for a complete list of Viewing a Wider World (p. 266) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.
3. The **judicious selection of Technical Electives** may lead to an ICT concentration on Cyber Defense, Network Technologies, or Software Development without the need for additional credits. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list is provided in this catalog.
4. **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 4-Year Bachelor's Degree

A Suggested Plan of Study for Students

These roadmaps assume student placement in MATH 1220G College Algebra or higher. The contents and order of this roadmap may vary depending on initial student placement in mathematics and previous coursework. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring and summer semester and may be subject to modification or change.

All Information and Communication Technology requirements must be completed with a C- or higher grade.

First Year		
Fall		**Credits**
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
Elective Course [4]		3
General Education Area I [1]		4
General Education Area II (MATH 1220G or Higher) [1]		3-4
General Education IV [1]		3
	Credits	**16-17**
Spring		
ICT 145	Network Essentials: N+ Certification Training	3
ICT 161	IT Essentials II: A+ Certification Training focused on the Software exam	3
General Education Area I [1]		3
General Education Area III [1]		4
General Education Area V [1]		3
	Credits	**16**
Second Year		
Fall		
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
General Education Area I [1]		3
General Education Area VI [1]		3
Elective Course [4]		3
	Credits	**15**
Spring		
ICT 267	Information Security+ Certification Preparation	3
ICT 280	Introduction to Web Development	3
General Education Area III or IV [1]		3-4
General Education Elective [1]		3
Elective Course [4]		3
	Credits	**15-16**
Third Year		
Fall		
ICT 360	Operating Systems for ICT	3
ICT 377	Computer Networking I	3
Elective Course [4]		3
Elective Course [4]		3
Elective Course [4]		3
	Credits	**15**
Spring		
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy [2]	3
ICT 355	Linux System Administration	3
ICT 364	Windows Enterprise Administration	3
Technical Elective (from pre-approved list) [3]		3
	Credits	**15**
Fourth Year		
Fall		
ICT 362	Software Technology II	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
Technical Elective (from pre-approved list) [3]		3
Technical Elective (from pre-approved list) [3]		3
	Credits	**15**
Spring		
ICT 457	Information Security Principles	3
Electives to bring total to 120 credits (if necessary) [4]		1-0
Technical Elective (from pre-approved list) [3]		3

Viewing a Wider World [2]		6
	Credits	**13-12**
	Total Credits	**120-121**

1. See the **General Education (p. 266)** section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.
2. The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 266) Requirements (6 credits). Visit the c (p. 266)atalog's Viewing a Wider World (p. 266) section for a complete list of Viewing a Wider World (p. 266) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.
3. The **judicious selection of Technical Electives** may lead to an ICT concentration on Cyber Defense, Network Technologies, or Software Development without the need for additional credits. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list is provided in this catalog.
4. **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 2+2 Bachelor's Degree

A Suggested Plan of Study for Students

These roadmaps assume student placement in MATH 1220G College Algebra or higher. The contents and order of this roadmap may vary depending on initial student placement in mathematics and previous coursework. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring and summer semester and may be subject to modification or change.

All Information and Communication Technology requirements must be completed with a C- or higher grade.

First Year		**Credits**
Elective Credits (include General Education credits) [1, 4]		30
	Credits	**30**
Second Year		
Elective Credits (include General Education credits) [1, 4]		33
	Credits	**33**
Third Year		
Fall		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 360	Operating Systems for ICT	3
ICT 377	Computer Networking I	3
	Credits	**15**
Spring		
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy [2]	3
ICT 355	Linux System Administration	3
ICT 364	Windows Enterprise Administration	3
Technical Elective (from pre-approved list) [3]		3
	Credits	**15**
Fourth Year		
Fall		
ICT 362	Software Technology II	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
Technical Elective (from pre-approved list) [3]		6
	Credits	**15**
Spring		
ICT 457	Information Security Principles	3
Technical Elective (from pre-approved list) [3]		3
Viewing a Wider World [2]		6
	Credits	**12**
	Total Credits	**120**

1. See the **General Education (p. 266)** section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.
2. The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 266) Requirements (6 credits). Visit the c (p. 266)atalog's Viewing a Wider World (p. 266) section for a complete list of Viewing a Wider World (p. 266) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.
3. The **judicious selection of Technical Electives** may lead to an ICT concentration on Cyber Defense, Network Technologies, or Software Development without the need for additional credits. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list is provided in this catalog.
4. **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Information and Communication Technology (Cyber Defense) - Bachelor of Information and Communication Technology

(120 credits)

The Bachelor of Information and Communication Technology (ICT) degree focuses on designing, implementing, and managing various information systems. The curriculum includes the fundamentals of operating systems, system integration, computer networking, software development, security, cloud technologies, and project management practices. Advanced Information Technology topics are

also included and differently emphasized according to the selected degree concentration:

- **No Concentration** - provides the ability to choose from various advanced courses on Cyber Defense, Network Technologies, and Software Development topics.
- **Cyber Defense Concentration (this option)** - focused on cyber security and defense, including ethical hacking and digital forensics;
- **Network Technologies Concentration** - focused on computer network design, configuration, and security;
- **Software Development Concentration** - focused on the design, application, deployment, and maintenance of software;

The ICT program is a distance education program and does not require on-campus visits. Students who are successful in distance education programs typically are self-motivated, do not rely heavily on face-to-face instruction, work independently, and can remain on schedule. Students must have familiarity with and access to:

- a high-speed Internet connection,
- a sound card, 12G of RAM minimum,
- a microphone/Webcam,
- Microsoft Operating System 8.1 or newer and Office ®.

The ICT program is accredited under NMSU's umbrella accreditation by the Higher Learning Commission (https://accreditation.nmsu.edu/) of the North Central Association of Colleges and Schools. Students must complete all university degree requirements, including General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Requirements may be met with transfer credits from any previous program or institution.

Pathway: 4-year Bachelor's Degree

This pathway is designed with the traditional student in mind. Students have the flexibility to pursue the degree as a main campus student, or they may choose to complete the degree online.

Prefix	Title	Credits
General Education [1]		
Area I: Communications [1]		*10*
English Composition - Level 1		
English Composition - Level 2		
Oral Communications		
Area II: Mathematics		*3 - 4*
MATH 1220G	College Algebra (Equivalent or Higher) [1]	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences [1]		*10-11*
Area III: Laboratory Science Course (4 credits)		
Area IV: Social/Behavioral Sciences Course (3 credits)		
Either an Area III: Laboratory Sciences of Area IV: Social/Behavioral Sciences Course (3-4 credits)		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [2]		**6**
Departmental/College Requirements		
Program-Specific Requirements		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 145	Network Essentials: N+ Certification Training	3
ICT 152	Java Programming	3
ICT 161	IT Essentials II: A+ Certification Training focused on the Software exam	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 267	Information Security+ Certification Preparation	3
ICT 280	Introduction to Web Development	3
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy [2]	3
ICT 355	Linux System Administration	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Enterprise Administration	3
ICT 377	Computer Networking I	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 457	Information Security Principles	3
Concentration/Technical Electives (Take all four courses)		*12*
ICT 339	Introduction to Digital Forensics and Incident Response [3]	
ICT 439	Advanced Digital Forensics and Incident Response [3]	
ICT 467	Communication Network Security [3]	
ICT 487	Data Security [3]	
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**19-16**
Total Credits		**120**

1. See the **General Education (p. 266)** section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.
2. The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 266) Requirements (6 credits). Visit the c (p. 266)atalog's Viewing a Wider World (p. 266) section for a complete list of Viewing a Wider World (p. 266) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.
3. The **provided selection of Technical Electives** will lead to an ICT concentration on **Cyber Defense**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.
4. **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 2+2 Bachelor's Degree

Prefix	Title	Credits
General Education [1]		
Area I: Communications [1]		*10*
English Composition - Level 1		

English Composition - Level 2		
Oral Communications		
Area II: Mathematics		*3 - 4*
MATH 1220G	College Algebra (Equivalent or Higher) [1]	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences [1]		*10-11*
Area III: Laboratory Science Course (4 credits)		
Area IV: Social/Behavioral Sciences Course (3 credits)		
Either an Area III: Laboratory Sciences of Area IV: Social/Behavioral Sciences Course (3-4 credits)		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [2]		**6**
Departmental/College Requirements		
Subject-Matter Courses		*12*
Introduction to Computer Networking (such as ICT 145)		
Introduction to Information Technology (such as ICT 161)		
Introduction to Information Security (such as ICT 267)		
Introduction to Web Development (such as ICT 280)		
Required Courses		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy [2]	3
ICT 355	Linux System Administration	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Enterprise Administration	3
ICT 377	Computer Networking I	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 457	Information Security Principles	3
Concentration/Technical Elective (take all four courses) [3]		*12*
ICT 339	Introduction to Digital Forensics and Incident Response [3]	
ICT 439	Advanced Digital Forensics and Incident Response [3]	
ICT 467	Communication Network Security [3]	
ICT 487	Data Security [3]	
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**19-16**
Total Credits		**120**

1 See the **General Education (p. 266)** section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

2 The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 266) Requirements (6 credits). Visit the c (p. 266)atalog's Viewing a Wider World (p. 266) section for a complete list of Viewing a Wider World (p. 266) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.

3 The **provided selection of Technical Electives** will lead to an ICT concentration on **Cyber Defense**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.

4 **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

A Suggested Plan of Study for Students

These roadmaps assume student placement in MATH 1220G College Algebra or higher. The contents and order of this roadmap may vary depending on initial student placement in mathematics and previous coursework. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring and summer semester and may be subject to modification or change.

All Information and Communication Technology requirements must be completed with a C- or higher grade.

Pathway: 4-year Bachelor's Degree

First Year		
Fall		**Credits**
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
Elective Course [4]		3
General Education Area I [1]		4
General Education Area II (MATH 1220G or Higher) [1]		3-4
General Education IV [1]		3
	Credits	**16-17**
Spring		
ICT 145	Network Essentials: N+ Certification Training	3
ICT 161	IT Essentials II: A+ Certification Training focused on the Software exam	3
General Education Area I [1]		3
General Education Area III [1]		4
General Education Area V [1]		3
	Credits	**16**
Second Year		
Fall		
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
General Education Area I [1]		3
General Education Area VI [1]		3
Elective Course [4]		3
	Credits	**15**
Spring		
ICT 267	Information Security+ Certification Preparation	3
ICT 280	Introduction to Web Development	3
General Education Area III or IV [1]		3-4
General Education Elective [1]		3

Elective Course [4]		3
	Credits	**15-16**
Third Year		
Fall		
ICT 360	Operating Systems for ICT	3
ICT 377	Computer Networking I	3
Elective Course [4]		3
Elective Course [4]		3
Elective Course [4]		3
	Credits	**15**
Spring		
ICT 320	Introduction to Internet Protocols	3
ICT 339	Introduction to Digital Forensics and Incident Response [3]	3
ICT 350V	Introduction to Personal Computer Security and Privacy [2]	3
ICT 355	Linux System Administration	3
ICT 364	Windows Enterprise Administration	3
	Credits	**15**
Fourth Year		
Fall		
ICT 362	Software Technology II	3
ICT 435	Senior Project	3
ICT 439	Advanced Digital Forensics and Incident Response [3]	3
ICT 450	Ethical Hacking	3
ICT 487	Data Security [3]	3
	Credits	**15**
Spring		
ICT 457	Information Security Principles	3
ICT 467	Communication Network Security [3]	3
Electives to bring total to 120 credits (if necessary) [4]		1-0
Viewing a Wider World [2]		6
	Credits	**13-12**
	Total Credits	**120-121**

1. See the **General Education (p. 266)** section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.
2. The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 266) Requirements (6 credits). Visit the c (p. 266)atalog's Viewing a Wider World (p. 266) section for a complete list of Viewing a Wider World (p. 266) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.
3. The **provided selection of Technical Electives** will lead to an ICT concentration on **Cyber Defense**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.
4. **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 2+2 Bachelor's Degree

First Year		**Credits**
Elective Credits (include General Education credits) [1, 4]		30
	Credits	**30**
Second Year		
Elective Credits (include General Education credits) [1, 4]		33
	Credits	**33**
Third Year		
Fall		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 360	Operating Systems for ICT	3
ICT 377	Computer Networking I	3
	Credits	**15**
Spring		
ICT 320	Introduction to Internet Protocols	3
ICT 339	Introduction to Digital Forensics and Incident Response [3]	3
ICT 350V	Introduction to Personal Computer Security and Privacy [2]	3
ICT 355	Linux System Administration	3
ICT 364	Windows Enterprise Administration	3
	Credits	**15**
Fourth Year		
Fall		
ICT 362	Software Technology II	3
ICT 435	Senior Project	3
ICT 439	Advanced Digital Forensics and Incident Response [3]	3
ICT 450	Ethical Hacking	3
ICT 487	Data Security [3]	3
	Credits	**15**
Spring		
ICT 457	Information Security Principles	3
ICT 467	Communication Network Security [3]	3
Viewing a Wider World [2]		6
	Credits	**12**
	Total Credits	**120**

1. See the **General Education (p. 266)** section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.
2. The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 266) Requirements (6 credits). Visit the catalog's Viewing a Wider World (p. 266) section for a complete list of Viewing a Wider World (p. 266) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.
3. The **provided selection of Technical Electives** will lead to an ICT concentration on **Cyber Defense**, one of the three concentration options. See the NMSU Catalog for information on other concentration

options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.

[4] **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Information and Communication Technology (Network Technologies) - Bachelor of Information and Communication Technology

(120 credits)

The Bachelor of Information and Communication Technology (ICT) degree focuses on designing, implementing, and managing various information systems. The curriculum includes the fundamentals of operating systems, system integration, computer networking, software development, security, cloud technologies, and project management practices. Advanced Information Technology topics are also included and differently emphasized according to the selected degree concentration:

- **No Concentration** - provides the ability to choose from various advanced courses on Cyber Defense, Network Technologies, and Software Development topics.
- **Cyber Defense Concentration** - focused on cyber security and defense, including ethical hacking and digital forensics;
- **Network Technologies Concentration (this option)** - focused on computer network design, configuration, and security;
- **Software Development Concentration** - focused on the design, application, deployment, and maintenance of software;

The ICT program is a distance education program and does not require on-campus visits. Students who are successful in distance education programs typically are self-motivated, do not rely heavily on face-to-face instruction, work independently, and can remain on schedule. Students must have familiarity with and access to:

- a high-speed Internet connection,
- a sound card, 12G of RAM minimum,
- a microphone/Webcam,
- Microsoft Operating System 8.1 or newer and Office ®.

The ICT program is accredited under NMSU's umbrella accreditation by the Higher Learning Commission (https://accreditation.nmsu.edu/) of the North Central Association of Colleges and Schools. Students must complete all university degree requirements, including General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Requirements may be met with transfer credits from any previous program or institution.

Pathway: 4-year Bachelor's Degree

This pathway is designed with the traditional student in mind. Students have the flexibility to pursue the degree as a main campus student, or they may choose to complete the degree online.

Prefix	Title	Credits
General Education [1]		
Area I: Communications [1]		*10*
English Composition - Level 1		
English Composition - Level 2		
Oral Communications		
Area II: Mathematics		*3 - 4*
MATH 1220G	College Algebra (Equivalent or Higher) [1]	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences [1]		*10-11*
Area III: Laboratory Science Course (4 credits)		
Area IV: Social/Behavioral Sciences Course (3 credits)		
Either an Area III: Laboratory Sciences of Area IV: Social/Behavioral Sciences Course (3-4 credits)		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [2]		**6**
Departmental/College Requirements		
Program-Specific Requirements		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 145	Network Essentials: N+ Certification Training	3
ICT 152	Java Programming	3
ICT 161	IT Essentials II: A+ Certification Training focused on the Software exam	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 267	Information Security+ Certification Preparation	3
ICT 280	Introduction to Web Development	3
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy [2]	3
ICT 355	Linux System Administration	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Enterprise Administration	3
ICT 377	Computer Networking I	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 457	Information Security Principles	3
Concentration/Technical Electives (Take all 4 courses)		*12*
ICT 339	Introduction to Digital Forensics and Incident Response [3]	
ICT 463	Enterprise Linux Network Administration Tools [3]	
ICT 467	Communication Network Security [3]	
ICT 477	Computer Networking II [3]	
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**16-19**
Total Credits		**120**

[1] See the **General Education (p. 266)** section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

[2] The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 266) Requirements (6 credits). Visit the catalog's Viewing a Wider World (p. 266) section for a complete list of Viewing a Wider World (p. 266) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.

[3] The **provided selection of Technical Electives** will lead to an ICT concentration on **Network Technologies**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.

[4] **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 2+2 Bachelor's Degree

Prefix	Title	Credits
General Education [1]		
Area I: Communications [1]		*10*
English Composition - Level 1		
English Composition - Level 2		
Oral Communications		
Area II: Mathematics		*3 - 4*
MATH 1220G	College Algebra ((equivalent or higher)) [1]	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences [1]		*10-11*
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [2]		**6**
Departmental/College Requirements		
Subject-Matter Courses		*12*
Introduction to Computer Networking (such as ICT 145)		
Introduction to Information Technology (such as ICT 161)		
Introduction to Information Security (such as ICT 267)		
Introduction to Web Development (such as ICT 280)		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy	3
ICT 355	Linux System Administration	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Enterprise Administration	3
ICT 377	Computer Networking I	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 457	Information Security Principles	3
Concentration/Technical Electives (take all four courses) [3]		*12*
ICT 339	Introduction to Digital Forensics and Incident Response [3]	
ICT 463	Enterprise Linux Network Administration Tools [3]	
ICT 467	Communication Network Security [3]	
ICT 477	Computer Networking II [3]	
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**19-16**
Total Credits		**120**

[1] See the **General Education (p. 266)** section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.

[2] The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 266) Requirements (6 credits). Visit the catalog's Viewing a Wider World (p. 266) section for a complete list of Viewing a Wider World (p. 266) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.

[3] The **provided selection of Technical Electives** will lead to an ICT concentration on **Network Technologies**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.

[4] **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra. The contents and order of this roadmap may vary depending on initial student placement in mathematics and previous English coursework that was transferred in. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Pathway: 4-year Bachelor's Degree

First Year		
Fall		**Credits**
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
Elective Course [4]		3
General Education Area I [1]		4
General Education Area II (MATH 1220G or Higher) [1]		3-4
General Education IV [1]		3
	Credits	**16-17**
Spring		
ICT 145	Network Essentials: N+ Certification Training	3

ICT 161	IT Essentials II: A+ Certification Training focused on the Software exam	3
General Education Area I [1]		3
General Education Area III [1]		4
General Education Area V [1]		3
	Credits	**16**
Second Year		
Fall		
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
General Education Area I [1]		3
General Education Area VI [1]		3
Elective Course [4]		3
	Credits	**15**
Spring		
ICT 267	Information Security+ Certification Preparation	3
ICT 280	Introduction to Web Development	3
General Education Area III or IV [1]		3-4
General Education Elective [1]		3
Elective Course [4]		3
	Credits	**15-16**
Third Year		
Fall		
ICT 360	Operating Systems for ICT	3
ICT 377	Computer Networking I	3
Elective Course [4]		3
Elective Course [4]		3
Elective Course [4]		3
	Credits	**15**
Spring		
ICT 320	Introduction to Internet Protocols	3
ICT 339	Introduction to Digital Forensics and Incident Response [3]	3
ICT 350V	Introduction to Personal Computer Security and Privacy [2]	3
ICT 355	Linux System Administration	3
ICT 364	Windows Enterprise Administration	3
	Credits	**15**
Fourth Year		
Fall		
ICT 362	Software Technology II	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 463	Enterprise Linux Network Administration Tools [3]	3
ICT 477	Computer Networking II [3]	3
	Credits	**15**
Spring		
ICT 457	Information Security Principles	3
ICT 467	Communication Network Security [3]	3
Electives to bring total to 120 credits (if necessary) [4]		1-0
Viewing a Wider World [2]		6
	Credits	**13-12**
	Total Credits	**120-121**

1. See the **General Education (p. 266)** section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.
2. The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 266) Requirements (6 credits). Visit the c (p. 266)atalog's Viewing a Wider World (p. 266) section for a complete list of Viewing a Wider World (p. 266) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.
3. The **provided selection of Technical Electives** will lead to an ICT concentration on **Network Technologies**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.
4. **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 2+2 Bachelor's Completion Degree

First Year		**Credits**
Elective Credits (include General Education credits) [1, 4]		30
	Credits	**30**
Second Year		
Elective Credits (include General Education credits) [1, 4]		33
	Credits	**33**
Third Year		
Fall		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 360	Operating Systems for ICT	3
ICT 377	Computer Networking I	3
	Credits	**15**
Spring		
ICT 320	Introduction to Internet Protocols	3
ICT 339	Introduction to Digital Forensics and Incident Response [3]	3
ICT 350V	Introduction to Personal Computer Security and Privacy [2]	3
ICT 355	Linux System Administration	3
ICT 364	Windows Enterprise Administration	3
	Credits	**15**
Fourth Year		
Fall		
ICT 362	Software Technology II	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3

ICT 463	Enterprise Linux Network Administration Tools [3]	3
ICT 477	Computer Networking II [3]	3
	Credits	**15**
Spring		
ICT 457	Information Security Principles	3
ICT 467	Communication Network Security [3]	3
Viewing a Wider World [2]		6
	Credits	**12**
	Total Credits	**120**

1. See the **General Education (p. 266)** section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.
2. The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 266) Requirements (6 credits). Visit the c (p. 266)atalog's Viewing a Wider World (p. 266) section for a complete list of Viewing a Wider World (p. 266) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.
3. The **provided selection of Technical Electives** will lead to an ICT concentration on **Network Technologies**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.
4. **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Information and Communication Technology (Software Development) - Bachelor of Information and Communication Technology

(120 credits)

The Bachelor of Information and Communication Technology (ICT) degree focuses on designing, implementing, and managing various information systems. The curriculum includes the fundamentals of operating systems, system integration, computer networking, software development, security, cloud technologies, and project management practices. Advanced Information Technology topics are also included and differently emphasized according to the selected degree concentration:

- **No Concentration** - provides the ability to choose from various advanced courses on Cyber Defense, Network Technologies, and Software Development topics.
- **Cyber Defense Concentration** - focused on cyber security and defense, including ethical hacking and digital forensics;
- **Network Technologies Concentration** - focused on computer network design, configuration, and security;
- **Software Development Concentration (this option)** - focused on the design, application, deployment, and maintenance of software;

The ICT program is a distance education program and does not require on-campus visits. Students who are successful in distance education programs typically are self-motivated, do not rely heavily on face-to-face instruction, work independently, and can remain on schedule. Students must have familiarity with and access to:

- a high-speed Internet connection,
- a sound card, 12G of RAM minimum,
- a microphone/Webcam,
- Microsoft Operating System 8.1 or newer and Office ®.

The ICT program is accredited under NMSU's umbrella accreditation by the Higher Learning Commission (https://accreditation.nmsu.edu/) of the North Central Association of Colleges and Schools. Students must complete all university degree requirements, including General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Requirements may be met with transfer credits from any previous program or institution.

Pathway: 4-year Bachelor's Degree

This pathway is designed with the traditional student in mind. Students have the flexibility to pursue the degree as a main campus student, or they may choose to complete the degree online.

Prefix	Title	Credits
General Education [1]		
Area I: Communications [1]		*10*
English Composition - Level 1		
English Composition - Level 2		
Oral Communications		
Area II: Mathematics		*3 - 4*
MATH 1220G	College Algebra (Equivalent or Higher) [1]	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences [1]		*10-11*
Area III: Laboratory Science Course (4 credits)		
Area IV: Social/Behavioral Sciences Course (3 credits)		
Either an Area III: Laboratory Sciences of Area IV: Social/Behavioral Sciences Course (3-4 credits)		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [2]		**6**
Departmental/College Requirements		
Program-Specific Requirements		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 145	Network Essentials: N+ Certification Training	3
ICT 152	Java Programming	3
ICT 161	IT Essentials II: A+ Certification Training focused on the Software exam	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 267	Information Security+ Certification Preparation	3
ICT 280	Introduction to Web Development	3
ICT 320	Introduction to Internet Protocols	3

ICT 350V	Introduction to Personal Computer Security and Privacy [2]	3
ICT 355	Linux System Administration	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Enterprise Administration	3
ICT 377	Computer Networking I	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 457	Information Security Principles	3
Concentration/Technical Electives (take all four courses)		*12*
E T 483	Mobile App Programming and Development [3]	
ICT 372	Software Engineering and Design [3]	
ICT 458	Web Development and Database Applications [3]	
ICT 460	Advanced Software Development Concepts [3]	
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**19-16**
Total Credits		**120**

1. See the **General Education (p. 266)** section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.
2. The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 266) Requirements (6 credits). Visit the catalog's Viewing a Wider World (p. 266) section for a complete list of Viewing a Wider World (p. 266) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.
3. The **provided selection of Technical Electives** will lead to an ICT concentration on **Software Development**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.
4. **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 2+2 Bachelor's Degree

Prefix	Title	Credits
General Education [1]		
Area I: Communications [1]		*10*
English Composition - Level 1		
English Composition - Level 2		
Oral Communications		
Area II: Mathematics		*3 - 4*
MATH 1220G	College Algebra ((equivalent or higher)) [1]	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences [1]		*10-11*
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing A Wider World [2]		**6**
Departmental/College Requirements		
Subject-Matter Courses		*12*
Introduction to Computer Networking (such as ICT 145)		
Introduction to Information Technology (such as ICT 161)		
Introduction to Information Security (such as ICT 267)		
Introduction to Web Development (such as ICT 280)		
Required Courses		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy	3
ICT 355	Linux System Administration	3
ICT 360	Operating Systems for ICT	3
ICT 362	Software Technology II	3
ICT 364	Windows Enterprise Administration	3
ICT 377	Computer Networking I	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 457	Information Security Principles	3
Concentration/Technical Electives (take all four courses)		*12*
E T 483	Mobile App Programming and Development [3]	
ICT 372	Software Engineering and Design [3]	
ICT 458	Web Development and Database Applications [3]	
ICT 460	Advanced Software Development Concepts [3]	
Second Language: (not required)		
Electives, to bring the total credits to 120 [4]		**19-16**
Total Credits		**120**

1. See the **General Education (p. 266)** section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.
2. The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 266) Requirements (6 credits). Visit the catalog's Viewing a Wider World (p. 266) section for a complete list of Viewing a Wider World (p. 266) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.
3. The **provided selection of Technical Electives** will lead to an ICT concentration on **Software Development**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.
4. **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 4-yr Bachelor's Degree

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra. The contents and order of this roadmap may vary depending on initial student placement in mathematics and previous English coursework that was transferred in. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
Elective Course [4]		3
General Education Area I [1]		4
General Education Area II (MATH 1220G or Higher) [1]		3-4
General Education IV [1]		3
	Credits	**16-17**
Spring		
ICT 145	Network Essentials: N+ Certification Training	3
ICT 161	IT Essentials II: A+ Certification Training focused on the Software exam	3
General Education Area I [1]		3
General Education Area III [1]		4
General Education Area V [1]		3
	Credits	**16**
Second Year		
Fall		
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3
General Education Area I [1]		3
General Education Area VI [1]		3
Elective Course [4]		3
	Credits	**15**
Spring		
ICT 267	Information Security+ Certification Preparation	3
ICT 280	Introduction to Web Development	3
General Education Area III or IV [1]		3-4
General Education Elective [1]		3
Elective Course [4]		3
	Credits	**15-16**
Third Year		
Fall		
ICT 360	Operating Systems for ICT	3
ICT 377	Computer Networking I	3
Elective Course [4]		3
Elective Course [4]		3
Elective Course [4]		3
	Credits	**15**
Spring		
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy [2]	3
ICT 355	Linux System Administration	3
ICT 364	Windows Enterprise Administration	3
Viewing a Wider World Elective [2]		3
	Credits	**15**
Fourth Year		
Fall		
ICT 362	Software Technology II	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
E T 483	Mobile App Programming and Development	3
ICT 458	Web Development and Database Applications	3
	Credits	**15**
Spring		
ICT 372	Software Engineering and Design	3
ICT 457	Information Security Principles	3
ICT 460	Advanced Software Development Concepts	3
Viewing a Wider World Elective [2]		3
Electives to bring total to 120 credits (if necessary) [4]		1-0
	Credits	**13-12**
	Total Credits	**120-121**

1. See the **General Education (p. 266)** section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.
2. The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 266) Requirements (6 credits). Visit the c (p. 266)atalog's Viewing a Wider World (p. 266) section for a complete list of Viewing a Wider World (p. 266) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.
3. The **provided selection of Technical Electives** will lead to an ICT concentration on **Software Development**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.
4. **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Pathway: 2+2 Bachelor's Degree

First Year		**Credits**
Elective Credits (include General Education credits) [4]		30
	Credits	**30**
Second Year		
Elective Credits (include General Education credits) [4]		33
	Credits	**33**
Third Year		
Fall		
ICT 141	IT Essentials I: A+ Certification Training Focused on the Hardware Exam	3
ICT 152	Java Programming	3
ICT 220	Discrete Math and Its Relationship to Information Technology	3

ICT 360	Operating Systems for ICT	3
ICT 377	Computer Networking I	3
	Credits	**15**
Spring		
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy	3
ICT 355	Linux System Administration	3
ICT 364	Windows Enterprise Administration	3
Viewing a Wider World Elective [2]		3
	Credits	**15**
Fourth Year		
Fall		
E T 483	Mobile App Programming and Development [3]	3
ICT 362	Software Technology II	3
ICT 435	Senior Project	3
ICT 450	Ethical Hacking	3
ICT 458	Web Development and Database Applications [3]	3
	Credits	**15**
Spring		
ICT 372	Software Engineering and Design [3]	3
ICT 457	Information Security Principles	3
ICT 460	Advanced Software Development Concepts	3
Viewing a Wider World [2]		3
	Credits	**12**
	Total Credits	**120**

1. See the **General Education (p. 266)** section of the catalog for a complete list of courses. The number of credits provided assumes MATH 1220G College Algebra placement or higher.
2. The ICT 350V Introduction to Personal Computer Security and Privacy course is part of the required curriculum for the ICT degree. It does not count towards the Viewing a Wider World (p. 266) Requirements (6 credits). Visit the c (p. 266)atalog's Viewing a Wider World (p. 266) section for a complete list of Viewing a Wider World (p. 266) Requirements. These courses will form part of the required 48 upper-level credit hours taken as part of the ICT program at NMSU.
3. The **provided selection of Technical Electives** will lead to an ICT concentration on **Software Development**, one of the three concentration options. See the NMSU Catalog for information on other concentration options. Concentrations are *optional* educational sequences that students may choose to focus on in IT-related areas. A Technical Electives pre-approved list for each concentration is provided in this catalog.
4. **Elective** credit may vary based on prerequisites, dual credit, AP credit, double majors, or minor coursework. The amount indicated in the requirements list is needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may need to complete more or less on a case-by-case basis, and students should discuss elective requirements with their academic advisor.

Mechanical Engineering Technology - Bachelor of Science in Engineering Technology

Mechanical Engineering Technology ((https://et.nmsu.edu/academics%20/mechanical-engineering-technology.html)MET (https://et.nmsu.edu/academics%20/mechanical-engineering-technology.html)) (https://et.nmsu.edu/academics%20/mechanical-engineering-technology.html) majors learn theory and applications in the fields of manufacturing, product design and development, power systems, machinery, and fluid technology. Our students take courses in mechanisms and machines, computer-aided modeling, heat transfer, and instrumentation, to name a few. They find employment in designing and testing tools, engines, machines, and other complex mechanical devices. MET represents one of the broadest engineering technology disciplines. Our MET students also learn by designing and racing mini-baja cars, designing and constructing machines to help our farmers, and even building systems in other countries.

The Mechanical Engineering Technology program is accredited by the Engineering Technology Accreditation Commission of ABET, https://www.abet.org (https://www.abet.org/), under the commission's General Criteria and Program Criteria for *Mechanical Engineering Technology and Similarly Named Programs.*

Mechanical Engineering Technology - (No Concentration)

Prefix	Title	Credits
General Education		
Area I: Communications [1]		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication (Recommended)	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
COMM 1115G	Introduction to Communication	3
or HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [2]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III: Laboratory Sciences [1]		*8*
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
or PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: Social/Behavioral Sciences [1]		*3*
Strongly Recommended:		
ECON 1110G	Survey of Economics	
PHLS 1110G	Personal Health & Wellness	
or PHLS 1110H	Personal Health and Wellness Honors	
PSYC 1110G	Introduction to Psychology	
SOCI 1110G	Introduction to Sociology	

Area V: Humanities [1]		*3*
Strongly Recommended:		
PHIL 1120G	Logic, Reasoning, & Critical Thinking	
PHIL 2110G	Introduction to Ethics	
Area VI: Creative and Fine Arts [1]		*3*
ARTS 1145G	Visual Concepts (Strongly Recommended)	
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II [2]	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World [1]		**6**
Strongly Recommended Courses:		
BFIN 303V	Personal Financial Planning and Investing in a Global Economy	
MGMT 310V	Entrepreneurial Mindset	
MGMT 388V	Leadership and Ethics	
MGMT 335V	Business and Government	
AEEC 3120V	Natural Resource Economics	
ECON 337V	Natural Resource Economics	
ECON 384V	Water Resource Economics	
HIST 302V	Science in Modern Society	
MKTG 311V	Consumer Behavior	
PHYS 303V	Energy and Society in the New Millennium	
Departmental/College Requirements		
A ST 311	Statistical Applications	3
E T 101	Introduction to Engineering Technology and Geomatics	1
E T 182	Introduction to Digital Logic	2
E T 184	Applied AC Circuits	2
E T 210	Advanced 3-D Modeling (Solid Works)	3
E T 217 & 217 L	Manufacturing Processes and Manufacturing Processes Lab	4
E T 305	Introduction to Product Design	3
E T 306 & 306 L	Thermodynamics and Laboratory Applications and Thermodynamics Lab	4
E T 308 & 308 L	Fluid Technology and Fluid Technology Lab	4
E T 310 & 310 L	Applied Strength of Materials and Applied Strength of Materials Lab	4
E T 317	Advanced Manufacturing and Design	3
E T 396	Heat Transfer and Applications	3
E T 402	Instrumentation	3
E T 410	Senior Seminar	1
E T 426	Analysis and Design of Machine Elements	3
ENGR 110	Introduction to Engineering Design	3
ENGR 120	DC Circuit Analysis	4
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 190	Introduction to Engineering Mathematics	4
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
I E 451	Engineering Economy	3
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	4
or PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Technical Electives [4,5]		*6*
E T 381	Renewable Energy Technologies	
E T 382	Solar Energy Technologies	
E T 384	Wind and Water Energy Technologies	
E T 401	Building Energy and Environment	
E T 420	Engineering Internship [5]	
E T 452	Advanced Automated Control Systems	
E T 480	Innovation and Product Development	
ENGR 400	Special Topics ((Choose three 1-credit courses related to the field)) [5]	
Electives, to bring the total credits to 120		**0**
Total Credits		**124**

1 See the General Education (p. 262) section of the catalog for a full list of courses. See the Viewing a Wider World (p. 266)section of the catalog for a full list of courses.

2 Students may need to take any prerequisites needed before enrolling in MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II. These courses satisfy both the Area II and General Education Elective requirements.

3 Elective credit may vary based on Math course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

4 Concentrations and Minors are 'optional' educational sequences that students may choose to focus in particular areas related to their major. Concentrations and Minors may often be done without additional credits by judicious use of electives and other optional course requirements.

5 Verify with your faculty advisor for pre-approval of ENGR 400 Special Topics that are related to the field and for discussion of E T 420 Engineering Internship limitations and specifications.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Fall		**Credits**
E T 101	Introduction to Engineering Technology and Geomatics	1
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
ENGR 110	Introduction to Engineering Design	3
ENGR 120	DC Circuit Analysis	4
ENGR 190	Introduction to Engineering Mathematics	4
	Credits	**16**
Spring		
Area IV: Social/Behavioral Sciences (see recommended list) [1]		3
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
COMM 1115G or HNRS 2175G	Introduction to Communication (Area I) or Introduction to Communication Honors	3

E T 182	Introduction to Digital Logic	2
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [2] or Calculus and Analytic Geometry I Honors	4
	Credits	**16**
Second Year		
Fall		
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 233	Engineering Mechanics I	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [2] or Calculus and Analytic Geometry II Honors	4
PHYS 1230G & PHYS 1230L or PHYS 1310G ***and*** PHYS 1310L	Algebra-Based Physics I or Calculus -Based Physics I ***and*** Calculus - Based Physics I Lab	4
	Credits	**15**
Spring		
E T 184	Applied AC Circuits	2
E T 210	Advanced 3-D Modeling (Solid Works)	3
E T 217 & 217 L	Manufacturing Processes and Manufacturing Processes Lab	4
ENGR 234	Engineering Mechanics II	3
PHYS 1240G & PHYS 1240L or PHYS 1320G ***and*** PHYS 1320L	Algebra-Based Physics II or Calculus -Based Physics II ***and*** Calculus - Based Physics II Lab	4
	Credits	**16**
Third Year		
Fall		
A ST 311	Statistical Applications	3
E T 306 & 306 L	Thermodynamics and Laboratory Applications and Thermodynamics Lab	4
E T 308 & 308 L	Fluid Technology and Fluid Technology Lab	4
E T 317	Advanced Manufacturing and Design	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
	Credits	**17**
Spring		
E T 305	Introduction to Product Design	3
E T 310 & 310 L	Applied Strength of Materials and Applied Strength of Materials Lab	4
E T 396	Heat Transfer and Applications	3
Area V: Humanities (See recommended list) [1]		3
Viewing a Wider World (See recommended list) [1]		3
	Credits	**16**
Fourth Year		
Fall		
E T 402	Instrumentation	3
E T 426	Analysis and Design of Machine Elements	3
ENGR 401	Engineering Capstone I	3
I E 451	Engineering Economy	3
Technical Elective (from pre-approved list) [4]		3
	Credits	**15**
Spring		
E T 410	Senior Seminar	1
ENGR 402	Engineering Capstone II	3
Technical Elective (from pre-approved list) [4]		3
Viewing a Wider World (See recommended list) [1]		3
Area VI: Creative and Fine Arts (see recommended list) [1]		3
	Credits	**13**
	Total Credits	**124**

1. See the General Education (p. 262) section of this catalog for a full list of courses. See the Viewing a Wider World (p. 266) section of this catalog for a full list of courses.
2. Students may need to take any prerequisites needed before enrolling in MATH 1511G Calculus and Analytic Geometry I and MATH 1521G Calculus and Analytic Geometry II. These courses satisfy both the Area II and General Education Elective requirements.
3. Elective credit may vary based on Math course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.
4. Concentrations and Minors are 'optional' educational sequences that students may choose to focus in particular areas related to their major. Concentrations and Minors may often be done without additional credits by judicious use of electives and other optional course requirements.

Computer Engineering Technology - Undergraduate Minor

This minor is intended for non-ECET majors.

Prefix	Title	Credits
Required Courses [1, 2, 3]		
ENGR 130	Digital Logic	4
ENGR 140	Introduction to Programming and Embedded Systems	4
E T 344	Microprocessor Systems	3
E T 398	Digital Systems	4
E T 444	Computer Hardware Senior Design	3
Total Credits		**18**

1. A grade of C- or better is required in each course (may not be taken S/U).
2. Listed courses may have additional prerequisites. Non-majors may contact the instructor to request a prerequisite waiver. Prerequisites waiver(s) may or may not be granted by the instructor.
3. Engineering Technology students can meet most of the requirements for this minor by judicious selection of their electives. Consult with a faculty advisor.

Digital Forensics - Undergraduate Minor

This minor can be fully completed online but may also list electives that are not typically online courses.

For non-IET, non-ICT majors.

Prefix	Title	Credits
Required Courses [1, 2, 3]		**12**
ICT 355	Linux System Administration	
ICT 339	Introduction to Digital Forensics and Incident Response	
ICT 439	Advanced Digital Forensics and Incident Response	
ICT 450	Ethical Hacking	
Select two from the following list: [1, 2, 3]		**6**
ICT 457	Information Security Principles	
or BCIS 482	Management of Information Security	
ICT 463	Enterprise Linux Network Administration Tools	
ICT 487	Data Security	
Total Credits		**18**

1 A grade of C- or better is required in each course (may not be taken S/U).

2 Listed courses may have additional prerequisites. Non-majors may contact the instructor to request a prerequisite waiver. Prerequisites waiver(s) may or may not be granted by the instructor.

3 Engineering Technology students can meet most of the requirements for this minor by judicious selection of their electives. Consult with a faculty advisor.

Geomatics - Undergraduate Minor

Geomatics involves the application of knowledge to the analysis, design and execution of mapping, geomatics, geospatial information systems, and surveying. When performing this work, professionals must have an understanding of: the science of geomatic measurement and analysis; the legal principles of boundary location; the laws related to boundaries and land use; and applicable mathematical and computational theories and principles. Geomatics is made up of positional accuracy, land planning and development concepts pertinent to subdivision science. Geomatics professionals work for private surveying or engineering firms, for City, County, State or Federal Highway Departments, for State Lands Commissions, for the US Forest Service and for the US Bureau of Land Management, among others.

The mission of the Department of ETSE is to provide students with the rigorous, fundamental education needed to enter and succeed in the Geomatics and related professions. To accomplish this mission, the department will introduce students to the theory and application of recognized geomatics principles.

Prefix	Title	Credits
SUR 222	Introduction to Geomatics	3
or DRFT 222	Introduction to Geomatics	
SUR 292	Legal Principles and Boundary Law I	3
SUR 361	Geodesy/Geodetic Control Surveying	3
Select 3 courses from the following:		**9-11**
E T 355	Site/Land Development and Layout	
GEOG 373	Introduction to Remote Sensing	
or GEOG 381	Cartography and GIS	
GEOG 481	Fundamentals of GIS	
SUR 285	Precise Digital Mapping	
SUR 312	Public Land Survey System Boundaries	
SUR 328 & 328L	Construction Surveying & Automation Technologies and Construction Surveying & Automation Technologies Lab	
SUR 351	Spatial Data Adjustment I	
SUR 452	Surveying Practicum	
SUR 461 & 461L	GNSS Positioning and GNSS Positioning Lab	
SUR 485	Emerging Techniques in Geospatial Technologies	
Total Credits		**18-20**

Information Security Technology - Undergraduate Minor

This minor can be completed fully online but may also list electives that are not typically online courses.

This minor is for non-ICT majors.

Prefix	Title	Credits
Required Courses [1, 2, 3]		
ICT 320	Introduction to Internet Protocols	3
ICT 350V	Introduction to Personal Computer Security and Privacy	3
ICT 450	Ethical Hacking	3
ICT 457	Information Security Principles	3
Elective - Select two from the following: [1, 2, 3]		**6**
CSCI 4205	Computer Security	
BCIS 480	Introduction to Cybersecurity: Exploring Computer, Network, and Data Security Principles	
ICT 467	Communication Network Security	
ICT 487	Data Security	
Total Credits		**18**

1 A grade of C- or better is required in each course (may not be taken S/U).

2 Listed courses may have additional prerequisites. Non-majors may contact the instructor to request a prerequisite waiver. Prerequisites waiver(s) may or may not be granted by the instructor.

3 Engineering Technology students can meet most of the requirements for this minor by judicious selection of their electives. Consult with a faculty advisor.

Manufacturing - Undergraduate Minor

The *Manufacturing Minor* provides students with an augmenting skillset to better facilitate entry-level employment in manufacturing related industries. Students completing the *Minor* also acquire specialized knowledge needed for successful pursuit of a career in the manufacturing sector.

Typical skills gained from *Manufacturing Minor* coursework include: management and coordination of manufacturing processes, design for manufacturing, fabrication and assembly, product design and development, product specification, operations planning, scheduling,

material handling, quality control, testing, evaluation and product validation.

A grade of C- or better is required in each course (may not be taken S/U). All prerequisites must be met before enrolling in a course. Engineering Technology students can meet most of the requirements for this minor by judicious selection of their electives.

Prefix	Title	Credits
Required Courses: Select one manufacturing course with any accompanying/embedded lab from the following:		**3-4**
E T 217 & 217 L	Manufacturing Processes and Manufacturing Processes Lab	
I E 217	Manufacturing Processes	
Select one from the following:		3
MGMT 335V	Business and Government	
MGMT 344	Production and Operations Management	
E T 305	Introduction to Product Design	3
E T 317	Advanced Manufacturing and Design	3
E T 480	Innovation and Product Development	3
I E 456	Large Scale Systems Engineering	3
Total Credits		**18-19**

Renewable Energy Technologies - Undergraduate Minor

A grade of C- or better is required in each course (no courses may be taken S/U). All prerequisites must be met before enrolling in a class. Engineering Technology students can meet most of the requirements for this minor by judicious selection of their electives. Students may receive credit for only one special topic course (must be renewable content) or internship.

Prefix	Title	Credits
Required Courses		
Select two or three from the required list [1]		*9-6*
E T 381	Renewable Energy Technologies [1]	
E T 382	Solar Energy Technologies	
E T 384	Wind and Water Energy Technologies	
Select two or three courses from the electives list: [2]		*6-9*
Any extra course from the required list		
C E 256/ENVS 2111	Environmental Engineering and Science	
C E 356	Fundamentals of Environmental Engineering	
CHME 486	Biofuels	
E T 306	Thermodynamics and Laboratory Applications	
or M E 340	Applied Thermodynamics	
E T 308	Fluid Technology	
or M E 338	Fluid Mechanics	
E T 396	Heat Transfer and Applications	
or M E 341	Heat Transfer	
E T 356	Applied Power Technologies	
or E E 333	AC Circuit Analysis and Introduction to Power Systems	
E T/M E 401	Building Energy and Environment	
E T 456	Applied Power Technologies II	
or E E 431	Power System Analysis	
E T 459	Construction Technology and Management	
Select 3 credits from the following: [3]		*3*
AEEC 3120V	Natural Resource Economics	
ECON 337V	Natural Resource Economics	
E T 360V	Technology in Business and Society	
ECON 384V	Water Resource Economics	
EPWS 380V	Science & Society	
HIST 302V	Science in Modern Society	
PHYS 303V	Energy and Society in the New Millennium	
Total Credits		**18**

1. Students must complete a total of five courses from the required and elective lists: either two from the required list and three from the electives, or three from the required list and two from the electives.
2. Other special topic courses could be counted for credit if related to renewable energies upon advisor's approval.
3. If the selected course is outside the student's college it may also satisfy a Viewing a Wider World requirement.

Industrial Engineering

Undergraduate Program Information

Industrial engineers design, develop, install, and improve integrated systems. Integrated systems can involve people, equipment, information, financial resources, software, materials, or energy. Industrial engineers work in a variety of manufacturing, health care, utility, retail, government, and research settings, therefore the tools and methods of the industrial engineer are both varied and broad. Industrial Engineers use knowledge and skills in engineering, mathematics, and physical and social sciences. They also use principles and methods of engineering analysis and design to monitor and improve systems. New Mexico State University's undergraduate degree program in Industrial Engineering prepares students to join the workforce or pursue graduate education while setting the foundation for lifelong learning.

Specifically, within 2-3 years of graduation, graduates of the program will have:

- successfully applied various industrial Engineering techniques in an integrated fashion to solve real-world problems in process design and/or improvement;
- been engaged in a successful career sustained by life-long learning experiences

In addition, the Engineering Accreditation Commission of ABET, Inc. criteria in conjunction with the Institute of Industrial Engineers, requires that:

- baccalaureate degree graduates will be able to demonstrate the ability to design, develop, implement, and improve integrated systems that include people, materials, information, equipment, and energy;
- industrial engineering curricula include in-depth instruction allowing students to accomplish the integration of systems using appropriate analytical, computational, and experimental practices; and
- that faculty teaching in industrial engineering departments shows evidence of understanding professional practice and staying current in their respective professional areas. Program faculty must have a responsibility and sufficient authority to define, revise, implement, and achieve program objectives.

Master's Accelerated Program: The Master's Accelerated Program (MAP) option provides excellent opportunities for academically qualified undergraduate students to begin working on a master's degree during their junior year and senior year. The student must obtain prior approval

from the department head before starting the MAP. Note that the MAP is only applicable if the student has not yet completed a bachelor's degree.

Graduate Program Information

The Department of Industrial Engineering offers graduate work leading to the degrees of Master of Engineering in Industrial Engineering (MEIE), Master of Science in Industrial Engineering (MSIE), and Doctor of Philosophy (Ph.D.) with a specialization in industrial engineering. Areas of emphasis include

- operations research and simulation analytics,
- manufacturing systems,
- quality and reliability engineering,
- engineering management and systems engineering.

Departmental admission requirements in addition to those of the Graduate School must be considered on an individual basis because of the diversity of backgrounds of applicants in the program. An applicant should meet or correspond directly with the department as a first step in determining his or her specific admission status. Applicants should present mathematics preparation equivalent to 9 credits of calculus for engineers, 3 credits of differential equations, and 3 credits of calculus-based probability and statistics.

The MEIE is a Professional Master's degree targeting a working professional who wants to pursue a Master's degree in Industrial Engineering. The minimum credit-hour requirements for the MEIE degree may be met in the following way:

- 30-semester credits of approved coursework.

The MSIE is a research-oriented degree. The minimum credit-hour requirements for the MSIE degree may be met in any of the following ways:

- 24-semester credits approved course work and 6-semester credits of thesis (I E 599 Master's Thesis) for a total of 30-semester credits or
- 27-semester credits approved course work and 3-semester credits of project (I E 598 Special Research Programs) for a total of 30-semester credits.

Approved coursework must meet all requirements of the Graduate School, represent a consistent master's program in relation to a student's graduate study goals as determined through consultation with the graduate program adviser, and be approved by a program committee of the graduate faculty of the department. Programs in the focus areas of operations research and simulation analytics, manufacturing systems, quality and reliability engineering, or engineering management and systems engineering can be developed with the aid of a faculty advisor.

Departmental facilities and equipment are available to support the research efforts of graduate students, including computer terminals and laboratories. In addition to departmental facilities, supporting facilities such as the Aggie Innovation Space (AIS) and interdisciplinary research clusters are available for research work.

The Ph.D. program is research-oriented with the final product being the dissertation. The general information (p. 31) chapter in this catalog describes the Ph.D. degree program. The Ph.D. in Industrial Engineering also includes the following requirements:

- the coursework must include at least 12 credits at the 500 level in a related field,
- 6 credits of 600-level research courses covering two areas, and
- 18 credits of 700-level courses following successful completion of the comprehensive examination.

The department does not have any foreign language or research tool requirements. Interested individuals should correspond directly with the department to determine eligibility for admission.

Degrees for the Department

Bachelor Degree(s)

- Industrial Engineering - Bachelor of Science in Industrial Engineering (p. 1209)

Master Degree(s)

The Master of Science in Industrial Engineering degree is a research-oriented degree. If you are interested in pursuing an advanced degree for a career in the engineering sciences or in preparation for a Ph.D., our MS degree is for you. The Master of Engineering in Industrial Engineering is the coursework-only degree. It is a **Professional Master's degree** targeting a working professional who wants to pursue a Master's degree in Industrial Engineering at New Mexico State University.

- Engineering Management - Master of Engineering in Engineering Management (Online) (https://catalogs.nmsu.edu/global/nmsu-global/engineering-management-meem-online/)
- Industrial Engineering (Systems Engineering) - Master of Engineering in Industrial Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/industrial-engineering-systems-engineering-meie-online/)
- Industrial Engineering - Master of Engineering in Industrial Engineering (p. 169)
- Industrial Engineering - Master of Engineering in Industrial Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/industrial-engineering-meie-online/)
- Industrial Engineering - Master of Science in Industrial Engineering (p. 170)
- Industrial Engineering - Master of Science in Industrial Engineering (Online) (https://catalogs.nmsu.edu/global/nmsu-global/industrial-engineering-msie-online/)

Doctoral Degree(s)

- Engineering (Industrial Engineering) - Doctor of Philosophy (p. 223)

Minors for the Department

- Advanced Manufacturing - Graduate Minor (p. 253)
- Entrepreneurship - Undergraduate Minor (p. 1211)
- Lean Manufacturing and Analytics - Undergraduate Minor (p. 1211)
- Supply Chain and Operations Research Analytics - Undergraduate Minor (p. 1212)
- Systems Engineering - Undergraduate Minor (p. 1212)

Graduate Certificates

- Systems Engineering - Graduate Certificate (p. 252)
- Systems Engineering - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/systems-engineering-gr-certificate-online/)

Hansuk Sohn, Department Head

Professors

Associate Professors Hansuk Sohn (Department Head), John Mullen, Raja Jayaraman

Assistant Professors Chaitanya Mahajan, Venkata Sirimuvva "Siri" Chirala

Professor of Practices Manuel Ivan Rodriguez Borbon, Salvador Rodriguez

Adjunct Professor German Reyes

Professor Emeritus Ed Pines

H. Sohn, Department Head, Ph.D. (University of Iowa)– Combinatorial optimization, Operations Research applications in logistics, transportation, and health systems; J. Mullen, Ph.D. (Iowa State)– Stochastic processes, quality, improvement, production system design; R. Jayaraman, Ph.D. (Texas Tech)- Digital supply chain, applied Operations Research, healthcare systems engineering; C. Mahajan, Ph.D. (Rochester Institute of Technology)- Additive manufacturing, computer integrated manufacturing, manufacturing systems; V. S. Chirala, Ph.D. (Wayne State)- Robot operating system, autonomous vehicles, multi-objective stochastic programming, machine learning; M. I. Rodriguez Borbon, Ph.D. (NMSU)- Experimental statistics, reliability, degradation analysis, survival analysis, lifecycle analysis; Salvador "Sal" Rodriguez, MS (NMSU)- Conceptual, Developmental and Operational Test & Evaluation, and Project Management; G. Reyes, Ph.D. (NMSU)- computer simulation modeling, including agent-based modeling, system dynamics modeling, and digital twin technology; E. Pines, Ph.D. (Penn State)– Quality and continuous improvement, technology policy;

Industrial Engineering Courses

I E 151. Computational Methods in Industrial Engineering
3 Credits (3)
History, social implications, and application of computers and an introduction to computer programming, word processing, and database management systems. Satisfies General Education computer science requirement. May be repeated up to 3 credits.
Prerequisite: MATH 1220G.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

I E 200. Special Problems-Sophomore
1-3 Credits
Directed individual projects. May be repeated up to 3 credits.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.

I E 217. Manufacturing Processes
3 Credits (2+3P)
Introduction to manufacturing and processing, including: casting, forming, and machining. Emphasis on creating products with the appropriate techniques. Crosslisted with: E T 217.
Prerequisite(s): A grade of C- or better in either E T 110 or ENGR 110 and C- or better in MATH 1220G.
Learning Outcomes
1. Identify the different manufacturing processes and their applications.
2. Use, set up, and calibrate measuring tools.
3. Apply geometric tolerances to engineering drawings.
4. Demonstrate basic knowledge of materials and material properties.
5. Demonstrate basic knowledge of GM codes and their application.
6. Proficiently use CAM packages such as SolidWorks CAM.
7. Identify different tooling, their use, and manufacturing application.

I E 300. Special Problems-Junior
1-3 Credits
Directed individual projects. May be repeated up to 3 credits.
Prerequisite: consent of faculty member.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.

I E 311. Engineering Data Analysis
3 Credits (3)
Methodology and techniques associated with identifying and analyzing industrial data.
Prerequisite: C- or better in MATH 1521G or MATH 1521H or ENGR 190.
Learning Outcomes
1. Ability to correctly interpret statistical reports
2. Ability to correctly identify and solve problems involving continuous and discrete probability and random variables.
3. Ability to correctly analyze random samples using methods that include: point estimates, confidence intervals, tests of hypothesis, analysis of variance (ANOVA), and linear regression.

I E 316. Methods Engineering
3 Credits (2+3P)
Methods analysis and design. Work measurement techniques. Job evaluation and wage incentive methods. May be repeated up to 3 credits.
Corequisite: I E 311.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
5. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

I E 351. Applied Problem Solving in Industrial Engineering
3 Credits (3)
Application of computational techniques to engineering problems including the use of commercial programs in statistics and applied mathematics. Restricted to majors.
Corequisite: I E 311.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

I E 365. Quality Control
3 Credits (3)
Statistical analysis of quality in manufacturing. Acceptance sampling and control charts.
Prerequisite: I E 311 or equivalent.
Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.

I E 375. Manufacturing Processes II
3 Credits (3)
Review of basic manufacturing processes. Advanced topics in casting, forming, machining and joining; major process parameters; economics of processes.
Prerequisite: I E 217 or E T 217.
Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
4. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

I E 400. Undergraduate Research
1-3 Credits
Directed individual projects. May be repeated up to 6 credits.
Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.

I E 411. Occupational Safety
3 Credits (3)
Practical methods to improve safety in the workplace. Topics include OSHA and other regulations, hazard recognition, assessment and control, industry standards, risk assessment and safety management. Material is applicable to a variety of workplace settings. This course is intended for College of Engineering students who have completed their lower-division requirements in mathematics, engineering, technology, and basic science. Same as I E 561 with differential assignments. May be repeated up to 3 credits.
Prerequisite: Junior standing.
Learning Outcomes

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

I E 412. Design for Manufacturing and Assembly
3 Credits (3)
Engineering methodology focusing on reducing time-to-market and total production costs by prioritizing both the ease of manufacture for the product's parts and the simplified assembly of those parts into the final product.
Prerequisite: (ENGR 217 or I E 217) and I E 316.
Learning Outcomes

1. The ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. The ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. The ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
4. The ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

I E 413. Engineering Operations Research I
3 Credits (3)
Deterministic operations research modeling including linear and integer programming.
Prerequisite: MATH 1521G or MATH 1521H or ENGR 190.
Corequisite: MATH 480 or MATH 2415.
Learning Outcomes

1. Ability to model optimization problems that can be solved by linear optimization.
2. Ability to solve linear optimization problems
3. Ability to interpret solutions of linear optimization problems in the context of the larger problem.

I E 423. Engineering Operations Research II
3 Credits (3)
Probabilistic operations research modeling, including queuing systems and their optimization; Markov chains.
Prerequisite: I E 311.
Corequisite: MATH 392.
Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.

3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 424. Manufacturing Systems
3 Credits (3)
Organization and functions of manufacturing planning and control systems including forecasting, MRP, capacity planning, JIT systems, scheduling, and inventory control.
Prerequisite: I E 311.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

I E 425. Supply Chain Modeling and Analysis
3 Credits (3)
This course introduces supply chain and logistics concepts integrating theory and its application. The course emphasis is on understanding the role of supply chains for competitive advantage, when and how these concepts are applied to improve the distribution of goods and services, as well as in using mathematical programming and optimization methods for their adequate implementation.
Prerequisite: MATH 1521G or MATH 1521H or ENGR 190.
Corequisite: MATH 2415.
Learning Outcomes
1. Define and understand different structures and the importance of the supply chain.
2. Identify the main drivers of supply chain performance and measure them using precise metrics.
3. Integrate production operations management topics in the context of the supply chain.
4. Develop the ability to formulate quantitative decision models for supply chain and logistics management.
5. Study inventory planning decisions, Economic Order Quantity (EOQ), and its variants.

I E 451. Engineering Economy
3 Credits (3)
Discounted cash flows, economics of project, contract and specifications as related to engineering design.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 456. Large Scale Systems Engineering
3 Credits (3)
Systems engineering approaches to large-scale complex technological and societal problems. Concepts of interaction and structural graphs, matrices, delta, and Gantt charts. The hall matrix approach, structural concepts, reachability matrices, and cross impact-analysis, modeling and decision making. May be repeated up to 3 credits.
Learning Outcomes
1. Ability to describe the systems engineering standards and best practices
2. Ability to characterize the limitations of the way that current systems engineering is practiced in terms of dealing with lifecycle uncertainty.

I E 459. Systems Thinking and Decision Making
3 Credits (3)
A general introduction to systems engineering. Topics include General Systems Theory, Systems Thinking and emerging concepts, Systems Dynamics approaches for modelling and analyzing non-linear feedback mechanisms in complex systems, and Complexity science and complex adaptive systems. May be repeated up to 3 credits.
Learning Outcomes
1. Ability to understand the complexities of engineering systems, and the implications of change on system behavior
2. Ability to understand the nature of complex systems in respect to people, processes, the environment and development organization
3. Ability to understand Systems Thinking's' role and value within organizations
4. Ability to recognize the advantages, as well as the flaws of our present predominant way of thinking (Cartesian), while looking at the changes that would enable us to deal with complex issues in daily practice (Systems Thinking)
5. Ability to recognize the value and limitations of modeling and simulation as well as how to construct and interpret various models to support decision making.

I E 460. Evaluation of Engineering Data
3 Credits (3)
Analysis of engineering systems possessing variability, employing regression, analysis of variance, distribution theory, and experimental design methods.
Prerequisite: I E 311 or equivalent.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

I E 466. Reliability
3 Credits (3)
Application of statistical theory to engineering reliability estimation, reliability improvement, and the analysis of reliability test data.
Prerequisite: I E 311 or equivalent.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

I E 467. Discrete-Event Simulation Modeling
3 Credits (3)
Basic modeling concepts, organizations of simulations, input data analysis, random variate generation, simulation design and analysis, model validation, output analysis, and management of simulations. Differentiated graduate assignments.
Prerequisite: I E 311 or equivalent.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
4. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
5. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

I E 468. Advanced Discrete-Event Simulation Applications
3 Credits (3)
Semester long project involving development and application of advanced simulation skills. May be repeated up to 3 credits.
Prerequisite: I E 467.
Learning Outcomes
1. Ability to understand the techniques of computer simulation modeling in the context of hierarchy of knowledge about a system and develop the capability to apply the same to study systems through available computer simulation software

I E 478. Facilities Planning and Design
3 Credits (3)
Plant location methods, total process analysis, process integration, materials handling analysis, and traditional and computerized plant layout methodologies.
Prerequisite: I E 316.
Prerequisite/Corequisite: I E 424.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

I E 490. Selected Topics
1-3 Credits
This course offers an in-depth exploration of specific topics within a given field or discipline. The content may vary each time the course is offered, allowing for flexibility in addressing emerging trends, current issues, or specialized areas of study. May be repeated up to 9 credits.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 505. Directed Readings
1-3 Credits
The Directed Readings course provides students with the opportunity to pursue an in-depth exploration of a specific topic or area of interest under the guidance of a faculty mentor. Through independent study and directed readings, students will delve into scholarly literature, research articles, and relevant texts to deepen their understanding of the chosen subject matter. The course allows for a flexible learning experience tailored to the student's academic goals and interests. Students will work closely with their mentor to develop a reading list, set learning objectives, and engage in discussions to enhance their comprehension and critical analysis skills. May be repeated up to 6 credits.
Learning Outcomes
1. An ability to demonstrate a comprehensive understanding of the chosen topic or area of interest through in-depth reading and analysis of relevant literature.
2. An ability to develop critical thinking skills by evaluating and synthesizing information from scholarly sources, research articles, and other relevant texts.
3. An ability to effectively communicate their insights, findings, and reflections on the chosen topic through written assignments, discussions, and presentations.
4. An ability to acquire research skills, including the ability to locate, evaluate, and integrate scholarly sources into their analysis and writing.

I E 511. Survey of Industrial Engineering
3 Credits (3)
A project-based course covering methods of engineering, plant layout, production and inventory control, economic analysis, etc. May be repeated up to 3 credits.
Learning Outcomes
1. Ability to apply the various techniques of Industrial Engineering to solve real-life problems

I E 515. Stochastic Processes Modeling
3 Credits (3)
Introduction to the use of stochastic processes in the modeling of physical and natural systems. Use of generating functions, conditional

probability and expectation, Poisson processes, random walk models, Markov chains, branching processes, Markov processes, and queuing processes in an applied setting.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 522. Queuing Systems
3 Credits (3)

Elements and classification of queuing systems, single server models, multi-server models, cost analysis and applications.

Learning Outcomes

1. Ability to model, analyze, and apply solutions to problems involving queueing systems
2. Ability to read and understand literature in the queueing system analysis field.

I E 523. Advanced Engineering Economy
3 Credits (3)

Theoretical basis for engineering economy methods, problems of cost estimation, replacement, nonmonetary factors, and feasibility studies. Same as C E 523.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 524. Advanced Production and Inventory Control
3 Credits (3)

Organization and functions of manufacturing planning and control systems including forecasting, MRP, capacity planning, JIT systems, scheduling and inventory control. Same as I E 424 with differentiated assignments.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

I E 525. Systems Synthesis and Design
3 Credits (3)

Examination of the production management complex in terms of its components and the synthesis of these components into an effective operating unit. Development of input-output models representing the basis structure of all production activities.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 530. Environmental Management Seminar
1 Credit (1)

Survey of practical and new developments in hazardous and radioactive waste management provided through a series of guest lectures and reports of ongoing research. Same as C E 530, E E 530, CHME 530.

Learning Outcomes

1. An ability to demonstrate a comprehensive understanding of key concepts, principles, and theories related to environmental management, including environmental policy, sustainability, resource conservation, and pollution control.
2. An ability to develop critical thinking and analytical skills by evaluating environmental issues, assessing their impact on ecosystems and human populations, and proposing evidence-based solutions to address complex environmental challenges.
3. An ability to gain an interdisciplinary perspective by exploring environmental management topics from multiple viewpoints, integrating knowledge from fields such as ecology, economics, sociology, and public policy.
4. An ability to develop an awareness of ethical considerations and values relevant to environmental management, including principles of environmental justice, equity, and responsibility towards future generations.

I E 533. Linear Programming
3 Credits (3)

Linear programming problem formulation, simplex algorithm, theory of linear programming, duality, revised simplex algorithm, and sensitivity analysis.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.

3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 534. Nonlinear Programming
3 Credits (3)
Theoretical and computational methods to solve optimization problems in engineering, statistics, economics, and operations research. Topics include convexity, optimality conditions, Newton's method, Lagrange multipliers, search algorithms for unconstrained and constrained problems, as well as barrier and penalty methods.
Learning Outcomes
1. Ability to model situations which may be solved by nonlinear optimization and to interpret the results in the context of the larger problem
2. Ability to employ several computer tools to correctly solve nonlinear optimization problems.
3. Ability to read and understand literature in the field of nonlinear optimization
4. Ability to select appropriate methods and algorithms from a core representative set of methods and tools to solve nonlinear optimization problems

I E 535. Discrete Optimization
3 Credits (3)
Combinatorial Optimization problems using both integer programming and graph theoretic approaches. Emphasis on modeling and computational algorithms. May be repeated up to 3 credits.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 537. Large Scale Systems Engineering
3 Credits (3)
Systems engineering approaches to large-scale complex technological and societal problems. Concepts of interaction and structural graphs, matrices, delta, and Gantt charts. The hall matrix approach, structural concepts, reachability matrices, and cross impact-analysis, modeling and decision making.
Learning Outcomes
1. Ability to describe the systems engineering standards and best practices.
2. Ability to characterize the limitations of the way that current systems engineering is practiced in terms of dealing with lifecycle uncertainty.

I E 545. Characterizing Time-Dependent Engineering Data
3 Credits (3)
Theory and techniques employed in the characterization of stochastic processes commonly found in engineering applications. Distribution models include exponential, gamma, Weibull, and extreme value. Design and analysis of experiments involving complete and censored data and elevated stress. Analytical techniques include parametric, nonparametric, and graphical approaches with emphasis on modern computer tools. Exact and approximate maximum-likelihood techniques are stressed.
Learning Outcomes
1. Ability to characterize a process, based on data that is time-dependent or sequential in nature.

I E 561. Advanced Safety Engineering
3 Credits (3)
Regulation as well as qualitative, and quantitative methods to achieve and maintain safety in the workplace. Includes liability, worker's compensation, OSHA, hazard control, safety assessment, cost justification, and system analysis.
Learning Outcomes
1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

I E 563. Topics in Engineering Administration
3 Credits (3)
Study of qualitative and quantitative aspects. Consideration given to philosophical, psychological, political and social implications of engineering administrative decisions.
Learning Outcomes
1. An ability to demonstrate a comprehensive understanding of key principles, theories, and practices related to engineering administration, including organizational management, leadership, strategic planning, and decision-making processes.
2. An ability to apply management techniques and tools to analyze and solve complex administrative problems commonly encountered in engineering organizations, such as resource allocation, project management, and risk assessment.
3. An ability to develop effective communication skills, including written, oral, and interpersonal communication, to convey technical information, lead teams, and interact with stakeholders in engineering settings.
4. An ability to enhance critical thinking and problem-solving abilities by evaluating case studies, identifying challenges, and proposing innovative solutions to address administrative issues in engineering contexts.
5. An ability to demonstrate an understanding of ethical and professional responsibilities in engineering administration, including considerations of integrity, fairness, and accountability in decision-making and leadership roles.
6. An ability to develop strategic leadership abilities by analyzing case studies, formulating organizational strategies, and articulating visions for future growth and innovation within engineering organizations.

I E 567. Design and Implementation of Discrete-Event Simulation
3 Credits (3)

Basic modeling concepts, organizations of simulations, input data analysis, random variate generation, simulation design and analysis, model validation, output analysis, and management of simulations. Taught with I E 467 with differentiated assignments for graduate students.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
4. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
5. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

I E 571. Advanced Quality Control
3 Credits (3)

Advanced topics in quality control and design of experiments for improvement of quality.

Prerequisite: I E 311 or equivalent.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.

I E 575. Advanced Manufacturing Processes
3 Credits (3)

Covers major process parameters in casting, forming, machining, and joining. Process economics and selection of processes design and interactions.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
4. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

I E 590. Selected Topics
1-3 Credits

This course offers an in-depth exploration of specific topics within a given field or discipline. The content may vary each time the course is offered, allowing for flexibility in addressing emerging trends, current issues, or specialized areas of study. May be repeated up to 9 credits.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 598. Special Research Programs
1-3 Credits (1-3)

Individual analytical or experimental investigations. May be repeated up to 6 credits.

Learning Outcomes

1. An ability to demonstrate the ability to develop a well-defined research question, formulate hypotheses or objectives, and design a research plan or methodology appropriate to address the research question or problem.
2. An ability to conduct a comprehensive literature review related to their research topic, critically evaluating existing scholarship, identifying gaps in the literature, and synthesizing relevant theoretical frameworks or conceptual models.
3. An ability to collect, analyze, and interpret data using appropriate qualitative or quantitative research methods, techniques, and tools, demonstrating proficiency in data management, statistical analysis, and data visualization.
4. An ability to apply critical thinking skills to evaluate research findings, draw conclusions, and generate insights that contribute to knowledge advancement or address practical problems in their field of study.
5. An ability to effectively communicate their research findings, methodologies, and interpretations to both specialized and non-specialized audiences through written reports, oral presentations, and visual aids, demonstrating clarity, coherence, and persuasiveness.
6. An ability to demonstrate an understanding of ethical principles and guidelines governing research conduct, including issues related to research integrity, confidentiality, informed consent, and the responsible conduct of research.
7. An ability to manage their research projects effectively, including setting timelines, allocating resources, and adapting to unforeseen challenges or setbacks, demonstrating skills in organization, time management, and project coordination.

I E 599. Master's Thesis
1-15 Credits

Thesis. May be repeated up to 88 credits.

Learning Outcomes

1. An ability to demonstrate the ability to develop a well-defined research question, formulate hypotheses or objectives, and design a research plan or methodology appropriate to address the research question or problem.
2. An ability to conduct a comprehensive literature review related to their research topic, identifying gaps in the literature, and synthesizing relevant theoretical frameworks or conceptual models.
3. An ability to collect, analyze, and interpret data using appropriate qualitative or quantitative research methods, techniques, and tools,

demonstrating proficiency in data management, statistical analysis, and data visualization.

4. An ability to apply critical thinking skills to evaluate research findings, draw conclusions, and generate insights that contribute to knowledge advancement or address practical problems in their field of study.
5. An ability to effectively communicate their research findings, methodologies, and interpretations to both specialized and non-specialized audiences through written reports, oral presentations, and visual aids, demonstrating clarity, coherence, and persuasiveness.
6. An ability to demonstrate an understanding of ethical principles and guidelines governing research conduct, including issues related to research integrity, confidentiality, informed consent, and the responsible conduct of research.
7. An ability to manage their research projects effectively, including setting timelines, allocating resources, and adapting to unforeseen challenges or setbacks, demonstrating skills in organization, time management, and project coordination.

I E 610. Topics in Operations Research
3 Credits (3)
Selected topics of current interest, to be designated by subtitle. May be repeated up to 6 credits.

Learning Outcomes

1. An ability to demonstrate a deep understanding of advanced topics in operations research, including but not limited to optimization theory, stochastic processes, queuing theory, decision analysis, and simulation modeling.
2. An ability to apply mathematical modeling techniques to formulate and solve complex optimization problems arising in real-world contexts, such as production planning, logistics, supply chain management, transportation, and resource allocation.
3. An ability to analyze and interpret optimization solutions generated by mathematical models, identifying optimal solutions, sensitivity analysis, trade-offs, and implications for decision-making under uncertainty or constraints.
4. An ability to develop algorithmic problem-solving skills by implementing and applying optimization algorithms, heuristic methods, and computational techniques to solve large-scale optimization problems efficiently and effectively.
5. An ability to demonstrate proficiency in using operations research software tools and programming languages commonly used in the field, such as linear programming solvers, simulation software, mathematical modeling languages (e.g., Xpress, CPLEX, AMPL, GAMS), and general-purpose programming languages (e.g., Python, MATLAB).
6. An ability to critically evaluate the application of operations research techniques in various industries and domains, assessing the strengths, limitations, and practical considerations of OR models and methodologies in addressing complex decision problems.
7. An ability to effectively communicate the results of their operations research analyses and findings to diverse stakeholders, including technical and non-technical audiences, through written reports, presentations, and visualizations.

I E 620. Topics in Computer Modeling
3 Credits (3)
Selected topics of current interest, to be designated by subtitle. May be repeated up to 6 credits.

Learning Outcomes

1. An ability to demonstrate an understanding of fundamental principles and techniques used in computer modeling, including conceptual modeling, mathematical modeling, simulation, and computational algorithms.
2. An ability to apply computer modeling tools and software packages to develop, implement, and validate models for solving real-world problems across various domains, such as engineering, science, economics, and social systems.
3. An ability to develop, analyze, and interpret computer models to simulate complex systems, processes, or phenomena, identifying relevant input parameters, defining system boundaries, and evaluating model outputs to draw meaningful conclusions.
4. An ability to acquire proficiency in programming languages and scripting tools commonly used for computer modeling, such as Python, MATLAB, R, or specialized simulation software, enabling them to implement and customize models to address specific requirements.
5. An ability to employ verification and validation techniques to assess the accuracy, reliability, and credibility of computer models, including sensitivity analysis, calibration, uncertainty quantification, and comparison with empirical data or experimental results.
6. An ability to integrate optimization techniques and decision support tools into computer models to optimize system performance, resource allocation, scheduling, or decision-making processes, considering constraints, objectives, and stakeholder preferences.
7. An ability to utilize visualization techniques and graphical representation methods to visualize model outputs, communicate results effectively, and facilitate stakeholders' understanding and interpretation of complex modeling scenarios.
8. An ability to apply critical thinking and problem-solving skills to analyze real-world problems, formulate hypotheses, design experiments, and iteratively refine models based on feedback and empirical observations.

I E 630. Topics in Engineering Management
3 Credits (3)
Selected topics of current interest, to be designated by subtitle. May be repeated up to 6 credits.

Learning Outcomes

1. An ability to demonstrate an understanding of fundamental concepts, theories, and principles in engineering management, including organizational behavior, project management, strategic planning, leadership, and decision-making processes.
2. An ability to apply engineering management techniques and tools to analyze, plan, and optimize engineering projects, processes, and systems, considering factors such as cost, quality, time, risk, and stakeholder requirements.
3. An ability to develop skills in strategic planning and decision-making, identifying organizational goals, formulating strategies, evaluating alternatives, and making informed decisions to achieve desired outcomes in engineering contexts.
4. An ability to acquire proficiency in project management methodologies, tools, and techniques, including project planning, scheduling, budgeting, resource allocation, risk management, and performance monitoring, to successfully execute engineering projects.
5. An ability to recognize the ethical and social responsibilities of engineering managers, considering the impact of engineering

projects on society, environment, and stakeholders, and integrating ethical considerations into decision-making processes.

6. An ability to engage in cross-functional collaboration, interacting with professionals from diverse disciplines such as engineering, business, finance, marketing, and operations to address complex engineering management challenges and opportunities.
7. An ability to evaluate and mitigate risks associated with engineering projects and operations, applying risk assessment techniques, developing risk management plans, and implementing proactive measures to minimize potential negative impacts.

I E 690. Selected Topics
1-15 Credits
This course offers an in-depth exploration of specific topics within a given field or discipline. The content may vary each time the course is offered, allowing for flexibility in addressing emerging trends, current issues, or specialized areas of study. May be repeated up to 99 credits.
Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 700. Doctoral Dissertation
15 Credits
Dissertation. May be repeated up to 88 credits.
Learning Outcomes

1. An ability to demonstrate the ability to develop a well-defined research question, formulate hypotheses or objectives, and design a research plan or methodology appropriate to address the research question or problem.
2. An ability to conduct a comprehensive literature review related to their research topic, identifying gaps in the literature, and synthesizing relevant theoretical frameworks or conceptual models.
3. An ability to collect, analyze, and interpret data using appropriate qualitative or quantitative research methods, techniques, and tools, demonstrating proficiency in data management, statistical analysis, and data visualization.
4. An ability to apply critical thinking skills to evaluate research findings, draw conclusions, and generate insights that contribute to knowledge advancement or address practical problems in their field of study.
5. An ability to effectively communicate their research findings, methodologies, and interpretations to both specialized and non-specialized audiences through written reports, oral presentations, and visual aids, demonstrating clarity, coherence, and persuasiveness.
6. An ability to demonstrate an understanding of ethical principles and guidelines governing research conduct, including issues related to research integrity, confidentiality, informed consent, and the responsible conduct of research.
7. An ability to manage their research projects effectively, including setting timelines, allocating resources, and adapting to unforeseen challenges or setbacks, demonstrating skills in organization, time management, and project coordination.

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Industrial Engineering - Bachelor of Science in Industrial Engineering

Requirements (121 credits)

In addition to the university requirements for graduation, a student must have at least a 2.0 grade-point average in all departmental courses.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 121 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
COMM 1115G	Introduction to Communication	3
or HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [1]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
ECON 2110G	Macroeconomic Principles	3
or ECON 2110H	Principles of Macroeconomics Honors	
or ECON 2120G	Principles of Microeconomics Honors	
or ECON 2120H	Principles of Microeconomics Honors	
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
Program Specific Requirements		
Mathematics		

MATH 1521G (or MATH 1521H) will count towards both the General Education Elective requirement and the Mathematics requirement for the department		
MATH 2530G	Calculus III	3
MATH 3160	Introduction to Ordinary Differential Equations	3
MATH 4230	Applied Linear Algebra	3
or MATH 2415	Introduction to Linear Algebra	
Natural Science Electives		*7-8*
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
or PHYS 1320G/1320L	Calculus -Based Physics II	
Choose one from the following (3-4 credits):		
GEOL 1110G	Physical Geology	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
PHYS 2120	Heat, Light, and Sound	
Engineering Core		
ENGR 110	Introduction to Engineering Design	3
ENGR 190	Introduction to Engineering Mathematics	4
ENGR 233	Engineering Mechanics I	3
CHME 361	Engineering Materials	3
Capstone Course		
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
Industrial Engineering Topics Electives		
Choose three 3 credit Industrial Engineering topics courses, consisting of engineering and computer sciences and engineering design, and utilizing modern engineering tools: At least two courses must be numbered 300 and above [4]		9
Industrial Engineering		
I E 151	Computational Methods in Industrial Engineering	3
I E 217	Manufacturing Processes	3
I E 311	Engineering Data Analysis	3
I E 316	Methods Engineering	3
I E 351	Applied Problem Solving in Industrial Engineering	3
I E 365	Quality Control	3
I E 413	Engineering Operations Research I	3
I E 423	Engineering Operations Research II	3
I E 424	Manufacturing Systems	3
I E 451	Engineering Economy	3
I E 460	Evaluation of Engineering Data	3
I E 467	Discrete-Event Simulation Modeling	3
Second Language: (not required)		
Electives, to bring the total credits to 121		**0**
Total Credits		**121-122**

1. MATH 1511G (or MATH 1511H) is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G (or MATH 1511H) first.
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4. Students are required to see the advisor for more detailed information about selecting the Industrial Engineering Topics Elective Courses that are approved to fulfill this requirement.

A Suggested Plan of Study for Students

This roadmap is a semester-by-semester planning guide for Industrial Engineering major. It assumes student placement in MATH 1511G Calculus and Analytic Geometry I (or MATH 1511H) and ENGL 1110G Composition I (or ENGL 1110H). The contents and order of this roadmap may vary depending on initial student placement in Mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from semester to semester and may be subject to modification or change. Roadmaps should be reviewed in consultation with your advisor.

First Year		
Fall		**Credits**
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGR 190	Introduction to Engineering Mathematics	4
	Credits	**16**
Spring		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
I E 151	Computational Methods in Industrial Engineering	3
Area V: Humanities Course [2]		3
ENGR 110	Introduction to Engineering Design	3
	Credits	**17**
Second Year		
Fall		
Choose one from the following:		4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
MATH 2530G	Calculus III	3
ENGR 233	Engineering Mechanics I	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Spring		
ECON 2110G or ECON 2110H or ECON 2120G or ECON 2120H	Macroeconomic Principles or Principles of Macroeconomics Honors or Principles of Microeconomics Honors or Principles of Microeconomics Honors	3
CHME 361	Engineering Materials	3
I E 217	Manufacturing Processes	3
I E 311	Engineering Data Analysis	3

COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
	Credits	**15**
Third Year		
Fall		
MATH 3160	Introduction to Ordinary Differential Equations	3
I E 316	Methods Engineering	3
I E 351	Applied Problem Solving in Industrial Engineering	3
I E 365	Quality Control	3
I E 451	Engineering Economy	3
	Credits	**15**
Spring		
I E 423	Engineering Operations Research II	3
I E 424	Manufacturing Systems	3
I E 460	Evaluation of Engineering Data	3
MATH 4230 or MATH 2415	Applied Linear Algebra or Introduction to Linear Algebra	3
Industrial Engineering Topics Elective [3]		3
	Credits	**15**
Fourth Year		
Fall		
I E 413	Engineering Operations Research I	3
I E 467	Discrete-Event Simulation Modeling	3
ENGR 401	Engineering Capstone I	3
Choose one from the following:		3-4
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
GEOL 1110G	Physical Geology	
PHYS 2120	Heat, Light, and Sound	
Viewing A Wider World Course [4]		3
	Credits	**15-16**
Spring		
Industrial Engineering Topics Elective [3]		6
ENGR 402	Engineering Capstone II	3
Viewing A Wider World Course [4]		3
	Credits	**12**
	Total Credits	**121-122**

1. MATH 1511G (or MATH 1511H) is the starting Math course for the degree but students may need to complete any prerequisites prior to enrolling in this course depending on math placement.
2. See the General Education (p. 262) Section of the catalog for a full list of courses.
3. See your adviser for more detailed information about selecting the Industrial Engineering Topics Elective Course that is approved to fulfill this requirement.
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

Entrepreneurship - Undergraduate Minor

The Entrepreneurship Minor is designed to promote entrepreneurship to students across the NMSU campus. The Department of Industrial Engineering coordinates an engineering cluster of electives to support the three required classes offered by the College of Business.

Prefix	Title	Credits
Entrepreneurship		
BLAW 330	Entrepreneurship Law	3
MGMT 310V	Entrepreneurial Mindset	3
Engineering Electives		**12**
Select four classes from the following:		
CHME 449	Intellectual Property for Engineers and Scientists	
E T 480	Innovation and Product Development	
I E 563	Topics in Engineering Administration	
I E 590	Selected Topics	
Total Credits		**18**

Lean Manufacturing and Analytics - Undergraduate Minor

Prefix	Title	Credits
Course Requirements		
Required Courses		
I E 316	Methods Engineering	3
I E 490	Selected Topics (Lean tools in Systems Engineering)	3
Technical Elective Courses (Choose 6 credits from the following)		*6*
Track One - Data Analytics		
I E 311	Engineering Data Analysis	
A ST 311	Statistical Applications	
I E 351	Applied Problem Solving in Industrial Engineering	
STAT 3110	Statistics for Engineers and Scientists	
I E 460	Evaluation of Engineering Data	
STAT 4210	Probability: Theory and Applications	
BCIS 461	Business Analytics I	
CSCI 4415	Introduction to Data Mining	
Track Two - Manufacturing Systems		
I E 375	Manufacturing Processes II	
I E 217	Manufacturing Processes	
E T 217	Manufacturing Processes	
I E 478	Facilities Planning and Design	
E T 480	Innovation and Product Development	
MGMT 344	Production and Operations Management	
Track Three - Quality Control		
I E 365	Quality Control	
I E 466	Reliability	
I E 490	Selected Topics (Introduction to Advanced Manufacturing)	
C E 498	Special Topics (Introduction to Nondestructive Testing)	
Applications in Engineering & Business (Choose 6 credits from the following) [1]		*6*
A E Courses 400-level (With approval of advisor and instructor)		
C E Courses 400-level (With approval of advisor and instructor)		
CHME Courses 400-level (With approval of advisor and instructor)		
E E Courses 400-level (With approval of advisor and instructor)		
E T Courses 400-level (With approval of advisor and instructor)		
I E Courses 400-level (With approval of advisor and instructor)		
M E Courses 400-level (With approval of advisor and instructor)		
BCIS Courses 400-level (With approval of advisor and instructor)		

MGMT Courses 400-level (With approval of advisor and instructor)	
CSCI Courses 4000-level (With approval of advisor and instructor)	
A ST Courses 400-level (With approval of advisor and instructor)	
Total Credits	**18**

[1] Courses numbered 450 or above may be used to satisfy course requirements for the Master's Accelerated Program (https://engr.nmsu.edu/students/Fifth-page.html) (requires department head approval)

Supply Chain and Operations Research Analytics - Undergraduate Minor

Prefix	Title	Credits
Course Requirements		
Required Courses		
MGMT 351	Supply Chain Management	3
Choose 3 credits from the following		*3*
I E 425	Supply Chain Modeling and Analysis	
I E 456	Large Scale Systems Engineering	
Technical Elective Courses (Choose 6-7 credits from the following)		*6-7*
Track One - Data Analytics		
I E 311	Engineering Data Analysis	
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
I E 460	Evaluation of Engineering Data	
STAT 4210	Probability: Theory and Applications	
E E 465	Machine Learning I	
BCIS 461	Business Analytics I	
BCIS 466	Business Analytics II	
BCIS 475	Database Management Systems	
CSCI 4140	Database Management Systems I	
CSCI 4415	Introduction to Data Mining	
CSCI 2220	Introduction to Data Structures and Algorithms	
Track Two - Optimization		
I E 413	Engineering Operations Research I	
I E 423	Engineering Operations Research II	
I E 424	Manufacturing Systems	
CHME 392	Numerical Methods in Engineering	
CSCI 2310	Discrete Mathematics for Computer Science	
MGMT 344	Production and Operations Management	
MGMT 470	Project Management in Organizations	
BCIS 485	Enterprise Resource Planning	
Track Three - Computer Programming and Applications		
I E 351	Applied Problem Solving in Industrial Engineering	
I E 467	Discrete-Event Simulation Modeling	
BCIS 321	Introduction to Software Development and Programming	
ICT 352	Software Technology I	
CSCI 2210	Object-Oriented Programming	
CSCI 2230	Assembly Language and Machine Organization	
CSCI 3720	Data Structures and Algorithms	
CSCI 3790	Algorithm Design & Implementation	
Applications in Engineering & Business (Choose 6 credits from the following) [1]		*6*
A E Courses 400-level (With approval of advisor and instructor)		
C E Courses 400-level (With approval of advisor and instructor)		
CHME Courses 400-level (With approval of advisor and instructor)		
E E Courses 400-level (With approval of advisor and instructor)		
E T Courses 400-level (With approval of advisor and instructor)		
I E Courses 400-level (With approval of advisor and instructor)		
M E Courses 400-level (With approval of advisor and instructor)		
ACCT Courses 400-level (With approval of advisor and instructor)		
BCIS Courses 400-level (With approval of advisor and instructor)		
BFIN Courses 400-level (With approval of advisor and instructor)		
MGMT Courses 400-level (With approval of advisor and instructor)		
CSCI Courses 4000-level (With approval of advisor and instructor)		
A ST Courses 400-level (With approval of advisor and instructor)		
Total Credits		**18-19**

[1] Courses numbered 450 or above may be used to satisfy course requirements for the Master's Accelerated Program (https://engr.nmsu.edu/students/Fifth-page.html) (requires department head approval)

Systems Engineering - Undergraduate Minor

Prefix	Title	Credits
Course Requirements		
Required Courses		*6*
I E 456	Large Scale Systems Engineering	
I E 459	Systems Thinking and Decision Making	
Technical Elective Courses (Choose 6 credits from the following)		*6*
Track One - Data Analysis, Optimization & Simulation Modeling		
I E 311	Engineering Data Analysis	
A ST 311	Statistical Applications	
STAT 3110	Statistics for Engineers and Scientists	
I E 413	Engineering Operations Research I	
I E 423	Engineering Operations Research II	
I E 460	Evaluation of Engineering Data	
I E 490	Selected Topics (Systems Engineering)	
STAT 4210	Probability: Theory and Applications	
I E 467	Discrete-Event Simulation Modeling	
BCIS 461	Business Analytics I	
BCIS 466	Business Analytics II	
CSCI 2310	Discrete Mathematics for Computer Science	
CSCI 3790	Algorithm Design & Implementation	
CSCI 3720	Data Structures and Algorithms	
CSCI 4415	Introduction to Data Mining	
Track Two - Manufacturing System		
I E 217	Manufacturing Processes	
E T 217	Manufacturing Processes	
I E 365	Quality Control	
I E 375	Manufacturing Processes II	
I E 424	Manufacturing Systems	
I E 466	Reliability	
I E 490	Selected Topics (Lean tools in Systems Engineering)	

I E 490	Selected Topics (Introduction to Advanced Manufacturing)	
A E 424	Aerospace Systems Engineering	
E E 333	AC Circuit Analysis and Introduction to Power Systems	
E E 431	Power System Analysis	
Track Three - Business		
I E 451	Engineering Economy	
C E 477	Engineering Economics and Construction Management	
E T 480	Innovation and Product Development	
CHME 449	Intellectual Property for Engineers and Scientists	
Applications in Engineering & Business (Choose 6 credits from the following) [1]		*6*
A E Courses 400-level (With approval of advisor and instructor)		
C E Courses 400-level (With approval of advisor and instructor)		
CHME Courses 400-level (With approval of advisor and instructor)		
E E Courses 400-level (With approval of advisor and instructor)		
I E Courses 400-level (With approval of advisor and instructor)		
M E Courses 400-level (With approval of advisor and instructor)		
ACCT Courses 400-level (With approval of advisor and instructor)		
BCIS Courses 400-level (With approval of advisor and instructor)		
BFIN Courses 400-level (With approval of advisor and instructor)		
MGMT Courses 400-level (With approval of advisor and instructor)		
CSCI Courses 4000-level (With approval of advisor and instructor)		
A ST Courses 400-level (With approval of advisor and instructor)		
Total Credits		**18**

[1] Courses numbered 450 or above may be used to satisfy course requirements for the Master's Accelerated Program (https://engr.nmsu.edu/students/Fifth-page.html) (requires department head approval)

Mechanical Engineering and Aerospace Engineering

Undergraduate Program Information

The mission of the Mechanical and Aerospace Engineering Department at New Mexico State University is threefold:

- to educate those who will advance knowledge and become the future leaders of industry and academia;
- to conduct both basic and applied research in mechanical and aerospace engineering and related interdisciplinary areas; and
- to provide service to the profession, to the State of New Mexico, to the country, and to the future development of engineering worldwide.

A critical focus within the department is to afford undergraduates of varying backgrounds and abilities every opportunity for achieving success in the mechanical and aerospace engineering professions. To address this focus, the faculty of the Mechanical and Aerospace Engineering Department, with input from other constituents, have established the following program educational objectives that inform the overall undergraduate programs:

- Our graduates will gain relevant employment and/or pursue a graduate degree.
- Our graduates will advance in their level of workplace responsibility.

Graduate Program Information

Graduate programs of study are available leading to the degrees of:

- Doctor of Philosophy in Aerospace Engineering
- Doctor of Philosophy in Engineering with a concentration in Mechanical Engineering
- Master of Science in Aerospace Engineering
- Master of Science in Mechanical Engineering
- Master of Engineering in Aerospace Engineering
- Master of Engineering in Mechanical Engineering.

Areas of active research in mechanical engineering include the following:

- Computational fluid dynamics
- Hypersonics
- Vortex dynamics
- Energy systems and components
- Thermal management
- Surface engineering
- Computational mechanics with application to material properties
- Composite materials and nanomaterials
- Structural damage diagnosis and prognosis
- Nonlinear dynamics and vibrations
- Reduced order modeling in multibody dynamics
- Fluid-structure interactions
- Renewable energy / energy harvesting
- Bio-inspired and bio-mimetic robotics
- Robotics and autonomous systems
- Multi-robot systems
- Advanced manufacturing and medical device
- Structure property relations and degradation / corrosion of materials.

Areas of active research in aerospace engineering include the following:

- Computational, theoretical, and experimental fluid dynamics
- Hypersonics
- Flow control
- Aero-optics
- Multi-phase, multi-scale, and reacting flows
- Rarefied gas dynamics
- Propulsion
- Aeroelasticity
- Structural health monitoring / damage detection
- Guidance, navigation, and control of space systems
- Small satellite missions
- Unmanned aerial systems.

Laboratory facilities supporting graduate research include a large low-speed wind tunnel facility; a shock tunnel facility for hypersonics; computational fluid dynamics lab; robotics, unmanned vehicles, and intelligent systems control lab; autonomous systems lab; mechanical design and advanced materials & structures lab; nonlinear dynamics & energy harvesting lab; computational mechanics of materials

and structures lab; non-destructive evaluation lab; medical device & microfabrication research lab; surface-environment interaction research lab; and renewable energy and thermal systems lab. A mechanical testing lab is also available in the College of Engineering.

In addition to fulfilling the basic requirements for admission to the Graduate School, applicants are expected to have an undergraduate degree equivalent to a BS in mechanical or aerospace engineering from a university accredited by ABET. Graduate students whose BS degree is in a discipline other than A E or M E will normally be required to take undergraduate courses in M E or A E in order to prepare for graduate course work; such undergraduate preparatory work will be determined by the graduate coordinator on a case by case basis. A candidate for *Master of Science* degree is required to complete a Thesis, whereas that for *Master of Engineering* is to complete the required coursework only. Both degrees require a minimum of 30 credits of graduate study.

A doctoral candidate must complete a program of study determined by the student and his / her advisory committee. The student must successfully pass a written qualifying examination (administered during the student's first year of full-time study) and an oral comprehensive examination which is administered after the student completes at least 80 percent of the course work and demonstrates sufficient progress in their research. The student must submit and defend an acceptable dissertation based on independent investigation in a field of study approved by the advisory committee.

Degrees for the Department

Bachelor Degree(s)

- Aerospace Engineering - Bachelor of Science in Aerospace Engineering (p. 1224)
- Mechanical Engineering - Bachelor of Science in Mechanical Engineering (p. 1226)

Master Degree(s)

- Aerospace Engineering - Master of Engineering in Aerospace Engineering (p. 95)
- Aerospace Engineering - Master of Science (p. 96)
- Mechanical Engineering - Master of Engineering in Mechanical Engineering (p. 173)
- Mechanical Engineering - Master of Science in Mechanical Engineering (p. 174)

Doctoral Degree(s)

- Aerospace Engineering - Doctor of Philosophy (p. 200)
- Engineering (Mechanical Engineering) - Doctor of Philosophy (p. 224)

Minors for the Department

- Aerospace Engineering - Undergraduate Minor (p. 1228)
- Mechanical Engineering - Undergraduate Minor (p. 1228)

Department Head: Jay Frankel, Ph. D.

Associate Department Head: Young Lee, Ph. D.

Professors Abdelkefi, Chaitanya, Frankel, Gross, Park; ***Associate Professors*** Drach, Haghshenas-Jaryani, Kota, Kuravi, Lee, Shashikanth, Shu, Wang; ***Assistant Professors*** Alaie, Guerrero-Bonilla, Liu, Mohammadshahi, Torres Herrador; ***Professors of Practice*** Waller, Dobbin

A. Abdelkefi, Ph.D. (Virginia Tech)– Nonlinear dynamics, energy harvesting, aeroelasticity, fluid-structure interaction, vibration and controls; S. Alaie, Ph.D. (UNM)– Implantable microsensors, advanced manufacturing and medical devices; V. Chaitanya, Ph.D. (Johns Hopkins)– Structure-property relations of materials, material degradation / corrosion / electrochemistry, additive manufacturing, biomaterials, engineering failure analysis; D. Dobbin, MS (NMSU & Georgia Tech)-Aerodynamics, mechanical design and mechanisms; B. Drach, Ph.D. (New Hampshire)– Composite materials, additive manufacturing, biomechanics; J. Frankel, Department head, Ph.D. (Virginia Tech)– Heat transfer, hypersonics; A. Gross, DEngr. (Aachen, Germany)– Computational fluid dynamics, fluid mechanics, aircraft design and propulsion, unmanned aerial systems, wind energy; L. Guerrero-Bonilla, Ph.D. (UPenn) - Robotics and autonomous systems, multi-robot systems; M. Haghshenas-Jaryani, Ph.D. (UT Arlington)– Soft robotics, bio-inspired and bio-mimetic robotics, dynamics and control; K. Kota, Ph.D. (Central Florida)– Heat transfer, functional surfaces, surface-environment interactions, thermal management, space transportation, engineering in public health and medicine; S. Kuravi, Ph.D. (Central Florida)– Renewable energy, thermal systems, concentrating solar power, thermal desalination, energy storage; Y. Lee, Associate Department Head, Ph.D. (UIUC)- Nonlinear dynamics, fluid-structure interactions; Q. Liu, Ph.D. (Universidad Politécnica de Madrid, Spain)-Computational fluid mechanics, modal analysis, data science, rarefied gas dynamics and multiphase flow; S. Mohammadshahi, Ph.D. (Pusan National University, South Korea & U of Massachusetts Dartmouth)-Experimental fluid dynamics, turbulent flows, flow control, surface engineering; Y. Park, Ph.D. (Iowa)– Design optimization, computational solid mechanics, atomistic and molecular simulations; B. Shashikanth, Ph.D. (Southern California)– Fluid mechanics, dynamical systems, controls; F. Shu, Ph.D. (Purdue)– Experimental fluid dynamics, biofluidics, microfluidics, flow control, and hypersonics; F. Torres Herrador, Ph.D. (VUB & UGent, Belgium)– Hypersonics, material characterization, multiscale modeling, thermal protection systems; J. Waller, Ph.D. (U Akron)– Nondestructive evaluation, additive manufacturing and materials; Y. Wang, Ph.D. (Penn State)– Computational fluid dynamics, multi-phase & reacting flows, aerospace propulsion, bio/micro-Fluidics.

Aerospace Engineering Courses

A E 339. Aerodynamics I
3 Credits (3)
Fluid properties, conservation equations, incompressible 2-dimensional flow; Bernoulli's equation; similarity parameters; subsonic aerodynamics: lift and drag, analysis and design of airfoils.
Prerequisite: C- or better grades in ENGR 234 and (M E 228 or MATH 3160).
Learning Outcomes

1. Ability to understand fundamental concepts of incompressible flows.
2. Ability to use Bernoulli equation to solve flow problems under specific conditions.
3. Ability to understand and use potential flow theory for canonical flows.
4. Ability to derive and use similarity parameters to design experiments and simulations.
5. An ability to understand fundamental concepts of lift and drag forces and their coefficients.

A E 362. Orbital Mechanics
3 Credits (3)
Dynamics of exoatmospheric flight of orbiting and non-orbiting bodies; 2-body orbital dynamics and Kepler's laws; orbits in 3 dimensions; orbit determination; orbit design and orbital maneuvers; lunar and interplanetary trajectories.

Prerequisite: C- or better grades in (M E 228 or MATH 3160), ENGR 234, and M E 261.

Learning Outcomes

1. Ability to understand dynamics of exo-atmospheric flight of orbiting and non-orbiting bodies; 2-body orbital dynamics and Kepler's laws; orbits in 3 dimensions; orbit determination; orbit design and orbital maneuvers; lunar and interplanetary trajectories.
2. Ability to identify, formulate, and solve engineering problems on orbital mechanics.
3. Ability to use the techniques, skills, and modern tools for orbital mechanics and engineering practice.

A E 363. Aerospace Structures
3 Credits (3)

Advanced concepts of stress and strain, introduction to the analysis of aero structures, complex bending and torsion, thin walled sections and shells, computational techniques. May be repeated up to 3 credits.

Prerequisite: C- or better grades in C E 301.

Learning Outcomes

1. An ability to formulate and solve some fundamental linearly-elastic problems.
2. Application of basic failure theory and perform thermal shock analysis for composite materials.
3. An ability to perform simplified dynamic loading analysis on aerospace structures.
4. Calculation of various area properties for nonhomogeneous cross-sections of a beam, and their principal values and directions.
5. Understanding of the formulations of stresses and strains in a beam under various loading and boundary conditions.

A E 364. Flight Dynamics and Controls
3 Credits (3)

Standard atmosphere and various definitions of altitudes, static and dynamic flight performance evaluations, 6-degree-of-freedom aircraft flight dynamics, static and dynamic flight stability and controls.

Prerequisite: C- or better grades in (M E 228 or MATH 3160), ENGR 234, and M E 261.

Learning Outcomes

1. Ability to evaluate static and dynamic flight performance.
2. Ability to understand static stability design for longitudinal / lateral/ directional flights.
3. Ability to use the 6-degree-of-freedom, rigid body equations of motion of aircraft.
4. Evaluation of longitudinal / lateral / directional dynamic stabilities of aircraft.

A E 400. Undergraduate Research
1-3 Credits (1-3)

Performed with the direction of a department faculty member. May be repeated for a maximum of 6 credits.

Prerequisite(s): Consent of faculty member.

A E 405. Special Topics
3 Credits (3)

Topics of modern interest to be offered by the departmental staff. Consent of instructor required.

A E 419. Propulsion
3 Credits (3)

Propulsion systems, thermodynamic cycles, combustion, specific impulse; principles of gas turbines, jet engines, and rocket propulsion systems. May be repeated up to 3 credits.

Prerequisite: C- or better grades in A E 439.

Learning Outcomes

1. Knowledge of relevant fluid and thermodynamics.
2. Understanding of jet engine operating principles.
3. Ability to carry out parametric analysis of jet engine and turbomachinery.
4. Knowledge of how to analyze rocket propulsion systems.

A E 424. Aerospace Systems Engineering
3 Credits (3)

Basic principles of top down systems engineering and current practice; preliminary and detailed design of aircraft and space vehicles, including requirement, subsystem interaction, and integration, tradeoffs, constraints and non-technical aspects. May be repeated up to 3 credits.

Prerequisite: C- or better grades in A E 362.

Learning Outcomes

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

A E 428. Aerospace Capstone Design
3 Credits (3+2P)

Team Project-analysis, design, hands-on build test, evaluate. May be repeated up to 3 credits.

Prerequisite: A E 363.

Corequisite: A E 424.

Prerequisite/Corequisite: A E 447.

Learning Outcomes

1. An ability to function as mechanical engineer within an engineering design and development group.
2. An ability to complete a real-life design task, to transform a client's needs into a tangible, tractable project definition, and to see the project through to completion.
3. An ability to understand and use a formal engineering design method, with emphasis on building concurrent engineering procedures into the basic design method.
4. Proficiency in collaboratively preparing and reviewing formal technical design package related to an engineering design including final design binder and report.

A E 439. Aerodynamics II
3 Credits (3)

Principles of compressible flow, momentum and energy conservation; thermal properties of fluids; supersonic flow and shock waves; basics of supersonic aerodynamics; lift and drag for airfoils and wings under incompressible and compressible flow conditions. May be repeated up to 3 credits.

Prerequisite: C- or better grades in (A E 339 or M E 338), M E 240, and (M E 328 or PHYS 395).

Learning Outcomes

1. Understanding of fundamentals of compressible flow.
2. An ability to solve 1D and 2D compressible flow problems including isentropic flow, shock wave and expansion wave flow problems.
3. An ability to understand and solve Fanno-line flow and Rayleigh-line flow problems.
4. Calculation of lift and drag coefficients of airfoils and wings under flow regimes.

A E 447. Aerofluids Laboratory
3 Credits (2+3P)
Use of subsonic and hypersonic wind tunnels and other flow facilities to study basic flow phenomena and methods of fluid measurement and visualization. May be repeated up to 3 credits.
Prerequisite: M E 345 or PHYS 325.
Prerequisite/Corequisite: A E 439.
Learning Outcomes

1. An ability to design fluid experiments using similarity law.
2. An ability to design and conduct fluid experiments in low-speed and hypersonic wind tunnel with various flow measurement and visualization techniques.
3. Use of data acquisition systems to acquire experimental data and conduct data processing, including particle image velocimetry.
4. An ability to write professional technical reports.

A E 451. Aircraft Design
3 Credits (3)
Conceptual design of aircraft based on existing designs, empirical relationships, and theory. Dimensioning, structural design, and performance analysis of major subcomponents such as fuselage, wing, and propulsion system. Static stability and control analysis. May be repeated up to 3 credits.
Prerequisite: (A E 339 and A E 363) or consent of instructor.
Learning Outcomes

1. Ability to design aircraft for specific mission and to carry out all necessary analyses.
2. Familiarization with different design options for various aircraft components.
3. Understanding of multi-disciplinary nature of conceptual aircraft design and tradeoffs in airplane design, and of how contradicting design requirements will lead to design compromises.
4. Ability to work as part of a team to accomplish the stated objectives of a design project.
5. Knowledge of how to use spreadsheets and engineering analysis methods for conceptual aircraft design.
6. Ability to carry out airfoil aerodynamic analysis using XFLR5 and to create a visual representation of an aircraft using OpenVSP.

A E 452. Control System Design
3 Credits (3)
Introduction to the control of dynamical systems, with a focus on mechanical and aerospace systems, including basic systems theory, controllability / observability, feedback and stabilization, PID controls, root-locus plot, and Bode diagram. May be repeated up to 3 credits.
Prerequisite: M E 261, M E 328 and ENGR 234.
Learning Outcomes

1. Construction of a block diagram of control systems to find a transfer function for a dynamical system.
2. Analysis of control systems by utilizing various linear control theories such as root-locus design method, bode, and lead / lag compensation techniques.
3. Design and simulation of PID control systems for mechanical / aerospace engineering applications.
4. Derivation of state space representation of a dynamical systems.

A E 464. Advanced Flight Dynamics and Controls
3 Credits (3)
Advanced airplane flight dynamics and stability control system design, longitudinal and lateral autopilots, missile/rocket control systems, and guidance systems.
Prerequisite: A E 364 or consent of instructor.
Learning Outcomes

1. An ability to construct a block diagram to find a transfer function for a dynamical system.
2. An ability to perform a control systems design by utilizing various linear control theories such as root-locus design method, bode / Nyquist plots, and lead / lag compensation techniques.
3. Understanding of longitudinal / directional / lateral dynamic flight stability controls associated with airplane designs.
4. Design and analysis of autopilot systems of an airplane with some knowledge in flight instrumentation.

A E 469. Hypersonic Aerothermodynamics
3 Credits (3)
Challenges of hypersonic flight. Large Mach number approximations. High-temperature effects. Vibrational and chemical non-equilibrium. Viscous high-temperature flows. Taught with A E 569. May be repeated up to 3 credits.
Prerequisite/Corequisite: A E 439.
Learning Outcomes

1. Awareness of challenges of hypersonic flight.
2. Understanding of vibrational and chemical non-equilibrium effects.
3. Governing equations for viscous high-temperature flows.

A E 509. Individualized Study
3 Credits (3)
Individualized study covering specialized topics in aerospace engineering. Consent of instructor required. Restricted to A E & M E majors.

A E 510. Special Topics
1-6 Credits (1-6)
Topics in aerospace engineering. May be repeated for a maximum of 6 credits. Consent of instructor required.

A E 512. Vibrations
3 Credits (3)
Free and forced vibrations for discrete and continuous systems with single or multiple degrees of freedom. Introduction to nonlinear and random vibration and solution techniques for such systems.
Prerequisite: M E 511 or consent of instructor.
Learning Outcomes

1. Ability to derive equations of motion of single- and multi-degree-of-freedom (DOF) systems.
2. Ability to analyze free and forced vibrations of single- and multi-DOF systems.
3. Ability to perform modal analysis of single- and multi-DOF systems.
4. Ability to derive equations of motion of continuous systems including beams, strings, and rods.

5. Ability to solve the governing equations of motion for several dynamical systems.

A E 527. Linear Systems Theory
3 Credits (3)
Introduction to control of linear multi-input-multi-output (MIMO) systems. Topics include representation of system dynamics using the state-space model, linearization, internal and input-to-output stability, controllability, observability, optimal control, linear quadratic regulator, and observer. May be repeated up to 3 credits.
Prerequisite: M E 452 or A E 452 or consent of instructor.
Learning Outcomes
1. Modeling of linear dynamical systems using state space methods.
2. Analysis of stability, controllability, and observability of linear systems.
3. Design of controllers and observers for linear systems using pole placement methods.

A E 530. Intermediate Fluid Mechanics
3 Credits (3)
Application of exact and empirical solutions to fundamental flow problems, including viscous and inviscid behavior. These applications establish a theoretical basis for the origin and physical role of common terms in the governing equations.
Prerequisite: M E 338 or A E 339 or consent of instructor.
Learning Outcomes
1. A basic knowledge of incompressible, viscous flows of Newtonian fluids, boundary layers and boundary layer behavior, vortex dynamics and 1D isentropic compressible flows, shocks and expansion waves.

A E 533. Numerical Methods for Fluid Mechanics and Heat Transfer
3 Credits (3)
Development of numerical techniques for the solution of ordinary and partial differential equations that arise in heat transfer and fluid mechanics; classification of equations, methods of solutions, examples.
Prerequisite: M E 530 or consent of instructor.
Learning Outcomes
1. An ability to understand fundamental aspects of solving differential equations using finite difference methods.
2. An ability to understand fundamental concepts such as stability, accuracy, consistency, systematic errors (phase/amplitude errors), artificial diffusion, etc.
3. An ability to implement and test algorithms for the solution of ordinary and partial differential equations.
4. An ability to develop ability to analyze numerical results and report results in a meaningful way.

A E 564. Advanced Flight Dynamics and Controls
3 Credits (3)
Advanced airplane flight dynamics and stability control system design, longitudinal and lateral autopilots, missile / rocket control systems, and guidance systems. May be repeated up to 3 credits.
Prerequisite: A E 364 or consent of instructor.
Learning Outcomes
1. An ability to construct a block diagram to find a transfer function for a dynamical system.
2. An ability to perform a control systems design by utilizing various linear control theories such as root-locus design method, bode / Nyquist plots, and lead / lag compensation techniques.
3. Understanding of longitudinal / directional / lateral dynamic flight stability controls associated with airplane designs.
4. Design and analysis of autopilot systems of an airplane with some knowledge in flight instrumentation.

A E 575. Propulsion
3 Credits (3)
Propulsion systems, thermodynamic cycles, combustion, specific impulse; principles of gas turbines, jet engines, and rocket propulsion systems. May be repeated up to 3 credits.
Prerequisite: A E 439 or consent of instructor.
Learning Outcomes
1. Knowledge of relevant fluid and thermodynamics.
2. Understanding of jet engine operating principles.
3. Ability to carry out parametric analysis of jet engine and turbomachinery.
4. Knowledge of how to analyze rocket propulsion systems.

A E 598. Special Research Programs
1-3 Credits (1-3)
Individual investigations, either analytical or experimental. May be repeated for a maximum of 6 credits. Restricted to A E & M E majors.

A E 599. Master's Thesis
1-15 Credits (1-15)
Thesis. Graded: Thesis/Dissertation.

A E 600. Doctoral Research
1-15 Credits (1-15)
This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination. Graded: Thesis/Dissertation.

A E 700. Doctoral Dissertation
15 Credits (15)
Dissertation. Graded: Thesis/Dissertation.

Mechanical Engineering Courses

M E 228. Engineering Analysis I
3 Credits (3)
Introduction to engineering analysis with emphasis on engineering applications. Topics include ordinary differential equations, linear algebra, and vector calculus with focus on analytical methods. May be repeated up to 3 credits.
Prerequisite: C- or better grades in MATH 2530G.
Learning Outcomes
1. An ability to derive differential equation models of phenomena relevant to mechanical and aerospace engineering.
2. An ability to use basic methods for solution of these ordinary and partial differential equations.
3. An ability to apply the solutions to simple analysis and design situations.

M E 234. Mechanics-Dynamics
3 Credits (3)
Kinematics and dynamic behavior of solid bodies utilizing vector methods. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better grade in the following: C E 233 and PHYS 1310G and MATH 1521G or MATH 1521H.
Learning Outcomes
1. Student will be able to apply concepts of kinematics and accelerated motion.

M E 240. Thermodynamics
3 Credits (3)

First and second laws of thermodynamics, irreversibility and availability, applications to pure substances and ideal gases.
Prerequisite: C- or better grades in PHYS 1310G.
Learning Outcomes
1. An ability to apply the first law of thermodynamics to energy systems.
2. Understanding and application of thermodynamic concepts and properties to analyze systems with pure substances and ideal gases.

M E 261. Numerical Methods
3 Credits (2+3P)
Introduction to programming syntax, logic, and structure. Numerical techniques for root finding, solution of linear and nonlinear systems of equations, integration, differentiation, and solution of ordinary differential equations will be covered. Multi function computer algorithms will be developed to solve engineering problems. May be repeated up to 3 credits.
Prerequisite: C- or better grades in MATH 1521G or MATH 1521H or ENGR 190.
Learning Outcomes
1. Ability to use a variety of numerical methods in both basic and advanced engineering calculations.
2. Ability to formulate algorithms and write programs to solve engineering problems.
3. Ability to develop an appreciation for the hazards and limitations of numerical solutions, including accuracy, stability, and computer limitations of memory and speed.

M E 326. Mechanical Design
3 Credits (3)
Kinematics and dynamics of machinery, analytical and computer-aided design of kinematics, mechanism synthesis involving linkages, cam and gear design, and motion analysis and balancing of forces. Project-based learning of multi-mechanism system design, analysis, fabrication, and evaluation. May be repeated up to 3 credits.
Prerequisite: C- or better in ENGR 234 and C E 301.
Learning Outcomes
1. An ability to perform motion analysis of mechanisms involving various mechanical components such as linkages, cams, and gears.
2. An ability to analyze and balance dynamic forces in machines.
3. Knowledge of how to design mechanism synthesis that can function as required in machines.
4. Understanding of ethics and professional responsibilities in engineering design.

M E 328. Engineering Analysis II
3 Credits (3)
Advanced engineering analysis with emphasis on engineering applications. Topics include systems of ordinary differential equations, Fourier analysis, partial differential equations, and functions of complex variable with focus on analytical methods.
Prerequisite: C- or better grades in M E 228.
Learning Outcomes
1. An ability to use basic properties of Laplace Transforms and apply to initial value problems.
2. Understanding of basics of phase space analysis for ordinary differential equations.
3. An ability to obtain Fourier Series representations of functions.
4. An ability to apply the method of separation of variables to solve linear homogeneous partial differential equations.
5. An ability to perform basic operations involving complex numbers.

M E 331. Intermediate Strength of Materials
3 Credits (3)
Covers stress and strain, theories of failure, curved flexural members, flat plates, pressure vessels, buckling, and composites. May be repeated up to 3 credits.
Prerequisite: C E 301 and M E 328.
Learning Outcomes
1. An ability to perform stress and strain analysis for bending of straight and curved beams, torsion of prismatic bars, and complex loading cases.
2. Application of governing equations of elasticity.
3. Use of common failure theories for failure prediction of ductile metals.

M E 332. Vibrations
3 Credits (3)
Vibration of single and n-degree of freedom systems considering free, forced, and damped motion. Lagrange s equations. Dynamic stability. Controls. Matrix iteration. May be repeated up to 3 credits.
Prerequisite: M E 328, ENGR 234, and M E 261.
Learning Outcomes
1. Ability to analyze free and forced vibrations of a single degree-of-freedom (DOF).
2. Ability to analyze free and forced vibrations of multi-DOF systems.
3. Ability to perform modal analysis for engineering structures to understand mechanical vibrations in terms of normal modes.

M E 333. Intermediate Dynamics
3 Credits (3)
Three dimensional kinematics and kinetics, orbal motion, Lagrange s equations, dynamic stability, and controls. May be repeated up to 3 credits.
Prerequisite: M E 328 and ENGR 234.
Learning Outcomes
1. An ability to derive the equations of motion for particles and rigid bodies based on analytical dynamics theories.
2. Analysis of linear / nonlinear dynamical systems with their equations of motion by finding the associated solutions and by performing simulations.
3. Application of dynamics theory to engineering applications in vehicle dynamics, gyroscopes, aircraft / spacecraft dynamics, and celestial mechanics.

M E 338. Fluid Mechanics
3 Credits (3)
Properties of fluids. Fluid statics and fluid dynamics. Applications of the conservation equations continuity, energy, and momentum to fluid systems.
Prerequisite: C- or better grade in ENGR 234 and in (M E 228 or MATH 3160).
Learning Outcomes
1. Ability to apply knowledge of mathematics, science, and engineering.
2. Ability to design and conduct experiments, as well as to analyze and interpret data.
3. Ability to design a system, component or process to meet desired needs within realistic constraints.
4. Ability to identify, formulate, and solve engineering problems.

M E 340. Applied Thermodynamics
3 Credits (3)

Thermodynamic cycles, availability, Maxwell relations, Gibbs and Helmholtz functions, mixtures, psychrometrics, implications for engineering materials.
Prerequisite: C- or better grades in M E 240.
Learning Outcomes
1. A thorough understanding of the transfer of work, heat, and energy by various thermodynamic processes in open and closed systems, and which processes and allowed and not allowed, and spontaneous and non-spontaneous.
2. An applied knowledge predicated on the four laws of thermodynamics and application to work producing and consuming devices where efficiency must optimized by selection of appropriate fuels, energy sources, working fluids, and design considerations for engineering devices such as nozzles, turbines, condensers, diffusers, regenerators, intercoolers, and feedwater systems.
3. The skills necessary to be successful in their professional duties in employment or further educational pursuits related to the automotive, commercial aviation, space, and energy sectors, and to be able to clearly identify, communicate, formulate, analyze, and deduce solutions to technical problems in the field of thermodynamics with peers in engineering and allied fields.

M E 341. Heat Transfer
3 Credits (3)
Heat balance equation. Fundamentals of conduction, convection, and radiation. Design of heat transfer systems.
Prerequisite: C- or better grades in M E 240 and in (M E 338 or A E 339).
Learning Outcomes
1. A thorough understanding of the three modes of heat transfer (conduction, convection, and radiation).
2. Basic knowledge required to apply heat transfer principles to practical and contemporary engineering problems (primarily in thermal management of electronics such as in data centers and smart phones, buildings, automobiles, and energy and power generation systems).
3. The skills necessary to be successful in their professional duties in employment or further educational pursuits and be able to clearly identify, communicate, formulate, analyze, and deduce solutions to technical problems in the field of heat transfer.

M E 345. Experimental Methods I
3 Credits (2+3P)
Emphasis on experimental techniques, basic instrumentation, data acquisition and analysis, and written presentation of results. Includes experiments in dynamics and deformable body mechanics. May be repeated up to 3 credits.
Prerequisite: C- or better grades in (M E 228 or MATH 3160), in (ENGR 140 or PHYS 2140), and in ENGR 234.
Prerequisite/Corequisite: C E 301.
Learning Outcomes
1. A thorough understanding of how to work in a laboratory with a focus on safety (use of PPE, waste disposal, and knowledge of common laboratory hazards and their mitigation).
2. An ability to implement good laboratory practice (GLP) to ensure proper documentation of results, accuracy of results, and adherence to written procedures to allow replication of results.
3. Hands-on laboratory skills using lab equipment (sensors, data-recording software, scales, calipers, micrometers, strain gages, tensile testing machines/load cells, vibration generators, oscilloscopes, function generators, power supplies, Wheatstone bridges, physical reference standards, and specimen preparation equipment) along with various tools and equipment accessories.
4. An ability to corroborate experimental findings with theoretical predictions.
5. An ability to apply the scientific method to experiments, including hypothesis, deduction, extrapolation (trend analysis), and inference.
6. Experience reducing data including error analysis, basic statistics, basic plotting and graphing, outlier identification, propagation of errors, SI/English units, and appropriate use of implied precision and significant figures.
7. Technical writing skills as a team and individual, effective team presentation skills, and delivering peer review.

M E 349. MAE Career Seminar
1 Credit (1)
Seminar course covering topics relevant to mechanical and aerospace engineering juniors (job placement, interviewing techniques, resume preparation, etc.). May be repeated up to 3 credits. Restricted to: M E and A E majors.
Prerequisite: Sophomore Standing.
Learning Outcomes
1. Students will learn how to prepare for their future career by learning job placement, resume preparation, interview skills, and others.

M E 400. Undergraduate Research
1-3 Credits
Performed with the direction of a department faculty member. May be repeated for a maximum of 6 credits.
Prerequisite: consent of faculty member.

M E 401. Building Energy and Environment
3 Credits (3)
Building energy and greenhouse gas emissions; energy usage distribution in residential and commercial buildings, HVAC, other end use entities (lighting, water heating, refrigeration, and computers and electronics), energy efficiency in buildings, indoor air quality, air filtration and purification, economics.
Prerequisite: C- or better grades in M E 340 and M E 341.
Learning Outcomes
1. Understanding of the energy usage in buildings and their impact on the environment.
2. Calculation of the energy loads for various end use entities and understand their role in building energy.
3. Analysis of HVAC systems and heat transfer and apply the knowledge for realizing energy efficiency in buildings.
4. An ability to write a technical term paper discussing the current and future trends on the topics of building energy and environmental impact and indoor air quality.

M E 405. Special Topics
3 Credits (3)
Topics of modern interest to be offered by the departmental staff. May be repeated up to 12 credits.
Prerequisite(s): Senior standing.

M E 425. Design of Machine Elements
3 Credits (3)
Design and analysis of machinery for load-bearing and power transmission by considering material failure modes such as yielding, fracture, and fatigue. Design and selection of machine elements including threaded fasteners, springs, rolling-element bearings, cams, gears and friction drives.

Prerequisite: C- or better grades in M E 326.

Learning Outcomes

1. An ability to incorporate analysis and design methods for designing and prototyping machine elements.
2. An ability to recognize the design process, to breakdown this complex process into a series of simple tasks, and to carry out those tasks to achieve the desired design.
3. Knowledges of how to apply the industrial specifications and requirements regarding the design of machine elements.
4. Implementation of these knowledge and experiences to real-world engineering projects with finite element method.

M E 445. Experimental Methods II

3 Credits (2+3P)

Emphasis on experimental techniques, instrumentation and data acquisition in fluid mechanics, heat transfer, and thermodynamics. Laboratory results will be presented in written and verbal formats. May be repeated up to 3 credits.

Prerequisite: C- or better grades in (M E 338 or A E 339), M E 340, M E 341, and M E 345.

Learning Outcomes

1. A thorough understanding of how to work in a laboratory with a focus on safety (use of PPE, waste disposal, and knowledge of common laboratory hazards and their mitigation).
2. An ability to implement good laboratory practice (GLP) to ensure proper documentation of results, accuracy of results, and adherence to written procedures to allow replication of results.
3. Hands-on laboratory skills using lab equipment (sensors, data-recording software, scales, calipers, micrometers, straingages, tensile testing machines/load cells, vibration generators, oscilloscopes, function generators, power supplies, Wheatstone bridges, physical reference standards, and specimen preparation equipment) along with various tools and equipment accessories.
4. An ability to corroborate experimental findings with theoretical predictions.
5. An ability to apply the scientific method to experiments, including hypothesis, deduction, extrapolation (trend analysis),and inference.
6. Experience reducing data including error analysis, basic statistics, basic plotting and graphing, outlier identification, propagation of errors, SI/English units, and appropriate use of implied precision and significant figures.
7. Technical writing skills as a team and individual, effective team presentation skills, and delivering peer review.

M E 452. Control System Design

3 Credits (3)

Introduction to the control of dynamical systems, with a focus on mechanical and aerospace systems, including basic systems theory, controllability / observability, feedback and stabilization, PID controls, root-locus plot, and Bode diagram. May be repeated up to 3 credits.

Prerequisite: M E 261, M E 328 and ENGR 234.

Learning Outcomes

1. Construction of a block diagram of control systems to find a transfer function for a dynamical system.
2. Analysis of control systems by utilizing various linear control theories such as root-locus design method, bode, and lead / lag compensation techniques.
3. Design and simulation of PID control systems for mechanical / aerospace engineering applications.
4. Derivation of state space representation of a dynamical systems.

M E 456. Experimental Modal Analysis

3 Credits (3)

Emphasis on hands-on techniques for structural vibration tests for practical applications. Interpretation of experimental results by means of advanced signal processing tools, basic system identification methodology, and reduced-order modeling procedures.

Prerequisite: M E 328 and M E 261 or consent of instructor.

Learning Outcomes

1. An ability to understand fundamentals of linear vibrations theory for discrete and continuous systems.
2. An ability to perform basic numerical and experimental modal analysis of structures.
3. An ability to utilize basic and advanced signal processing tools.
4. An ability to extract system parameters for a mathematical model from a physical model.

M E 457. Engineering Failure Analysis

3 Credits (3)

Introduction to failure theories and causes. Topics include general procedures for failure analysis, ductile and brittle modes of failure, elements of fracture mechanics, fractography, and failures in various engineering applications due to fatigue, wear, corrosion, design or processing defects.

Prerequisite: Grade of C- or better in C E 301 and CHME 361 or consent of instructor.

Learning Outcomes

1. An ability to systematically conduct failure analysis, identify cause(s) of failure, suggest remedial steps to prevent failures and/or improve performance for a variety of engineering applications involving metals, polymers, ceramics and composites.
2. Use of skills and knowledges in any industry and engineering applications such as in aerospace, mechanical, microelectronics, construction, chemical, automotive, energy, and medical areas.

M E 458. Properties and Mechanical Behavior of Materials

3 Credits (3)

Understanding the microstructure of engineering materials and their influence on mechanical behavior. Topics include Material Structure and Physical Properties, Thermodynamics and Kinetics of Materials, Mechanical Properties, Strengthening Mechanisms, Time and Temperature Dependent Behavior, Degradation, Fatigue, and Fracture.

Prerequisite: (Grade of C- or better in C E 301 and CHME 361) or consent of instructor.

Learning Outcomes

1. An ability to correlate mechanical behavior of materials with their microstructure, processing history and composition.
2. An ability to recognize impact of operating conditions, predict life span, and design materials to improve reliability and efficiency.
3. An ability to select appropriate materials for a given application from class of materials such as metals, polymers, ceramics and composites.

M E 460. Applied Finite Elements

3 Credits (3)

Introduction to the practical aspects of structural finite element modeling. Course focuses on providing a working knowledge of how to effectively incorporate finite element techniques into the design process.

Corequisite: M E 425 or consent of instructor.

Learning Outcomes

1. Use of direct stiffness and potential energy approaches to assemble global system of linear equations for static elastic and steady state heat transfer problems (bar, beam, plane stress / strain elements).
2. An ability to solve the global system of linear equations for unknown degrees of freedom (displacements or temperatures).
3. An ability to postprocess the solution to find stresses, strains, or temperature gradients.
4. An ability to solve two-dimensional and three-dimensional problems of elasticity and heat transfer using commercial general purpose finite element analysis software.

M E 481. Alternative and Renewable Energy

3 Credits (3)

Current and future energy needs of the United States and the world will be considered primarily from the standpoint of renewable energy sources such as solar, wind, ocean, and biomass. Technical, economic, and environmental aspects of each technology will be addressed.

Prerequisite: (M E 338 or A E 339) and M E 340 or consent of instructor.

Prerequisite/Corequisite: M E 341.

Learning Outcomes

1. Understanding of current and future energy needs of the United States and the whole world.
2. Understanding of the role of renewable and alternative energy sources such as solar, wind, ocean, and biomass.
3. An ability to conduct basic techno-economic analysis of various renewable and alternative energy technologies.

M E 483. Introduction to Combustion

3 Credits (3)

Introduction to combustion kinetics, combustion thermochemistry, flame dynamics, flame stability, and pollutant formation. Course coverage includes laminar and turbulent flames, premixed and diffusion flames, and detonations. Emphasis is placed on the role of chemical kinetics, heat transfer, mass transfer, and fluid dynamics on flame structure and flame stability. May be repeated up to 3 credits.

Prerequisite: M E 228 and M E 340 or consent of instructor.

Learning Outcomes

1. Understanding of reaction rates of chemical processes.
2. Derivation of simplified reactor models based on coupled chemical and thermal analysis.
3. Knowledge of conservation / transport equations for reacting flows.
4. Calculation of structure and propagation limits of laminar premixed combustion waves.
5. Analysis of structure and controlling processes in laminar diffusion flames, time and spatial scales in turbulent flames, and basic issues in turbulent combustion.

M E 486. Introduction to Robotics

3 Credits (3)

This course provides students with an introduction to the theories and methods for analysis, design, and control of robotic manipulators. This course is devoted to understanding the spatial descriptions and transformations, kinematics, and dynamics of these mechanisms and how to practically implement these concepts into actual robotic manipulators.

Prerequisite: M E 328 and ENGR 234.

Learning Outcomes

1. An ability to develop spatial description and transformations of rigid body motion and coordinate frames.
2. An ability to derive the kinematics and dynamics of robotic manipulators in forward and inverse forms.
3. An ability to plan motion and trajectories, program, and control these robotic platforms.
4. Application of the theoretical methods into industrial robots, and implementation of the knowledge and experiences to real-world engineering projects.

M E 487. Mechatronics

3 Credits (2+3P)

Introduction to the analysis and design of computer-controlled electromechanical systems, including data acquisition and conversion, force and motion sensors, actuators, mechanisms, feedback control, and robotic devices. Students required to work in teams to construct and test simple robotic systems.

Prerequisite: M E 345.

Learning Outcomes

1. An ability to define a mechatronic system and its primary elements.
2. An ability to exercise a computational model of the mechatronic system and evaluate the system response.
3. An ability to design, formulate and implement an appropriate closed-loop controller.
4. An ability to design and demonstrate a functional physical device that solve a practical problem while meets system requirements.
5. Knowledge of contemporary issues.

M E 502. Elasticity I

3 Credits (3)

Introduction to the theory of elastic media with emphasis on understanding the fundamental principles and solution methods used in the analysis of elastic solids and structures. Cartesian tensors are introduced for formulations of general deformations and states of stress. May be repeated up to 3 credits.

Learning Outcomes

1. An ability to understand the fundamental principles and solution methods used in the analysis of elastic solids and structures.
2. Use of cartesian tensors for formulations of general deformations and states of stress.

M E 503. Thermodynamics

3 Credits (3)

A comprehensive study of the first and second laws of thermodynamics, nonequilibrium processes, equations of state, and statistical thermodynamics.

Prerequisite: C- or better grade in M E 340 or consent of instructor.

Prerequisite/Corequisite: M E 570.

Learning Outcomes

1. Application of 1st law and 2nd law of thermodynamics to closed and open systems for analysis of thermodynamic cycles with and without phase change and for pure substances and mixtures as the working fluids.
2. Understanding of thermodynamic properties and their relationships, thermodynamics equilibrium and stability.
3. Understanding of the basics of statistical thermodynamics and its differences from classical thermodynamics.

M E 504. Continuum Mechanics

3 Credits (3)

Introduction to the fundamentals of the mechanics for continuous media. This covers the concepts and general principles common to all branches of mechanics to facilitate further study in various fields such as elasticity,

plasticity, fluid, and continuum damage mechanics. Computational aspects of the theory are also discussed. May be repeated up to 3 credits.

Learning Outcomes

1. An ability to understand the fundamentals of the continuum mechanics, which covers the concepts and general principles common to all branches of mechanics to facilitate further study in various fields such as elasticity, plasticity, fluid, and continuum damage mechanics.

M E 509. Individualized Study
3 Credits (3)
Individualized study covering specialized topics in mechanical and aerospace engineering. Consent of instructor required.

M E 510. Special Topics
1-6 Credits
Topics in mechanical engineering. May be repeated for a maximum of 6 credits.
Prerequisite: consent of the department head.

M E 511. Dynamics
3 Credits (3)
An advanced study of the dynamical behavior of systems of particles and rigid bodies, with emphasis on the theoretical background of dynamics.
Prerequisite: ENGR 234 and M E 328.

Learning Outcomes

1. Knowledge of the techniques to describe the motion of mechanical systems.
2. Ability to derive the equations of motion of dynamical systems.
3. Understanding of the difference between several methodologies used to derive the governing equations of systems.
4. Ability to find and classify the dynamical responses of systems.

M E 512. Vibrations
3 Credits (3)
Free and forced vibrations for discrete and continuous systems with single or multiple degrees of freedom. Introduction to nonlinear and random vibration and solution techniques for such systems.
Prerequisite: M E 511 or consent of instructor.

Learning Outcomes

1. Ability to derive equations of motion of single- and multi-degree-of-freedom (DOF) systems.
2. Ability to analyze free and forced vibrations of single- and multi-DOF systems.
3. Ability to perform modal analysis of single- and multi-DOF systems.
4. Ability to derive equations of motion of continuous systems including beams, strings, and rods.
5. Ability to solve the governing equations of motion for several dynamical systems.

M E 517. Nonlinear Dynamics and Chaos
3 Credits (3)
Singular points, periodic solutions, stability, and local bifurcations for ODEs and maps; phase space methods, invariant manifolds, and Poincare maps; nonsmooth, periodic, time-delay, and Hamiltonian systems; perturbation, averaging, and harmonic balance methods; center manifold reduction and normal forms; strange attractors, Liapunov exponents, attractor dimension; dissipative and Hamiltonian chaos. May be repeated up to 3 credits.

Learning Outcomes

1. Ability to qualitatively and quantitatively understand and determine the dynamical response of nonlinear systems.
2. Understanding of various nonlinear behaviors and concepts.
3. Ability to use several perturbation techniques to solve the governing equations of motion.
4. Ability to characterize the response of a nonlinear dynamical system.

M E 518. Finite Element Analysis
3 Credits (3)
Introduction to finite element method. Topics include mathematical modeling, variational formulation, shape functions, truss, beam, solid, and shell elements. Includes static, dynamic, and nonlinear analysis.

M E 527. Linear Systems Theory
3 Credits (3)
Introduction to control of linear multi-input-multi-output (MIMO) systems. Topics include representation of system dynamics using the state-space model, linearization, internal and input-to-output stability, controllability, observability, optimal control, linear quadratic regulator, and observer.
Prerequisite: M E 452 or A E 452 or consent of instructor.

Learning Outcomes

1. Modeling of linear dynamical systems using state space methods.
2. Analysis of stability, controllability, and observability of linear systems.
3. Design of controllers and observers for linear systems using pole placement methods.

M E 530. Intermediate Fluid Mechanics
3 Credits (3)
Application of exact and empirical solutions to fundamental flow problems, including viscous and inviscid behavior. These applications establish a theoretical basis for the origin and physical role of common terms in the governing equations.
Prerequisite: M E 338 or A E 339 or consent of instructor.

Learning Outcomes

1. A basic knowledge of incompressible, viscous flows of Newtonian fluids, boundary layers and boundary layer behavior, vortex dynamics and 1D isentropic compressible flows, shocks and expansion waves.

M E 533. Numerical Methods for Fluid Mechanics and Heat Transfer
3 Credits (3)
Development of numerical techniques for the solution of ordinary and partial differential equations that arise in heat transfer and fluid mechanics; classification of equations, methods of solutions, examples.
Prerequisite: M E 530 or consent of instructor.

Learning Outcomes

1. An ability to understand fundamental aspects of solving differential equations using finite difference methods.
2. An ability to understand fundamental concepts such as stability, accuracy, consistency, systematic errors (phase/amplitude errors), artificial diffusion, etc.
3. An ability to implement and test algorithms for the solution of ordinary and partial differential equations.
4. An ability to develop ability to analyze numerical results and report results in a meaningful way.

M E 536. Hydrodynamic Stability and Turbulence
3 Credits (3)
Introduction to fundamentals of hydrodynamic stability, classical linear stability analysis of parallel shear flows and rotating flows, nonlinear stability, basic concepts in turbulence theory.
Prerequisite/Corequisite: M E 530.

Learning Outcomes

1. An ability to understand fundamentals of hydrodynamic stability.
2. An ability to apply classical linear / nonlinear stability analysis of parallel shear flows and rotating flows.
3. Understanding of basic concepts in turbulence theory.

M E 540. Intermediate Heat Transfer
3 Credits (3)
Fundamentals of conduction, convection, and radiation heat transfer. Emphasis on the application of combined heat transfer to the solution of problems not accessible at the undergraduate level.
Prerequisite: M E 341.
Prerequisite/Corequisite: M E 570.
Learning Outcomes

1. An ability to solve heat transfer problems involving conduction, convection, and radiation.
2. Use of algebra and differential and integral calculus to obtain solutions to heat transfer problems.
3. Understanding of the final solution for a heat transfer problem and predict its correctness using fundamental heat transfer principles.

M E 557. Engineering Failure Analysis
3 Credits (3)
Introduction to failure theories and causes. Topics include general procedures for failure analysis, ductile and brittle modes of failure, elements of fracture mechanics, fractography, and failures in various engineering applications due to fatigue, wear, corrosion, design or processing defects. May be repeated up to 3 credits.

M E 558. Properties and Mechanical Behavior of Materials
3 Credits (3)
Understanding the microstructure of engineering materials and their influence on mechanical behavior. Topics include Material Structure and Physical Properties, Thermodynamics and Kinetics of Materials, Mechanical Properties, Strengthening Mechanisms, Time and Temperature Dependent Behavior, Degradation, Fatigue, and Fracture. May be repeated up to 3 credits.
Prerequisite: CHME 361.

M E 570. Engineering Analysis I
3 Credits (3)
Introduction to engineering analysis with emphasis on engineering applications. Topics include linear algebra, linear ordinary differential equations, and linear partial differential equations with focus on analytical methods.
Prerequisite: M E 328 or PHYS 395 or equivalent.
Learning Outcomes

1. Proficient knowledge of Laplace Transforms and application to initial value problems.
2. Basic knowledge of phase space analysis for ODEs.
3. Proficient knowledge of Fourier Series representations of functions, and basic knowledge of Fourier Transforms.
4. Proficient knowledge of linear, homogeneous boundary value PDEs; basic knowledge of nonhomogeneous BVP, Poisson's equation and Green's Functions.
5. Proficient knowledge of elementary complex functions, basic knowledge of theory of analytic functions, contour integral theorems, Laurent Series and Residue Theorem.

M E 583. Introduction to Combustion
3 Credits (3)
Introduction to combustion kinetics, combustion thermochemistry, flame dynamics, flame stability, and pollutant formation. Course coverage includes laminar and turbulent flames, premixed and diffusion flames, and detonations. Emphasis is placed on the role of chemical kinetics, heat transfer, mass transfer, and fluid dynamics on flame structure and flame stability. May be repeated up to 3 credits.
Prerequisite: (M E 228 and M E 340) or consent of instructor.
Learning Outcomes

1. Understanding of reaction rates of chemical processes.
2. Derivation of simplified reactor models based on coupled chemical and thermal analysis.
3. Knowledge of conservation / transport equations for reacting flows.
4. Calculation of structure and propagation limits of laminar premixed combustion waves.
5. Analysis of structure and controlling processes in laminar diffusion flames, time and spatial scales in turbulent flames, and basic issues in turbulent combustion.

M E 586. Introduction to Robotics
3 Credits (3)
This course provides students with an introduction to the theories and methods for analysis, design, and control of robotic manipulators. This course is devoted to understanding the spatial descriptions and transformations, kinematics, and dynamics of these mechanisms and how to practically implement these concepts into actual robotic manipulators.
Prerequisite: M E 328 and ENGR 234 or consent of instructor.
Learning Outcomes

1. An ability to develop spatial description and transformations of rigid body motion and coordinate frames.
2. An ability to derive the kinematics and dynamics of robotic manipulators in forward and inverse forms.
3. An ability to plan motion and trajectories, program, and control these robotic platforms.
4. Application of the theoretical methods into industrial robots, and implementation of the knowledge and experiences to real-world engineering projects.

M E 587. Mechatronics
3 Credits (2+3P)
Introduction to the analysis and design of computer-controlled electromechanical systems, including data acquisition and conversion, force and motion sensors, actuators, mechanisms, feedback control, and robotic devices. Students required to work in teams to construct and test simple robotic systems. Crosslisted with: M E 487.
Prerequisite: M E 345.
Learning Outcomes

1. An ability to define a mechatronic system and its primary elements.
2. An ability to exercise a computational model of the mechatronic system and evaluate the system response.
3. An ability to design, formulate and implement an appropriate closed-loop controller.
4. An ability to design and demonstrate a functional physical device that solve a practical problem while meets system requirements.
5. Knowledge of contemporary issues.

M E 598. Special Research Programs
1-3 Credits
Individual investigations, either analytical or experimental. May be repeated for a maximum of 6 credits.

M E 599. Master's Thesis
15 Credits
Thesis.

M E 600. Doctoral Research
1-15 Credits
This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.

M E 698. Special Research Programs
1-3 Credits
May be repeated for a maximum of 6 credits.

M E 700. Doctoral Dissertation
15 Credits
Dissertation.

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Aerospace Engineering - Bachelor of Science in Aerospace Engineering

The aerospace engineering program prepares students for a range of professional engineering careers in aerospace and related professions. The aerospace engineering curriculum covers the important classical areas of low and high speed aerodynamics, propulsion, orbital mechanics, flight mechanics and control, aerospace structures and laboratory practice. In addition, the principles of systems engineering and design that are necessary to conceive, design, analyze and troubleshoot complex engineering systems are covered extensively and are considered to be especially important in the overall educational experience. Students will also be encouraged to participate in significant non-classroom experiences, including:

- co-ops and internships;
- industrial and laboratory field trips;
- guest speakers from outside NMSU;
- the New Mexico Space Grant Program;
- special seminar programs on current topics in aerospace.

Aerospace engineers find employment in areas of launch vehicles, space vehicles and missions, aircraft systems design, land and sea vehicle design, robotics and automated manufacturing, safety and other areas. The aerospace engineering background also allows graduates to pursue careers in non-aerospace fields of engineering. Graduates of the aerospace engineering program will be prepared to apply the following skills to problems of interest either in the industry or research and development:

- engineering sciences,
- mathematics,
- computational methods,
- modern experimental methods,
- effective communication skills and
- systems engineering principles.

The aerospace engineering program is also intended to prepare students to pursue graduate study, which can be of significant benefit in the aerospace profession. The general goals of the aerospace engineering program, as well as the program educational objectives, are the same as those stated above for the mechanical engineering program.

Requirements (123 Credits)

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 123 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

In addition to the NMSU and College of Engineering requirements for graduation, a student must obtain a minimum grade of C- in all math, science, and engineering courses applied toward their Bachelor of Science in Aerospace Engineering (AE) and/or Mechanical Engineering (ME) minor.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		*4*
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
English Composition - Level 2 [1]		*3*
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
Oral Communication [1]		*3*
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		*4*
MATH 1511G	Calculus and Analytic Geometry I [2]	
MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences & Social/Behavioral Sciences		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
Area IV: Social/Behavioral Sciences [1]		3
Areas V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		*4*
MATH 1521G	Calculus and Analytic Geometry II	
MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing a Wider World		
Viewing a Wider World Electives [3]		6
Departmental/College Requirements		
Mechanical Engineering		
ENGR 110	Introduction to Engineering Design	3
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
ENGR 217	Manufacturing Processes	3
ENGR 217 L	Manufacturing Processes Lab	1

M E 228	Engineering Analysis I	3
M E 240	Thermodynamics	3
M E 261	Numerical Methods	3
M E 328	Engineering Analysis II	3
M E 341	Heat Transfer	3
M E 345	Experimental Methods I	3
M E 349	MAE Career Seminar	1
Aerospace Engineering		
A E 339	Aerodynamics I	3
A E 362	Orbital Mechanics	3
A E 363	Aerospace Structures	3
A E 364	Flight Dynamics and Controls	3
A E 419	Propulsion	3
A E 439	Aerodynamics II	3
A E 424	Aerospace Systems Engineering	3
A E 428	Aerospace Capstone Design [4]	3
A E 447	Aerofluids Laboratory	3
Select one Aerospace Engineering Senior Elective from the following:		3
A E 405	Special Topics	
A E 451	Aircraft Design	
A E 464	Advanced Flight Dynamics and Controls	
A E 469	Hypersonic Aerothermodynamics	
M E 401	Building Energy and Environment	
M E 405	Special Topics	
M E 452	Control System Design	
M E 456	Experimental Modal Analysis	
M E 457	Engineering Failure Analysis	
M E 458	Properties and Mechanical Behavior of Materials	
M E 460	Applied Finite Elements	
M E 481	Alternative and Renewable Energy	
M E 483	Introduction to Combustion	
M E 486	Introduction to Robotics	
M E 487	Mechatronics	
ENGR 400	Special Topics [5]	
Non- Departmental Requirements		
Mathematics		
MATH 2530G	Calculus III	3
Natural Science		
PHYS 1320G	Calculus -Based Physics II	3
Engineering		
ENGR 190	Introduction to Engineering Mathematics	4
C E 301	Mechanics of Materials	3
CHME 361	Engineering Materials	3
Second Language: (not required)		
Electives to bring the total credits to 123		**0**
Total Credits		**123**

1 See General Education (p. 262) section in this catalog for a full list of courses.

2 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

3 See the Viewing a Wider World (p. 266) section in this catalog for a full list of courses.

4 A E 428 Aerospace Capstone Design can be substituted by ENGR 401 Engineering Capstone I for those who pursue dual degrees in Mechanical Engineering and in Aerospace Engineering.

5 The total number of credits must be 3 in order for ENGR 400 to be counted as Aerospace Engineering Elective.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		
Fall		**Credits**
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
ENGR 190	Introduction to Engineering Mathematics	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
	Credits	**16**
Spring		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
ENGR 110	Introduction to Engineering Design	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
Area IV: Social/Behavioral Sciences [2]		3
	Credits	**17**
Sophomore		
Fall		
MATH 2530G	Calculus III	3
ENGR 233	Engineering Mechanics I	3
PHYS 1320G	Calculus -Based Physics II	3
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 217	Manufacturing Processes	3
ENGR 217 L	Manufacturing Processes Lab	1
	Credits	**17**
Spring		
M E 228	Engineering Analysis I	3
ENGR 234	Engineering Mechanics II	3
M E 261	Numerical Methods	3
M E 240	Thermodynamics	3
COMM 1115G or COMM 1130G or HNRS 2175G	Introduction to Communication or Public Speaking or Introduction to Communication Honors	3
	Credits	**15**
Junior		
Fall		
M E 328	Engineering Analysis II	3
A E 339	Aerodynamics I	3
A E 362	Orbital Mechanics	3
C E 301	Mechanics of Materials	3

CHME 361	Engineering Materials	3
M E 349	MAE Career Seminar	1
	Credits	**16**
Spring		
A E 363	Aerospace Structures	3
A E 439	Aerodynamics II	3
A E 424	Aerospace Systems Engineering	3
M E 345	Experimental Methods I	3
M E 341	Heat Transfer	3
	Credits	**15**
Senior		
Fall		
A E 428	Aerospace Capstone Design	3
A E 447	Aerofluids Laboratory	3
A E 364	Flight Dynamics and Controls	3
Area V: Humanities [2]		3
Area VI: Creative and Fine Arts [2]		3
	Credits	**15**
Spring		
A E 419	Propulsion	3
Aerospace engineering senior elective		3
Viewing a Wider World [3]		3
Viewing a Wider World [3]		3
	Credits	**12**
	Total Credits	**123**

1. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
2. See the General Education (p. 262) section in this catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section in this catalog for a full list of courses.

Mechanical Engineering - Bachelor of Science in Mechanical Engineering

The mechanical engineering program prepares students for a wide range of professional engineering careers in such areas as: research and development; design; facilities operation and maintenance; management; and production. Graduates of the program will be prepared to apply engineering sciences, mathematics, computational methods, modern experimental methods, and effective communication skills to problems of interest in industry as well as government or scholarly topics. Employment opportunities for graduates are extensive. These opportunities include: energy and utility; manufacturing; automotive; aerospace; defense and space; research and development; and many others. The emphasis in the curriculum is on engineering sciences (solid mechanics, thermal sciences, fluid mechanics and materials science); mathematics; engineering analysis; engineering design; general sciences; and communication balanced with general education topics and electives. Graduates of the program will also be prepared for graduate studies (subject to grade-point and standardized test qualifications). Students will be prepared to take the fundamentals of engineering examination (and are encouraged to do so) as a step towards professional registration.

Requirements (123 Credits)

In addition to the NMSU and College of Engineering requirements for graduation, a student must obtain a minimum grade of C- in all math, science and engineering courses applied toward their Bachelor of Science in Mechanical Engineering (ME) and/or Aerospace Engineering (AE) minor.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 123 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
State of New Mexico Common Core		
Area I: Communications		
English Composition - Level 1		*4*
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
English Composition - Level 2 [1]		*3*
ENGL 2210G	Professional and Technical Communication	
ENGL 2210H	Professional and Technical Communication	
Oral Communication [1]		*3*
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		*4*
MATH 1511G	Calculus and Analytic Geometry I [2]	
MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social Behavioral Sciences		*11*
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: Social/Behavioral Sciences [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		*4*
MATH 1521G	Calculus and Analytic Geometry II	
MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing A Wider World		**6**
Viewing a Wider World courses [3]		
Departmental/College Requirements		
Mechanical Engineering		
ENGR 110	Introduction to Engineering Design	3
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 217	Manufacturing Processes	3
ENGR 217 L	Manufacturing Processes Lab	1
M E 228	Engineering Analysis I	3
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
M E 240	Thermodynamics	3
M E 261	Numerical Methods	3
M E 326	Mechanical Design	3

M E 328	Engineering Analysis II	3
M E 338	Fluid Mechanics	3
M E 340	Applied Thermodynamics	3
M E 341	Heat Transfer	3
M E 345	Experimental Methods I	3
M E 349	MAE Career Seminar	1
M E 425	Design of Machine Elements	3
M E 445	Experimental Methods II	3
Select one Mechanics Elective from the following: [4]		3
M E 331	Intermediate Strength of Materials	
M E 332	Vibrations	
M E 333	Intermediate Dynamics	
Select two Mechanical Engineering Electives from the following:		6
M E 401	Building Energy and Environment	
M E 405	Special Topics	
M E 452	Control System Design	
M E 456	Experimental Modal Analysis	
M E 460	Applied Finite Elements	
M E 457	Engineering Failure Analysis	
M E 458	Properties and Mechanical Behavior of Materials	
M E 481	Alternative and Renewable Energy	
M E 483	Introduction to Combustion	
M E 486	Introduction to Robotics	
M E 487	Mechatronics	
A E 405	Special Topics	
A E 451	Aircraft Design	
A E 464	Advanced Flight Dynamics and Controls	
A E 469	Hypersonic Aerothermodynamics	
ENGR 400	Special Topics [5]	
Non-Departmental Requirements		
Mathematics		
MATH 2530G	Calculus III	3
Natural Science		
PHYS 1320G	Calculus -Based Physics II	3
Engineering		
ENGR 190	Introduction to Engineering Mathematics	4
C E 301	Mechanics of Materials	3
CHME 361	Engineering Materials	3
ENGR 401	Engineering Capstone I	3
ENGR 402	Engineering Capstone II	3
Second Language: (not required)		
Electives to bring the total credits to 123		**0**
Total Credits		**123**

1 See the General Education (p. 262) section in the catalog for a full list of courses.

2 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

3 See Viewing a Wider World (p. 266) section in the catalog for a full list of courses.

4 A E 362 Orbital Mechanics, A E 363 Aerospace Structures, or A E 364 Flight Dynamics and Controls can be counted towards the Mechanics Elective course requirement for those who are pursuing dual degrees in Mechanical Engineering and Aerospace Engineering. However, these cannot be double-counted for a minor degree.

5 The total number of credits must be 3 in order for ENGR 400 to be counted as Mechanical Engineering Elective. ENGR 400 Special Topics credits more than 3 would not be accepted as any additional Mechanical Engineering Elective.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman		
Fall		**Credits**
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
ENGR 190	Introduction to Engineering Mathematics	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
	Credits	**16**
Spring		
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	4
ENGR 110	Introduction to Engineering Design	3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	3
Area IV: Social/Behavorial Sciences Course [2]		3
	Credits	**17**
Sophomore		
Fall		
MATH 2530G	Calculus III	3
ENGR 233	Engineering Mechanics I	3
PHYS 1320G	Calculus -Based Physics II	3
ENGR 140	Introduction to Programming and Embedded Systems	4
ENGR 217	Manufacturing Processes	3
ENGR 217 L	Manufacturing Processes Lab	1
	Credits	**17**
Spring		
M E 228	Engineering Analysis I	3
ENGR 234	Engineering Mechanics II	3
M E 261	Numerical Methods	3
M E 240	Thermodynamics	3
COMM 1115G or COMM 1130G or HNRS 2175G	Introduction to Communication or Public Speaking or Introduction to Communication Honors	3
	Credits	**15**
Junior		
Fall		
M E 328	Engineering Analysis II	3
M E 338	Fluid Mechanics	3

C E 301	Mechanics of Materials	3
M E 340	Applied Thermodynamics	3
CHME 361	Engineering Materials	3
M E 349	MAE Career Seminar	1
	Credits	**16**
Spring		
M E 326	Mechanical Design	3
Choose one Mechanics Elective from the following: [4]		3
M E 331	Intermediate Strength of Materials	
M E 332	Vibrations	
M E 333	Intermediate Dynamics	
M E 345	Experimental Methods I	3
M E 341	Heat Transfer	3
Area V: Humanities Course [2]		3
	Credits	**15**
Senior		
Fall		
ENGR 401	Engineering Capstone I	3
M E 425	Design of Machine Elements	3
M E 445	Experimental Methods II	3
Viewing a Wider World Course [3]		3
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**15**
Spring		
ENGR 402	Engineering Capstone II	3
Mechanical Engineering Senior Electives		6
Viewing a Wider World Course [3]		3
	Credits	**12**
	Total Credits	**123**

1 MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.

2 See General Education (p. 262) section in the catalog for a full list of courses.

3 See Viewing a Wider World (p. 266) section in the catalog for a full list of courses.

4 A E 362 Orbital Mechanics, A E 363 Aerospace Structures, or A E 364 Flight Dynamics and Controls can be counted towards the Mechanics Elective course requirement for those who are pursuing dual degrees in Mechanical Engineering and Aerospace Engineering. However, these cannot be double-counted for a minor degree.

Aerospace Engineering - Undergraduate Minor

Prefix	Title	Credits
Requirements		
Math and Science		
MATH 1511G	Calculus and Analytic Geometry I	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
MATH 2530G	Calculus III	3
PHYS 1310G	Calculus -Based Physics I	3
Required Engineering		
C E 301	Mechanics of Materials	3
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
M E 240	Thermodynamics	3
M E 328	Engineering Analysis II	3
A E 339	Aerodynamics I	3
Technical Electives [1]		
Select one from the following:		3
A E 364	Flight Dynamics and Controls	
A E 439	Aerodynamics II	
Select one from the following:		3
A E 362	Orbital Mechanics	
A E 363	Aerospace Structures	
A E 419	Propulsion	
Total Credits		**38**

1 Technical Electives cannot be used to satisfy BSME Engineering elective requirement.

Mechanical Engineering - Undergraduate Minor

Prefix	Title	Credits
Requirements		
Math and Science		
MATH 1511G	Calculus and Analytic Geometry I	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
MATH 2530G	Calculus III	3
PHYS 1310G	Calculus -Based Physics I	3
Required Engineering		
C E 301	Mechanics of Materials	3
M E 240	Thermodynamics	3
ENGR 233	Engineering Mechanics I	3
ENGR 234	Engineering Mechanics II	3
M E 328	Engineering Analysis II	3
M E 338	Fluid Mechanics	3
M E 326	Mechanical Design	3
Technical Elective [1]		
Select one from the following:		3
M E 401	Building Energy and Environment	
M E 425	Design of Machine Elements	
M E 452	Control System Design	
M E 456	Experimental Modal Analysis	
M E 457	Engineering Failure Analysis	
M E 458	Properties and Mechanical Behavior of Materials	
M E 460	Applied Finite Elements	
M E 481	Alternative and Renewable Energy	
M E 483	Introduction to Combustion	
M E 486	Introduction to Robotics	
M E 487	Mechatronics	
Total Credits		**38**

[1] Technical Elective cannot be used to satisfy BSAE Engineering elective requirement.

College of Health, Education and Social Transformation

Dean - ***Rick Marlatt***

Interim Associate Dean for Academic Affairs - ***Rebecca Palacios***

Associate Dean for Research - ***Michael Hout***

Director of Research Operations - ***Juanita Hannan***

Director of Finance - ***Aida Lopez***

Coordinator, Educational Support and Resource Center- ***Margo Trevino-Torres***

Student Program Coordinator - ***Sapphira Garner***

Communication Specialist - ***Amanda Adame***

The College of Health, Education, and Social Transformation (HEST) was established in 2021 to serve students, faculty, and staff whose efforts aim to improve individual, societal, and policy outcomes. The college was formed by combining the previous College of Education, College of Health and Social Services, and the Department of Sociology from the College of Arts & Sciences. In the Spring of 2023, the college added the Borderlands and Ethnic Studies Department. We offer stackable credentials, certificates, minors, and degrees in the following areas: borderlands and ethnic studies; communication disorders; counseling and educational psychology; kinesiology; nursing; public health; social work; sociology; and teacher preparation, administration, and leadership (TPAL).

General Undergraduate Requirements

1. Complete at least 120 - 132 acceptable credits, including a minimum of 48 credits in courses numbered 300 or above. NMSU Viewing the Wider World (VWW) classes are included in the 48-credit hour requirement.
2. The minimum GPA varies per degree program. Please refer to your department/school for application, admission, or program GPA requirements. Each department has information about minimum GPA, program prerequisites, and program-specific testing requirements. Application to a HEST program does not automatically end in acceptance.
3. Satisfy New Mexico general education requirements. The HEST Undergraduate Resource Center and the Center for Academic Advising and Support Services (CAASS) have detailed degree maps, program information, and curricula.
4. All students, including transfer students, must complete the last 30 semester credits required for the baccalaureate degree within the New Mexico State University system. Students in the four-year Servicemen's Opportunity College Program are not exempt from this regulation.
5. Students interested in teacher preparation (including secondary education minors), nursing, social work, and public health programs must apply and be accepted into these programs based on a set of prerequisites and a competitive admission process. For information about these application and admission processes, please refer to each department's information in this catalog.
6. In addition, if department faculty determine that a student is performing below expected program standards in a particular skill, that department may require that a remediation plan be developed to promote student success.

General Education Requirements (non-teacher education programs)

1. Ten credits in General Education Area I: Communication
2. Three to four credits in General Education Area II: Mathematics
3. Ten to eleven credits in General Education Area III/IV: Laboratory Science and Social/Behavioral Sciences
4. Three credits in General Education Area V: Humanities
5. Three credits in General Education Area VI: Creative and Fine Arts
6. Three to four additional credits from a General Education Elective

General Education Requirements (teacher education programs)

1. Ten credits in General Education Area I: Communication
2. Three credits in General Education Area II: Mathematics
3. Eleven credits in General Education Area III/IV: Laboratory Science and Social/Behavioral Sciences
4. Three credits in General Education Area V: Humanities
5. Three credits in General Education Area VI: Creative and Fine Arts
6. Three additional credits from a General Education Elective (HIST 1110G United States History I or HIST 1120G United States History II)

HEST programs may require more credit hours or additional courses specific to the major. Check the departmental pages for degree requirements in each program of study.

While the ultimate responsibility for planning an academic program in compliance with university, college, and departmental requirements rests with the student, the College recognizes the importance of sound and accessible advising for academic programs. Students formally admitted to a HEST major are provided academic advising within the department of that major. Students not formally admitted to a professional studies program are advised by CAASS.

Transferring Undergraduate Courses

Certain courses within the curricula offered by HEST programs have been identified as transferable from NMSU to other public two-year and four-year institutions in New Mexico. The equivalent course at other institutions can be identified using the common course number. Similarly,

students from other institutions can use the common course number to identify education courses that can be transferred to NMSU.

The School of Nursing offers the New Mexico Nursing Education Consortium (NMNEC) state-wide.

Pre-professional Programs

NMSU offers several programs for students to transfer into professional schools throughout the university. The pre-professional programs administered by the HEST are pre-nursing and pre-social work. Students new to NMSU or working on completing their departmental prerequisites can declare a pre-professional major in HEST. Once prerequisites have been satisfied, an application process specific to each major is required. Application details and requirements are available through the "Academic Departments" link on the HEST website (https://hest.nmsu.edu/) and the Central Advising Center (CAASS).

Graduate Work

HEST offers curricula leading to the degrees of:

- Master of Arts
- Master of Public Health
- Master of Science
- Master of Social Work
- Specialist in Education
- Doctor of Education
- Doctorate of Nursing Practice
- Doctor of Philosophy in Health Equity Sciences
- Doctor of Philosophy in Kinesiology.

Those interested in pursuing graduate degrees should consult the Graduate Catalog for full information at https://catalogs.nmsu.edu/nmsu/graduate-school/.

Bachelor Degrees

A

- Applied Studies (Zero-to-Four (Early Childhood)) - Bachelor of Applied Studies (p. 1418)

C

- Communication Disorders - Bachelor of Science in Communication Disorders (p. 1281)
- Communication Disorders - Bachelor of Science in Communication Disorders (Online) (https://catalogs.nmsu.edu/global/nmsu-global/communication-disorders-bscd-online/)
- Counseling and Community Psychology - Bachelor of Science (p. 1267)
- Counseling and Community Psychology - Bachelor of Science (Online) (https://catalogs.nmsu.edu/global/nmsu-global/counseling-community-psychology-bs-online/)

D

- Dance - Bachelor of Arts in Dance (p. 1307)

E

- Early Childhood Education - Bachelor of Science in Education (p. 1421)
- Elementary Education (Language Arts K-8) - Bachelor of Science in Education (p. 1423)
- Elementary Education (Math K-8) - Bachelor of Science in Education (p. 1425)
- Elementary Education (Science K-8) - Bachelor of Science in Education (p. 1427)
- Elementary Education (Social Studies K-8) - Bachelor of Science in Education (p. 1428)

K

- Kinesiology (Applied Exercise Science) - Bachelor of Science in Kinesiology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/kinesiology-applied-exercise-science-bachelor-science-kinesiology-online/)
- Kinesiology (Exercise Science) - Bachelor of Science in Kinesiology (p. 1308)
- Kinesiology (Performance Psychology) - Bachelor of Science in Kinesiology (p. 1311)
- Kinesiology (Physical Education) - Bachelor of Science in Kinesiology (p. 1314)

N

- Nursing - Bachelor of Science in Nursing (p. 1346)

P

- Public Health - Bachelor of Public Health (p. 1361)
- Public Health - Bachelor of Public Health (Online) (https://catalogs.nmsu.edu/global/nmsu-global/public-health-bph-online/)

S

- Secondary Education (Secondary Education General Science) - Bachelor of Science in Education (p. 1429)
- Secondary Education (Secondary Education Language Arts) - Bachelor of Science in Education (p. 1432)
- Secondary Education (Secondary Education Math) - Bachelor of Science in Education (p. 1434)
- Secondary Education (Secondary Education Social Studies) - Bachelor of Science in Education (p. 1437)
- Social Work - Bachelor of Social Work (p. 1461)
- Social Work - Bachelor of Social Work (Online) (https://catalogs.nmsu.edu/global/nmsu-global/social-work-bsw-online/)
- Sociology - Bachelor of Arts (p. 1474)
- Sociology - Bachelor of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/sociology-ba-online/)
- Special Education (Elementary Education) - Bachelor of Science in Education (p. 1439)

Masters Degrees

A

- Athletic Training - Master of Science (p. 103)

C

- Clinical Mental Health Counseling - Master of Arts (p. 132)
- Clinical Psychopharmacology - (Postdoctoral) - Master of Science (Online) (https://catalogs.nmsu.edu/global/nmsu-global/clinical-psychopharmacology-postdoctoral-ms-online/)
- Communication Disorders - Master of Arts (p. 133)
- Counseling and Guidance (Educational Diagnostics) - Master of Arts (p. 139)

E

- Education (Bilingual Education) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-bilingual-education-master-arts-online/)
- Education (Curriculum & Instruction) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-curriculum-instruction-ma-online/)
- Education (Early Childhood Education Plus Licensure) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-early-childhood-ed-plus-licensure-ma-online/)
- Education (Early Childhood Education) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-early-childhood-ed-ma-online/)
- Education (Educational Learning Technologies) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-educational-learning-technologies-ma-online/)
- Education (Elementary Licensure Prep) - Master of Arts (p. 146)
- Education (Elementary Licensure Prep) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-elementary-licensure-prep-ma-online/)
- Education (Elementary Mathematics and Science) - Master of Arts (p. 148)
- Education (Language, Literacy & Culture) - Master of Arts (p. 148)
- Education (Language, Literacy & Culture) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-language-literacy-culture-ma-online/)
- Education (Secondary Licensure Prep) - Master of Arts (p. 149)
- Education (Secondary Licensure Prep) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-secondary-licensure-prep-ma-online/)
- Education (Spanish) - Master of Arts in Teaching (https://catalogs.nmsu.edu/nmsu/graduate-school/education-spanish-master-arts-teaching/)
- Education (Teaching English to Speakers of Other Languages) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-teaching-english-speakers-other-languages-master-arts-online/)
- Educational Leadership & Administration (Higher Education Administration) - Master of Arts (p. 151)
- Educational Leadership & Administration (Higher Education Administration) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/educational-leadership-administration-higher-ed-admin-ma-online/)
- Educational Leadership & Administration (Pk-12 Administration) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/educational-leadership-administration-pk12-admin-ma-online/)

M

- Master of Public Health/Master of Social Work - Dual Degree (https://catalogs.nmsu.edu/nmsu/graduate-school/master-public-health-master-social-work-dual-degree/)

N

- Nursing Leadership and Administration - Master of Science in Nursing (Online) (https://catalogs.nmsu.edu/global/nmsu-global/nursing-leadership-administration-msn-online/)

P

- Public Health (Health Behavior and Health Promotion) - Master of Public Health (p. 182)
- Public Health (Health Management, Administration & Policy) - Master of Public Health (p. 184)

S

- Social Work - Master of Social Work (Full-Time Advanced) (p. 188)
- Social Work - Master of Social Work (Full-Time Advanced) (Online) (https://catalogs.nmsu.edu/global/nmsu-global/social-work-msw-full-time-advanced-online/)
- Social Work - Master of Social Work (Full-Time) (p. 187)
- Social Work - Master of Social Work (Full-Time) (Online) (https://catalogs.nmsu.edu/global/nmsu-global/social-work-msw-online/)
- Social Work - Master of Social Work (Part-Time) (p. 189)
- Social Work - Master of Social Work (Part-Time) (Online) (https://catalogs.nmsu.edu/global/nmsu-global/social-work-msw-part-time-online/)
- Sociology - Master of Arts (p. 190)
- Special Education - Master of Arts (p. 193)
- Special Education - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/special-education-ma-online/)

Specialist Degree

- Reading - Specialist in Education (p. 244)
- School Psychology - Specialist in Education (p. 244)

Doctoral Degrees

C

- Counseling Psychology - Doctor of Philosophy (p. 211)
- Curriculum and Instruction - Doctor of Philosophy (p. 213)
- Curriculum and Instruction - Doctor of Philosophy (Online) (https://catalogs.nmsu.edu/global/nmsu-global/curriculum-instruction-phd-online/)

E

- Educational Leadership & Administration (Higher Education Administration) - Doctor of Education (p. 215)
- Educational Leadership & Administration (Higher Education) - Doctor of Philosophy (p. 216)
- Educational Leadership & Administration (Pk-12 Administration) - Doctor of Education (p. 217)

- Educational Leadership & Administration (Pk-12 Education) - Doctor of Philosophy (p. 218)

H

- Health Equity Sciences - Doctor of Philosophy (p. 228)

K

- Kinesiology - Doctor of Philosophy (p. 229)

N

- Nursing Practice (Family Nurse Practitioner) - Doctor of Nursing Practice (Online) (https://catalogs.nmsu.edu/global/nmsu-global/nursing-practice-family-nurse-practitioner-dnp-online/)
- Nursing Practice (Nurse Anesthesiology) - Doctor of Nursing Practice (p. 232)
- Nursing Practice (Population Health Leadership) - Doctor of Nursing Practice (Online) (https://catalogs.nmsu.edu/global/nmsu-global/nursing-practice-population-health-leadership-dnp-online/)
- Nursing Practice (Psychiatric/Mental Health) - Doctor of Nursing Practice (Online) (https://catalogs.nmsu.edu/global/nmsu-global/nursing-practice-psychiatric-mental-health-dnp-online/)

S

- School Psychology - Doctor of Philosophy (p. 235)

Graduate Certificates

- Autism and Spectrum Disorders - Graduate Certificate (p. 245)
- Autism and Spectrum Disorders - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/autism-spectrum-disorders-gr-certificate-online/)
- Bilingual Education - Graduate Certificate (p. 245)
- Bilingual Education - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/bilingual-education-gr-certificate-online/)
- Borderlands and Ethnic Studies - Graduate Certificate (p. 245)
- Communication Disorders - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/communication-disorders-graduate-certificate-online/)
- Early Childhood Alternative Licensure - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/early-childhood-alt-licensure-gr-cert-online/)
- Elementary Education Alternative Licensure - Graduate Certificate (p. 247)
- Family Nurse Practitioner - Post-Masters Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/family-nurse-practitioner-pm-certificate-online/)
- Online Teaching and Learning - Graduate Certificate (p.)
- Online Teaching and Learning - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/online-teaching-learning-gr-certificate-online/)
- Principal Licensure - Graduate Certificate (p. 249)
- Psychiatric/Mental Health Nurse Practitioner - Post-Masters Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/psychiatric-mental-health-nurse-practitioner-pmc-online/)
- Public Health - Graduate Certificate (p. 249)
- Public Health - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/public-health-gr-certificate-online/)
- School Social Work: Special Education Related Services - Graduate Certificate (p. 250)
- School Social Work: Special Education Related Services - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/school-social-work-special-education-related-services-graduate-certificate-online/)
- Secondary Education Alternative Licensure - Graduate Certificate (p. 251)
- Special Education Alternative Licensure - Graduate Certificate (https://catalogs.nmsu.edu/nmsu/graduate-school/special-education-alternative-licensure-graduate-certificiate/)
- Special Education Alternative Licensure - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/special-education-alternative-licensure-graduate-certificate-online/)
- Teaching English to Speakers of Other Languages - Graduate Certificate (p. 252)
- Teaching English to Speakers of Other Languages - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/tesol-gr-certificate-online/)

Undergraduate Minors

- American Sign Language - Undergraduate Minor (p. 1283)
- Borderland and Ethnic Studies - Undergraduate Minor (p. 1244)
- Chicana/o Studies - Undergraduate Minor (p. 1245)
- Counseling and Education Psychology - Undergraduate Minor (p. 1270)
- Dance - Undergraduate Minor (p. 1316)
- Exercise Science - Undergraduate Minor (p. 1316)
- Gerontology - Undergraduate Minor (p. 1363)
- Gerontology - Undergraduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/gerontology-ug-minor-online/)
- Native American Studies - Undergraduate Minor (p. 1245)
- Pre-Health - Undergraduate Minor (p. 1233)
- Public Health Sciences - Undergraduate Minor (p. 1363)
- Public Health Sciences - Undergraduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/public-health-sciences-ug-minor-online/)
- Sociology - Undergraduate Minor (p. 1476)
- Sociology - Undergraduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/sociology-ug-minor-online/)
- U.S.-Mexico Border Health Issues - Undergraduate Minor (p. 1363)

Graduate Minors

- Decolonial Research - Graduate Minor (p. 1246)
- Educational Administration (Doctoral) - Graduate Minor (p. 255)
- Educational Administration (Higher Ed.) - Graduate Minor (p. 255)
- Educational Administration (Pk-12) - Graduate Minor (p. 255)
- Gerontology - Graduate Minor (p. 257)
- Integrated Behavioral Health Care - Graduate Minor (p. 258)
- Native American Studies - Graduate Minor (p. 260)
- Sociology - Graduate Minor (p. 261)

- Spanish Counseling - Graduate Minor (p. 261)
- Special Education - Graduate Minor (p. 262)
- Special Education - Graduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/special-education-graduate-minor-online/)
- U.S.-Mexico Border Health Issues - Graduate Minor (p. 262)
- U.S.-Mexico Border Health Issues - Graduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/us-mexico-border-health-issues-graduate-minor-online/)

Accreditation

The programs offered by HEST provide undergraduate students with a broad general education with an emphasis on professional preparation in various disciplines. These programs are nationally accredited, while some require approval by the State of New Mexico. These programs include:

Athletic Training: The Athletic Training Degree in the Department of Kinesiology is accredited by the Commission on Accreditation of Athletic Training (CAATE).

Communication Disorders: The master's program in Speech-Language Pathology is accredited by the American Speech-Language-Hearing Association (CAA - ASHA).

Counseling and Educational Psychology: The Master of Arts (MA) in Clinical Mental Health Counseling is accredited by the Council for Accreditation of Counseling and Related Educational Programs (CACREP); the Specialist in Education (Ed.S.) in School Psychology is accredited by the National Association of School Psychologists (NASP), and the doctoral (Ph.D.) programs in Counseling Psychology and School Psychology are both accredited by the American Psychological Association (APA). The post-doctoral program in Clinical Psychopharmacology holds APA designation.

Nursing: The baccalaureate degree program in nursing, master's degree program in nursing, Doctor of Nursing Practice program, and post-graduate APRN certificates at New Mexico State University are accredited by the Commission on Collegiate Nursing Education, 655 K Street NW, Suite 750, Washington, DC 20001, 202-887-6791. The baccalaureate degree program in nursing has full approval from the New Mexico Board of Nursing.

Public Health: The Bachelor of Public Health and Master of Public Health degree programs in the Department of Public Health Sciences are accredited by the Council on Education for Public Health (CEPH).

Social Work: The baccalaureate and master's degree programs in the School of Social Work are accredited by the Council on Social Work Education (CSWE).

Teacher Preparation: The university's teacher preparation program, which involves several colleges and is directed by the College of Health, Education, and Social Transformation, was re-accredited in 2018 by the Council for the Accreditation of Education Preparation Programs (CAEP). The undergraduate and graduate programs that prepare individuals for licensure to work in public and private schools in New Mexico have been approved by the New Mexico State Public Education Department.

Pre-Health - Undergraduate Minor

The Pre-Health minor is designed to be useful for undergraduate students interested in attending health-related professional schools (i.e., medical, dental, physical therapy, etc.). The courses selected for the minor represents content that will help prepare students to apply and attended health-related professional schools.

Requirements

A minor in Pre-Health must include 22 credits from the listed courses work below.

Prefix	Title	Credits
Core Courses [1]		
BCHE 395	Biochemistry I	3
BIOL 354	Physiology of Humans	3
or SPMD 2225	Anatomy and Physiology II	
BIOL 305	Principles of Genetics	3
or GENE 320	Hereditary and Population Genetics	
Choose one of the following:		*4*
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II [2]	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Biology, Genetics, Anthropology, Kinesiology and Public Health area courses		
Choose one of the following:		*3-4*
BIOL 311	General Microbiology	
BIOL 377	Cell Biology	
BIOL 385	An Introduction to Cancer	
BIOL 474	Immunology	
BCHE 396	Biochemistry II, Lecture and Laboratory	
GENE 320	Hereditary and Population Genetics	
GENE 315	Molecular Genetics	
TOX 361	Basic Toxicology	
SPMD 3050	Therapeutic Modalities	
SPMD 4450	Pathophysiology and Human Function(s)	
SPMD 4510	Neurophysiology and Human Function	
PHLS 4610	Health Disparities: Determinants and Interventions	
ANTH 355	Biological Anthropology	
ANTH 402	Contemporary Medical Anthropology	
ANTH 435	Human Health and Biological Variation	
Statistics and Math area courses		
Choose one of the following:		*3*
MATH 1350G	Introduction to Statistics	
A ST 311	Statistical Applications	
Experiential Learning area courses		
Choose one of the following:		*3*
CHEM 441	Advanced Research	
BCHE 441	Advanced Research in Biochemistry	
HNRS 413	Medical Shadowing	
HNRS 400	Honors Capstone	
SPMD 4610	Research Seminar	
SPMD 4997	Problems	
PHLS 4515	Approaches to Community-Focused Public Health	
PHLS 4998	Applied Practice Experience	

ANTH 486	Community Engagement and Service Learning	
Total Credits		**22-23**

[1] Any prerequisites for courses on the list must be satisfied before taking listed courses.

[2] PHYS 2230G General Physics for Life Science I/PHYS 2230L Laboratory to General Physics for Life Science I should be taken in the fall semester before taking PHYS 2240G General Physics for Life Science II/PHYS 2240L Laboratory to General Physics for Life Science II in the following spring semester.

Recommendations for VWW courses (not required):

- PHLS 3130V Global Environmental Health Issues
- PHLS 4620V Cross-Cultural Aspects of Health
- ANTH 357V Medical Anthropology
- GNDR 381V Women's Health Issues/PHLS 3120V Women's Health Issues (cross-listed class)
- GNDR 433V Sex, Gender and Culture
- SOCI 3245V Comparative Family Systems

Borderlands and Ethnic Studies

Borderlands and Ethnic Studies (BEST)

The BEST department originated at NMSU in 2022 because of long-standing requests from students, faculty, and the broader community. Faculty in the BEST Department are student-focused and respond to societal complexities through theoretical, structural, and historical lenses. We offer place-based curriculum that supports students' deeper understanding themselves, each other, and relations with the natural environment.

BEST is home to three programs:

- Borderlands and Ethnic Studies (BEST (https://best.nmsu.edu/programs/borderlands-ethnic-studies.html))
- Chicana/o Studies (CCST (https://best.nmsu.edu/programs/chicana-studies.html))
- Native American Studies (NATV (https://best.nmsu.edu/programs/native-american-studies.html))

We offer:

Undergraduate Minors in: Borderlands and Ethnic Studies, Chicana/o Studies, and Native American Studies

Graduate Minors in: Native American Studies and Decolonial Research

Graduate Certificate in Borderlands and Ethnic Studies

Degrees for the Department

- Borderlands and Ethnic Studies - Graduate Certificate (p. 245)

Minor for the Department

- Borderland and Ethnic Studies - Undergraduate Minor (p. 1244)
- Chicana/o Studies - Undergraduate Minor (p. 1245)
- Native American Studies - Undergraduate Minor (p. 1245)
- Decolonial Research - Graduate Minor (p. 1246)
- Native American Studies - Graduate Minor (p. 260)

Department Head and Professor: Dulcinea Lara, dulcinea@nmsu.edu

University of California, Berkeley (*Ph.D. in Comparative Ethnic Studies*) -- Relational Ethnic Studies, Chicana/o Studies, Chicana/o History

Professor: Manal Hamzeh, manahamz@nmsu.edu

New Mexico State University (*Ph.D. in Curriculum and Instruction*) -- Decolonial research methodologies, Palestine Studies

Visiting Professor: Jorge Gonzalez, profjmg@nmsu.edu

University of California, Berkeley (*Ph.D. in Comparative Ethnic Studies*) -- Relational Ethnic Studies, Chicana/o Studies, Critical Theory

Visiting Professor: Ruben Leyva, rleyva1@nmsu.edu

University of New Mexico (*ABD in Native American Studies*) -- Native American Studies, Critical Apache Studies

Borderlands and Ethnic Studies

BEST 1110G. Introduction to Borderlands and Ethnic Studies
3 Credits (3)

The field of Ethnic Studies is about 1) critical knowing and 2) unapologetic imagining and creation of a better, more just world. This course explores the roots, logics, and administrations of racism within the U.S. context, locally along the border, and framed within a larger global and historical context. The past few decades have borne witness to increasing global diversity and cross- border migrations, which has led many in the U.S. to imagine the nation as “post-racial.” Simultaneously, increasing clashes that can only be described as “racist” have led people to wonder about the dark racist underpinnings of a society that believes it has achieved the goals put forth by the distinct and intersecting Civil Rights Movements of the 1960s.Perhaps now, more than any other time in history, there is earnest desire to talk about race and racism and unpack these constructs/activities/outcomes. This course is designed to inform us about how colonization, racism, and hegemony function. Secondly, it is designed for self and collective exploration of these somewhat broad and abstract concepts in an applied manner. Finally, it is designed for us to arrive at a shared understanding of the decolonial turn, or a re-humanization imperative. How do we understand, apply, and heal as these activities each relate to coloniality of power

Learning Outcomes

1. Learn and understand broad histories of social struggles, social movements, and ensuing human relationships.
2. Meaningfully engage classical and new materials from the Borderlands and Ethnic Studies “canon.”
3. Articulate observations using key terms, theories, and concepts in Borderlands and Ethnic Studies.
4. Apply key concepts in “everyday life” via course activities.
5. Gain a better understanding of your own worldviews and opinions towards issues of race, class, gender, nationalism, migration, borders, social movements, and resistance.

6. Learn mindful and constructive ways to engage peers about sometimes "difficult" topics like race, power, and privilege.

BEST 2750G. Introduction to Palestine Studies: History, Land, Resistance, and Justice
3 Credits (3)
This course is an undergraduate general education "Palestine Studies" course that draws on "interdisciplinary and multidisciplinary". Palestine studies that engage with critical ethnic studies, settler-colonial studies, critical media literacy studies, gender, sexuality, and queer studies, and decolonial Arab feminisms as set of knowledges, methodologies, and practices. It also draws on an array of historical content published by Palestinian and Palestine Studies scholars and Palestinians' lived experiences represented in oral history studies, and cultural creations such as film, visual art, music, etc. and world media. The course is structured to connect the themes addressed throughout the semester by going back and forth from the critical historical moments in Palestinian history to the ongoing and contemporary Palestinian displacement, resistance, and struggles for freedom, justice, and the right of return to the land of their ancestors. The course aims to help participants understand how the Zionist form of settler-colonialism in Palestine is interlocked with settler-colonialism as an ongoing practice in the USA and other parts of the world. It also addresses the worldwide influence of settler-colonialism on the lives of colonized/gendered/racialized peoples, land theft and extraction, flow of capital, incarceration/detentions, mobility across borders, militarism and wars, mega sports events, and cultural and knowledge creation.
Learning Outcomes
1. Identify key major significant: (a) Events in the history of Palestine (historicize) and in the contemporary context inside Palestine and in the diaspora (contextualize); (b) Moments of solidarity with other global intersectional liberation struggles against settler colonialism (the indivisibility of justice).
2. Apply key concepts, theories, and approaches/methodologies in Palestinian Studies and Critical Ethnic Studies to critically assess: (a) Historical and contemporary consequences on Palestine as indigenous land and Palestinians as indigenous people. (b) Settler-colonialism, racism, and heteronormativity in the case of Palestine. (c) Implication of Zionist settler-colonialism and global settler-colonial powers' complicities/alliances and logics/tactics that maintain the occupation of Palestine and the displacement, dispossession, and incremental ethnic cleansing of Palestinians and their struggles in the diaspora. (d) Material presented by contemporary US media outlets.

BEST 300. History and Theories in Borderlands and Ethnic Studies
3 Credits (3)
This course provides a basic understanding of the history and theoretical foundations of Borderlands and Ethnic Studies. It engages in an in-depth analysis of the concepts and history that resulted in reshaping the way we understand race, national borders, immigration, education, and the law. It examines borderlands theorizing to critically engage the border not simply as a physical barrier meant to regulate migration, but the economic, cultural, spatial, and metaphorical borderlands that informs us on larger processes of membership, belonging, identity, politics, and dehumanization linked to social structures and institutions. It explores the history of social movements in the U.S. that sought to illuminate social inequalities and social justice issues and investigates the underlying causes and sources of these social movements as they relate to reconceptualizing race and the borderlands and their overall impact on society at large. Throughout the course we will ask the following questions: How does the idea of race permeate our everyday lives? How does education reinforce our understandings of race? How do historical struggles over economic resources and political power illuminate the formation and development of the borderlands? How does law relate to power relations and mechanisms of social control?
Learning Outcomes
1. Explain how race and ethnicity has been historically socially constructed in the U.S.
2. Understand how the social construction of race and ethnicity is related to issues of social control.
3. Understand how the idea of race helps to reinforce existing power arrangement.
4. Connect historical struggles for justice and equality in the U.S. to current social and political issues dealing with the Borderlands.
5. Explain hegemony and its link to shifting borders and nationalism.
6. Identify how racial beliefs are tied to laws, policies, and practices of social institutions and organizations.
7. Understand how race relates to the development of the border.
8. Analyze the ways race, class, and gender serve as interlocking systems of oppression.
9. Gain a better understanding of your own worldviews and opinions towards issues of race, class, , gender, nationalism, migration, borders, social movements, and resistance. 1
10. Critically engage and "think outside the box" when discussing the conceptualization and history of the idea of race.

BEST 3999. Capstone in Borderlands and Ethnic Studies
3 Credits (3)
This seminar is designed to culminate the undergraduate minor by summarizing knowledge and experience garnered in pre-courses: Intro to Borderlands & Ethnic Studies, History & Theories of Ethnic Studies, as well as the chosen gender course, the chosen race, history & education course, and the chosen elective course. Students will be asked to write a reflective essay at the start of the course that highlights 1) materials and ideas that have most impacted the student throughout the core courses, 2) discuss how the elective course complemented and expanded materials and ideas from BEST core classes, 3) what materials and ideas remain challenging to grasp, and 4) what kind of culminating project the student would like to complete. This essay will be the foundational document to carry the student through the semester, along with close guidance provided by the instructor as well as peer feedback.
Prerequisite/Corequisite: BEST 1110G, BEST 300, and either (AFST 2140G, CCST 3120V, or NATV 4110) and either (AFST 4110, CCST 3110, or NATV 4210).
Learning Outcomes
1. Design and develop a semester-long project that draws upon all previous BEST in collaboration with instruction and peers.
2. Re-explain vis-a-vis previous courses how race and ethnicity has been historically socially constructed in the U.S.
3. Critically engage and "think outside the box" when discussing the conceptualization and history of the idea of race.
4. Work with a community organization, agency, or other group to collaborate on the final project.
5. Present project to class as a final product.

BEST 4550. Borderlands Representations
3 Credits (3)
In this course, we will explore contemporary portrayals of border spaces and peoples in literature, film, visual art, and theory. We will engage an interdisciplinary and cross-genre exploration to examine the flexibility, tensions, and range of border-focused textual/artistic production. The

Mexico-U.S. border will be the foundation and we will extend from this most familiar border to borders globally, with particular attention to the Canada-U.S. border, the Haitian-Dominican border, the Palestine/Israel nation states. Questions that will guide the course: How do representations of the Mexico-U.S. border reflect/converse with historical and contemporary political tensions? How do the perspectives and vantage points of Mexican, Chicano, and U.S. Anglo producers of cultural artifacts, including literature, diverge, collide, and coalesce? And, finally, how do perceptions and portrayals of geopolitical borders converse with understandings of the Mexico-U.S. border, what can we bring from our border-knowing to global borders, and what are specificities of particular border spaces?

Learning Outcomes

1. Express knowledge of major economic, political, social and cultural realities of multiple global borderlands.
2. Explain the multidisciplinary diversity and intellectual rigor that compose cultural productions of these borderlands.
3. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
4. Interpret, understand, and engage texts within cultural, social and historical contexts.
5. Gather, analyze, and evaluate information from a variety of sources.
6. Compose texts in a variety of media formats.

BEST 4660V. Social Movements: Borderlands and Beyond
3 Credits (3)

The field of ethnic studies is about critical knowing and unapologetic imagining and creation of a better, more just world. One way that is accomplished is through social movements. In this class we will study social movements in this class – and why some were more successful than others. We will explore the roots, logic, and ongoing practice of social movements around the world, and with a specific focus on the Borderlands. "A social movement is a complex set of different types of actions by different actors all oriented toward some general social change goal" (Oliver, 1995) After the murder of George Floyd, a social movement was sparked in which hundreds of thousands of people took to the street hoping to affect change in U.S. society. Did it work? This class will look at social movements – both successful and unsuccessful – throughout history.

Learning Outcomes

1. Learn and understand broad histories of social struggles, and social movements.
2. Meaningfully engage in traditional and new materials regarding social movements.
3. Articulate observations using key terms, theories, and concepts though the analysis of ethical issues related to social movements.
4. Apply key concepts in "everyday life" via course activities.
5. Develop an ability to engage peers in mindful and constructive ways about sometimes "difficult" topics like race, power, and privilege.

BEST 470. Literary Explorations of Race & Justice
3 Credits (3)

While this course is, as the title suggests, a survey of literary texts emphasizing race and justice, an exploration like this one posits an argument about which works of a literary tradition are most important, most fundamental, and, especially, how works that are deemed "political" feature in literary traditions. How have some authors and their texts become popularized, for whom, and what are some of the consequences (both positive and negative) of how the processes (both organic and inorganic) of popularization (canonicity, if you will) establish the parameters of ethnic literary traditions? We will work with these questions as you read and respond in discussion and in writing to some of what I, and others, consider a handful of the most prominent U.S. writers of color, their works, and their representations of race and justice. Other questions that will help us explore the multiplicity and richness of these literary texts: How do these texts converse with broader traditions of literatures? What are the conversations between and tensions within these texts and among its writers? How do aesthetics, politics, and community intersect? How do issues, including race and justice, ethnicity, gender, sexuality, and self-representation manifest within texts? What histories impact literary production and publication of these texts? How are these literary explorations of race and justice evolving and what does the future hold? The course will be writing-intensive, reading-intensive, and genre-inclusive, as we connect the "creative" realm of textual representation in fiction, poetry, and nonfiction to the "theoretical" realm of criticism and scholarship that provides ways for us to see and read textual representation critically, imaginatively, differently. The course promises to incite provocative discussions, as it engages the relevance of a rapidly changing U.S. population.

Learning Outcomes

1. Summarize the major economic, political, social and cultural forces influencing the composition, publication, and reception of literary texts focusing upon race and justice.
2. Explain the multidisciplinary diversity and intellectual rigor that compose these texts.
3. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
4. Interpret, understand, and engage texts within cultural, social and historical contexts.
5. Gather, analyze, and evaluate information from a variety of sources.
6. Compose texts in a variety of media formats.

BEST 480V. Narratives and Representations of Palestinians: Media, Music, Film, and Art
3 Credits (3)

This course is an undergraduate (that fulfills requirements for VWW) and graduate Palestine Studies course that draws on Palestine, settler-colonial studies, and decolonial Arab feminisms as an intersectional set of knowledges, methodologies, and practices. It also draws on various examples of contemporary Palestinian arts–paintings, fashion, land-based ceremonies/rituals, music, and film. The course is structured to connect the themes addressed throughout the semester with their iterations in world media, Palestinian art creation, and representation. The course aims to help the learners address 1) how Palestinian art creation is a resistance tool to the erasures imposed by the Zionist settler-colonial state of Israel on Palestinians and 2) how art creation in all its forms act to counter the Zionist's narratives and propaganda about Palestinian history, heritage, identity and right to their land. It also introduces and engages liberatory and decolonial visions of art/knowledge creation, as well as, global resistance and solidarity with Palestinian artists.

Learning Outcomes

1. How Palestinian art creation is a resistance tool to the erasures imposed by the Zionist settler-colonial state of Israel on Palestinians.
2. How art creation in all its forms act to counter the Zionist's narratives and propaganda about Palestinian history, heritage, identity and right to their land. It also introduces and engages liberatory and decolonial visions of art/knowledge creation, as well as, global resistance and solidarity with Palestinian artists.

BEST 4996. Special Topics in Borderlands and Ethnic Studies
3 Credits (3)
This course is a focused and intensive study of particular historical, aesthetic, cultural, political, or social issues and contexts within the discipline of Borderlands and Ethnic Studies. Repeatable under different subtitles.

Learning Outcomes

1. Define and articulate the fundamental characteristics and issues related to the topic of focus.
2. Contextualize the topic of focus within the broader field of Ethnic Studies, Chicanx Studies, Africana Studies, and/or Native American Studies.
3. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
4. Interpret, understand, and engage texts within cultural, social and historical contexts.
5. Gather, analyze, and evaluate information from a variety of sources.
6. Compose texts in a variety of media formats.

BEST 510. Foundations in Borderlands & Ethnic Studies
3 Credits (3)
This seminar explores the roots, logics, and administrations of racism within the U.S. context, locally along the border, and framed within a larger global and historical context. In addition to race, other social locations such as gender, class, and sexual orientation are explored as intersectional. The course uses traditional lecture format, multi-media, guest lecturers, and engaging activities inside and outside the classroom to apply materials in tangible and impactful ways. May be repeated up to 6 credits.

Learning Outcomes

1. Identify, compare and contrast broad histories of social struggles, social movements, and ensuing human relationships.
2. Meaningfully engage classical and new materials from the Borderlands and Ethnic Studies "canon."
3. Articulate observations using key terms, theories, and concepts in Borderlands and Ethnic Studies.
4. Apply key concepts in "everyday life" via course activities.
5. Demonstrate mindful and constructive ways to engage peers about sometimes "difficult" topics like race, power, and privilege.

BEST 5110. Decolonial Research I: Overview
3 Credits (3)
This seminar introduces the practice of indigenizing research methods by looking beyond the canon of Eurocentric methodologies that have often trapped marginalized communities outside of normative time frames. Through the deconstruction of colonial apparatuses and their influence on research methods, the class explores key concepts in decolonizing research to move us to new understandings of communities according to indigenous traditions that privilege ancestral ways of knowing.

Learning Outcomes

1. Explain how producing research is connected to producing knowledge.
2. Identify and describe the impact of colonialism and imperialism on disrupting ways of knowing.
3. Recognize political and cultural implications of the world seen as a colonial, constructed narrative
4. Describe how a social reality can have set political and ideological conditions.
5. Distinguish how indigenous methodologies relate to decolonizing methods.
6. Describe how decolonizing methods are a different approach to research.
7. Identify decolonizing methods that have been used in research.
8. Critically engage with research lenses stemming from a decolonizing standpoint.

BEST 512. Theories in Borderlands and Ethnic Studies
3 Credits (3)
This seminar provides a basic understanding of theoretical foundations of Borderlands and Ethnic Studies. It also examines borderlands theorizing to critically engage the border not simply as a physical barrier meant to regulate migration, but the economic, cultural, spatial, and metaphorical borderlands that informs us on larger processes of membership, belonging, identity, politics, and dehumanization linked to social structures and institutions. Social movements in the U.S. that sought to illuminate social inequalities and social justice issues are explored. The course investigates the underlying causes and sources of these social movements as they relate to reconceptualizing race and the borderlands and their overall impact on society at large. May be repeated up to 6 credits.

Learning Outcomes

1. Explain how race and ethnicity has been socially constructed in the U.S.
2. Recognize how the social construction of race and ethnicity is related to issues of social control
3. Describe how the idea of race helps to reinforce existing power arrangements
4. Connect historical struggles for justice and equality in the U.S. to current social and political issues dealing with the borderlands
5. Explain hegemony and its link to shifting borders and nationalism
6. Identify how racial beliefs are tied to laws, policies, and practices of social institutions and organizations
7. Distinguish how biopolitics relates to the development of the border.
8. Analyze the ways race, class, and gender serve as interlocking systems of oppression.
9. Gain an understanding of and be able to evaluate your own worldviews and opinions towards issues of race, class, gender, nationalism, migration, borders, social movements, and resistance. 1
10. Critically engage and "think outside the box" when discussing the conceptualization and development of the idea of race.

BEST 5120. Theories in Borderlands and Ethnic Studies
3 Credits (3)
This seminar provides a basic understanding of theoretical foundations of Borderlands and Ethnic Studies. It also examines borderlands theorizing to critically engage the border not simply as a physical barrier meant to regulate migration, but the economic, cultural, spatial, and metaphorical borderlands that informs us on larger processes of membership, belonging, identity, politics, and dehumanization linked to social structures and institutions. Social movements in the U.S. that sought to illuminate social inequalities and social justice issues are explored. The course investigates the underlying causes and sources of these social movements as they relate to reconceptualizing race and the borderlands and their overall impact on society at large. May be repeated up to 6 credits.

Learning Outcomes

1. Explain how race and ethnicity has been socially constructed in the U.S.

2. Recognize how the social construction of race and ethnicity is related to issues of social control
3. Describe how the idea of race helps to reinforce existing power arrangements
4. Connect historical struggles for justice and equality in the U.S. to current social and political issues dealing with the borderlands
5. Explain hegemony and its link to shifting borders and nationalism
6. Identify how racial beliefs are tied to laws, policies, and practices of social institutions and organizations
7. Distinguish how biopolitics relates to the development of the border.
8. Analyze the ways race, class, and gender serve as interlocking systems of oppression.
9. Gain an understanding of and be able to evaluate your own worldviews and opinions towards issues of race, class, gender, nationalism, migration, borders, social movements, and resistance. 1
10. Critically engage and "think outside the box" when discussing the conceptualization and development of the idea of race.

BEST 5125. Decolonial Research II: Methodologies
3 Credits (3)
This course is a graduate Research Methodologies in Borderlands and Ethnic Studies course that draws on tenets of decolonizing academic research methodologies such as testimonios, pláticas, and art-based research. It is structured for participants to have hands-on practice to design a small pilot research project guided by one or two of the presented decolonial methodologies and collect data. The course builds on students' knowledge and practices they gained in previous best courses.

Learning Outcomes

1. Read a number of studies driven by decolonial methodologies such as testimonios, pláticas, and art-based research.
2. Design a small pilot study guided by one or more of the methodologies decolonial methodologies justifiable by decolonial theoretical frames.
3. Complete basic social and behavioral research training from the Collaborative Institutional Training Initiative (CITI Program) and obtaining the corresponding CITI certificate.
4. Apply for IRB on NMSU's Streamline for approval.
5. Collect data using one or more methods guided by their selected methodology/ies while working with 1-3 collaborators/participants in a local community.
6. Organize and protect the data collected.

BEST 5135. Decolonial Research III: Data Analysis and Publication
3 Credits (3)
This course is a graduate Research Methodologies in Borderlands and Ethnic Studies course that draws on tenets of decolonizing academic research. It is structured for participants to have hands-on practice of qualitative data analysis as a decolonial praxis of co/creating knowledge while explicitly working with decolonial paradigms of inquiry. The course builds on students' knowledge and practices they gained in BEST 5110.

Learning Outcomes

1. Read examples of data analysis approaches in a number of exemplars of decolonizing, decolonial indigenous, anti-colonial, anti-racist, and critical race feminist academic research.
2. Select the components of a decolonial paradigm of inquiry that will guide their process of data analysis i.e., the epistemological framing.
3. Select the components of a decolonial paradigm of inquiry that will guide their process of data analysis i.e., the epistemological framing.
4. Practice the data analysis process by: a)"Plugging-in" data by thinking with the main disciplinary concepts, and the tenets of the epistemological framing and the methodologies that guided their original research study. b) Addressing their positionalities and relationality and answerability to the communities they collaborated with in their research project.
5. Complete several layers of analysis.
6. Theorize and assert a number of insights that contribute to their field of study.
7. Write an analysis section suitable for an academic publication such as a peer-reviewed article or book chapter.

BEST 550. Advanced Special Topics in Borderlands and Ethnic Studies
3 Credits (3)
This course is a focused and intensive study of particular historical, aesthetic, cultural, political, or social issues and contexts within the discipline of Borderlands and Ethnic Studies. Repeatable under different subtitles. May be repeated up to 9 credits.

Learning Outcomes

1. Define and articulate the fundamental characteristics and issues related to the topic of focus.
2. Contextualize the topic of focus within the broader field of Ethnic Studies, Chicanx Studies, Africana Studies, and/or Native American Studies.
3. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
4. Interpret, understand, and engage texts within cultural, social and historical contexts.
5. Gather, analyze, and evaluate information from a variety of sources.
6. Compose texts in a variety of media formats.

BEST 5750. Advanced Introduction to Palestine Studies: History, Land, Resistance, and Justice
3 Credits (3)
This course is graduate level course on "Palestine Studies" that draws on "interdisciplinary and multidisciplinary" Palestine studies that engage with critical ethnic studies, settler-colonial studies, critical media literacy studies, gender, sexuality, and queer studies, and decolonial Arab feminisms as set of knowledges, methodologies, and practices. It also draws on an array of historical content published by Palestinian and Palestine Studies scholars and Palestinians' lived experiences represented in oral history studies, and cultural creations such as film, visual art, music, etc. and world media. The course is structured to connect the themes addressed throughout the semester by going back and forth from the critical historical moments in Palestinian history to the ongoing and contemporary Palestinian displacement, resistance, and struggles for freedom, justice, and the right of return to the land of their ancestors. The course aims to help participants understand how the Zionist form of settler-colonialism in Palestine is interlocked with settler-colonialism as an ongoing practice in the USA and other parts of the world. It also addresses the worldwide influence of settler-colonialism on the lives of colonized/gendered/racialized peoples, land theft and extraction, flow of capital, incarceration/detentions, mobility across borders, militarism and wars, mega sports events, and cultural and knowledge creation.

Learning Outcomes

1. Apply key concepts, theories, and approaches/methodologies in Palestinian Studies and Critical Ethnic Studies to critically assess:

(a) Historical and contemporary consequences on Palestine as indigenous land and Palestinians as indigenous people.

2. Apply key concepts, theories, and approaches/methodologies in Palestinian Studies and Critical Ethnic Studies to critically assess: (b) Settler-colonialism, racism, and heteronormativity in the case of Palestine.
3. Apply key concepts, theories, and approaches/methodologies in Palestinian Studies and Critical Ethnic Studies to critically assess: (c) Implication of Zionist settler-colonialism and global settler-colonial powers' complicities/alliances and logics/tactics that maintain the occupation of Palestine and the displacement, dispossession, and incremental ethnic cleansing of Palestinians and their struggles in the diaspora.
4. Apply key concepts, theories, and approaches/methodologies in Palestinian Studies and Critical Ethnic Studies to critically assess: (d) material presented by contemporary US media outlets.

BEST 5760. Advanced Narratives and Representations of Palestinians: Media, Music, Film, and Art
3 Credits (3)
This course is a graduate Palestine Studies course that draws on Palestine, settler-colonial studies, and decolonial Arab feminisms as an intersectional set of knowledges, methodologies, and practices. It also draws on various examples of contemporary Palestinian arts–paintings, fashion, land-based ceremonies/rituals, music, and film. The course is structured to connect the themes addressed throughout the semester with their iterations in world media, Palestinian art creation, and representation.
Learning Outcomes
1. Palestinian art creation is a resistance tool to the erasures imposed by the Zionist settler-colonial state of Israel on Palestinians.
2. Art creation in all its forms act to counter the Zionist's narratives and propaganda about Palestinian history, heritage, identity and right to their land. It also introduces and engages liberatory and decolonial visions of art/knowledge creation, as well as, global resistance and solidarity with Palestinian artists.

BEST 5999. Capstone in Borderlands and Ethnic Studies
3 Credits (3)
This seminar is designed to culminate the graduate certificate by summarizing knowledge and experience garnered in pre-courses: BEST 510, 511, 512. Students will be asked to write a reflective essay at the start of the course that highlights 1) materials and ideas that have most impacted the student throughout the core courses, 2) discuss how the elective course complemented and expanded materials and ideas from BEST core classes, 3) what materials and ideas remain challenging to grasp, and 4) what kind of culminating project the student would like to complete. This essay will be the foundational document to carry the student through the semester, along with close guidance provided by the instructor as well as peer feedback. May be repeated up to 6 credits.
Prerequisite: BEST 5105, BEST 5110, and BEST 5120.
Learning Outcomes
1. Summarize, concisely, key concepts and frameworks learned in BEST seminars.
2. Express, reflectively, what these concepts and frameworks mean in the context of historical and contemporary social issues related to power dynamics created and exacerbated by hierarchies associated with racial, gender, class, sexual orientation and other positionalities.
3. Design a culminating project that encapsulates a nuanced understanding of Borderlands and Ethnic Studies, ensuring its impact on a broader audience.
4. Generously evaluate cohort mates' projects as they progress during semester.
5. Receive feedback about one's own project and apply those comments and critiques in useful ways and in collaboration with instructor.
6. Create/generate a culminating project that aligns with rubrics in the most effective manner possible.
7. Present work to cohort and instructor in an effective way.

Chicana and Chicano Studies

CCST 2110G. Introduction to Chicana and Chicano Studies
3 Credits (3)
An introductory survey of the Mexican American experience in the United States, with special reference to New Mexico. The course includes exploration of historical, political, social and cultural dimensions. NMSU Specific It seeks to review the historical causes and consequences of the formation of the Chicano identity and to understand its relation to the development of the Chicano experience as a distinct culture. The course explores the social and political impact that Chicana/o thought and theory has had on the United States over time, specifically developing concepts related to identity, community, social movements, and social justice. Ultimately, the course will facilitate understanding the historical ways in which Chicana/os have negotiated the pressures of their surroundings and in the process shaped or redefined American conceptions of identity, race, gender, sexuality, ethnicity, education, protest, and resistance.
Learning Outcomes
1. Apply various transdisciplinary perspectives and processes to understand humanist expressions through a variety of creative productions.
2. Assess and apply social, historical, economic and cultural perspectives as they impact diverse populations over a period of time.
3. Explain the ways in which narratives help people understand one another more clearly and profoundly across ethnic and cultural groups.
4. Design projects that foster and increase a full understanding of a subject in order to promote change in their own and listeners' attitudes, values, beliefs, or behaviors.
5. Apply qualitative and numerical data to explain diverse human actions in an everyday context of life.

CCST 3110. Chicana/o History
3 Credits (3)
This course is an exploration and discuss the history of Mexican Americans in the U.S., with emphasis on their contributions to society and the political, economic and cultural forces that exemplify their experiences as a population. Beginning in 1492, at the onset of European "contact" with indigenous people living in what is now called Mexico, students will study the early beginnings of Mexicans as a mestizo (mixed) race and follow this group on a rough timeline through the present. Films, music, images and poetry are included to supplement lecture material. With special attention to New Mexico and the borderlands specifically, students will endeavor to make relevant, contemporary connections to the material. Additionally, the course will contextualize this history of a population and experiences within the establishment of Chicana/o Studies as an evolving discipline.
Learning Outcomes
1. Summarize the major economic, political, social and cultural histories defining and effected by the Mexican American population.

2. Gain understanding of how these histories evolved in political solidarity with other minority populations in the United States.
3. Understand the multidisciplinary diversity and intellectual rigor that effected and currently compose Chicana/o Studies as an academic discipline.
4. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
5. Interpret, understand, and engage texts within cultural, social and historical contexts.
6. Gather, analyze, and evaluate information from a variety of sources.
7. Compose texts in a variety of media formats.

CCST 3120V. Chicana/o Genders and Sexualities
3 Credits (3)
This survey course introduces students to Chicanx genders and sexual identities and representations as socially and culturally constructed in transnational Latinx communities and contexts. Through a lens of Chicana feminist and queer theories, students will gain familiarity with gender- and sexuality-related stereotypes and cultural expectations, as well as the histories of individual and group resistance to these norms. Course materials will highlight the revolutionary challenges to limitations and contributions to social, political, and cultural change made by queer Chicanx individuals and groups, women, and men resisting confining constructions of masculinity. This course will be both reading and writing intensive.
Learning Outcomes
1. Explain the multidisciplinary diversity and intellectual rigor that compose Chicanx feminist and queer theoretical traditions
2. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions
3. Interpret, understand, and engage texts within cultural, social and historical contexts
4. Gather, analyze, and evaluate information from a variety of sources
5. Compose texts in a variety of media formats.

CCST 3130. Chicana/o Education
3 Credits (3)
This course deconstructs the history of education through the lens of culture and race. Using a framework of intersectionality, the creation of public education, and the impact of historical shifts within the law concerning education will be examined. Special emphasis is placed on the role of ethnicity in the development of the United States and its education system. Includes an overview of multicultural/multilingual curricula with a special focus on culturally / linguistically responsive instruction and assessment practices. This course provides a critical examination of race and culture using multicultural theoretical frameworks to analyze the conditions of education today. Additionally, this course will particularly foreground Latinx and Chicanx resistance and revolution in the realm of education and what this history and activism teaches us about our own identity, worldviews, environment, and ways of understanding in the contexts of both informal and formal processes and experiences of education.
Learning Outcomes
1. Analyze and interpret the historical, philosophical, economic, and sociocultural elements of education as it relates to race and culture.
2. Evaluate and interpret the ways in which education policies influence and are influenced by equity issues.
3. Describe multicultural education initiatives and assumptions about teaching, learning, and knowing.
4. Understand how cultural groups and students' cultural identities affect language learning and education overall, especially for Latinx and Chicanx students.
5. Explain and provide examples of anti-bias teaching strategies and education practices.

CCST 5110. Introduction to Chicana/o Studies
3 Credits (3)
An graduate survey of the Mexican American experience in the United States, with special reference to New Mexico. The course includes exploration of historical, political, social and cultural dimensions. Seeks to review the historical causes and consequences of the formation of the Chicano identity and to understand its relation to the development of the Chicano experience as a distinct culture. The course explores the social and political impact that Chicana/o thought and theory has had on the United States over time, specifically developing concepts related to identity, community, social movements, and social justice. Ultimately, the course will facilitate understanding the historical ways in which Chicana/os have negotiated the pressures of their surroundings and in the process shaped or redefined American conceptions of identity, race, gender, sexuality, ethnicity, education, protest, and resistance.
Learning Outcomes
1. Apply various transdisciplinary perspectives and processes to understand humanist expressions through a variety of creative productions.
2. Assess and apply social, historical, economic and cultural perspectives as they impact diverse populations over a period of time.
3. Explain the ways in which narratives help people understand one another more clearly and profoundly across ethnic and cultural groups.
4. Design projects that foster and increase a full understanding of a subject in order to promote change in their own and listeners' attitudes, values, beliefs, or behaviors.
5. Apply qualitative and numerical data to explain diverse human actions in an everyday context of life.

CCST 5120. Advanced Chicana/o Genders and Sexualities
3 Credits (3)
This survey course introduces students to Chicanx genders and sexual identities and representations as socially and culturally constructed in transnational Latinx communities and contexts. Through a lens of Chicana feminist and queer theories, students will gain familiarity with gender- and sexuality-related stereotypes and cultural expectations, as well as the histories of individual and group resistance to these norms. Course materials will highlight the revolutionary challenges to limitations and contributions to social, political, and cultural change made by queer Chicanx individuals and groups, women, and men resisting confining constructions of masculinity. This course will be both reading and writing intensive.
Learning Outcomes
1. Explain the multidisciplinary diversity and intellectual rigor that compose Chicanx feminist and queer theoretical traditions.
2. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
3. Interpret, understand, and engage texts within cultural, social and historical contexts.

4. Gather, analyze, and evaluate information from a variety of sources.
5. Compose texts in a variety of media formats.

CCST 5130. Advanced Chicana/o Education
3 Credits (3)
This course deconstructs the history of education through the lens of culture and race. Using a framework of intersectionality, the creation of public education, and the impact of historical shifts within the law concerning education will be examined. Special emphasis is placed on the role of ethnicity in the development of the United States and its education system. Includes an overview of multicultural/ multilingual curricula with a special focus on culturally / linguistically responsive instruction and assessment practices. This course provides a critical examination of race and culture using multicultural theoretical frameworks to analyze the conditions of education today. Additionally, this course will particularly foreground Latinx and Chicanx resistance and revolution in the realm of education and what this history and activism teaches us about our own identity, worldviews, environment, and ways of understanding in the contexts of both informal and formal processes and experiences of education.
Learning Outcomes
1. Analyze and interpret the historical, philosophical, economic, and sociocultural elements of education as it relates to race and culture.
2. Evaluate and interpret the ways in which education policies influence and are influenced by equity issues.
3. Describe multicultural education initiatives and assumptions about teaching, learning, and knowing.
4. Understand how cultural groups and students' cultural identities affect language learning and education overall, especially for Latinx and Chicanx students.
5. Explain and provide examples of anti-bias teaching strategies and education practices.

CCST 5140. Advanced Chicana/o History
3 Credits (3)
This course is an exploration and discuss the history of Mexican Americans in the U.S., with emphasis on their contributions to society and the political, economic and cultural forces that exemplify their experiences as a population. Beginning in 1492, at the onset of European "contact" with indigenous people living in what is now called Mexico, students will study the early beginnings of Mexicans as a mestizo (mixed) race and follow this group on a rough timeline through the present. Films, music, images and poetry are included to supplement lecture material. With special attention to New Mexico and the borderlands specifically, students will endeavor to make relevant, contemporary connections to the material. Additionally, the course will contextualize this history of a population and experiences within the establishment of Chicana/o Studies as an evolving discipline.
Learning Outcomes
1. Summarize the major economic, political, social and cultural histories defining and effected by the Mexican American population.
2. Gain understanding of how these histories evolved in political solidarity with other minority populations in the United States.
3. Understand the multidisciplinary diversity and intellectual rigor that effected and currently compose Chicana/o Studies as an academic discipline.
4. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
5. Interpret, understand, and engage texts within cultural, social and historical contexts.
6. Gather, analyze, and evaluate information from a variety of sources.
7. Compose texts in a variety of media formats.

Native American Studies

NATV 1150G. Introduction to Native American Studies
3 Credits
This course surveys the significance of Native American Studies through an inter-disciplinary approach to two areas of academic concentration: Indigenous Learning Communities, and Leadership and Building Native Nations.
Learning Outcomes
1. Students will develop a general understanding of the various concentration areas in Native American Studies throughout the United States.
2. Students will identify the contributions of various academic disciplines to Native American Studies.
3. Students will understand the intricacies and intersections of Indigenous scholarship in Native American Studies.
4. Students will articulate the importance of Native American Studies as a stand-alone discipline in academia.
5. Students will be able to connect community issues in both Native and Non-Native America to concepts taught in Native American Studies.

NATV 2120. Native American Experience
3 Credits (3)
Introductory survey of Native American History, culture an contemporary issues. Students read literature by and about Native Americans covering a variety of topics including tribal sovereignty, federal policy, activism, economic development, education and community life.
Learning Outcomes
1. Apply cultural and historical context to text about Native Americans (by Natives and non-Natives).
2. Analyze texts about Native Americans in relation to tribal sovereignty, federal policy, activism, economic development, education and community life.
3. Evaluate texts by and about Native Americans from an NAS perspective.

NATV 3120. An Indigenous Peoples History of the United States
3 Credits (3)
This course is a history of United States as experienced by the Indigenous people. It delineates the Indigenous experience as reflected in Native American scholarship and research. The Indigenized and decolonized Native perspective provides an educative authenticity of Indigenous knowledge comprehensible to all, particularly the non-Indian.
Learning Outcomes
1. The student can identify and describe significant historic periods as experienced by the Indigenous inhabitants in United States.
2. The student is able to identify and differentiate aspects of the Native American historic experience in relationship to the standard linear chronicle timeline as reflected in U.S. history.
3. The student it able to compose a brief summary review of the Native American historic periods as evidenced in scholarship and research.

NATV 4110. Native American Women
3 Credits (3)
Students investigate the status, experience, and contributions of Native American women from pre-contact to contemporary times. Identifying the

contribution of Native American women to societies, communities, and Nations as keepers of knowledge, teachings, and traditions. Crosslisted with: ANTH 553.

Learning Outcomes

1. Explore and examine the roles of American Indian women within a tribal society and analyze the impact of colonization and decolonization upon their place / roles over time.
2. Evaluate historical and contemporary issues of importance to American Indian women and their communities.
3. Assess a topic, book or issue of importance to Native women through a research paper, case study, or exam demonstrating in-depth knowledge and understanding.
4. Demonstrate in-depth knowledge and understanding of Native American women histories and contemporary issues.
5. Formulate a paper on Native woman/tribal women from historical or contemporary sources and share with class (undergraduates).
6. Demonstrate in-depth knowledge and understanding of Native American women through an exam/final (undergraduates).

NATV 4120V. Native American Visual Culture
3 Credits (3)

This course examines the various theoretical and methodological challenges inherent to the study of indigenous art, including the issues of identity, sovereignty, gender, cultural critique, and the role of the artist.

Learning Outcomes

1. Identify NA / Indigenous, film/video writers and directors.
2. Locate NA / Indigenous nations with their geo-physical location.
3. Consider issues of identity concerning Indigenous population.
4. Apply "colonizing" / "decolonizing" methodologies.
5. To practice writing short analytical journal entries.
6. To learn effective group discussion techniques

NATV 4130. Indigenous Ways of Knowing
3 Credits (3)

This course examines Indigenous knowledge and ways of knowing to gain an appreciation of an epistemology and ontology that may be outside the boundaries of Eurocentric theory, concepts, and principles. The course explores and analyzes the nature and ways that Native Americans' develop knowledge as well as the concepts and composition of metaphysics and cosmology. Students analyze knowledge development through mythology and storytelling by emphasizing the nature of difference rather than comparative analysis.

Learning Outcomes

1. By the end of the semester, through dialogue and interaction, reading, writing, exercises, out of classroom experiences, auto/visual aids and computer technologies, the student is able to describe and explain characters and ways that Native Americans' develop knowledge (epistemology); as measured by reports, critiques, reflective summaries, learning logs, analysis techniques and assessments.
2. By the end of the semester, through dialogue and interaction, reading, writing, exercises, out of classroom experiences, auto/visual aids and computer technologies, the student is able to describe and explain concepts and composition of the metaphysics and cosmology (ontology) of Native American knowledge; as measured by reports, critiques, reflective summaries, learning logs, analysis techniques, and assessments.

NATV 4210. Native American Education
3 Credits (3)

This is a survey course that explores the education of Natives from multiple perspectives; the perspectives of Native theories and practices, the colonizers'-imposed education theories and practices, U.S. federal educational policies and practices, tribal systems of education, and responses from those experiencing the education. Starting with traditional education, the course will examine colonial education, federal and tribal efforts, contemporary models of Indian education including issues and challenges, and the educational sovereignty of tribes.

Learning Outcomes

1. Describe (verbally and written) traditional methods of education used by Native Americans.
2. Discuss and interpret (verbally and written) the theories and practices of educating Natives in different eras.
3. Compare (verbally and written) the different systems of education for Native Americans.
4. Articulate (verbally and written) contemporary Native American educational issues and challenges.
5. Be able to articulate (verbally and written) support for educational sovereignty of tribes.
6. Research, analyze and orally present a written a paper about an American Indian boarding school and its legacy.

NATV 4210V. Native American Education
3 Credits (3)

Native American education will be examined by investigating historical and contemporary perspectives of Native Peoples' and settlers' ideas of education and the latter's development of educational systems. Students will survey various types of schools (missionary, boarding, public, etc.), read Native student accounts of westernized schooling, and examine key historical and contemporary policies, laws, and reports, as well as curricular and pedagogical literature. Native perspectives will become central to understanding present and future trends in education to transform educational futures while centering and supporting sovereignty, self-determination, and cultural continuance.

Learning Outcomes

1. Describe (verbally and/or written) traditional methods of education used by Native Americans.
2. Discuss and interpret (verbally and/or written) the theories and practices of educating Natives in different eras.
3. Compare (verbally and/or written) the different systems of education for Native Americans.
4. Articulate (verbally and/or written) contemporary Native American educational issues and challenges.
5. Be able to articulate (verbally and/or written) support for educational sovereignty of tribes.

NATV 4220. Federal Indian Policy
3 Credits (3)

This course provides a basic historic overview of federal Indian policy. As preexisting sovereign nations, the U. S. Constitution acknowledges only states, foreign nations, and Indian tribes as sovereign governments. The purpose is to provide a fundamental understanding of the unique position Indian tribes occupy in this country. It examines impacts and effects on culture and contemporary livelihood.

Learning Outcomes

1. The student can recall and identity fundamental laws, policies, and court actions affecting Indian tribes.
2. The student can describe and explain the effects of federal Indian policy on activities and interactions between Native American and the overall society.

3. The student can analyze and interpret the impacts and effects of federal Indian policy on culture and contemporary lives of Native Americans

NATV 4310. Indigenizing Methodologies in Native American Studies
3 Credits (3)
This course utilizes decolonizing (indigenizing) methodologies and praxis to gain insight into the complex effects of oppression and colonization. The course uses critical and indigenous concepts to identify and analyze hegemonic, ethnocentric, historic and contemporary human rights and social justice issues of indigenous people. Emphasis includes research theory and methodology, such as community participatory action research, that is collaborative, inclusive, and pragmatic to ethics, intellectual property, and cultural boundaries of indigenous people. Crosslisted with: ANTH 541.
Learning Outcomes
1. The student is able to describe and explain some of the complex effects of oppression and colonization on indigenous peoples.
2. The student is able to identify historic and contemporary issues that have influenced and affected the study and research of indigenous peoples.
3. The student is able to convey particular research theory and methodology that is collaborative, inclusive, and pragmatic to ethics and cultural boundaries of indigenous people.

NATV 5110. Advanced Indigenizing Methodologies in Native American Studies
3 Credits (3)
This course utilizes indigenizing methodologies and praxis to gain insight into the complex effects of oppression and colonization. Critical and indigenous concepts are used to identify and analyze hegemonic, ethnocentric, historic and contemporary human rights and social justice issues of indigenous people. Research theory and methodology such as community participatory action research that is collaborative, inclusive, and pragmatic to ethics, intellectual property, and cultural boundaries of indigenous people is emphasized.
Learning Outcomes
1. Explain how producing research is connected to producing knowledge.
2. Identify and describe the impact of colonialism and imperialism on disrupting ways of knowing.
3. Recognize political and cultural implications of the world seen as a colonial, constructed narrative.
4. Describe how a social reality can have set political and ideological conditions.
5. Distinguish how indigenous methodologies relate to decolonizing methods.
6. Describe how decolonizing methods are a different approach to research.
7. Identify decolonizing methods that have been used in research.
8. Critically engage with research lenses stemming from a decolonizing standpoint.

NATV 5120. Advanced Indigenous Peoples History of the United States
3 Credits (3)
This course is a history of United States as experienced by the Indigenous people. It delineates the Indigenous experience as reflected in Native American scholarship and research. The Indigenized and decolonized Native perspective provides an educative authenticity of Indigenous knowledge comprehensible to all, particularly the non-Indian.
Learning Outcomes
1. The student can identify and describe significant historic periods as experienced by the Indigenous inhabitants in United States
2. The student is able to identify and differentiate aspects of the Native American historic experience in relationship to the standard linear chronicle timeline as reflected in U.S. history.
3. The student it able to compose a brief summary review of the Native American historic periods as evidenced in scholarship and research.

NATV 5210. Advanced Native American Education
3 Credits (3)
This is a survey course that explores the education of Natives from multiple perspectives; the perspectives of Native theories and practices, the colonizers'-imposed education theories and practices, U.S. federal educational policies and practices, tribal systems of education, and responses from those experiencing the education. Starting with traditional education, the course will examine colonial education, federal and tribal efforts, contemporary models of Indian education including issues and challenges, and the educational sovereignty of tribes.
Learning Outcomes
1. Describe (verbally and written) traditional methods of education used by Native Americans.
2. Discuss and interpret (verbally and written) the theories and practices of educating Natives in different eras.
3. Compare (verbally and written) the different systems of education for Native Americans.
4. Articulate (verbally and written) contemporary Native American educational issues and challenges.
5. Be able to articulate (verbally and written) support for educational sovereignty of tribes.
6. Research, analyze and orally present a written a paper about an American Indian boarding school and its legacy.

NATV 5220. Advanced Native American Visual Cultures
3 Credits (3)
This course examines the various theoretical and methodological challenges inherent to the study of indigenous art, including the issues of identity, sovereignty, gender, cultural critique, and the role of the artist.
Learning Outcomes
1. Identify NA/Indigenous, film/video writers and directors.
2. Locate NA/Indigenous nations with their geo-physical locations.
3. Consider issues of identity concerning Indigenous populations.
4. Apply "colonizing"/ "decolonizing" methodologies.
5. To Practice writing short analytical journal entries.
6. To learn effective group discussion techniques.

NATV 5520. Advanced Native American Women
3 Credits (3)
Students investigate the status, experience, and contributions of Native American women from pre-contact to contemporary times. Identifying the contribution of Native American women to societies, communities, and Nations as keepers of knowledge, teachings, and traditions.
Learning Outcomes
1. Explore and examine the roles of American Indian women within a tribal society and analyze the impact of colonization and decolonization upon their place / roles over time.
2. Evaluate historical and contemporary issues of importance to American Indian women and their communities.

3. Assess a topic, book or issue of importance to Native women through a research paper, case study, or exam demonstrating in-depth knowledge and understanding.
4. Demonstrate in-depth knowledge and understanding of Native American women histories and contemporary issues.
5. Formulate a paper on Native woman/tribal women from historical or contemporary sources and share with class (undergraduates).
6. Demonstrate in-depth knowledge and understanding of Native American women through an exam/final (undergraduates).

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Borderland and Ethnic Studies - Undergraduate Minor

Students must pass a total of 18 credits of which at least 9 must be upper division. There are three required courses for the minor: **BEST 1110G Introduction to Borderlands and Ethnic Studies, BEST 300 Borderlands and Ethnic Studies Histories,** and **BEST 3999 Capstone in Borderlands and Ethnic Studies** . A grade of C- or better must be obtained for each course. Students may count S grades only in courses in which all grades are S/U, and no more than 6 hours of S credit can be accepted.

Prefix	Title	Credits
Required Courses		
BEST 1110G	Introduction to Borderlands and Ethnic Studies	3
BEST 300	Borderlands and Ethnic Studies Histories	3
BEST 3999	Capstone in Borderlands and Ethnic Studies	3
Choose one course from the following:		*3*
AFST 2140G	Black Women in the African Diaspora	
CCST 3120V	Chicana/o Genders and Sexualities	
NATV 4110	Native American Women	
Choose one from the following:		*3*
NATV 4210V	Native American Education	
CCST 3130	Chicana/o Education	
AFST 4110V	Race, Culture, and Education	
Elective Course		
Choose one from the following:		*3*
AFST 2110G	African American History	
CCST 3130	Chicana/o Education	
CCST 2110G	Introduction to Chicana and Chicano Studies	
CCST 3110	Chicana/o History	
NATV 3120	Indigenous Peoples History of the United States	
NATV 4310	Indigenous Research Methodologies	
NATV 4220	Federal Indian Policy	
NATV 4130	Indigenous Ways of Knowing	
BEST 450	Special Topics in Borderlands and Ethnic Studies	
BEST 455	Borderlands Visual Culture	
BEST 480V	Palestine Studies: Media, Music, Film, and Art	
CJUS 428/528	Mexican-Americans and Issues of Social Justice	
CJUS 429/529	Immigration & Justice	
ENGL 339V	Chicana/o Literature	
ENGL 458/558	Latino/a Literature and Culture	
HNRS 336V	Testimonios from the Borderlands	
NATV 1150G	Introduction to Native American Studies	
NATV 2120	Native American Experience	
NATV 4120V	Native American Visual Culture	
POLS 378	U.S.-Mexico Border Politics	
SOCI 3410/5410	Race and Ethnic Relations	
SPAN 385	Introduction to Chicano/US-Mexican Literature	
SPAN 421/521	New Mexico Culture and Literature	
SPAN 427/567	Chicano Literature	
SPAN 448/548	U.S.-Hispanic Film	
SPAN 451/551	Hispanic Cultures	
Total Credits		**18**

First Year		
Semester 1		**Credits**
BEST 1110G	Introduction to Borderlands and Ethnic Studies	3
	Credits	**3**
Semester 2		
BEST 300	Borderlands and Ethnic Studies Histories	3
	Credits	**3**
Second Year		
Semester 1		
Choose one from the following:		3
AFST 2140G	Black Women in the African Diaspora	
CCST 3120V	Chicana/o Genders and Sexualities	
NATV 4110	Native American Women	
	Credits	**3**
Semester 2		
Choose one from the following:		3
NATV 4210	Native American Education	
CCST 3130	Chicana/o Education	
AFST 4110V	Race, Culture, and Education	
	Credits	**3**
Third Year		
Semester 1		
Elective Course [1]		3
	Credits	**3**
Semester 2		
BEST 3999	Capstone in Borderlands and Ethnic Studies	3
	Credits	**3**
	Total Credits	**18**

[1] **Elective Courses**
See the requirements section for a full list of electives.

Chicana/o Studies - Undergraduate Minor

Prefix	Title	Credits
Required Courses		
CCST 2110G	Introduction to Chicana and Chicano Studies	3
CCST 3110	Chicana/o History	3
CCST 3120V	Chicana/o Genders and Sexualities	3
CCST 3130	Chicana/o Education	3
Elective Courses		
Choose two courses from the following:		*6*
AFST 1110G	Introduction to Africana Studies	
AFST 2110G	African American History	
AFST 2140G	Black Women in the African Diaspora	
BEST 1110G	Introduction to Borderlands and Ethnic Studies	
BEST 300	Borderlands and Ethnic Studies Histories	
CJUS 414/514	Race, Crime and Justice	
CJUS 428/528	Mexican-Americans and Issues of Social Justice	
CJUS 429/529	Immigration & Justice	
ENGL 339V	Chicana/o Literature	
ENGL 458/558	Latino/a Literature and Culture	
HNRS 336V	Testimonios from the Borderlands	
NATV 1150G	Introduction to Native American Studies	
NATV 2120	Native American Experience	
NATV 3120	Indigenous Peoples History of the United States	
NATV 4110	Native American Women	
NATV 4120V	Native American Visual Culture	
POLS 378	U.S.-Mexico Border Politics	
SOCI 3410/5410	Race and Ethnic Relations	
SPAN 350	Introduction to Chicano Studies	
SPAN 385	Introduction to Chicano/US-Mexican Literature	
SPAN 421/521	New Mexico Culture and Literature	
SPAN 427/567	Chicano Literature	
SPAN 448/548	U.S.-Hispanic Film	
SPAN 451/551	Hispanic Cultures	
BEST 4550	Borderlands Visual Culture	
BEST 470	Race in Literary Production	
BEST 480V	Palestine Studies: Media, Music, Film, and Art	
NATV 4130	Indigenous Ways of Knowing	
NATV 4210V	Native American Education	
NATV 4220	Federal Indian Policy	
NATV 4310	Indigenous Research Methodologies	
Total Credits		**18**

First Year

Semester 1		**Credits**
CCST 2110G or SPAN 350	Introduction to Chicana and Chicano Studies or Introduction to Chicano Studies	3
	Credits	**3**
Semester 2		
CCST 3110	Chicana/o History	3
	Credits	**3**
Second Year		
Semester 1		
CCST 3110	Chicana/o History	3
	Credits	**3**
Semester 2		
CCST 3120V	Chicana/o Genders and Sexualities	3
	Credits	**3**
Third Year		
Semester 1		
Elective Course: AFST, BEST or NATV prefix [1]		3
	Credits	**3**
Semester 2		
Elective Course [1]		3
	Credits	**3**
	Total Credits	**18**

[1] **Elective Courses:**
See the requirements section for a full list of electives.

Native American Studies - Undergraduate Minor

Students must pass a total of 18 credits of which at least 9 must be upper division. There are three required courses for the minor: **NATV 1150G Introduction to Native American Studies** , **NATV 4110 Native American Women** , and **NATV 2120 Native American Experience** . A grade of C- or better must be obtained for each course. Students may count S grades only in courses in which all grades are S/U, and no more than 6 hours of S credit can be accepted. Please contact Dr. Georgina Badoni (gbadoni@nmsu.edu) regarding the minor.

Prefix	Title	Credits
Requirements		
Required Courses [1]		
NATV 1150G	Introduction to Native American Studies	3
NATV 4110	Native American Women	3
NATV 2120	Native American Experience	3
Choose 3 more courses from this list: [2]		*9*
NATV 3120	Indigenous Peoples History of the United States	
NATV 4120V	Native American Visual Culture	
BEST 1110G	Introduction to Borderlands and Ethnic Studies	
BEST 300	Borderlands and Ethnic Studies Histories	
HNRS 336V	Testimonios from the Borderlands	
BEST 4550	Borderlands Visual Culture	
NATV 4210V	Native American Education	
NATV 4220	Federal Indian Policy	
NATV 4310	Indigenous Research Methodologies	
CCST 2110G	Introduction to Chicana and Chicano Studies	
AFST 1110G	Introduction to Africana Studies	
PHLS 4996	Special Topics (American Indian Health)	
POLS 326	Public Policy & Indigenous Communities	
POLS 354	Native American Politics	
HIST 413	Native American History	
CJUS 414	Race, Crime and Justice	
Total Credits		**18**

[1] Course substitutions require approval of the Director of the Native American Studies minor, Dr. Georgina Badoni gbadoni@nmsu.edu.
[2] 9 credits of the overall 18 credits must be upper division.

Decolonial Research - Graduate Minor

Prefix	Title	Credits
BEST 5110	Decolonial Research I: Overview	3
BEST 5125	Decolonial Research II: Methodologies	3
BEST 5135	Decolonial Research III: Data Analysis and Publication	3
Total Credits		**9**

First Year		
Fall		**Credits**
BEST 5110	Decolonial Research I: Overview	3
	Credits	**3**
Spring		
BEST 5125	Decolonial Research II: Methodologies	3
	Credits	**3**
Second Year		
Fall		
BEST 5135	Decolonial Research III: Data Analysis and Publication	3
	Credits	**3**
	Total Credits	**9**

Counseling and Education Psychology

Undergraduate Program Information

The Bachelor of Science (B.S.) in Counseling and Community Psychology (CCP) prepares students to work at the bachelor's level, focusing on interpersonal skills, case management, awareness of mental health issues, understanding human behavior, and multicultural awareness. Alternatively, the CCP undergraduate major prepares students for graduate school to become practitioners in the field of psychology with an additional focus on research and professional psychology practice opportunities. Two undergraduate degrees are available:

1. Bachelor of Science (B.S.) in Counseling & Community Psychology-NMSU Main Campus
2. Bachelor of Science (B.S.) in Counseling & Community Psychology-NMSU Global Campus

Graduate Program Information

The major thrust of the Counseling and Educational Psychology (CEP) Department is the preparation of professionals in clinical mental health counseling, clinical psychopharmacology, counseling psychology, and school psychology. Five graduate degrees are available on NMSU Main Campus:

1. Masters of Arts (M.A.) in Clinical Mental Health Counseling
2. Specialist in Education (Ed.S.) in School Psychology
3. Doctor of Philosophy (Ph.D.) in Counseling Psychology
4. Doctor of Philosophy (Ph.D.) in School Psychology
5. Postdoctoral Masters of Science (M.S.) in Clinical Psychopharmacology

Departmental Graduate Admission Requirements

Admission requirements and procedures are specific to each degree program in the CEP department. Applicants must meet the basic admission requirements of the Graduate School before they are considered for admission to CEP graduate programs. To be considered for admission to CEP Graduate Programs, application requirements may include, but are not limited to, the following:

1. Completion and submission of NMSU online graduate application form and fee.
2. Unofficial transcript from every college or university you have attended. If the program decides to recommend you for admission, official transcripts must be submitted to the Graduate School. You will not be considered admitted until after the Graduate School has reviewed these materials and made a final decision.
3. Letters of recommendation from persons familiar with the applicant's academic and/or professional record (please check with the degree program to determine the number needed).
4. Curriculum vitae or resume that includes a list of completed upper-division and/or graduate coursework related to counseling, school psychology, counseling psychology, or related professions.
5. Letter of intent and/or statement of purpose (please check with the degree program to determine what the content should include).
6. Writing Sample (please check with the degree program to determine what type of writing sample is needed).
7. Interviews are required as a part of the selection process.

For more information about the CEP Department, contact the department office or visit the departmental website. For questions related to degree programs admission procedures and requirements, please contact the Program Director and/or Program Admissions Director, program websites indicate contact information for these individuals.

CEP Departmental Policy on Enrollment Restrictions for Graduate Courses

Restricted Enrollment:

Due to student demand, limited university resources and the nature of graduate training programs which lead to licensure in the helping professions, enrollment in CEP graduate level courses is restricted to those graduate students who have been admitted to both the Graduate School, as well as to the particular academic program.

This restriction also applies to persons who may wish to audit a course. It is anticipated that certain situations may warrant an exception from the general rule limiting enrollment. The process to obtain an exception is provided in the following section.

Exception Criteria and Process:

The department head may grant exceptions to this policy, provided a screening process similar and equally rigorous to that required for admission to the program is performed. An exception must be requested before enrollment and shall include the following:

1. Consideration and validation of the reason provided by the individual requesting to enroll, which must include academic and professional qualifications relevant to the professional level of study. For example,

active licensure as a psychologist is required to audit or register for courses in the postdoctoral program in Psychopharmacology.

2. Agreement from the individual that they will comply with all program requirements imposed for those who are admitted to the program, such as a background check.
3. Examples of justifications that will be considered sufficient to warrant an exception and permit students to register for graduate courses in CEP include:
   a. Previous admission by NMSU for purposes of a graduate minor in the helping professions. For example, the Minor in Integrated Behavioral Healthcare, which is also open to graduate students previously admitted to Social Work, Public Health, Nursing, and Marriage and Family Therapy programs.
   b. Licensed graduates of the Postdoctoral MS of Clinical Psychopharmacology program who need continuing education credits to maintain competency.
4. Written, including electronic, approval from the:
   a. Course Instructor,
   b. Program Director, and
   c. CEP Department Head.

Degrees for the Department

Bachelor Degree(s)

- Counseling and Community Psychology - Bachelor of Science (p. 1267)
- Counseling and Community Psychology - Bachelor of Science (Online) (https://catalogs.nmsu.edu/global/nmsu-global/counseling-community-psychology-bs-online/)

Master Degree(s)

- Clinical Mental Health Counseling - Master of Arts (p. 132)
- Clinical Psychopharmacology - (Postdoctoral) - Master of Science (Online) (https://catalogs.nmsu.edu/global/nmsu-global/clinical-psychopharmacology-postdoctoral-ms-online/)
- Counseling and Guidance (Educational Diagnostics) - Master of Arts (p. 139)

Specialist Degree(s)

- School Psychology - Specialist in Education (p. 244)

Doctoral Degree(s)

- Counseling Psychology - Doctor of Philosophy (p. 211)
- School Psychology - Doctor of Philosophy (p. 235)

Minors for the Department

- Counseling and Education Psychology - Undergraduate Minor (p. 1270)
- Integrated Behavioral Health Care - Graduate Minor (p. 258)
- Spanish Counseling - Graduate Minor (p. 261)

Associate Professor Elsa C. Arroyos, Department Head

Professors: M. Kalkbrenner, A. Lopez; ***College Professor***: C. McDougall; ***Associate Professors***: E. Arroyos, G. De Necochea; ***Assistant Professors***: S. Ballard, L. Bell; H. Chung, E-A. Gentzis, K. Joshi, J. Lopez-Harder, B. P. Moturu, L. Peterson, S. Ramos, W. Stem; **College Assistant Professor:** L. McVann; ***Emeritus Professors:*** E. Adams, E. Vázquez, & L. Vázquez

E. Adams, Ph.D. *(Ohio State University)- multiculturalism & diversity, mindfulness, supervision;* ***E. Arroyos, Ph.D.*** *(University of Iowa)- school psychology and multicultural training and competence, mentoring, and women in academia;* ***S. Ballard, Ph.D.*** *(University of Massachusetts Boston)- alternative education; social, emotional, and behavioral interventions and assessment; school-based equity;* ***L. Bell, Ph.D.*** *(University of New Mexico)-counselor self-awareness/cultural responsiveness, equity-focused practice, addiction/behavioral health risks/community contexts for counselor preparation;* ***H . Chung, Ph.D.*** *(University of Iowa)- work psychology, process and outcome of counseling, social justice;* ***G. De Necochea, Ph.D.*** *(University of California, Santa Barbara)- outreach, access, persistence/retention, and leadership development of diverse populations of students, staff and faculty in higher education;* **E-A. Gentzis, Ph.D.** (*Michigan State University)–- academic motivation, psychosocial perceptions and achievement, historically marginalized and gifted student outcomes;* ***K. Joshi, Ph.D****. (University of Nebraska–Lincoln) -contextual behavioral science; neurobiological pathways of developmental psychopathology and resilience; psychological flexibility in international school psychology, school neuropsychology;* ***M. Kalkbrenner, Ph.D.*** *(Old Dominion University)- college student mental health, reducing barriers to help seeking behaviors among mental health professionals, and experiential learning;* ***A. Lopez, Ph.D.*** *(University of Texas-San Antonio)- multicultural counseling, social justice, immigration, bilingual counseling/ supervision, eating disorders and body image;* ***J. López-Harder, Ph.D.*** *(New Mexico State University)- intersectionality, culturally responsive healthcare/ mental healthcare services, integrated behavioral health;* ***C. McDougall, Ph.D.*** *(University of North Dakota)- clinical psychopharmacology, cross-cultural psychology;* ***L. McVann, MA*** *(New Mexico State University)- clinical supervision/counseling, professional school counseling, professional growth/ mentorship, sustainable ethical practices among emerging professionals;* ***B.P. Moturu, Ph.D.*** *(University of Maryland, College Park)- issues relevant to women, career development and meaning making, immigration related concerns, group counseling and supervision;* ***L. Peterson, Ph.D.*** *(Texas A&M University)- bilingual and multicultural school psychology, school-based mental health, professional issues in school psychology;* ***S. Ramos, Ph.D.*** *(New Mexico State University)- Latinas in academia, Latinx psychology, bilingual (Spanish) therapy, bilingual (Spanish) clinical training;* ***W. Stem, Ph.D.*** *(New Mexico State University)- cyberpsychology, mindfulness-based interventions, graduate student wellness/concerns, LGBTQ+ populations/ concerns, men's issues, ACT/RCT approaches, clinical supervision and training;* ***E. Vázquez, Ph.D.*** *(University of Iowa)– school psychology, assessment, psychoeducational interventions, acculturation, ethnic and linguistic diversity;* ***L. Vázquez, Ph.D.*** *(University of Iowa)– counseling psychology, multicultural curriculum development and counseling, bilingual therapy, acculturation, identity development, and phenotype research*

Counseling and Educational Psychology Courses

CEPY 1120G. Human Growth and Behavior
3 Credits (3)
Introduction to the principles of human growth and development throughout the life span. May be repeated up to 3 credits.
Learning Outcomes

1. Students will demonstrate an understanding of the scientific study of processes of change and stability throughout the human lifespan (i.e. Human Development).
2. Students will demonstrate a familiarity with the generally recognized stages of human development from conception to death.
3. Students will be able to demonstrate understanding of the normal and exceptional patterns of human development.

4. Students will be able to demonstrate understanding of recent research development regarding the identified stages of human development as they relate to gender and multicultural issues

CEPY 1150. Career Excellence
1 Credit (1)
Professional career curriculum to assist students in developing an understanding and ability to articulate who they are as emerging professionals through personal assessment activities. The focus will be on providing students with tools and strategies for reflection, planning, and goal-setting.Course does not count toward CEP minor. Spring only course offering. Restricted to College of HEST Majors only.
Learning Outcomes
1. Demonstrate an understanding of the relationship between academic and professional career success.
2. Express a familiarity with professionalism and career culture and communicate a comprehension of various professional career skills.
3. Apply material learned to other aspects to professional excellence.
4. Develop a career life plan that will highlight goals, taking into account life circumstances.
5. Become competent in appropriate professional communication.

CEPY 1160. Academic Excellence
1 Credit (1)
The course is designed to provide you students with a foundation in their personal academic process. The course will assist students in developing an understanding and ability to articulate who they are as beginning college students through personal assessment activities. The focus will be on providing students with tools and strategies for reflection, planning, and goal-setting. Topics discussed will include time management, study skills, test taking skills, stress management, motivational and academic discipline skills, interpersonal skills and college survival skills. We intend for this to be a supportive, respectful and collaborative environment where everyone can learn and grow. Fall only course offering. Restricted to College of HEST majors.
Learning Outcomes
1. Students will be able to demonstrate an understanding of the relationship between time management and academic success.
2. Students will be able to express a familiarity with college culture.
3. Students will be able to communicate a comprehension of study skills and test taking strategies.
4. Students will be able to apply material learned to other aspects to enhance academic excellence.
5. Students will be able to develop an academic life plan that will highlight goals, taking into account life circumstances.
6. Become competent in appropriate academic communication.

CEPY 2110. Learning in the Classroom
3 Credits (3)
This class introduces you to the basic principles of learning, including cognition, motivation, and assessment. You will examine the relationships between theory, research, and practice in learning, memory, child development, motivation, and educational assessment for the school setting. This course will provide the student with concepts and principles of educational psychology that will form a framework for thinking about learning and instruction and how theories of learning are connected to classroom situations May be repeated up to 3 credits.
Learning Outcomes
1. Define learning and compare and contrast the factors that cognitive, behavioral, and humanistic theories believed to influence the learning process, giving specific examples of how these principles could be used in the classroom.
2. Observe and reflect upon the teaching learning processes in economically, socially, culturally and educationally diverse classroom populations in order to develop a current understanding of students and families in public and private school.
3. Discuss how theories of information processing and cognitive theories of learning can impact memory, study strategies, and how certain teaching techniques can help students learn.
4. Compare teacher-centered and student-centered approaches to learning, and to identify a positive learning environment.
5. Identify various methods to motivate students and create effective learning environments.
6. Use major concepts of child and adolescent development, human learning, and social and cultural influences in planning and implementing classroom instruction, strategies, and management.
7. Evaluate the best means of accommodating instruction to meet individual needs and differences.
8. Students will examine how learning style, cultural and social issues and learning disabilities impact the learner's effectiveness in the classroom setting.
9. Explain different types of assessment used to assess learning and provide examples of effective assessment practices. 1
10. Discuss the relationship between motivation and classroom management

CEPY 2120. The Preschool Child
3 Credits (3)
Survey of psychological development from conception to age five. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate an understanding of major theories of early childhood development
2. Demonstrate an understanding of recognized stages of human development from prenatal to preschool years
3. Explore cultural influences that may create variability in human development
4. Apply major theories to themselves and reflect on their early childhood development.

CEPY 2130. Adolescence - School Setting
3 Credits (3)
This course is designed to present the student with an introduction to the area of adolescent development with an emphasis on the positive aspects of this life stage. Students will be encouraged to be reflective on the topics presented in class that will include issues on diversity, culture, health, and well-being, emerging adulthood and suggestions for improving the lives of adolescents. May be repeated up to 3 credits.
Learning Outcomes
1. Students will become knowledgeable about the historical background of adolescent development.
2. Students will become knowledgeable about the major theories related to adolescence.
3. Students will evaluate different developmental theories and their fit across cultures as you reflect on your personal experiences through discussions and videos you will watch.
4. Students will identify key developmental milestones, conflicts, and concepts of each chapter presented by utilizing critical thinking skills as you complete summary questions.

5. Students will define relevant terms, ideas, and concepts in the study of adolescent development through quizzes and homework assignments.

CEPY 2140. Explorations of Counseling & Community Psychology
3 Credits (3)
An introduction and exploration of various career options and functions within the mental health disciplines to aid in professional development. Emphasis will be placed on depth and scope of the choices available including research, teaching, community work, public policy, and clinical work and prevention (e.g. counseling, psychotherapy, assessment, consultation). May be repeated up to 6 credits.
Learning Outcomes
1. Acquire knowledge of historical and contemporary issues which affect the provision of mental health services by members of diverse mental health disciplines including clinical, counseling, school, and community psychologists, clinical mental health counselors, and others.
2. Acquire knowledge pertaining to education and training requirements for various disciplines.
3. Acquire survey-level knowledge of psychological assessment, measurement, and treatment.
4. Acquire survey-level knowledge of various inquiry approaches applicable to research pertaining to mental health and well-being—both at the individual and community level.
5. Understand the mental health recovery model and explore the lived experiences of individuals with mental health problems in contemporary society.
6. Understand the principles of sensitivity and respect for diverse populations as integral to professional practice in diverse mental health disciplines and settings, including practice in educational and community settings.

CEPY 2140H. Exploration of CCP
3 Credits (3)
An exploration of careers, activities, & techniques in counseling, school, and community psychology. Taught with CEPY 2140 with differentiated instruction and/or independent project to be determined. Restricted to Las Cruces campus only.
Learning Outcomes
1. Demonstrating knowledge of the basic functions of careers in counseling, community and school psychology.
2. Establishing a familiarity with the educational requirements necessary for a career in counseling, community, and school psychology.
3. Acknowledging and enhancing sensitivity and respect for diverse populations in various counseling areas; including educational and community settings.
4. Beginning to develop the interpersonal skills needed to succeed in the counseling, community and school psychology professions.

CEPY 3110. Gender Roles in Education
3 Credits (3)
Physiological, psychological, and political aspects of sex role socialization and the effects of these factors on personal development.
Learning Outcomes
1. Increase awareness of gender issues insect with other identities.
2. Increase knowledge about feminism and masculinity from a multicultural and systems perspective.
3. Increase knowledge about gender issues among people of color, geographic regions, and differing socioeconomic status.
4. Gain an understanding of intentional and unintentional sexist behavior and the consequences of such behavior.
5. Prepare students to work with diverse populations by emphasizing differences in values based on gender roles.
6. Practice interpersonal and team-building skills.
7. Practice critical thinking skills in evaluating research evidence.
8. Increase knowledge of how gender influences education.
9. Understanding systemic influences on gender issues and learning how to take action for social justice.

CEPY 3210V. Human Relations Training
3 Credits (3)
Gain skills, knowledge, and sensitivity for living and working with others. May be repeated up to 3 credits.
Learning Outcomes
1. Critically evaluate academic literature regarding human relations.
2. Be familiar with theories of human relations.
3. Integrate and apply these theories toward understanding the dynamics of interpersonal and organizational relationships.
4. Demonstrate an increased understanding of human relations as they apply to one's family systems.
5. Demonstrate an increased understanding of the impact of culture on human relations.
6. Translate knowledge of human relations into attitudes, skills, and techniques that will result in favorable learning experiences for students.

CEPY 4110V. Introduction to Counseling
3 Credits (3)
Principles of counseling for nonmajors. May be repeated up to 3 credits.

CEPY 4120. Introduction of Mindfulness Practice
3 Credits (3)
Students will learn about contemplative practices through learning and participation in various mindfulness practices. Engages students in a practice or experience that leads to reflection and, thus, acquired knowledge about themselves, others, and group functioning. May be repeated up to 3 credits.
Learning Outcomes
1. To learn about mindfulness practices for self-care.
2. To incorporate mindfulness practices into daily life.
3. To learn how mindfulness practices may increase well-being.
4. To increase students' knowledge of mindfulness theory and research.
5. To learn about the philosophical underpinnings of mindfulness.

CEPY 4130. Addictions Prevention and Recovery
3 Credits (3)
Understanding addictions process, prevention, and recovery, including biological, interpersonal and sociological influences, and intervention strategies. May be repeated up to 3 credits.
Learning Outcomes
1. To introduce students to the basic categories and processes of different addictions.
2. To introduce students to psychopharmacology and assist them to obtain an understanding of drug classification, specific drugs, and the etiology of drug addiction.
3. To foster students' awareness of the most prominent approaches to prevention in the development of addictions.

4. To foster students' awareness of the most prominent theories and approaches for conceptualizing clients presenting with addictions (i.e., transtheoretical, motivational interviewing, cognitive behavioral).
5. To assist students to better understand how different cultural groups (i.e., gender, race/ethnicity, sexual orientation, etc.) use and abuse drugs and recover from various addictions.
6. To assist students to gain awareness of ethical issues of particular importance to addictions treatment.

CEPY 4140. Family Guidance
3 Credits (3)
Systems based guidance procedures for enhancing family strengths and development, and application of family guidance procedures for prevention and remediation of problems.
Prerequisite: CEPY 1120G.
Learning Outcomes
1. Identify, describe, and explain human behaviors and how they are influenced by social structures, institutions, and processes within the contexts of complex and diverse communities.
2. Articulate how beliefs, assumptions, and values are influenced by factor s such as politics, geography, economics, culture, biology, history, and social#institutions.
3. Describe ongoing reciprocal interactions among self, society, and the environment.
4. Apply the knowledge base of the social and behavioral sciences to identify, describe, explain, and critically evaluate relevant issues, ethical dilemmas, and arguments.

CEPY 4150. Psychology, Multiculturalism and Counseling
3 Credits (3)
Understanding social identities such as race, ethnicity, sexual orientation, age, social class and spirituality as it relates to psychosocial development, academic achievement and counseling.
Learning Outcomes
1. Demonstrate a multicultural, global, and multiple perspectives approach to cultural differences.
2. Demonstrate increased cultural awareness, sensitivity, and empathy toward marginalized groups.
3. Identify subjective perceptions, biases, and the role culture plays in social interactions.
4. Examine societal institutions for privileges and barriers encountered by various groups.
5. Demonstrate increased flexibility, knowledge, and skills related to becoming multicultural.
6. Recognize that intersecting identities affect appropriate treatment and education.

CEPY 4150H. Psych., Multiculturalism & Counseling
3 Credits (3)
Understanding social identities such as race, ethnicity, sexual orientation, age, social class and spirituality as it relates to psycho-social development, academic achievement and counseling. Taught with CEPY 4150. Differentiated instruction/independent project to be determined.

CEPY 4997. Independent Study
1-6 Credits (1-6)
Individual study directed by consenting faculty. May be repeated up to 6 credits.

CEPY 4998. Internship in Counseling & Community Psychology: Clinical
3 Credits (3)
Students will deepen their understanding of the fields of counseling, community psychology, and school psychology by completing a department-approved, supervised clinical internship. Internship placements may occur in schools, community agencies, or counseling centers, providing students with hands-on exposure to the helping professions. Through direct experience in these settings, students will develop practical skills in client interaction, enhance their understanding of ethical and culturally responsive practice, and strengthen their interpersonal competence. This course supports the development of professional identity and sensitivity when working with diverse populations, preparing students for future graduate study or entry-level roles in human services and mental health fields. May be repeated up to 6 credits.
Learning Outcomes
1. Analyze in-depth the fields of counseling, community, and school psychology professions.
2. Examine their interests, strengths, and abilities to develop a better sense of their career goals.
3. Evaluate counseling, community, and school psychology professions through their interaction with faculty and supervisors.
4. Connect with on-site supervisors and gain hands-on work experience.
5. Practice sensitivity and respect for diverse populations in various counseling arenas to include educational and community settings.
6. Apply interpersonal skills needed to succeed in the counseling, community, and school psychology professions and graduate school.

CEPY 4999. Internship in Counseling & Community Psychology: Research
3 Credits (3)
This course offers students the opportunity to deepen their understanding of research in the fields of counseling, community, and school psychology through a structured research internship. Students will engage in supervised research activities such as literature reviews, data collection and analysis, and dissemination of findings. The internship fosters critical thinking, ethical research practices, and collaboration with diverse populations. Through this experience, students will gain insight into how research informs practice, contribute to ongoing scholarly projects, and build foundational skills for future graduate study or professional roles in the behavioral sciences and helping professions.
Learning Outcomes
1. Analyze in-depth the research processes, methods, and ethics in the fields of counseling, community, and school psychology professions.
2. Examine their interests, strengths and abilities to develop a greater sense of their career goals.
3. Construct an original literature review to transform their clinical or personal interests into a research inquiry consistent with the scientist-practitioner model of training.
4. Evaluate counseling, community, and school psychology professions through their interaction with faculty and supervisors.
5. Conduct research by establishing a connection with a faculty member and research team leader.
6. Practice sensitivity and respect for diverse populations in various counseling arenas to include educational and community settings.
7. Apply interpersonal skills needed to succeed in the counseling, community, and school psychology professions and graduate school.

CEPY 5110. Introduction to Counseling
3 Credits (3)
Overview of counseling theory, techniques, ethics, and professional issues. Same as CEPY 4110V. This course is open to all majors. Non-majors may be permitted to enroll in this course under limited

circumstances with the permission of the course instructor, department head, and graduate school dean.

Learning Outcomes

1. Fostering intelligent inquiry into the field of counseling which may include abstract and logical thinking, critical analysis and the integration and synthesis of general knowledge in counseling and psychological principles (applying counseling to everyday task of life).
2. Promoting literacy in writing, reading, speaking, and listening as per topics relating to counseling (for example, completing assigned readings in preparation for class, completing the required assignments).
3. Promoting the application of information and digital literacy.
4. Encouraging an understanding of scientific inquiry within the field of counseling.
5. Providing a historical consciousness including an understanding of one's own heritage as well as a sensitivity and respect for other peoples and cultures that are represented in the community at large.
6. Examining one's value system and enhancing awareness to issues of diversity including multiculturalism (for example, exploring personal qualities of effective counselors and multicultural issues in counseling).
7. Being accountable for assuming personal and social responsibility.
8. Promoting an appreciation of the application of creative arts, such as art and music, movement, and mindfulness to the counseling process.

CEPY 5120. Human Development
3 Credits (3)

Theory and research regarding cognitive, social, and emotional development across the lifespan with emphasis on enhancing human development. Non majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will understand and be able to apply the major theories and research that attempt to explain chronological constancy and change in human beings, with emphasis on practical applications and implications.
2. Students will build a foundational knowledge of human development for adaptation to the professional fields of education, counseling, and psychology.
3. Students will explore the universality and cultural variations in human development from conception to death.
4. Students will learn about the factors which facilitate and impede healthy physical, cognitive, social, and affective/emotional development.

CEPY 5130. Multicultural Counseling
3 Credits (3)

Understanding age, gender, ethnicity, socioeconomic status and culture in relation to human development, education, and counseling. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Awareness will be accomplished by assisting students in the exploration and identification of students' individual cultural assumptions(i.e. WORLDVIEW) in relation to people diverse from themselves. This will be accomplished via modeling, observations, readings, group processing and other experiential exercises.
2. Knowledge will be accomplished by exploring the question, "What is Multiculturalism" in its many forms, roles, and relationships. It will begin with the examination of the psychology of multiculturalism and the requirements of cultural competency in intercultural communications. In addition, a review of various theories of diversity (i.e. identity development, acculturation, worldview, bilingualism, and disability, to name a few) will be embedded in readings, assignments, and class discussion. Exploration of various diverse populations will also be integrated into this course.
3. Skills will focus on "How to" of multicultural competency and its practical applications to everyday interactions. Students will learn about basic issues related to assumptions that are used in communication intra-cultural and intercultural interactions.

CEPY 5150. The Art & Science of Mindfulness for Helping Professionals
1-3 Credits (1-3)

In this course students will learn about contemplative practices by learning about and participating in various mindfulness practices for self-care and to increase well-being. Students will learn about psychological theories and research that support the use of mindfulness in helping others increase their well-being. Students will learn how to teach mindfulness to others. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. To learn about mindfulness practices for self-care.
2. To incorporate mindfulness practices into daily life.
3. To learn how mindfulness practices may increase well-being.
4. To increase students' knowledge of mindfulness theory and research.
5. To develop skills to teach mindfulness to others.

CEPY 5160. Organization and Administration of School Counseling Services
3 Credits (3)

Procedures for establishing and maintaining counseling programs in the schools. Professional and ethical issues in school counseling and group laboratory experience to enhance self-awareness and interpersonal skills for effective professional relationships. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will learn about the history of school guidance/counseling and apply that knowledge to assess current trends and the quality of services provided in counseling programs with respect to the changing needs of today's diverse systems.
2. Students will learn to develop and administer a school guidance/counseling program according to professional and ethical standards developed by The American School Counseling Association's (ASCA) National Model of School Counseling.
3. Students will be introduced to a variety of technology-based career development applications, educational resources and research to promote academic advancement and social-emotional well-being. Additionally, students will explore the use of technology designed to implement, monitor, and evaluate a comprehensive school counseling program.

4. Students will gain an understanding of effective teamwork within a school setting including theories, models, and processes of consultation and change with teachers, administrators, and other school personnel. Students will explore strategies and methods of advocacy with families and communities designed to empower them to address issues of social justice within an educational system.
5. Students will build a framework for facilitating school-level individual and group counseling services. They will analyze and interpret trends in academic achievement by understanding the cultural context of the school environment as it relates to groups of students and to institutional functioning.

CEPY 5170. Professional Issues in Mental Health Counseling
3 Credits (3)
History, roles, organizational structures, settings, ethics, standards, laws, and credentialing related to mental health counseling. Group laboratory experience to enhance self-awareness and interpersonal skills for effective professional relationships. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students should understand and demonstrate ethical decision-making processes and resources.
2. Students should demonstrate understanding of the expectations and requirements of their new professional identity.
3. Students should demonstrate knowledge of history and philosophy of the counseling profession and its specialty areas.
4. Students should demonstrate understanding of the multiple professional roles and functions of counselors across specialty areas, and their relationships with human service and integrated behavioral health care systems, including inter-agency and inter-organizational collaboration and consultation.
5. Students should demonstrate knowledge and understanding of counselors' roles and responsibilities as members of interdisciplinary community outreach and emergency management response teams.
6. Students should demonstrate knowledge and understanding of the the role and process of the professional counselor advocating on behalf of the profession; advocacy processes needed to address institutional and social barriers that impede access, equity, and success for clients.

CEPY 5180. Addictions Counseling
3 Credits (3)
Emphasis on alcohol and other psychoactive substance abuse. Also includes eating disorders, gambling, and other addictive behaviors. Covers review of psychopharmacology, assessment, and diagnosis with the major focus on treatment and professional issues. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize the potential for substance use disorders to mimic and coexist with a variety of medical and psychological disorders.
2. Know the disease concept and etiology of addiction and co-occurring disorders.
3. Identify standard screening and assessment instruments for substance use disorders and process addictions.

CEPY 5210. Research Methods
3 Credits (3)
Develop research and program evaluation including critical literature review, generating questions, quantitative and qualitative methodology, analysis, and writing proposals. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will understand how to critically evaluate research relevant to the practice of clinical mental health counseling.
2. Become knowledgeable of models of program evaluation for clinical mental health programs.
3. Demonstrate knowledge of evidence-based treatments and basic strategies for evaluating counseling outcomes in clinical mental health counseling.
4. Apply relevant research findings to inform the practice of clinical mental health counseling.
5. Develop measurable outcomes for clinical mental health counseling programs, interventions, and treatments.
6. Analyze and use data to increase the effectiveness of clinical mental health counseling interventions and programs.

CEPY 5220. Testing, Assessment, and Psychometric Theory
3 Credits (3)
Selection, administration, and interpretation of tests and other assessment methods. Topics include reliability, validity, norms, cultural factors, and ethics related to appraisal. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Basic concepts of standardized and non-standardized testing and other assessment techniques, including norm-referenced and criterion-referenced assessment, environmental assessment, performance assessment, individual and group test and inventory methods, psychological testing, and behavioral observations (II-G-seven-b)
2. Statistical concepts, including scales of measurement, measures of central tendency, indices of variability, shapes and types of distributions, and correlations (II-G-seven-c)c.Reliability (i.e., theory of measurement error, models of reliability, and the use of reliability information) (II-G-seven-d)
3. Validity (i.e., evidence of validity, types of validity, and the relationship between reliability and validity) (II-G-seven-e)
4. Social and cultural factors related to the assessment and evaluation of individuals, groups, and specific populations (II-G-seven-f)
5. Ethical strategies for selecting, administering, and interpreting assessment and evaluation instruments and techniques in counseling (II-G-seven-g)

CEPY 5230. Counseling Theory and Technique
3 Credits (3)
Major theories of counseling with an emphasis on development of the ability to offer theory-based counseling and consultation. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course

instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate the ability to foster counseling and helping relationships that are based on studies of the counseling process in a multicultural society and include an orientation to wellness and prevention as desired counseling goals.
2. Students will be able to apply theories and models of counseling, including a systems approach, to conceptualize clients, help select appropriate counseling interventions, and so the student begins to develop a personal model of counseling based on current professional research and practice with the aid of processes provided in this course.
3. Students will demonstrate the ability to foster counseling and helping relationships that include essential interviewing, counseling, and case conceptualization skills as well as developing the ability to provide professional feedback in consultation with other trainees.
4. Students will demonstrate the ability to foster counseling and helping relationships that include developmentally relevant counseling treatment or intervention plans, the development of measurable outcomes for clients, and evidence-based counseling strategies and techniques for prevention and intervention
5. Students will be able to demonstrate counselor characteristics and behaviors that influence helping processes.
6. Students will demonstrate knowledge and ability to provide suicide prevention, crisis intervention, trauma-informed, and community-based strategies, such as Psychological First Aid.

CEPY 5235. Counseling Theory and Techniques for School Psychologists
3 Credits (3)

Major theories of counseling with an emphasis on development of the ability to offer theory-based counseling and consultation. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. The student will demonstrate an understanding of their psychosocial and cultural context and how such phenomena influence their values, beliefs and, therefore, theoretical orientation.
2. The student will demonstrate the ability to examine and apply critical perspectives related to counseling theory and techniques.
3. The student will be able to compare and contrast various theoretical perspectives in the area of counseling children and adolescents in school settings.
4. The student will demonstrate the development of skills leading toward becoming a culturally responsive practitioner in the area of counseling with individuals from a variety of diverse backgrounds.
5. The student will be able to identify, describe, and apply legal and ethical issues relevant to practice in the area of counseling children and adolescents in the schools.
6. The student will be able to collaborate with others in the process of becoming a competent school psychologist in providing counseling services in the schools.

CEPY 5240. Child and Adolescent Counseling Theory and Technique
3 Credits (3)

Counseling theory and technique applied to children and adolescents from a developmental perspective in school and mental health settings. Restricted to CEP graduate students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate understanding of their psychosocial and cultural context and how such phenomena influence their values, beliefs and, therefore, theoretical orientation to counsel children and adolescents.
2. Students will examine and apply critical perspectives related to counseling children and adolescents.
3. Students will compare and contrast various theoretical perspectives in the area of counseling children and adolescents.
4. Students will develop a knowledge base leading toward becoming a culturally responsive practitioner in the area of counseling with individuals from a variety of diversebackgrounds.
5. Students will identify, describe, and apply legal and ethical issues relevant to practice in the area of counseling children and adolescents in various settings.
6. Students will collaborate with others in the process of developing relevant treatment plans and providing counseling services to children and adolescents in diverse settings.

CEPY 5250. Family Therapy Theory and Technique
3 Credits (3)

Major theories of family therapy and associated assessment, intervention and evaluation techniques. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to explain a systems perspective and differentiate family and other systems theories and major models of family and related interventions.
2. Students will be able to demonstrate and apply an understanding of the family life cycle and impact on family and individual functioning.
3. Students will be able to prepare and utilize various forms of assessment for families and couples, including observation, collection of collateral information, and interviewing.
4. Students will be able to illustrate awareness of and skill in the use of formal and informal assessment measures used in family and couple counseling.
5. Students will be able to summarize evidence-based interventions and treatments for family and couple counseling.
6. Students will be able to analyze multicultural counseling theories and techniques for diverse family types and apply multicultural and family theories to one's own experience.
7. Students will be able to demonstrate an ability to communicate and relate effectively with families and couples.
8. Students will be able to describe ethical issues related#to counseling families and couples and be able to identify a process to make sound judgments.

CEPY 5260. Group Work Theory and Technique
3 Credits (3)

Didactic and experiential learning in group theory and practice, which involves experiences in group participation and leadership. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course

instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Provide students with an intellectual understanding of group work theory and technique.
2. Provide students with an experiential understanding of group work.
3. To help students develop specific group facilitation competencies

CEPY 5270. Diagnosis and Treatment Planning
3 Credits (3)

Appraisal and conceptualization of mental disorders and other problems through diagnostic interviewing using the DSM. Treatment planning for counseling with children, adolescents, and adults. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will know the etiology, the diagnostic process and nomenclature, treatment, referral, and prevention of mental and emotional disorders.
2. Students will know the principles, models, and documentation formats of biopsychosocial case conceptualization and treatment planning.
3. Students will understand current literature that outlines theories, approaches, strategies, and techniques shown to be effective when working with specific populations of clients with mental and emotional disorders.
4. Students will understand the basic classifications, indications, and contraindications of commonly prescribed psychopharmacological medications so that appropriate referrals can be made for medication evaluations and so that the side effects of such medications can be identified.
5. Students will know the principles of the diagnostic process, including differential diagnosis, and the use of current diagnostic tools, such as the current edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM).
6. Students will understand the established diagnostic criteria for mental and emotional disorders, and describes treatment modalities and placement criteria within the continuum of care.
7. Students will know the impact of co-occurring substance use disorders on medical and psychological disorders.
8. Students will understand the relevance and potential biases of commonly used diagnostic tools with multicultural populations.
9. Students will understand appropriate use of diagnosis during a crisis, disaster, or other trauma- causing event. 1
10. Students will be able to differentiate between diagnosis and developmentally appropriate reactions during crises, disasters, and other trauma-causing events.

CEPY 5280. Primary Care Psychology
3 Credits (3)

Didactic and experiential learning in primary care psychology issues. Through this course students will learn about the cultural necessity of the integration of mental and physical health issues and multidisciplinary collaboration. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: Biologic bases of behavior as related to health/illness and coping
2. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: Psychological bases of behavior as related to health/illness and coping
3. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: Sociocultural bases of behavior as related to health/illness and coping
4. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: Understanding and application of inter-professional collaboration
5. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: A knowledge of substance use disorders, particularly opioid use disorder and treatment in a primary care setting
6. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: How to utilize telemedicine effectively

CEPY 5310. Academic Assessment And Intervention
3 Credits (3)

Advanced theory and use of norm and criterion referenced instruments in the classroom: planning of prescriptive and educational programs. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to CEP graduate majors.

Learning Outcomes

1. Practitioner: Define assessment and describe the steps in the assessment process.
2. Research, Pedagogy: Describe a flowchart for the screening/referral/evaluation process according to New Mexico regulations.
3. Practitioner, Effectiveness: Describe the uses of criterion and norm-referenced instruments as well as alternative forms of assessment (observation, curriculum based assessment and informal techniques).
4. Effectiveness: Identify and discuss instruments/assessment procedures appropriate for use in identifying academic achievement, learning aptitude, vocational aptitude, performance in specific areas, and social emotional functioning.
5. Effectiveness: Identify appropriate instruments/assessment procedures required for the exceptionality recognized under New Mexico regulations.
6. Effectiveness: Administer and score twenty-four instruments in reading, math, written language and processing and to utilize these results in completing test interpretations and psycho-educational reports.
7. Reflection, Pedagogy: Interpret, report, and utilize assessment date in special education programming.
8. Diversity: Determine the assessment needs of students who are speakers of languages other than English.
9. Practitioners: Evaluate a test, write a review, and demonstrate and explain it in class. 1

10. Assessment, Evaluation: Synthesize information gathered through comprehensive assessment procedures into a practical whole.

CEPY 5320. Career/Life Planning and Vocational Assessment
3 Credits (3)
Vocational choice theories, relationship between career choice and life style, sources of occupational and educational information, and approaches to decision making and values clarification. Laboratory involves supervised interpretation of vocational assessment. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean.

Learning Outcomes

1. Career development theories and decision-making models.
2. Career, vocational, educational, occupational and labor market information resources, and career information systems.
3. Career development program planning, organization, implementation, administration, and evaluation.
4. Interrelationships among and between work, family, and other life roles and factors, including the role of multicultural issues in career development.
5. Career and educational planning, placement, follow-up, and evaluation.
6. Assessment instruments and techniques relevant to career planning and decision making.
7. Career counseling processes, techniques, and resources, including those applicable to specific populations in a global economy.

CEPY 5985. Counseling Practicum
3 Credits (3P)
Supervised experience of counseling and consultation. Weekly individual and group supervision involves review of audio, video, and/or live sessions and case presentations. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 6 credits.
Prerequisite: CEPY 5230.

Learning Outcomes

1. Understands ethical and legal considerations specifically related to the practice of clinical mental health counseling.
2. Understands a variety of models and theories related to clinical mental health counseling, including the methods, models, and principles of clinical supervision.
3. Understands the management of mental health services and programs, including areas such as administration, finance, and accountability.
4. Demonstrates the ability to apply and adhere to ethical and legal standards in clinical mental health counseling.
5. Recognizes the importance of family, social networks, and community systems in the treatment of mental and emotional disorders.
6. Uses the principles and practices of diagnosis, treatment, referral, and prevention of mental and emotional disorders to initiate, maintain, and terminate counseling.
7. Applies multicultural competencies to clinical mental health counseling involving case conceptualization, diagnosis, treatment, referral, and prevention of mental and emotional disorders.
8. Applies effective strategies to promote client understanding of and access to a variety of community resources.
9. Demonstrates appropriate use of culturally responsive individual, couple, family, group, and systems modalities for initiating, maintaining, and terminating counseling. 1
10. Demonstrates the ability to use procedures for assessing and managing suicide risk. 1
11. Applies current record-keeping standards related to clinical mental health counseling. 1
12. Provides appropriate counseling strategies when working with clients with addiction and co-occurring disorders. 1
13. Demonstrates the ability to recognize his or her own limitations as a clinical mental health counselor and to seek supervision or refer clients when appropriate. 1
14. Maintains information regarding community resources to make appropriate referrals. 1
15. Advocates for policies, programs, and services that are equitable and responsive to the unique needs of clients. 1
16. Demonstrates the ability to modify counseling systems, theories, techniques, and interventions to make them culturally appropriate for diverse populations. 1
17. Knows the principles and models of assessment, case conceptualization, theories of human development, and concepts of normalcy and psychopathology leading to diagnoses and appropriate counseling treatment plans. 1
18. Understands various models and approaches to clinical evaluation and their appropriate uses, including diagnostic interviews, mental status examinations, symptom inventories, and psychoeducational and personality assessments. 1
19. Demonstrates skill in conducting an intake interview, a mental status evaluation, a biopsychosocial history, a mental health history, and a psychological assessment for treatment planning and caseload management. 2
20. Demonstrates appropriate use of diagnostic tools, including the current edition of the DSM, to describe the symptoms and clinical presentation of clients with mental and emotional impairments. 2
21. Demonstrates the ability to conceptualize an accurate multi-axial diagnosis of disorders presented by a client and discuss the differential diagnosis with collaborating professionals.

CEPY 5990. Advanced Counseling Practicum
3-6 Credits (3-6P)
Supervised experience of appraisal and individual, family, and/or group counseling and consultation serving child, adolescent, and/or adult clients. Weekly individual and group supervision involves review of counseling sessions and case presentations. This course will carry a subtitle to reflect the practicum setting. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to CEP graduate majors. May be repeated up to 6 credits.
Prerequisite: CEPY 5985 or consent of instructor.

Learning Outcomes

1. Obtain a minimum of one-hundred and fifty clinical hours including sixty hours of direct service (face-to-face) with clients appropriate to the program. For students enrolled in only six credits, this translates to three-hundred clinical hours, including one-hundred and twenty hours of direct service.
2. Obtain one hour a week of individual supervision with the on-site supervisor and a minimum of one and a half hours per week of group supervision with a program faculty member.

3. Students will have the opportunity to become familiar with a variety of professional activities in addition to direct service such as record keeping, information and referral, in-service, and staff meeting.
4. Students will have an opportunity to gain supervised experience in the use of a variety of professional resources such as assessment instruments, technologies, professional literature, and research.
5. Students receive a formal evaluation by site supervisor and program faculty member.
6. Students will have opportunity to work with clients who represent the ethnic and demographic diversity of their community.
7. Students will formally evaluate their supervisors and learning experience at the end of their internship experiences.
8. Students will be covered by professional liability insurance while enrolled in this course.
9. Students will adhere to ethical standards of ACA and related entities, and applications of ethical and legal considerations in professional counseling. 1
10. Students will have an opportunity to apply concepts of mental health education, consultation, collaboration, outreach and prevention strategies, and community mental health advocacy.

CEPY 5997. Special Research Programs
1-6 Credits (1-6)
Individual investigations either analytical or experimental. Maximum of 6 credits per semester and total of 9 credits overall. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 9 credits.
Learning Outcomes
1. Learning outcomes will vary depending on course content.

CEPY 5998. Counseling Internship
3-12 Credits (3-12)
Supervised experience in a professional counselor role in a school or agency. Students perform all counselor functions including appraisal, individual/family/group counseling, consultation, administration, program development, research, and/or evaluation. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 12 credits.
Prerequisite: CEPY 5990.
Learning Outcomes
1. Obtain a minimum of six-hundred clinical hours including two-hundred and forty hours of direct service (face-to-face) with clients appropriate to the program. For students enrolled in only six credits, this translates to three-hundred clinical hours, including one-hundred and twenty hours of direct service.
2. Obtain one hour a week of individual supervision with the on-site supervisor and a minimum of one and a half hours per week of group supervision with a program faculty member.
3. The student has the opportunity to become familiar with a variety of professional activities in addition to direct service such as record keeping, information and referral, in-service, and staff meeting.
4. The student has an opportunity to gain supervised experience in the use of a variety of professional resources such as assessment instruments, technologies, professional literature, and research.
5. Students receive a formal evaluation by site supervisor and program faculty member.
6. Students will have opportunity to counsel clients who represent the ethnic and demographic diversity of their community.
7. Students will formally evaluate their supervisors and learning experience at the end of their internship experiences.
8. Students will be covered by professional liability insurance while enrolled in internship.
9. Students will adhere to ethical standards of ACA and related entities, and applications of ethical and legal considerations in professional counseling. 1
10. Students will have an opportunity to apply concepts of mental health education, consultation, collaboration, outreach and prevention strategies, and community mental health advocacy.

CEPY 5999. Master's Thesis
1-15 Credits (1-15)
Thesis. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 88 credits.
Learning Outcomes
1. To develop and complete master's research thesis.

CEPY 6120. Human Development
3 Credits (3)
Same as CEPY 5120 with differentiated assignments for Ed.S and Ph.D. students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Students will understand and be able to apply the major theories and research that attempt to explain chronological constancy and change in human beings, with emphasis on practical applications and implications.
2. Students will build a foundational knowledge of human development for adaptation to the professional fields of education, counseling, and psychology.
3. Students will explore the universality and cultural variations in human development from conception to death.
4. Students will learn about the factors which facilitate and impede healthy physical, cognitive, social, and affective/emotional development.

CEPY 6130. Psychology of Multiculturalism
3 Credits (3)
In this advanced course for post-master's graduate students in applied fields of psychology, students will apply psychological concepts related to multiculturalism as well as critical race theories, feminist theories, queer theories, and liberation theories to understand intersecting social identities. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: SPSY, C EP, CEP majors.
Learning Outcomes
1. Students will understand and apply multicultural and pluralistic characteristics within and among diverse groups nationally and internationally.
2. Students will understand and apply theories and models of multicultural counseling, cultural identity development, and social justice and advocacy.

3. Students will understand and apply multicultural counseling competencies.
4. Students will understand and apply the impact of heritage, attitudes, beliefs, understandings, and acculturative experiences on an individual's views of others
5. Students will understand and apply the effects of power and privilege for counselors and clients.
6. Students will understand and apply help-seeking behaviors of diverse clients.
7. Students will understand the impact of spiritual beliefs on clients' and counselors' worldviews.
8. Students will understand and apply strategies for identifying and eliminating barriers, prejudices, and processes of intentional and unintentional oppression and discrimination.

CEPY 6140. Cognitive & Affective Basis of Behavior
3 Credits (3)
This course provides an overview of cognitive and affective bases of behavior as well as the integration of cognition and affect in psychological processes. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, program director, department head, and graduate school dean. Restricted to CEP graduate majors. May be repeated up to 3 credits.

Learning Outcomes
1. Students will be able to identify key concepts of cognition such as memory, attention and learning.
2. Students will identify the functions and roles of affect and emotional expression.
3. Students will understand the connection between cognition and affect and how these two areas of human function influence each other.
4. Students will be able to integrate and apply research findings and implications in the study of cognition and affect to practical experiences.
5. Students will apply models and theories of cognition and affect to understanding and predicting behavior.

CEPY 6150. Social Psychology
3 Credits (3)
Theory, research and practice from feminist and multicultural perspectives will examine the integration of social identities such as gender, sexual orientation, race, ethnicity, age, social class, spirituality, and ability in relation to counseling psychology. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to: CEP graduate majors. May be repeated up to 3 credits.

Learning Outcomes
1. Heighten the student's awareness of multiple social identities, worldview beliefs, and other within-group variables.
2. Aid the student in developing a knowledge base in the realms of social psychology and multicultural research, culturally-responsive interventions and professional practice.
3. provide experiences for the application of this awareness and knowledge as a means of Develop the skills necessary for being a reflective decision-maker, creative problem solver, and responsive service provider for diverse individuals in a variety practice settings and intervention modalities.

CEPY 6160. History and Systems of Psychology
3 Credits (3)
History and systems of psychology related to contemporary applied psychology. This course will focus largely on the history of modern psychology and on the major systems (or schools) of psychology. Restricted to CEP graduate majors.

Learning Outcomes
1. Effectively discuss historical and philosophical antecedents and contexts of psychology and compare and contrast multiple perspectives on important issues in this field.
2. Apply global awareness to this topic (e.g., intersecting identities; how interlocking oppressions vary by epoch, continent, nation, cultural group, region, organizational system; etc.)
3. Develop professional arguments; support opinions with reason and personal experience; and demonstrate higher order thinking and creative engagement (for definitions of terms like analyze, synthesize, evaluate, and create.
4. Develop thoughtful inquiries that inspire scholarly discourse and further investigation; consider which types of evidence are needed to find answers; and effectively facilitate respectful, thought-provoking discussions of controversies and debatable topics.

CEPY 6170. Psychology of Poverty
3 Credits (3)
This course is designed to examine the nature, extent and impact of poverty on Southwestern populations and across the United States in relation to assessment and interventions and its impact on the education and psychological well-being of children and families. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: CEP graduate majors.

Learning Outcomes
1. Students will learn how views of poverty have evolved in history.
2. Students will be aware and demonstrate the skills of the different methods used to measure and understand poverty.
3. Students will identify and apply relevant issues from education, health disparities, and criminal justice related to the psychology of poverty.
4. Students will evaluate and present their own self-awareness and understanding of their worldview of poverty, along with its impact of how they view others in poverty.
5. Students will conduct self-assessments regarding their range of liberalism/conservatism; implicit bias and how it impacts their interpretation of information of poverty.
6. Students will understand and lead discussions as to why poverty remains so prevalent in U.S. society.
7. Students will be able to articulate the within group differences and similarities of racial and ethnic backgrounds or family types that are susceptible to poverty.
8. Students will learn successful interventions in working with children, adolescents and families impacted by the psychology of poverty.

CEPY 6175. School Intervention and Organization in a Diverse Society
3 Credits (3)
Introduces public school organization and laws and the psycho-sociological perspective of education. Curriculum and theory, teaching methods and materials will be presented and operationalized through a psycho-educational point of view.

Learning Outcomes

1. Show knowledge of public school organizations and their functions.
2. Demonstrate knowledge of public school and special education law.
3. Express knowledge of sociological and psychological constructs in education.
4. Convey knowledge of and be able to utilize research-based multi-contextual teaching, curriculum, theory, and intervention methods for students in special education settings.
5. Communicate knowledge of and be able to utilize appropriate materials for students in special education settings.

CEPY 6180. Physiology of Behavior
3 Credits (3)

Basic biological aspects of psychopharmacology with applications to clinical populations and treatment implications. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, and department head. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to understand and apply concepts related basic neuroanatomy, neurochemistry, and neurophysiology.
2. Students will be able to understand and apply basic knowledge related basic biological basis of the interdependence between behavior, cognition, and emotion.
3. Students will understand the pharmacology and pharmacodynamics of major drug groups used in the treatment of CNS diagnoses; including, but no limited to, antidepressants, antipsychotics, anxiolytics, anticonvulsants, and natural remedies or herbal supplementation.
4. Students will recognize the strengths and weaknesses of a wide range of research methodologies to screen compounds and test the mechanisms of action of drugs.
5. Students will understand the drug development process from target identification to FDA approval and ongoing safety surveillance.
6. Students will appreciate how pharmacological investigation informs the understanding of the underlying pathology of the illness.
7. Students will access, critique, and assimilate evidence from scientific studies as it relates to translational neuroscience and the search for promising targets for psychotropic drugs.
8. Students will become familiar with to the indication, contraindication, therapeutic drug monitoring, and effectiveness of medications across DSM-V classifications. As well as psychotropic drug tapering or switching. The implications of patient characteristic and medical co-morbidities are addressed.
9. Students will share informed opinions about advances and challenges in experimental (off-label) psychopharmacology; and of their opinions of integrated psychotherapy or combined medicine. 1
10. Students will work effectively with peers and Instructor; as part of multidisciplinary learning environment.

CEPY 6185. Ethics, Law & Professional Issues in School Psychology
3 Credits (3)

This course provides an introduction and overview of the profession of school psychology with emphasis on the roles, functions, and competencies of the school psychologist within the context of legal and ethical practice. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean.

Learning Outcomes

1. Students will demonstrate an understanding of various professional issues, role functions, and historical contexts related to the field of school psychology.
2. Students will demonstrate the ability to examine and apply critical perspectives related to various professional issues, role functions, and the historical contexts associated with the field of school psychology.
3. Students will explore best practices issues associated with school psychology role functions and practices.
4. Students will demonstrate the development of skills leading her or him toward becoming a culturally responsive practitioner in the field of school psychology.
5. Students will obtain knowledge of the National Association of School Psychologists (NASP) Principles of Professional Ethics (2020) and the American Psychological Association's Ethical Principles of Psychologists and Code of Conduct (2010; 2016 amendments) and learn to apply these principles to specific areas of practice such as assessment, direct and indirect intervention, consultation, and research.
6. Students will understand complexities of ethical and legal issues occurring in school settings and will develop ethical decision-making skills.
7. Students will demonstrate knowledge of the provisions of state and federal statutes such as the Individuals with Disabilities Education Improvement Act (2004), Every Student Succeeds Act (2017) and Section 504of the Rehabilitation Act of 1973 as well as other case laws related to the practice of school psychology and learn how to apply these mandates to the practice of school psychology.
8. Students will understand the importance of developing awareness of the legal and ethical issues affecting their professional identity and the need to remain current on these issues throughout their careers as school psychologists.
9. Students will continue to emerge as critical thinkers, reflective decision-makers, and creative problem-solvers, in general.

CEPY 6190. Ethical/Professional Issues in Counseling Psychology
3 Credits (3)

History of counseling psychology, scientist-practitioner model, American Psychological Associations Ethical Principles of Psychologists and Code of Conduct. Focus on current ethical, professional, and scientific issues. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to: CEP majors. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be knowledgeable of and act in accordance with the current version of the APA Ethical Principles of Psychologists and Code of Conduct, relevant laws, regulations, rules, and policies governing health service psychology at the organizational, local, state, regional, and federal levels, and relevant professional standards and guidelines; Recognize ethical dilemmas as they arise, and apply ethical decision-making processes in order to resolve the dilemmas; Conduct self in an ethical manner in all professional activities.
2. Students will develop an understanding of how their own personal/cultural history, attitudes, and biases may affect how they understand and interact with people different from themselves; Apply knowledge of the current theoretical and empirical knowledge base as it relates to addressing diversity in all professional activities including research, training, supervision/consultation,and service.

3. Students will be expected to behave in ways that reflect the values and attitudes of psychology, including integrity, deportment, professional identity, accountability, lifelong learning, and concern for the welfare of others; Engage in self-reflection regarding one's personal and professional functioning and engage in activities to maintain and improve performance, well-being, and professional effectiveness
4. Students will be expected to produce and comprehend oral, nonverbal, and written communications that are informative and well-integrated; demonstrate a thorough grasp of professional language and concepts; Demonstrate effective interpersonal skills and the ability to manage difficult communication well.

CEPY 6210. School Psychology Research and Program Evaluation
3 Credits (3)
Survey and analysis of research and program evaluation procedures in school psychology. Critical review of literature, formulating questions, quantitative and qualitative methodology, and data analysis as foundations for reading research literature and generating research, program evaluation, and/or grant proposals. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Students will advance their foundational knowledge of research methodology and research design.
2. Students will develop skills and knowledge to conduct comprehensive literature reviews.
3. Students will critique scientific research studies by applying attained knowledge in research methodology and design.
4. Students will produce a research proposal they will conduct in their areas of interest within the field of school psychology.
5. Students will present a research proposal that will conduct within the field of school psychology.
6. Students will demonstrate skills and knowledge for program evaluation by developing a program evaluation plan.
7. Students will demonstrate knowledge and skills necessary to conduct single-subject design studies.

CEPY 6220. Spanish for Mental Health Professionals
3 Credits (3)
This course emphasizes the vocabulary for Mental Health Professionals to include academic, psychological and medical terminology. Students will incorporate Spanish terms in assessment and treatment plans through role plays. Further, the course will include an overview of the use of interpreters and translators in working with culturally and linguistically diverse clientele. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: CEP graduate majors. May be repeated up to 3 credits.
Learning Outcomes
1. Students will be able to demonstrate brief, basic conversation in Spanish using mental health and health-care related expressions and terminology.
2. Students will be able to understand and respond to relevant cultural and linguistic client concerns related to presenting issues.
3. Students will be able to increase their Spanish speaking capabilities when engaged in their professional roles (e.g. conducting clinical interviews, gathering mental health histories, conducting assessments and delivering interventions using various theoretical frameworks).
4. Students will understand cultural and social factors that influence the practitioner-client relationship and communication with Latinx clients.
5. Students will be able to engage effectively in role play situations involving application of concepts learned.

CEPY 6240. Child and Adolescent Counseling Theory and Technique
3 Credits (3)
Taught with CEPY 5240 with differentiated assignments for Ed.S. and Ph.D. students. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Students will be able to demonstrate an understanding of their psychosocial and cultural context and how such phenomena influence their values, beliefs and, therefore, theoretical orientation to counsel children and adolescents.
2. Students will be able to demonstrate the ability to examine and apply critical perspectives related to counseling children and adolescents.
3. Students will be able to compare and contrast various theoretical perspectives in the area of counseling children and adolescents.
4. Students will be able to demonstrate the development of a knowledge base leading toward becoming a culturally responsive practitioner in the area of counseling with individuals from a variety of diverse backgrounds
5. Students will be able to identify, describe, and apply legal and ethical issues relevant to practice in the area of counseling children and adolescents in various settings.
6. Students will be able to collaborate with others in the process of developing relevant treatment plans and providing counseling services to children and adolescents in diverse settings.

CEPY 6250. Family Therapy Theory and Technique
3 Credits (3)
Taught with CEPY 5250 with differentiated assignments for Ed.S and Ph.D students. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Students will demonstrate their comprehension of a systems perspective that provides an understanding of family and other systems theories and major models of family and related interventions.
2. Students will demonstrate an understanding of the family life cycle and impact on family and individual functioning.
3. Students will demonstrate an awareness of and develop skills with various forms of assessment for families and couples, including observation, collection of collateral information, and interviewing.
4. Students will demonstrate an awareness of and develop skills in using formal and informal assessment measures used in family and couple counseling.
5. Students will develop conceptual skills that demonstrate an understanding of theory and implementation of interventions.
6. Students will demonstrate knowledge about evidenced-based interventions and treatments for family and couple counseling.

7. Students will demonstrate their understanding of multicultural counseling theories and techniques for family and marital counseling.
8. Students will be able to apply multicultural and family theories to their own experience in an effort to improve your counseling work.
9. Students will demonstrate will demonstrate an ability to communicate and relate effectively to families and couples. 1
10. Students will be able to design and implement outreach and psychoeducational interventions to families and couples. 1
11. Students will demonstrate their knowledge related to ethical issues surrounding counseling families and couples and be able to make sound judgments.

CEPY 6260. Consultation
3 Credits (3)
Didactic and experimental trainings in theory-based consultation. Supervision provided by faculty involves audio, video, and/or live observation consultation activities and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean.
Learning Outcomes
1. You will develop knowledge and skills in the practice of problem-solving model in school settings.
2. You will develop knowledge of various consultation and supervision theories.
3. You will develop their theoretical orientation to consultation in school settings.
4. You will develop knowledge and skills to devise and conduct a single-subject design intervention in the context of the consultation.
5. You will demonstrate an understanding of current issues in relation to consultation practices in school settings.
6. You will demonstrate skills for conducting consultation with teachers and parents with diverse backgrounds.
7. You will understand and adhere to ethical practices in conducting a consultation case.

CEPY 6265. Diagnostic Class
3 Credits (3)
Emphasis on developing the knowledge, skills, and necessary application abilities related to diagnosis and associated interventions related to mental health and psychopathology issues that impact a student's ability to navigate the education setting. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Students will be expected to demonstrate the knowledge of the etiology, the diagnostic process and nomenclature, treatment, referral, and prevention of mental and emotional disorders.
2. Students will be expected to demonstrate knowledge of the principles, models, and documentation formats of biopsychosocial case conceptualization and treatment planning.
3. Students will be expected to demonstrate understanding of current literature that outlines theories, approaches, strategies, and techniques shown to be effective when working with specific populations of clients with mental and emotional disorders.
4. Students will be expected to demonstrate understanding of basic classifications, indications, and contraindications of commonly prescribed psychopharmacological medications so that appropriate referrals can be made for medication evaluations and so that the side effects of such medications can be identified
5. Students will be expected to demonstrate knowledge of the principles of the diagnostic process, including differential diagnosis, and the use of current diagnostic tools, such as the current edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM)
6. Students will be expected to demonstrate understanding of the established diagnostic criteria for mental and emotional disorders, and describes treatment modalities and placement criteria within the continuum of care.
7. Students will be expected to demonstrate knowledge of the the impact of co-occurring substance use disorders on medical and psychological disorders.
8. Students will be expected to demonstrate understanding of the relevance and potential biases of commonly used diagnostic tools with multicultural populations.
9. Students will be expected to demonstrate understanding of the appropriate use of diagnosis during a crisis, disaster, or other trauma-causing events. 1
10. Students will be expected to differentiate between diagnosis and developmentally appropriate reactions during crises, disasters, and other trauma-causing events.

CEPY 6270. Diagnosis and Treatment Planning
3 Credits (3)
Taught with CEPY 5270 with differentiated assignments for Ph.D. students. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Students will be expected to demonstrate knowledge of the etiology, the diagnostic process and nomenclature, treatment, referral, and prevention of mental and emotional disorders.
2. Students will be expected to demonstrate knowledge of the principles, models, and documentation formats of biopsychosocial case conceptualization and treatment planning.
3. Students will be expected to demonstrate practice of using the DSM 5 to create differential diagnoses.
4. Students will be expected to construct an initial treatment plan based upon a systemic and differential diagnosis.
5. Students will be expected to formulate a culturally relevant diagnosis and treatment plan.
6. Students will be expected to discuss the barriers to assessment and treatment, as it relates to mental illness stigma.

CEPY 6275. Professional Preparation Seminar
3 Credits (3)
This seminar course provides academic support for students enrolled in the Specialist in Education (Ed.S.) School Psychology Program in preparation for capstone experiences (i.e., internship and culminating exams) in addition to continued development of students' professional identity as School Psychologists.
Learning Outcomes
1. Students will reflect on the growth of their knowledge, experiences, and skills gained in the School Psychology Program (SPP).
2. Students will reflect on how to expand their knowledge and skills during their internship.
3. Students will prepare for securing an internship position.

4. Students will develop and articulate a professional philosophy of counseling within school psychology.
5. Students will demonstrate skill in oral and written presentations.
6. Students will understand the role of mentoring and supervision in personal and professional.

CEPY 6320. Career/Life Planning and Vocational Assessment
3 Credits (3)
Taught with CEPY 5320 with differentiated assignments for Ed.S and Ph.D. students. Restricted to CEP graduate students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Knowledge and understanding of career development theories and decision-making models.
2. Knowledge and understanding of career, vocational, educational, occupational and labor market information resources, and career information systems.
3. Knowledge and understanding of career development program planning, organization, implementation, administration, and evaluation.
4. Knowledge and understanding of interrelationships among and between work, family, and other life roles and factors, including the role of multicultural issues in career development.
5. Knowledge and understanding of career and educational planning, placement, follow-up, and evaluation.
6. Knowledge and understanding of assessment instruments and techniques relevant to career planning and decision making.
7. Knowledge and understanding of career counseling processes, techniques, and resources, including those applicable to specific populations in a global economy.

CEPY 6330. Behavior Assessment and Intervention
3 Credits (3)
This course introduces basic concepts, methods, and applications of academic and behavior assessment and intervention. Students will learn how to conduct functional/informal assessments of academic and behavior and how to write behavior and academic plans. Methods appropriate for assessment and intervention of school-age children will be emphasized. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: CEP graduate majors.
Learning Outcomes
1. Students will gain and demonstrate knowledge on how behavior assessment fits within psychological/psycho-educational assessment.
2. Students will demonstrate the ability to examine and apply critical perspectives related to educational assessment.
3. Students will learn the rational, defining features and theoretical underpinnings of behavioral assessment.
4. Students will learn how to conduct and complete functional assessments of behavior.
5. Students will learn how to develop and evaluate a satisfactory positive behavior intervention plan.
6. Students will develop and/or learn techniques of behavioral observation.
7. Students will learn how to integrate behavioral observation findings with other assessment methods.

CEPY 6340. Appraisal of Cognitive Functioning
3 Credits (3)
Selection, administration, scoring, interpretation, and report writing using individual tests of intelligence. Moderator variables, such as acculturation, ethnic identity development, and world view are also incorporated. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Students will become knowledgeable about the historical background of intelligence testing.
2. Students will become knowledgeable about the major theories of intelligence.
3. Students will be able to discuss orally and in writing the pros and cons of intelligence testing and will be able to support the discussion with specific facts and research.
4. Students will be able to select “appropriate” intellectual assessment instruments for children, adolescents, and adults.
5. Students will be able to state pertinent information relative to these major intelligence tests such as age range, standardization, reliability, and validity.
6. Students will demonstrate mastery of administration, scoring, and interpretation of various norm-referenced cognitive assessment instruments while taking into consideration the cultural context of the individual.
7. The student will be able to demonstrate the ability to integrate information into meaningful written reports.

CEPY 6350. Appraisal of Personality
3 Credits (3)
Selection, administration, scoring, interpretation, and report writing using major objective and projective tests of personality. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Knowledge of the current theoretical and empirical knowledge base as it relates to addressing diversity in all professional activities including research, training, supervision/consultation, and service.
2. Produce and comprehend oral, nonverbal, and written communications that are informative and well-integrated; demonstrate a thorough grasp of professional language and concepts.
3. Demonstrate current knowledge of diagnostic classification systems, functional and dysfunctional behaviors, including consideration of client strengths and psychopathology.
4. Demonstrate understanding of human behavior within its context (e.g., family, social, societal and cultural).
5. Demonstrate the ability to apply the knowledge of functional and dysfunctional behaviors including context to the assessment and/or diagnostic process.
6. Select and apply assessment methods that draw from the best available empirical literature and that reflect the science of measurement and psychometrics; collect relevant data using multiple sources and methods appropriate to the identified goals

and questions of the assessment as well as relevant diversity characteristics of the service recipient.

7. Interpret assessment results, following current research and professional standards and guidelines, to inform case conceptualization, classification, and recommendations, while guarding against decision-making biases, distinguishing the aspects of assessment that are subjective from those that are objective.
8. Communicate orally and in written documents the findings and implications of the assessment in an accurate and effective manner sensitive to a range of audiences.

CEPY 6360. School Safety and Crisis Response
3 Credits (3)
This course emphasizes a comprehensive and systematic approach for school safety, emergency readiness, and crisis response skill development for school-based mental health professionals. Developing prevention and post-crisis intervention skills through teaming, planning, and data-based decision making is highlighted. Course content fits within a multi-tiered system of support assessment and intervention model.
Learning Outcomes

1. Demonstrate knowledge of school crisis prevention and intervention within a multi-tiered system of support.
2. Demonstrate knowledge of school physical safety and psychological safety as crisis prevention concepts.
3. Demonstrate knowledge of legal requirements and best practices surrounding school safety teams/plans and school crisis teams/plans.
4. Demonstrate knowledge of how to evaluate school and individual needs after a school crisis.
5. Demonstrate knowledge of important school crisis data for making decisions about crisis prevention, preparedness, and intervention.
6. Demonstrate knowledge and skills related to school crisis intervention (e.g., psychoeducational strategies, group crisis intervention, individual crisis intervention, and long-term psychotherapy).
7. Demonstrate emerging crisis intervention skills (through role playing in the classroom).

CEPY 6410. Introduction to Qualitative Research
3 Credits (3)
This course is intended to be an introduction to qualitative research methods for persons wishing to understand, apply, and conduct qualitative studies with human subjects in the fields of counseling and psychology. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes

1. Students will understand the importance of applying and conducting culture-centered and ethical psychological research among persons from ethnic, linguistic, and racial minority backgrounds.
2. Students will understand the shift that has taken place in the past century from ignoring cultural variables to that of valuing the vast amounts of uncharted knowledge that is contained therein.
3. Students will gain a deeper understanding of the qualitative paradigm that informs research and the way we conduct and consume it.
4. Students will understand the components that make up good qualitative research considering carefully the variables that inform the proposed outcome of the study.
5. Students will assess the benefit of research to the entities, individuals and communities being studied.
6. Students will learn to be grounded in the empirical and conceptual literature on the ways that culture influences the variables under investigation, as well as psychological and social science research traditions and skills.
7. Students will be aware of their cultural assumptions on which their research questions are based (Egharevba, 2001).
8. Students will learn to be aware of, and if appropriate, to apply indigenous theories when conceptualizing research studies. They are encouraged to include members of cultural communities when conceptualizing research, with particular concern for the benefits of the research to the community (Fontes, 1998; LaFromboise, 1988).
9. Students will learn to consider the psychological (rather than demographic) contextual factors of race, ethnicity, language, gender, sexual orientation, socio-economic status, and other social dimensions of personal experience in conceptualizing their research design (Fouad Brown, 2000; Quintana et al., 2001). 1
10. Students will strive to recognize and incorporate research methods that most effectively complement the worldview and lifestyles of persons who come from a specific cultural and linguistic population; e.g., quantitative and qualitative research strategies (Hoshmand, 1989; Marin Marin, 1991; Ponterotto Casas, 1991). 1
11. Students will learn to consider culturally sensitive assessment techniques and data-generating procedures. 1
12. In analyzing and interpreting data from research studies and in proposed research, students will learn to consider cultural influences as possible explanations for their findings. 1
13. Students will learn the importance of considering the benefit to participants, and to include participants in the interpretation of results. They are encouraged to find ways for the results to be of benefit to the community, and to represent the participants' perspectives accurately and authentically.

CEPY 6420. Psychometrics
3 Credits (3)
An introduction to psychometrics, including topics such as theory and techniques of psychological measurement, scale and inventory construction, reliability, validity, evaluation of measurement quality, classical and contemporary measurement theory, and standardization. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean.
Learning Outcomes

1. Students will acquire knowledge and skills in psychometrics.
2. Students will understand and apply psychometric theory through the completion of instrument evaluation, instrument development,and factor analysis projects.

CEPY 6425. Counseling Psychology Research
3 Credits (3)
Survey and analysis of research and program evaluation procedures in counseling psychology. Critical review of literature, formulating questions, quantitative and qualitative methodology, and data analysis are covered as a foundation for reading research literature and generating research, program evaluation, and/or grant proposals. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor,

program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students refine their foundational knowledge of research methods.
2. Students learn how to conduct comprehensive literature reviews in counseling psychology.
3. Students learn about sampling procedures and their limitations.
4. Students refine their knowledge about measurement applied to research (including the reliability, validity, norms and cultural relevance of measurement procedures).
5. Students refine their knowledge of statistics and the application of statistics to deriving conclusions from research data.
6. Students learn about ethical issues related to conducting research.
7. Students apply knowledge and skills in the areas described above to the critique of counseling psychology research.
8. Students apply knowledge and skills in the areas described above to the development of a draft proposal for research they can conduct in their area of interest within counseling psychology.
9. Students present and defend a proposal for research in counseling psychology.

CEPY 6430. Advanced Statistics
3 Credits (3)

An intermediate course focusing on more advanced theories and techniques of inferential statistics as applied to education and psychology. Includes ANOVA, planned contrasts, ANCOVA, simple regression, and non-parametrics. Both hand calculation and computer packages will be employed. Open to all College of HEST majors. May be repeated up to 3 credits.

Learning Outcomes

1. Students will understand how to describe procedural steps to submit proposals to the IRB at NMSU.
2. Students will be able to create data files and use SPSS to clean and examine datasets to assess data quality.
3. Students will be understand how to plan to address a research question, identify appropriate statistical tests and variables.
4. Students will be able to use SPSS to run statistical analyses to examine differences in means or relationships between two variables.
5. Students will understand how to assess assumptions and interpret findings of these analyses.
6. Students will understand key concepts, such as statistical significance, error, effect size, sample size, and statistical power.of analytic approaches, findings, and interpretations of the data
7. Students will be able to effectively communicate using scientific writing and accurate portrayal of the data in terms.

CEPY 6440. Multivariate Statistics
3 Credits (3)

Theories and techniques of multivariate statistics as applied to education and psychology. Includes multiple regression, logistic regression, MANOVA, factor analysis, and structural equation modeling. Computer packages will be the primary tool for data analysis. Open to all majors of the College of HEST. May be repeated up to 3 credits.

Learning Outcomes

1. To be able to construct statistical models, both non-multivariate (e.g., multiple regression) and multivariate (e.g., MANOVA, MANCOVA), and carry out the analysis using statistical software (e.g., SPSS, R).
2. To be able to interpret results of both non-multivariate and multivariate analyses, in the context of the data.
3. To be able to generate original research questions that can be answered with quantitative methods discussed in this course.
4. To be able to carry out a quantitative method discussed in this course to answer a research question(s), and to be able to appropriately interpret the results.
5. To be able to read published research in your field of study that makes use of multivariate methods, and critically interpret the results based on the claims and evidence provided.

CEPY 6450. Educational Experimentation
3 Credits (3)

Same as ELAD 6910. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Reflect on abilities to identify and effectively manage strengths and potential barriers that may impact progress on dissertation by thoroughly analyzing strengths and barriers and developing an action plan.
2. Conceptualize a dissertation topic that is germane to the field of Counseling Psychology and provide a convincing argument supporting the need for such research.
3. Conduct extensive and systematic literature searches for previous research and theory relevant to dissertation topic.
4. Write a comprehensive outline and annotated bibliography of the literature that incorporates the most relevant research and theoretical work associated with dissertation topic to inform literature review.
5. Clearly state research questions and hypotheses that will be examined in dissertation.
6. Create a detailed and comprehensive action plan that adheres to APA ethical guidelines for research that a reader can use to replicate dissertation study (i.e., method section).
7. Demonstrate understanding of the importance of having a diverse sample.
8. Present dissertation research to the class in a simulated proposal meeting.
9. Become more adept at providing support and challenge to student peers during weekly seminars and simulated proposal meetings. 1
10. Identify strategies for choosing and working with your dissertation committee effectively. 1
11. Demonstrate your knowledge of APA writing style.

CEPY 6510. Practicum in School Psychology: Psychoeducational
1-6 Credits (1-6)

Supervised practicum in psychological and educational evaluation. Skill development in ecological assessment, including interviewing, observations micro-counseling, acculturation, world view, and ethnic identity formation. Graded: S/U Grading (S/U, Audit). Restricted to CEP graduate majors. May be repeated up to 6 credits.

Prerequisite: CEPY 6340, CEPY 5310.

Learning Outcomes

1. Students will demonstrate sound diagnostic reasoning and data based decision-making through the formulation of possible preliminary hypotheses and testing of hypotheses via use of appropriate assessment methods.
2. Students will demonstrate skills in planning appropriate assessments, taking into consideration contextual factors, referral concerns, and background information; and will select appropriate evaluation methods.

3. Students will demonstrate skills related to devising and implementing evidence-based academic interventions for students in need.
4. Students will demonstrate sensitivity in regards to cultural diversity and diversity of values, as well as begin the process of being culturally responsive in their professional practices.
5. Students will become familiar with and practice in accordance with best practices and relevant standards of the profession.
6. Students will become familiar with the application of state special education rules and regulations.
7. Students will identify and apply relevant legal and ethical responsibilities and requirements.
8. Students will demonstrate effective interpersonal skills with clients and colleagues, appropriate to the functioning as a professional school psychologist.

CEPY 6520. Field Experience in Educational Diagnostics
1-6 Credits (1-6)
CEPY 6520 is designed to provide students with supervised school-based experiences and practices. The goal of the course is for students to master the competencies required for the delivery of academic services in the educational diagnostician role. The specific emphases in this course are placed on a data-based decision-making skills, psychoeducational assessment activities, and academic interventions.Under faculty and school-system staff supervisions, students will assume service delivery responsibilities and with increasing independence will respond to the diagnostic and intervention needs of students. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 6 credits.
Prerequisite: CEPY 6340 and CEPY 5310.
Learning Outcomes
1. Students will demonstrate sound diagnostic reasoning and data-based decision-making through the formulation of possible preliminary hypotheses and testing of hypotheses via use of appropriate assessment methods.
2. Students will demonstrate skills in planning appropriate assessments, taking into consideration contextual factors, referral concerns, and background information; and will select appropriate evaluation method.
3. Students will demonstrate skills related to devising and implementing evidence-based academic interventions and provide recommendations for students in need.
4. Students will demonstrate sensitivity in regards to cultural diversity and diversity of values, as well as begin the process of being culturally competent in their professional practices.
5. Students will become familiar with and practice in accordance with best practices and relevant standards of the profession.
6. Students will become familiar with the application of state special education rules and regulations.
7. Students will identify and apply relevant legal and ethical responsibilities and requirements.
8. Students will demonstrate effective interpersonal skills with clients and colleagues.

CEPY 6530. Practicum in School Psychology: Psychological
1-6 Credits (1-6)
School-based supervised experience for the advanced student. Provides experiences in various roles and models of service delivery (group, multifactored, integrative, family assessments) expected of school psychologists. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to: CEP graduate majors. May be repeated up to 6 credits.
Prerequisite: CEPY 6350 and CEPY 5235.
Learning Outcomes
1. Enhance the knowledge and skill students already possess and aid in the development of new knowledge and skills (related to psychological, behavioral needs of students).
2. Provide students with the opportunity to respond to supervision and use supervision in a constructive manner.
3. Provide students with the opportunity to share experiences as school psychologists in training in a supportive environment.
4. Provide the students with the opportunity to engage in learning activities that will assist them in functioning independently as school psychologists (i.e., data-based decision-making and accountability).
5. Provide the instructor with the opportunity to observe the student's ability to plan and execute successful interventions and demonstrate diagnostic skills.
6. Students will be able to establish a counseling relationship with students' clients through the provision of individual and/or group counseling as stated on their IEP's.
7. Students will be exposed to current issues, theories, and practices in the field of school psychology.
8. Students will be able to integrate theory/research and practice via case presentations.
9. Students will be able to demonstrate knowledge and integration of technology in their practice as school psychologist. 1
10. Students will refine their skills in working with culturally and linguistically diverse students, families, educators, and other professionals.

CEPY 6540. Advanced Multicultural School Psychology Field Experience
3 Credits (3)
Supervised school psychology field experience including appraisal diagnosis, case conceptualization, treatment planning, theory-based counseling and evaluation from a multicultural perspective with diverse populations. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of sessions and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to CEP graduate majors.
Prerequisite: CEPY 6510, CEPY 6530.
Learning Outcomes
1. Students will enhance the knowledge and skill they already possess and aid in the development of new knowledge and skills (related to psychological, behavioral needs of students).
2. Students will respond to supervision and use supervision in a constructive manner.
3. Students will share experiences as school psychologists in training in a supportive environment.
4. Students will engage in learning activities that will assist them in functioning independently as doctoral-level school psychologists (i.e., data-based decision-making and accountability).

CEPY 6550. Counseling Psychology Theory/Practicum
1-6 Credits (1-6)
Theories of counseling and psychotherapy and their application during supervised counseling with clients. Supervision provided by doctoral

psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 6 credits.

Learning Outcomes

1. Students will refine their understanding of counseling theory and hone counseling skills through readings, lecture, demonstration, case presentation, and supervised counseling experiences.
2. Students will learn about and employ a variety of evidence-based approaches to counseling and psychotherapy that have historically been used by counseling psychologists.
3. Students will reflect on their development of an approach to counseling that is effective, theoretically sensible, and personally congruent.

CEPY 6560. Group Work Theory/Practicum
1-6 Credits (1-6)

Application of theory in group work with clients and in supervising group leaders in training. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to: CEP majors. May be repeated up to 6 credits.

Prerequisite: CEPY 6550.

Learning Outcomes

1. Apply the basic elements of group theory to small groups, including principles of group dynamics, group process components, developmental stage theories, group member roles and behaviors, and therapeutic factors.
2. Demonstrate effective leadership skills and intervention strategies in simulated class discussions to actual group sessions in the community.
3. Possess knowledge of ethical and professional issues encountered by group leaders.
4. Develop awareness of the relative advantages of group work for clients and counselors, as well as other practical advantages; discern when group may not be the preferred modality for clients.
5. Distinguish characteristics of various group theoriesand approaches.
6. Identify relevant socio-cultural factors and multicultural considerations in group work and its impact on theory, process, and group leadership skills.
7. Communicate how they have improved their skill development relative to self-awareness and group leadership.
8. Have knowledge of professional group organizations, certifications (Certified Group Psychotherapist), and be able to effectively market group skills in preparation for the pre-doctoral internship year.

CEPY 6570. Advanced Counseling Psychology Practicum
1-6 Credits (1-6P)

Supervised counseling psychology experience including appraisal, diagnosis, case conceptualization, treatment planning, theory-based counseling and evaluation. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Restricted to CEP graduate majors. Graded: S/U Grading (S/U, Audit). May be repeated up to 12 credits.

Prerequisite: CEPY 6560.

Learning Outcomes

1. To increase skill level in clinical work with individual/group/couple therapy and initial intakes through practice, formal supervision, and group case discussion.
2. To integrate one's theoretical orientation into a brief practice therapy model and to improve treatment planning ability.
3. To improve treatment planning ability by increasing knowledge and integration of empirically supported interventions.
4. To increase exposure and use of assessment procedures and tools in clinical work.
5. To be cognizant of cultural/diversity issues with clients and develop enough self-awareness to respond effectively to a wide range of clients.
6. To examine professional identity concerns as they arise and increase one's knowledge base about specific areas of clinical interest.
7. To adhere to APA's Ethical Principles of Psychologists and Code of Conduct and Specialty Guidelines for the Delivery of Service by Counseling Psychologists and Guidelines for Providers of Psychological Services to Ethnic, Linguistic, and Culturally Diverse Populations, and to develop a more applied understanding of them.
8. To increase one's knowledge of relevant Mental Health Statutes and the Board of Psychologist Examiners Rules and Regulations for the state in which you are practicing (NM or TX).
9. To demonstrate self-awareness and self-reflection through ongoing self-evaluation of counseling skills. 1
10. To learn how to design and implement outreach presentations and to gain experience in consulting with interdisciplinary staff. 1
11. To become familiar with and acquire practice with career counseling and the use of career inventories.

CEPY 6580. Supervision Theory and Practicum
1-6 Credits (1-6)

Didactic and experimental training in theory-based supervision. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of supervision sessions and case presentations. Restricted to CEP graduate majors. May be repeated up to 6 credits.

Prerequisite: CEPY 6530 or CEPY 6570.

Learning Outcomes

1. Students will be able to conceptualize the counseling supervision process.
2. Students will be able to understand the differences between various models of counseling supervision in order to develop a clearly conceptualized supervision theory/style.
3. Students will be able to establish an effective supervisory relationship.
4. Students will be able to demonstrate a variety of appropriately used supervision interventions.
5. Students will be able to demonstrate self-awareness through ongoing self-assessment of supervisory skills and self- reflection of your experience.
6. Students will be able to accurately assess your supervisee's abilities and developmental level.
7. Students will be able to be cognizant of cultural/diversity issues with supervisees and develop enough self-awareness to respond effectively to such issues in both supervision and counseling.
8. Students will be able to provide clear and timely feedback to your supervisee based on your on-going assessment.

9. Students will be able to demonstrate the ability to write accurate and timely supervision process and progress notes. 1
10. Students will be able to understand the differences between various models of consultation. 1
11. Students will be able to understand the major issues in consulting and its place within the counseling profession, including orienting students to their professional identities.1
12. Students will be able to understand how to orient students to their professional identities (school psychology, counseling psychology, or counseling. In addition, this course also provides supervisors an orientation to the counseling profession, including its history, counseling professional associations (e.g., the American Counseling Association), counseling licensure, roles counselors full fill in the community, and the difference between counseling and other related professions.

CEPY 6590. Behavioral Health Practicum
1-6 Credits (1-6)
An intensive supervised experience in providing behavioral health services at an on or off campus interdisciplinary health setting. Supervision provided by doctoral level psychologist faculty in collaboration with other team disciplines' supervising faculty involves audio, video, and/or live observation of counseling sessions and team interventions and case presentations. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 6 credits.
Learning Outcomes
1. Students will be able to apply a Biopsychosocial model of health and illness to case conceptualizations, treatment plans, and interventions at individual, group, and systemic levels.
2. Students will learn and use motivational interviewing to support patient behavior change
3. Students will learn strategies to employ telehealth services
4. Students will learn behavioral strategies for Opiate Use Disorder
5. Students will learn and perform a functional assessment of patient problems
6. Students will learn and apply evidence-based brief behavior change interventions (e.g. goal setting, self-monitoring, stimulus control, positive reinforcement, guided imagery, progressive muscle relaxation, mindfulness social support)
7. Students will describe and demonstrate behavioral health consultation skills
8. Students will demonstrate understanding of health disparities and social justice issues relevant to health care setting, patient population, and service delivery models.
9. Students will learn about ethical considerations for psychologists in health care settings

CEPY 6610. Internship in School Psychology
1-12 Credits (1-12)
Supervised experience in school psychology. Restricted to CEP graduate majors. May be repeated up to 12 credits.
Prerequisite: CEPY 6510 , CEPY 6530.
Learning Outcomes
1. Student will complete 1200 clock hour internship experience an approved site.

CEPY 6620. Internship in Counseling Psychology I
1-18 Credits (1-18)
Full-time equivalent of one-half calendar year of internship preferably in an APA-approved or APA-equivalent site. Available to Ph.D. students who have successfully completed their comprehensive exams. Restricted to CEP graduate majors. May be repeated up to 18 credits.
Learning Outcomes
1. Students will complete the full-time equivalent of one calendar year internship at a site accredited by the American Psychological Association (APA) that has been matched with the student through the APPIC process.

CEPY 6630. Internship in Counseling Psychology II
1-18 Credits (1-18)
Full-time equivalent of one-half calendar year of internship preferably in an APA-approved or APA-equivalent site. Available to Ph.D. students who have successfully complete their comprehensive exams. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean May be repeated up to 18 credits.
Learning Outcomes
1. Varies by site.

CEPY 6640. Doctoral Internship in School Psychology
1-18 Credits (1-18)
Supervised doctoral internship experience in school psychology. 1800 to 2000 clock hours are completed on a full-time basis. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to CEP graduate majors. May be repeated up to 12 credits.
Prerequisite: CEPY 6510, CEPY 6530, CEPY 6540.
Learning Outcomes
1. Varies by site.

CEPY 6996. Selected Topics
1-6 Credits (1-6)
Offered under various subtitles which indicate the subject matter covered. A maximum of 6 credits in any one semester and a total of 18 credits overall. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 18 credits.
Learning Outcomes
1. Varies

CEPY 6999. Ed.S. Thesis
1-15 Credits (1-15)
Study and research at the Specialist in Education level. Each problem to be designated by a qualifying subtitle. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 88 credits.
Learning Outcomes
1. Varies

CEPY 7000. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

Office Location: O'Donnell Hall, Suite 222

Phone: (575) 646-2121

Email: cep@nmsu.edu

Website: http://cep.nmsu.edu

Counseling and Community Psychology - Bachelor of Science

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. This face-to-face program requires in-person attendance in classes, especially in internship courses. Attendance is mandatory in the Internship, which is 6 credits.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I [1]	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Choose one of the following		3
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Choose one of the following		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
or HNRS 2175G	Introduction to Communication Honors	
COMM 1130G	Public Speaking	
Area II: Mathematics		
MATH 1220G	College Algebra (or higher/except MATH 1130G) [1,2]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
CEPY 1120G	Human Growth and Behavior	3
Choose any two of the following		8
AGRO 1110G	Introduction to Plant Science (Lecture & Lab)	
or HORT 1115G	Introductory Plant Science	
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
or ASTR 1120G	The Planets Lecture & Laboratory	
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 1190G	Contemporary Problems in Biology	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
ENVS 1110G	Environmental Science I	
GEOG 1110G	Physical Geography	
GEOL 1110G	Physical Geology	
PHYS 1115G	Survey of Physics with Lab	
PHYS 1125G	Physics of Music	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
Area V: Humanities		
Choose one of the following		3
HIST 1110G	United States History I	
HIST 1120G	United States History II	
HIST 1130G	World History I	
HIST 1140G	World History II	
HIST 1150G	Western Civilization I	
HIST 1160G	Western Civilization II	
HIST 2245G	Islamic Civilizations to 1800	
HIST 2250G	East Asia to 1600	
HIST 2251G	East Asia since 1600	
Area VI: Creative and Fine Arts		
Choose one of the following		3
ARTH 1115G	Orientation in Art	
ARTS 1145G	Visual Concepts	
ARTH 2110G	History of Art I	
ARTH 2120G	History of Art II	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
General Education Elective		
PSYC 1110G	Introduction to Psychology [1]	3
Viewing a Wider World [3]		**6**
CEPY 3210V and CEPY 4110V may not be used.		
Departmental/College Requirements		
Core Courses [1]		
CEPY 2110	Learning in the Classroom	3
CEPY 2120	The Preschool Child	3
CEPY 2130	Adolescence - School Setting	3
CEPY 2140	Explorations of Counseling & Community Psychology	3
CEPY 3210V	Human Relations Training	3
CEPY 3110	Gender Roles in Education	3
CEPY 4120	Introduction of Mindfulness Practice	3
CEPY 4110V	Introduction to Counseling	3
CEPY 4130	Addictions Prevention and Recovery	3
CEPY 4140	Family Guidance	3
CEPY 4150	Psychology, Multiculturalism and Counseling	3

CEPY 4998	Internship in Counseling & Community Psychology: Clinical	3
CEPY 4999	Internship in Counseling & Community Psychology: Research	3
CJUS 416	Global Perspectives on Youth and Drug Use	3
PHIL 2110G	Introduction to Ethics	3
SOCI 3240	Sociology of the Family	3
FCSC 4815	Research Methods in Family and Consumer Sciences	3
or PSYC 3110	Experimental Methods	
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Choose one from the following:		3
MATH 1350G	Introduction to Statistics [1]	
MATH 2350G	Statistical Methods [1]	
Choose one from the following:		3
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1115G	Introduction to Anthropology	
ANTH 1160G	World Archaeology	
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
POLS 1120G	American National Government	
POLS 1110G	Introduction to Political Science	
POLS 1130G	Issues in American Politics	
POLS 2120G	International Relations	
SOCI 1110G	Introduction to Sociology	
SOCI 2310G	Contemporary Social Problems	
GNDR 2110G	Introduction to Women, Gender, and Sexuality Studies	
GNDR 2120G	Representing Women Across Cultures	
Second Language: (not required)		
Electives, to bring to the total credits to 120 [1,4]		**24**
Select sufficient electives from approved CEP Department list (https://cep.nmsu.edu/academic-programs/counseling-and-community-psychology.html) to meet 120 minimum credit hours for the Bachelor degree (minimum of 24 credits required). [5]		
ANSC 312V	Companion Animals and the Human- Animal Interaction	
BEST 1110G	Introduction to Borderlands and Ethnic Studies	
BLED 3140	Issues in Schooling for Bilingual Learners	
CCST 3120V	Chicana/o Genders and Sexualities	
CJUS 417	Drugs In Our World	
EDUC 3120	Multicultural Education	
ELAD 2340	Multicultural Leadership in Education	
FCST 2110	Infancy Through Middle Childhood in the Family	
FCST 2135	Adolescent Development and the Family	
FCST 2140	Adult Development and Aging	
FCST 3220	Family Dynamics	
GNDR 359	Psychology of Gender	
Course has prerequisite(s)		
GNDR 360	Masculinities Studies	
GNDR 401	Women & Immigration	
GNDR 402	Transnational Feminisms	
GNDR 405	Alternative Genders and Sexualities	
GNDR 465	Sex, Gender and the Body	
HMSV 2110	Case Management	
Course has prerequisite(s)		
HNRS 2170G	The Human Mind	
NUTR 2110	Human Nutrition	
NUTR 3110	Nutrition Throughout the Lifecycle	
Course has prerequisite(s)		
PHIL 328	Applied Ethics	
PHIL 346	Philosophy of Mind	
PHLS 4710	Introduction to Gerontology	
PHLS 4720	Health Promotion for the Older Adult	
PHLS 4730	Adulthood and Aging	
PHLS 3130V	Global Environmental Health Issues	
PHLS 4610	Health Disparities: Determinants and Interventions	
PHLS 4620V	Cross-Cultural Aspects of Health	
PHLS 4650	Coping with Loss and Grief: A Cross-Cultural Perspective	
PSYC 2210	Abnormal Psychology	
Course has prerequisite(s)		
PSYC 3310	Emotion	
Course has prerequisite(s)		
PSYC 2110	Social Psychology	
Course has prerequisite(s)		
PSYC 3220	Learning	
Course has prerequisite(s)		
PSYC 3320	Psychology of Personality	
Course has prerequisite(s)		
PSYC 3410	Health Psychology	
Course has prerequisite(s)		
PSYC 2220	Cognitive Psychology	
Course has prerequisite(s)		
PSYC 2250	Brain and Behavior	
Course has prerequisite(s)		
PSYC 2120	Developmental Psychology	
Course has prerequisite(s)		
SOCI 3240	Sociology of the Family	
SOCI 2261	Issues in Death and Dying	
SOCI 2310G	Contemporary Social Problems	
SOCI 3610V	Sociology of Pop Culture	
SOCI 3270	Gender and Society	
SOCI 3410	Race and Ethnic Relations	
SOCI 3245V	Comparative Family Systems	
SOCI 3415	Social Inequality	
SOCI 3520	Juvenile Delinquency	
SOCI 3255	Youth and Society	
SOCI 3110V	Sociology of Religion	
SOCI 4410	Diversity in Alternative Families	
SOCI 4510	Social Deviance	
SOWK 3110	Sociocultural Concepts	
SOWK 4230	Family and Child Welfare Practice	
SOWK 4210	Generalist Social Work Practice with Organizations and Communities	
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	
SPED 4220	Classroom Management for Diverse Learners	
SPED 4310	Introduction to Autism	
SPED 4330	Social Skills and Autism	

Course has prerequisite/corequisite		
SPMD 3550	Psychology of Sport	
Course has prerequisite(s)		
SPMD 3610	Health and Exercise Psychology	
Course has prerequisite(s)		
ENGL 2310G	Introduction to Creative Writing	
Total Credits		**120**

1 The College of Health, Education, & Social Transformation requires a minimum cumulative GPA of 2.5 or higher for graduation and a minimum grade of C- or higher is required for all CCP core and elective courses.

2 MATH 1220G College Algebra (or any MATH higher math course, excluding MATH 1130G Survey of Mathematics) is required for the degree but students may need to take any prerequisites needed to enter either MATH 1220G College Algebra or higher (excluding MATH 1130G Survey of Mathematics) first.

3 CEPY 3210V Human Relations Training and CEPY 4110V Introduction to Counseling may not be used as a VWW.

4 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

5 Electives for CCP program are selected from list of approved electives.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1220G	College Algebra [1]	3
CEPY 1120G	Human Growth and Behavior	3
CEPY 2110	Learning in the Classroom	3
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Semester 2		
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
Choose from one of the following:		3
MATH 1350G	Introduction to Statistics [1]	
MATH 2350G	Statistical Methods [1]	
PSYC 1110G	Introduction to Psychology	3
CEPY 2120	The Preschool Child	3
Area V: Humanities (HIST course) [2]		3
	Credits	**15**

Second Year

Semester 1		
CEPY 2140	Explorations of Counseling & Community Psychology	3
Area III: Laboratory Science Course [2]		4
An additional Area IV: Social and Behavioral Science Course (see list from non-departmental requirements) [3]		3
Choose from one of the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science [1]	
ENGL 2215G	Advanced Technical and Professional Communication	
CEPY Approved Elective Course [4]		3
	Credits	**16**
Semester 2		
CEPY 2130	Adolescence - School Setting	3
PHIL 2110G	Introduction to Ethics	3
Area III: Laboratory Science Course [2]		4
CEPY Approved Elective Course [4]		3
CEPY Approved Elective Course [4]		3
	Credits	**16**

Third Year

Semester 1		
CEPY 3210V	Human Relations Training	3
CEPY 4130	Addictions Prevention and Recovery (Fall Only)	3
Viewing a Wider World Course [5]		3
Choose from one of the following:		3-4
PSYC 3110	Experimental Methods	
FCSC 4815	Research Methods in Family and Consumer Sciences	
CEPY Approved Elective Course [4]		3
	Credits	**15-16**
Semester 2		
CEPY 3110	Gender Roles in Education	3
CEPY 4140	Family Guidance	3
CJUS 416	Global Perspectives on Youth and Drug Use	3
CEPY Approved Elective Course [4]		3
CEPY Approved Elective Course [4]		3
	Credits	**15**

Fourth Year

Semester 1		
CEPY 4120	Introduction of Mindfulness Practice	3
CEPY 4110V	Introduction to Counseling	3
CEPY 4998	Internship in Counseling & Community Psychology: Clinical	3
SOCI 3240	Sociology of the Family	3
CEPY Approved Elective Course [4]		3
	Credits	**15**
Semester 2		
CEPY 4150	Psychology, Multiculturalism and Counseling	3
CEPY 4999	Internship in Counseling & Community Psychology: Research	3
VWW: Viewing a Wider World Course [5]		3

CEPY Approved Elective Course [4]		3
	Credits	**12**
	Total Credits	**120-121**

1 These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
2 See the General Education (p. 262) section of the catalog for a full list of courses.
3 See the Non-Departmental Requirements (p. 1267) section of the Requirements tab for the program.
4 Select from approved CEP Department list (https://cep.nmsu.edu/academic-programs/counseling-and-community-psychology (https://cep.nmsu.edu/academic-programs/counseling-and-community-psychology.html)/).
5 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Counseling and Education Psychology - Undergraduate Minor

A minor in Counseling and Educational Psychology (CEP) is available to the student receiving a bachelor's degree from another department in the university. The minor in CEP is designed to be useful to the undergraduate who is preparing to enter one of the helping professions such as psychology, education, social work, criminal justice or nursing. A total of 18 credits is required to obtain the CEP minor, of which, at least 9 credits must be at 3000 level or above.

Students must earn a C or better in all CEP minor courses.

Contact the CEP office for more information on the minor application process or see CEP Minor website: (https://cep.nmsu.edu/academic-programs/minor-in-counseling-and-educational-psychology.html)

Prefix	Title	Credits
Requirements		
Select 18 credits of CEPY electives from the following, with at least 9 credits of upper division (3000 and above):		18
CEPY 1120G	Human Growth and Behavior	
CEPY 2110	Learning in the Classroom	
CEPY 2120	The Preschool Child	
CEPY 2130	Adolescence - School Setting	
CEPY 2140	Explorations of Counseling & Community Psychology	
CEPY 3210V	Human Relations Training	
CEPY 3110	Sex Roles in Education	
CEPY 4120	Introduction of Mindfulness Practice	
CEPY 4110V	Introduction to Counseling	
CEPY 4130	Addictions Prevention and Recovery	
CEPY 4140	Family Guidance	
CEPY 4150	Psychology, Multiculturalism and Counseling	
CEPY 4997	Independent Study	
Total Credits		**18**

Communication Disorders

General Information

The NMSU Department of Communication Disorders offers in-person and online undergraduate programs leading to a **Bachelor of Science degree** and an in-person graduate program leading to a **Master's degree** in Speech-Language Pathology. The Master's degree in Speech-Language Pathology satisfies the educational requirements to obtain **state licensure** (in ALL states within the US) and **national certification** in Speech-Language Pathology.

Further information regarding the fields of Audiology and Speech-Language Pathology may be obtained on the American Speech-Language-Hearing Association (http://www.asha.org) website. Information about the NM license requirements can be found on the New Mexico Regulations & Licensing Department (http://www.rld.state.nm.us/boards/speech_language_pathology_audiology_and_hearing_aid_dispensing_practices.aspx website.

Undergraduate Information

The NMSU undergraduate program in Communication Disorders offers a *pre-professional* **Bachelor of Science degree** that prepares students for graduate work in Speech-Language Pathology or Audiology. Students who complete a Bachelor's degree in Communication Disorders may either go on to complete a Master's degree in Speech-Language Pathology, complete a doctoral degree in Audiology, or complete additional supervised clinical hours to become a Speech-Language Pathology Assistant (SLP-A) or the comparable Apprentice of Speech-Language Pathology (ASL) in New Mexico.

Students who have declared a major in Communication Disorders are required to successfully complete a minimum of 120 credits for the Bachelor of Science degree in Communication Disorders. This includes a minimum of 48 upper-division credits.

Graduate Information

The Department of Communication Disorders at NMSU offers a **Master's degree in Speech-Language Pathology**, which meets the educational requirements for certification by the American Speech-Language-Hearing Association (ASHA) (https://www.asha.org/#https://wwwashaorg/) as well as the educational requirements for state licensure in all states within the U.S. Students entering the graduate program with an undergraduate major in Communication Disorders can expect to complete the program in two years (including the summer between the two years) of full-time study or in three years of part-time study and be awarded a Masters of Arts in Communication Disorders with a specialization in Speech-Language Pathology. To complete this course of study, each student is expected to meet the program's academic and clinical competency criteria which are aligned with the requirements of state and national certifying bodies for licensure and clinical certification. The graduate program for students without a background in Communication Disorders is generally one year longer because one year of leveling coursework is required.

Information for Prospective Graduate Students

The Master of Arts (M.A.) residential education program in speech-language pathology at New Mexico State University is accredited by

the **Council on Academic Accreditation in Audiology and Speech-Language Pathology** (CAA) of the American Speech-Language-Hearing Association (ASHA) (http://www.asha.org/), 2200 Research Boulevard, #310, Rockville, MD 20850, 800-498-2071 or 301-296-5700.

Please apply to our graduate program in Speech-Language Pathology via the CSDCAS (https://csdcas.liaisoncas.com/applicant-ux/#/login). The deadline for applications is February 1st of each year.

Bachelor Degree(s)

- Communication Disorders - Bachelor of Science in Communication Disorders (p. 1281)
- Communication Disorders - Bachelor of Science in Communication Disorders (Online) (https://catalogs.nmsu.edu/global/nmsu-global/communication-disorders-bscd-online/)

Undergraduate Minor(s)

- American Sign Language - Undergraduate Minor (p. 1283)

Graduate Degree(s)

- Communication Disorders - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/communication-disorders-graduate-certificate-online/)

Master Degree(s)

- Communication Disorders - Master of Arts (p. 133)

Department Head: Dr. Heike Lehnert-LeHouillier

Professors: Dr. Boutsen; ***Associate Professors:*** Dr. Lehnert-LeHouillier; ***Assistant Professors:*** Dr. Rafferty, Dr. Stone, Dr. Young; ***College Professors:*** Dr. Spencer; ***College Assistant Professors***: Dr. De Froy, Ms. Norris, Ms. Ogaz, ***Emeritus Professors***: Dr. Farmer, Dr. Valdez

Dr. Boutsen, Ph.D., CCC-SLP, (Southern Illinois University): motor speech disorders, voice disorders, fluency disorders, anatomy and physiology of speech mechanisms;

Dr. De Froy, Ph.D., CCC-SLP, (The University of Texas at Dallas): pediatric speech and language disorders, autism spectrum disorders, assessment of communication disorders;

Dr. Lehnert-Lehouiller, Ph.D., CCC-SLP, (State University of New York at Buffalo): speech science, speech sound disorders, autism spectrum disorders, voice disorders;

Ms. Norris, M.A., CCC-SLP, (University of Southern Alabama): speech sound disorders, childhood apraxia of speech, pediatric language disorders;

Ms. Ogaz, M.A., CCC-SLP, (New Mexico State University): pediatric speech and language disorders, early intervention, autism spectrum disorders;

Dr. Rafferty, Ph.D. (University of Tennessee Health Science Center): adult neurogenic language disorders, cognitive communication disorders, neuroanatomy and physiology;

Dr. Stone, Ph.D. (University of Tennessee Health Science Center): voice disorders, dysphagia, speech science;

Dr. Spencer, Ph.D., CCC-SLP, (University of Iowa): speech, language and cognitive development in children with hearing loss

Dr. Young, Ph.D., CCC-SLP, (The University of Texas at Austin): fluency disorders, speech sound disorders, phonetics

Sign Language Courses

SIGN 1110. American Sign Language I
3 Credits (3)
American Sign Language I is an introductory level language course in the language of the American Deaf Culture. Content includes ASL vocabulary and conversational skills; linguistic features of ASL; and skills in narrative/storytelling. In-class activities, comprehension and expressive examinations, narrative and storytelling assignments in addition to semester projects are venues for students to demonstrate their learning. In addition, Deaf Culture and Deaf Community issues are addressed. May be repeated up to 3 credits.
Learning Outcomes

1. Engage in basic conversations using ASL, such as introducing oneself, exchanging personnel information, and talking about one's surroundings.
2. Demonstrate the use of grammatical structures, including spatial referencing, use of classifiers, role shifting, ASL syntax, and non-manual signals (NMS).
3. Demonstrate clear sign production using an understanding of sign parameters: handshapes, movement, location, palm orientation, and NMS in targeted lexicon.
4. Demonstrate the use of basic ASL vocabulary and expressions necessary for conversationsabout real-life situations.
5. Evaluate and provide feedback concerning peers' and one's own uses of ASL.
6. Develop culturally-appropriate behaviors and conversation strategies within a variety of contexts for interacting with people who are Deaf.
7. Demonstrate effective use of comprehension and expressive ASL skills through narrative and/or storytelling activities.
8. Describe issues of the American Deaf community and Culture.

SIGN 1120. American Sign Language II
3 Credits (3)
American Sign Language II is a continuation course that builds on concepts and skills developed in American Sign Language I. Students gain further exposure to ASL structure and grammar, and Deaf Culture and the Deaf community. Emphasis is on increasing students' ability to comprehend other signers and express themselves with more elaboration when conversing or presenting in ASL. May be repeated up to 3 credits.
Prerequisite: SIGN 1110 or consent of instructor.
Learning Outcomes

1. Further develop basic conversational skills in ASL, taking on more complicated topics.
2. Apply knowledge of ASL grammar, including classifiers, spatial referencing and agreement, role shifting, and non-manual markers.
3. Develop ASL vocabulary, fingerspelling, number, narrative and storytelling skills.
4. Evaluate and provide feedback concerning peers' and one's own uses of ASL.
5. Demonstrate effective use of comprehension and expressive ASL skills through conversation, discussion, narrative and/or storytelling activities.
6. Demonstrate knowledge and appreciation of the American Deaf community and ASL

7. Through first-hand experience in the American Deaf community and ASL, relate and reflect on perspectives of the community.

SIGN 2110. American Sign Language III
3 Credits (3)
This is an intermediate level course in American Sign Language (ASL). Expected areas of intermediate skill and knowledge development include: language comprehension and production, conversational use, narratives, ASL language features and further knowledge of and interaction with Deaf culture and the Deaf community. May be repeated up to 3 credits.
Prerequisite: SIGN 1120.
Learning Outcomes
1. Demonstrate intermediate ASL vocabulary, conversation and narrative/storytelling skills.
2. Demonstrate fundamental ASL features including visual/spatial orientation, constructed dialogue and action, spatial referencing, classifiers, non-manual behaviors and syntax/word order.
3. Demonstrate appropriate use of cultural behaviors and conversational strategies.
4. Translate written and spoken English to ASL and vice versa.
5. Self-evaluate and provide feedback to peers concerning ASL usage.
6. Examine the culture of the American Deaf community through engaging in community activities and its language.

SIGN 3110. American Sign Language IV
3 Credits (3)
This course is a continuation of SIGN 2110 (ASL III) with a focus on more complex grammatical features. Involves intensive practice to include the advance skills of receptive/expressive abilities in complex grammatical dialogues and storytelling, conversational use and expressing narratives. May be repeated up to 9 credits.
Prerequisite: SIGN 2110.
Learning Outcomes
1. Students will recognize sociolinguistic variation in American Sign Language.
2. Students will develop proficiency by learning the semantic and grammatical accuracy of American Sign Language.
3. Students will be able to utilize different strategies dependent on the communication contexts.
4. Students will enhance their receptive and expressive language ability as needed to integrate into the Deaf Culture by communicating in American Sign Language.

SIGN 3210. Introduction to Deaf Community
3 Credits (3)
This course is an introduction to American Deaf Community's cultural versus clinical view of deafness with emphasizes on the language, physical, educational, social, political, and cultural implications within the context of deaf and hard of hearing individuals. The course emphasizes personal lives, family and their current educational and vocational programs, legislation, technology, oppression, and other issues. May be repeated up to 6 credits.
Prerequisite: SIGN 1110 American Sign Language I & SIGN 1120 American Sign Language II.
Learning Outcomes
1. Students will define and comprehend basic terms, causes, conditions and processes relating to hearing loss and how it impacts an individual's personal life, family, language education and vocational services.
2. Students will identify professionals involved in the field and their roles, functions, and professional credentials.
3. Students will identify and define common language and communication methods utilized by deaf and hard of hearing people.
4. Students will compare and contrast cultural versus pathological views of Deaf Community.

SIGN 4110. Deaf Culture
3 Credits (3)
This course offers a historical and contemporary overview of all genres of American Deaf Culture. Topics include education, socio-cultural, political, and economic aspects of the Deaf culture. Cultural identity, values, group norms, communication, language, and the significant contributions made by Deaf/deaf people to the world.
Prerequisite: SIGN 1110 American Sign Language I and SIGN 1120 American Sign Language II.
Learning Outcomes
1. Students will comprehend the Deaf Cultures in America from a multicultural perspective by recognizing the political and cultural importance of the ASL as a language.
2. Students will discuss past, present and future trends for D/deaf and Hard of Hearing communities by outlining the historical roots of American Deaf culture and education.
3. Students will comprehend how significant federal, state, and local legislation contributes to the lives of D/deaf and Hard of Hearing people.

Speech & Hearing Science Courses

SPHS 2110. Introduction to Communication Disorders
3 Credits (3)
This introductory course provides an overview of common speech, language, and hearing disorders in children and adults including etiologies, characteristics, prevention, identification, assessment and intervention. The course provides an overview of the field of speech-language pathology and audiology. May be repeated up to 3 credits.
Learning Outcomes
1. Describe normal human communication anatomy and processes as they relate to speech and language production.
2. Describe the nature of speech, language, and hearing disorders and differences.
3. Describe the principles of prevention, assessment and intervention of communication disorders.
4. List requirements for licensure, certification, and other relevant professional credentials.
5. Exhibit basic knowledge of contemporary professional issues in speech-language pathology.
6. List possible psychosocial implications of various communication disorders.
7. Identify cultural, educational, legal, and ethical issues related to communication disorders.
8. Describe the scope of practice of speech-language pathologists and audiologists.

SPHS 3110V. Autism Spectrum Disorders - a Lifespan Perspective
3 Credits (3)
This course will introduce students to concepts related to autism spectrum disorder across the lifespan. Diagnostic criteria, etiologies, assessment, and intervention will be explored from a historical perspective. May be repeated up to 6 credits.

Learning Outcomes

1. Summarize the diagnostic criteria for autism spectrum disorder as presented in the DSM-5-TR and provide examples of its core features.
2. Discuss how to individualize an autism assessment based on an individual's developmental level (e.g., chronological age, language skills), including the specific materials/assessment(s) used.
3. Describe the continuum of autism intervention (discrete to naturalistic) and the pros and cons of methods on the continuum.
4. Describe specific issues for autistic individuals across the lifespan and how intervention/supports may be individualized to their needs.

SPHS 4510. Phonetics
3 Credits (3)

This course introduces you to articulatory and acoustic phonetics as well as transcription. In this course, you will gain the ability to recognize and describe phonetic symbols. You will learn to transcribe American English using the International Phonetic Alphabet (IPA). By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Prerequisite: B or better in SPHS 2110; Cumulative GPA of 3.0 or better.

Learning Outcomes

1. Students will be able to identify articulatory, acoustic and perceptual characteristics of speech sounds.
2. Students will be able to utilize the International Phonetic Alphabet (IPA) to transcribe speech sounds in single words, phrases, and connected speech.
3. Students will be able to classify speech sounds into natural classes, and describe the phonological organization of speech sounds, including prosodic organization.
4. Students will be able to identify common phonological processes during language acquisition and in varieties of English.
5. Students will be able to recognize phonological processes in disordered speech.

SPHS 4520. Audiology
3 Credits (3)

This course is an introductory course to the science and profession of Audiology. Simply stated, Audiology is the clinical profession that deals with hearing and balance disorders (Gelfand, 2009). By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Prerequisite: B or better in SPHS 2110, and a minimum GPA of 3.0 or better.

Learning Outcomes

1. Recall aspects of the history of the profession of Audiology.
2. Explain the key concepts related to sound.
3. Identify the anatomical structures of the auditory system and their respective function to hearing.
4. Explain the tests performed during a comprehensive hearing assessment.
5. Demonstrate the protocols used during hearing assessments.
6. Classify audiometric test results.

SPHS 4610. Language Acquisition
3 Credits (3)

This course introduces students to the study of the development of language, speech, and communication. Includes language sampling. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Prerequisite: B or better in SPHS 2110 Introduction to Communication Disorders; Cumulative GPA of 3.0 or higher.

Learning Outcomes

1. Describe the development of phonology, semantics, morphology, syntax, and pragmatics.
2. Describe biological, cognitive, social aspects of language acquisition.
3. Evaluate the current methods for studying language acquisition and critically evaluate their contributions to our understanding of how children learn language.
4. Compare and contrast current theories of language acquisition in relation to the available data and to each other.
5. Apply basic observational methods to draw conclusions about a child's level of language knowledge.

SPHS 4620. Speech and Hearing Science
3 Credits (3)

This course will introduce you to the field of speech and hearing science, including basic acoustics, the acoustics of speech sounds (consonants and vowels), and speech perception. You will examine the acoustic properties of speech sounds using acoustic analysis software (Praat). By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Prerequisite: B or better in SPHS 2110, C- or better in SPHS 4510, SPHS 4520; and minimum 3.0 GPA.

Learning Outcomes

1. Students will describe concepts of basic acoustic physics such as simple harmonic motion, complex waveforms, and resonances.
2. Students will correlate the acoustic properties of the sound source in human speech with characteristics of vocal fold function.
3. Students will describe and measure the acoustic characteristics of vowels and correlate these characteristics to the articulatory parameters of tongue height, tongue advancement, and lip rounding.
4. Students will describe and measure the acoustic properties of the consonant like approximants, nasals, fricatives, stops, and affricates.
5. Students will describe basic human hearing and psychoacoustic properties and understand and describe important theories of speech perception.

SPHS 4710. Speech Disorders Across the Lifespan
3 Credits (3)

This course explores the bases, etiologies, and clinical management of disabilities specific to articulation, phonology, voice, resonance, motor speech, stuttering, and cluttering disorders. Building upon fundamental theories and knowledge regarding communication, we will review characteristics of various speech disabilities along with evidence-based methods of assessment and treatment. Throughout the course, we will critically examine and reflect upon the importance of identities specific to race, gender, language, socioeconomic status, and culture as it pertains to communication and the provision of clinical services. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Prerequisite: A grade of B or better in SPHS 2110, SPHS 4510, SPHS 4610 and minimum GPA of 3.0.

Learning Outcomes

1. Describe diverse etiologies of speech disorders and compare/contrast assessment procedures (ASHA Standard III-B).
2. Define and compare/contrast the classification for a variety of speech disorders (ASHA Standard III-C).

3. Differentiate between a speech disorder vs a difference that can be attributed to culturally and linguistically different groups (ASHA Standard III-D).
4. Describe evidence-based treatment; evaluate treatment-efficacy evidence for a variety of speech disorders (ASHA Standard III-D).

SPHS 4715. Language Disorders Across the Life Span
3 Credits (3)
In this course, we will learn about developmental and acquired language disorders, including assessment and intervention. We will explore the bases, symptoms, etiologies, and treatment of language disorders. This course includes a short review of normal language acquisition. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Prerequisite: Grade of B or better in SPHS 2110 and SPHS 4610, minimum cumulative GPA of 3.0.
Learning Outcomes
1. Describe diverse etiologies of language disorders and compare/contrast assessment procedures (ASHA Standard III-B).
2. Define and compare/contrast the classification for a variety of language disorders (ASHA Standard III-C).
3. Differentiate between a disorder vs a difference that can be attributed to culturally and linguistically different groups (ASHA Standard III-D).
4. Describe evidence-based treatment; evaluate treatment-efficacy evidence for a variety of language disorders (ASHA Standard III-D).

SPHS 4720. Anatomy and Physiology of Speech Mechanisms
3 Credits (3)
In this course, we will delve into the intricate mechanisms that enable human speech. From the complexities of vocal fold vibrations to the nervous system processes involved in speech production, we will explore how the human body orchestrates the art of communication. In this course, you will gain a comprehensive understanding of the biological foundations that shape our ability to speak. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Prerequisite: B or better in SPHS 2110, and minimum 3.0 GPA.
Learning Outcomes
1. Students will recognize key anatomical structures associated with speech swallowing.
2. Students will be able to explain the physiological function of systems involved in speech swallowing.
3. Students will be able to evaluate the functional integrity of systems involved in speech swallowing.
4. Students will classify speech swallowing symptoms according to their associated clinical syndromes.

SPHS 4810. Clinical Methods and Procedures
3 Credits (3)
Clinical Methods and Procedures in Speech-Language Pathology is designed to provide the undergraduate Communication Disorders major with an introduction to clinical methods, clinical oral and written reporting, and clinical observation skills. May be repeated up to 6 credits. Must have completed SPHS 4510, SPHS 4520, SPHS 4620, SPHS 4610; and have a minimum GPA of 3.0.
Prerequisite: B or better in SPHS 2110.
Learning Outcomes
1. Articulate the scope of practice and the roles and responsibilities of Speech-Language Pathologists (SLP), Speech-Language Pathology Assistants (SLPAs), and graduate clinicians.
2. Use basic professional terminology specific to the field of Speech-Language Pathology.
3. Apply principles and therapeutic techniques to oral and written clinical reporting.
4. Identify on- and off-target behaviors, procedures, data collection, and maintenance strategies.
5. Summarize basic procedures for comprehensive clinical assessments.
6. Complete 25 of the 25 American Speech-Language-Hearing Association (ASHA) clock hours of required supervised clinical observation of speech, language, and hearing services.
7. Identify factors to consider when serving culturally and linguistically diverse patient populations.
8. Recognize the ASHA Code of Ethics.

SPHS 4820. Neural Bases of Communication Disorders
3 Credits (3)
This course will cover the neurological bases for speech, language, and hearing. We will explore topics on neuroanatomy and neurophysiology of sensory and motor systems. Specific topics include Central Nervous System development, the structure and function of brain cells, and organization and function of the brain and spinal cord. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Prerequisite: B or better in SPHS 2110, must have taken SPHS 4720 and 3.0 GPA or better.
Learning Outcomes
1. Explain foundational principles of human neuroscience, including neuronal signaling, embryology, neuroplasticity, sensation/perception, and motor function.
2. Describe and identify the organization and function of major neural structures and pathways involved in speech, language, swallowing, and hearing processes.
3. Evaluate current research on the neural underpinnings of language and speech processing.
4. Interpret clinical case studies and neurological assessment results to hypothesize the likely site and nature of neural damage affecting communication.

SPHS 4830. Aural Rehabilitation
3 Credits (3)
This course introduces you to the theories and procedures used to provide aural/audiological rehabilitation to children and adults who have hearing loss and to provide concomitant services to their family members. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Prerequisite: B or better in SPHS 2110, SPHS 4520, and 3.0 GPA or higher.
Learning Outcomes
1. Knowledge and understanding of basic concepts and components of aural/audiological rehabilitation.
2. Understanding of assessment procedures for determining aural rehabilitation needs, including means for assessing hearing status, auditory and audiovisual speech recognition, hearing-related disabilities, and conversational fluency.
3. Knowledge about the importance of auditory and visual cues in spoken communication.
4. Knowledge about how hearing loss affects conversational fluency.
5. Knowledge about auditory and speechreading training and communication strategies training.

6. Knowledge about counseling, psychosocial support, and assertiveness training.
7. Understanding how to develop and implement aural rehabilitation plans for children, adults, and their family members.
8. Procedures for developing and implementing auditory training for the pediatric population.
9. Knowledge about the challenges hearing loss poses for acquiring speech and language and learning to read and related assessments and interventions. 1
10. Define and use the appropriate terminology when discussing hard of hearing and deafness 1
11. Describe the effects of hearing impairment on various aspects of life (cognitive, educational, occupational, and psycho-social aspects in all age ranges). 1
12. Identify the communication needs and develop a basic understanding of common intervention options including communication strategies, auditory training, speech reading, hearing aids, assistive devices, and cochlear implantation. 1
13. Be acquainted with the relevant public laws.

SPHS 5010. Phonetics
3 Credits (3)
This course introduces you to articulatory and acoustic phonetics as well as transcription. In this course, you will gain the ability to recognize and describe phonetic symbols. You will learn to transcribe American English using the International Phonetic Alphabet (IPA). By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Students will be able to identify articulatory, acoustic and perceptual characteristics of speech sounds.
2. Students will be able to utilize the International Phonetic Alphabet (IPA) to transcribe speech sounds in single words, phrases, and connected speech.
3. Students will be able to classify speech sounds into natural classes, and describe the phonological organization of speech sounds, including prosodic organization.
4. Students will be able to identify common phonological processes during language acquisition and in varieties of English.
5. Students will be able to recognize phonological processes in disordered speech.

SPHS 5015. Audiology
3 Credits (3)
This course is an introductory course to the science and profession of Audiology. Simply stated, Audiology is the clinical profession that deals with hearing and balance disorders (Gelfand, 2009). By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Recall aspects of the history of the profession of Audiology.
2. Explain the key concepts related to sound.
3. Identify the anatomical structures of the auditory system and their respective function to hearing.
4. Explain the tests performed during a comprehensive hearing assessment.
5. Demonstrate the protocols used during hearing assessments.
6. Classify audiometric test results.

SPHS 5020. Language Acquisition
3 Credits (3)
This course introduces students to the study of the development of language, speech, and communication. Includes language sampling. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Describe the development of phonology, semantics, morphology, syntax, and pragmatics.
2. Describe biological, cognitive, social aspects of language acquisition.
3. Evaluate the current methods for studying language acquisition and critically evaluate their contributions to our understanding of how children learn language.
4. Compare and contrast current theories of language acquisition in relation to the available data and to each other.
5. Apply basic observational methods to draw conclusions about a child's level of language knowledge.

SPHS 5025. Language Disorders Across the Life Span
3 Credits (3)
In this course, we will learn about developmental and acquired language disorders, including assessment and intervention. We will explore the bases, symptoms, etiologies, and treatment of language disorders. This course includes a short review of normal language acquisition. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Describe diverse etiologies of language disorders and compare/contrast assessment procedures (ASHA Standard III-B).
2. Define and compare/contrast the classification for a variety of language disorders (ASHA Standard III-C).
3. Differentiate between a disorder vs a difference that can be attributed to culturally and linguistically different groups (ASHA Standard III-D).
4. Describe evidence-based treatment; evaluate treatment-efficacy evidence for a variety of language disorders (ASHA Standard III-D).

SPHS 5030. Anatomy and Physiology of Speech Mechanisms
3 Credits (3)
In this course, we will delve into the intricate mechanisms that enable human speech. From the complexities of vocal fold vibrations to the nervous system processes involved in speech production, we will explore how the human body orchestrates the art of communication. In this course, you will gain a comprehensive understanding of the biological foundations that shape our ability to speak. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Students will recognize key anatomical structures associated with speech swallowing.
2. Students will be able to explain the physiological function of systems involved in speech swallowing.
3. Students will be able to evaluate the functional integrity of systems involved in speech swallowing.
4. Students will classify speech swallowing symptoms according to their associated clinical syndromes.

SPHS 5035. Speech and Hearing Science
3 Credits (3)
This course will introduce you to the field of speech and hearing science, including basic acoustics, the acoustics of speech sounds (consonants

and vowels), and speech perception. You will examine the acoustic properties of speech sounds using acoustic analysis software (Praat). By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Learning Outcomes

1. Students will describe concepts of basic acoustic physics such as simple harmonic motion, complex waveforms, and resonances.
2. Students will correlate the acoustic properties of the sound source in human speech with characteristics of vocal fold function.
3. Students will describe and measure the acoustic characteristics of vowels and correlate these characteristics to the articulatory parameters of tongue height, tongue advancement, and lip rounding.
4. Students will describe and measure the acoustic properties of the consonant like approximants, nasals, fricatives, stops, and affricates.
5. Students will describe basic human hearing and psychoacoustic properties and understand and describe important theories of speech perception.

SPHS 5040. Speech Disorders Across the Lifespan
3 Credits (3)

This course explores the bases, etiologies, and clinical management of disabilities specific to articulation, phonology, voice, resonance, motor speech, stuttering, and cluttering disorders. Building upon fundamental theories and knowledge regarding communication, we will review characteristics of various speech disabilities along with evidence-based methods of assessment and treatment. Throughout the course, we will critically examine and reflect upon the importance of identities specific to race, gender, language, socioeconomic status, and culture as it pertains to communication and the provision of clinical services. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Learning Outcomes

1. Describe diverse etiologies of speech disorders and compare/contrast assessment procedures (ASHA Standard III-B).
2. Define and compare/contrast the classification for a variety of speech disorders (ASHA Standard III-C).
3. Differentiate between a speech disorder vs a difference that can be attributed to culturally and linguistically different groups (ASHA Standard III-D).
4. Describe evidence-based treatment; evaluate treatment-efficacy evidence for a variety of speech disorders (ASHA Standard III-D).

SPHS 5045. Clinical Methods and Procedures
3 Credits (3)

Clinical Methods and Procedures in Speech-Language Pathology is designed to provide the undergraduate Communication Disorders major with an introduction to clinical methods, clinical oral and written reporting, and clinical observation skills. May be repeated up to 6 credits.

Learning Outcomes

1. Articulate the scope of practice and the roles and responsibilities of Speech-Language Pathologists (SLP), Speech-Language Pathology Assistants (SLPAs), and graduate clinicians.
2. Use basic professional terminology specific to the field of Speech-Language Pathology.
3. Apply principles and therapeutic techniques to oral and written clinical reporting.
4. Identify on- and off-target behaviors, procedures, data collection, and maintenance strategies.
5. Summarize basic procedures for comprehensive clinical assessments.
6. Complete 25 of the 25 American Speech-Language-Hearing Association (ASHA) clock hours of required supervised clinical observation of speech, language, and hearing services.
7. Identify factors to consider when serving culturally and linguistically diverse patient populations.
8. Recognize the ASHA Code of Ethics.

SPHS 5050. Neural Bases of Communication Disorders
3 Credits (3)

This course will cover the neurological bases for speech, language, and hearing. We will explore topics on neuroanatomy and neurophysiology of sensory and motor systems. Specific topics include Central Nervous System development, the structure and function of brain cells, and organization and function of the brain and spinal cord. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Learning Outcomes

1. Explain foundational principles of human neuroscience, including neuronal signaling, embryology, neuroplasticity, sensation/perception, and motor function.
2. Describe and identify the organization and function of major neural structures and pathways involved in speech, language, swallowing, and hearing processes.
3. Evaluate current research on the neural underpinnings of language and speech processing.
4. Interpret clinical case studies and neurological assessment results to hypothesize the likely site and nature of neural damage affecting communication.

SPHS 5055. Aural Rehabilitation
3 Credits (3)

This course introduces you to the theories and procedures used to provide aural/audiological rehabilitation to children and adults who have hearing loss and to provide concomitant services to their family members. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Learning Outcomes

1. Knowledge and understanding of basic concepts and components of aural/audiological rehabilitation.
2. Understanding of assessment procedures for determining aural rehabilitation needs, including means for assessing hearing status, auditory and audiovisual speech recognition, hearing-related disabilities, and conversational fluency.
3. Knowledge about the importance of auditory and visual cues in spoken communication.
4. Knowledge about how hearing loss affects conversational fluency.
5. Knowledge about auditory and speechreading training and communication strategies training.
6. Knowledge about counseling, psychosocial support, and assertiveness training.
7. Understanding how to develop and implement aural rehabilitation plans for children, adults, and their family members.
8. Procedures for developing and implementing auditory training for the pediatric population.
9. Knowledge about the challenges hearing loss poses for acquiring speech and language and learning to read and related assessments and interventions. 1
10. Define and use the appropriate terminology when discussing hard of hearing and deafness. 1

11. Describe the effects of hearing impairment on various aspects of life (cognitive, educational, occupational, and psycho-social aspects in all age ranges). 1
12. Identify the communication needs and develop a basic understanding of common intervention options including communication strategies, auditory training, speech reading, hearing aids, assistive devices, and cochlear implantation. 1
13. Be acquainted with the relevant public laws.

SPHS 5110. Research Methods
3 Credits (3)
This course focuses on introduction to basic research methodology in CSD. The course presents information pertaining to research design and statistical analyses used in speech-language pathology with special consideration of the role of research in evidence-based practice. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Students will demonstrate understanding of the concepts of research ethics and integrity including protection of human subjects.
2. Students will comprehend of concepts of evidence-based practice.
3. Students will locate, use, and critically evaluate library and online sources that support the investigation of research questions pertinent to speech-language and hearing science.
4. Students will interpret basic single variable and two-variable statistical procedures appropriate for single and group designs.
5. Students will read and critically evaluate pertinent research.

SPHS 5120. Assessment of Communication Disorders
3 Credits (3)
Diagnostic theories and management of communication disorders using standardized and descriptive methodology. Includes the practice of interviewing, testing, and oral and written reporting. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Demonstrate knowledge of testing statistics and basic concepts in psychometric assessment.
2. Formulate, implement and summarize one complete successful and efficient assessments: including pre-planning meeting, interview design and implementation, administration of instruments, analysis and integration of results and report writing.
3. Review, summarize and critique one assessment tool for design, use, interpretation and cultural/linguistic inclusivity to classmates.
4. Given case study information, students will be able to: choose an appropriate instrument from assessment tools reviewed; develop an assessment plan for a client; write a report and develop treatment goals.

SPHS 5130. Pediatric Language and Disorders
3 Credits (3)
Normal communication development of neonates, infants, toddlers, and preschoolers; etiologies, and treatment of cognitive, linguistic and social elements of communication problems in family systems. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Demonstrate a working knowledge of the major theories of language acquisition and theoretical perspectives of disorders.
2. Demonstrate an understanding of the aspects related to dialect and second language acquisition of English.
3. Demonstrate knowledge of the core principles of language assessment for the pediatric population (zero-five year old).
4. Summarize and interpret content material relating to pediatric language development/disorders.

SPHS 5140. Speech Sound Disorders
3 Credits (3)
The purpose of this course is to provide graduate students with the knowledge necessary to effectively assess and provide intervention for individuals with speech sound disorders. The content of this course includes the anatomical, linguistic, cultural, and physiological basis of speech sound production; speech sound disorders of differing etiologies; phonetic transcription; culturally sensitive assessment and treatment approaches; appraisal of evidence-based treatment approaches; and discussion of power, privilege, and positionality in the field of speech, language and hearing sciences. Video examples and hands-on learning experiences will be provided to bolster student learning. Students will demonstrate their understanding through multiple modalities. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Identify the impact of anatomical, motor, sensory, cognitive-linguistic, and social factors in speech acquisition associated with typical and atypical development.
2. Transcribe American English speech using the International Phonetic Alphabet and identify the presence of phonological processes.
3. Identify and implement components of a comprehensive, culturally sensitive evaluation for a child with a suspected speech sound disorder.
4. Describe different treatment approaches, generate developmentally appropriate treatment goals, and design activities for a child with a speech sound disorder.
5. Analyze and interpret current and foundational research in the area of speech sound disorders.

SPHS 5210. School Age Language and Disorders
3 Credits (3)
This course will discuss normal communication-learning development of elementary, secondary, and postsecondary students; etiologies, diagnosis, and treatment of interpersonal communication and language-based academic disorders. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Demonstrate a working knowledge of legislation governing service provision in the schools (IDEIA, NCLB) and implementation practices (IEP, five-hundred-four plan, RtI).
2. Demonstrate knowledge of normal language development of school-age children.
3. Demonstrate understanding of language disorders relevant to school-age children.
4. Demonstrate knowledge of evidence-based intervention methodologies for the treatment of language disorders in the school-aged population.

SPHS 5220. Adult Neurogenic Language Disorders
3 Credits (3)
Of the estimated 800,000 strokes that occur each year in the United States, more than one-third result in chronic aphasia or right-hemisphere

disorder. Individuals with aphasia and right-hemisphere disorder following stroke report that their communicative difficulties contribute to feelings of social isolation and reduced functional autonomy, which together result in negative long-term mental health outcomes and reduced quality of life. Speech-language therapy may help to alleviate these hardships, and the skills that you learn in this course will prepare you to do so. As we progress through this course, we'll work to explore the neuropathological underpinnings of aphasia and RHD, while learning more about how such impairments may be assessed and treated. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Learning Outcomes

1. Characterize aphasia and its sub-types based on lesion data and behavioral profiles.
2. Specify standardized and non-standardized measures to evaluate clients with aphasia.
3. Describe principles and techniques to maximize linguistic recovery in individuals with aphasia.
4. Describe the etiology and patterns of recovery associated with aphasia and right-hemisphere disorder.
5. Describe cognitive processes and systems, including language, attention, memory, and executive function, and their relationship to adult neurogenic language disorders.
6. Apply theoretical perspectives of language, cognition, and neurological function as they relate to adult neurogenic language disorders.

SPHS 5230. Fluency Disorders
3 Credits (3)

This course explores theories, perspectives, advocacy, and clinical management relating to children and adults who stutter and/or clutter. We will discuss theoretical perspectives relating to topics such as etiology, persistence, disability, and identity through the evaluation of peer-reviewed research as well as the insights and lived experiences of people who stutter. You will learn about assessment practices, intervention strategies, and counseling principles specific to individuals who stutter and/or clutter. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Learning Outcomes

1. Identify terminology and theories associated with stuttering, cluttering, and typical disfluency.
2. Label, describe and discern typical from atypical disfluency across speakers of one or more languages.
3. Describe and practice using the variety of evidence-based assessment measures and intervention strategies appropriate for individuals who stutter and/or clutter.
4. Demonstrate an understanding of the lived experiences and intersecting identities (culture, gender, race, socioeconomic status) of people who stutter and/or clutter and their family members.
5. Design an advocacy project on behalf of the stuttering and/or cluttering community that may be implemented at the local, regional, national, or international level.

SPHS 5310. Introduction to Augmentative and Alternatice Communication
3 Credits (3)

Assessment and intervention for children and adults with developmental disabilities; Alternative communication strategies and systems for individuals with severe speech and/or language impairments. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: Graduate standing; overall GPA of 3.0.

Learning Outcomes

1. Understand and consider physical and psycho-social, linguistic, and cognitive characteristics of AAC users.
2. Describe assessment methods to determine the best fit of AAC systems to meet the needs of AAC users.
3. Understand how to provide training in the use of various AAC systems for AAC users, their families, and caregivers and educators.

SPHS 5320. Cognitive Communication Disorders
3 Credits (3)

What does it mean to be human? And what are the contents and functions of the human mind? Central to the human experience is cognition—the brain functions that allow us to reason, remember, attend, and communicate. While cognitive processes occur automatically for most people, those with neurological pathologies (such as dementia or traumatic brain injury) often experience cognitive impairments. In this course, we'll work to explore the nature of human cognition, the brain networks that support it, the underlying pathologies that lead to cognitive impairment, and how such impairments may be assessed and treated. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Learning Outcomes

1. Describe dementing diseases and how they affect cognitive-communicative functioning.
2. Specify standardized and non-standardized measures to evaluate clients with dementia.
3. Describe principles and techniques to maximize communicative functioning of individuals with dementia.
4. Describe the epidemiology and etiology of traumatic brain injury.
5. Specify the relationships between the mechanisms of traumatic brain injury and the nature and severity of cognitive-communicative impairments.
6. Specify appropriate diagnostic and treatment methods for individuals with different severity levels of traumatic brain injury.
7. Describe cognitive processes and systems, including attention, memory, and executive function, and their relationship to cognitive communication disorders.

SPHS 5330. Dysphagia
3 Credits (3)

Study of the anatomy and physiology of swallowing and upper aerodigestive systems. Review of the bases and etiologies of child and adult swallowing disorders, including diagnosis, assessment, and treatment. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: A course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Define the anatomy and physiology of normal swallowing and causes of abnormal swallow in the pediatric to geriatric age ranges.
2. Define dysphagia team components.
3. Describe protocol for clinical and instrumental dysphagia evaluation.
4. Describe dysphagia diagnosis and treatment.

SPHS 5335. Swallowing and its Disorders in the Pediatric Population
2 Credits

This class is an introduction to swallowing disorders, normal and abnormal swallow function for the pediatric population. The primary focus of instruction will include normal and impaired swallow function, evaluation and treatment. Your instruction will include lecture, videos, small group discussion, and occasional labs. Of note, this is an introductory course to build a strong foundation of pediatric dysphagia. Your internships, fellowships and professional careers will help build upon this foundation. May be repeated up to 2 credits.
Prerequisite/Corequisite: SPHS 5330.
Learning Outcomes
1. Students will be able to define the anatomy and physiology of normal swallowing and causes of abnormal swallow in the pediatric population.
2. Students will be able to define dysphagia team components and describe protocol for clinical dysphagia evaluation in infants and children.
3. Students will demonstrate knowledge of dysphagia diagnosis and treatment as well as demonstrate ability to document diagnostic findings for the pediatric population.
4. Students will be able to explain indications and methods of non-oral nutrition and ethical considerations when working with pediatric clients from different cultural backgrounds.

SPHS 5340. Motor Speech Disorders
3 Credits (3)
The course will explore role of the central and peripheral motor systems in speech production and speech disorders related to abnormalities in these motor systems. We will emphasize the clinical characteristics, etiologies, neurological bases, and pathologies, assessment, and clinical management of the dysarthrias and apraxia of speech across the lifespan. Students will be able to recognize, assess, and serve the multiple needs of clients with dysarthria and apraxia. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Analyze the neurological and physiological mechanisms underlying motor speech disorders, differentiating between dysarthria types (flaccid, spastic, unilateral upper motor neuron, ataxic, hypokinetic hyperkinetic mixed dysarthria and apraxia of speech).
2. Apply evidence-based assessment techniques to diagnose motor speech disorders across diverse clinical populations.
3. Develop individualized treatment plans incorporating motor learning principles and augmentative communication strategies for individuals with motor speech disorders.
4. Critique current research on motor speech disorders to determine best practices for clinical decision-making.
5. Synthesize patient data, interdisciplinary input, and clinical observations to formulate differential diagnoses and prognostic outcomes for individuals with motor speech disorders.
6. Justify the selection of treatment approaches for motor speech disorders based on current theories of neuroplasticity and motor learning.

SPHS 5350. Voice Disorders/Head and Neck Anomalies
3 Credits (3)
In this course, you will review the laryngeal and respiratory anatomy and physiology necessary for normal voice production. The course will further introduce you to the etiology of different voice disorders of structural, neurological, and psychogenic origin, including phonotraumatic behaviors. We will discuss the assessment and differential diagnosis of these voice disorders and you will have an opportunity to synthesize this knowledge by researching treatment protocols that adequately meet the needs of clients with different voice disorders. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Students will be able to recognize and describe relevant anatomy and physiology of normal voice production including laryngeal and respiratory anatomy and physiology.
2. Students will be able to identify and discuss structural/organic voice disorders.
3. Students will be able to identify and differentially diagnose functional voice disorders.
4. Students will be able to rate different degrees of voice quality and voice characteristics using perceptual rating scales.
5. Students will be able to explain and demonstrate selected therapy techniques for functionally and structurally based voice disorders.

SPHS 5360. Communication Disorders in Neurodiverse Populations
3 Credits (3)
This course is primarily aimed at providing meaningful foundations for the application of evidence-based intervention designs that enhance the development of communication skills for individuals with Autism Spectrum Disorders across the lifespan. May be repeated up to 6 credits.
Learning Outcomes
1. Identify and implement evidence-based interventions for individuals with ASD across a range of ages and abilities
2. Evaluate several evidence-based interventions and determine the best fit based on a client scenario
3. Discuss key features of evidence-based interventions for individuals with ASD
4. Implement evidenced communication interventions with individuals with ASD

SPHS 5410. Professional Issues and Multicultural Practices in Communication Disorders
3 Credits (3)
This course examines professional ethics and issues, reviews regulations and requirements for professional practice, provides an overview and discusses cultural considerations for studying, assessing and treating communication and swallowing disorders in culturally and linguistically diverse (CLD) populations. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Demonstrate use of ASHA code of ethics to interpret specific situations and determine whether they have followed the code.
2. Demonstrate knowledge of professional issues that affect speech-language pathology: may include but are not limited to trends in professional practice; academic program accreditation standards; ASHA practice policies and guidelines; cultural competency and patient centered care; educational legal requirements or policies; and reimbursement procedures.
3. Demonstrate knowledge of appropriate ASHA certification and state licensure requirements.

SPHS 5510. Advanced Spanish Morpho-Syntax for Education Professionals
3 Credits (3)
This class has been designed for Heritage Speakers of Spanish who work in educational settings. It will cover the essential linguistic theory and fundamental structures of the Spanish language. This includes, but is not

limited to, verb morphology, morphosyntactic and syntactic structures. The main goal of this course is to determine what usages fall within the norms of an individual's speech community, or if there are elements that fall outside those norms. Students have to be fluent in Spanish as course will be conducted in Spanish.

SPHS 5520. Best Practices in Bilingual/Multicultural Assessment for Practitioners
3 Credits (3)
The purpose of this course is to provide future speech-language pathologists, educational diagnosticians and special educators with a foundation for evaluating the linguistic, cognitive and academic skills of students from any cultural linguistic background. The course covers a review of the literature on best practices for working with interpreters during assessments. Practitioners will be expected to gather qualitative information about cultural/linguistic and educational histories of school-age children and integrate those results with the results of standardized tests. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Students will be able to summarize cross-cultural differences in communication styles of various cultural groups, and analyze and critically evaluate how these differences impact speech-language services.
2. Students will be able to identify cultural and linguistic variables that may impact speech-language pathology services to members of specific culturally and linguistically diverse (CLD) groups.
3. Students will be able to use culturally and linguistically appropriate assessment tools and practice for diagnosing and distinguishing language disorder vs language difference, describe potential limitations of standardized tests with CLD clients and explain how to use alternative, nonstandardized methods for nonbiased assessment.
4. Students will learn to use culturally and linguistically appropriate intervention strategies for CLD children with speech-language disorders.

SPHS 5988. Clinical Education
1 Credit (1)
This course will provide students with the knowledge base necessary to initiate and successfully complete clinical practicum in Communication Disorders. This course will complement SPHS 5990 (Clinical Practicum) during the first fall and spring semester of the the graduate program. Students will be introduced to current knowledge of the principles and methods of prevention, assessment, and intervention for persons with communication and swallowing disorders, including standards of ethical conduct and interprofessional education. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 4 credits.
Prerequisite/Corequisite: SPHS 5990.
Learning Outcomes
1. Students will recognize treatment strategies used in various clinical settings to work with clients and their families from various cultural backgrounds.
2. Students will understand the importance of ethical and confidential service delivery, including HIPAA and the ASHA Code of Ethics.
3. Students will be able to identify characteristics of professional communication, including report writing, clinical documentation, and the creation of short and long-term clinical goals.
4. Students will demonstrate understanding of critical elements of professional verbal communication with clients, their families, and other professionals.

SPHS 5989. Externship in Communication Disorders
3-9 Credits (3-9)
Students will engage in diagnostic and therapeutic contact with individuals who exhibit speech, language, communication, feeding and/or swallowing disorders. Students will be supervised by licensed Speech-Language Pathologists at the designated setting. The experience will include treatment planning, goal and report writing, patient/parent/family counseling and education, and any additional tasks required. Restricted to: C DS majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 15 credits.
Prerequisite: Completion of a minimum of 8 credits of SPHS 5990 with a grade of B or better.
Learning Outcomes
1. Students will demonstrate the skills necessary to plan and execute an assessment of clients with communication and swallowing disorders at varying severity levels while under the direction of a certified SLP.
2. Students will demonstrate the skills necessary to plan and implement the treatment of clients with communication and swallowing disorders at varying severity levels while under the direction of a certified SLP.
3. Students will demonstrate the principles and methods of identifying and preventing communication swallowing disorders.

SPHS 5990. Practicum in Speech-Language Pathology
1-4 Credits (1-4)
Students will have the opportunity to engage in diagnostic and therapeutic contact with individuals who exhibit speech, language and feeding/swallowing disorders. The experience will include treatment planning, report writing, and patient/parent counseling. Students will be assigned to clients in the ERG Speech and Hearing Center, and may also be assigned to outside mini-externship sites. All students will be supervised by licensed Speech-Language Pathologists. Restricted to: C DS,C D majors. May be repeated up to 15 credits.
Prerequisite: Good standing in the graduate school; a course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.
Learning Outcomes
1. Students will be able to explain a variety of therapeutic approaches, and how to apply these approaches to different communication disorders.
2. Students will be able to select appropriate methods of assessment and treatment based on client presentation.
3. Students will collect clinical data and analyze the data to determine appropriate treatment goals.
4. Students will create and implement treatment plans to target treatment goals.

SPHS 5996. Special Topics
1-9 Credits (1-9)
Individual and/or group study of special topics identified by subtitle. Restricted to: C DS majors. May be repeated up to 9 credits.
Prerequisite: Prior arrangement with faculty; a course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.
Learning Outcomes
1. Varies

SPHS 5999. Master's Thesis
1-15 Credits (1-15)

This is a thesis course and will require you to work with your thesis advisor independently to complete a thesis that meets the requirements of the Graduate School. May be repeated up to 15 credits.

Learning Outcomes

1. Formulate research question(s) by (a) identifying a specific focus of research and (b) reviewing the current literature to identify gaps in the research.
2. Implement an appropriate research method (experimental research project, literature review) – including, as appropriate, IRB approval, data collection, and data analysis – that (a) is aligned with standard procedures in the field, (b) sufficiently addresses the question(s) posed, and (c) is feasible given the time and resources available.
3. Prepare a thesis that meets the standards set by the thesis advisor, the committee, and the Graduate School.

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Communication Disorders - Bachelor of Science in Communication Disorders

The Communication Disorders curriculum provides specialized preparation for students who would like to enter a graduate program in speech-language pathology or audiology and those who plan to work as Speech-Language Pathology Assistant (SLP-A). Students supplement their academic study of typical communication development, communication disorders, and clinical management with observation of the clinical experience in the department's Edgar R. Garrett Speech and Hearing Center and/or via alternative clinical education such as virtual patients. Students must maintain a grade of B or better in all Speech Language Hearing Sciences (SPHS) courses and maintain a cumulative GPA of 3.0 or higher, to remain in the program.

The undergraduate program fulfills all educational requirements needed for certification as Speech-Language Pathology Assistant (SLP-A) by the American Speech-Language-Hearing Association. Details regarding certification are available from the American Speech-Language-Hearing Association (http://www.asha.org/certification/) (ASHA), and for those seeking a license as Apprentice in Speech-Language (ASL) in New Mexico, information can be found on the website of the New Mexico Regulations & Licensing Department (http://www.rld.state.nm.us/boards/speech_language_pathology_audiology_and_hearing_aid_dispensing_practices.aspx).

Professional employment opportunities for speech-language pathologists and audiologists are numerous within settings such as school systems, community clinics, medical centers, hospitals, private practice, residential programs, and schools for individuals with disabilities.

Program Requirements

Required coursework (120 credits; minimum 48 upper-division credits)

Electives to meet the 120 minimum credit hours for this degree can either come from any minor that a student chooses to pursue or any other elective courses not counting elsewhere towards the degree. Recommended minors for this degree are Linguistics, Spanish, or Counseling and Educational Psychology.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: English and Communication		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Choose one from the following:		3
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
or HNRS 2175G	Introduction to Communication Honors	
COMM 1130G	Public Speaking	
Area II: Mathematics		
MATH 1220G	College Algebra (or higher) [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
PSYC 1110G	Introduction to Psychology	3
Choose one sequence from the following:		4
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 1190G	Contemporary Problems in Biology	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
Choose one from the following:		4
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1115G	Survey of Physics with Lab	
PHYS 1125G	Physics of Music [recommended]	
Area V: Humanities [2]		*3*
PHIL 2110G	Introduction to Ethics [recommended]	
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective [2]		
SOCI 1110G	Introduction to Sociology	3
or SOCI 2310G	Contemporary Social Problems	
Viewing a Wider World Courses (must be from two different colleges) [3]		**6**
Departmental/College Requirements		
SPHS 2110	Introduction to Communication Disorders	3

SPHS 4510	Phonetics	3
SPHS 4520	Audiology	3
SPHS 4610	Language Acquisition	3
SPHS 4620	Speech and Hearing Science	3
SPHS 4710	Speech Disorders Across the Lifespan	3
SPHS 4715	Language Disorders Across the Life Span	3
SPHS 4720	Anatomy and Physiology of Speech Mechanisms	3
SPHS 4810	Clinical Methods and Procedures	3
SPHS 4820	Neural Bases of Communication Disorders	3
SPHS 4830	Aural Rehabilitation	3
Non- Departmentals Requirements (in addition to Gen.Ed/VWW)		
PSYC 2120	Developmental Psychology	3
or PSYC 2220	Cognitive Psychology	
PHLS 4620V	Cross-Cultural Aspects of Health	3
or PHLS 3130V	Global Environmental Health Issues	
LING 2110G	Introduction to the Study of Language and Linguistics	3
LING 302V	Language and Society	3
or LING 303	Exploring Language Systems	
Choose one from the following:		3
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
A ST 311	Statistical Applications	
Choose one from the following:		3
GNDR 381V	Women's Health Issues	
BEST 4550	Borderlands Representations	
ANTH 1140G	Introduction to Cultural Anthropology	
Second Language: (see below)		
SIGN 1110	American Sign Language I [3]	3
or SPAN 1110	Spanish I	
SIGN 1120	American Sign Language II [3]	3
or SPAN 1120	Spanish II	
Electives, to bring total credits to 120 [5]		**24**
SPHS 3110V	Autism Spectrum Disorders - a Lifespan Perspective	
12 credits must be upper-division		
Total Credits		**120**

1. MATH 1220G College Algebra is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G first.
2. See the General Education (https://catalogs.nmsu.edu/nmsu/general-education-viewing-wider-world/) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. SPAN 1110 Spanish I/SPAN 1120 Spanish II or an advanced Spanish course.
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1220G	College Algebra [1]	3
PSYC 1110G	Introduction to Psychology	3
Choose two from one of the following:		6
ANTH 1140G	Introduction to Cultural Anthropology	
GNDR 381V	Women's Health Issues	
PHIL 2110G	Introduction to Ethics	
	Credits	**16**
Semester 2		
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
MATH 1350G	Introduction to Statistics [1]	3
SOCI 1110G	Introduction to Sociology	3
LING 2110G	Introduction to the Study of Language and Linguistics	3
SPHS 2110	Introduction to Communication Disorders	3
	Credits	**15**
Second Year		
Semester 1		
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	4
PSYC 2120	Developmental Psychology	3
LING 302V	Language and Society	3
Choose from one of the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
Minor (or Elective) Course		3
SIGN 1110 or SPAN 1110	American Sign Language I or Spanish I	
	Credits	**16**
Semester 2		
PHYS 1125G	Physics of Music	4
SPHS 3110V	Autism Spectrum Disorders - a Lifespan Perspective	3
Choose from one of the following:		3
LING 303	Exploring Language Systems	
PHLS 3130V	Global Environmental Health Issues	
Minor (or Elective) Course		3
SIGN 1120 or SPAN 1120	American Sign Language II or Spanish II	
	Credits	**13**

Third Year		
Semester 1		
SPHS 4510	Phonetics (Fall Only) [1]	3
SPHS 4520	Audiology (Fall Only) [1]	3
Minor (or Elective) Course		3
PHLS 4620V	Cross-Cultural Aspects of Health	
PSYC 2220	Cognitive Psychology	
Minor (or Elective) Course		3
SIGN 2110	American Sign Language III	
	Credits	**12**
Semester 2		
SPHS 4610	Language Acquisition (Spring Only) [1]	3
SPHS 4620	Speech and Hearing Science (Spring Only) [1]	3
Minor (or Elective) Course		9
SIGN 3110	American Sign Language IV	
BFIN 303V	Personal Financial Planning and Investing in a Global Economy	
MUSC 1210	Fundamentals of Music for Non-majors	
	Credits	**15**
Fourth Year		
Semester 1		
SPHS 4715	Language Disorders Across the Life Span (Fall Only) [1]	3
SPHS 4720	Anatomy and Physiology of Speech Mechanisms (Fall Only) [1]	3
SPHS 4810	Clinical Methods and Procedures [1]	3
VWW: Viewing a Wider World Course [3]		3
GNDR 381V	Women's Health Issues	
Minor (or Elective) Course		3
SIGN 3210	Introduction to Deaf Community	
	Credits	**15**
Semester 2		
SPHS 4830	Aural Rehabilitation (Spring Only) [1]	3
SPHS 4710	Speech Disorders Across the Lifespan (Spring Only) [1]	3
SPHS 4820	Neural Bases of Communication Disorders (Spring Only) [1]	3
Minor (or Elective) Course		3
SIGN 4110	Deaf Culture	
Upper Division Elective [3]		6
	Credits	**18**
	Total Credits	**120**

1. These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

American Sign Language - Undergraduate Minor

Prefix	Title	Credits
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
SIGN 2110	American Sign Language III	3
SIGN 3110	American Sign Language IV	3
SIGN 3210	Introduction to Deaf Community	3
SIGN 4110	Deaf Culture	3
Total Credits		**18**

Kinesiology

Undergraduate Program Information

The **Department of Kinesiology** at New Mexico State University offers a dynamic Bachelor of Science in Kinesiology designed to prepare students for a range of professional careers, advanced study, and meaningful engagement in health, human movement, and education. Grounded in scientific inquiry, applied practice, and experiential learning, our programs equip students with the knowledge, skills, and professional competencies to succeed in diverse fields such as allied health sciences (including physical therapy, occupational therapy, clinical exercise physiology, and pre-medicine pathways), athletic training, strength and conditioning, dance, physical education, performance psychology, and leadership roles within the fitness and wellness industries.

The **Bachelor of Science in Kinesiology** provides a strong scientific foundation in anatomy, physiology, biomechanics, motor behavior, and the psychology of movement, paired with applied learning experiences that build critical thinking, professional competency, and evidence-based practice. Students may tailor their studies through concentrations in **Exercise Science**, **Performance Psychology**, and **Physical Education**, each offering distinct pathways and outcomes. The Department of Kinesiology also offers a fully online Bachelor of Science in Kinesiology with a concentration in **Applied Exercise Science**.

The **Bachelor of Arts in Dance** provides focused and progressive training in dance technique, performance, choreography, and movement studies within a supportive and artistically rich environment. Students develop technical strength, creative expression, and cultural and artistic understanding that prepare them for careers in performance, teaching, community arts, and related professional pathways.

In addition, students may pursue **minors in Dance, Exercise Science, or Pre-Health,** which provide meaningful opportunities to explore movement, creativity, and human performance while complementing a variety of academic majors. These programs broaden students' professional skill sets, enrich their educational experience, and strengthen preparation for careers in health, education, performance, and community wellness.

Graduate Program Information

Master of Science in Athletic Training

The **Master of Science in Athletic Training (MSAT)** at New Mexico State University is a dynamic, professional graduate program designed to prepare students to become highly skilled, compassionate, and evidence-informed athletic trainers. This 60-credit hour, 2-year (24-month) program blends rigorous academic preparation with meaningful hands-on clinical experiences through a combination of traditional and hybrid coursework. Students develop advanced knowledge in injury prevention, clinical evaluation and diagnosis, emergency care, rehabilitation, and patient-centered healthcare delivery while gaining practical experience in diverse athletic and clinical settings.

The program begins each June and prepares graduates to sit for the **Board of Certification (BOC)** examination leading to the ATC credential.

The MSAT is **accredited by the Commission on Accreditation of Athletic Training Education (CAATE)**, ensuring that students are trained to the highest professional standards. Admission is competitive and applications are submitted through the **ATCAS centralized application system**, with a deadline of April 15. Prospective students are encouraged to reach out for guidance and support as they explore the program. Questions can be directed to the Athletic Training Program Director, Kim O'Connell, at **(575-646-5744)**.

Doctor of Philosophy in Kinesiology

The **Doctor of Philosophy (Ph.D.) in Kinesiology** at New Mexico State University provides students with the opportunity to engage in deep, meaningful scholarship across the physiological, biomechanical, psychological, and pedagogical dimensions of human movement. The program emphasizes the development of advanced research skills, innovative teaching practices, and scholarly expertise that prepare graduates to contribute new knowledge to the field and improve health, performance, and quality of life across diverse populations.

Doctoral students work closely with faculty mentors to design individualized programs of study aligned with their professional interests and career goals. Areas of specialization include **Exercise Physiology, Biomechanics, Sport Psychology, Motor Behavior, Aging, and Physical Education**. Graduates are prepared for academic faculty positions, postdoctoral research placements, and leadership roles in applied, clinical, educational, and performance settings, where they can shape the future of kinesiology research, practice, and education. Questions can be directed to the Graduate Program Coordinator, Larissa True, at **(575-646-5873)**.

Admission

Applicants are encouraged to submit materials by **January 15** for priority consideration for fall admission. Admission is competitive and based on a holistic review of academic preparation, research potential, and alignment with faculty expertise. Applicants should identify and connect with a prospective faculty mentor as part of the application process. A complete application typically includes official transcripts, GRE scores, three letters of recommendation, a CV or résumé, a personal statement outlining research interests and career goals, and a faculty support letter from a Department of Kinesiology mentor. To apply, please visit the graduate school (https://gradschool.nmsu.edu/) website.

Degrees for the Department

Bachelor Degree(s)

- Dance - Bachelor of Arts in Dance (p. 1307)
- Kinesiology (Applied Exercise Science) - Bachelor of Science in Kinesiology (Online) (https://catalogs.nmsu.edu/global/nmsu-global/kinesiology-applied-exercise-science-bachelor-science-kinesiology-online/)
- Kinesiology (Exercise Science) - Bachelor of Science in Kinesiology (p. 1308)
- Kinesiology (Performance Psychology) - Bachelor of Science in Kinesiology (p. 1311)
- Kinesiology (Physical Education) - Bachelor of Science in Kinesiology (p. 1314)

Master Degree(s)

- Athletic Training - Master of Science (p. 103)

Doctoral Degree(s)

- Kinesiology - Doctor of Philosophy (p. 229)

Minors for the Department

- Dance - Undergraduate Minor (p. 1316)
- Exercise Science - Undergraduate Minor (p. 1316)
- Pre-Health - Undergraduate Minor (p. 1233)

Faculty and Administration

Department Head: Christopher A. Aiken, PhD

Professors Iwasaki, Oliver ***Associate Professor*** Aiken, True ***Assistant Professor*** Hirsch, Yoder, Vanderlinden ***College Professor*** O'Connell ***College Associate Professor*** Aranda, Meyer, Snyder ***College Assistant Professor*** McMullen, Spicer

C. Aiken, PhD *(Louisiana State University) - Department Head, Kinesiology Program Director, Motor Behavior;* ***R. Aranda, MS*** *(New Mexico State University) - Physical Education;* ***K. Hirsch, PhD*** *(University of Windsor) - Sport and Exercise Psychology;* ***Y. Iwasaki, PhD*** *(University of Waterloo) - Recreation;* ***R. McMullen, MFA*** *(Florida State University) - Dance;* ***S. Meyer, PhD*** *(New Mexico State University) - Strength and Conditioning;* ***K. O'Connell, MS*** *(California University of Pennsylvania) - Athletic Training Program Director;* ***B. Snyder, DAT*** *(AT Still University) - Coordinator of Clinical Education, Athletic Training;* ***K. Oliver, PhD*** *(Virginia Polytechnical Institute) - Physical Education;* ***K. Spicer, MS*** *(Northern Arizona University) - Athletic Training;* ***L. True, PhD*** *(Michigan State University) - Graduate Program Coordinator, Motor Behavior;* ***A. Vanderlinden, PhD*** *(University of Texas, El Paso) - Biomechanics;* ***H. Yoder, PhD*** *(University of Alabama) - Exercise Physiology*

Dance Courses (DANC)

DANC 1110G. Dance Appreciation
3 Credits (3)
This course introduces the student to the diverse elements that make up the world of dance, including a broad historic overview,roles of the dancer, choreographer and audience, and the evolution of the major genres. Students will learn the fundamentals of dance technique, dance history, and a variety of dance aesthetics. Restricted to: Main campus only. May be repeated up to 3 credits.
Learning Outcomes

1. Explain a range of ideas about the place of dance in our society.
2. Identify and apply critical analysis while looking at significant dance works in a range of styles.
3. Identify dance as an aesthetic and social practice and compare/contrast dances across a range of historical periods and locations.
4. Recognize dance as an embodied historical and cultural artifact, as well as a mode of nonverbal expression, within the human experience across historical periods and cultures.
5. Use dance to consider contemporary issues and modes of thought.

DANC 1130. Ballet I
1 Credit (1)
This course is the beginning level of ballet technique. Students learn the basic fundamentally and performance skills of ballet techniques, which may include flexibility, strength, body alignment, coordination, range of motion, vocabulary, and musicality. May be repeated up to 2 credits.

Learning Outcomes

1. Apply fundamental movements of ballet techniques.
2. Enhance flexibility, strength, body alignment, coordination, balance, kinesthetic awareness, range of motion, and musicality.
3. Employ basic theories of classical ballet placement and proper alignment.
4. Develop basic ballet terminology, variations in timing and changes of facing, and barre and center combinations.

DANC 1131. Introduction to Ballroom Dance
1 Credit (1)
An introduction to ballroom dance at the beginning level. Students will learn the fundamentals of technique including carriage, common movement vocabulary, and partnering, and will be introduced to steps and dances from the Bronze Syllabus of American Smooth and International Standard dances. Offered every Fall. May be repeated up to 2 credits.

Learning Outcomes

1. Execute the basic figures of various Ballroom dances in American and International styles
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow
3. Develop the skills of style and performance quality within the dance
4. Demonstrate improved overall physical capability, musicality, and movement memory
5. Appreciate Ballroom dancing as an artform and a discipline

DANC 1135. Introduction to Argentine Tango
1 Credit (1)
An introduction to Argentine Tango at the beginning level. Students will learn the fundamentals of technique including carriage, common movement vocabulary, and partnering, as well as the history and culture of the form. Offered Spring of even years. May be repeated up to 2 credits.

Learning Outcomes

1. Execute the basic figures of Tango and Argentine Tango
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow
3. Develop the skills of style and performance quality within the dance
4. Articulate the cultural and historical underpinnings of these forms as World dances
5. Demonstrate improved overall physical capability, musicality, and movement memory
6. Appreciate Tango as an artform and a discipline

DANC 1140. Flamenco I
1 Credit (1)
This course introduces the student to the art of flamenco and its cultural features and significance. Students will learn the fundamentals of this art form and introductory techniques and skills, which may include handwork, footwork, postures, and specific dances. May be repeated up to 2 credits.

Learning Outcomes

1. Demonstrate a basic level of competency in the principles of alignment, anatomy, coordination, mobility, stability, and stamina.
2. Demonstrate fundamental flamenco techniques relative to spatial awareness, rhythm, phrasing, and sequencing.
3. Demonstrate competency with basic flamenco movement vocabulary.
4. Perform a variety of flamenco dances, poses, steps, hand movements, and combinations.

DANC 1150. Modern Dance I
1 Credit (1)
Modern Dance techniques and styles. Students are introduced to proper warm-up techniques, body alignment, control and flexibility. Students work with various rhythms and combinations of movements. The course emphasizes dance technique and creative experience. The history, terminology and philosophy of Modern Dance are also discussed. May be repeated up to 2 credits.

Learning Outcomes

1. Use a more developed sense of muscle control and strength, stretch and balance, coordination.
2. Demonstrate and verbalize an increased awareness of Modern Dance techniques
3. Execute dance phrases,combining several movements and in more than one rhythm.
4. Demonstrate an increased awareness of musicality while dancing and use Modern Dance Techniques creatively.

DANC 1155. Introduction to Hip Hop Dance
1 Credit (1)
This course provides an engaging and energetic introduction to the foundational elements and cultural history of hip-hop dance. Students will learn basic techniques, rhythms, and movements inspired by various hip-hop styles, including breaking, popping, locking, and social dances. The course emphasizes musicality, body awareness, self-expression, and an understanding of hip-hop as a global cultural phenomenon. No prior dance experience is required.

Learning Outcomes

1. Identify and execute fundamental hip-hop dance movements and techniques.
2. Understand the historical context and cultural significance of hip-hop dance.
3. Develop a basic sense of rhythm, musicality, and timing in relation to hip-hop music.
4. Explore personal style and self-expression through freestyle and choreography.
5. Demonstrate improved body awareness, coordination, and spatial understanding.
6. Engage respectfully with the diverse origins and evolution of hip-hop culture.

DANC 1161. Tap Dance
1 Credit (1)
The theory and practice of tap dance technique at the beginning level. No previous dance experience is expected. Coursework includes vocabulary and movement exercises in both Buck & Wing and Rhythm styles. May be repeated once for a maximum of 2 credits. May be repeated up to 2 credits.

Learning Outcomes

1. Recognize and articulate the fundamentals of tap technique, vocabulary, and history.
2. Exhibit improved timing, dexterity, and style through the experience of various schools of tap dance technique, including Buck and Wing and Rhythm.
3. Define proper body alignment and control and understand basic mechanical concepts essential to efficient movement.
4. Demonstrate improved overall physical capability, musicality, and movement memory.
5. Appreciate tap dance as an artform and a discipline.

DANC 1185. Introduction to Country Western Dance
1 Credit (1)
An introduction to Country Western Dance at the beginning level. Students will learn the fundamentals of technique and several dances, including Country Western Two-Step, Nightclub Two-Step, Polka, and Line Dance. Offered Fall of odd years. May be repeated up to 2 credits.
Learning Outcomes
1. Execute the basic figures of various Country Western social dances.
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow.
3. Develop the skills of style and performance quality within the dance.
4. Demonstrate improved overall physical capability, musicality, and movement memory.
5. Appreciate Country Western dancing as an artform and a discipline.

DANC 1220. Introduction to Latin Social Dance
1 Credit (1)
An introduction to Latin social dance at the beginning level. Students will learn the fundamentals of technique including carriage, common movement vocabulary, and partnering, and will be introduced to steps and dances from the Bronze Syllabus of American Rhythm and International Latin dances. Offered every Spring. May be repeated up to 2 credits.
Learning Outcomes
1. Execute the basic figures of various Latin dances in American and International styles.
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow.
3. Develop the skills of style and performance quality within the dance.
4. Demonstrate improved overall physical capability, musicality, and movement memory.
5. Appreciate Latin dancing as an artform and a discipline.

DANC 1235. Introduction to West Coast Swing Dance
1 Credit (1)
An introduction to West Coast Swing dancing at the beginning level. Students will learn the fundamentals of technique of several Swing forms and the Hustle, including basic steps, partnering, and musical forms. Offered Fall of even years. May be repeated up to 2 credits.
Learning Outcomes
1. Execute the basic figures of both West Coast Swing and the Hustle.
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow.
3. Develop the skills of style and performance quality within the dance.
4. Demonstrate improved overall physical capability, musicality, and movement memory.
5. Appreciate Swing dancing as an artform and a discipline.

DANC 2130. Ballet II
2 Credits (2)
Intermediate level of ballet technique; Introduction of more advanced Ballet vocabulary at barre/center work; increase flexibility, strength, body alignment, and coordination for practice of steps/combinations with variations in timing and changes of facing. Restricted to Las Cruces campus only. May be repeated up to 8 credits.
Learning Outcomes
1. A successful student will be able to understand and execute with accuracy all the steps presented on the take home quizzes and are encouraged and expected to attend at least two semesters of each level in order to advance to the next level of ballet technique

DANC 2150. Modern Dance II
2 Credits (2)
Modern II is designed to further the student's abilities in modern dance technique, to enhance efficient use of weight and momentum, to release held patterns in the body's mechanics, to enrich spatial awareness, and to begin work on performance techniques. May be repeated up to 8 credits.
Learning Outcomes
1. Improve accuracy in alignment and shape
2. Improve precision in space, in timing and rhythm, and in focus/intent
3. Learn combinations and movement dynamics quickly
4. Begin to integrate performance techniques while working in the classroom setting
5. Use a concentrated attitude and an open, creative mind to approach the work in an artistic manner unique to your abilities
6. Listen, see and apply all the information given within one class period and over the semester
7. Self-awareness and mindfulness: how much space do you take in the class and why? How aware are you of those around you, and those you are dancing with?
8. Release of weight to create controlled momentum
9. Locating center and moving from there

DANC 2157. Hip-Hop Dance II
2 Credits (2)
This course covers hip hop dance and its relationship to other aspects of hip-hop culture, music, and media, with an emphasis on creativity, individuality, and expression. Coursework may include street styles, breaking, and various regional forms. This is an intermediate level dance course. May be repeated up to 6 credits.
Learning Outcomes
1. Recognize and articulate the fundamentals of various styles of hip hop dance technique and vocabulary.
2. Contextualize the history and cultural aspects of hip hop dance.
3. Examine the relationship between dance and other aspects of hip hop culture such as music and media representation.
4. Demonstrate improvement in overall physical capability, musicality, and movement memory.
5. Appreciate hip hop dance as an artform and a discipline.

DANC 2170. Commercial Dance
2 Credits (2)
This course delves into the dynamic world of commercial dance, focusing on the foundational techniques, stylistic nuances, and performance demands of commercial jazz and hip-hop. Students will explore the historical evolution, influential choreographers, and current trends within these vibrant dance forms as they apply to the entertainment industry (music videos, live concerts, film, television, and touring). Emphasis will be placed on developing versatility, adaptability, stage presence, and the ability to quickly learn and execute complex choreography.
Learning Outcomes
1. Demonstrate proficiency in core techniques and stylistic elements of commercial jazz and various hip-hop styles (breaking, popping, locking, house, new school).
2. Execute complex choreographic phrases with musicality, dynamics, and performance quality.
3. Analyze and articulate the historical and cultural contexts of commercial jazz and hip-hop.

4. Identify and apply strategies for quick retention and execution of choreography.
5. Develop a heightened sense of stage presence, adaptability, and versatility in performance.
6. Understand the professional expectations and demands of the commercial dance industry.
7. Work collaboratively in a studio setting, demonstrating professionalism and respect.

DANC 2270. Dance Improvisation
2 Credits (2)
An introduction to the practice of dance improvisation focusing on play and discovery as methods for generating movement and exploring the full potential of the communicative, authentic body in motion. Course content includes concepts in Body, Effort, Shape, Space, Kinesthetic Response, Scoring, and Contact. Offered Spring of even years.
Prerequisite: DANC 1150.
Learning Outcomes
1. Understand the core concepts of exploration and authenticity and the importance of these ideas to a modern dancer and choreographer.
2. Demonstrate immediacy of presence, both physically and mentally, in the way that they responding to both choices and instincts in the moment.
3. Connect the concepts learned in Modern dance technique to the study of dance improvisation and the concepts of this class to outside work as dancers, students, and citizens.
4. Access the constantly expanding movement vocabulary which will inform their work moving forward in dance technique and composition.
5. Improvise confidently both individually and as part of a group.

DANC 2310. Bronze American Rhythm
2 Credits (2)
Bronze level American Rhythm patterns, techniques, and partnering with emphasis on elements of dance. May be repeated up to 6 credits.
Learning Outcomes
1. Learn to dance the Bronze DIVIDA Manual in American Rhythm
2. Develop Bronze level dance technique
3. Gain deeper understanding of the Elements of Dance
4. Develop rhythmic accuracy in movement, ability to dance on time discover phrasing
5. Further develop lead follow skills that will enable you to dance at more advanced levels

DANC 2311. Bronze American Smooth
2 Credits (2)
Bronze level American Smooth patterns, technique, and partnering with an emphasis on the elements of dance. May be repeated up to 4 credits.
Learning Outcomes
1. Learn to dance the Bronze DIVIDA Manual in International Latin
2. Develop Bronze level dance technique
3. Gain deeper understanding of the Elements of Dance
4. Develop rhythmic accuracy in movement, ability to dance on time discover phrasing
5. Further develop lead follow skills that will enable you to dance at more advanced levels

DANC 2320. Bronze International Latin
2 Credits (2)
This is the style of Latin dance that is danced around the globe and is featured in the World DanceSport Championships. Students will learn the Bronze Level figures and techniques in four (4) International Style dances: Rumba, Cha Cha, Samba & Jive. May be repeated up to 6 credits.
Learning Outcomes
1. Learn to dance the Bronze DIVIDA Material for the International Latin Syllabus
2. Develop Bronze level dance technique
3. Gain deeper understanding of the Elements of Dance
4. Develop Smooth accuracy in movement, ability to dance on time discover phrasing
5. Further develop lead follow skills that will enable you to dance more advanced levels

DANC 2321. Bronze International Standard
2 Credits (2)
This is the style of Ballroom dance that is performed around the globe and is featured in the World DanceSport Championships. Learn the Bronze Level figures and techniques in five (5) International Style dances: Waltz, Tango, Viennese Waltz, Foxtrot & Quickstep. Students will focus on understanding technical elements of dance, memorizing and performing routines. May be repeated up to 6 credits.
Learning Outcomes
1. Learn to dance the Bronze DIVIDA Manual in International Standard
2. Develop Bronze level dance technique
3. Gain deeper understanding of the Elements of Dance
4. Develop Smooth accuracy in movement, ability to dance on time discover phrasing
5. Further develop lead follow skills that will enable you to dance at more advanced levels

DANC 2460. Dance for Musical Theatre
2 Credits (2)
This course will supplement the dance technique curriculum specifically in support of the study of Musical Theatre. Students will practice various social, world, and theatrical dance forms, learn selections from iconic choreography, experience mock dance auditions, and explore the skill of dance composition for musical theatre repertory. Offered every Spring. May be repeated up to 4 credits.
Prerequisite: DANC 1130 or DANC 1160.
Learning Outcomes
1. Participate successfully in dance techniques and styles outside of the basic tap, jazz, ballet, and modern dance curriculum.
2. Recognize and contextualize musical theatre history and repertory through exposure to significant historical choreography and choreographers.
3. Understand and excel at the skill of taking part in a musical theatre dance audition.
4. Demonstrate improvement in overall physical capability, musicality, and movement memory.
5. Appreciate the practice of musical theatre dance as an artform and a discipline.

DANC 3110. DanceSport Pedagogy: Smooth
3 Credits (3)
In this teacher education course, students will begin to develop skills necessary in becoming a successful, professional Ballroom Dance Instructor. Students will gain technical mastery of Bronze level figures in the four (4) American Style Smooth Ballroom Dances to include the Waltz, Foxtrot, Tango and Viennese Waltz. Students will gain practical teaching

experience in the area of Group Class Instruction with required in class practicums. May be repeated up to 12 credits.
Prerequisite: DANC 2311.
Learning Outcomes
1. Students will understand several philosophies of teaching
2. They will gain teaching skills through practical experience.
3. The students will teach both group and private lessons.
4. The student will gain knowledge about learning styles.

DANC 3114. DanceSport Ensemble
1 Credit (1)
Involvement with the DanceSport performance ensemble rehearsal and performance process. May substitute for 1 credit of the Contemporary Dance Ensemble course in the Dance Major. May be taken in every semester of undergraduate study or for up to 8 hours credit. Students can enroll by audition only. Consent of the instructor is required. May be repeated up to 8 credits.
Learning Outcomes
1. Collaborate in the process of creating a work of Latin or Ballroom dance.
2. Participate in the process of producing a dance concert with fully realized technical elements including lighting and costumes.
3. Apply the knowledge and skills that are being developed in the study of dance technique, choreography, and pedagogy to the culminating performance experience.
4. Demonstrate a more developed sense of artistry, energy, ingenuity, and presence onstage.

DANC 3130. Ballet III
2 Credits (2)
The theory and practice of ballet technique at the advanced level. A high level of technical accomplishment, artistry, and professionalism is expected. May be repeated twice for a maximum of 6 credits. May be repeated up to 6 credits.
Prerequisite: DANC 2130.
Learning Outcomes
1. Achieve a greater clarity of line, released use of turnout, and expressivity in port de bras and epaulement, demonstrating improved adagio and allegro skills at the advanced level.
2. Experience the idiosyncrasies of the Cecchetti, Vaganova, and Bournonville techniques and differentiate the Romantic, Classical, Neo-Classical, and Contemporary styles.
3. Apply experience from other disciplines such as modern dance to the exercise of ballet, referencing concepts such as body patterning and energy pathways.
4. Demonstrate an increased level of physical and artistic achievement and professionalism.

DANC 3150. Modern Dance III
2 Credits (2)
The theory and practice of modern dance technique at the advanced level. A high level of technical accomplishment, artistry, and professionalism is expected. Course may be repeated twice for a maximum of 6 credits. May be repeated up to 6 credits.
Prerequisite: DANC 2150.
Learning Outcomes
1. Delve into movement concepts with a greater sense of risk and challenge at the advanced level.
2. Achieve an increased mastery of alignment, control, and efficiency, taking full advantage of the knowledge of body patterning and energy pathways.
3. Improvise solo, in an ensemble, and with a partner, demonstrating the application of instinct and choice in the authentic body.
4. Increase the student driven problem-solving skill that is essential to a professional modern dance artist.
5. Demonstrate a high level of physical and artistic achievement.

DANC 3210. Music for Dancers
2 Credits (2)
This course is designed to deepen dancers' understanding of musical principles and their direct application to dance. Students will explore fundamental concepts of rhythm, tempo, dynamics, form, and style, learning how to listen analytically and respond expressively to various musical genres. The class will integrate theoretical knowledge with practical movement exercises, fostering a more nuanced and musical approach to dance performance and choreography. No prior musical training is required, but a basic understanding of dance technique is recommended.
Learning Outcomes
1. Identify and articulate fundamental musical elements such as rhythm, tempo, meter, and dynamics.
2. Analyze musical structures and forms (AABA, verse-chorus) and apply this understanding to dance.
3. Develop a heightened sense of musicality and timing in their movement.
4. Respond expressively to different musical genres and styles.
5. Utilize musical cues to inform choreographic choices and improvisation.
6. Understand the relationship between music and dance history, recognizing key periods and influential artists.
7. Communicate effectively about musical concepts using appropriate terminology.

DANC 3250. Dance Repertory
1 Credit (1)
This course is designed to immerse students in the process of learning, rehearsing, and performing existing dance works (repertory). Students will gain practical experience in various choreographic styles and performance practices, developing their technical proficiency, artistic interpretation, and collaborative skills. The class will focus on understanding choreographic intent, adapting to different movement vocabularies, and preparing works for presentation. Prior dance experience is required, and students should be prepared for rigorous physical and mental engagement. May be taken in every semester of undergraduate study or for up to 8 hours credit. May be repeated up to 8 credits.
Learning Outcomes
1. Accurately learn and reproduce complex choreographic sequences from existing repertory.
2. Develop a deeper understanding of various choreographic styles and their historical contexts.
3. Enhance technical proficiency, musicality, and performance quality in diverse dance forms.
4. Cultivate artistic interpretation and expressiveness within a choreographic framework.
5. Collaborate effectively with peers and instructors in a rehearsal setting.

6. Understand the process of preparing a dance work for public performance.
7. Apply critical thinking to analyze and discuss choreographic choices and performance aesthetics.

DANC 3265. Dance Composition I
3 Credits (3)
An introduction to the basic tools of dance composition, beginning with improvisation and including body, space, time, energy, and elements of design. Offered Fall of even years.
Prerequisite: DANC 2270.
Learning Outcomes
1. Understand the core improvisational concepts of exploration, authenticity, instinct, and choice, and the importance of these ideas to a modern dancer and choreographer.
2. Connect the concepts learned in Modern I to the study of dance improvisation and composition and the concepts of this class to outside work as dancers, students, and citizens.
3. Build a constantly expanding movement vocabulary.
4. Recognize and use the basic components of dance composition- body, space, time, and energy- and explore the roles of invention and communication in the creation of contemporary dances.
5. Develop the communication skills necessary to articulate and defend academic and artistic choices and to give and receive feedback.
6. Begin building a body of creative work and developing a sense of personal values as an individual and as an artist.

DANC 3310. Silver American Rhythm
3 Credits (3)
Silver level American Rhythm patterns and technique with emphasis on performance. May be repeated up to 9 credits.
Prerequisite: DANC 2310.
Learning Outcomes
1. To enhance advanced dance sport skills beyond Bronze Level

DANC 3311. Silver American Smooth
3 Credits (3)
Silver level American Smooth patterns and technique with emphasis on performance. May be repeated up to 9 credits.
Prerequisite: DANC 2311.
Learning Outcomes
1. Advance introductory skill levels and enhancing technique towards Gold level

DANC 3320. Silver International Latin
3 Credits (3)
Students will learn Silver Level syllabus figures in four (4) International Style dances: Rumba, Cha Cha, Samba & Jive and Bronze Level figures in Paso Doble. Continued training and practice in International Style Latin dance technique. May be repeated up to 9 credits.
Prerequisite: DANC 2320.
Learning Outcomes
1. Learn and work towards mastery for the four different styles of dances in Dance Sport

DANC 3321. Silver International Standard
3 Credits (3)
Learn Silver Level syllabus figures in the five (5) International Style Standard dances: Waltz, Tango, Viennese Waltz, Foxtrot & Quickstep. Students will focus on increased technical understanding to increase their ability in partnering and musicality. May be repeated up to 9 credits.
Prerequisite: DANC 2321.

DANC 3350. Dance Pedagogy I
3 Credits (3)
This course will include discussion of human development, body patterning, teaching methods, the structure and analysis of course content, and educational values as they apply to teaching creative movement and dance technique. Student must have one semester each of ballet and modern technique or permission of the instructor to enroll. Offered Spring of odd years.
Prerequisite: DANC 2130 and DANC 2150.
Learning Outcomes
1. Understand the basic progression of human development and how the study of Creative Movement and Dance can aid in that development physically, cognitively, and emotionally.
2. Recognize basic sociological and developmental demographic factors and determine how to develop lessons that are appropriate, safe, and constructive.
3. Communicate clearly, assertively, thoughtfully, appropriately, and constructively, recognizing communication as a vital skill in education.
4. Expand upon an existing syllabus of terminology, rhythmic structures, and movement vocabulary that is necessary in a comprehensive elementary dance education.
5. Practice executing a basic dance class structure including short and long-term lesson plans and a variety of teaching methods.
6. Begin developing a system of personal values and a philosophy of education that will engender an effective, ethical, and responsible teaching practice.

DANC 3510V. World Dance
3 Credits (3)
Examination of dance forms from a cross-cultural perspective, focusing on the role of dance in different cultures around the globe. Same as HNRS 347V. May be repeated up to 3 credits.
Learning Outcomes
1. An understanding of the social importance of dance in diverse cultural settings
2. A familiarity with the importance of dance as a vehicle through which various identities (i.e. cultural, gender and personal), roles (i.e. social and status) and values (i.e., personal and cultural) are identified and expressed.
3. An understanding of dance as a form of non-verbal communication.
4. The ability to discuss and compare culture's dance forms.
5. The ability to recognize how other art forms, religions, and political climates affect cultural identity.

DANC 3610. Dance History
3 Credits (3)
A survey of dance history from ancient Greece to the 21st century. Major emphasis on the development of dance as a Theatrical artform, on Ballet and Modern dance in Europe, Russia, and the U.S., and on criticism and theory of choreography and performance. Offered Fall of even years.
Learning Outcomes
1. Quantify factual knowledge of the progression of dance including primitive forms, court dance, ballet, and modern dance.
2. Recognize and contextualize important choreography, dancers, choreographers, composers, events, and phenomena in the history of Western Theatrical dance.
3. Discuss some of the root problems that dance historians face, such as the imperfect nature of documentation.

4. Understand how history shapes contemporary practices in dance.
5. Watch dance critically in order to derive choreographic intention and meaning in the work.
6. Articulate and support an informed point of view, both verbally and in writing, about works of concert dance.

DANC 3710. Somatics and Anatomy of Movement
3 Credits (3)
This course combines the study of human anatomy and physiology with the principles of Somatics in various forms to address dance movement in terms of body connectivity, efficiency, and access to full physical capability. Student should complete one semester of Modern Dance technique before enrolling. Offered Fall of odd years.
Learning Outcomes
1. Understand the mechanics of basic human anatomy and physiology, including but not limited to bones, muscles, and joints, and explore the way that this quantitative knowledge can help in understanding and developing the dancer's kinesthetic abiity.
2. Recognize the vitality of basic components of wellness, including nutrition and injury prevention and treatment, and the impact that these issues have on dance as a professional practice.
3. Integrate the basic principles of various somatic fields outside of ballet and modern dance technique into their personal artistic practice and understand the ways that these additional methods can enhance their physical capability.
4. Apply their knowledge of physiology, wellness, and somatic systems to the study and practice of dance pedagogy.

DANC 3720. Dance Technology and Design
3 Credits (3)
This course explores the integration of technology into the creative process, focusing on projects in graphic design and filmmaking. Students will learn the fundamentals of photography, publicity design, sound editing and design, film documentation of live dance, and Dance for the Camera, and will be introduced to software including Photoshop and Final Cut. Offered Spring of odd years.
Prerequisite: DANC 3265.
Learning Outcomes
1. Demonstrate proficiency with some of the relevant technology, software, and tools that are used in producing digital images and video.
2. Effectively promote themselves and their work in their communities and online as 21st century artists and professionals must be prepared to do.
3. Think more broadly about the capabilities of their creative work, beginning with the choreographic process, with respect for the way that technology can enhance the artform of concert dance, and produce choreography in non-traditional formats.
4. Apply the skill of articulating specific and purposeful artistic choices, as is also being developed in technique, pedagogy, and composition classes.

DANC 4250. Dance Pedagogy II
3 Credits (3)
The theory and practice of dance pedagogy focusing in greater depth on technique and branching into professional preparation, including dance studio management. Coursework will include application of somatic and anatomical principles and diverse teaching methods in many disciplines, plus the creation of a business plan and professional portfolio. Outside field experience in teaching dance technique will be required. Offered Spring of even years.
Prerequisite: DANC 3350.
Learning Outcomes
1. Demonstrate a deepening understanding of both theoretical and practical aspects of dance pedagogy, organizing the knowledge, skills, and artistic content of dance into effective, ethical, and responsible teaching practices.
2. Give and receive constructive critical feedback to and from their peers.
3. More effectively communicate with their students to answer questions and address concerns in the classroom.
4. Integrate artifacts, readings, and teaching tools which facilitate critical thinking and technical development in the dance class.
5. Prepare and implement a plan to establish and run a school of dance as a business.
6. Continue formulating an expanding system of educational values regarding the rights and responsibilities of the teacher, the student, and the institution.

DANC 4265. Dance Composition II
3 Credits (3)
Using the tools introduced in Dance Composition I, students will explore new methods of generating movement, delving into language, rhythmic and musical studies, props and architecture, sources of inspiration, and meaning making. Students will also be guided to consider the integration of technical and theatrical elements into the choreographic process and the relationship between their artistic work and their personal and social values.
Prerequisite: DANC 3265.
Learning Outcomes
1. Surpass the principles learned in Choreography I to create increasingly complex contemporary work, informed by new points of inspiration, broader subject matter, and greater relevance.
2. Demonstrate a deepening understanding of the choreographic process as an exercise in Meaning-Making, using an unlimited movement vocabulary applied with absolute clarity.
3. Articulate the choices in craft and intention that are the underpinnings for the creation of work that is reflective of the artist's personal and social values.
4. Create a wide and diverse body of work, utilizing multiple dancers, various styles of music, and varied creative processes.

DANC 4266. Advanced Independent Projects
1-3 Credits (1-3)
Independent work in dance practice, pedagogy, composition, or theory under faculty guidance. Intended to allow the student to broaden their experience and expertise in an artistic or academic area of dance beyond the published coursework. This course may substitute for Special Topics within the dance major if a project of sufficient depth and rigor is proposed. Consent of Instructor required. May be repeated up to 6 credits.
Learning Outcomes
1. Demonstrate development in the skill of self-driven learning.
2. Apply strong practices of inquiry and discovery, developed in other cross-disciplinary coursework, to their own personal areas of research and creative interest.
3. Exhibit a deeper understanding of specific artistic, academic, or theoretical field within the study of dance, reflective of the student's goals and values.

DANC 4310. Gold American Rhythm
3 Credits (2+2P)
Advanced level American Rhythm dance technique and partnering work with choreography and performance emphasized. Includes cultural history and pedagogy methods. May be repeated up to 6 credits.
Prerequisite: DANC 3310.
Learning Outcomes
1. To enhance dance sport skills beyond Silver Rhythm

DANC 4311. Gold American Smooth
3 Credits (3)
Gold level American Smooth technique and choreography with an emphasis on performance and competition dancing. May be repeated up to 9 credits.
Prerequisite: DANC 3311.
Learning Outcomes
1. Continue to work towards mastery of dance sport perfection through advanced training

DANC 4320. Gold International Latin
3 Credits (3)
Students will complete all syllabus figures through the Gold level in the Rumba, Cha Cha, Samba, Jive and Paso Doble. Advanced training and practice in International Style Latin dance technique. May be repeated up to 9 credits.
Prerequisite: DANC 3320.

DANC 4321. Gold International Standard
3 Credits (3)
Students will learn Gold Level syllabus figures in the five (5) International Style Standard dances: Waltz, Tango, Viennese Waltz, Foxtrot & Quickstep. Students will focus on physical and cognitive mastery of standard dance technique and elements as well as high-level performance ability, musicality and choreography. May be repeated up to 9 credits.
Prerequisite: DANC 3321.

DANC 4610. DanceSport Certification Preparation
3 Credits (3)
The Professional Certification process offers extraordinary benefits to dance teachers, deeply enriching their dancing and teaching, and greatly expanding their career opportunities. This intensive course is designed to fully prepare students in taking the DVIDA and/or ISTD exams in the Smooth, Rhythm, Standard or Latin dances depending on course offered. See subtitle for specific style being taught in schedule of classes. May be repeated up to 12 credits.

DANC 4710. Senior Project
3 Credits (3)
As a capstone to the undergraduate study of dance, majors will select a research topic of interest to them and use the information gathered to inform the choreographic or pedagogical process. The project will include both academic and creative components. Students must be in Senior standing. Consent of Instructor required.
Learning Outcomes
1. Synthesize the complete undergraduate study of dance technique, performance, pedagogy, and choreography.
2. Connect the practice of academic research to the choreographic or pedagogical process.
3. Demonstrate a reinforced understanding of dance as an art form and the essential practices of creation, communication, meaning making, and reflection.
4. Present a professional portfolio appropriate to a dance artist, including a cover letter, CV, resume, and statement of teaching philosophy.

DANC 4996. Special Topics
1-3 Credits (1-3)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 3 credits.
Learning Outcomes
1. Varies

DANC 4997. Problems
1-6 Credits (1-6)
Problems in dance education, dance pedagogy, dance performance and independent work in their solutions. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

Physical Education Courses (PHED)

PHED 1110. Dance:
1 Credit (1)
Individual sections vary based on topic content; “audience”; type or level of participation. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

PHED 1230. Individual Sport:
1 Credit (1)
Individual sections vary based on topic content; “audience”; type or level of participation. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

PHED 1290. Team Sport:
1 Credit (1)
Individual sections vary based on topic content; “audience”; type or level of participation. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

PHED 1310. Swim I:
1 Credit (1)
Individual sections vary based on topic content; “audience”; type or level of participation. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

PHED 1320. Aqua Fit:
1 Credit (1)
Individual sections vary based on topic content; “audience”; type or level of participation. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

PHED 1330. Lifeguarding
2 Credits (2)
Skills training for a nonsurf lifeguard. Course will include Standard First Aid and CPR certification. May be repeated up to 2 credits.
Learning Outcomes
1. To help the student become aware of the common hazards associated with various types of aquatic facilities and to develop the knowledge and skills to eliminate or minimize such hazards.

2. To help the student develop the skills necessary to recognize a person in distress or in a drowning situation and to effectively rescue that person.
3. To help the student understand their responsibility to their employer, fellow employees and especially to the patrons of their facility.
4. To provide explanations, demonstrations, practice and review of the rescue skills essential for lifeguarding.
5. To instill in the students an understanding and appreciation for the responsibilities, swimming skills and additional duties of lifeguarding.
6. To develop more advance swimming skills to assist in a water rescue.

PHED 1410. Yoga:
1 Credit (1)
Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

PHED 1430. Pilates:
1 Credit (1)
Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

PHED 1510. Training:
1 Credit (1)
Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

PHED 1620. Fitness:
1 Credit (1)
Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

PHED 1630. Career Fitness:
1 Credit (1)
Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 10 credits.
Learning Outcomes
1. Varies

PHED 1670. Aerobics:
1 Credit (1)
Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

PHED 1830. Running:
1 Credit (1)
Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 4 credits.
Learning Outcomes
1. Varies

PHED 1910. Outdoor Experience
1 Credit (1)
Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

PHED 2120. Healthy Life Skills and Personal Wellness
3 Credits (3)
This course has been designed to provide students with the knowledge and skills necessary to cultivate a holistic approach to well-being by giving students effective strategies for achieving and maintaining a balanced and fulfilling life, including coping skills to navigate the challenges of college life. Through a combination of lectures, discussions, activities, and self-reflection, students will explore various dimensions of wellness and develop practical strategies to enhance their overall health and vitality.
Learning Outcomes
1. Explain the principles of wellness, emphasizing the significance of exercise, nutrition, and wellbeing for sustaining health throughout life.
2. Describe effective strategies and methodologies to enhance wellness.
3. Develop individualized goals pertaining to various facets of wellness to promote personal growth and fulfillment.
4. Evaluate personal wellness levels to establish baseline and monitor progress towards specific goals across diverse dimensions of well-being.
5. Participate in a self-tailored wellness regimen, integrating introspective assessments to monitor personal progress effectively.
6. Critically assess and refine wellness plans based on alterations in wellness evaluations and personal reflections, ensuring continuous alignment with evolving health and fitness aspirations.

PHED 2996. Special Topics
1-3 Credits (1-3)
Specific subjects to be announced in the Schedule of Classes. Each offering will carry appropriate subtitle. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

Sports Medicine (SPMD - Kinesiology and Athletic Training)

SPMD 1110. Introduction to Athletic Training
3 Credits (3)
Introduction to the principles of athletic training. May be repeated up to 3 credits.
Learning Outcomes
1. Understand the historical development of athletic training and sports medicine.
2. Understand the knowledge and experiences needed to become a Certified Athletic Trainer.
3. Understand the specific responsibilities and duties of an athletic trainer.
4. Understand the diverse jobs settings within the profession of athletic training.
5. Understand the relationship between the athletic trainer and the sports medicine team.
6. Understand some of the general and specific injuries and medical conditions that occur in athletics;their causes, signs and symptoms, treatments, rehabilitation, and prevention.

7. Understand some of the contemporary issues and problems facing the athletic training profession.

SPMD 1120. Medical Terminology
3 Credits (3)
Study of the structure of medical language with emphasis on sports medicine-related terminology. To include analysis and interpretation of medical documentation. Restricted to: Las Cruces campus only.
Learning Outcomes
1. Master the fundamentals of word analysis, including the separation of terms into word roots or combining forms, common prefixes, and suffixes.
2. Differentiate types of medical terms and the relationships among terms.
3. Develop a proficiency in the use of physiological and anatomical terms as reflected in medical documents.
4. Master the terms, words, phrases, and symbols that describe the human body in its various states of health and disease, including essential anatomical terms.

SPMD 1190. Clinical Practicum I
2 Credits (2)
Introduction to the clinical aspects of the athletic training education program. Must maintain at least 3.0 GPA. May be repeated up to 4 credits.
Learning Outcomes
1. The Athletic Training Program application procedures.
2. The ability to perform selected taping and wrapping techniques.
3. Knowledge of HIPAA guidelines, pre-participation physical examinations, environmental illnesses, the history of Athletic Training and its governing bodies, Evidence Based Practice and its implications in the field of athletic training, evaluation procedures for the injured athlete, NMSU AT program and its affiliated clinical sites.
4. Proper documentation for the athletic training environment including SOAP notes.

SPMD 1195. Clinical Practicum II
3 Credits (3)
Athletic training related content and psycho-motor skills are introduced, enhanced, and assessed in the classroom and clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses while providing increased depth of understanding and clinical practice. Must maintain a 3.0 GPA. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate knowledge and skill in emergency situation prevention, recognition, and management.
2. Demonstrate proficiency in basic skills of musculoskeletal injury recognition and management.
3. Demonstrate competency in basic pre-participation exam skills, including but not limited to taking vital signs.
4. Demonstrate competency in wound care and first aid.

SPMD 1310. Introduction to Kinesiology
3 Credits (3)
An introduction to the field of Kinesiology which will explore areas such as exercise physiology, sport and exercise psychology, motor behavior, biomechanics, strength and conditioning, exercise prescription, as well as professional and graduate programs, and allied health and applied careers opportunities.

Learning Outcomes

SPMD 1350. Social Foundations of Physical Activity
3 Credits (3)
Historical and cultural foundations and vocational, scientific, and educational data on careers in health education, physical education, and recreation.
Learning Outcomes
1. Improve students' knowledge of foundations of physical education. (Research) (Standard 4 j, k, l, m, o, p)
2. Improve students' abilities to analyze current physical activity issues based on historical, philosophical, sociological, and psychological perspectives. (Research) (Standard 4 l, m, e, g)
3. Improve students' knowledge of and ability to critically analyze how gender, race, social class, sexual orientation, and ability issues affect physical education and performance programs. (Research, Diversity) (Standard 4j, k, l, m, o; Standard 2 d, g, j, f, k)
4. Improve students' knowledge of forces influencing the development of physical education programs. In particular, attitudes, values, and beliefs about gender, race, social class, sexual orientation, and ability, etc. (Diversity, Practitioners, Reflection, Pedagogy) (Standard 1 a, b, h, l; Standard 4 j, k, l, m, o; Standard 2 a, d, g, j, f, k)
5. Improve students' knowledge of strategies for becoming an advocate in the school and/or community to promote a variety of physical activity opportunities. (Practitioners) (Standard 2 m, n; Standard 3 n, o, p, q, r; Standard 10 d, j, p
6. Improve students' knowledge of current educational issues and trends. In particular, socio-cultural issues that affect educational, fitness, and sports settings. (Diversity, Research) (Standard 4 j, k, l, m,o, p Standard 9 a, c, e, f m, n)
7. Improve students' knowledge of how students' learning is influenced by individual experiences, talents, and prior learning, including language and family/community values and conditions. (Diversity, Research) (Standard 1 b, h, l; Standard 2 d, g, j, k, m, n, o; Standard 3 l)
8. Improve students' knowledge of the impact of international changes on the content of physical education, fitness, and sports programs. (Research) (Standard 4 j, k, l, m, o, p)
9. Improve students' ability to critically analyze how gender, race, sexuality and social class issues affect how we view the body, and how these views can affect students' health and participation in physical education, fitness, and sports programs. (Diversity, Reflection) (Standard 2 d, g, j, f, k, m, o) 1
10. Improve students' ability to become critically aware of how their feelings, beliefs, and values in relation to gender, race, social class, sexual orientation, and ability issues will affect their abilities to work as professionals in the fields of physical education, sport, or fitness. (Diversity, Reflection) (Standard 2d, g, j, f, k, m, o Standard 9 e, d, g, l, m) 1
11. Improve students' knowledge of and ability to critically analyze cultural stereotypes of diverse populations of people. (Diversity) (Standard 2 d, g, j, f, k, m, o) 1
12. Improve students' knowledge of how cultural stereotypes influence the development of physical education, fitness and sport programs. (Research, Diversity) (Standard 2 d, g, j, f, k, m, o; Standard 4 j, k, m, o, p, q Standard 8 p) 1
13. Improve students' knowledge of how groups influence individuals, and how individuals influence groups in a democratic society. (Diversity) (Standard 2 d, g, j, f, k, m, o; Standard 4 m, p;) 1

14. Improve students' abilities to communicate in ways that demonstrate sensitivity to all learners. (Diversity, Effectiveness) (Standard 1 d, h, l; Standard 2 d, g, j, f, k, m, o) 1
15. Students will demonstrate through writing the ability to apply the issues discussed in class to their specific fields in ways that benefit society. (Evaluation) (Standard 9 e, g, l, m) 1
16. Students will improve their ability to take the content from readings and present it in thought provoking ways to their classmates. (Research, Evaluation, Reflection) (Standard 9 e, g, l, m; Standard 10 a, d, h, n) 1
17. Writing proficiency is required for a passing grade in this course. (Standard 4 l) 1
18. Improve students' abilities to use computers and other technologies to communicate, network, and/or foster inquiry. (Standard 10 g) 1
19. Consult professional literature, colleagues, and other resources to develop as a professional.(Standard 10 e, f, h, l, n, r)

SPMD 2210. Anatomy and Physiology I
3 Credits (3)
Detailed study of the structure and function of the human musculoskeletal, cardiovascular, respiratory, and peripheral nervous systems. Designed specifically for students interested in allied health professions.
Learning Outcomes
1. The student will learn and identify bones, connective tissue, joints and muscular structures of the human body.
2. The student will study joints and associated structures of the body.
3. The student will learn about skeletal muscle, origins, insertions, and actions.
4. The student will learn about the fundamentals of the nervous system and associated structures.
5. The student will learn about smooth and cardiac muscle and their association actions.
6. The student will learn the structures associated with the cardiovascular system (heart and blood vessels).
7. The student will learn the location of all visceral organs.
8. Evaluation of knowledge is determined through practical identification of anatomical structures via written opened ended exams.

SPMD 2210L. Anatomy and Physiology Laboratory
1 Credit (1P)
Students will engage in activities designed to enhance appreciation of the anatomical structures related to the content areas for SPMD 2210. Restricted to Las Cruces campus only.
Learning Outcomes
1. The student will learn and identify bones, connective tissue, joints and muscular structures of the human body.
2. The student will study joints and associated structures of the body.
3. The student will learn about skeletal muscle, origins, insertions, and actions.
4. The student will learn about the fundamentals of the nervous system and associated structures.
5. The student will learn about smooth and cardiac muscle and their association actions.
6. The student will learn the structures associated with the cardiovascular system (heart and blood vessels).
7. The student will learn the location of all visceral organs.
8. Evaluation of knowledge is determined through practical identification of anatomical structures via written opened ended exams.

SPMD 2225. Anatomy and Physiology II
3 Credits (3)
This course is the second of two that serve as an introduction to human anatomy and physiology for any student interested in allied health and/or kinesiology. The course entails describing, explaining, and analyzing structure and function from the submicroscopic to the organismal level with emphasis on specific cellular, tissue, and organ structure and physiology, and organ system structure and function# specifically the endocrine, urinary, digestive, integumentary, renal, central nervous, and reproductive systems. Additionally, an analysis of these concepts is included: fluid and electrolyte balance, pregnancy, growth and development from zygote to newborn, and heredity.
Prerequisite: SPMD 2210 or BIOL 2210.
Learning Outcomes
1. Identify and describe the major anatomical features of the endocrine, lymphatic, digestive, integumentary, renal, urinary, and reproductive systems.
2. Analyze the physiological roles of the endocrine, lymphatic, digestive, urinary, central nervous, immune, and reproductive systems in maintaining homeostasis in the human body.
3. Explain how fluid and electrolyte balance is maintained in the human body.
4. Compare and contrast the anatomy and physiology of male and female reproductive systems.
5. Describe pregnancy from conception to parturition including human growth and development from zygote to newborn.
6. Explain heredity and genetic control.

SPMD 2225L. Anatomy and Physiology II Lab
1 Credit (1)
This is the second in a series of two laboratory courses designed to introduce laboratory practices and techniques for human anatomy and physiology, from the basic cell structure through the organ system level# specifically the endocrine, digestive, lymphatic, respiratory, urinary, and reproductive systems.
Prerequisites: SPMD 2210; SPMD 2210L; or BIOL 2210; BIOL 2210L.
Learning Outcomes
1. Apply the scientific method correctly.
2. Collect, analyze, and interpret scientific data.
3. Use laboratory equipment correctly and safely.
4. Identify the anatomical components of human tissues, organs, and organ systems using models, diagrams, illustrations, or cadaver specimens.
5. Describe the functional characteristics of human tissues, organs, and organ systems using models, diagrams, illustrations, or cadaver specimens.
6. Analyze the physiological processes of the endocrine, lymphatic, respiratory, digestive, urinary, and reproductive systems.
7. Analyze the physiological processes of fluid and electrolyte balance and acid base balance in the human body.
8. Analyze heredity and genetic control.

SPMD 2250. Fitness for Health and Sport
3 Credits (3)
A study of the fitness needs for health enhancement and sport participation.

Learning Outcomes

1. Recognize the importance of incorporating positive fitness/wellness habits within one's lifestyle in terms of enhancing longevity, disease prevention, and overall quality of life.
2. Examine various physiological benefits and adaptations to such factors as muscular strength, muscular endurance, cardiovascular fitness, flexibility, and body composition when certain stimuli are applied to each. Assessment of these characteristics will be witnessed primarily in practical experiences within the course's laboratory settings.
3. Identify current trends and/or health patterns within society in regards to scientific findings, declination in health habits, and increases in health ailments.
4. Compare various nutritional concepts, specifically proper dietary habits and their impact on weight management aspects.
5. Describe the role physical activity and sport specific training play on competitive athletic performance.

SPMD 2310. Career Preparation
1 Credit (1)
From concept to implementation: Career exploration, setting up degree plans, finding graduate programs, developing professional resumes, writing letters of application, seeking letters of recommendation, and interview preparation.

Learning Outcomes

1. Career opportunities within human movement and allied health fields
2. Chose both a primary and secondary career of their interest
3. Search for appropriate graduate schools to match their career choices
4. Create a plan by aligning their undergraduate curriculum with their career choices
5. Explore additional education (dual majors, minors, and certifications specific to their chosen field)
6. Study and create a professional resume
7. Create a curriculum vita as a historical reference for future job prospects
8. Write a professional letter of application for jobs and school applications
9. Learn how to seek "outstanding' letters of recommendation 1
10. Study appropriate interview protocol 1
11. Practice interviews (one on one, panel and group)

SPMD 3050. Therapeutic Modalities
4 Credits (4)
The physiological effects, indications, contraindication, dosage, and maintenance of therapeutic modalities related to the treatment of athletic or activity-related injuries. May be repeated up to 4 credits.
Prerequisite: SPMD 2210 or BIOL 2210; 2.75 GPA.

Learning Outcomes

1. Demonstrate proper assessment techniques to identify appropriate therapeutic modalities for the treatment of injury and illnesses.
2. Design treatment plans based upon sound clinical assessment and appropriate selection of modalities that address the physiological and psychological needs of the patient.
3. Demonstrate competence with the application of a wide variety of modalities including patient preparation, modality application and modification based upon clinical findings using principles of evidence based practice.
4. Perform appropriate documentation of treatments to include patient history, evaluation, treatment goals, expectations and treatment outcomes.
5. Demonstrate competence with the collection and analysis of baseline and post-treatment data to evaluate and interpret treatment outcomes based upon principles of evidence-based practice.

SPMD 3110. Racquet Sports
2 Credits (2)
Knowledge and skills related to the racquet sports of tennis, badminton, and pickleball with emphasis on developmental strategies and skill performance that influences pedagogical content knowledge. Administrative issues will be addressed.

SPMD 3120. Theory and Technique of Lifelong Outdoor Leisure Activities
2 Credits (2)
Knowledge and skills related to lifelong outdoor leisure activities, including the examination of environmental science and awareness, kinesiology, and fundamental motor skills.

SPMD 3130. Theory and Technique of Sports and Games
2 Credits (2)
Knowledge and skills related to team sports and games, with emphasis on developmental strategies and skill performance that influence pedagogical content knowledge. Administrative issues will also be addressed.

SPMD 3140. Designing Student Centered Afterschool Physical Activity Clubs
3 Credits (3)
Knowledge, skills and field based practical application for creating student centered and student designed after school physical activity clubs.

SPMD 3150. Theory and Technique of Dance and Rhythms
2 Credits (2)
Knowledge and skills related to dance and rhythms, with emphasis on the analysis of dance elements and its role in physical education.

SPMD 3160. Elementary School Physical Education
3 Credits (2+2P)
Methods for teaching physical education at the elementary level. Primary focus on creating a learning environment for the acquisition and enhancement of developmentally appropriate locomotor, manipulative, and nonmanipulative skills. Field experience included. Consent of Instructor required.
Prerequisite: GPA of 2.5.

Learning Outcomes

1. Improve your knowledge of K-5 physical education content, disciplinary concepts, and tools of inquiry related to the development of a physically educated person.
2. Improve your knowledge of and ability to plan instruction based on curriculum goals/objectives and students' experiences.
3. Improve your ability to design and teach developmentally appropriate K-5 physical education curriculum for diverse learners.
4. Improve your knowledge of, and ability to, teach a variety of manipulative, nonmanipulative and locomotor skills and concepts.
5. Improve your ability to teach using a variety of strategies such as cooperative learning, problem-based learning, direct instruction that facilitate learning.
6. Improve your ability to plan effective units/lessons to insure equity and sensitivity to the needs of students with diverse characteristics, including, critically analyzing content/curriculum in light of

broad goals for education and b) structuring a safe, educational environment that facilitates learning for all students.
7. Improve your knowledge of and ability to help individuals work productively and cooperatively with others.
8. Improve your ability to create an equitable learning climate in which individual differences are respected and be able to model, teach, and integrate multicultural awareness, acceptance, and appreciation.
9. Improve your knowledge of and ability to incorporate critical thinking, problem solving and creative exploration into your lessons. 1
10. Improve your knowledge of professional literature, research, organizations, and other technological resources for continuing professional development. 1
11. Improve your knowledge of and ability to use appropriate professional behavior. 1
12. Improve your ability to model appropriate verbal and written communications. 1
13. Improve your ability to encourage students to recognize, question, and interpret ideas from a variety of perspectives.

SPMD 3240. Research Methods in Kinesiology
3 Credits (3)
This course will provide you with a foundational understanding of research methods. Specifically, the course is designed to prepare you to critically read, understand, and evaluate research; retrieve scholarly articles; and develop research-related skills for future graduate education and/or professional work in kinesiology.
Learning Outcomes
1. Research a topic of interest using scholarly sources.
2. Identify a research problem based on relevant literature.
3. Compare research methods in various kinesiology subdisciplines.
4. Discuss ethical issues in research.
5. Design a research methodology to answer a kinesiology question.

SPMD 3250. Introduction to Exercise Science: Exercise Physiology and Biomechanics
3 Credits (3)
This course serves to provide a broad introduction to both the physiology of exercise and the mechanics of human movement. The conceptual framework of the course will allow for the development of a broad knowledge base regarding these concepts and the latter portions of the course will focus on real world application of the concepts.
Learning Outcomes
1. Students will learn a basic introduction to both exercise physiology and biomechanics and describe physiological systems and their relationship to exercise.
2. Explain how different forces affect human movement.
3. Evaluate current research in exercise physiology and biomechanics.
4. Apply exercise science concepts to real-world examples.
5. Integrate exercise science concepts into a physical activity lesson.

SPMD 3310. Lifetime Activities
2 Credits (2)
Knowledge and skills related to the lifetime activities of swimming, weight training, and other fitness promoting activities with emphasis on learning progressions.
Prerequisite: GPA 2.5.
Learning Outcomes
1. All course objectives are linked to the InTASC Teaching Standards
2. Improve your ability to design and teach developmentally appropriate fitness lesson plans for diverse learners (e.g. aerobics, yoga, strength training). (Standard 7 a, b, c, l, j Standard 8 a, b, d)
3. Improve your ability to modify instructions, lesson plans and tasks based on students' strengths and needs. (Standard 1 b, Standard 3 e, Standard 7 b, c, i, j, l, Standard 8 a, b, d)
4. Improve your knowledge of, and ability to teach a variety fitness content (Standard 7 a, g, h, k, l, n)
5. Improve your ability to plan effective lesson plans to insure equity and sensitivity to students with diverse characteristics. This includes structuring a safe, educational environment that facilitates learning for all students. (Standard 3, e, Standard 7 q, i)
6. Improve your ability to use self-assessment and peer-assessment to reflect on your teaching and plan for adaptations/adjustments (Standard 8 b, d, Standard 9 g).
7. Improve your ability to evaluate and modify instructional resources and curriculum to better meet the needs of their students. (Standard 4 f, Standard 7 g, Standard 8 a)

SPMD 3350. Inferential Statistics in Sport and Exercise Science
3 Credits (3)
Statistical concepts and methods basic to experiential research to include normal distribution, z-tests, t-tests, analysis of variance and regression analysis. An understanding of sport and exercise science theory is required for students enrolling in this course.
Learning Outcomes
1. Express mathematical information symbolically, visually, numerically, and verbally.
2. Employ quantitative methods, such as arithmetic, algebra, geometry, or statistics to solve problems.
3. Evaluate mathematical results for reasonableness.
4. Employ technology to organize, analyze, and present statistical information.
5. Interpret and draw inferences from mathematical models such as formulas, graphs, tables, and schematics.
6. Critically evaluate statistical outcomes for their practical significance.

SPMD 3410. Exercise Physiology
3 Credits (3)
Basic physiological principles as they apply to exercise and fitness programs. Laboratory experiences included. Requires 2.75 GPA.
Prerequisite: SPMD 2210 or BIOL 2210; GPA 2.75.
Learning Outcomes
1. Describe the structure and function of skeletal muscle.
2. Illustrate physiological responses and adaptations to acute bout of exercise as well as to exercise training.
3. Describe the structure and function of the cardiorespiratory system.
4. Describe age and sex considerations in sport and exercise.
5. Demonstrate effects of physical activity for health and fitness.
6. Explain the intervention strategies for athletic success.
7. Describe the laboratory procedures used to study the human body system.

SPMD 3410L. Exercise Physiology Lab
1 Credit (1P)
Laboratory experiments emphasizing the understanding of fundamental physiological mechanisms, regulating responses, and adaptation to

exercise. Basic analytical methodologies pertaining to the energy, muscular and circulatorespiratory systems. Includes factors affecting physiological performance capacities and experimental basis of exercise assessment and training.
Prerequisite: SPMD 2210, SPMD 2210L.
Corequisite: SPMD 3410.
Learning Outcomes

1. Develop basic skills and competencies in clinical and experimental laboratory assessment techniques. Emphasis is placed on a healthy population with introductory concepts for special populations.
2. Understand the theory behind basic tests used in the exercise physiology laboratory.

SPMD 3450. Biomechanics
3 Credits (3)
The application of anatomical, mechanical and electrical concepts to better understand the fundamental nature of human movement.
Prerequisite: SPMD 2210 or BIOL 2210, and GPA of 2.75.
Learning Outcomes

1. Understand how human motion is generated using basic anatomical, kinematic, and kinetic concepts, laws, and principles.
2. Demonstrate an understanding of linear and angular motion.
3. Describe human motion using appropriate, well-defined terminology.
4. Demonstrate an understanding of how the body is affected by forces.
5. Utilize kinematic and kinetic concepts to solve computational and practical problems.

SPMD 3450L. Biomechanics Laboratory
1 Credit (1)
This course serves to provide an introduction to human movement and its analysis. The conceptual framework of the course will allow for the application of anatomical, mechanical, and electrical concepts in order to better understand the fundamental nature of movement.
Prerequisite: SPMD 2210 or BIOL 2210, GPA 2.75.
Corequisite: SPMD 3450.
Learning Outcomes

1. Utilize kinematic and kinetic concepts to solve computational and practical problems.
2. Gain exposure to the various data collection and analysis tools in biomechanics.
3. Apply conceptual biomechanics knowledge to biomechanics datasets.
4. Collaborate in student teams to develop a biomechanics research proposal.

SPMD 3550. Psychology of Sport
3 Credits (3)
Development of coaching techniques to enhance sport performance based on understanding and use of psychological principles.
Prerequisite: GPA 2.75.
Learning Outcomes

1. Identify psychological characteristics associated with peak performance.
2. Recognize and define the psychological constructs including, but not limited to, confidence, motivation, stress/anxiety, and arousal.
3. Understand how personal factors and situational factors can affect human performance.
4. Describe and explain factors practitioners should consider when diagnosing, designing, and implementing a mental training intervention.
5. Read, evaluate, and apply sport psychology literature.

SPMD 3610. Health and Exercise Psychology
3 Credits (3)
The course examines the reciprocal relationship among physical activity, exercise behavior, and psychological determinants associated with adopting and maintaining an exercise program. Topics include theories of behavioral change, exercise psychology interventions, the benefits/pitfalls of exercise, and psychological factors influencing patient rehabilitation.
Prerequisite: GPA 2.75.
Learning Outcomes

1. Describe and compare various theories for explaining health and exercise behaviors.
2. Define key constructs prevalent in motivating clients to maintain or enhance health and exercise behaviors.
3. Describe and explain relationships between various antecedents of exercise and exercise as well as between exercise and various outcomes.
4. Apply health and exercise psychology constructs, such as motivation, mental health, and personality, to realistic scenarios to help promote health and exercise behaviors.

SPMD 3650V. Motor Development
3 Credits (3)
Covers development of motor skills from infancy through maturity. Focus on the principles of motor development, early motor behavior, stage theory, and assessment. Field experiences will augment lecture and readings.
Prerequisite: GPA 2.5.
Learning Outcomes

1. Define and discuss key terms, concepts, and theories related to lifespan motor development.
2. Analyze the various constraints that surround the development of motor skills and discuss how they contribute to the resulting motor skill behavior.
3. Explain key processes, sequences, factors, and milestones related to various stages of motor development across the life span.
4. Apply theoretical knowledge in a real-world setting through structured field observations of children at various lifespan and developmental stages.
5. Understand basic biomechanical processes as they apply to developmental change.
6. Describe the qualitative as well as quantitative changes that occur in fundamental motor skills (walking, running, jumping, hopping, throwing, kicking, catching, and striking).
7. Assess developmental levels of fundamental motor skills on video and in real-world settings.
8. Identify motor development phenomena that are universal while applying concepts of environmental and sociocultural constraints that contribute to individual variability in motor development.

SPMD 3710. Motor Learning
3 Credits (3)
An examination of the theoretical foundations and related literature that underline the learning, performing, and retention of motor skills with implications for effective teaching and coaching.

Prerequisite: GPA 2.5.

Learning Outcomes

1. Assess functional differences between motor skill types.
2. Compare motor control theories and how they control human movement.
3. Critically evaluate current research in motor learning.
4. Recommend strategies to improve motor learning in both therapy and sport settings.
5. Facilitate a practical example of motor learning over time.

SPMD 4015. Therapeutic Exercise
3 Credits (3)

The physiological effects, indications, contraindications, dosage, and maintenance of therapeutic modalities related to the treatment of athletic or activity-related injuries. Must maintain a 3.0 GPA. May be repeated up to 3 credits.

Learning Outcomes

1. Apply appropriate clinical reasoning to the selection of therapeutic exercises based upon evidence-based practice guidelines, relevant physical findings, indications, contradictions and precautions.
2. Demonstrate appropriate application of therapeutic exercises and techniques including selection, application, patient instruction, and documentation.
3. Design an individualized therapeutic exercise program incorporating appropriate modifications for tissue repair timelines, physiological and psychological factors, and any additional clinical findings.
4. Demonstrate effective assessment skills to determine safe levels of physical activity for patients.

SPMD 4095. Clinical Practicum VII
3 Credits (3)

Athletic training psycho-motor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses. Students may complete a general medical rotation as part of this course. Must maintain 3.0 GPA. Consent of Instructor required. Restricted to: Athletic Training majors.

Learning Outcomes

1. Be prepared to sit for the Board of Certification (BOC) examination.
2. Confidently understand the BOC exam format, and method of delivery.
3. Meet the requirements to maintain certification, including evidence based practice requirements and continuing education units and their reporting cycles.
4. Demonstrate competence in in the following educational content areas for the practice of Athletic Training: evidence-based practice, prevention and health promotion, clinical examination and diagnosis, acute care of injury and illness, therapeutic interventions, psychosocial strategies and referral, healthcare administration, professional development and responsibility.

SPMD 4210. Advanced Exercise Physiology
3 Credits (3)

Detailed study of the integrated response of neuromuscular, cardiovascular, and respiratory systems to acute and chronic exercise, nutrition, and environmental conditions with a strong emphasis on laboratory experiences.

Prerequisite: SPMD 3410 and GPA of 2.75 or consent of instructor.

Learning Outcomes

1. Fundamental concepts about nutrition and it application to human performance
2. Advanced understanding of nutrition and its association with human bioenergetics
3. Human bioenergetics and its responsibility for performance enhancement and outcomes
4. Energy transfer and expenditure under various physical and environmental conditions
5. Pulmonary and cardiovascular responses to exercise
6. Cardiovascular and cellular adaptations to altitude

SPMD 4250. Principles of Strength and Conditioning
3 Credits (3)

Application of research, theory, and methods of high-intensity, resistive overload training. Performance-specific topics include management, nutrition. Requires SPMD 2210 and SPMD 3410; GPA of 2.75.

Prerequisite: SPMD 3410; SPMD 2210 or BIOL 2210; GPA 2.75.

Learning Outcomes

1. Students will examine both applied and theory-based strength conditioning concepts by applying designated guidelines set forth by the National Strength and Conditioning Association (NSCA).
2. Students will discuss various acute and chronic human performance adaptations by examining practical examples involving (but not limited to) musculoskeletal adaptation, muscular power output, speed and agility characteristics, plyometric training, body composition characteristics, and cardiovascular characteristics, among many others.
3. Students will recognize strength and conditioning adaptations regarding specific groups, such as youth, female, and elderly populations by contrasting various case studies that feature these populations.
4. Students will examine the administration of human performance testing/assessments on subjects of various skill-levels, experience, and athletic backgrounds, while understanding reliability and validity concerns of said assessments, accomplishing this by participating in practical-based performance testing featured in the course's lab component.
5. Students will analyze strength and conditioning testing results in order to properly prescribe a complete exercise regimen for an individual, based on their sport- or fitness-specific goals, accomplishing this primarily through the course's capstone final project.
6. Students will examine the practicality of strength training towards today's athlete as well as how proper periodization implementation affects this mode of activity, accomplishing this by applying both traditional and undulated periodization guidelines.
7. This course will prepare students to sit for the NSCA's Certified Strength Conditioning Specialist (CSCS) exam by relying upon human performance guidelines set forth by the NSCA along with implementing published study resources provided by the NSCA.

SPMD 4250L. Principles of Strength and Conditioning Laboratory
1 Credit (2P)

An applied examination of the theory, principles, rules and regulations associated with various strength and conditioning exercises to include but not limited to Olympic lifting, powerlifting, bodybuilding, plyometrics, speed, agility and speed-endurance development. Lab required for Kinesiology majors.

Prerequisite: SPMD 2210 or BIOL 2210, and SPMD 3410; GPA 2.75.

Corequisite: SPMD 4250.

Learning Outcomes

1. Students will examine commonly relied upon human performance testing practices towards various exercise science-based concepts by applying guidelines set forth by the National Strength and Conditioning Association (NSCA).
2. Students will assess various physiological adaptations by conducting performance tests that target muscular power output, speed, agility, anaerobic capacity, aerobic capacity, vertical jumping, plyometric training, and non-traditional training modes (among numerous others).
3. Students will demonstrate proficiency towards proper administration of human performance assessments by effectively conducting, instructing, and demonstrating said assessments and physical capabilities.
4. Students will properly evaluate and interpret human performance testing results by documenting their own performance test results as well their peers' and applying these data to set norms commonly relied upon by professionals in the field.
5. Students will value the importance of effective and efficient training methodologies based on the varying needs of today's physically active population, accomplished by examining the role physical activity and sport-specific training play on competitive athletic performance.
6. Students will use this lab to prepare and sit for the NSCA's Certified Strength Conditioning Specialist (CSCS) exam by relying upon human performance guidelines set forth by the NSCA along with implementing published study resources provided by the NSCA.

SPMD 4350. Exercise Testing and Prescription
3 Credits (3)

This combined lecture and lab class introduces students to the scientific basis for and principles of exercise testing and prescription. The focus is on basic approaches to exercise testing and prescription for healthy adults, while application to some special populations with chronic disease will be discussed.

Prerequisite: SPMD 2210 or BIOL 2210; SPMD 3410; GPA 2.75.

Learning Outcomes

1. Students will examine the application and procedures of both fitness and clinical based exercise tests commonly used in the Kinesiology field by participating in practical lab sessions conducted within this course.
2. Students will examine appropriate exercise prescription principles designed for healthy adults by applying published ACSM guidelines to various hypothetical subjects and case studies used in this course.
3. Students will analyze appropriate exercise programming strategies used by today's practitioners by studying such concepts as established physical activity (PA) minimums and defined lifestyle risks for cardiovascular disease (CVD).
4. Students will compare various pre-participation measures for exercise by utilizing such instruments as the PAR-Q and ACSM Algorithm screening tools.
5. This course will prepare students to sit for ACSM's credential-based exams by relying upon exercise prescription guidelines set forth by ACSM along with implementing published study resources provided by ACSM.

SPMD 4410. Exercise for Special Populations
3 Credits (3)

Fundamentals of kinesiology adapted for adults with various diseases and disabilities. Focus will be on the application of exercise assessment and prescription for selected conditions.

Prerequisite: SPMD 3410 or consent of instructor; GPA of 2.75.

Learning Outcomes

1. To develop an understanding of the pathophysiology of various cardiovascular, pulmonary, metabolic, skeletal muscle, orthopedic, and mental diseases.
2. To provide a medical perspective in the treatment and management of individuals with these conditions in which exercise therapy may be beneficial.
3. To provide a sound understanding of exercise testing and prescription for a variety of chronic disease states.
4. To be able to assess, interpret, and evaluate case studies of diseased individuals and to develop comprehensive rehabilitation programs based on this information.
5. To develop the ability to articulate / present information of various diseases / conditions in a professional manner both formally and in a one on one setting.

SPMD 4450. Pathophysiology and Human Function(s)
3 Credits (3)

Students will discuss basic concepts of pathophysiology such as inflammation & repair, infectious diseases, neoplasms, and diseases of specific physiological systems. In addition, students will discuss a variety of case studies, and in so doing will be able to relate pathophysiologic conditions to symptoms, activity restrictions and disability.

Prerequisite: SPMD 2210 or BIOL 2210; SPMD 2210L or BIOL 2210L; SPMD 3410; GPA 2.75.

Learning Outcomes

1. Students will develop knowledge about basic neurophysiological function of the central and peripheral nervous system
2. Individuals will develop knowledge about motor control theory and assessment of human movement.
3. Students will demonstrate their knowledge about the control processes of both gross and fine motor skills.
4. Students will apply knowledge of sensory physiology to the relationship with human performance.
5. Individuals will develop and improve their ability to communicate complex theories and physiological processes through both oral and written work.

SPMD 4510. Neurophysiology and Human Function
3 Credits (3)

Students will be introduced to a comprehensive study of the human nervous system. Fundamental structures of the central and peripheral nervous system will be discussed to understand the physiology of the brain and rest of the nervous system. This course will also enhance the understanding how sensory information reaches the brain and how information is processed, leading to effective action. In addition, students will be introduced to the basic concepts regarding neurodynamics, neurological mechanisms of pain, and pathophysiology of neurologic disorders/conditions, with emphasis placed on recognition, pathophysiologic signs/symptoms, assessment, and management of selected conditions.

Prerequisite: SPMD 2210 or BIOL 2210; SPMD 2210L or BIOL 2210L; SPMD 3410; and GPA of 2.75.

Learning Outcomes

1. Identify and describe the organization of the central and peripheral nervous systems, the structure and function of neurons and glia, and the anatomy of the brain and its internal and external structures.

2. Develop knowledge about the basic neurophysiological function of the central and peripheral nervous systems.
3. Describe the neurobiology and pathways of the special senses.
4. Identify and analyze major neurological disorders and mental health disorders and describe their clinical presentations.
5. Describe and understand the clinical examination process relevant to neurological injury, illness, and disease.

SPMD 4520. Adapted Physical Education
3 Credits (3)
Selection and scope of corrective activities in posture and body mechanics, and the adaptation of movement activities for the exceptional student.
Learning Outcomes
1. Students will learn to implement principles of inclusion into the practice of physical education.

SPMD 4530. Methods of Teaching Secondary Physical Education
6 Credits (6)
Theoretical and practical applications of curriculum, pedagogy and assessment for teaching secondary physical education. Provides the students opportunities to develop curriculum, teach, and assess student learning through a supervised practicum in both middle and high school physical education settings. Consent of Instructor required.
Prerequisite: SPMD 3160.
Learning Outcomes
1. Improve your knowledge of 6-12 physical education content, disciplinary concepts, and tools of inquiry related to the development of a physically educated person.
2. Improve your knowledge of and ability to plan instruction based on curriculum goals/objectives and students' experiences.
3. Improve your ability to design and teach developmentally appropriate 6-12 physical education curriculum for diverse learners.
4. Improve your knowledge of, or ability to, teach a variety of skills and concepts a Student-Centered Inquiry as Curriculum approach.
5. Improve your ability to teach using a variety of strategies such as cooperative learning, problem-based learning, direct instruction, divergent convergent discovery, that facilitate student learning across difference.
6. Improve your ability to plan effective units/lessons to insure equity and sensitivity to the needs of students with diverse characteristics: this includes a) critically analyzing content/curriculum in light of broad goals for education and b) structuring a safe, educational environment that facilitates learning for all students.
7. Improve your knowledge of and ability to help individuals work productively and cooperatively with others to produce quality work.
8. Improve your ability to create an equitable learning climate in which individual differences are respected and be able to model, teach, and integrate multicultural awareness, acceptance, and appreciation.
9. Improve your knowledge of and ability to incorporate inquiry, critical thinking, problem solving and creative exploration into your lessons. 1
10. Improve your knowledge of professional literature, research, organizations, and other technological resources for continuing professional development. 1
11. Improve your knowledge of and ability to use appropriate professional behavior. 1
12. Improve your ability to model appropriate verbal and written communications. 1
13. Improve your ability to encourage students to recognize, question, and interpret health related ideas from a variety of perspectives. 1
14. Improve your ability to reflect on your teaching in relation to sound educational philosophy, social, moral and other educational issues, theoretical knowledge, research, and your personal beliefs and values. 1
15. Improve your ability to design and implement formal and informal practical assessments with students as a way to check for student learning. 1
16. Use a variety of formal and informal assessment techniques to assess learner performance, provide feedback, and communicate learner progress.

SPMD 4540. Psychology of Coaching in Sport
3 Credits (3)
This course is designed to focus on major topics and theories dealing with the social-psychological factors affecting the performance of athletes and teams, with practical suggestions for enhancing the effectiveness of teachers and coaches. The course will also focus on team and group dynamics that influence physical performance.
Prerequisite: SPMD 3550 or SPMD 3610.
Learning Outcomes
1. Examine current literature and popular media to consider the influence of coaching behaviors on human performance in sport and non-sport activities.
2. Compare coaching from a psychological perspective to current understandings in motor learning.
3. Evaluate coaching behavior using evidence-based sources and measurement tools.
4. Develop a coaching portfolio for a sport program of choice.

SPMD 4550. Exploring Extreme Human Performance
3 Credits (3)
A reading, writing and documentary based course studying human's quest and the related sacrifices associated with participating in extreme performance activities such as the Olympics, wakeboarding, snowboarding, military special forces, ultra-run events, marathons, etc. Consent of Instructor required.
Prerequisite: Consent of instructor and GPA 2.75.

SPMD 4610. Research Seminar
3 Credits (3P)
Capstone course for Kinesiology/Pre-Health minors. Consent of Instructor required.
Prerequisite: GPA 2.75.
Learning Outcomes
1. The Student Learning Outcomes are dependent on instructor and specific direction of course with individual group of students, similar to an independent study/research/practicum experience

SPMD 4620. Nutrition and Metabolism of Sport
3 Credits (3)
This course addresses the aspects of nutrition that are related to exercise performance. Emphasis will be placed on the bioenergetics systems, the components of nutrition, nutritional and body composition assessments, ergogenic aids, and diet modifications for physically active individuals and athletes.
Prerequisite: SPMD 2210, SPMD 3410.

Learning Outcomes

1. Describe the metabolism of macronutrients and micronutrients.
2. Clarify the effects of high and low-carbohydrate diets on exercise performance.
3. Explain the potential athletic benefits of manipulating fat content in our diet.
4. Discuss increasing protein intake to promote exercise adaptations.
5. Explain specific physiological functions of micronutrients.
6. Specify fluid intake recommendations before, during, and after exercise.
7. Calculate macronutrient recommendations for endurance athletes, strength/power athletes, and team sport athletes.
8. Provide nutritional recommendations for special populations of athletes.
9. Recommend nutrition strategies related to weight management goals . 1
10. Discuss the benefits and challenges of unique body composition assessments. 1
11. Provide macronutrient recommendations within a periodized training program. 1
12. Compare and contrast the ergogenic benefits of popular dietary supplements.

SPMD 4805. Emergency Response
2 Credits (2)
Comprehensive approach to the identification of risk factors, preparation of emergency action plans, and recognition and care of emergency medical conditions including those that may lead to sudden death. This is a hybrid course combining online instructional components and clinical skills experience including clinical safety (blood-borne pathogens, ECC, first-aid, etc), and on-field emergency management. Consent of Instructor required.

Learning Outcomes

1. Identify the individuals involved in the Emergency Response Team
2. Construct the components of an effective Emergency Action Plan.
3. Assess the scene and patient during an emergency situation.
4. Demonstrate proper universal precautions and wound care.
5. Demonstrate effective Cardiopulmonary Resuscitation, AED use.
6. Demonstrate effective Rescue Breathing Airway Management techniques.
7. Demonstrate effective splinting techniques.
8. Demonstrate understanding of the techniques utilized in cervical stabilization
9. Identify components of acute care for general medical and orthopedic emergencies

SPMD 4997. Problems
1-3 Credits (1-3)
Independent study in either Kinesiology and/or Athletic Training May be repeated up to 9 credits.

Learning Outcomes

1. Varies

SPMD 4998. Internship
6 Credits (6P)
A part-time internship in an approved wellness, fitness, athletic, recreation, research lab or other program as agreed upon by the internship supervisor. The student will gain experience in all phases of management and operation. This is a 6-hour internship which can be repeated for an additional 6-credit hours at the same or a different location allowing the student to gain one or multiple field experiences. Field instructor supervision will oversee the students performance. This internship may require relocation to a site outside of the Las Cruces area.

Learning Outcomes

1. Students will apply their academic program didactic knowledge, skills and abilities at a professional site gaining hands-on learning experiences under the supervision of a practicing professional
2. Students will learn in a working environment such that the internship becomes the capstone of their undergraduate education allowing them practical experience in a career field of their choice.

SPMD 5005. Foundations of Athletic Training
3 Credits (3)
This course provides an introduction to clinical decision making and covers standard techniques and procedures for the evaluation and diagnosis of musculoskeletal injuries and common illnesses, injury prevention concepts, documentation and management. Consent of Instructor required.

Learning Outcomes

1. Demonstration of clinical decision making skills
2. Articulation of standard techniques and procedures for evaluation and diagnosis
3. Produce standardized documentation of clinical findings.

SPMD 5010. Clinical & Functional Anatomy in Athletic Training
3 Credits (3)
This course allows students to develop applied knowledge and hands-on skills for future athletic training practitioners. Emphasizes skills for identifying musculoskeletal structures visually and via palpation, and then assessing their function. Use of anatomical and live human models to develop and demonstrate skills. Acceptance into the MSAT program.

Learning Outcomes

1. Demonstrate knowledge of human musculoskeletal structures and function.
2. Identification of boney landmarks for assessment of musculoskeletal conditions.
3. Demonstrate appropriate palpation of muscles, bones and joints for musculoskeletal assessment.
4. Demonstrate knowledge of actions, origins, insertions and innervations of the major muscle groups of the human body.
5. Demonstrate appropriate techniques for assessment of functional movements.

SPMD 5015. Behavioral Health, Wellness, and Prevention
3 Credits (3)
Exploration of models of patient care delivery in athletic training, behavioral health, wellness and prevention principles as they apply to an athletic or physically active population.

Learning Outcomes

1. Identify, refer and give support to athletes/patients with behavioral health conditions.
2. Collaborate with other healthcare providers to provide appropriate interventions for behavioral health and overall wellness.
3. Develop and implement strategies to mitigate risks associated with long-term health conditions across the lifespan including patient education.
4. Demonstrate competent communication and patient education strategies within a variety of behavioral health and wellness scenarios.

5. Articulate the importance and key components of a mental health emergency action plan.
6. Explore and analyze the impact of group identification including the intersectionality of multiple identities on health disparities, patient care and patient outcomes.

SPMD 5020. Graduate Athletic Training Research I
1-3 Credits (1-3)
Advanced research topics in athletic training. Students will explore research and evidence based practices within the field of athletic training. Students will work under the direct supervision of a Commission on Accreditation of Athletic Training Education (CAATE) accredited Athletic Training Program faculty member. Students should be prepared to further explore research topics within a specific discipline with the intent of disseminating and sharing information with the athletic training community. topics previously covered in SPMD 5310 (Graduate Athletic Training Seminar I) Students may engage in teaching and research opportunities in unique areas May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate increased knowledge within the designated topic areas identified for the semester.
2. Demonstrate increased skill in assessing and conducting research for the athletic training community

SPMD 5025. Graduate Athletic Training I
1-3 Credits (1-3)
Advanced clinical experiences and education in athletic training. Students will examine topics in athletic training in conjunction with faculty members within the Commission on the Accreditation of Athletic Training Education (CAATE) Athletic Training Program at New Mexico State University . Assessment of Athletic Training Program clinical proficiencies as described by the National Athletic Trainers' Association Education Council. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate increased knowledge within the designated topic areas identified for the semester.
2. Demonstrate increased skill in teaching or academic preparation techniques as identified for the semester.

SPMD 5030. Graduate Athletic Training II
3 Credits (3)
Advanced clinical experiences and education in athletic training. Assessment of Athletic Training Program clinical proficiencies as described by the National Athletic Trainers' Association Education Council. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate increased knowledge within the designated topic areas identified for the semester.
2. Demonstrate increased skill in teaching or academic preparation techniques as identified for the semester.

SPMD 5050. Clinical Education I
3 Credits (3)
Integration of clinical competencies with classroom instruction and a supervised field based experience in athletic training to link theory into practice. Consent of Instructor required.
Learning Outcomes
1. Demonstrate basic evaluation, taping, bracing and emergency care skills.
2. Select and properly fit protective equipment for a variety of injury and sport scenarios.
3. Demonstrate proper equipment removal for emergency care of the injured athlete.
4. Perform a pre-participation examination including physical evaluation, documentation and referral if needed.

SPMD 5120. Lower Extremity Injury Evaluation + Lab
4 Credits (4)
This course provides a comprehensive approach to the pathomechanics, clinical examination, diagnosis, role of clinical outcome measures and appropriate medical referral and treatment of orthopedic injuries and other conditions to the lower extremity. Consent of Instructor required.
Learning Outcomes
1. Demonstrate knowledge and ability to apply current best practices in acute care, diagnosis and treatment of injuries involving the lower extremity
2. Demonstrate strong clinical examination skills in order to accurately diagnose and effectively treat the patient.
3. Demonstrate the knowledge and skills necessary to evaluate and provide immediate management of acute injuries.
4. Determine and apply therapeutic interventions designed to maximize the patient's participation and health-related quality of life.
5. Develop and implement strategies and programs to prevent the incidence and/or severity of injuries.

SPMD 5150. Clinical Education II
3 Credits (3)
Integration of clinical competencies with classroom instruction and a supervised field based experience in athletic training to link theory into practice.
Prerequisite: SPMD 5050.
Learning Outcomes
1. Students will become effective practitioners in the field of Athletic Training and Sports Medicine by utilizing critical thinking strategies based in evidence based practice theories combined with pedagogical knowledge of the concepts in Athletic Training.
2. Students will utilize their clinical experience and knowledge of injury evaluation to enhance their athletic training skills working with an athletic population under the supervision of a preceptor.

SPMD 5180. Therapeutic Interventions I
4 Credits (3+1P)
Stud of physical rehabilitation theory and techniques used as therapeutic intervention for orthopedic injuries and conditions.
Learning Outcomes
1. Demonstrate appropriate application techniques for therapeutic modalities to include thermal, electrical, ultrasound and mechanical therapeutic modalities.
2. Demonstrate proper clinical assessment techniques to establish treatment and rehabilitation plans for a variety of orthopedic injuries and conditions including proper documentation procedures.
3. Demonstrate knowledge of the physiological and pathological processes of trauma, wound healing and tissue repair and their role/implications within the therapeutic intervention process.

SPMD 5205. Evidence Based Practice
2 Credits (2)
This course investigates the concepts of evidence based practice as it relates to musculoskeletal assessment, diagnosis and therapeutic interventions with a primary focus on clinician- and patient-oriented outcome measures and appropriate referral decisions. Students will

explore primary literature focused on clinical questions related to a comprehensive approach to injury evaluation.

Learning Outcomes

1. Define evidence-based practice as it relates to athletic training clinical practice.
2. Explain the role of evidence in the clinical decision-making process.
3. Describe and differentiate the types of quantitative and qualitative research, research components, and levels of research evidence.
4. Describe a systematic approach (eg, five step approach) to create and answer a clinical question through review and application of existing research.
5. Develop a relevant clinical question using a pre-defined question format (eg, PICO= Patients, Intervention, Comparison, Outcomes; PIO = Patients, Intervention, Outcomes).

SPMD 5220. Upper Extremity Injury Evaluation + Lab
4 Credits (3+1P)

This course provides a comprehensive approach to the pathomechanics, clinical examination, diagnosis, role of clinical outcome measures and appropriate medical referral and treatment of orthopedic injuries and other conditions to the upper extremity. Consent of Instructor required.

Learning Outcomes

1. Demonstrate knowledge and ability to apply current best practices in acute care, diagnosis and treatment of injuries involving the upper extremity
2. Demonstrate strong clinical examination skills in order to accurately diagnose and effectively treat the patient.
3. Demonstrate the knowledge and skills necessary to evaluate and provide immediate management of acute injuries.
4. Determine a therapeutic intervention designed to maximize the patient's participation and health-related quality of life.
5. Develop and implement strategies and programs to prevent the incidence and/or severity of injuries and optimize their patient's overall health and quality of life.

SPMD 5250. Immersive Clinical Experience
3 Credits (3P)

Integration of clinical competencies during an immersive, supervised, field based experience in athletic training to link theory into practice. May be repeated up to 6 credits.

Prerequisite: SPMD 5150.

Learning Outcomes

1. Students will be proficient in the day to day operations of an athletic training room.
2. This immersive experience will prepare students for future employment as a full-time athletic trainers.
3. Students will demonstrate skills in all aspects of athletic training including patient-centered care, clinical examination, diagnosis and intervention, prevention, health promotion and wellness and healthcare administration.

SPMD 5280. Therapeutic Interventions II
4 Credits (3+1P)

A detailed study of the physiological effects, indications, contraindication, dosage, and maintenance of modern therapeutic devices related to the treatment and rehabilitation of orthopedic injuries and conditions.

Prerequisite: SPMD 5180.

Learning Outcomes

1. Demonstrate proper clinical assessment techniques to establish treatment and rehabilitation plans for a variety of orthopedic injuries and conditions including proper documentation procedures.
2. Demonstrate knowledge of the physiological and pathological processes of trauma, wound healing and tissue repair and their role/implications within the therapeutic intervention process.
3. Design treatment plans based upon sound clinical assessment and appropriate selection of modalities that address the physiological and psychological needs of the patient.
4. Demonstrate competence with the collection and analysis of baseline and post-treatment data to evaluate and interpret treatment outcomes based upon principles of evidence-based practice.
5. Demonstrate competence with the application of a wide variety of modalities including patient preparation, modality application and modification based upon clinical findings using principles of evidence based practice.

SPMD 5310. Inferential Statistics in Sports and Exercise Science
3 Credits (3)

This course serves to provide an introduction to statistical analyses. The conceptual framework of the course will allow for the application of a variety of statistical concepts in order to better understand the nature of data associated with scientific literature publications. Consent of Instructor required for registration.

Learning Outcomes

1. Exhibit an understanding of basic statistical concepts and techniques that are consistent with contemporary and valid research in the field of exercise science.
2. Effectively organize data and accurately calculate appropriate statistics for specific research applications.
3. Exhibit an understanding of specific factors that affect validity, reliability and subjectivity of various data gathering techniques.
4. Exhibit knowledge of how to analyze and interpret data using current appropriate technology (SPSS).
5. Interpret performance and fitness data in order to make appropriate and relevant conclusions.
6. Select an appropriate statistical test upon being presented with a data set, interpret the statistical test, and present the results in APA format.

SPMD 5350. Principles of Strength and Conditioning
3 Credits (3)

Application of research, theory, and methods of high-intensity, resistance training. Performance-specific topics include management, nutrition, exercise prescription, periodization, lifting techniques, testing, and evaluation. Course will emphasize standards set forth by the National Strength and Conditioning Association preparing students interested in sitting for the NSCA certification examinations. Consent of Instructor

Learning Outcomes

1. Understanding of general physiology and its responses to acute and chronic exercise
2. Understanding of cardiovascular effects of exercise, training and sport
3. Understanding of strength training affects on special populations such as youth, women and the elderly
4. Understanding of musculoskeletal changes from exercise, training and sport
5. Practicality and application of power and strength training

6. Comprehension of training programs and how they pertain to different training aspects
7. Demonstrate principles of plyometrics and training
8. Understand and demonstrate principles of periodization

SPMD 5370. Research Methods in Kinesiology
3 Credits (3)
This course will provide students with graduate-level understanding of research methods. Specifically, the course is designed to prepare students to critically read, understand, and evaluate research; retrieve scholarly articles; and develop research-related skills for further graduate education and professional work. Students will be trained to become scientific thinkers rather than anecdotal thinkers.
Learning Outcomes
1. Be able to accurately identify a research problem.
2. Conduct a literature search and summarize literature to develop a research problem.
3. Develop a hypothesis and research statement appropriate to their specific research interests.
4. Determine an appropriate study design/method to test the hypothesis.
5. Demonstrate understanding of measurement concepts such as validity, reliability, scales of measurement, field tests, and laboratory tests.
6. Interpret statistical analyses, tables, and summaries presented in research.
7. Understand research ethics.
8. Use written and verbal forms for reporting research.

SPMD 5410. Biomechanics
3 Credits (3)
The application biomechanical analysis of human movement as it relates to human performance through the use of anatomical, mechanical and electrical concepts. Consent of Instructor
Learning Outcomes
1. The student will be able to competently assess physical anatomy, analyze linear and angular forces, examine gait, understand the relationships between kinetics and kinematics, understand how muscle and bone architecture impact human movement, and be familiar with the utilization of various data collection methods used in evaluating and improving human movement.

SPMD 5450. Exercise for Special Populations
3 Credits (3)
Fundamentals of kinesiology adapted for adults with various diseases and disabilities. Focus will be on the application of exercise assessment and prescription for selected conditions. Consent of Instructor
Learning Outcomes
1. To develop an understanding of the pathophysiology of various cardiovascular, pulmonary, metabolic, skeletal muscle, orthopedic, and mental diseases.
2. To provide a medical perspective in the treatment and management of individuals with these conditions in which exercise therapy may be beneficial.
3. To provide a sound understanding of exercise testing and prescription for a variety of chronic disease states.
4. To be able to assess, interpret, and evaluate case studies of diseased individuals and to develop comprehensive rehabilitation programs based on this information.
5. To develop the ability to articulate / present information of various diseases / conditions in a professional manner both formally and in a one on one setting.

SPMD 5510. Psychology of Sport
3 Credits (3)
Development of coaching techniques to enhance sport performance based on understanding and use of psychological principles. Consent of Instructor
Learning Outcomes
1. Identify psychological characteristics associated with peak performance
2. Describe and explain factors practitioners should consider when diagnosing, designing, and implementing a mental training intervention.
3. Recognize and define the psychological constructs of –for example but not limited to—concentration, confidence, motivation, stress/anxiety, and arousal.
4. Understand how personality attributes and the environment affect human performance and injury rehabilitation.

SPMD 5550. Skill Acquisition and Performance
3 Credits (3)
Behavioral and physiological examination factors that influence the acquisition and performance of motor skills. Consent of Instructor
Learning Outcomes
1. Describe and explain the principles and processes underlying skilled performance
2. Know the factors to consider when diagnosing, designing, and assessing learning experiences
3. Understand the elements of an effective instructional plan for skill acquisition

SPMD 5575. Advanced Motor Development
3 Credits (3)
Advanced coverage of motor development topics including: Theoretical perspectives of motor development; the sequential, age-related, continuous process of physical growth and maturation; changes in movement behavior from infancy to older adulthood; external influences on development of motor skills; research approaches in motor development. Consent of Instructor
Learning Outcomes
1. Describe the historical progression of motor development within the broader field of kinesiology
2. Explain the various theories and foundational concepts of motor development
3. Understand and apply the processes (social, cognitive, perceptual) involved in motor skill development throughout the lifespan (infancy, childhood, adolescence, adulthood)
4. Identify procedures and methodologies used to assess various aspects of motor development
5. Interpret the supporting literature and research related to the fundamental principles of motor development
6. Apply and transfer the knowledge gained to develop a research proposal to enhance understanding of a motor development topic of interest

SPMD 6005. Athletic Training Research I
2 Credits (2)

Instruction and development of research skills through the study of published reports and readings in athletic training and related fields. Consent of Instructor required.

Learning Outcomes

1. Describe a systematic approach (eg, five step approach) to create and answer a clinical question through review and application of existing research.
2. Develop skill in utilizing multiple scales for critical appraisal of literature and research studies.
3. Develop a relevant clinical question utilizing a predefined question format and conduct a literature review on the subject.
4. Describe multiple forms of research, research and literature resources and the differences between narrative reviews, systematic reviews and meta analyses.
5. Describe and apply concepts of diagnostic accuracy and clinical prediction rules as they pertain to patient centered care and evidence based practice.

SPMD 6010. Organization and Administration in Athletic Training
3 Credits (3)

Organization and administration of athletic training services including management, leadership, financial, human resources, facility, information technology and risk management.

Learning Outcomes

1. Students will employ values consistent with the NATA code of ethics for all health care administration actions.
2. Demonstrate knowledge of legal, ethical and risk management concepts in athletic training and health care administration.
3. Demonstrate mastery of a variety of health care management concepts.
4. Demonstrate comprehension of fiscal management strategies, resource management and facility design as it relates to athletic training.

SPMD 6020. Evaluation of the Head, Neck, Spine and Torso
3 Credits (3)

This course provides a comprehensive approach to the pathomechanics, clinical examination, diagnosis, role of clinical outcome measures and appropriate medical referral and treatment of orthopedic injuries and other conditions to the head, neck and spine.

Prerequisite: SPMD 5220.

Learning Outcomes

1. Demonstrate knowledge and ability to apply current best practices in acute care, diagnosis and treatment of injuries involving the head, neck, spine and torso.
2. Demonstrate strong clinical examination skills in order to accurately diagnose and effectively treat the patient.
3. Demonstrate the knowledge and skills necessary to evaluate and provide immediate management of acute injuries and illnesses.
4. Determine a therapeutic intervention designed to maximize the patient's participation and health-related quality of life.
5. Develop and implement strategies and programs to prevent the incidence and/or severity of injuries and optimize their patients' overall health and quality of life.

SPMD 6050. Clinical Education III
3 Credits (3)

Integration of clinical competencies with classroom instruction and a supervised field based experience in athletic training to link theory into practice.

Prerequisite: SPMD 5150.

Learning Outcomes

1. Students will become effective practitioners in the field of Athletic Training and Sports Medicine by utilizing critical thinking strategies based in evidence based practice theories combined with pedagogical knowledge of the concepts in Athletic Training.
2. Students will utilize their clinical experience and knowledge of injury evaluation to enhance their athletic training skills working with an athletic population under the supervision of a preceptor.

SPMD 6110. Professional Preparation
3 Credits (3)

Knowledge and skills for successful pursuit of athletic training credentials, employment and continuing professional competency; emphasis on current topics and issues contributing to the professional preparation of athletic training. Student must be enrolled in their final semester of the MSAT program to enroll in this course.

Learning Outcomes

1. Students will create a profile with the Board of Certification (BOC) in preparation for their BOC Examination
2. Students will analyze their individual strengths and weaknesses through practice examinations in order to prepare for a successful challenge of the BOC Examination
3. Students will demonstrate knowledge of basic human resources policies and procedures and the hiring process for athletic trainers.
4. Students will self-assess professional competence and create professional development plans according to personal and professional goals and requirements

SPMD 6150. Clinical Education IV
3 Credits (3)

Integration of clinical competencies with classroom instruction and a supervised field based experience in athletic training to link theory into practice.

Prerequisite: SPMD 6050.

Learning Outcomes

1. Students will become effective practitioners in the field of Athletic Training and Sports Medicine by utilizing critical thinking strategies based in evidence based practice theories combined with pedagogical knowledge of the concepts in Athletic Training.
2. Students will utilize their clinical experience and knowledge of injury evaluation to enhance their athletic training skills working with an athletic population under the supervision of a preceptor.
3. Students will demonstrate professional behaviors congruent with the ethical standards of the profession of athletic training.
4. Students will develop, implement, and revise policies that pertain to prevention, preparedness, and response to medical emergencies and other critical incidents.

SPMD 6280. General Medical Conditions & Therapeutic Medications
4 Credits (3+1P)

Pathophysiology, assessment, and appropriate intervention and referral for general medical conditions and disabilities; common diagnostic tests and imaging assessment tools; commonly used therapeutic medications.

Prerequisite: SPMD 5280.

Learning Outcomes

1. Recognition of general medical conditions including emergent physical and psychological conditions for intervention, referral or return to play criteria as appropriate.

2. Demonstrate proper clinical examination techniques for the assessment of general medical conditions including signs and symptoms of catastrophic and emergent conditions.
3. Demonstrate knowledge of common therapeutic medications and the general medical conditions they treat within the fields of athletic training and sports medicine.
4. Demonstrate knowledge of the principles of pharmacology, including pharmacokinetics and pharmacodynamics, as they relate to the fields of athletic training and sports medicine.
5. Demonstrate knowledge of federal, state and local laws, regulations and procedures for proper storage, disposal, transportation, dispensing and documentation dealing with prescription and non-prescription medications.

SPMD 6310. The Social Construction of the Body
3 Credits (3)
This course will explore how people's health and physical activity experiences and choices are often shaped by cultural narratives and expectations of the male and female body. Designed for graduate students in allied health and physical activity professions

SPMD 6350. Advanced Exercise Physiology
3 Credits (3)
Detailed study of the integrated response of neuromuscular, cardiovascular and respiratory systems to acute and chronic exercise, nutrition and environmental conditions with a strong emphasis on laboratory experience. Consent of Instructor
Learning Outcomes
1. Fundamental concepts about nutrition and it application to human performance
2. Advanced understanding of nutrition and its association with human bioenergetics
3. Human bioenergetics and its responsibility for performance enhancement and outcomes
4. Energy transfer and expenditure under various physical and environmental conditions
5. Pulmonary and cardiovascular responses to exercise
6. Cardiovascular and cellular adaptations to altitude

SPMD 6410. Cardiovascular Physiology
3 Credits (3)
This graduate level course provides an in-depth study of cardiovascular structure and function. The course assumes that students have a strong background in human physiology. Topics include, but are not limited to: cellular structure of the heart and vascular system; cardiac function, including electrophysiology of the heart; vascular function; neurohumoral control of the heart and circulation, organ blood flow, exchange function of the microcirculation; the impact of common cardiovascular diseases on cardiovascular structure and function, and cardiovascular adaptations to chronic exercise. Consent of Instructor
Learning Outcomes
1. The student will demonstrate a comprehensive knowledge cardiovascular structure and function
2. The student will be able to relate common cardiovascular pathophysiology to cardiovascular functional impairments and physical functional limitations.
3. The student will be able to discuss chronic exercise training adaptations on the cardiovascular system and their value as a treatment strategy for cardiovascular diseases.

SPMD 6450. Skeletal Muscle: Structure and Function
3 Credits (3)
Basic muscle morphology and physiology with molecular and cellular adaptations in skeletal muscle as consequences to varying exercise regimens. Consent of Instructor
Learning Outcomes
1. To gain knowledge of the structure and function of skeletal muscle
2. To gain knowledge related to the skeletal muscle in reference to cellular and molecular responses and adaptions to exercise
3. To understand laboratory procedures used to study muscle metabolism
4. To develop ability to scientifically critique published papers and present them in a professional manner

SPMD 6510. Designing Resistance Training Program
3 Credits (3)
Detailed study of the physiological concepts associated with designing resistance-training programs for children, women, seniors, athletic performance and rehabilitation. Consent of Instructor
Learning Outcomes
1. Fundamental components associated with resistance training and exercise prescription
2. Compare and contrast isometric, dynamic, variable, isokinetic, eccentric, concentric resistance training
3. Design programs guided by a needs analysis
4. Demonstrate appropriate techniques and implement systems for training
5. Study physiological adaptations of resistance training for women, children, seniors, athletics and rehabilitation
6. Understand anatomical and physiological changes associated with detraining
7. Integrate components and concepts of resistance training for program design (periodization)
8. Explore alternative training programs

SPMD 6710. Project
1-12 Credits (1-12)
Selected projects for doctoral students. May be repeated up to 12 credits.
Learning Outcomes
1. Students will develop research skills through the work on projects with faculty members.

SPMD 6750. Kinesiology Research
1-3 Credits (1-3)
Research to be conducted under the direction of a Kinesiology faculty member May be repeated up to 15 credits.

SPMD 6996. Special Topics
1-3 Credits (1-3)
Offered under various subtitles that indicate the subject matter. May be repeated up to 9 credits.
Learning Outcomes
1. Varies

SPMD 6999. Capstone Project
1,3 Credits (1,3)
Students will prepare an individualized capstone project and prepare for the board exams.
Prerequisite: SPMD 5205.

Learning Outcomes

1. Utilize evidence-based research and data from the field of athletic training to create a scholarly capstone project.
2. Disseminate communicate project findings to appropriate stakeholders by various presentation methods.
3. Advocate for the profession of athletic training via the capstone project.

SPMD 7000. Doctoral Dissertation
1-18 Credits (1-18)
Doctoral Dissertation hours to be conducted under the direction of a Kinesiology Faculty. May be repeated up to 18 credits.
Learning Outcomes

1. Varies

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Dance - Bachelor of Arts in Dance

The Bachelor of Arts in Dance offers a broad technical, artistic, and academic curriculum designed to provide a well-rounded and comprehensive experience in technique, composition, pedagogy, performance, and interdisciplinary study.

Students must complete all University degree requirements, including General Education and Viewing the Wider World coursework and Dance Technique, Dance Technique Electives, Dance Major Core Requirements, and Interdisciplinary Electives.

Grades of C- or better are required in Area 1: ENGL 1110G Composition I and Area II: Mathematics, as well as Dance Major Core Courses. The College of Health, Education and Social Transformation requires a minimum GPA of 2.5 for graduation. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed to take the necessary English and Mathematics coursework.

Students must complete a minimum of 120 credits with 48 credits in courses numbered 3000 (300) or above.

Prefix	Title	Credits
General Education Requirements [1]		
Students may take any general education course under each area as listed in the undergraduate course catalog.		
Area I: Communications [1]		*10*
English Composition - Level 1		
ENGL 1110G	Composition I	
or ENGL 1110H	Composition I Honors	
English Composition - Level 2 [1]		
ENGL 2210G	Professional and Technical Communication	
or ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication [1]		
COMM 1130G	Public Speaking	
Area II: Mathematics [1,2]		*3-4*
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences [1]		*10-11*
Area III: Laboratory Science [1]		
Area IV: Social/Behavioral Science (PHLS 1110G recommended) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
DANC 1110G	Dance Appreciation	
or THEA 1110G	Introduction to Theatre	
or THEA 1210G	Acting for Non-Majors	
or HNRS 2114G	Music in Time and Space	
General Education Elective (Must have a "G" distinction) [1]		*3-4*
Viewing the Wider World [3]		**6**
Dance Requirements		
DANC 1155	Introduction to Hip Hop Dance	1
PHED 1110	Dance:	1
DANC 1130	Introduction to Ballet	1
or DANC 1150	Modern Dance I	
PHED 1430	Pilates:	1
or PHED 1410	Yoga:	
DANC 2130	Ballet II	2
DANC 2150	Modern Dance II	2
DANC 2157	Hip-Hop Dance II	2
DANC 2270	Dance Improvisation	2
DANC 2460	Dance for Musical Theatre	2
DANC 3130	Ballet III	2
DANC 3150	Modern Dance III	2
DANC 3210	Music for Dancers	2
Dance Repertory		4-6
DANC 3250	Dance Repertory (Course must be taken at least 4 times)	
DANC 3265	Dance Composition I	3
DANC 3350	Dance Pedagogy I	3
DANC 3510V	World Dance	3
DANC 4265	Dance Composition II	3
DANC 4266	Advanced Independent Projects	1-3
DANC 4710	Senior Project	3
DANC 4996	Special Topics	2-3
SPMD 2210	Anatomy and Physiology I (If student takes SPMD 2210, they should also take SPMD 2210L)	3
or DANC 3710	Somatics and Anatomy of Movement	
SPMD 3150	Theory and Technique of Dance and Rhythms	2
SPMD 3250	Introduction to Exercise Science: Exercise Physiology and Biomechanics	3
Electives		**32**
DANC 1131	Introduction to Ballroom Dance	
DANC 1135	Introduction to Argentine Tango	
DANC 1140	Introduction to Flamenco	
DANC 1150	Modern Dance I	
DANC 1161	Tap Dance	
DANC 1185	Introduction to Country Western Dance	
DANC 1220	Introduction to Latin Social Dance	
DANC 3710	Somatics and Anatomy of Movement	
DANC 4997	Problems	
DANC 1235	Introduction to West Coast Swing Dance	
DANC 2170	Commercial Dance	
DANC 3610	Dance History	
DANC 3720	Dance Technology and Design	
DANC 4250	Dance Pedagogy II	
THEA 1110G	Introduction to Theatre	

	THEA 1210G	Acting for Non-Majors
	THEA 334	Introduction to Stage Makeup
	THEA 352	Costume Design
	THEA 355	Lighting Design
	ARTH 2120G	History of Art II
	ARTS 1145G	Visual Concepts
	BUSA 1110	Intro to Business
	DANC 4266	Advanced Independent Projects
	ECED 1110	Child Growth, Development, and Learning
	EDUC 1120	Introduction to Education
	ENTR 1110	Entrepreneurship
	MGMT 310V	Entrepreneurial Mindset
	MUSC 1210	Fundamentals of Music for Non-majors
	SPMD 1310	Introduction to Kinesiology
	SPMD 1350	Social Foundations of Physical Activity
Total Credits		**120-128**

[1] See the General Education (p. 262) Section of the catalog for a full list of courses

[2] A Mathematics General Education course is required for the degree, but students may need to take any prerequisites needed to enter the Mathematics course of their course.

[3] See the Viewing the Wider World (p. 266) Section of the catalog for a full list of courses

[4] Elective credit may vary based on General Education course selection, prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change. Additional courses to bring total hours up to 120 may be taken in any semester.

First Year		**Credits**
ENGL 1110G	Composition I	4
ENGL 2210G	Professional and Technical Communication	3
MATH 1130G	Survey of Mathematics	3
DANC 1110G	Dance Appreciation	3
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	3
PHED 1110	Dance:	1
DANC 1155	Introduction to Hip Hop Dance	1
DANC 1130	Introduction to Ballet	1
DANC 1150	Modern Dance I	1
DANC 2270	Dance Improvisation	2
DANC 3250	Dance Repertory	1
PHED 1410	Yoga:	1
THEA 1210G	Acting for Non-Majors	3
BUSA 1110	Intro to Business	3
	Credits	**30**
Second Year		
DANC 2130	Ballet II	2
DANC 2150	Modern Dance II	2
DANC 2157	Hip-Hop Dance II	2
DANC 3510V	World Dance	3
DANC 3250	Dance Repertory	1
DANC 3610	Dance History	3
DANC 3265	Dance Composition I	3
DANC 3710	Somatics and Anatomy of Movement	3
SPMD 3150	Theory and Technique of Dance and Rhythms	2
COMM 1130G	Public Speaking	3
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
PHLS 1110G	Personal Health & Wellness	3
	Credits	**31**
Third Year		
DANC 1220	Introduction to Latin Social Dance	1
DANC 2170	Commercial Dance	2
DANC 2460	Dance for Musical Theatre	2
DANC 3130	Ballet III	2
DANC 3150	Modern Dance III	2
DANC 3210	Music for Dancers	2
DANC 3250	Dance Repertory	1
DANC 3350	Dance Pedagogy I	3
DANC 4265	Dance Composition II	3
PHIL 2110G	Introduction to Ethics	3
ANTH 433V	Sex, Gender and Culture	3
CEPY 1120G	Human Growth and Behavior	3
	Credits	**27**
Fourth Year		
ECED 1110	Child Growth, Development, and Learning	3
SOCI 3120V	Introduction to Population Studies	3
DANC 1235	Introduction to West Coast Swing Dance	1
DANC 4266	Advanced Independent Projects	3
DANC 4710	Senior Project	3
DANC 4996	Special Topics	3
SPMD 3250	Introduction to Exercise Science: Exercise Physiology and Biomechanics	3
DANC 3250	Dance Repertory	1
DANC 3720	Dance Technology and Design	3
THEA 355	Lighting Design	3
MGMT 310V	Entrepreneurial Mindset	3
ARTH 2120G	History of Art II	3
	Credits	**32**
	Total Credits	**120**

Kinesiology (Exercise Science) - Bachelor of Science in Kinesiology

Kinesiology is a great option that prepares students for many career options in allied health. Students may explore options in medicine, physical and occupational therapy, athletic training, corporate health and wellness, chiropractic medicine, dentistry, physical education, pharmacy, and much more.

The Bachelor of Science in Kinesiology degree program can be completed in one of three concentration areas: Exercise Science, Performance Psychology, or Physical Education. Regardless of concentration, students are required to complete a minimum of 120 total credits. Additionally, students are required to complete a minimum of 48 upper division credits (300/3000 and 400/4000 level courses). Kinesiology students must maintain a minimum 2.75 GPA to enroll in most upper division SPMD courses. ENGL 1110G/ENGL 1110H Composition I Honors , Area II General Education courses, Kinesiology courses, and Approved Electives must be completed with a grade of C- or better.

Students must complete all University degree requirements. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Information about Kinesiology and potential career opportunities may be obtained at the Department of Kinesiology, Activity Center 204, phone 575-646-2215.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
English Composition - Level 2 [1]		
Choose one from the following: (ENGL 2210G or ENGL 2215G recommended)		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication [1]		*3*
Area II: Mathematics [2]		*3-4*
Choose one of the following:		
MATH 1220G	College Algebra	
MATH 1250G	Trigonometry & Pre-Calculus	
MATH 1430G	Applications of Calculus I	
MATH 1511G	Calculus and Analytic Geometry I	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
Area III: Laboratory Science Courses (8 credits total)		
Choose two from the following of the following (8 credits total): (BIOL 2110G/L recommended)		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
Area IV: Social/Behavioral Sciences Course (3 credits)		
PSYC 1110G	Introduction to Psychology	
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		**3-4**
Viewing a Wider World [3]		**6**
Departmental/College Requirements		
Chose three of the following:		3
PHED 1230	Individual Sport:	
PHED 1290	Team Sport:	
PHED 1310	Swim I:	
PHED 1410	Yoga:	
PHED 1430	Pilates:	
PHED 1510	Training:	
PHED 1620	Fitness:	
PHED 1670	Aerobics:	
PHED 1830	Running:	
PHED 2996	Special Topics	
DANC 1130	Introduction to Ballet	
DANC 1131	Introduction to Ballroom Dance	
DANC 1140	Introduction to Flamenco	
DANC 1150	Modern Dance I	
DANC 1161	Tap Dance	
DANC 1185	Introduction to Country Western Dance	
DANC 1220	Introduction to Latin Social Dance	
DANC 1235	Introduction to West Coast Swing Dance	
DANC 2157	Hip-Hop Dance II	
SPMD 1310	Introduction to Kinesiology	3
SPMD 1350	Social Foundations of Physical Activity	3
SPMD 2210	Anatomy and Physiology I	3
SPMD 2210L	Anatomy and Physiology Laboratory	1
SPMD 2250	Fitness for Health and Sport	3
SPMD 2225	Anatomy and Physiology II	3
SPMD 2225L	Anatomy and Physiology II Lab	1
SPMD 3410	Exercise Physiology (Students should also take the Exercise Physiology Lab)	3
SPMD 3450	Biomechanics	3
SPMD 3450L	Biomechanics Laboratory	1
SPMD 3550	Psychology of Sport	3
or SPMD 3610	Health and Exercise Psychology	
SPMD 3650	Motor Development	3
SPMD 3710	Motor Learning	3
SPMD 4250	Principles of Strength and Conditioning	3
SPMD 4250L	Principles of Strength and Conditioning Laboratory	1
SPMD 4350	Exercise Testing and Prescription	3
SPMD 4410	Exercise for Special Populations	3
SPMD 4620	Nutrition and Metabolism of Sport	3
or SPMD 4210	Advanced Exercise Physiology	
SPMD 4998	Internship	6
Departmental Requirements (in addition to Gen.Ed/VWW)		
Choose one from the following:		3
A ST 311	Statistical Applications	

MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
SPMD 3350	Inferential Statistics in Sport and Exercise Science	
Electives, to bring the total credits to 120		**23**
Choose from the following		
ANTH 355	Biological Anthropology	
ANTH 357V	Medical Anthropology	
ANTH 431V	Nutritional Anthropology	
ANTH 458	Gender and Reproduction	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
BIOL 2110L	Principles of Biology: Cellular and Molecular Biology Laboratory	
BIOL 2310	Microbiology	
BIOL 2310L	Microbiology Lab	
BIOL 2320	Public Health Microbiology	
BIOL 2505	Pathophysiology	
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	
BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 305	Principles of Genetics	
BIOL 377	Cell Biology	
BIOL 385	An Introduction to Cancer	
BIOL 424	Human Osteology	
BIOL 470	Developmental Biology	
BIOL 474	Immunology	
BIOL 475	Virology	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
CHEM 313	Organic Chemistry I	
CHEM 314	Organic Chemistry II	
CHEM 315	Organic Chemistry Laboratory	
PHYS 1230G	Algebra-Based Physics I	
PHYS 1230L	Algebra-Based Physics I Lab	
PHYS 1240G	Algebra-Based Physics II	
PHYS 1240L	Algebra-Based Physics II Lab	
PHYS 2230G	General Physics for Life Science I	
PHYS 2230L	Laboratory to General Physics for Life Science I	
PHYS 2240G	General Physics for Life Science II	
PHYS 2240L	Laboratory to General Physics for Life Science II	
SPMD 1110	Introduction to Athletic Training	
SPMD 1120	Medical Terminology	
SPMD 3350	Inferential Statistics in Sport and Exercise Science	
SPMD 3550	Psychology of Sport	
SPMD 3610	Health and Exercise Psychology	
SPMD 4210	Advanced Exercise Physiology	
SPMD 4450	Pathophysiology and Human Function(s)	
SPMD 4510	Neurophysiology and Human Function	
SPMD 4520	Adapted Physical Education	
SPMD 4540	Psychology of Coaching in Sport	
SPMD 4997	Problems	
SPMD 4998	Internship	
NUTR 2110	Human Nutrition	
NUTR 3110	Nutrition Throughout the Lifecycle	
NUTR 3750	Applied Nutrition Research	
NUTR 4110	Advanced Nutrition	
PSYC 2210	Abnormal Psychology	
PSYC 2120	Developmental Psychology	
PSYC 2220	Cognitive Psychology	
PSYC 3220	Learning	
PSYC 3410	Health Psychology	
PSYC 2250	Brain and Behavior	
PSYC 3210	Perception	
PSYC 3230	Memory	
PHLS 4720	Health Promotion for the Older Adult	
PHLS 4730	Adulthood and Aging	
BCHE 395	Biochemistry I	
CEPY 1120G	Human Growth and Behavior	
SPHS 2110	Introduction to Communication Disorders	
SPHS 3110V	Autism Spectrum Disorders - a Lifespan Perspective	
Total Credits		**120-122**

[1] See the General Education (p. 262) section of the catalog for a full list of courses

[2] A Mathematics General Education course is required for the degree but students may need to take developmental mathematics to enter the course of their choosing.

[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		**Credits**
ENGL 1110G	Composition I	4
MATH 1220G	College Algebra	3
SPMD 1310	Introduction to Kinesiology	3
SPMD 1350	Social Foundations of Physical Activity	3
SPMD 2250	Fitness for Health and Sport	3
COMM 1115G	Introduction to Communication	3
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	3
BIOL 2110L	Principles of Biology: Cellular and Molecular Biology Laboratory	1
PSYC 1110G	Introduction to Psychology	3
PHED 1510	Training:	1
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
	Credits	**31**
Second Year		
ENGL 2210G	Professional and Technical Communication	3
PHYS 1240G	Algebra-Based Physics II	3
PHYS 1240L	Algebra-Based Physics II Lab	1

PHIL 2110G	Introduction to Ethics	3
SPMD 1110	Introduction to Athletic Training	3
SPMD 1120	Medical Terminology	3
SPMD 2210	Anatomy and Physiology I	3
SPMD 2210L	Anatomy and Physiology Laboratory	1
SPMD 2225	Anatomy and Physiology II	3
SPMD 2225L	Anatomy and Physiology II Lab	1
SPMD 3410	Exercise Physiology	3
SPMD 3410L	Exercise Physiology Lab	1
PHED 1310	Swim I:	1
PHED 1230	Individual Sport:	1
	Credits	**30**
Third Year		
ANTH 357V	Medical Anthropology	3
SPMD 3650V	Motor Development	3
SPMD 3450	Biomechanics	3
SPMD 3450L	Biomechanics Laboratory	1
SPMD 3550	Psychology of Sport	3
SPMD 4350	Exercise Testing and Prescription	3
SPMD 3710	Motor Learning	3
SPMD 3350	Inferential Statistics in Sport and Exercise Science	3
SPMD 4510	Neurophysiology and Human Function	3
SPMD 4540	Psychology of Coaching in Sport	3
CEPY 1120G	Human Growth and Behavior	3
	Credits	**31**
Fourth Year		
SPMD 4210	Advanced Exercise Physiology	3
EPWS 325V	Insects, Humans, and the Environment	3
SPMD 4250	Principles of Strength and Conditioning	3
SPMD 4250L	Principles of Strength and Conditioning Laboratory	1
SPMD 4410	Exercise for Special Populations	3
SPMD 4620	Nutrition and Metabolism of Sport	3
SPMD 4998	Internship	12
DANC 1110G	Dance Appreciation	3
	Credits	**31**
	Total Credits	**123**

Kinesiology (Performance Psychology) - Bachelor of Science in Kinesiology

Kinesiology is a great option that prepares students for many careers in allied health. Students may explore options in medicine, physical and occupational therapy, athletic training, corporate health and wellness, chiropractic medicine, dentistry, physical education, pharmacy, and much more.

The Bachelor of Science in Kinesiology degree program can be completed in one of three concentration areas: Exercise Science, Performance Psychology, or Physical Education. Regardless of the concentration, students are required to complete a minimum of 120 credits. Additionally, students are required to complete a minimum of 48 upper division credits (300/3000 and 400/4000 level courses). Kinesiology students must maintain a minimum 2.75 GPA to enroll in most upper-division SPMD courses. ENGL 1110G/ENGL 1110H Composition I Honors , Area II General Education courses, Kinesiology courses, and Approved Electives must be completed with a grade of C- or better.

Students must complete all University degree requirements. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Information about Kinesiology and potential career opportunities may be obtained at the Department of Kinesiology , Activity Center 204, phone 575-646-2215.

With a concentration in Performance Psychology, students can also receive a Minor in Psychology. Official Minor documentation and verification of completion must be approved through the Department of Psychology.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
English Composition - Level 2 [1]		
Choose one from the following: (ENGL 2210G or ENGL 2215G recommended)		3
ENGL 2130G	Advanced Composition	
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication [1]		*3*
Area II: Mathematics [2]		*3-4*
Choose one of the following:		
MATH 1220G	College Algebra	
MATH 1250G	Trigonometry & Pre-Calculus	
MATH 1430G	Applications of Calculus I	
MATH 1511G	Calculus and Analytic Geometry I	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
Area III: Laboratory Sciences Courses (8 credits) (Preferred Below) [1]		
Choose two (8 credits) of the following: (BIOL 2110G recommended)		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	

Area IV: Social/Behavioral Sciences Course (3 credits) [1]		
PSYC 1110G	Introduction to Psychology	
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing a Wider World [3]		**6**
Departmental/College Requirements		
Choose three of the following:		3
PHED 1230	Individual Sport:	
PHED 1290	Team Sport:	
PHED 1310	Swim I:	
PHED 1410	Yoga:	
PHED 1430	Pilates:	
PHED 1510	Training:	
PHED 1620	Fitness:	
PHED 1670	Aerobics:	
PHED 1830	Running:	
PHED 2996	Special Topics	
HLED 1154	Lifeguarding	
DANC 1130	Introduction to Ballet	
DANC 1131	Introduction to Ballroom Dance	
DANC 1135	Introduction to Argentine Tango	
DANC 1140	Introduction to Flamenco	
DANC 1150	Modern Dance I	
DANC 1161	Tap Dance	
DANC 1185	Introduction to Country Western Dance	
DANC 1220	Introduction to Latin Social Dance	
DANC 1235	Introduction to West Coast Swing Dance	
DANC 2157	Hip-Hop Dance II	
SPMD 1310	Introduction to Kinesiology	3
SPMD 1350	Social Foundations of Physical Activity	3
SPMD 2210	Anatomy and Physiology I	3
SPMD 2210L	Anatomy and Physiology Laboratory	1
SPMD 2250	Fitness for Health and Sport	3
SPMD 2225	Anatomy and Physiology II	3
SPMD 2225L	Anatomy and Physiology II Lab	1
SPMD 3410	Exercise Physiology	3
SPMD 3450	Biomechanics	3
SPMD 3450L	Biomechanics Laboratory	1
SPMD 3550	Psychology of Sport	3
SPMD 3650	Motor Development	3
SPMD 3610	Health and Exercise Psychology	3
SPMD 3710	Motor Learning	3
SPMD 4998	Internship	6
Psychology Courses		*18*
Students can select the official Psychology Minor requiring 18 credit hours in PSYC [4]		
Departmental Requirements (in addition to Gen.Ed/VWW)		
Choose one from the following:		3
A ST 311	Statistical Applications	
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
SPMD 3350	Inferential Statistics in Sport and Exercise Science	
Electives, to bring the total credits to 120		**15**
Choose from the following list		
ANTH 355	Biological Anthropology	
ANTH 357V	Medical Anthropology	
ANTH 431V	Nutritional Anthropology	
ANTH 458	Gender and Reproduction	
BIOL 2110G	Principles of Biology: Cellular and Molecular Biology	
BIOL 2110L	Principles of Biology: Cellular and Molecular Biology Laboratory	
BIOL 2505	Pathophysiology	
BIOL 2310	Microbiology	
BIOL 2310L	Microbiology Lab	
BIOL 2320	Public Health Microbiology	
BIOL 2610G	Principles of Biology: Biodiversity, Ecology, and Evolution	
BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 305	Principles of Genetics	
BIOL 377	Cell Biology	
BIOL 385	An Introduction to Cancer	
BIOL 424	Human Osteology	
BIOL 470	Developmental Biology	
BIOL 474	Immunology	
BIOL 475	Virology	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
CHEM 313	Organic Chemistry I	
CHEM 314	Organic Chemistry II	
CHEM 315	Organic Chemistry Laboratory	
PHYS 1230G	Algebra-Based Physics I	
PHYS 1230L	Algebra-Based Physics I Lab	
PHYS 1240G	Algebra-Based Physics II	
PHYS 1240L	Algebra-Based Physics II Lab	
SPMD 1110	Introduction to Athletic Training	
SPMD 1120	Medical Terminology	
SPMD 3350	Inferential Statistics in Sport and Exercise Science	
SPMD 4210	Advanced Exercise Physiology	
SPMD 4250	Principles of Strength and Conditioning	
SPMD 4250L	Principles of Strength and Conditioning Laboratory	
SPMD 4350	Exercise Testing and Prescription	
SPMD 4410	Exercise for Special Populations	
SPMD 4450	Pathophysiology and Human Function(s)	
SPMD 4510	Neurophysiology and Human Function	
SPMD 4520	Adapted Physical Education	
SPMD 4540	Psychology of Coaching in Sport	
SPMD 4620	Nutrition and Metabolism of Sport	
SPMD 4997	Problems	
SPMD 4998	Internship	
NUTR 2110	Human Nutrition	
NUTR 3110	Nutrition Throughout the Lifecycle	
NUTR 3750	Applied Nutrition Research	
NUTR 4110	Advanced Nutrition	
PSYC 2210	Abnormal Psychology	
PSYC 2120	Developmental Psychology	
PSYC 2220	Cognitive Psychology	
PSYC 3220	Learning	

PSYC 3410	Health Psychology	
PSYC 2250	Brain and Behavior	
PHLS 4720	Health Promotion for the Older Adult	
PHLS 4730	Adulthood and Aging	
BCHE 395	Biochemistry I	
CEPY 1120G	Human Growth and Behavior	
SPHS 2110	Introduction to Communication Disorders	
SPHS 3110V	Autism Spectrum Disorders - a Lifespan Perspective	
Total Credits		**120-122**

1 See the General Education (p. 262) section of the catalog for a full list of courses

2 A Mathematics General Education course is required for the degree but students may need to take developmental mathematics to enter the course of their choosing.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

4 Courses used for PSYC minor cannot also be used for credit as electives.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
Choose one from the following:		4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
PHYS 1230L	Algebra-Based Physics I Lab	
PSYC 1110G	Introduction to Psychology	3
Area VI: Creative and Fina Arts		3
SPMD 1310	Introduction to Kinesiology	3
	Credits	**17**
Semester 2		
Area I: English Comp Level 2		3
Area II: Mathematics		3-4
Choose one from the following:		4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
PHYS 1240G	Algebra-Based Physics II	
Area V: Humanities		3
SPMD 1350	Social Foundations of Physical Activity	3
	Credits	**16-17**
Second Year		
Semester 1		
Area I: Oral Communications		3
General Education Elective		3-4
SPMD 2210	Anatomy and Physiology I	3
SPMD 2210L	Anatomy and Physiology Laboratory	1
SPMD 2250	Fitness for Health and Sport	3
Viewing Wider World		3
	Credits	**16-17**
Semester 2		
SPMD 2225	Anatomy and Physiology II	3
SPMD 2225L	Anatomy and Physiology II Lab	1
SPMD 3410	Exercise Physiology	3
Psychology Course-See Psychology Dept Courses (3000/4000)		3
Choose one from the following:		3
A ST 311	Statistical Applications	
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
SPMD 3350	Inferential Statistics in Sport and Exercise Science	
Viewing Wider World		3
	Credits	**16**
Third Year		
Semester 1		
SPMD 3450	Biomechanics	3
SPMD 3450L	Biomechanics Laboratory	1
SPMD 3550	Psychology of Sport	3
SPMD 3650	Motor Development	3
Psychology Course-See Psychology Dept Courses (3000/4000)		3
Psychology Course-See Psychology Dept Courses (3000/4000)		3
	Credits	**16**
Semester 2		
SPMD 3610	Health and Exercise Psychology	3
SPMD 3710	Motor Learning	3
Psychology Course-See Psychology Dept Courses (3000/4000)		3
Psychology Course-See Psychology Dept Courses (3000/4000)		3
Psychology Course-See Psychology Dept Courses (3000/4000)		3
	Credits	**15**
Fourth Year		
Semester 1		
Physical Education Course (PHED)		1
Physical Education Course (PHED)		1
Physical Education Course (PHED)		1
Kinesiology Approved Elective		3
Kinesiology Approved Elective		3
Kinesiology Approved Elective		3
Kinesiology Approved Elective: If Needed to enroll in 15 credits for Financial Aid		
	Credits	**12**
Semester 2		
Kinesiology Approved Elective		3
Kinesiology Approved Elective		3
SPMD 4998	Internship	6

Kinesiology Approved Elective: If Needed to enroll in 15 credits for Financial Aid	
Credits	**12**
Total Credits	**120-122**

1 These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
2 See the General Education (p. 262) section of the catalog for a full list of courses.
3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4 A list of approved electives can be found at https://kind.nmsu.edu/kin/ (https://kind.nmsu.edu/).

Kinesiology (Physical Education) - Bachelor of Science in Kinesiology

Kinesiology is a great option that prepares students for many career options in allied health. Students may explore options in medicine, physical and occupational therapy, athletic training, corporate health and wellness, chiropractic medicine, dentistry, physical education, pharmacy, and much more.

The Bachelor of Science in Kinesiology degree program can be completed in three concentration areas: Exercise Science, Performance Psychology, or Physical Education. Regardless of concentration, students are required to complete a minimum of 120 total credits. Additionally, students are required to complete a minimum of 48 upper division credits (300/3000 and 400/4000 level courses). Kinesiology students must maintain a minimum 2.75 GPA to enroll in most upper-division SPMD courses. ENGL 1110G/ENGL 1110H Composition I Honors , Area II General Education courses, Kinesiology courses, and Approved Electives must be completed with a grade of C- or better.

Students must complete all University degree requirements. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed to take the necessary English and Mathematics coursework.

With a concentration in Physical Education and successfully meeting state requirements, students will be eligible to teach in the school system (e.g., Elementary, Middle and High School settings). All Teacher Education Program (TEP) pre-requisite courses must be completed with a C- or better.

Information about Kinesiology and potential career opportunities may be obtained at the Department of Kinesiology, Activity Center 204, phone 575-646-2215.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
Choose one from the following:		4
ENGL 1110G	Composition I	
ENGL 1110H	Composition I Honors	
English Composition - Level 1 [1]		*3*
Oral Communication [1]		*3*
Area II: Mathematics		
MATH 1220G	College Algebra [2]	3
or MATH 1250G	Trigonometry & Pre-Calculus	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
Area III: Laboratory Sciences Course (8 credits) [1]		
Area IV: Social/Behavioral Sciences (3 credits)		
CEPY 1120G	Human Growth and Behavior (Required with a "C-" or better)	
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
MATH 1130G	Survey of Mathematics	3
or MATH 1430G	Applications of Calculus I	
Viewing a Wider World [3]		**6**
Must be from two different colleges, cannot be DANC 3510V/ HNRS 347V		
Departmental/College Requirements		
Kinesiology Core (specific to Physical Education only)		
SPMD 1350	Social Foundations of Physical Activity	3
SPMD 2210	Anatomy and Physiology I	3
SPMD 2210L	Anatomy and Physiology Laboratory	1
SPMD 2250	Fitness for Health and Sport	3
SPMD 3710	Motor Learning	3
K-12 Physical Education Concentration Courses		
SPMD 3110	Racquet Sports	2
SPMD 3120	Theory and Technique of Lifelong Outdoor Leisure Activities	2
SPMD 3130	Theory and Technique of Sports and Games	2
SPMD 3140	Designing Student Centered Afterschool Physical Activity Clubs	3
SPMD 3150	Theory and Technique of Dance and Rhythms	2
SPMD 3250	Introduction to Exercise Science: Exercise Physiology and Biomechanics	3
SPMD 3310	Lifetime Activities	2
SPMD 3650	Motor Development	3
Professional Education Coures		
CEPY 2110	Learning in the Classroom [4]	3
EDUC 1995	Field Experience I [4]	1
EDUC 3120	Multicultural Education [4,5]	3
EDLT 3110	Integrating Technology with Teaching [4]	3
READ 4330	Content Area Literacy [6]	3
SPED 3105	Introduction to Special Education in a Diverse Society [4]	3
SPMD 3160	Elementary School Physical Education	3
SPMD 4520	Adapted Physical Education [6]	3
SPMD 4530	Methods of Teaching Secondary Physical Education [6]	6
Student Teaching		
EDUC 4820	Secondary Student Teaching [6]	9
EDUC 4821	Middle and High School Student Teaching Seminar [6]	3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
Choose two from the following:		6
ANTH 1115G	Introduction to Anthropology	
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1160G	World Archaeology	
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	

GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
POLS 1120G	American National Government	
POLS 1110G	Introduction to Political Science	
POLS 1130G	Issues in American Politics	
POLS 2120G	International Relations	
HNRS 2170G	The Human Mind	
HNRS 2172G	Archaeology: Search for the Past	
HNRS 2180G	Citizen and State Great Political Issues	
JOUR 105G	Media and Society	
LING 2110G	Introduction to the Study of Language and Linguistics	
PHLS 1110G	Personal Health & Wellness	
PSYC 1110G	Introduction to Psychology	
SOWK 2110G	Introduction to Human Services & Social Work	
SOCI 1110G	Introduction to Sociology	
SOCI 2310G	Contemporary Social Problems	
GNDR 2110G	Introduction to Women, Gender, and Sexuality Studies	
GNDR 2120G	Representing Women Across Cultures	
One additional Area V/VI: Humanities or Creative & Fine Arts Course (must be a different subject area than the course selected above) [1]		3
Total Credits		**120**

1 See the General Education (p. 262) section of the catalog for a full list of courses
2 MATH 1220G College Algebra or MATH 1250G Trigonometry & Pre-Calculus is required for the degree but students may need to take prerequisites needed to enter either course first.
3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4 Pre/co-requisite to Teacher Ed program
5 Must be completed prior to Submission of TEP portfolio
6 Requires admission to Teacher Ed Program (TEP)

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested study plan for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
CEPY 1120G	Human Growth and Behavior	3
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1220G or MATH 1250G	College Algebra or Trigonometry & Pre-Calculus	3-4
SPMD 1350	Social Foundations of Physical Activity	3
Area V: Humanities Course [2]		3
	Credits	**16-17**
Semester 2		
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
EDUC 1995	Field Experience I (Spring Only)	1
MATH 1130G or MATH 1430G	Survey of Mathematics or Applications of Calculus I	3
SPMD 2250	Fitness for Health and Sport	3
An additional Area IV: Social and Behavioral Science Course (for licensure purposes) [2]		3
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Second Year		
Semester 1		
CEPY 2110	Learning in the Classroom	3
ENGL 2221G	Writing in the Humanities and Social Science	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Area III: Laboratory Science Course (BIOL, CHEM, or PHYS) [2]		4
An additional Area IV: Social and Behavioral Science Course (for licensure purposes) [2]		3
	Credits	**16**
Semester 2		
EDUC 3120	Multicultural Education	3
EDLT 3110	Integrating Technology with Teaching	3
SPMD 2210 & 2210L	Anatomy and Physiology I and Anatomy and Physiology Laboratory	4
SPMD 3110	Racquet Sports (Spring Only)	2
Either an additional Area V: Humanities or Area VI: Creative and Fine Arts Course (for licensure purposes) [2]		3
	Credits	**15**
Third Year		
Semester 1		
APPLY TO TEACHER EDUCATION PROGRAM (TEP)		
SPMD 3120	Theory and Technique of Lifelong Outdoor Leisure Activities (Fall Only)	2
SPMD 3130	Theory and Technique of Sports and Games (Fall Only)	2
SPMD 3150	Theory and Technique of Dance and Rhythms (Fall Only)	2
SPMD 3310	Lifetime Activities	2
SPMD 3710	Motor Learning	3
Area III: Laboratory Science Course [2]		4
	Credits	**15**
Semester 2		
APPLY TO STUDENT TEACHING		
READ 4330	Content Area Literacy (Spring Only)	3
SPMD 3140	Designing Student Centered Afterschool Physical Activity Clubs (Spring Only)	3
SPMD 3160	Elementary School Physical Education (Spring Only)	3
SPMD 3650	Motor Development (Spring Only)	3
SPMD 4520	Adapted Physical Education (Spring Only)	3
	Credits	**15**
Fourth Year		
Semester 1		
SUBMIT STEP PACKET		
SPMD 3250	Introduction to Exercise Science: Exercise Physiology and Biomechanics (Fall Only)	3
SPMD 4530	Methods of Teaching Secondary Physical Education (Fall Only)	6
VWW: Viewing a Wider World Course [3]		3

VWW: Viewing a Wider World Course [3]		3
	Credits	**15**
Semester 2		
EDUC 4820	Secondary Student Teaching	9
EDUC 4821	Middle and High School Student Teaching Seminar	3
	Credits	**12**
	Total Credits	**120-121**

1 These courses may have prerequisites and/or co-requisites, and it is the student's responsibility to check to ensure the requirements are fulfilled.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Dance - Undergraduate Minor

The Dance Minor includes courses in dance technique, choreography, and performance with opportunities in history and pedagogy. Students should take a minimum of 18 credits, with at least nine hours of upper division coursework.

Prefix	Title	Credits
Dance Technique Requirements		
One semester of Ballet Technique from:		*1-2*
DANC 1130	Introduction to Ballet	
DANC 2130	Ballet II	
DANC 3130	Ballet III	
One semester of Modern Dance Technique from:		*1-2*
DANC 1150	Modern Dance I	
DANC 2150	Modern Dance II	
DANC 3150	Modern Dance III	
At least two courses from Ballet, Modern Dance, or the following:		*3-4*
DANC 1131	Introduction to Ballroom Dance	
DANC 1140	Introduction to Flamenco	
DANC 1161	Tap Dance	
DANC 1220	Introduction to Latin Social Dance	
DANC 2157	Hip-Hop Dance II	
DANC 2460	Dance for Musical Theatre	
Dance Minor Core Requirements		
DANC 1110G	Dance Appreciation	3
DANC 2270	Dance Improvisation	2
DANC 3265	Dance Composition I	3
Choose one of the following:		*3*
DANC 3350	Dance Pedagogy I	
DANC 3510V	World Dance	
DANC 3610	Dance History	
Two semesters of the following:		*2*
Courses are repeatable for credit		
DANC 3114	DanceSport Ensemble	
DANC 3250	Dance Repertory	
Total Credits		**18-21**

Exercise Science - Undergraduate Minor

Prefix	Title	Credits
Required Courses [1,2]		
SPMD 2210	Anatomy and Physiology I	3
SPMD 2210L	Anatomy and Physiology Laboratory	1
SPMD 2250	Fitness for Health and Sport	3
SPMD 3410	Exercise Physiology	3
Select a minimum of 9 credits from the following:		9
SPMD 3450 & 3450L	Biomechanics and Biomechanics Laboratory	
SPMD 3550	Psychology of Sport	
SPMD 3650	Motor Development	
SPMD 3710	Motor Learning	
SPMD 4210	Advanced Exercise Physiology	
SPMD 4350	Exercise Testing and Prescription	
SPMD 4410	Exercise for Special Populations	
SPMD 4250 & 4250L	Principles of Strength and Conditioning and Principles of Strength and Conditioning Laboratory	
Total Credits		**19**

1 Official minor documentation must be completed with the Department of Kinesiology and Dance. Upon completion of all coursework, final signature approval must be obtained by the Department Head or Kinesiology Program Director.

2 Many courses above such as SPMD 3410, SPMD 3450, SPMD 3450L, SPMD 3710, SPMD 4210, SPMD 4250, SPMD 4250L, SPMD 4350 and SPMD 4410 all require SPMD 2210 Anatomy and Physiology I as a prerequisite.

Nursing

Undergraduate Program Information

NMSU's School of Nursing (SON) offers a Bachelor of Science in Nursing (BSN) degree. The degree plan provides two options to accommodate either the beginning nursing student and the beginning nursing student with a baccalaureate degree in another major. Students graduating from the two options are eligible to take the NCLEX-RN® examination for licensure as a registered nurse upon completing their program of studies. This BSN degree is also offered at two additional satellite sites at NMSU Grants, NM and NMSU Alamogordo, NM.

The Bachelor of Science in Nursing (BSN) degree program is accredited by the Commission on Collegiate Nursing Education (CCNE). Accreditation by the CCNE assures prospective students and employers that the program has met national education standards. The BSN degree program in nursing has full approval from the New Mexico Board of Nursing. Approval by the New Mexico Board of Nursing is required for BSN graduates to be eligible to take the National Council Licensing Examination (NCLEX-RN®) for licensure as a registered nurse.

The NMSU SON is a full New Mexico Nursing Education Consortium (NMNEC) member and offers the NMNEC BSN curriculum.

NMSU pre-nursing and transfer students should contact the pre-nursing advisors in the Center for Academic Advising and Student Support

(CAASS) at Educational Services Center, Suite 200 for information on the pre-nursing curriculum. Second-degree students should contact the School of Nursing Advising Center (https://schoolofnursing.nmsu.edu/nursing/son-pages/SON-Advising-Center.html) to determine eligibility for the Pathways or Roadrunner options. Contact the School of Nursing Advising Center (https://schoolofnursing.nmsu.edu/nursing/son-pages/SON-Advising-Center.html) for the BSN program application (all options) and information about the HESI A2 Entrance Exam, Military students, and specific questions about the nursing program.

School of Nursing Advising Office: HSS 110, 575-646-3812, nursing@nmsu.edu

Application and Admission Requirements: Traditional 4-year BSN Program

Application and admission requirements for the four-year BSN program are as follows:

1. Obtain admission to NMSU.
2. Satisfy NMSU basic academic competency requirements in English and Math.
3. Completed or in the last semester of nursing prerequisite courses (see BSN degree plan (https://schoolofnursing.nmsu.edu/nursing/son-documents/BSN-4-Sem-Degree-plan-2022-2023-revised-2021-11-11.pdf)).
4. Prerequisite science courses must have been completed within the past seven years at the time of application.
5. Minimum nursing prerequisite course GPA 2.75 or above, which includes grades earned from all higher education institutions.
6. Minimum of C- grade in all prerequisite and general education courses
7. Completion of the HESI-A2 Admission Exam (https://schoolofnursing.nmsu.edu/nursing/son-pages/faq-bsn-admission.html#hesi) (Biology, Chemistry, Math, and all English sections) by the application deadline with a score of > 75% in each section.
8. Submit a complete BSN program application and all supporting documents by the program deadline (see below). No incomplete applications will be considered.
9. Acceptance of transfer students into the BSN program is contingent upon NMSU Admissions receiving an official transcript verifying completion of all required prerequisite courses with satisfactory grades, as defined by BSN program requirements. The official transcript must be received by NMSU Admissions within 30 days following the end of the term in which the final prerequisite courses were completed.

Students should meet with a School of Nursing advisor to determine eligibility to apply to the five-semester BSN program and to obtain the BSN program application.

Application deadlines:

- April 1st—for consideration for Fall admission to the nursing major (Las Cruces, Grants and Alamogordo applicants)
- September 1st—for consideration for Spring admission to the nursing major (Las Cruces applicants only).

For more information on the application/admission policies and procedures, please visit the School of Nursing website (https://schoolofnursing.nmsu.edu/nursing/son-pages/bsn-program.html).

NOTES: Admission to the BSN program is competitive and available seats in each class are limited. Admission scores are based primarily on nursing pre-requisite GPA and scores on the HESI A2 Entrance Exam*. Any applicant not admitted to the nursing major may reapply during the next admission cycle. Applicants for fall semester admission may not finish nursing prerequisites in the summer session immediately preceding the fall semester in which they wish to be admitted.*

Application and Admission Requirements: Second Degree Options (Roadrunner and Pathways)

The Nursing Program offers two options for 2nd-degree-seeking students. Both programs are designed for students who already have a Bachelor's degree in another major but would like to pursue a Bachelor of Science in Nursing (BSN). The Roadrunner option starts in the summer semester and is completed in 19 months. Students in the Pathways option are admitted alongside traditional 4-year BSN students in the fall and spring semesters. Please refer to the School of Nursing website (https://schoolofnursing.nmsu.edu/nursing/son-pages/2nd-degree-BSN-options.html) for more information about the two options.

Application and admission requirements for the Roadrunner and Pathways BSN options are as follows:

1. Obtain admission to NMSU as a second bachelor's degree-seeking student.
2. Have a minimum GPA of 3.0 on a 4.0 scale for the first bachelor's degree.
3. Achieve a B grade in all nursing prerequisite courses: Anatomy and Physiology or A&P I and A&P II (8 credits), Microbiology with lab, and Statistics (3 credits). Roadrunner applicants must have completed Pathophysiology (4-6 credits) prior to the start of the program.
4. Nursing prerequisite courses must not be older than 7 years at the time of application. Pathway applicants must complete at least two prerequisites prior to application. Roadrunner applicants must complete three prerequisites prior to application.
5. Completion of the HESI-A2 Admission Exam (https://schoolofnursing.nmsu.edu/nursing/son-pages/bsn-program.html) (Biology, Chemistry, Math, and all English sections) by the application deadline with a score of > 75% in each section.
6. Submit a complete BSN program application and all supporting documents by the program deadline (see below). No incomplete applications will be considered.
7. Acceptance of transfer students into the BSN program is contingent upon NMSU Admissions receiving an official transcript verifying completion of all required prerequisite courses with satisfactory grades, as defined by BSN program requirements. The official transcript must be received by NMSU Admissions within 30 days following the end of the term in which the final prerequisite courses were completed.

Application deadlines:

- April 1st—for consideration for Fall admission to the nursing major (Las Cruces, Grants, and Alamogordo Pathways applicants)
- February 1st—for consideration for Summer admission to the nursing major (Las Cruces campus Roadrunner option)
- September 1st—for consideration for Spring admission to the nursing major (Las Cruces Pathways applicants only)

For more information on the application/admission policies and procedures, please visit the School of Nursing website (https://

schoolofnursing.nmsu.edu/nursing/son-pages/bsn-program.html). Second-degree students must contact an advisor at the NMSU School of Nursing Advising Center (https://schoolofnursing.nmsu.edu/nursing/son-pages/SON-Advising-Center.html).

NOTES: Admission to the BSN program is competitive, and available seats in each class are limited. Admission scores are based primarily on the nursing prerequisite GPA and the HESI A2 Entrance Exam scores*. Any applicant not admitted to the nursing major may reapply during the next admission cycle. Pathways applicants for fall semester admission may not finish nursing prerequisites in the summer session immediately preceding the fall semester in which they wish to be admitted.*

Graduate Program Information

New Mexico State University's School of Nursing offers graduate education designed to advance nursing practice and improve care outcomes for individuals, families, communities, and systems. Across these programs, students build expertise in evidence-based practice, quality improvement, leadership, policy advocacy, informatics, culturally-sensitive practice, and systems thinking, with a strong emphasis on translating research to practice improving outcomes for populations experiencing or at risk for health disparities. Graduate study culminates in advanced clinical and scholarly preparation that supports nurses, nurse practitioners, and nurse anesthetists in leading healthcare system improvements and strengthening patient-centered care.

New Mexico State University's master's degree program in nursing (MSN), Doctor of Nursing Practice (DNP) programs, and post-graduate APRN certificate programs are accredited by the Commission on Collegiate Nursing Education (CCNE), 655 K Street NW, Suite 750, Washington, DC 20001,202-887-6791. The Nurse Anesthesiology concentration in the DNP program is accredited by the Council on Accreditation of Nurse Anesthesia Educational Programs (COA), 10275 W. Higgins Rd., Suite 906, Rosemont, IL 60018-5603; (847) 655-1160. Accreditation by CCNE and COA ensure programs undergo rigorous scrutiny and meet national education standards.

Detailed information about degree options, including program pathways, clinical requirements, and application and admission guidelines is provided below. For more information, please visit the **School of Nursing website**.

MSN Degree

The Master of Science in Nursing (MSN) provides graduate-level education and training in the field of Nursing Leadership and Administration. Students enrolled in the Nursing Leadership and Administration MSN program acquire the knowledge and experience to assume leadership positions in a wide range of healthcare systems and fulfill the fundamental requirements to secure middle and top-level administrative positions in healthcare agencies. The MSN Leadership and Administration degree option is available to nurses who possess an RN license and a Bachelor of Science degree in Nursing (BSN). Courses for this degree are delivered via distance education through NMSU Global Campus (i.e., online), allowing nurses to advance their careers while remaining in their communities.

Please visit the Master's of Science in Nursing webpage (https://schoolofnursing.nmsu.edu/nursing/son-pages/MSN-Program.html) or contact the Nursing Graduate Advisor for more information about application and admission requirements at (575) 646-4007.

Application deadline: January 2 for a spring semester start**; August 2** for a fall semester start.

DNP Degree

The Doctor of Nursing Practice (DNP) degree is a terminal degree in nursing that focuses on advancing nursing practice directed towards improving nursing care outcomes for individuals, families, communities, and systems. The program emphasizes culturally sensitive practice, evidenced-based practice, and translation of research to practice as it relates to improving the care of individuals, families, groups and communities experiencing or at risk for health disparities. The complexity of health care combined with rapidly increasing knowledge and the need for both evidence-based practice and translation of research to practice support the scholarship goals of the DNP. Students in the DNP program complete a year-long final project. A minimum of 1000 supervised clinical contact hours must be completed for the DNP degree.

MSN-DNP Option

The MSN-to-Doctor of Nursing Practice (DNP) concentration in Population Health Leadership allows nurses with a Master's degree in a nursing field to obtain a terminal degree with advanced education in population health, evidence-based practice, quality improvement, leadership, policy advocacy, informatics, and systems thinking. Nurses with the DNP degree are prepared to lead efforts to make healthcare system changes and improve patient outcomes. Nurses with the MSN degree who are working in APRN or non-APRN roles are encouraged to apply. Upon admission, a review of supervised contact hours obtained in the MSN degree will be conducted. Students will be required to complete a minimum of 1000 clinical and/or leadership contact hours between their prior Master's degree and the DNP degree. Courses for this degree are delivered via distance education through NMSU Global Campus (i.e., online), allowing nurses to advance their careers while remaining in their communities.

Please visit the MSN to DNP webpage (https://schoolofnursing.nmsu.edu/graduate-program/msn-dnp-in-population-health-leadership.html) or contact the Nursing Graduate Advisor for more information about application and admission requirements at 575-646-4007.

Application deadline: May 15 for a fall semester start.

BSN-DNP Option

Concentration: Family Nurse Practitioner, Psychiatric-Mental Health Nurse Practitioner

The BSN Doctor of Nursing Practice (DNP) option allows baccalaureate-prepared RNs to assume advanced practice nursing (APRN) roles within the health care arenas of **Family Nurse Practitioner (FNP)** and **Psychiatric-Mental Health Nurse Practitioner (PMHNP).** In these DNP concentrations, students must take courses in advanced pathophysiology, advanced assessment, and advanced pharmacology, in addition to specialty courses within their area of study. The clinical training consists of over 1000 supervised clinical contact hours completed in the student's clinical specialty and related areas. Courses for this degree are delivered via distance education through NMSU Global Campus (i.e., online), allowing nurses to advance their careers while remaining in their communities.

For more information, please visit the Family Nurse Practitioner webpage (https://schoolofnursing.nmsu.edu/graduate-program/family-nurse-practitioner.html) or the Psychiatric Mental Health Nurse Practitioner webpage (https://schoolofnursing.nmsu.edu/graduate-program/

psychiatric-mental-health-nurse-practitioner-specialty.html). You can also contact the Nursing Graduate Advisor for more information about application and admission requirements at 575-646-4007.

Application deadlines: **February 15** for a fall semester start.

Concentration: Nurse Anesthesiology

The BSN Doctor of Nursing Practice (DNP) option allows baccalaureate-prepared RNs to assume an advanced practice nursing (APRN) role within the health care arena as a **Nurse Anesthesiologist**. In this **3-year** DNP concentration, students must take advanced courses in anatomy, physiology, pathophysiology, health assessment, and pharmacology, in addition to other specialty courses within anesthesiology. The clinical training requires a minimum of 2400 supervised clinical contact hours completed in the student's clinical specialty and related areas. Courses for this degree are delivered through a combination of in-person didactic and laboratory experiences at the Las Cruces campus, and asynchronous and synchronous online learning. The majority of clinical training is completed at hospitals and surgical centers in the Las Cruces/El Paso and Albuquerque/Santa Fe regions. Residents complete a required rural New Mexico clinical rotation.

Please visit the Doctor of Nursing Practice Nurse Anesthesiology webpage (https://schoolofnursing.nmsu.edu/graduate-program/doctor-of-nursing-practice-dnp.html) or contact the Nursing Anesthesiology Student Program Coordinator for more information about application and admission requirements at 575-646-3688.

Application deadline: **February 1** for a start in the following Spring semester.

Post-Graduate APRN Certificates

This program is for currently certified Master's or doctorally-prepared nurse practitioners, certified nurse midwives, and certified registered nurse anesthetists who wish to obtain the coursework needed to sit for certification in another specialty. Post-Graduate APRN certificates are offered in the following specialties: **Family Nurse Practitioner** and **Psychiatric-Mental Health Nurse Practitioner.** Courses for these certifications are delivered via distance education through NMSU Global Campus (i.e., online), allowing nurses to advance their careers while remaining in their communities.

Please visit the Post Graduate APRN Certificate webpage (https://schoolofnursing.nmsu.edu/graduate-program/post-graduate-aprn-certificates/) or contact the Nursing Graduate Advisor for more information about application and admission requirements at (575) 646-4007.

Application deadline: January 15 for a fall semester start.

Degrees for the Department

Bachelor Degree(s)

- Nursing - Bachelor of Science in Nursing (p. 1346)

Master Degree(s)

- Nursing Leadership and Administration - Master of Science in Nursing (Online) (https://catalogs.nmsu.edu/global/nmsu-global/nursing-leadership-administration-msn-online/)

Doctoral Degree(s)

- Nursing Practice (Family Nurse Practitioner) - Doctor of Nursing Practice (Online) (https://catalogs.nmsu.edu/global/nmsu-global/nursing-practice-family-nurse-practitioner-dnp-online/)
- Nursing Practice (Nurse Anesthesiology) - Doctor of Nursing Practice (p. 232)
- Nursing Practice (Population Health Leadership) - Doctor of Nursing Practice (Online) (https://catalogs.nmsu.edu/global/nmsu-global/nursing-practice-population-health-leadership-dnp-online/)
- Nursing Practice (Psychiatric/Mental Health) - Doctor of Nursing Practice (Online) (https://catalogs.nmsu.edu/global/nmsu-global/nursing-practice-psychiatric-mental-health-dnp-online/)

Post Graduate APRN Certificate(s)

- Family Nurse Practitioner - Post-Masters Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/family-nurse-practitioner-pm-certificate-online/)
- Psychiatric/Mental Health Nurse Practitioner - Post-Masters Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/psychiatric-mental-health-nurse-practitioner-pmc-online/)

Alexa Doig, Director of the School of Nursing

Wanda Borges, Associate Director for Graduate Programs

Teresa León, Associate Director for the Undergraduate Program

Sandra Perez, Assistant Director for Student Success

Professors

W. Borges, C. DeBlieck, A. Doig, T. Keller

Associate Professors

J. Ade-Oshifogun, S. Lynch, S. Noe, L. Saiki

Assistant Professors

J. Patterson

College Professors

M. Chalenor, E. Kuchler, T. León

College Associate Professors

D. Cates, S. Davidson, S. Flaherty, K. Jones, C. Lombardi, M. MacKinnon, S. Perez, T. Schumacher, J. White, J. Williams

College Assistant Professors

C. Cothern, J. Creager, B. Ekechukwu, E. Falkner, E. Fitzgerald, K. Giron, E. Hendricks, A. Hunt, P. Jimerson, J. Kaiser, P. King, M. Leong, L. Linton, N. May, L. Monarrez, B. Natividad, C. Neskahi, E. Ortiz, H. Parsons, T. Pearson, C. Shannon, P. Shaw, N. Thurston, K. Ventura, E. Yglecias

New Mexico Nursing Education Consortium

NMNC 3110. Introduction to Nursing Concepts
3 Credits (3)
This course introduces the nursing student to the concepts of nursing practice and conceptual learning. Same as NMNC course number: NMNC

1110. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.
Corequisite: NMNC 3120, NMNC 3135.
Learning Outcomes
1. Integrate knowledge from nursing pre- and co-requisites into a conceptual learning model.
2. Apply conceptual learning to select nursing concepts.
3. Define personal values, beliefs, and attitudes about health and wellness.
4. Describe importance of identifying patient safety issues.
5. Describe roles and values of nursing and members of the health care team.
6. Describe standards and regulations that apply to nursing practice.

NMNC 3120. Evidence-Based Practice
3 Credits (3)
The focus of this course is the principles of evidence-based nursing practice. It includes the identification of clinical practice problems, the evaluation of available evidence, and the integration of evidence with clinical expertise and patient preferences in application to practice. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.
Corequisite: NMNC 3110, NMNC 3135.
Learning Outcomes
1. Examine integrating evidence-based practice with diverse patients' values.
2. Identify clinical practice problems and issues.
3. Explain the research process.
4. Describe how evidence is generated through the research process.
5. Appraise evidence and standards of care that support best clinical outcomes and patient safety.
6. Utilize informatics to access evidence-based practice guidelines.

NMNC 3135. Principles of Nursing Practice
4 Credits (4)
This course introduces the nursing student to the application of concepts through clinical skills in seminar, laboratory, and/or clinical settings. Principles of communication, assessments, safety, and interventions including accurate calculation, measurement, and administration of medications will be included. Same as NMNC course number: NMNC 1135. Restricted to: BSN, BSNP, and BSNR Majors. May be repeated up to 4 credits.
Corequisite: NMNC 3110, NMNC 3120.
Learning Outcomes
1. Describe the different types and characteristics of communication in professional nursing practice.
2. Utilize the concepts presented in Level One nursing courses in the application to the care of the patient.
3. Demonstrate the principles of safety during the implementation of nursing skills.
4. Demonstrate the learned skills in patient based scenarios.
5. Utilize the nursing process to provide safe and effective care.

NMNC 3210. Health and Illness Concepts I
3 Credits (3)
This course will focus on health and illness concepts across the lifespan. Concepts covered are related to homeostasis/regulation, sexuality/reproductive, protection/movement, and emotional processes. Same as NMNC course number: NMNC 1210. May be repeated up to 3 credits.
Prerequisite: NMNC 3110, NMNC 3120, NMNC 3135.
Corequisite: NMNC 3220, NMNC 3230, NMNC 3235.
Learning Outcomes
1. Describe the scope, risk factors, physiologic processes, attributes, and clinical management of selected concepts and exemplars across the lifespan.
2. Discuss evidence-based practices and health care standards of care related to the concepts/exemplars of the course.
3. Explain the collaboration necessary related to the concepts/exemplars of the course.
4. Utilize informatics and resources related to the concepts/exemplars of the course.
5. Integrate considerations of normal physiology and healthy adaptations into nursing practice of patients across the lifespan.

NMNC 3220. Health Care Participant
3 Credits (3)
This course introduces the nursing student to the attributes of the health care participant as an individual, a family, or a community. Same as NMNC course number: NMNC 1220. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.
Prerequisite: NMNC 3110, NMNC 3120, NMNC 3135.
Corequisite: NMNC 3210, NMNC 3230, NMNC 3235.
Learning Outcomes
1. Identify values, beliefs and attitudes toward health and illness of the health care recipient.
2. Articulate the role of nursing in relation to the health of vulnerable populations and elimination of health disparities.
3. Describe the protective and predictive factors which influence the health of families, groups, communities, and populations.
4. Describe the use of evidence-based practices to guide health teaching, health counseling, screening, outreach, disease and outbreak investigation, referral, and follow-up throughout the lifespan.
5. Describe the use of information and communication technologies in preventive care.
6. Examine the health care and emergence preparedness needs of the local community and in the state of New Mexico.
7. Identify clinical prevention and population-focused interventions with attention to effectiveness, efficiency, cost-effectiveness, and equity.

NMNC 3230. Nursing Pharmacology
3 Credits (3)
This course introduces the nursing student to pharmacologic nursing practice from a conceptual approach. Same as NMNC course number: NMNC 1230. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.
Prerequisite: NMNC 3110, NMNC 3120, NMNC 3135.
Corequisite: NMNC 3210, NMNC 3220, NMNC 3235.
Learning Outcomes
1. Identify the nurse's professional role related to pharmacotherapeutics in diverse populations across the lifespan.
2. Identify safety issues and minimize risk potential associated with pharmacotherapeutics and complementary and alternative medicine.
3. Utilize evidence-based information integrating pharmacologic and pathophysiologic concepts to guide medication therapeutics.
4. Describe health care system protocols related to pharmacotherapeutics.
5. Identify methods of communication with the health care team related to pharmacotherapeutics.
6. Utilize informatics systems related pharmacotherapeutics.

7. Describe common classes of drugs that are used in health care, including pharamacokinetics, pharmacodynamics, and pharmacotherapeutics.

NMNC 3235. Assessment and Health Promotion
4 Credits (4)
This course introduces the nursing student to the assessment of and the health promotion for the health care participant as an individual, a family, or a community. This course uses seminar, laboratory and/or clinical settings. Same as NMNC course number: NMNC 1235. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.
Prerequisite: NMNC 3110, NMNC 3120, NMNC 3135.
Corequisite: NMNC 3210, NMNC 3220, NMNC 3230.
Learning Outcomes
1. Assess physical health including a focus on the health/illness beliefs, values, attitudes, developmental level, functional ability, culture, and spirituality of the participant.
2. Assess family health including a focus on family health history, environmental exposures, and family genetic history to identify current and future health problems.
3. Collaborate with a community to assess their health needs
4. Utilize community assessment data and evidence-based practice as basis for identifying community health needs.
5. Document health assessments in electronic health record or written formats.
6. Share community assessment data with other health care professionals to identify needed interventions.
7. Explain the role of the nurse in relation to advocacy for the health care recipient.
8. Analyze education materials for health literacy concerns.

NMNC 4310. Health & Illness Concepts II
3 Credits (3)
This course covers health and illness concepts across the lifespan with the focus on chronic conditions. Concepts covered are related to oxygenation and hemostasis, homeostasis and regulation, protection and movement, and cognition and behavior processes. Same as NMNC course number: NMNC 2310. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.
Prerequisite: NURS 328, NMNC 3210, NMNC 3220, NMNC 3230, NMNC 3235.
Corequisite: NMNC 4320, NMNC 4335.
Learning Outcomes
1. Relate the scope, risk factors, physiologic processes, attributes, and clinical management of selected concepts and exemplars across the lifespan.
2. Investigate evidenced-based practice, standards of nursing care, and factors to improve safety related to selected concepts and exemplars.
3. Examine how members of the health care team collaborate in the delivery of care related to selected concepts and exemplars.
4. Discuss available technology for the delivery of nursing care related to selected concepts and exemplars.
5. Apply selected health and illness concepts to the nursing care of patents across the lifespan.

NMNC 4320. Professional Nursing Concepts I
3 Credits (3)
This course covers foundational concepts for professional development, including selected professional attributes and care competencies. Same as NMNC course number: NMNC 2320. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.
Prerequisite: NURS 328, NMNC 3210, NMNC 3220, NMNC 3230, NMNC 3235.
Corequisite: NMNC 4310, NMNC 4335.
Learning Outcomes
1. Examine the ethical values, virtues, principles, and policies that guide the moral delivery of health care.
2. Relate the nurse's interpretation of patient needs, concerns, and health problems with nursing decisions.
3. Discuss the factors which motivate individuals, groups, and organization to deliver quality nursing care.
4. Determine how interactions of health care team members provide quality patient care.

NMNC 4335. Care of Patients with Chronic Cndtns
4 Credits (8P)
The focus of this course is to provide safe, evidence-based nursing care for patients with chronic conditions, across the lifespan in a variety of settings. This course builds upon curricular concepts. This course is a combination of lab and clinical. Same as NMNC course number: NMNC 2335. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.
Prerequisite: NURS 328, NMNC 3210, NMNC 3220, NMNC 3230, NMNC 3235.
Corequisite: NMNC 4310, NMNC 4320.
Learning Outcomes
1. Demonstrate ethical practice in the delivery of nursing care to patients with chronic conditions.
2. Apply understanding of the principles of safe nursing care for patients with chronic conditions.
3. Demonstrate knowledge of appropriate evidence-based protocols when providing nursing care to patients with chronic conditions.
4. Apply understanding of appropriate health care policy, finance, and regulatory environments in the care of patients with chronic conditions.
5. Communicate effectively with patients with chronic conditions and health care team members.
6. Demonstrate an understanding of the technology used in the care of patients with chronic conditions.
7. Utilize the nursing process to deliver nursing care to patients with chronic conditions.

NMNC 4410. Health & Illness Concepts III
4 Credits (4)
This course will cover health and illness concepts, with the focus on acute conditions across the lifespan. Concepts covered are related to homeostasis/ regulation, oxygenation/ hemostasis, protection/ movement, and emotional processes. Same as NMNC course number: NMNC 2410. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.
Prerequisite: NMNC 4310, NMNC 4320, NMNC 4335.
Corequisite: NMNC 4435, NMNC 4445.
Learning Outcomes
1. Anticipate health care participant's risk for potentially harmful situations related to the concepts/exemplars of the course.
2. Integrate evidence-based practices and health care standards of care related to the concepts/exemplars of the course.
3. Differentiate the multiple roles of the health care team related to the concepts/exemplars of the course.

4. Integrate use of appropriate technology related to the concepts/exemplars of the course.
5. Interrelate risk factors, concepts, physiologic processes, patient attributes, and clinical management of the exemplars covered in this course.

NMNC 4435. Clinical Intensive I
4 Credits (4)
This is the first of two Level Four clinical courses in which the student will apply the curricular concepts in the management of care participants with acute conditions across the lifespan. Same as NMNC course number: NMNC 2435. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.
Prerequisite: NMNC 4310, NMNC 4320, NMNC 4335.
Corequisite: NMNC 4410, NMNC 4445.
Learning Outcomes
1. Integrate nursing practice concepts into their professional nursing practice.
2. Integrate diverse patient values into plan of care for patients with acute illness.
3. Interpret and analyze factors and system contributions that impact the quality and safety of nursing practice.
4. Integrate an evidence-based approach in the delivery and evaluation of nursing care to acutely ill patients across the lifespan.
5. Evaluate the use of policies and procedures within the acute care settings.
6. Effectively collaborate with the health care team in the delivery of patient care.
7. Integrate use of appropriate technology for the delivery of nursing care to acutely ill patients.

NMNC 4445. Clinical Intensive II
4 Credits (4)
This is the second of two Level Four clinical courses in which the student will apply the curricular concepts in the management of care participants with acute conditions across the lifespan. Same as NMNEC course number: NMNC 404. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.
Prerequisite: NMNC 4310, NMNC 4320, NMNC 4335.
Corequisite: NMNC 4410, NMNC 4435.
Learning Outcomes
1. Integrate nursing practice concepts into their professional nursing practice.
2. Integrate diverse patient values into pan of care for patients with acute illness.
3. Interpret and analyze factors and system contributions that impact the quality and safety of nursing practice.
4. Integrate an evidence-based approach in the delivery and evaluation of nursing care to acutely ill patients across the lifespan.
5. Evaluate the use of policies and procedures within the acute care setting.
6. Effectively collaborate with the health care team in the delivery of patient care.
7. Integrate use of appropriate technology for the delivery of nursing care to acutely ill patients.

NMNC 4510. Concept Synthesis
3 Credits (3)
This course focuses on the synthesis of curricular concepts in the care of complex patients. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.
Prerequisite: NMNC 4410, NMNC 4435, NMNC 4445.
Corequisite: NMNC 4520, NMNC 4535, NMNC 4545.
Learning Outcomes
1. Synthesize curricular concepts into patient-centered nursing practice that is appropriate for diverse individuals, families, and communities.
2. Synthesize the evidence base into nursing care of patients across the lifespan.
3. Evaluate leadership principles that integrate the application of health care policies and standards.
4. Evaluate effectiveness of interprofessional collaboration in the delivery of health care for quality patient outcomes.
5. Evaluate technologies for the management of information and in the delivery of patient care.

NMNC 4520. Professional Nursing Concepts II
3 Credits (3)
This course covers policy concepts for professional nursing. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.
Prerequisite: NMNC 4410, NMNC 4435, NMNC 4445.
Corequisite: NMNC 4510, NMNC 4535, NMNC 4545.
Learning Outcomes
1. Integrate principles of quality improvement and safety into nursing practice within health care organizations and systems.
2. Demonstrate leadership behaviors through the application of policies that apply to health care delivery.
3. Synthesize care delivery concepts to improve quality patient outcomes and professional nursing practice.
4. Analyze impact of health care delivery systems on patient care outcomes.
5. Compare and contrast health care policies and evidence-based practice.

NMNC 4535. Clinical Intensive III
4 Credits (4)
The focus of this clinical course is application of the curricular concepts in the management of care participants with complex conditions across the lifespan. Same as NMNEC course no.: NMNEC503. Restricted to: BSN,BSNP,BSNR,NURS majors. May be repeated up to 4 credits.
Prerequisite: NMNC 4410, NMNC 4435, NMNC 4445.
Corequisite: NMNC 4510, NMNC 4520, NMNC 4545.
Learning Outcomes
1. Engage in professional nursing practice that is patient--centered and appropriate for diverse individuals, families, and communities.
2. Integrate principles of quality improvement and safety into nursing practice within health care organizations and systems.
3. Deliver nursing care that is evidence-based across the lifespan.
4. Demonstrates leadership behaviors through the application of policies that apply to health care delivery.
5. Engage in effective interprofessional collaboration in the delivery of health care for quality patient outcomes.
6. Utilize technologies for the management of information and in the delivery of patient care.

NMNC 4545. BSN Capstone
4 Credits (4)
The synthesis, integration, and application of concepts to professional nursing practice will be applied in the final clinical course to ensure

readiness to enter practice. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.
Prerequisite: Successful completion of all previous nursing courses.
Corequisite: NMNC 4510, NMNC 4520, NMNC 4535.
Learning Outcomes

1. Synthesize and integrate nursing practice concepts into their professional nursing practice.
2. Engage in professional nursing practice that is patient-centered and appropriate for diverse individual, families, and communities.
3. Integrate principles of quality improvement and safety into nursing practice within health care organizations and systems.
4. Deliver nursing care that is evidence-based.
5. Demonstrate leadership behaviors through the application of policies that apply to health care delivery.
6. Engage in effective interprofessional collaboration in the delivery of health care for quality patient outcomes.
7. Utilize technologies for the management of information and in the delivery of patient care.

Nursing Courses

NURS 1110. Pre-Nursing Freshman Seminar
1 Credit (1)
This Freshman seminar provides an introduction to the university and its resources, an orientation to the pre-nursing curriculum, and overview of concepts for professional nursing practice. Emphasis is placed on exploring the nurse's role as an integral member of the healthcare team across multiple contexts and settings, and developing a professional identity. Consent of Instructor required.
Learning Outcomes

1. Develop strategies for transitioning to university life and a pathway to the nursing program, through evaluating knowledge, skill, and experience strengths and deficits.
2. Understand the role nurses and other interprofessional partners play in addressing issues regarding the patient experience across multiple healthcare settings.
3. Identify and examine cultural, professional and personal beliefs and values of nurses as they relate to patient care and working in multidisciplinary teams.
4. Begin to explore nursing careers in a variety of healthcare settings, across the nation.

NURS 1120. Fundamentals of Nursing Lecture and Laboratory
6 Credits (4+6P)
This course will introduce the nursing student to foundational theoretical concepts of professional nursing practice, the nursing process, and fundamental nursing skills. It includes developmental concepts related to clients across the lifespan. Clinical experiences in various healthcare settings will provide the student with the opportunity to apply learned skills to provide total care to meet client needs and to develop care planning skills related to actual problems. May be repeated up to 6 credits.
Corequisite: NURS 1154.
Learning Outcomes

1. Describe personally held values, attitudes, and beliefs related to health and wellness.
2. Describe scopes of practice, roles and values of health care team members.
3. Describe an evidence-based practice approach to provision of patient care and professional nursing practice across the lifespan.
4. Identify policies, procedures, standards of care and nursing leadership and management skills related to the provision of professional nursing care.
5. Describe strategies that reduce the risk of harm to self and others.
6. Identify essential information that must be available in a common database to support patient care across the lifespan.

NURS 1121. Foundations of Nursing Practice
4 Credits (4)
This course will introduce the nursing student to foundational theoretical concepts of professional nursing practice, the nursing process, and fundamental nursing skills. It includes developmental concepts related to clients across the lifespan. Clinical experiences in various healthcare settings will provide the student with the opportunity to apply learned skills to provide total care to meet client needs and to develop care planning skills related to actual problems.
Prerequisite/Corequisite: NURS 1134, NURS 1134L, NURS 1121L.
Learning Outcomes

1. Describe personally held values, attitudes, and beliefs related to health and wellness.
2. Describe scopes of practice, roles and values of health care team members.
3. Describe an evidence-based practice approach to provision of patient care and professional nursing practice across the lifespan.
4. Identify policies, procedures, and standards of care related to the provision of professional nursing care.
5. Describe strategies that reduce the risk of harm to self and others.
6. Identify essential information that must be available in a common database to support patient care across the lifespan.

NURS 1121L. Foundations of Nursing Lab
2 Credits (6P)
This course will introduce the nursing student to foundational theoretical concepts of professional nursing practice, the nursing process, and fundamental nursing skills. It includes developmental concepts related to clients across the lifespan. Clinical experiences in various healthcare settings will provide the student with the opportunity to apply learned skills to provide total care to meet client needs and to develop care planning skills related to actual problems.
Prerequisite/Corequisite: NURS 134, NURS 134L, NURS 136.
Learning Outcomes

1. Describe personally held values, attitudes, and beliefs related to health and wellness.
2. Describe scopes of practice, roles and values of health care team members.
3. Describe an evidence-based practice approach to provision of patient care and professional nursing practice across the lifespan.
4. Identify policies, procedures, standards of care and nursing leadership and management skills related to the provision of professional nursing care.
5. Describe strategies that reduce the risk of harm to self and others.
6. Identify essential information that must be available in a common database to support patient care across the lifespan.

NURS 1125. Medical Surgical Nursing I
4 Credits (4)
This course introduces nursing care and management of the adult client with common medical-surgical conditions.
Prerequisite: NURS 1134, NURS 1134L, NURS 1121, NURS 1121L.
Prerequisite/Corequisite: NURS 1130, NURS 1125L.

Learning Outcomes

1. Recognize personally held values and demonstrate assessment of the values held by diverse patients, as well as their preferences and expressed needs related to health and wellness.
2. Communicate with other members of the healthcare team to establish a plan to meet the needs of individuals, including commonly occurring chronic and acute health care problems throughout the lifespan.
3. Compare an individualized patient care plan utilizing an evidence-based approach for patient(s) across the lifespan to outcomes for the patient(s).
4. Demonstrate adherence to policies, procedures, and standards of care for the provision of care in healthcare delivery systems.
5. Apply strategies to reduce the risk of harm to self or others while providing professional nursing care.
6. Utilize varied communication technologies, electronic healthcare databases, and electronic health records to plan nursing care for patients with chronic illnesses across the lifespan.

NURS 1125L. Medical/Surgical Nursing I Clinical
2 Credits (6P)
Clinical experiences provide the student an opportunity to apply theoretical concepts and implement safe patient care to adults in a variety of settings.
Prerequisite: NURS 1134, NURS 1134L, NURS 1121, NURS 1121L.
Prerequisite/Corequisite: NURS 1130, NURS 1125L.
Learning Outcomes

1. Patient Centered Care: Recognize personally held values and demonstrate assessment of the values held by diverse patients, as well as their preferences and expressed needs related to health and wellness.
2. Teamwork and Collaboration: Communicate with other members of the healthcare team to establish a plan to meet the needs of individuals, including commonly occurring chronic and acute health care problems throughout the lifespan.
3. Evidenced Based Practice: Prepare an individualized patient care plan utilizing an evidence- based approach for patient(s) across the lifespan to outcomes for the patient(s).
4. Quality Improvement: Demonstrate adherence to policies, procedures, and standards of care for the provision of care in healthcare delivery systems.
5. Safety: Apply strategies to reduce the risk of harm to self or others while providing professional nursing care.
6. Informatics: Utilize varied communication technologies, electronic healthcare databases, and electronic health records to plan nursing care for patients with chronic illnesses across the lifespan.

NURS 1131. Foundations of Pharmacology
5 Credits (5)
This course provides the nursing student with an introduction to the foundations of pharmacology including: science of drug action, principles of medication administration, accurate calculation of drug doses, medication therapy across the lifespan, application of medications to treat health alterations, normal and adverse responses by the client to medication therapy, medication safety, medication regulation, national patient safety goals, and appropriate nursing interventions to achieve the desired goals of medication therapy.

Learning Outcomes

1. Recognize personally held values and demonstrate assessment of the values held by diverse patients, as well as their preferences and expressed needs related to pharmacological therapy.
2. Communicate with other members of the healthcare team to establish a plan to meet the needs of individuals, including commonly related to adverse or side effects of pharmacological therapy throughout the lifespan.
3. Compare an individualized patient care plan utilizing an evidence-based approach for patient(s) across the lifespan to outcomes related to the administration of pharmacological therapy.
4. Demonstrate adherence to policies, procedures, and standards of care for the administration of pharmacological therapy in healthcare delivery systems.
5. Apply strategies to reduce the risk of harm to self or others while providing professional nursing care.
6. Utilize varied communication technologies, electronic healthcare databases, and electronic health records to plan nursing care for the administration of pharmacological therapy across the lifespan.

NURS 1134. Foundation of Nursing Skills and Assessment
1 Credit (1)
This course provides nursing students with introductory nursing knowledge related to performance of nursing skills and assessment including: techniques of fundamental nursing care, basic and intermediate nursing skills, and foundational physical assessment techniques associated with care across the lifespan.
Corequisite: NURS 1134L, NURS 1121, NURS 1121L.
Learning Outcomes

1. Describe personally held values, attitudes, and beliefs related to health and wellness as measured by: Describe modifications to nursing care based on client cultural and religious influences; Demonstrate physical assessment skills for clients across the lifespan utilizing appropriate equipment and techniques.
2. Describe scopes of practice, roles and values of health care team members as measured by: Identify independent and collaborative nursing interventions.
3. Describe an evidence-based practice approach to provision of patient care and professional nursing practice across the lifespan as measured by: Demonstrate safe performance of basic nursing procedures; Identify quality sources of information to verify skills and interventions are based on evidence.
4. Identify policies, procedures, and standards of care related to the provision of professional nursing care as measured by: Identify need/situation where reporting of incident/event/irregular occurrence/variance is appropriate.
5. Describe strategies that reduce the risk of harm to self and others as measured by: Identify methods utilized to provide safe and effective care; Identify and document changes in patient status.
6. Identify essential information that must be available in a common database to support patient care across the lifespan as measured by: Select standard technology utilized to provide basic care to clients across the lifespan; Identify approved abbreviations and standard terminology for documenting care.

NURS 1134L. Foundation of Nursing Skills and Assessment Laboratory
2 Credits (6P)
This course provides nursing students with introductory nursing knowledge related to performance of nursing skills and assessment including: techniques of fundamental nursing care, basic and

intermediate nursing skills, and foundational physical assessment techniques associated with care across the lifespan.
Corequisite: NURS 1134, NURS 1121, NURS 1121L.
Learning Outcomes

1. Describe personally held values, attitudes, and beliefs related to health and wellness.
2. Describe scopes of practice, roles and values of health care team members.
3. Describe an evidence-based practice approach to provision of patient care and professional nursing practice across the lifespan.
4. Identify policies, procedures, and standards of care related to the provision of professional nursing care.
5. Describe strategies that reduce the risk of harm to self and others.
6. Identify essential information that must be available in a common database to support patient care across the lifespan.

NURS 1150. Medical Terminology
3 Credits (3)
Study and understanding of medical terminology. Emphasis will be placed on learning the basic elements of medical words, appropriate spelling and use of the terms, and abbreviations.
Learning Outcomes

1. Demonstrate proficient interpretation of medical abbreviations.
2. Explain the importance of utilizing medical terms/abbreviations in the medical field.
3. Define medical terms correctly.
4. Interpret medical language including roots, prefixes and suffixes.
5. Pronounce medical terms correctly.
6. Spell medical terms correctly.

NURS 1153. Medication & Dosage Calculation
2 Credits (2)
Techniques of dosage calculation for medication and fluid administration. May be repeated up to 2 credits.
Learning Outcomes

1. Utilize the nursing process, clinical judgment, evidenced based information and knowledge from the arts and sciences to provide safe client centered care.
2. Coordinate and collaborate effectively through verbal, nonverbal, and technological means with individuals, families and the interdisciplinary team.
3. Integrate accountability and responsibility for practice within the legal and ethical standards of the nursing profession.
4. Apply the principles of delegation, management and leadership in providing client centered care.
5. Participate in activities that promote professional development and personal growth.

NURS 1154. Physical Assessment
2 Credits (2)
Beginning techniques of physical assessment by systems will be presented using the nursing process as a guide for providing safe client centered care throughout the life span. Laboratory experiences provide an opportunity to practice assessment skills on patients across the lifespan in a variety of settings.
Prerequisite: BIOL 1130 or BIOL 2210.
Corequisite: NURS 1153, NURS 1120.
Learning Outcomes

1. Discuss the purpose, guidelines, safety factors, and equipment necessary for performing a physical exam.
2. Discuss and demonstrate techniques necessary to facilitate communication to obtain a health history.
3. Identify and demonstrate correct documentation of each body system.
4. Define ethical/legal implications as they relate to documentation and the physical assessment exam.
5. Identify and discuss the nutritional implications as they relate to the physical assessment exam.
6. Recognize key terms, exam techniques, and the anatomy and physiology on the assessment of each body system.
7. Discuss developmental and cultural differences in performing a physical assessment.
8. Identify and discuss components of the nursing process focusing on assessment and beginning to recognize self-care deficits.
9. Identify opportunities to promote self-care assessment within the physical exam. 1
10. Identify methods by which airing behaviors facilitate the nurse-patient relationship in the performance of a physical assessment.

NURS 1157. Maternal/Child Health Deviations Lecture
5 Credits (5)
This course provides the intermediate nursing student with an in-depth review of care of the childbearing woman, family structures and roles, and nursing care of the child from birth through adolescence. Emphasis includes the care of pre-partum, intra-partum and postpartum clients, the neonate and health deviations in pediatric clients. Clinical experiences in the simulation laboratory, the community, and acute care settings will provide the student with the opportunity to apply learned skills to provide total care to meet needs of up to two adult, neonatal, or pediatric clients and to apply care planning skills related to actual, psychosocial and potential problems. Students must be concurrently enrolled in both the lecture and laboratory sections of the course. Students must be admitted into the Nursing Program to enroll in this course.
Prerequisite: NURS 1130, NURS 1134, NURS 1134L, NURS 1121, NURS 1121L, NURS 1125, NURS 1125L, NURS 2214, NURS 2214L.
Prerequisite/Corequisite: NURS 1157L.
Learning Outcomes

1. Utilize diverse patients' values, preferences, and expressed needs to drive development of the plan of care for the child bearing woman (19-65 years) and pediatric client (newborn-18).
2. Evaluate ability to function within own scope of practice as a member of the healthcare team to deliver care to individuals and families across the lifespan with complex health alterations as it relates to the child bearing woman (19-65 years) and pediatrics.
3. Demonstrate the use of evidence-based approaches for the delivery and evaluation of care to patients across the lifespan as it relates to the child bearing woman (19-65 years) and pediatric client (newborn-18).
4. Formulate a plan of care for the provision of care in healthcare delivery systems using policies, procedures and standards of care as it relates to the child bearing woman (19-65 years) and pediatric client (newborn-18).
5. Interpret effective use of strategies to reduce risk of harm to self or others while providing professional nursing care including evidence-based practice, national patient safety goals, and core measures as it relates to the child bearing woman (19-65 years) and pediatric client (newborn-18).
6. Utilize information management tools to monitor outcomes of care processes and deliver nursing care to patients with chronic or acute

illness across the lifespan as it relates to the child bearing woman (19-65 years) and pediatric client (newborn-18).

NURS 1157L. Maternal/Child Health Deviations Laboratory
2 Credits (6P)
This course provides the intermediate nursing student with an in-depth review of care of the childbearing woman, family structures and roles, and nursing care of the child from birth through adolescence. Emphasis includes the care of pre-partum, intra-partum and postpartum clients, the neonate and health deviations in pediatric clients. Clinical experiences in the simulation laboratory, the community, and acute care settings will provide the student with the opportunity to apply learned skills to provide total care to meet needs of up to two adult, neonatal, or pediatric clients and to apply care planning skills related to actual, psychosocial and potential problems.
Prerequisite: NURS 1130, NURS 1134, NURS 1134L, NURS 1121, NURS 1121L, NURS 1125, NURS 1125L, NURS 2214, NURS 2214L.
Prerequisite/Corequisite: NURS 1157.
Learning Outcomes
1. Utilize diverse patients' values, preferences, and expressed needs to drive development of the plan of care for the childbearing woman (19-65 years) and pediatric client (newborn-18).
2. Evaluate ability to function within own scope of practice as a member of the healthcare team to deliver care to individuals and families across the lifespan with complex health alterations as it relates to the childbearing woman (19-65 years) and pediatric client (newborn-18).
3. Demonstrate the use of evidence-based approaches for the delivery and evaluation of care to patients across the lifespan as it relates to the childbearing woman (19-65 years) and pediatric client (newborn-18).
4. Formulate a plan of care for the provision of care in healthcare delivery systems using policies, procedures, and standards of care as it relates to the childbearing woman (19-65 years) and pediatric client (newborn-18).
5. Interpret effective use of strategies to reduce risk of harm to self or others while providing professional nursing care including evidence-based practice, national patient safety goals, and core measures as it relates to the childbearing woman (19-65 years) and pediatric client (newborn-18).
6. Utilize information management tools to monitor outcomes of care processes and deliver nursing care to patients with chronic or acute illness across the lifespan as it relates to the childbearing woman (19-65 years) and pediatric client (newborn-18).

NURS 2210. Pharmacological Requisites of the Childbearing Family
1 Credit (1)
Basic concepts of pharmacology including pharmacokinetics, pharmacodynamics, and pharmacotherapeutics, and their relationship to nursing care will be discussed focusing on medications commonly utilized with the childbearing family. Medication classes to be discussed include labor and delivery, analgesic, vitamins, respiratory, gynecological, endocrine, and anti-microbial/anti-infective drugs. May be repeated up to 1 credit.
Prerequisite: NURS 1154 and NURS 1120.
Learning Outcomes
1. Incorporate the values, preferences and expressed needs of maternal/child and pediatric clients in the administration of pharmacotherapeutics to these clients.
2. Apply principles of teaching/learning in education maternal/child and pediatric clients on the use, adverse effects and interactions of pharmacotherapeutic agents.
3. Explain how members of the health care team collaborate in the delivery of pharmacotherapeutics to maternal/child and pediatric clients.
4. Discuss pharmacokinetics and pharmacodynamics of drugs specific to the maternal/child and pediatric client.
5. Apply evidenced based information to the administration of pharmacotherapeutics to maternal/child and pediatric clients.
6. Give examples of policies, procedures and standards of care related to pharmacotherapeutics utilized in the care of maternal/child and pediatric clients.

NURS 2214. Psychiatric Mental Health Nursing Theory
3 Credits (3)
This course will allow the nursing student to develop skills necessary to provide nursing care for clients with mental health problems in various health care settings including: common mental health disorders, psychosocial dysfunction, psychosocial safety/substance abuse issues, violence, suicide, restraints, developmental age related pathophysiology, psychopharmacology, cultural/religious considerations, grief/loss, promotion of mental health, and therapeutic communication.
Prerequisite: NURS 1134, NURS 1134L, NURS 1121, NURS 1121L.
Prerequisite/Corequisite: NURS 1130, NURS 2214L.
Learning Outcomes
1. Recognize personally held values and demonstrate assessment of the values held by diverse patients, as well as their preferences and expressed needs related to health and wellness. wellness.
2. Communicate with other members of the healthcare team to establish a plan to meet the needs of individuals, including commonly occurring chronic and acute health care problems throughout the lifespan.
3. Compare an individualized patient care plan utilizing an evidence-based approach for patient(s) across the lifespan to outcomes for the patient(s).
4. Demonstrate adherence to policies, procedures, and standards of care for the provision of care in healthcare delivery systems.
5. Apply strategies to reduce the risk of harm to self or others while providing professional nursing care.
6. Utilize varied communication technologies, electronic healthcare databases, and electronic health records to plan nursing care for patients with chronic illnesses across the lifespan.

NURS 2214L. Psychiatric Mental Health Nursing Clinical
1 Credit (3P)
This course will allow the nursing student to develop skills necessary to provide nursing care for clients with mental health problems in various health care settings including: common mental health disorders, psychosocial dysfunction, psychosocial safety/substance abuse issues, violence, suicide, restraints, developmental age related pathophysiology, psychopharmacology, cultural/religious considerations, grief/loss, promotion of mental health, and therapeutic communication. Selected clinical learning experiences in the simulation Laboratory, acute care, and community settings will allow the student to develop ability to develop: proficiency in performance of nursing skills, collaborative skills with clients, families, peers and health care team members, care planning skills related to patient actual, psychosocial, and potential problems in the delivery of total nursing care to meet needs of one client across the life span with acute/chronic mental health needs.
Prerequisite: NURS 1134, NURS 1134L, NURS 1121, NURS 1121L.
Prerequisite/Corequisite: NURS 1134, NURS 2214.

Learning Outcomes

1. Recognize personally held values and demonstrate assessment of the values held by diverse patients, as well as their preferences and expressed needs related to health and wellness.
2. Communicate with other members of the healthcare team to establish a plan to meet the needs of individuals, including commonly occurring chronic and acute health care problems throughout the lifespan.
3. Compare an individualized patient care plan utilizing an evidence-based approach for patient(s) across the lifespan to outcomes for the patient(s).
4. Demonstrate adherence to policies, procedures, and standards of care for the provision of care in healthcare delivery systems.
5. Apply strategies to reduce the risk of harm to self or others while providing professional nursing care.
6. Utilize varied communication technologies, electronic healthcare databases, and electronic health records to plan nursing care for patients with chronic illnesses across the lifespan.

NURS 2225. Medical Surgical Nursing II
4 Credits (4)

This course focuses on the care of adult clients with complex medical/surgical health problems. Emphasis is placed on helping clients and their families cope with alterations in body functions. Concepts of pharmacology, health promotion and education, evidence-based practice, and interdisciplinary collaboration will be integrated throughout the course.

Learning Outcomes

1. Utilize diverse patients' values, preferences, and expressed needs to drive development of the plan of care for the adult client with acute illness.
2. Evaluate ability to function within own scope of practice as a member of the healthcare team to adult clients with acute illness.
3. Demonstrate the use of evidence-based approaches for the delivery and evaluation of care to patients across the lifespan as it relates to adult clients with acute illness.
4. Formulate a plan of care for the provision of care in healthcare delivery systems using policies, procedures and standards of care as it relates to adult clients with acute illness.
5. Interpret effective use of strategies to reduce risk of harm to self or others while providing professional nursing care including evidence-based practice, national patient safety goals, and core measures as it relates to adult clients with acute illness.
6. Utilize information management tools to monitor outcomes of care processes and deliver nursing care to adult clients with acute illness.

NURS 2225L. Medical Surgical Nursing Clinical II
2 Credits (6P)

Clinical experiences provide the student an opportunity to apply theoretical concepts and implement safe care to clients and selected groups in a variety of settings.

Prerequisite: NURS 1130, NURS 1134, NURS 1134L, NURS 1121, NURS 1121L, NURS 1125, NURS 1125L, NURS 2214, NURS 2214L.
Corequisite: NURS 2225, NURS 1157, NURS 1157L.

Learning Outcomes

1. Utilize diverse patients' values, preferences, and expressed needs to drive development of the plan of care for the adult client with acute illness.
2. Evaluate ability to function within own scope of practice as a member of the healthcare team to adult clients with acute illness.
3. Demonstrate the use of evidence-based approaches for the delivery and evaluation of care to patients across the lifespan as it relates to adult clients with acute illness.
4. Formulate a plan of care for the provision of care in healthcare delivery systems using policies, procedures and standards of care as it relates to adult clients with acute illness.
5. Interpret effective use of strategies to reduce risk of harm to self or others while providing professional nursing care including evidence-based practice, national patient safety goals, and core measures as it relates to adult clients with acute illness.
6. Utilize information management tools to monitor outcomes of care processes and deliver nursing care to adult clients with acute illness.

NURS 2235. Medical Surgical Nursing III
3 Credits (3)

This course focuses on advanced concepts of nursing care as they relate to patients across the lifespan with complex, multisystem alterations in health. Emphasis is placed on implementing time management and organizational skills while managing the care of patients with multiple needs and collaborating with the interdisciplinary team. Complex clinical skills, as well as priority setting, clinical judgment, and tenets of legal and ethical practice, are integrated throughout the course.

Prerequisite: NURS 1130, NURS 1134, NURS 1134L, NURS 1121, NURS 1121L, NURS 1125, NURS 1125L, NURS 2214, NURS 2214L, NURS 1157, NURS 1157L, NURS 2225, NURS 2225L.
Prerequisite/Corequisite: NURS 2996, NURS 2235L.

Learning Outcomes

1. Integrate the values, preferences, attitudes, and expressed needs of the acutely ill patient into the plan of care related to the care of the adult client with complex health deviations.
2. Integrate the contributions of other members of the healthcare team into the delivery of nursing care for individuals across the lifespan with complex or multi-system health alterations related to the care of the adult client with complex health deviations.
3. Discriminate between valid and invalid reasons for modifying evidence-based clinical practice based on clinical expertise or patient/family preferences in the creation of a plan of care for delivery and evaluation of care for patients across the lifespan related to the care of the adult client with complex health deviations.
4. Evaluate the use of policies, procedures and standards of care in healthcare delivery systems and adapt the care as appropriate related to the care of the adult client with complex health deviations.
5. Interpret and analyze effective use of strategies to reduce risk of harm to self or others while providing professional nursing care, creating a structure for implementation of evidence- based practice, national patient safety goals, and core measures in the care of the adult client with complex health deviations.
6. Integrate use of appropriate technology and information management tools to support safe delivery of care to the adult client with complex health deviations.

NURS 2235L. Medical Surgical Nursing III Clinical
4 Credits (12P)

Clinical experiences provide the student an opportunity to apply theoretical concepts and implement safe care to clients and selected groups in a variety of settings. Experiences that facilitate entry into practice are included in this practicum.

Prerequisite: NURS 1130, NURS 1134, NURS 1134L, NURS 1121, NURS 1121L, NURS 1125, NURS 1125L, NURS 2214, NURS 2214L, NURS 1157, NURS 1157L, NURS 2225, NURS 2225L.
Prerequisite/Corequisite: NURS 2996, NURS 2235.

Learning Outcomes

1. Integrate the values, preferences, attitudes, and expressed needs of the acutely ill patient into the plan of care related to the care of the adult client with acute, chronic, or complex health deviations.
2. Integrate the contributions of other members of the healthcare team into the delivery of nursing care for individuals across the lifespan with complex or multi-system health alterations related to the care of the adult client with acute, chronic, or complex health deviations.
3. Discriminate between valid and invalid reasons for modifying evidence-based clinical practice based on clinical expertise or patient/family preferences in the creation of a plan of care for delivery and evaluation of care for patients across the lifespan related to the care of the adult client with acute, chronic, or complex health deviations.
4. Evaluate the use of policies, procedures, and standards of care in healthcare delivery systems and adapt the care as appropriate related to the care of the adult client with acute, chronic, or complex health deviations.
5. Interpret and analyze effective use of strategies to reduce risk of harm to self or others while providing professional nursing care, creating a structure for implementation of evidence- based practice, national patient safety goals, and core measures in the care of the adult client with acute, chronic, or complex health deviations.
6. Integrate use of appropriate technology and information management tools to support safe delivery of care to the adult client with acute, chronic, or complex health deviations.

NURS 2996. Nursing Topics
3 Credits (3)
Varies.
Prerequisite: NURS 1130, NURS 1134, NURS 1134L, NURS 1121, NURS 1121L, NURS 1125, NURS 1125L, NURS 2214, NURS 2214L, NURS 1157, NURS 1157L, NURS 2225, NURS 2225L.
Corequisite: NURS 2235, NURS 2235L.
Learning Outcomes

1. Varies.

NURS 3110. Human Pathophysiology Foundation for Nursing
4 Credits (4)
Human pathophysiology concepts of adaptation and alteration in function and structure across the life span and their implications for nursing practice. Restricted to: BSNR,BSN,BSNP or consent of instructor majors. May be repeated up to 4 credits.
Prerequisite: Grade of C- or better in both (BIOL 353 & BIOL 2221/ BIOL 354), or (BIOL 2210 & BIOL 2225), or (SPMD 2210 & SPMD 3210).
Corequisite: NMNC 3110, NMNC 3135.
Learning Outcomes

1. Identify the functional and structural (pathophysiology) alterations that occur in the human body.
2. Relate the impact of functional and structural alterations on human health.
3. Recognize the relationships of pathophysiology to the practice of professional nursing.
4. Discuss the basic concepts of patterns of genetic inheritance of disease with related nursing implications and ethical considerations.
5. Use medical terminology appropriately.
6. Relate the impact of socio-cultural, legal-ethical factors, and scientific advances on pathophysiology.

NURS 3115. Care of the Veteran Population
3 Credits (3)
This course prepares healthcare and other professionals to care for the Veteran population. Specific topics and health issues explored include military and veteran culture, women in the military, post-traumatic stress disorder, traumatic brain injury, military sexual trauma, and chemical exposures. An overview of the Veterans Health Administration, the largest healthcare system in the USA, will be provided. May be repeated up to 3 credits.
Learning Outcomes

1. Examine Veterans' demographics and the impact of political, social, cultural, and environmental factors.
2. Analyze the mission of the Veterans Health Administration with a focus on healthcare system and services.
3. Evaluate health concerns, issues, and health seeking behaviors within the diverse Veteran population.
4. Appraise available evidence on delivering culturally sensitive care that addresses the needs of the Veteran patient and their family.

NURS 3996. Special Topics
1-9 Credits (1-9)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 21 credits.
Learning Outcomes

1. Varies

NURS 4110. Strategies for Student Success
3 Credits (3)
This course is designed to assist and support students as they identify learning needs and develop a plan for successfully mastering nursing knowledge. Course activities and assignments will be designed to address student's self-identified learning goals to enhance their opportunity for success. Restricted to NURS, BSN, BSNP, BSNR majors. May be repeated up to 3 credits.

NURS 4997. Independent Study
1-3 Credits (1-3)
Individual studies with prior approval of department head. May be repeated up to 3 credits.
Learning Outcomes

1. Varies

NURS 5105. Scholarly Preparation for the Doctor of Nursing Practice
1 Credit (1)
This course is designed to enhance students' scholarly writing skills while fostering an effective school and study mindset. Students will explore current research on the science of learning, delving into evidence-based practices that improve student learning outcomes. Students will also identify techniques and habits that support an effective school/ study mindset, essential for academic success. By the end of the course, students will be equipped with practical skills to enhance their academic performance and produce high-quality scholarly writing.
Learning Outcomes

1. Explore strategies to improve memory and make learning easier.
2. Compare and contrast the common myths with scientifically-backed facts about learning.
3. Utilize APA formatting guidelines to properly format a given writing assignment, including citations and references.
4. Identify key characteristics of professional writing, such as clarity, conciseness, proper grammar, and appropriate tone.

NURS 5110. Evidence-Based Practice for Healthcare Leaders
3 Credits (3)
This course is designed to prepare nurse administrators and other healthcare leaders with the skills and knowledge needed to critically analyze and synthesize scholarly evidence to promote high quality evidence-based practice.

Learning Outcomes

1. Utilize information sources, such as bibliographic databases and electronic resources and experts, to locate existing knowledge relevant to healthcare and nursing practice.
2. Critically appraise selected research designs, methods of data collection (quantitative and qualitative), and data analytic methods in relation to selected clinical practice and healthcare systems problems.
3. Discuss the relevance of theory and conceptual frameworks to health care research and practice.
4. Evaluate the use of evidence-based practice models to investigate clinical practice and healthcare systems problems.
5. Discuss the ethical, cultural, and professional concerns with human subjects in nursing research and considerations for evidence-based practice.
6. Propose a clinical practice change utilizing evidence-based practice guidelines.

NURS 5115. Quality Improvement for Healthcare Leaders
3 Credits (3)
This course prepares nurse administrators and healthcare leaders to be engaged in the process of continuous quality improvement on interprofessional healthcare teams. Healthcare improvement principles and practice will focus on improving patient care and outcomes, lowering costs, reducing healthcare disparities, and increasing access to healthcare. Restricted to: exclude Online MSN in Nursing Administration majors.

Learning Outcomes

1. Explain the value of improvement science in healthcare and its impact on healthcare quality.
2. Articulate the role of administrators in leading and facilitating change in healthcare systems through quality improvement processes.
3. Compare and contrast conceptual models and frameworks that guide quality improvement work in healthcare systems.
4. Articulate the principles for selecting a systems-level problem for continuous quality improvement action.
5. Demonstrate the use of quality improvement methods, tools and clinical data to address a systems-level problem in the clinical setting.
6. Examine the role of health policy and national standards in guiding quality improvement initiatives.

NURS 5120. Nursing Informatics
3 Credits (3)
This course is designed to meet the needs of the doctoral nurse of practice and master's prepared nurse in acquiring informatics knowledge for the use of information technology in meeting today's health care challenges. Areas of concentration examine the implications of informatics for practice, including nursing, public health, and healthcare in general, electronic health record issues, related ethical, legislative, standardization and political issues in health informatics and explore global and future informatics issues. Restricted to: NURS, NUSC, NURP majors.

Learning Outcomes

1. Analyze the rationale for the development of informatics competencies at all levels of nursing practice.
2. Synthesize knowledge management principles with the advanced practice and nurse leadership role.
3. Use the knowledge of information technology to inform and guide the design of databases that generate meaningful evidence for nursing practice.
4. Analyze critical elements necessary for the selection, use, and evaluation of healthcare information systems and patient care technology.
5. Appraise the impact of the legal, ethical and policy issues surrounding technological advances in health care systems to include the use of information, information technology, communication networks and patient care technology.
6. Evaluate programs that monitor outcomes of care, care systems and quality improvement including consumer use of healthcare information systems.

NURS 5125. Health Policy for Advanced Nursing Practice
3 Credits (3)
Course provides a conceptual approach to understanding and analyzing the environment of professional nursing practice. Focus on the impact of health care economics, financing, law and regulation, ethics and health policy on individual and collaborative nursing practice. Restricted to: NURS, NUSC, NURP majors.

Learning Outcomes

1. Demonstrates an understanding of the interdependence of policy and practice.
2. Advocate for ethical policies that promote access, equity, quality, and cost.
3. Analyze ethical, legal, and social factors influencing policy development.
4. Demonstrate ability to contribute to the development of health policy.
5. Analyze the implications of health policy in the development of collaboration, interdisciplinary, and inter-organizational practices.
6. Evaluate the impact of globalization on health care policy development.
7. Advocate for policies for safe and healthy practice environments.

NURS 5130. Promoting Health Behavior
3 Credits (3)
This course provides an overview of the advance practice nurse's role in affecting health behavior change. Relationships among health behaviors and health status are examined to include education and structural approaches to the modification of those behaviors, ethics of health promotion, sites for health promotion activities, and evaluation of health promotion. Theoretical models of behavior change, and primary, secondary, and tertiary prevention concepts serve as a basis for developing nursing interventions that promote behavior change.

Learning Outcomes

1. Identify determinants of health-related behavior, behavior change, and relevant outcomes.
2. Describe the relationships between health promotion intervention activities, expected changed in behavior, and expected outcomes.
3. Apply theories of health behavior, learning, and changes as a basis for planning health promotion programs.

4. Conduct a needs assessment that includes the use of epidemiological methods to determine learning needs of a specific community, group of individuals, or health-related organization.
5. Evaluate the effectiveness of educational methods and materials in achieving behavior changes using appropriate measures of health-related behavior change.
6. Develop a nursing intervention with an evaluation plan to promote behavior change in a given population.
7. Explore the use/integration of an array of interdisciplinary paraprofessionals and professional health providers along with that of the advance education nurse in efforts to promote behavior change.

NURS 5210. Advanced Leadership in Healthcare
3-5 Credits (3+1-2P)
Analysis of leadership theories as they pertain to the nurse executive and the advanced practice nurse in complex health care organizations. Emphasis will be placed on organizational change and conflict management in working with interdisciplinary health care teams. Clinical component included for DNP students only. Restricted to: NURS,NUSC,NURP majors. May be repeated up to 5 credits.
Learning Outcomes
1. Develop strategies for managing the ethical concerns inherent to in-patient care, the health care organization, and research.
2. Demonstrate knowledge required to initiate and guide change, work collaboratively with other professionals for the improvement of healthcare practices and outcomes.
3. Apply leadership, change, and management theories to practice at the organizational and individual levels.
4. Develop written and verbal communication skills necessary to advance innovations in health care systems and health care practice.
5. Develop strategies that promote/improve access to quality, cost-effective health care.
6. Apply the principles of persuasion, influence, negotiation, and consensus-building to lead high-reliability teams.

NURS 5220. Management of Human and Fiscal Resources in Nursing
4 Credits (3+3P)
This graduate level course examines and applies contemporary concepts of human and fiscal resource management for the nurse administrator. Focus is placed on achieving quality outcomes through effective management of human assets and organizational resources in health care settings. The course includes a clinical component. May be repeated up to 4 credits.
Learning Outcomes
1. Demonstrate an understanding of the economic and market factors that affect health care organizations.
2. Demonstrate understanding of financial reports common to health care organizations.
3. Utilize common strategies and techniques for fiscal planning and management in health organizations.
4. Demonstrate understanding of the legal and regulatory environment of health care organizations that influence fiscal planning and management.
5. Address current issues facing Human Resource managers and organizational leaders, from a nursing perspective.
6. Determine how organizational vision sets the context for strategic objectives and action plans.
7. Demonstrate application of human resources management through case analysis.
8. Enhance leadership skills in performance evaluation, motivation and professional development.
9. Evaluate how an organization improves administrative effectiveness, productivity, and systems.1
10. Analyze ethical, legal, and regulatory issues in Human Resource Management and organizational leadership.

NURS 5230. Seminar in Nursing Administration- Roles
3 Credits (3)
This course is designed for role preparation for the nurse administrator as manager, leader, collaborator and change agent. It involves synthesis of concepts from management and nursing as a basis for role effectiveness in nursing administration.
Corequisite: NURS 5240.
Learning Outcomes
1. Differentiate between levels of preparation for nursing practice at the graduate level.
2. Differentiate the nature and scope of the role of the nurse administrator among the roles of various healthcare team members.
3. Analyze role expectations of selected career options for the graduate prepared nurse administrator.
4. Articulate the role of the nurse administrator in relation to the health of vulnerable populations and elimination of health disparities.
5. Synthesize theories from the disciplines of nursing, business, organizational, fiscal, and human resource management for the application to the role of the nurse administrator.
6. Evaluate leadership responsibilities of the nurse administrator in health care organizations in relation to the accepted scope and standards for that role.
7. Analyze and evaluate evidence-based practice for effective administration in health care organizations.

NURS 5240. Advanced Field Work in Nursing
1-3 Credits (1P)
A practicum in Nursing Administration. Application of concepts from management and nursing to the clinical, educational, or community setting. Restricted to: MSN, DNP, PHD majors. May be repeated up to 12 credits.
Prerequisite: NURS 5210.
Corequisite: NURS 5230.
Learning Outcomes
1. Analyze organizational processes observed/experienced in the clinical setting and the roles of nursing administrators in these processes.
2. Utilize research findings as a basis for nursing administration practice.
3. Establish networking relationships with colleagues in nursing administration and related areas.

NURS 5996. Special Topics
1-3 Credits (1-3)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits.

NURS 5997. Independent Study
1-10 Credits (1-10)
Individual studies and directed research with prior approval of department head. May be repeated up to 20 credits.

NURS 6110. Introduction to Population Health
1 Credit (1)
This interprofessional survey course will provide the student with a theoretical foundation in population health approaches to improving systems of care and health outcomes. The student will analyze empirical evidence in population health and appraise interprofessional population health strategies from a local, national, and international perspective. Students will identify and demonstrate methods for completing a community or health systems assessment and apply the assessment to the conceptualization of interprofessional strategies for improving population health systems of care.
Learning Outcomes
1. Analyze key concepts in population health.
2. Examine population-based services from a local, national and international perspective with an emphasis on opportunities for interprofessional collaborations and contributions.
3. Appraise the population health evidence-based literature on a topic of interest.
4. Develop a community health or health systems assessment within an interprofessional student team and propose strategies for improving the delivery of population health services within a community of interest.

NURS 6112. Population Health Leadership and Epidemiologic Decision-Making
3 Credits (3)
This course prepares advanced nursing students to integrate epidemiologic principles with population health strategies to improve outcomes across diverse populations. The course emphasizes data-driven decision-making, evidence-based interventions, interprofessional collaboration, and advocacy for health equity. Students will analyze disease patterns, assess community health needs, and design interventions to address social determinants of health, health disparities, and system-level barriers to care.
Learning Outcomes
1. Use epidemiologic methods to evaluate health disparities and needs in populations.
2. Evaluate the impact of social determinants of health on population health outcomes.
3. Synthesize evidence-based practices to inform equitable and culturally competent population health programs.
4. Develop a comprehensive program management plan, including budget analysis and evaluation strategies, to address a population health priority.

NURS 6115. Advanced Nursing Knowledge and the DNP Role
3 Credits (3)
This course provides an exploration of advanced nursing knowledge and the pivotal role of the Doctor of Nursing Practice (DNP) in healthcare. Students will examine the theoretical foundations and advanced practices that underpin the DNP role and review nursing's scientific and disciplinary knowledge.
Learning Outcomes
1. Analyze theoretical concepts, principles and processes to create a framework for advanced nursing practice.
2. Discuss the history and structure of nursing knowledge.
3. Assess the roles of the DNP from a nursing theory lens.
4. Conceptualize the role and function of the DNP within healthcare systems.

NURS 6120. Quality Improvement in Healthcare
3 Credits (3)
This course prepares advanced practice nurses to be leaders of inter-professional teams engaged in the process of continuous quality improvement in healthcare settings. Healthcare quality improvement principles and practice will focus on improving patient care and outcomes, lowering costs, reducing health disparities, and increasing access to healthcare. May be repeated up to 3 credits.
Learning Outcomes
1. Explain the value of improvement science in healthcare and its impact on healthcare quality.
2. Articulate the role of the doctorally-prepared nurse in leading and facilitating change in healthcare systems through quality improvement processes.
3. Compare and contrast conceptual models and frameworks that guide quality improvement work in healthcare systems.
4. Articulate the principles for selecting a systems-level problem for continuous quality improvement action.
5. Demonstrate the use of quality improvement methods, tools and clinical data to address a systems-level problem in the clinical setting.
6. Understand the role of health policy and national standards in guiding quality improvement initiatives.

NURS 6125. Evidence-Based Practice in Healthcare
3 Credits (3)
This course is designed to prepare nurse practitioners and other advanced practice nurses with the skills and knowledge needed to critically analyze and synthesize scholarly evidence to promote high quality evidence-based practice. Restricted to: Family Nurse Practitioner; Psych/Mental Health Nursing; Nursing Practice; Family Nurse Practitioner Certificate; and Psych/Mental Health Nursing Certificate majors.
Prerequisite: NURS 6120.
Learning Outcomes
1. Utilize information sources, such as bibliographic databases and electronic resources and experts, to locate existing knowledge relevant to healthcare and nursing practice.
2. Critically appraise selected research designs, methods of data collection (quantitative and qualitative), and data analytic methods in relation to selected clinical practice and healthcare systems problems.
3. Discuss the relevance of theory and conceptual frameworks to health care research and practice.
4. Evaluate the use of evidence-based practice models to investigate clinical practice and healthcare systems problems.
5. Discuss the ethical, cultural, and professional concerns with human subjects in nursing research and considerations for evidence-based practice.
6. Propose a clinical practice change utilizing evidence-based practice guidelines.

NURS 6130. Epidemiology for Advanced Nursing Practice
2 Credits (2)
Emphasis is on the practical application of the principles of epidemiology in the measurement and evaluation of population health. Epidemiological literature will be critiqued and synthesized to evaluate population-based public health nursing problems. Issues related to disease surveillance, causation, genetic patterns, screening and social trends in population

health will be examined. Use of existing data bases and technology programs are covered. Restricted to: NURP, NURS, NUSC majors.

Learning Outcomes

1. Analyze epidemiological evidence for rigor and application in designing population- based intervention strategies for selected health issues.
2. Evaluate current legislative and regulatory policies that have influenced the impact of the epidemiological factors on health and disease in human populations.
3. Integrate knowledge of epidemiological concepts when evaluating population based public health nursing problems within diverse/ undeserved populations.
4. Synthesize data from existing sources to assess, plan, implement and evaluate population-based interventions.

NURS 6135. Interdisciplinary Leadership and Role Development for Practice Excellence
3 Credits (3)

This required course prepares students for organizational and systems leadership and knowledge and skills critical to role development in independent and inter and intra-disciplinary practice. Content includes communication, conflict resolution, collaboration and negotiation, leadership, and team functioning to maximize success in the establishment of safe, effective patient-centered care in complex environments.

Learning Outcomes

1. Evaluate interdisciplinary care delivery models from a systems perspective using evidence-based findings.
2. Incorporate principles of specialty practice management, quality improvement, and interdisciplinary teamwork in order to meet the health needs of the specialty population served.
3. Analyze effective strategies for the management of ethical dilemmas, incorporation of sensitivity to diverse cultures, and elimination of health disparities.
4. Differentiate among the multiple roles in advanced nursing practice.
5. Evaluate leadership styles in a team environment in the analysis of complex practice and organizational issues.
6. Incorporate consultative and leadership skills with inter and intra-disciplinary teams to facilitate change.

NURS 6150. Advanced Anatomy
3 Credits (2+1P)

This course presents an extensive exploration of human anatomy from a topographical and regional perspective. The knowledge gained in this course serves as a foundation for advanced clinical assessment for anesthesia practice, clinical decision-making, and patient management.

Learning Outcomes

1. Survey the regional organization and topography of anatomical structures within the key clinical regions of the human body with a focus on neurovascular anatomy and internal organs.
2. Discover the structure and function of the central nervous system and the distribution of all of the major peripheral nerves in the body.
3. Classify the relationship between palpable anatomical landmarks and the deep anatomy of the head, neck, thorax, abdomen, pelvis and limbs.
4. Evaluate major anatomical structures in the human body using radiographs, ultrasound, CT, MRI images.

NURS 6155. Advanced Physiology
3 Credits (3)

This course presents an extensive and detailed exploration of human physiology from a molecular, cellular, tissue, organ, and system perspective. The course will cover individual differences in physiology and how they relate to culture, gender, race, age, and genetics. The knowledge gained in this course serves as a foundation for advanced nursing clinical assessment, pharmacology, clinical decision-making, and patient management. This course provides an in-depth exploration of human physiology with a focus on the principles and mechanisms relevant to advanced nurse practice. Students will study advanced concepts in cardiovascular, respiratory, renal, endocrine, and neurological systems. Emphasis is placed on understanding the physiological responses to critical care scenarios and how to manage patient homeostasis throughout. The course aims to enhance the student's ability to assess, analyze, and intervene in complex clinical situations, ensuring safe and effective advanced nursing care.

Learning Outcomes

1. Identify structures and normal physiologic physiological functions of the human body organs and Systems.
2. Demonstrate knowledge of the concept of homeostasis and be able to Analyze the physiological impact on different organ systems and apply this knowledge to clinical practice.
3. Summarize the complexities of normal human physiologic physiological multi-system interactions.
4. Discuss how principles of normal physiology impact advance practice nursing care of individuals and develop critical thinking skills to identify and manage complex physiological changes, complications, and emergencies related to anesthesia, using evidence-based practices to guide clinical decision-making.
5. Understand advanced physiological mechanisms within the cardiovascular, respiratory, renal, endocrine, and nervous systems, and how these systems are affected by disease processes and medications.

NURS 6160. Chemistry and Physics for Anesthesia
3 Credits (3)

This course synthesizes the principles of math, inorganic chemistry, organic chemistry, biochemistry, and physics to advanced nursing practice, specifically nurse anesthesiology. Topics are covered from a molecular, cellular, tissue, organ, and system perspective. The knowledge gained in this course serves as a foundation for advanced clinical assessment, pharmacology, clinical decision-making, and patient management.

Learning Outcomes

1. Demonstrate proficiency in medical mathematics: algebraic equations, math conversions, and medical word problems.
2. Interpret physical and chemical principles related to concentration gradients, thermodynamics, the gas laws, solutions, fluids, volume and flow.
3. Evaluate and analyze basic and advanced bio-scientific concepts to normal and abnormal human physiologic states and critically assess the effectiveness and limitations of various types of clinical monitoring equipment in patient care.
4. Interpret basic and advanced bioscience concepts to assess hazards and implement electrical, fire, and radiation safety in the clinical anesthesia setting.
5. Formulate solutions to patient and equipment clinical dilemmas using the scientific underpinnings of bio-scientific principles.

NURS 6210. Professional Roles for Advanced Practice Clinical Nursing
3 Credits (3)

This course will focus on providing an in depth understanding of the legal, historical, political, social, and ethical aspects of advanced practice nursing. Traditional and emerging roles for advanced practice nursing are examined. Students must be Admitted to the DNP program. Restricted to DNP majors. May be repeated up to 3 credits.
Prerequisite: NURS 6430 OR NURS 6520.
Learning Outcomes

1. Analyze the development, functions and roles of advance practice nurse in multidisciplinary and collaborative settings.
2. Use conceptual and analytical skills to evaluate the links among practice, organizational, population, fiscal, and policy issues related to advance practice nurses.
3. Create a practice framework for entry into advanced practice with a complex, multicultural health care system.
4. Articulate the role of the advance practice nurse in resolution of ethical and legal, and policy issues within a complex health care system.
5. Analyze the role of the Advance Practice Nurse in promoting positive changes in the health status of individuals, families, groups, communities and populations.
6. Describe the role of the Advance Practice Nurse in dissemination of nursing knowledge.

NURS 6215. Professional Aspects of Nurse Anesthesiology Practice
3 Credits (3)
This course examines professional role development of the nurse anesthetist with an emphasis on the history and evolution of nurse anesthesiology practice, as well as scope, standards, legal aspects, ethics, quality, and regulations. Professional advocacy topics and the business of anesthesiology practice will be appraised. This course also addresses the risks of the role related to wellness and substance use disorder. Cultural competence modules for healthcare workers will be completed during this course.
Learning Outcomes

1. Discuss the history and evolution of nurse anesthesiology practice.
2. Analyze the professional components of nurse anesthesiology practice, emphasizing scope, standards, legal aspects, ethics, and regulation.
3. Differentiate between state, national, and international anesthesia organization roles and functions.
4. Identify quality assessment tools in anesthesiology practice.
5. Compare various business models of anesthesia, reimbursement methods, payment policies, reimbursement, and nurse anesthesiology practice patterns.
6. Examine the impact of wellness and substance use disorder on anesthesia providers.
7. Demonstrate cultural awareness and sensitivity of patient background characteristics including, but not limited to race, ethnicity, socioeconomic status, age, gender and sexuality.
8. Examine professional advocacy and other selected current issues affecting nurse anesthesiology practice.

NURS 6220. Advanced Pathophysiology for Clinical Nursing
3 Credits (3)
In-depth study of the physiological and pathological bases of altered health states of patients across the life span. Case studies facilitate application of complex concepts to clinical nursing practice. Restricted to: NURS, NUSC, NURP majors.
Learning Outcomes

1. Identify the functional alterations that occur as a result of illness in individuals across the life span.
2. Recognize risk factors, signs, and symptoms produced by the physiological changes to frequently occurring illnesses as a basis for health care, evidence-based practice, and therapeutic nursing interventions.
3. Analyze the concepts of altered molecular and cellular function related to selected disease processes.
4. Critically analyze the impact of alterations in structure and function including the relationship of genetics and environment on the individual as a system.
5. Discuss effective and ineffective adaptations to stressors by the human body across the lifespan.

NURS 6224. Diagnostic Reasoning and Advanced Health Assessment
3 Credits (3)
This course is designed to assist students to refine history taking, psychosocial assessment and physical assessment skills. Content focuses on assessment of individuals throughout the lifespan. Emphasis is placed on detailed health history taking, differentiation, interpretation and documentation of normal and abnormal findings. Diagnostic reasoning skills are emphasized as students develop processes to formulate differential diagnoses for acute and chronic physical and mental illnesses in the primary care setting across the lifespan.
Prerequisite: NURS 6235.
Learning Outcomes

1. Analyze and use the most effective communication methods to obtain a health history and to develop a therapeutic relationship.
2. Differentiate variations in normal and abnormal health and physical data.
3. Explore processes of diagnostic reasoning and potential cognitive biases.
4. Using data from the health and physical assessment, formulate differential diagnoses for given physical and mental illnesses across the lifespan.
5. Demonstrate advanced clinical judgment by using data from the health and physical assessment to design and implement clinically safe and patient-focused interventions.

NURS 6226. Advanced Health Assessment Practicum
1 Credit (1P)
Assessment skills for advanced clinical practice. Emphasis on assessment of patients across the life span. May be repeated up to 2 credits.
Corequisite: NURS 6225.
Learning Outcomes

1. Conduct a comprehensive and systematic assessment of health and illness in complex situations.
2. Collect and interpret health data related to the health history, chief complaint, and history of the present illness.
3. Use effective communication methods to obtain a health history and to develop a therapeutic relationship
4. Assess variations in normal and abnormal health and physical data.
5. Document advanced clinical judgment by using data from the health and physical assessment to determine a health status.

NURS 6230. Advanced Clinical Pharmacology
3 Credits (3)

Principles of clinical pharmacology and the related human physiology and pharmacology for advanced clinical practice.

Learning Outcomes

1. Relate associated physiology.
2. Classify drugs based on their mechanism of action.
3. Examine and discuss the pharmacokinetics, pharmadynamics, contraindications, and anesthesia implication for the following drug categories: Sympathomimetic and Sympatholytic, Respiratory pharmacology, Vasodilators, Antiarrhythmic, Neurologically active drugs, Diuretics, Lipid-lowering drug, Antacids, gastrointestinal motility, and antiemetics, Hypothyroidism and hyperthyroidism, Glucose regulation, Other endocrine drugs, Antimicrobials, antiseptics, and disinfectants, Chemotherapeutic, Psychopharmacologic.
4. Articulate and correlate drug characteristics and rationale for use in a professional manner.
5. Apply, appraise, and evaluate pharmaceutical characteristics when applied to a clinical scenario.
6. This course covers the following NCE content: Pharmacokinetics, Pharmadynamics, Sympathomimetic and Sympatholytic, Respiratory pharmacology, Vasodilators, Antiarrhythmic, Neurologically active drugs, Diuretics, Lipid-lowering drugs, Antacids, gastrointestinal motility, and antiemetics, Hypothyroidism and hyperthyroidism, Glucose regulation, Other endocrine drugs, Antimicrobials, antiseptics, and disinfectants, Chemotherapeutic, Psychopharmacologic.

NURS 6235. Advanced Pathophysiology for Nurse Anesthesiology Practice
4 Credits (4)

This course focuses on pathophysiology of diseases relevant to nurse anesthesiology practice. Evidence-based practice resulting from relevant research will be incorporated in discussions related to anesthesia management of patients with health status alterations. Students will utilize this information to build a foundation for anesthesia clinical reasoning and principles of nurse anesthesiology practice.

Learning Outcomes

1. Analyze the relationship between normal physiology and pathologic consequences produced by selected disease states.
2. Demonstrate understanding of selected biochemical, genetic, and cellular mechanisms that lead to common health alterations that occur in individuals across the lifespan.
3. Identify various pathologic alterations relevant to anesthesia practice.
4. Integrate the clinical application of pathophysiology into the practice of nurse anesthesiology.
5. Discuss the relationship between pathophysiology of various systems and anesthesia planning and management.

NURS 6240. Advanced Health Assessment for Nurse Anesthesiology Practice
4 Credits (3+1P)

This course focuses on development of knowledge and skills necessary to conduct comprehensive and focused health assessments for patients across the lifespan with special attention given to nurse anesthesiology practice. Principles of conducting detailed health histories, physical examinations, and diagnostic study interpretations will be featured. Students will obtain and document detailed culturally sensitive health histories and physical examinations. They will use critical thinking to identify and/or interpret pertinent diagnostic studies related to alterations in health patterns. Emphasis is placed on differentiation between normal and abnormal health history, physical assessment, and diagnostic findings.

Learning Outcomes

1. Demonstrate a systematic approach to the collection and documentation of data for health history and physical assessment while maintaining confidentiality and respecting privacy.
2. Collect and interpret health data related to the health history, history of the present illness, laboratory and other diagnostic findings.
3. Document relevant findings for both comprehensive and focused health histories and physical assessments.
4. Identify potential anesthesia risks based on patient health history, physical exam findings, and current literature.
5. Conduct and document a comprehensive preanesthesia evaluation to include health and surgical history, physical examination, and interpretation of diagnostic data using effective communication while maintaining confidentiality and respecting privacy.

NURS 6245. Advanced Pharmacology for Nurse Anesthesiology Practice
3 Credits (3)

This course builds upon the advanced clinical pharmacology course and is designed to provide an evidence-based in-depth foundation of pharmacology and its application to anesthesiology practice across the lifespan. The primary focus will be on topics such as pharmacodynamics, pharmacokinetics, pharmacotherapeutics, pharmacy, and toxicology of currently used anesthetic agents

Learning Outcomes

1. Identify general pharmacokinetic, pharmacodynamic, pharmacogenetic, and pharmacotherapeutic principles related to anesthetic agents and adjunct drugs
2. Discuss the uptake and distribution of primary anesthetic agents and adjunct drugs.
3. Summarize indications/contraindications for selected anesthetic agents and adjunct drugs.
4. Calculate accurate doses of selected anesthetic agents and adjunct drugs.
5. Review potential adverse effects and drug interactions of selected anesthetic agents and adjunct drugs.
6. Describe evidence-based anesthetic considerations of anesthetic agents and adjunct drugs used for various procedures and various patients across the lifespan with diverse comorbidities and demographics.

NURS 6250. Healthcare Policy and Ethics
3 Credits (3)

This course examines complex challenges faced in the US healthcare system for nurses in advanced practice roles within an ethical framework. Ethical, social, and political issues that affect the provision of health care, communities, and society are critically analyzed with an emphasis on interprofessional roles in health care. Concepts that support advocating for social justice, reducing healthcare disparities. improving quality, promoting ethical aspects of care, and cost containment are overarching themes in the course discussions and assignments. Students use self-reflection, case studies and presentations to apply ethical principles, develop healthcare policy recommendations to improve care access, and reduce disparities in professional practice and population health.

Learning Outcomes

1. Analyze the historical evolution of health care systems and their influence on the development of institutional, local, state, federal and international health policy.

2. Critique socioeconomic, legal, ethical, and political issues relevant to policymaking and provision of equitable, safe, and quality health care at the local, state, and national levels.
3. Assess health policies, infrastructure, financing, and complex systems in the US in contrast to other nations.
4. Critically analyze bioethical issues in clinical practice settings as they impact policy, disparities, advocacy, ethics, improved patient outcomes and reduced costs.
5. Synthesize the principle of human rights and ethics in conduct of health care research and policy design.
6. Interpret the value and importance of advanced practice nursing role(s) to policy makers, health care professionals, and consumers.

NURS 6255. Innovations and Health Care Organizations
3 Credits (3)
Examines complexity and innovation within health care systems, health care delivery, and population health. Areas of focus are systems, organizations, health disparities, and ethical decision making. Emphasis is on improvement in services and outcomes. Restricted to: NURS, NUSC, NURP majors.
Learning Outcomes
1. Apply knowledge of organizational practices and complex systems to improve health care delivery.
2. Facilitate the development of health care systems that address the needs of culturally diverse populations, providers, and other stakeholders.
3. Evaluate the impact of health care delivery on patients, providers, other stakeholders, and the environment.
4. Analyze organizational structure, functions, and resources to improve the delivery of care.
5. Evaluate the relationships among access, cost, quality, and safety and their influence on health care.
6. Evaluate how organizational structure, care processes, financing, marketing, and policy decisions impact the quality of health care.

NURS 6260. Population Health and the Environment
3 Credits (3)
This course provides an overview of the core principles in environmental health. Emphasis is on the integration of key concepts of environmental health into nursing education, practice, research, and policy/advocacy efforts. Students will apply the key concepts to address specific environmental hazards that affect the health of individuals and populations.
Prerequisite: NURS 6110.
Learning Outcomes
1. Describe the scope and nature of environmental health sciences and relevance to population health, nursing research and practice, and theory.
2. Analyze the impact of environmental health hazards including mechanisms of exposure, health effects of exposure, and populations more vulnerable to exposure.
3. Apply risk management and risk communication strategies for environmental health exposures.
4. Appraise the impact of climate change on population health and its implications for nursing practice.
5. Describe the effect of regional, national, and international legislation on environmental health.
6. Discuss the role of advocacy and justice in environmental health in achieving equity and countering injustice in the form of systemic and structural conditions such as racism and privilege.

NURS 6265. Strategic and Financial Planning for Population Health Programs
3 Credits (3)
This course explores the role of nurses in advanced nursing practice within a rapidly changing healthcare system. Theories of leadership, quality, risk outcomes, and financial structures for healthcare organizations are discussed providing a framework for change within advanced nursing practice specialties. Accounting, finance, and marketing principles are presented enabling students to complete a financial plan for an evidence based practice change.
Prerequisite: NURS 6270.
Learning Outcomes
1. Use the principles of population focused program planning, development, implementation, and evaluation to develop an evidence-based population focused strategy to address a health priority issue.
2. Analyze the potential influence of cultural, ethical, and public health policy issues when working with diverse populations.
3. Analyze aspects of organizational culture and planned change that may influence success of planned interventions.
4. Evaluate feasibility issues related to implementing planned interventions such as cost, time, and available resources.
5. Integrate principles of program evaluation to determine impact and sustainability of evidence-based interventions.
6. Analyze the impact of financial models on costs, quality and health outcomes.

NURS 6266. Strategic and Financial Decision-Making in Healthcare Systems
3 Credits (3)
This course prepares graduate nursing students to lead within complex healthcare organizations. The course emphasizes the clinical leader's role in understanding the structure, function, and financing of healthcare systems and organizations. Students will develop systems-based practice competencies, financial literacy, and strategic planning skills necessary to guide evidence-based organizational change.
Learning Outcomes
1. Evaluate healthcare systems as complex adaptive environments, integrating organizational learning and interconnected subsystems to inform strategic decision-making.
2. Apply financial literacy and financial stewardship principles to assess revenue streams, cost structures, and ethical resource management in healthcare organizations.
3. Analyze healthcare financing models, reimbursement structures, and economic influences to support ethical financial decision-making and long-term sustainability.
4. Develop a comprehensive strategic plan that incorporates budgeting methodologies, technology-driven decision-making, and community relations to advance healthcare innovation.

NURS 6270. Clinical Data Management and Analysis
2 Credits (2)
This required course provides students with the knowledge base to understand, collect, manage, and measure clinical data. Students will explore data collection and management processes, levels of measurement, basic statistics, and measurement for improvement in order to effectively use clinical data. Data entry exercises employed through analytical tools and statistical software packages will allow the

students practice and apply the basic data management and analysis skills needed for the evaluation of clinical data and evidence-based practice.

Learning Outcomes

1. Apply principles of sound data collection and management.
2. Create a database to collect and aggregate data.
3. Promote internal and external validity by identifying appropriate levels of measurement.
4. Organize data through use of Microsoft Excel and/or IBM SPSS Statistics Software.
5. Perform basic statistical analysis using descriptive, parametric, and non-parametric statistics appropriately.
6. Construct statistical analyses while preventing the introduction of errors.

NURS 6305. Introduction to the DNP Project
1 Credit (1)

This course is designed to assist the student in exploring a clinical problem and selecting an area of interest within a practice specialization, and in demonstrating professional competencies related to an area of interest to begin foundational development of the scholarly project. The student will document previously acquired abilities and competencies while developing an understanding of the scholarly project process. Students will work towards selection of a setting (hospital, long-term, primary care or community health agency) where concepts, theories, and principles of leadership, administration, and management can be applied.

Learning Outcomes

1. Examine the role of the DNP in the development and implementation of evidence based change of practice projects.
2. Identify a DNP Project practice site and clinical advisor.
3. Develop a portfolio demonstrating expertise in the specialty area of interest and understanding of a clinical problem.

NURS 6307. DNP Project Practicum
1-3 Credits (1-3P)

This leadership practicum courses provide for the development of a population health leader as demonstrated through the DNP project. The student will conduct an assessment of a population, community and/or organization where evidenc- based leadership activities may be employed. Once a problem or issue is identified in the practice setting, the student will develop an evidence-based project designed to positively impact population- specific and/or patient care outcomes. After approval of the DNP project proposal, the student will implement an evidence-based project designed to positively impact population health and/or patient/client care outcomes. The culmination of the DNP project is evaluation and dissemination of the evidence-based changes. May be repeated up to 9 credits.

Learning Outcomes

1. Demonstrate competence in the role of population health leader who delivers advanced practice nursing, including educators, clinicians, administrators, and translators of research.
2. Execute the DNP Project that meets the needs of diverse populations
3. Collaborate with DNP committee and the organization to establish an intra- and inter-professional continuous quality improvement process for achievement of the desired outcomes
4. Exhibit consistent professional behavior, performance, accountability, and responsibility within a population health leadership role

NURS 6310. DNP Project I
1 Credit (1)

This is the first in a three-course series that culminates in the implementation, evaluation and dissemination of scholarly work that demonstrates the student's synthesis of the Essentials of Doctoral Education for Advanced Practice Nursing (i.e., the DNP Essentials). The project must use evidence to improve clinical practice, healthcare delivery and/or patient outcomes. Upon completion of this course, students will identify a problem in healthcare, explore the existing evidence and develop a preliminary proposal for a project that demonstrates synthesis of DNP coursework and lays the groundwork for future scholarship.
Prerequisite: NURS 6120 and NURS 6125.

Learning Outcomes

1. Systematically review the existing evidence pertaining to selected clinical problem, generating a written review of the existing evidence.
2. Identify a theoretical framework or model that will guide the development of a solution or intervention and/or the execution of the DNP project.
3. Identify a theoretical framework or model that will guide the development of a solution or intervention and/or the execution of the DNP project.
4. Defend the DNP project proposal in front of the student's project committee and submit to IRB

NURS 6340. Clinical Scholarly Project
1-4 Credits (1-4)

Building on the practice expertise of the DNP student, this series of credits is to provide the student with the opportunity to design an innovative clinical practice improvement project/program addressing an actual health care concern. Through mentored activities, the DNP student will identify, develop, implement, evaluate, and disseminate an independent analytic. Graded: S/U Grading (S/U, Audit). Students must be Admitted to the DNP program.Restricted to: NURP majors. May be repeated up to 4 credits.

Learning Outcomes

1. Within the context of the chosen clinical problem, identify an evidence-based, system-level change or intervention that has the potential to address the problem.
2. Develop a detailed implementation plan to guide the execution of the proposed DNP project.
3. Develop a detailed evaluation plan that includes the identification of outcome measures that will allow the student to determine whether the project objectives were met.
4. Identify the DNP Essentials that are represented in the project and describe how the project addresses the requirement.
5. Defend the DNP project proposal in front of the student's project committee.
6. After successfully defending the DNP project proposal, submit an Institutional Review Board (IRB) application for the proposed project.
7. Initiate the approved DNP project implementation and evaluation plan.

NURS 6352. Integrated Care for Diverse Populations
2 Credits (2)

This course examines integrated health care as an approach to health care delivery characterized by a high degree of collaboration and communication among health professionals. Students expand their knowledge of interprofessional competencies and learn the concepts of the development of comprehensive treatment plans to address the biological, psychological and social needs of the patient in diverse patients across care settings. The focus is on delivering behavioral or biomedical health interventions relevant to everyday clinical practice

across disciplines and practice settings. There is a strong emphasis on feasible brief interventions in a fast-paced clinical context and on adapting interventions to each patient's unique biopsychosocial, socioeconomic, and cultural context.
Prerequisite: NURS 6410 or NURS 6510.
Learning Outcomes

1. Analyze the relationship between behavioral and biomedical health and cultural contexts, including an understanding of the common health/illness presentations.
2. Compare and contrast models of integrated health.
3. Develop a treatment plan for a given patient addressing the investigation and management of the patient's illness, and the personal and social issues to which the illness may give rise.
4. Identify strategies for communicating clearly and sensitively with patients and their families and with other health professionals.
5. Analyze inter-professional team members roles in collaboration and cooperation with other team members as an integral component of team function.

NURS 6404. Neurobiology of Mental Disorders
2 Credits (2)
This course advances foundational knowledge of anatomy, physiology, and pathophysiology, focusing on the neurobiological mechanisms that sustain homeostasis within the brain and body. It explores the multifactorial etiology of mental disorders, including genetic, developmental, traumatic, infectious, and degenerative influences. The curriculum focuses on important biological theories, exploring how psychiatric disorders interact with brain structures, chemical pathways, and the related behaviors and symptoms. Mental disorders across the lifespan, including autism spectrum disorder, obsessive-compulsive disorder, attention deficit hyperactivity disorder, and substance use disorders, are critically analyzed.
Learning Outcomes

1. Synthesize foundational concepts of anatomy, physiology, and pathophysiology to understand the neurobiological mechanisms that maintain homeostasis within the brain and body.
2. Evaluate the multifactorial causes of major mental disorders, including genetic, developmental, traumatic, infectious, and degenerative factors.
3. Investigate the relationship between psychiatric disorders and their associated neuroanatomical structures and neurochemical pathways.
4. Identify the genetic etiology and neuropathological alterations associated with major mental disorders and substance use disorders.
5. Incorporate current research findings to inform evidence-based approaches to the care of individuals with mental health disorders.

NURS 6405. Psychopharmacology for Advanced Practice
3 Credits (3)
Principles of clinical psychopharmacology with emphasis on clinical application of major drug classifications including decision making, prescribing, drug monitoring and patient education.
Learning Outcomes

1. Utilize scientific and evidence-based findings to understand the molecular-physiological bases and chemical action of psychopharmacological agents.
2. Evaluate the clinical pharmacotherapeutics of broad categories of drugs along with alternative therapies needed for the therapeutic interventions.
3. Evaluate the legal, financial, policy and ethical issues with administering psychopharmacological agents.
4. Implement and analyze the role of the advanced practice nurse in delivering safe and effective psych pharmacotherapeutic agents for patient-centered care.
5. Serve as a role model for advanced practice nursing when administering psychopharmacological agents in collaborative settings.
6. Apply evidence-based findings to develop and improve practice.

NURS 6408. PMHNP Role in Diagnostics and Screening
3 Credits (3)
This course explores the diagnostics and screening of mental health disorders across the lifespan, focusing on advanced assessment techniques, diagnoses, and care strategies. Students will engage in risk assessment and develop individualized treatment plans based on relevant theoretical frameworks.
Learning Outcomes

1. Apply advanced assessment techniques to effectively evaluate mental health conditions across the lifespan.
2. Formulate individualized care strategies informed by relevant theoretical frameworks and best practices.
3. Utilize appropriate assessment tools to facilitate accurate diagnoses based on the DSM-5-TR.
4. Analyze cultural aspects of clinical practice to provide effective care for diverse populations and promote optimal outcomes.
5. Identify risk assessment strategies and tools to identify potential challenges and needs of individuals with mental health disorders.
6. Apply ethical considerations and legal requirements relevant to mental health practice.

NURS 6410. PMHNP Across the Lifespan I
3 Credits (3)
This is the first in a series of three didactic for the psychiatric mental health nurse practitioner (PMHNP) student. This course introduces the PMHNP student to the scope and standards of practice; legal and ethical issues; comprehensive psychiatric assessment and evaluation; developmental theories; and the theory and practice of psychotherapy. Emphasis is placed on individuals across the lifespan from diverse populations. May be repeated up to 6 credits.
Prerequisite: NURS 6220, NURS 6230.
Corequisite: NURS 6411.
Learning Outcomes

1. Synthesize the current scientific evidence along with theoretical models for personality development into therapeutic interventions within a healthy environment.
2. Promote and evaluate the role of the Advanced Practice Nurse in the management of evidence-based interventions with individuals experiencing psychosocial and neurobiological disorders.
3. Apply theoretical concepts and psychotherapeutic modalities to develop age appropriate therapeutic alliances with mental health individuals during developmental transitions and life-style adjustments across the lifespan, including focus on vulnerable populations at risk for mental health problems, based on current evidence and clinical practice guidelines.
4. Evaluate strategies to promote the negotiation of mutually acceptable and collaborative treatment plans.
5. Apply evidence-based findings to develop and improve practice.

NURS 6411. PMHNP Across the Lifespan I Practicum
2-4 Credits (2-4P)

This is the first in a series of three clinical practicum courses for the psychiatric mental health nurse practitioner (PMHNP) student. This course provides the family psychiatric nurse practitioner student opportunities to work with a preceptor to gain advanced practice skills in individual therapies, comprehensive psychiatric evaluation, personality development concepts, dual diagnoses and psychotherapy principles; including management of health promotion, health maintenance and disease prevention activities. Students will work in practice settings that see patients across the lifespan to include: children, adolescents, women, men and older adults. Multiple clinical settings may be required; however, students must spend a minimum of 64 clock hours in each clinical setting and should have no more than two clinical settings per semester. 1 P = 64 clock hours of practicum. May be repeated up to 6 credits.

Prerequisite: NURS 6220, NURS 6230.

Corequisite: NURS 6410.

Learning Outcomes

1. Utilize communication skills and ethical strategies to develop and terminate therapeutic relationships.
2. Promote and evaluate the role of the Advanced Practice Nurse in the management of evidence-based interventions with individuals experiencing psychosocial and neurobiological disorders.
3. Demonstrate knowledge of psychotherapeutic theories and concepts by independently conducting psychotherapy with individuals with mental illness or at risk for mental health problems, under the supervision of a preceptor.
4. Apply theoretical concepts and psychotherapeutic modalities to develop age appropriate therapeutic alliances with mental health individuals during developmental transitions and life-style adjustments across the lifespan, including focus on vulnerable populations at risk for mental health problems.
5. Use current evidence and clinical practice guidelines in the assessment and management of patients across the lifespan.

NURS 6420. PMHNP Across the Lifespan II
3 Credits (3)

This is the second in a series of three didactic courses for the psychiatric mental health nurse practitioner (PMHNP) student. This course provides further theoretical foundations, knowledge and evidence-based practice experiences in differential diagnosis for mental health conditions; family and group therapy; and integrated management of mental health conditions. Emphasis is placed on working with families from diverse populations. May be repeated up to 6 credits.

Prerequisite: NURS 6410.

Corequisite: NURS 6421.

Learning Outcomes

1. Evaluate core professional values and ethical/legal standards in the implementation of the nurse practitioner role, identifying and maintaining professional boundaries to preserve the integrity of the therapeutic process.
2. Integrate history, laboratory and physical exam data with the knowledge of pathophysiology and psychopathology of acute and chronic diseases across the life span, to construct comprehensive and concise biopsychosocial assessments and diagnosis of individuals with common psychiatric disorders.
3. Identify age appropriate theoretical concepts and psychotherapeutic modalities to develop age-appropriate therapeutic alliances with individuals and families during developmental transitions and life-style adjustments across the lifespan.

NURS 6421. PMHNP Across the Lifespan II Practicum
3-4 Credits (3-4P)

This is the second in a series of three clinical practicum courses for the psychiatric mental health nurse practitioner (PMHNP) student. The student gains knowledge and evidence-based practice experiences in differential diagnosis for mental health conditions; family and group therapy; and integrated management of mental health conditions. The course involves working with a preceptor to develop and implement comprehensive treatment plans that include psychotherapy and psychopharmacology in inpatient and/or outpatient settings. May be repeated up to 8 credits.

Prerequisite: NURS 6411.

Corequisite: NURS 6420.

Learning Outcomes

1. Demonstrate self-awareness of core professional values and ethical/legal standards in the implementation of the nurse practitioner role.
2. Integrate history, laboratory and physical exam data with the knowledge of pathophysiology and psychopathology of acute and chronic diseases across the life span, to construct comprehensive and concise biopsychosocial assessments and diagnosis of individuals with common psychiatric disorders.
3. Demonstrate interdisciplinary communication and care coordination by seeking consultation with colleagues to improve clinical outcomes for individuals with mental health problems and psychiatric disorders.
4. Recognize cultural diversity, spiritual preferences, values, and beliefs to create a climate of patient-centered care demonstrating confidentiality, privacy, comfort, emotional support, mutual trust, and respect.
5. Apply theoretical concepts and psychotherapeutic modalities to develop age-appropriate therapeutic alliances with individuals and families during developmental transitions and life-style adjustments across the lifespan based on current evidence and clinical practice guidelines.
6. Demonstrate increasing independence in the application of supportive, psychodynamic principles, cognitive-behavioral and other evidence- based psychotherapy/-ies to both brief and long-term individual encounters, family therapy and group therapy.

NURS 6430. PMHNP Across the Lifespan III
1 Credit (1)

This is the third in a series of three didactic/clinical courses for the psychiatric mental health nurse practitioner (PMHNP) student. This course provides further knowledge and skills for the family psychiatric nurse practitioner student to refine competencies in neuropsychology, assessment, diagnosis and treatment. Emphasis will be placed on individuals, families and groups across the lifespan in a multicultural environment. May be repeated up to 5 credits.

Prerequisite: NURS 6420.

Corequisite: NURS 6431.

Learning Outcomes

1. Synthesize and use current scientific evidence, differential and diagnostic reasoning along with theoretical models for group dynamics into therapeutic interventions.
2. Utilize communication skills, self-reflection, and ethical strategies to develop and terminate therapeutic relationships.
3. Promote and evaluate the role of the advanced practice nurse in the management of evidence-based interventions with groups experiencing psychosocial and neurobiological disorders.

4. Evaluate strategies to promote the negotiation of mutually acceptable and collaborative treatment plans.
5. Apply evidence-based findings to develop and improve practice.

NURS 6431. PMHNP Across the Lifespan III Practicum
3,4 Credits (3,4P)
This third course in the series of PMHNP clinical courses provides further knowledge and skills for the psychiatric nurse practitioner student to refine competencies in neuropsychology, assessment, diagnosis and treatment of patients with mental health illness. Emphasis will be placed on psychotherapeutic and psychopharmacologic treatment of individuals, families and groups across the lifespan in a multicultural environment. May be repeated up to 6 credits.
Prerequisite: NURS 6421.
Corequisite: NURS 6430.
Learning Outcomes
1. Demonstrate self-awareness of core professional values and ethical/legal standards in the implementation of the nurse practitioner role, identifying and maintaining professional boundaries to preserve the integrity of the therapeutic process.
2. Independently integrate history, laboratory and physical exam data with the knowledge of pathophysiology and psychopathology of acute and chronic diseases across the life span, to construct comprehensive and concise biopsychosocial assessments and diagnosis of individuals with common psychiatric disorders.
3. Demonstrate interdisciplinary communication and care coordination by seeking consultation with colleagues to improve clinical outcomes for individuals with mental health problems and psychiatric disorders.
4. Apply theoretical concepts and psychotherapeutic modalities to develop age-appropriate therapeutic alliances with individuals and/or families during developmental transitions and life-style adjustments across the lifespan based on current evidence and clinical practice guidelines.
5. Demonstrate theoretical concepts, evidence-based psychotherapeutic modalities, and knowledge of psychopharmacology to independently develop, implement and document comprehensive treatment plans.

NURS 6432. PMHNP Across the Lifespan Residency
2 Credits (2P)
The nurse practitioner student will be expected to fully immerse in the role of the Psychiatric Mental Health Nurse Practitioner (PMHNP) with increasing levels of autonomy, under the supervision of qualified preceptors. Students will demonstrate efficacy in practice, management, and treatment of broad types of mental health issues that present in children, adolescents, adults and/or geriatric individuals and families in a variety of settings. The student will demonstrate the ability to utilize psychopharmacological and psychotherapeutic (individual, family and group) interventions in specialty or subspeciality clinical settings, particularly those that are of clinical relevance to the student's area of intended practice. In this course, the student will demonstrate proficiency in the PMHNP role in integrated healthcare settings. Students must complete psychiatric mental health clinical rotation hours treating patients across the lifespan while offering opportunities for board certification exam preparation. Restricted to Nursing majors. May be repeated up to 4 credits.
Prerequisite: NURS 6421.
Corequisite: NURS 6431.
Learning Outcomes
1. Fully integrate the mental health nurse practitioner role in the implementation of practice in diverse practice settings.
2. Provide high quality, safe, cost-effective, patient centered care recognizing cultural diversity and the patient or designee as a full partner in decision-making.
3. Appropriately diagnose, manage, and develop treatment plans for patients experiencing mental health care problems, to maximize the patient's health potential using psychosocial, psychopharmacologic and psychotherapeutic interventions.
4. Demonstrate the highest level of accountability for ethical professional practice.
5. Evaluate patient outcomes and responses, and modify the patient plan of care accordingly.
6. Participate in opportunities for board certification exam preparation

NURS 6450. Advanced Concepts in the Treatment of Substance Use Disorders
1 Credit (1)
This course examines scope of practice, epidemiology, cultural issues, and common co-occurring psychiatric, medical and legal problems related to substance use disorders, including opioid use disorder. Students will review theories and research as the basis for psychometric screening and evidence-based interventions, including medication-assisted treatment for substance use disorders. Emphasis is placed on individuals across the lifespan from diverse populations. Consent of Instructor required.
Learning Outcomes
1. Demonstrate the significance of professionalism and self-awareness by maintaining professional, ethical and legal standards, preserving the integrity of the therapeutic process, demonstrating commitment to the health and well-being of individuals and society ethical practice, and upholding high personal standards of behavior.
2. Recognize addictive disorders as developmental biopsychosocial disorders using a model of interconnection encompassing neurobiology, genetic, medical and mental health co-morbidities, familial, social, environmental, cultural, spiritual influences as contributors of substance use disorders.
3. Apply an evidence-based approach to detecting substance use disorders by recognizing medical, psychological, social, and functional indicators of subclinical addiction disorders through use of validated standardized substance use disorder screening instruments, and accurately interpret screening results indicative of hazardous and harmful substance use. Integrate positive substance use screening results with therapeutic and counseling strategies appropriate to the patient's readiness to change, by assessing the patient's background, ethnicity, and belief system to accommodate and respect the values and attitudes of various cultures.
4. Recognize the indications, contraindications, duration and utilization of evidence-based medication-assisted treatment and pharmacotherapy for substance use disorders including medications for acute withdrawal and relapse prevention.
5. Diagnose substance use disorders and existing co-occurring mental health and/or medical disorders, and match appropriate level or care, secure consultation and referrals for specialty treatment of addiction and other medical and psychiatric conditions.

NURS 6506. Health Needs of Women and Children
3 Credits (3)
The course will examine patient and family perspectives as well as health care system variables and societal issues affecting the organization and delivery of primary care for women, adolescent, and pediatric populations. Emphasis includes a focus on ways in which poverty, politics, racial and ethnic disparities affect the health of families, women,

children, and adolescents. Content addresses comprehensive diagnosis and management of common health problems, including appropriate diagnostic procedures, laboratory tests, and follow-up care for patients with both acute and chronic conditions. There is a strong focus on health promotion, disease prevention, the care of underserved populations, and culturally competent care.
Prerequisite: NURS 6220, NURS 6225, NURS 6230.
Learning Outcomes

1. Analyze the etiology, pathophysiology, presentation, and prognosis of women and children's conditions as they present in clinical settings.
2. Assess the public health impact of clinical problems for both women and children in the community, including the epidemiology of common risk factors and early intervention strategies.
3. Synthesize scientific and evidence-based knowledge along with theory to promote health, prevent illness and treat common acute and chronic conditions of women and children.
4. Apply the principles of health care ethics to the care of women and children with an understanding of legal implications within the sociopolitical environment.
5. Formulate a plan to investigate and manage the health state of women and children taking into account the values and preferences of the patient and addressing the personal and social issues to which the health status may give rise.

NURS 6507. Pediatric Primary Care
3 Credits (3)
This didactic course provides foundational knowledge and clinical decision-making skills necessary for Family Nurse Practitioner (FNP) students to provide safe, developmentally appropriate, and evidence-based care to pediatric patients from infancy through adolescence. The course addresses common acute and chronic pediatric conditions, growth and development milestones, anticipatory guidance, and preventive care, including immunizations, screenings, and nutritional counseling.
Learning Outcomes

1. Provide evidence based assessments and screenings using age appropriate frameworks.
2. Develop differential diagnoses and evidence-based treatment plans for common pediatric conditions.
3. Identify developmental, behavioral, and family-centered care needs in pediatric populations.
4. Apply principles of health promotion, immunization, and disease prevention in managing care across pediatric age groups.
5. Analyze how social, cultural, and environmental determinants influence child health outcomes.

NURS 6510. FNP Across the Lifespan I
3 Credits (3)
The course provides the Family Nurse Practitioner student with advanced theoretical knowledge and practice in the assessment and management of health promotion, health maintenance and disease prevention activities across the lifespan; including the assessment and management of common acute and chronic health concerns. Emphasis will be placed on primary health care of individuals and their families in a multicultural environment. May be repeated up to 6 credits.
Prerequisite: NURS 6220, NURS 6230.
Corequisite: NURS 6511.
Learning Outcomes

1. Apply evidence-based knowledge and theory related to the prevention, diagnosis and management of selected common acute health problems in clients across the lifespan.
2. Plan collaborative case to assist clients and their families from diverse backgrounds to maximize functional health status
3. Formulate patient centered therapeutic plans based on holistic health assessment, risk reduction and safety for the treatment and prevention of select, uncomplicated and common, acute illnesses.

NURS 6511. FNP Across the Lifespan Practicum I
2-4 Credits (2-4P)
This is the first in a series of three clinical courses for the family nurse practitioner (FNP) student. Working with a preceptor students will use advance skills in patient history taking, performing physical assessments, and interpreting laboratory and other test results. Development of a plan of care with health promotion components is also expected. Students will work in practice settings that see patients across the lifespan to include: children, adolescents, women, men and older adults. Multiple clinical settings may be required; however, students must spend a minimum of 64 clock hours in each clinical setting and should have no more than two clinical settings per semester. 1 P = 64 clock hours of practicum. May be repeated up to 8 credits.
Prerequisite: NURS 6220, NURS 6230.
Corequisite: NURS 6510.
Learning Outcomes

1. Develop physical exam competency.
2. Integrate, implement and evaluate evidence-based therapeutic interventions in complex acute care practice situations.
3. Develop and sustain therapeutic relationships with patients across the life span (child, adolescents, young adult, adult, older adult, seniors) and other professional to optimize patient-centered outcomes.
4. Demonstrate advanced clinical judgment based on current standards of practice.
5. Synthesize clinical judgment, systems thinking, and accountability to provide evidenced based care.

NURS 6520. FNP Across the Lifespan II
3 Credits (3)
This is the second in a series of three didactic courses for the family nurse practitioner (FNP) student. This course provides further theoretical foundations, knowledge and evidence-based practice experiences in the differential diagnosis and management of acute and chronic diseases. Emphasis is placed on individuals across the lifespan from diverse populations. Building on knowledge and skills from the previous course, students will be expected to manage patients with an increasing complexity of health issues and multiple co-morbidities. May be repeated up to 6 credits. NURS 6511.
Prerequisite: NURS 6510.
Corequisite: NURS 6521.
Learning Outcomes

1. Integrate knowledge of pathophysiologic and psychosocial changes associated with common chronic health problems into immersion in practice decision-making.
2. Demonstrate an advanced knowledge base of normal changes and common patterns across the life span, including the physiologic, psychological, social, and spiritual domains.
3. Demonstrate an advanced knowledge base of common pathologies across the life span, and the diagnosis and treatment of common chronic health problems, including referral and follow-up.
4. Evaluate the relationships between access, cost, quality, and safety and their influence on health care.

NURS 6521. FNP Across the Lifespan II Practicum
3,5 Credits (3,5P)
This is the second in a series of three clinical courses for the family nurse practitioner (FNP) student. This course builds on knowledge and skills from the previous course, students will be expected to manage patients with an increasing complexity of health issues and multiple co-morbidities. This course involves working with a preceptor to refine skills in assessment and differential diagnosis as well as the development and implementation of comprehensive treatment plans, that include referrals to other specialties and services. Students are expected to work within Integrated Health Care settings for a minimum of 64 hours of practicum. May be repeated up to 10 credits.
Prerequisite: NURS 6510, NURS 6511.
Corequisite: NURS 6520.
Learning Outcomes
1. Apply conceptual frameworks to and compare strategies for risk analysis and reduction, screening, disease and injury prevention, and health promotion across the life span.
2. Integrate relevant research findings in management of selected health care conditions across the life span.
3. Use the principles of case management process to coordinate effective therapeutic interventions, referrals, and collaboration with other health care providers for clients/patients with chronic illness across the life span.
4. Demonstrate cultural competence related to the individual's ethnicity, culture and lifestyle when considering prevention strategies or developing the health promotion and disease management plan for chronic conditions across the life span.
5. Analyze client and patient outcomes to identify the effectiveness of treatment, the need for change, and the health status of client/patient across the life span in an integrated care setting.
6. Apply inter-professional competencies in addressing integrated health needs of patients across the lifespan.

NURS 6530. FNP Across the Lifespan III
1 Credit (1)
This is the final didactic course for the family nurse practitioner (FNP) student. The course continues the development of knowledge and skills for the nurse practitioner student for the assessment and management of selected common acute and chronic health conditions across the lifespan. Emphasis will be placed on primary health care of individuals and their families in a multicultural environment. This course includes preparation for the FNP board certification exam. May be repeated up to 5 credits.
Prerequisite: NURS 6520, NURS 6521.
Corequisite: NURS 6531.
Learning Outcomes
1. Integrate knowledge of pathophysiologic and psychosocial changes associated with common chronic health problems into clinical decision-making.
2. Demonstrate an advanced knowledge base of normal changes and common patterns across the life span, including the physiologic, psychological, social, and spiritual domains.
3. Demonstrate an advanced knowledge base of common pathologies across the life span, and the diagnosis and treatment of common chronic health problems, including referral and follow-up.
4. Translate knowledge of acute and chronic illness to the development, implementation and documentation of appropriate comprehensive treatment plans, including referrals to other specialties and services.
5. Use self-reflection to evaluate progress in professional development as an integral member of the interprofessional team.
6. Integrate ethical principles in decision-making and demonstrate core professional values in the implementation of the nurse practitioner role.

NURS 6531. FNP Across the Lifespan III Practicum
3-4 Credits (3-4P)
This is the final clinical course for the family nurse practitioner (FNP) student. In this course, the student works with a preceptor to develop mastery of skills required to assess, diagnose and manage acute and chronic conditions in primary care settings. Advancement of knowledge and skills attained through previous practicum experiences, as well as this final course, produces a capable, qualified provider, who will transition into a safe, novice, primary care nurse practitioner. May be repeated up to 8 credits.
Prerequisite: NURS 6521.
Corequisite: NURS 6530.
Learning Outcomes
1. Apply theoretical concepts of patient-centered care with emphasis on health promotion, disease prevention, guidance/counseling, disease management, and palliative care during developmental transitions and life-style adjustments.
2. Incorporate primary/secondary prevention guidance into comprehensive treatment plans for patients across the lifespan.
3. Integrate history, physical examination laboratory and other test data with knowledge of pathophysiology of acute and chronic diseases/conditions to develop appropriate differential diagnoses.
4. Identify pharmacological interventions in the treatment and management of illness for diverse populations.
5. Integrate evidence-based clinical guidelines into the diagnosis and management of illness in patients across the lifespan.
6. Translate knowledge of acute and chronic illness to the development, implementation and documentation of appropriate comprehensive treatment plans, including referrals to other specialties and services.

NURS 6610. Nurse Anesthesiology Principles I
2 Credits (2)
This is the first of four sequential nurse anesthesiology principles courses. The course introduces the student to advanced nursing practice in anesthesia and focuses heavily on anesthetic delivery systems. The course design integrates theoretical perspectives from anatomy, physiology, physics, and chemistry. The lab will emphasize perioperative preparation, management, and evaluation of the patient, anesthetizing area, and equipment.
Learning Outcomes
1. Review fundamentals of safe evidence-based anesthesia practice related to anesthesia techniques, airway management techniques, perioperative patient/anesthetizing area preparation, anesthesia planning, safety measures, appropriate use of equipment and monitoring devices, and anesthesia complications.
2. Demonstrate a comprehensive equipment check and proper utilization and/or interpretation of anesthesia delivery systems, airway equipment, monitoring devices, communication techniques, documentation, and patient positioning.
3. Assess patient fluid status and calculate, initiate, and manage fluid/blood component therapy.
4. Examine chemistry, physics, biochemistry, and imaging principles and their relationship to anesthesia.

5. Differentiate between acute and chronic pain management based on the neuroscience of pain.
6. Integrate anesthesia research and best practices related to basic anesthesia care, anesthesia equipment, technology, and pain management into anesthesia planning and delivery.

NURS 6620. Nurse Anesthesiology Principles II
5 Credits (4+1P)
This is the second of four sequential nurse anesthesiology principles courses and expands the knowledge gained from the previous course to include advanced airway management, advanced and invasive monitoring, preoperative assessment and anesthesia plan of care development. This course emphasizes evidence-based anesthesia techniques for fluid volume assessment, fluid/blood component therapy replacement, total intravenous anesthesia (TIVA), monitored anesthesia care (MAC), hypotensive techniques, intraoperative fire safety, and basic regional anesthesia knowledge and skills. Students will also learn anesthesia considerations and complications for a variety of patients undergoing selected procedures. The simulation lab focuses on the application of knowledge and skills from the didactic course.
Learning Outcomes
1. Discuss the integration of anesthesia principles, pathophysiology, physiology, and pharmacology for the planning of safe evidence-based anesthesia care for diverse patients undergoing a variety of surgical procedures.
2. Describe the indications and benefits of neuraxial and peripheral nerve blockade for diverse populations, as well as management of associated complications.
3. Identify via ultrasound key anatomy relevant to the brachial plexus and femoral (adductor canal) peripheral nerve blockade.
4. Demonstrate proper#approach and peripheral nerve block technique for the brachial plexus and femoral nerve(s).
5. Analyze the key anatomical structures when demonstrating correct techniques for a subarachnoid and epidural block.
6. Discover anesthesia techniques, considerations, and complications (and their management) related to intra-abdominal, extra thoracic, extracranial, orthopedic, perineal, pelvic, non-operating room, robotic, pediatric, obstetrics, and geriatric procedures.
7. Integrate anesthesia research and best practice guidelines into anesthesia planning and delivery for patients undergoing intra-abdominal, extra thoracic, extracranial, orthopedic, perineal, pelvic, non-operating room, robotic, pediatric, obstetrics, and geriatric procedures and/or regional anesthesia techniques.

NURS 6630. Nurse Anesthesiology Principles III
4 Credits (4)
This is the third of four sequential nurse anesthesiology principles courses and builds upon knowledge gained from previous courses. This course emphasizes evidence-based anesthesia techniques and complications in special populations across the lifespan, as well as selected surgical procedures. The course also addresses scope of practice, standards of practice, central nervous system monitoring devices, massive transfusion protocols, thromboelastography, enhanced recovery after surgery (ERAS), postanesthesia care and respiratory therapy.
Corequisite: NURS 6700.
Learning Outcomes
1. Discuss the integration of anesthesia principles, pathophysiology, physiology, and pharmacology for the planning of safe evidence-based anesthesia care#for#special populations across the lifespan undergoing#intracranial, cardiac, non-cardiac intrathoracic, neck, spine, and vascular surgical procedures.
2. Identify#modifications required for anesthesia planning and management for obese patients across the lifespan related to their physiology, comorbidities, and congenital anomalies as applicable.
3. Individualize common anesthesia techniques across the patients' lifespan undergoing intracranial, cardiac, non-cardiac intrathoracic, neck, spine, and vascular surgical procedures.
4. Identify common comorbid conditions of patients undergoing complex procedures.
5. Integrate anesthesia research and best practice guidelines into anesthesia planning and delivery for patients' undergoing intracranial, cardiac, non-cardiac intrathoracic, neck, spine, and vascular surgical procedures.
6. Examine anesthesia techniques, considerations, and complications (and their management) of diverse patients undergoing a variety of complex procedures.

NURS 6640. Nurse Anesthesiology Principles IV
3 Credits (3)
This is the final of four sequential nurse anesthesiology principles courses and builds upon knowledge gained from previous courses. This course emphasizes evidence-based anesthesia techniques and strategies to mitigate risk from anesthesia complications, as well as considerations for the following special populations: substance use disorder, immunocompromised and oncology populations and selected procedures. A major focus of this course is on pain theory, pain management, imaging, imaging safety and wellness.
Corequisite: NURS 6710.
Learning Outcomes
1. Discuss the integration of anesthesia principles, pathophysiology, physiology, and pharmacology for the planning of safe evidence-based anesthesia care#for#diverse patients undergoing#non-operating room anesthesia (NORA), trauma, burns, organ transplants, organ procurement, and laser procedures.
2. Discuss management of anesthesia complications related to special populations across the lifespan.
3. Examine anesthesia techniques, considerations, and complications (and their management) of diverse patients undergoing a variety of complex procedures.
4. Integrate anesthesia research and best practice guidelines into anesthesia planning and delivery for diverse patients undergoing a variety of complex procedures.

NURS 6650. Nurse Anesthesiology Principles V
4 Credits (3+1P)
This is the final of five sequential nurse anesthesiology principles courses and builds upon knowledge gained from previous courses. This course emphasizes evidence-based anesthesia techniques, complications, and considerations for administering regional anesthesia including spinal, epidural and nerve block procedures and management protocols.
Learning Outcomes
1. Discuss the integration of anesthesia principles, pathophysiology, physiology, and pharmacology for the planning of safe evidence-based anesthesia care for diverse patients undergoing regional anesthesia.
2. Examine regional anesthesia techniques, considerations, and complications (and their management) of diverse patients undergoing a variety of complex procedures.

3. Integrate anesthesia research and best practice guidelines into anesthesia planning and delivery for diverse patients undergoing procedures for regional anesthesia.

NURS 6700. Introduction to the Clinical Residency
3 Credits (3P)
This introductory clinical course provides students extensive simulation in preparation for the clinical environment and the clinical role of advanced nursing practice in anesthesiology. The student will apply concepts in a simulated perioperative environment and begin to learn communication and documentation skills. The student will analyze data from monitors and other equipment to ensure safe delivery of anesthesia care

Learning Outcomes

1. Integrate knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe simulated anesthesia care.
2. Formulate a comprehensive history and physical assessment and begin to formulate an evidence-based anesthesia plan of care based on the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Demonstrate basic anesthesia skills/techniques and incorporate new skills with guidance.
4. Demonstrate safe use of anesthesia monitors and equipment operation, calibration, and interpretation of data.
5. Demonstrate selection of drugs according to surgical patients across the lifespan.
6. In a simulated environment, develop#effective communication strategies and documentation skills in the perioperative environment to facilitate safe patient care.
7. Demonstrate patient positioning requirements for a given surgical procedure and implement appropriate safeguards to protect patients from physiologic compromise or injury.
8. Model integrity, ethics, honesty, and accountability in professional interactions in accordance with the AANA professional practice standards and code of ethics.

NURS 6710. Nurse Anesthesiology Clinical Residency I
3 Credits (3P)
This is the first of six clinical residency courses and provides students with the opportunity to begin developing the advanced nursing practice role in anesthesiology. Students are expected to integrate didactic knowledge learned in previous courses and co-requisite courses into perianesthesia care of the patient. Students begin to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider.

Learning Outcomes

1. Summarize knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into the planning and delivery of an evidence-based safe anesthetic.
2. Translate a comprehensive history and physical assessment into an evidence-based anesthesia plan of care based on the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Develop new anesthesia skills/techniques with guidance while maintaining basic/foundational anesthesia skills/techniques.
4. Make use of safe use of data from anesthesia monitors, equipment operation, and calibration.
5. Choose a selection of drugs according to surgical patients across the lifespan.
6. Compare and use#effective communication and documentation skills with diverse patients, families, other healthcare workers, and ancillary personnel to facilitate safe patient care.
7. Implement appropriate safeguards to protect patients from physiologic compromise or injury due to patient positioning requirements for a given surgical procedure.
8. Build integrity, ethics, honesty, and accountability in professional interactions in accordance with the AANA professional practice standards and code of ethics.

NURS 6720. Nurse Anesthesiology Clinical Residency II
4 Credits (4P)
This is the second of six clinical residency courses and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in Clinical Residency I and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. Students progressively assume more responsibility for patients as they gain skills and knowledge.

Learning Outcomes

1. Organize knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Utilize an evidence-based anesthesia plan of care based on a comprehensive history and physical assessment that takes into account the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Utilize basic anesthesia skills/techniques and discover new skills with guidance.
4. Analyze data from the anesthesia monitors, equipment operation, and calibration to increase patient safety.
5. Dissect selection of drugs according to surgical patients across the lifespan.
6. Construct effective communication and documentation skills with diverse patients, families, other healthcare workers, and ancillary personnel to facilitate safe patient care.
7. Utilize patient positioning requirements for a given surgical procedure and implement.
8. Dissect integrity, ethics, honesty, and accountability in professional interactions in accordance with the AANA professional practice standards and code of ethics.

NURS 6730. Nurse Anesthesiology Clinical Residency III
4 Credits (4P)
This is the third of six clinical residency courses and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in previous clinical residency courses and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. As students complete clinical experiences in various specialties, they will provide anesthesia services to patients with more complex alterations in health patterns requiring more expertise in anesthesia management.

Learning Outcomes

1. Categorize knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Infer an evidence-based anesthesia plan of care based on a comprehensive history and physical assessment taking into account the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Utilize new skills with guidance while maintaining basic anesthesia skills/techniques.
4. Interpret data for safe use of anesthesia monitors, equipment operation, and calibration.
5. Discover selection of drugs according to surgical patients across the lifespan.
6. Discover and simplify effective communication and documentation skills with diverse patients, families, other healthcare workers, and ancillary personnel to facilitate safe patient care.
7. Survey appropriate safeguards to protect patients from physiologic compromise due to patient positioning requirements for a given surgical procedure.
8. Judge integrity, ethics, honesty, and accountability in professional interactions in accordance with the AANA professional practice standards and code of ethics.

NURS 6740. Nurse Anesthesiology Clinical Residency IV
4 Credits (4P)

This is the fourth of six clinical residency courses and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in previous clinical residency courses and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. As students complete clinical experiences in various specialties, they will provide anesthesia services autonomously to patients with more complex alterations in health patterns requiring more expertise in anesthesia management.

Learning Outcomes

1. Appraise knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Design an evidence-based anesthesia plan of care based on a comprehensive history and physical assessment taking into account the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Adapt new skills with guidance while maintaining basic anesthesia skills/techniques.
4. Deduct data from the use of anesthesia monitors, equipment operation, and calibration to increase patient safety.
5. Determine #effective communication and documentation skills with diverse patients, families, other healthcare workers, and ancillary personnel to facilitate safe patient care.
6. Evaluate patient positioning requirements for a given surgical procedure and implement appropriate safeguards to protect patients from physiologic compromise or injury.
7. Develop integrity, ethics, honesty, and accountability in professional interactions in accordance with the AANA professional practice standards and code of ethics.

NURS 6750. Nurse Anesthesiology Clinical Residency V
5 Credits (5P)

This is the last of five clinical residency courses and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in previous clinical residency courses and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. Students are expected to provide anesthesia services independently to patients with more complex alterations in health patterns requiring more expertise in anesthesia management.

Learning Outcomes

1. Maximize knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Design an evidence-based anesthesia plan of care based on a comprehensive history and physical assessment taking into account the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Identify new skills with guidance while mastering basic anesthesia skills/techniques.
4. Analyze data with the use of anesthesia monitors, equipment operation, and calibration to increase patient safety.
5. Modify selection of drugs according to surgical patients across the lifespan.
6. Adapt#effective communication and documentation skills with diverse patients, families, other healthcare workers, and ancillary personnel to facilitate safe patient care.
7. Improve patient positioning requirements for a given surgical procedure and implement appropriate safeguards to protect patients from physiologic compromise or injury.
8. Maximize integrity, ethics, honesty, and accountability in professional interactions in accordance with the AANA professional practice standards and code of ethics.

NURS 6760. Nurse Anesthesiology Clinical Residency VI
5 Credits (5P)

This is the final clinical residency course and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in previous clinical residency courses and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. Students are expected to provide anesthesia services independently to patients with more complex alterations in health patterns requiring more expertise in anesthesia management.

Learning Outcomes

1. Adapt knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Improve an evidence-based anesthesia plan of care based on a comprehensive history and physical assessment attacking into account the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Maximize new skills with guidance while solidifying mastery of basic anesthesia skills.

4. Interpret data with the use of anesthesia monitors, equipment operation and calibration to increase patient safety.
5. Invent selection of drugs according to surgical patients across the lifespan.
6. Imagine and originate effective communication and documentation skills with diverse patients, families, other healthcare workers, and ancillary personnel to facilitate safe patient care.
7. Construct appropriate safeguards to protect patients from physiologic compromise or injury given patient positioning requirements for a given surgical procedure and implement.
8. Internalize integrity, ethics, honesty, and accountability in professional interactions in accordance with the AANA professional practice standards and code of ethics.

NURS 6770. Rural Health Anesthesiology Seminar
3 Credits (3)
This course focuses on unique issues and challenges surrounding the provision of nurse anesthesiology services in rural communities. Topics covered include working with scarce resources, needs of individuals/populations living in rural communities, regulatory issues, health policy, reimbursement practices, cultural issues, technology, and local/state/federal aspects that impact rural nurse anesthesiology practice.
Learning Outcomes
1. Define unique needs of individuals and/or populations living in rural communities.
2. Identify challenges of working with scarce resources.
3. Discuss regulatory, policy, reimbursement, and cultural issues unique to rural nurse anesthesiology practice.
4. Illustrate local, state, and/or federal issues that impact rural nurse anesthesiology practice.

NURS 6771. Anesthesiology Integration/Clinical Correlation I
4 Credits (4)
This course highlights the culmination of reflective learning that the nurse anesthesiology resident has accomplished over the three years of the program.
Learning Outcomes
1. Actively engage in professional advocacy by effectively representing the interests of the nurse anesthesiology profession, contributing to policy development, participating in the state and national organizations, and promoting ethical standards and social responsibility within anesthesia.
2. Prioritize sustainable personal and professional wellness practices by integrating strategies for physical, emotional, and mental well-being, maintaining work-life balance, managing stress effectively, and fostering resilience to support long-term career success and personal fulfillment.
3. Improve leadership and interpersonal effectiveness by applying emotional intelligence, communication, teamwork, adaptability, conflict resolution, and problem-solving skills to lead and collaborate within diverse professional settings.
4. Examine foundational financial literacy principles in both personal and business contexts, including budgeting, debt management, investment planning, financial decision-making, and understanding basic accounting and entrepreneurship practices.
5. Produce educational content using evidence-based teaching strategies, communication techniques, and presentation skills to facilitate learning in academic, clinical, or public settings.
6. Demonstrate readiness for professional practice and certification through active participation in simulation-based assessments, development and execution of a personalized study plan, and successful completion of comprehensive final evaluations that integrate theoretical knowledge with practical application.

NURS 6772. Anesthesiology Integration/Clinical Correlation II
2 Credits (2)
This course is the second of a two-course sequence and continues to further develop critical thinking skills and foster continued integration of theoretical knowledge into clinical practice. Clinically relevant evidence-based research and anesthesia topics will be presented by students and faculty. This course also includes student participation in discussion of clinical experiences and case presentations. Students will continue to critically analyze, synthesize, and evaluate the knowledge gained in all previous nurse anesthesiology courses in preparation for the national certification examination and clinical practice.
Learning Outcomes
1. Demonstrate the ability to critically review pertinent literature and its application to clinical practice.
2. Deliver case-based presentations that incorporate current evidence-based best practices and culturally relevant information.
3. Demonstrate consistent professional growth and development through discussion, presentation, interaction, and individual and/or group participation.
4. Complete the student self-evaluation of graduate standards form.
5. Implement the previously created action plan to pass the NBCRNA NCE and revise it as needed.

NURS 6990. Advanced Practice Nursing Immersion
1-4 Credits (1-4)
Practicum experience for advanced practice students. Focus will be on a practice issue chosen by the student for further development as an evidence-based doctoral project. Clinical practice hours as needed to meet DNP requirements. Up to 24 credits may be completed by student. Restricted to: NURP majors. May be repeated up to 24 credits.
Prerequisite: NURS 6220, NURS 6530 or enrollment in post-masters track.

NURS 6991. DNP Project Development
1,2 Credits (1,2+1,2P)
The DNP Project course is repeated for a minimum of three (3) semesters and is the culmination of the DNP coursework. The three semesters of coursework include development, implementation, evaluation and dissemination of scholarly work that demonstrates the student's synthesis of the Essentials of Nursing Education, Advanced Level. The project must use evidence to improve clinical practice, healthcare delivery and/or patient outcomes. Students will actively participate with their DNP project chair each semester to develop a learning contract with individualized learning objectives based on the student's progression in the DNP project process. The student will register for a minimum of 2 credits which will include 1 hour of didactic and 1 hour of practicum credit (for leading the DNP Project) each semester following NURS 6305 (Intro to the DNP Project) until project completion and a minimum of six (6) credit hours during the course of the program of study. Students who have not completed the DNP Project will repeat the course until the student has met all DNP project requirements for graduation. S/U PR grading. May be repeated up to 8 credits.
Prerequisite: NURS 6305.
Learning Outcomes
1. Synthesize knowledge from experience and specialty literature for application to the project area of interest.
2. Demonstrate the ability to complete a organizational needs assessment, literature review, executive summary, IRB application and write a scholarly manuscript for public dissemination.

3. Identify a theoretical framework or model that will guide the development of a solution or intervention and/or the execution of the DNP project.
4. Incorporate elements of scientific inquiry into a defined project in the specialty practice area or area of clinical interest.
5. Demonstrate the ability to present in a scholarly fashion for the DNP project proposal comprehensive examination and the DNP project final defense.
6. Develop a portfolio demonstrating expertise in the specialty practice area.

NURS 6993. Doctoral Nursing APRN Seminar
1 Credit (1P)
Seminar to build APRN clinical skills, consisting of a 32-40 hour on-site immersion with skills labs and Objective Structured Clinical Evaluation using standardized patients that are used as formative and summative evaluation. May be repeated up to 6 credits.
Prerequisite: NURS 6220, NURS 6224.
Learning Outcomes
1. Apply clinical decision making skills to diagnose and treat given patient cases in area of specialty.
2. Integrate screening and diagnostic tools into diagnosis and treatment of given patient cases in area of specialty.
3. Use advanced health assessment skills to differentiate between normal, variations of normal and abnormal findings.
4. Develop skills in the interpretation of commonly used diagnostic tests in management of patient conditions in area of specialty.
5. Perform procedures commonly used in the treatment of patients in area of specialty.

NURS 6997. Independent Study
1-6 Credits (1-6)
Individual studies and directed research with prior approval of department head. May be repeated up to 12 credits.

NURS 7000. Doctoral Dissertation
1-9 Credits (1-9)
Dissertation may be repeated to maximum of 30 credits. Minimum requirements are 21 credit hours. Comprehensive examine is included within these 21 credits. May be repeated up to 30 credits.
Learning Outcomes
1. Varies.

NURS 999. Practical Nursing Requirements Completed
99 Credits
A phantom course created to indicate a student has met Practical Nursing requirements. Used to indicate this in academic history to replace an administrative message not converted from SOLAR to VISTAS. 01/97 May be repeated up to 99 credits.
Learning Outcomes
1. N/A

Office Location: Health and Social Services Building, Room 310, 3rd Floor

1335 International Mall, MSC 3185

Las Cruces, NM 88003

Phone: (575) 646-3812

Website: http://schoolofnursing.nmsu.edu/ (http://schoolofnursing.nmsu.edu)

Email: nursing@nmsu.edu

Nursing - Bachelor of Science in Nursing

Four-Year Curriculum Plan Courses

A grade of C- or better is required for all courses in the curriculum. Students must also complete six elective credits from the Part III Viewing a Wider World general education category.

Math basic academic skills requirement must be satisfied.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 122 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics		
Choose one from the following: [2]		3-4
MATH 1220G	College Algebra	
MATH 1430G	Applications of Calculus I	
MATH 1250G	Trigonometry & Pre-Calculus	
MATH 1511G	Calculus and Analytic Geometry I	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
MATH 1521G	Calculus and Analytic Geometry II	
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	4
or CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
or CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
CEPY 1120G	Human Growth and Behavior	3
or PSYC 2120	Developmental Psychology	
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
PSYC 1110G	Introduction to Psychology	3
Viewing A Wider World [3]		**6**
Departmental/College Requirements		
Nursing Courses [4]		
Level 1		
NMNC 3110	Introduction to Nursing Concepts	3
NMNC 3135	Principles of Nursing Practice	4
NMNC 3120	Evidence-Based Practice	3

Choose one from the following (3-6 credits):		3-6
NURS 3110	Human Pathophysiology Foundation for Nursing	
BIOL 2511 & BIOL 2512	Human Pathophysiology and Human Pathophysiology II	
Level 2		
NMNC 3210	Health and Illness Concepts I	3
NMNC 3220	Health Care Participant	3
NMNC 3230	Nursing Pharmacology	3
NMNC 3235	Assessment and Health Promotion	4
Level 3		
NMNC 4310	Health & Illness Concepts II	3
NMNC 4320	Professional Nursing Concepts I	3
NMNC 4335	Care of Patients with Chronic Cndtns	4
Nursing Elective Course-3 credits (Specific List of Courses from Nursing Advisor)		3
ANTH 436	Evolutionary Medicine	
BIOL 305	Principles of Genetics	
CEPY 4130	Addictions Prevention and Recovery	
COMM 480	Health Communication	
GENE 305	Principles of Genetics	
GNDR 371	Introduction to LGBTQ Studies	
NURS 3115	Care of the Veteran Population	
PHLS 3120V	Women's Health Issues	
PHLS 3130V	Global Environmental Health Issues	
PHLS 4610	Health Disparities: Determinants and Interventions	
PHLS 4620V	Cross-Cultural Aspects of Health	
PHLS 4630	International Health Problems	
PHLS 4640	Rural Health Issues	
PHLS 4650	Coping with Loss and Grief: A Cross-Cultural Perspective	
PHLS 4660	U.S.-Mexico Border Health Issues	
PHLS 4670	American Indian Health	
PHLS 4680	Hispanic Health Issues	
PHLS 4720	Health Promotion for the Older Adult	
PSYC 302	Abnormal Psychology	
PSYC 325	Health Psychology	
Level 4		
NMNC 4410	Health & Illness Concepts III	4
NMNC 4435	Clinical Intensive I	4
NMNC 4445	Clinical Intensive II	4
Level 5		
NMNC 4510	Concept Synthesis	3
NMNC 4520	Professional Nursing Concepts II	3
NMNC 4535	Clinical Intensive III	4
NMNC 4545	BSN Capstone	4
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
NUTR 2110	Human Nutrition	3
Anatomy and Physiology Requirement		
Choose one combination of courses from the following:		8
Combination One		
BIOL 2210 & BIOL 2225	Human Anatomy and Physiology I and Human Anatomy and Physiology II	
Combination Two		
BIOL 354	Physiology of Humans	
and		
BIOL 353 & 353 L	Pre-Professional Human Anatomy and Pre-Professional Human Anatomy Laboratory	
Combination Three		
SPMD 2210 & 2210L	Anatomy and Physiology I and Anatomy and Physiology Laboratory	
and		
SPMD 2225 & 2225L	Anatomy and Physiology II and Anatomy and Physiology II Lab	
Statistics Requirement		
Choose one from the following:		3
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
A ST 311	Statistical Applications	
Microbiology Requirement		
Choose one from the following:		4-5
BIOL 2310 & 2310L	Microbiology and Microbiology Lab	
BIOL 2320 & BIOL 311 L	Public Health Microbiology and General Microbiology Laboratory	
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory	
Second Language: (not required)		
Electives, to bring the total credits to 122		**0**
Total Credits		**122-127**

[1] See the General Education (p. 262) section of the catalog for a full list of courses

[2] A Mathematics General Education course is required for the degree but students may need to take any prerequisites needed to enter the course selected first.

[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

[4] **Formal Acceptance required before taking NURSING courses.** The NMSU School of Nursing participates in the New Mexico Nursing Education Consortium. The nursing curriculum offered is the NMNEC Statewide Curriculum Plan.

Note: A grade of C- or better is required for all courses in the curriculum. You must also complete 6 elective credits from the Part III Viewing a Wider World general education category.

1. An applicant who is not a U.S. citizen or who has been convicted of a felony is advised to contact the appropriate State Board of Nursing regarding eligibility for licensure.
2. Clinical clearances are required for all students prior to admission and concurrent with each semester of studies. These include: current immunizations; background screening; drug testing; individual health insurance coverage; current CPR status; various health agency orientations, as well as other requirements mandated by clinical affiliation agreements. Failure to complete and provide documentation within timelines established by the School of Nursing may prevent admission to/or continuation within the nursing program.
3. Students are required to make a satisfactory score on nationally-normed, standardized tests before application. In the last semester of the curriculum, students are required to take a comprehensive/ standardized exam and to make a satisfactory score on this exam prior to their final clinical experience.

4. Newly admitted students are required to attend an orientation session which occurs prior to the start of classes for their first nursing semester.
5. School-wide activities begin 1-3 days prior to the start of classes. Attendance is required.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
MATH 1220G	College Algebra [1]	3
CHEM 1120G or CHEM 1215G or CHEM 1225G	Introduction to Chemistry Lecture and Laboratory (non majors) [1] or General Chemistry I Lecture and Laboratory for STEM Majors or General Chemistry II Lecture and Laboratory for STEM Majors	4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory [1]	4
PSYC 1110G	Introduction to Psychology	3
	Credits	**18**
Semester 2		
MATH 1350G	Introduction to Statistics [1]	3
CEPY 1120G or PSYC 2120	Human Growth and Behavior or Developmental Psychology	3
Choose from one of the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication [1] or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science [1]	
Choose from one of the following:		4-5
SPMD 2210 & 2210L	Anatomy and Physiology I and Anatomy and Physiology Laboratory [1]	
BIOL 2210	Human Anatomy and Physiology I [1]	
BIOL 353 & 353 L	Pre-Professional Human Anatomy and Pre-Professional Human Anatomy Laboratory [1]	
NUTR 2110	Human Nutrition	3
	Credits	**16-17**
Second Year		
Semester 1		
BSN Application Term - start planning for HESI exam (resources and deadlines)		
COMM 1115G or COMM 1130G or HNRS 2175G	Introduction to Communication or Public Speaking or Introduction to Communication Honors	3
Choose from one of the following:		3-4
SPMD 2225 & 2225L	Anatomy and Physiology II and Anatomy and Physiology II Lab	
BIOL 2225	Human Anatomy and Physiology II (Fall Only)	
BIOL 354	Physiology of Humans (Spring Only)	
Choose from one of the following:		4-5
BIOL 2310 & 2310L	Microbiology and Microbiology Lab	
BIOL 2320 & BIOL 311 L	Public Health Microbiology and General Microbiology Laboratory [1]	
BIOL 311 & 311 L	General Microbiology and General Microbiology Laboratory [1]	
Area V: Humanities Course [2]		3
	Credits	**13-15**
Semester 2		
NMNC 3110	Introduction to Nursing Concepts	3
NMNC 3135	Principles of Nursing Practice	4
NURS 3110	Human Pathophysiology Foundation for Nursing	4
NMNC 3120	Evidence-Based Practice	3
Students who need to enroll in 15 credits for Finanical Aid purposes will need to take additional electives		
	Credits	**14**
Third Year		
Semester 1		
NMNC 3210	Health and Illness Concepts I	3
NMNC 3220	Health Care Participant	3
NMNC 3230	Nursing Pharmacology	3
NMNC 3235	Assessment and Health Promotion	4
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Semester 2		
NMNC 4310	Health & Illness Concepts II	3
NMNC 4320	Professional Nursing Concepts I	3
NMNC 4335	Care of Patients with Chronic Cndtns	4
VWW: Viewing a Wider World Course [3]		3
NURS Elective Course		3
	Credits	**16**
Fourth Year		
Semester 1		
NMNC 4410	Health & Illness Concepts III	4
NMNC 4435	Clinical Intensive I	4
NMNC 4445	Clinical Intensive II	4
VWW: Viewing a Wider World Course [3]		3
	Credits	**15**
Semester 2		
NMNC 4510	Concept Synthesis	3
NMNC 4520	Professional Nursing Concepts II	3
NMNC 4535	Clinical Intensive III	4
NMNC 4545	BSN Capstone	4
	Credits	**14**
	Total Credits	**122-125**

[1] These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

[2] See the General Education (p. 262) section of the catalog for a full list of courses

[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Public Health Sciences

Undergraduate Program Information

The Bachelor in public health (BPH) degree prepares students for careers in community and public health. Graduates typically pursue employment in governmental agencies, as well as in voluntary, private, and other organizations. Upon completion of the degree, graduates are eligible to take the national Certified Health Education Specialist (CHES) examination administered by the National Commission for Health Education Credentialing, Inc. The Bachelor of Public Health program is fully accredited by the Council on Education for Public Health (CEPH).

Students must attain a grade of C- or better in all required PHLS core coursework.

Failure to obtain a satisfactory grade of C- or better in any two PHLS courses could be grounds for dismissal from the program. Any student who receives two or more grades of D or F in required PHLS core courses must petition, in writing, to continue as a major.

Graduate Program Information

MPH

The Department of Public Health Sciences offers the Master of Public Health degree (MPH) in Health Behavior and Health Promotion concentration and Health Management, Administration, and Policy concentration. The Master's degree programs prepare public health professionals to function in a variety of settings, including health programs at the local, state, and federal government levels; profit and nonprofit organizations and agencies; worksite settings; and educational institutions. The MPH program is fully accredited by the Council on Education for Public Health (CEPH).

Students may participate in either the full-time on-campus MPH program with HBHP concentration or either of the part-time (i.e., two courses/semester) online programs, including HBHP concentration or the HMAP concentration. All coursework for online degrees can be completed off-campus utilizing web-based technologies aimed at meeting the needs of working students and others for whom a campus-based program is not an option.

Admission to the MPH program is on a continuous (rolling) basis with two deadlines. The deadline for spring semester admission is November 15, and the deadline for fall admission is March 15.

HES PhD

The Department of Public Health Sciences offers a PhD in Health Equity Sciences (PhD) with concentrations in Socio-Cultural and Behavioral Sciences, Applied Biostatistics (Joint NMSU/UNM concentration), Health Administration and Policy, Health Across the Lifespan, Environmental and Occupational Health.

This doctoral program will provide graduates with comprehensive research training to prepare them for positions of leadership in state, federal, and global governmental and non-governmental agencies, public health and social justice organizations, healthcare provider organizations, and institutions of higher learning. Students will develop the skills and experience necessary to address growing and complex problems that underlie health and healthcare inequities, as well as emerging health threats.

Admission to the PhD occurs bi-annually on even years.

Admissions Requirements

MPH Admissions: https://publichealth.nmsu.edu/graduate-program/welcome.html

PhD Admissions: https://publichealth.nmsu.edu/phd-in-health-equity-sciences/phd-admissions-requirements.html

Applications are now completed online at http://gradschool.nmsu.edu/.

For more information, contact the respective Graduate Coordinator at tomaka@nmsu.edu (MPH) or tstimatz@nmsu.edu (PhD), or visit the website: publichealth.nmsu.edu (https://publichealth.nmsu.edu).

Degrees for the Department

Bachelor Degree(s)

- Public Health - Bachelor of Public Health (p. 1361)
- Public Health - Bachelor of Public Health (Online) (https://catalogs.nmsu.edu/global/nmsu-global/public-health-bph-online/)

Master Degree(s)

- Master of Public Health/Master of Social Work - Dual Degree (https://catalogs.nmsu.edu/nmsu/graduate-school/master-public-health-master-social-work-dual-degree/)
- Public Health (Health Behavior & Health Promotion) - Master of Public Health (Online) (https://catalogs.nmsu.edu/global/nmsu-global/public-health-health-behavior-health-promotion-mph-online/)
- Public Health (Health Behavior and Health Promotion) - Master of Public Health (p. 182)
- Public Health (Health Management, Administration & Policy) - Master of Public Health (p. 184)
- Public Health (Health Management, Administration & Policy) - Master of Public Health (Online) (https://catalogs.nmsu.edu/global/nmsu-global/public-health-health-mgt-admin-policy-mph-online/)

Doctoral Degree(s)

- Health Equity Sciences - Doctor of Philosophy (p. 228)

Minors for the Department

- Gerontology - Graduate Minor (p. 257)
- Gerontology - Graduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/gerontology-graduate-minor-online/)
- Gerontology - Undergraduate Minor (p. 1363)
- Gerontology - Undergraduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/gerontology-ug-minor-online/)
- Public Health Sciences - Undergraduate Minor (p. 1363)
- Public Health Sciences - Undergraduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/public-health-sciences-ug-minor-online/)
- U.S.-Mexico Border Health Issues - Graduate Minor (p. 262)

- U.S.-Mexico Border Health Issues - Graduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/us-mexico-border-health-issues-graduate-minor-online/)
- U.S.-Mexico Border Health Issues - Undergraduate Minor (p. 1363)
- U.S.-Mexico Border Health Issues - Undergraduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/us-mexico-border-health-issues-ug-minor-online/)

Graduate Certificate(s)

- Public Health - Graduate Certificate (p. 249)
- Public Health - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/public-health-gr-certificate-online/)

Becky Pearson, PhD, MPH - Department Head

Professors Khubchandani, Kopera-Frye, Palacios, Pearson, Tomaka; ***Associate Professors*** Rahman, Shin, Stimatze; ***Assistant Professors*** England-Kennedy, Estrada, Hebert-DeRouen, Magoc; ***College Associate Professor*** Latz

E. England-Kennedy, PhD (University of Arizona, Tucson) - homelessness and health, suicide prevention, social and environmental justice, health equity;

S. Estrada, PhD (University of Northern Colorado) biostatistics;

M. Hebert-DeRouen, PhD (Stanford University), MPH (UC Berkeley) - structural and social determinants of health, cancer health inequities, epidemiology, multi-level data integration, EHR data for research;

J. Khubchandani, PhD (University of Toledo, Ohio)- Social Epidemiology and Global Health;

K. Kopera-Frye, PhD (Wayne State University) - gerontology, health promotion and obesity among ethnically diverse groups, rural health, substance abuse;

I. Latz, PhD (University of Texas at El Paso), Field Experience Coordinator health policy, community engagement, social determinants of health;

D. Magoc, PhD (University of Texas at El Paso) – active living, health behavior;

R. Palacios, PhD (University of Texas at El Paso) – cancer survivorship, masculinity and health, cultural adaptations;

B. Pearson, PhD (University of Arkansas), MPH (New Mexico State University) – structural determinants of health, food justice, rights- and values-based approaches to consumer health;

H. Rahman, MD (Rangpur Medical College, Bangladesh), PhD (University of South Florida) - toxicology;

D.Y. Shin, PhD (University of Alabama, Birmingham) - healthcare management;

T. Stimatze. PhD (New Mexico State University) biostatistics;

J. Tomaka, PhD (University of Buffalo), Graduate Coordinator– health behavior, program evaluation.

Emeritus J. McDonald, PhD, (University of Washington), S.L. Wilson, PhD (Southern Methodist University), C. Kozel, PhD (University of New Mexico), C. Kratzke, PhD (Old Dominion University)

Public Health Sciences Courses

PHLS 1110G. Personal Health & Wellness
3 Credits (3)
A holistic and multi-disciplinary approach towards promoting positive lifestyles. Special emphasis is placed on major problems that have greatest significance to personal and community health. Topics to include nutrition, stress management, fitness, aging, sexuality, drug education, and others.
Learning Outcomes

1. Students will identify, describe and explain human health behaviors and how they are influenced by social structures, institutions, and processes within the contexts of complex and diverse communities. Students should: Develop an understanding of self and the world by examining content and processes used by social and behavioral sciences to discover, describe, explain, and predict human behaviors and social systems.
2. Students will articulate how beliefs, assumptions, and values are influenced by factors such as politics, geography, economics, culture, biology, history, and social institutions. Students should: Enhance knowledge of social and cultural institutions and the values of their society and other societies and cultures in the world.
3. Students will describe ongoing reciprocal interactions among self, society, and the environment. Students should: Understand the interdependent nature of the individual, family/social group, and society in shaping human behavior and determining quality of life.
4. Students will apply the knowledge base of the social and behavioral sciences to identify, describe, explain, and critically evaluate relevant issues, ethical dilemmas, and arguments. Students should: Articulate their role in a global context and develop an awareness and appreciation for diverse value systems in order to understand how to be good citizens who can critically examine and work toward quality of life within a framework of understanding and justice.

PHLS 1110H. Personal Health and Wellness Honors
3 Credits (3)
A holistic and multi-disciplinary approach towards promoting positive lifestyles. Special emphasis is placed on major problems that have greatest significance to personal and community health. Topics to include nutrition, stress management, fitness, aging, sexuality, drug education, and others. In addition students will complete an experiential learning component or project.
Learning Outcomes

1. Students will identify, describe and explain human health behaviors and how they are influenced by social structures, institutions, and processes within the contexts of complex and diverse communities. Students should: Develop an understanding of self and the world by examining content and processes used by social and behavioral sciences to discover, describe, explain, and predict human behaviors and social systems.
2. Students will articulate how beliefs, assumptions, and values are influenced by factors such as politics, geography, economics, culture, biology, history, and social institutions. Students should: Enhance knowledge of social and cultural institutions and the values of their society and other societies and cultures in the world.
3. Students will describe ongoing reciprocal interactions among self, society, and the environment. Students should: Understand the

interdependent nature of the individual, family/social group, and society in shaping human behavior and determining quality of life.

4. Students will apply the knowledge base of the social and behavioral sciences to identify, describe, explain, and critically evaluate relevant issues, ethical dilemmas, and arguments. Students should: Articulate their role in a global context and develop an awareness and appreciation for diverse value systems in order to understand how to be good citizens who can critically examine and work toward quality of life within a framework of understanding and justice.

PHLS 2110. Foundations of Health Education
3 Credits (3)
Role and responsibility of the health educator with emphasis on small group dynamics, oral and written communication skills, building community coalitions and introduction to grant writing. Taught with PHLS 3210. Cannot receive credit for both PHLS 2110 and PHLS 3210.
Prerequisite: PHLS 1110G or consent of instructor.
Learning Outcomes

1. Define health, three levels of prevention, health education and health promotion, and describe the major determinants of health.
2. Describe the 7 major areas of responsibility, major competencies and sub-competencies of a professional health educator and the CHES's possible roles in various community health settings.
3. Describe and examine the historical context and development of the profession of health education.
4. Identify and critique major processes and practices of health education programming.
5. Describe the steps involved in conducting needs assessments, program and intervention planning, implementation, and program evaluation.
6. Identify, examine and describe elected health behavior change theories and models and explore possible applications in health education practice.
7. Describe and discuss the process of community mobilization and building of a community coalition.
8. Identify health issues and describe effective methods/strategies in health education advocacy.
9. Describe and discuss the future trends and issues in the professional preparation and practice of professional health educators. 1
10. Demonstrate effective and appropriate oral and written communication skills for health education professionals.

PHLS 2120. Essentials of Public Health
3 Credits (3)
The course will focus on principles and major areas if public health, including ecological and total personal concept of health care system, epidemiological approaches to disease prevention and control . Consent of Instructor required.
Learning Outcomes

1. Understand the sources of public health data, and how to interpret that information.
2. Access existing health related data.
3. Analyze health related data.
4. Identify populations for health education programs.
5. Incorporate data analysis and principles of community organization.
6. Interpret results from evaluation and research.
7. Infer implications from findings for future health–related activities.
8. Have a basic understanding of health topics faced by various populations.

PHLS 3110V. Human Sexuality
3 Credits (3)
Examination of human sexuality from a variety of perspectives: cultural, sociological, physiological and psychological. Issues examined from viewpoints such as gender, individual, family, and professional roles.
Learning Outcomes

1. Understand the cultural and historical inputs resulting in our current understanding of the human sexual experience.
2. Examine the early and modern researcher in the field of human sexuality, along with an overview of basic research skills.
3. Study gender roles and similarities and differences between men and women.
4. Examine male and female reproductive anatomy and the physiology of sexual arousal.
5. Identify the factors affecting love and attraction, and the development of relationships.
6. Discuss homophobia and the factors associated with negative attitudes toward homosexuality.
7. Identify and discuss current techniques of contraception along with fertility problems.
8. Discuss the sexual behavior of adults.
9. Examine the medical, relational, and stress factors related to sexual dysfunction. 1
10. Learn the facts and fallacies about sexually transmitted diseases. 1
11. Identify the continuum of behaviors related to paraphililias. 1
12. Examine sexual coercion and violence.

PHLS 3120V. Women's Health Issues
3 Credits (3)
A focus on the unique issues and problems that confront women today and how they affect the health of women. Crosslisted with: GNDR 381V. May be repeated up to 3 credits.

PHLS 3130V. Global Environmental Health Issues
3 Credits (3)
Introduction to global environmental health challenges in the 21st century with an emphasis on environmental problems as they affect public health and personal well-being.
Learning Outcomes

1. Discuss the major environmental health issues facing our global environment in the 21st century.
2. Discuss the status of our global environmental health.
3. Articulate basic concepts of environmental health and convey and understanding of their value and importance.
4. Discuss, define, and develop insight into the following terms and concepts as they relate to global environmental health: population dynamics, population control, the people-food predicament, impacts of growth on ecosystems, environmental disease, toxic substances, pests, pesticides, food quality, radiation, solid waste, and hazardous waste.
5. Specify common environmental hazards that pose risks to human health and safety.
6. Discuss global human population numbers and the impact on our global environmental health.
7. Describe federal and state regulatory programs, guidelines, and authorities that control environmental health issues.

8. Identify sources of reference research relevant to global environmental health.
9. Identify individual and human behaviors that foster or hinder the well-being of our global environmental health.

PHLS 3210. Foundations of Community Health Education
3 Credits (3)
This course introduces students to principles and practices of community health information, perspectives, and competencies necessary to promote health in various settings (e.g., community, school, workplace, and health care). The course explores concepts related to health and health education, including determinants of health, health equity, and various physical, mental, and environmental health conditions. The historical origins of the profession, the roles and responsibilities of community health educators, and the Certified Health Education Specialist competencies are examined. Equivalent to PHLS 2110 for prerequisite purposes.
Learning Outcomes
1. Define health, three levels of prevention, health education and health promotion, and describe the major determinants of health.
2. Describe the seven major areas of responsibility, major competencies and sub-competencies of a professional health educator and the CHES's possible roles in various community health settings.
3. Describe and examine the historical context and development of the profession of health education.
4. Identify and critique major processes and practices of health education programming.
5. Describe the steps involved in conducting needs assessment, program and intervention planning, implementation, and program evaluation.
6. Identify, examine and describe elected health behavior change theories and models and explore possible applications in health education practice.
7. Identify and describe governmental agency roles, and the ethical and economic dimensions of health education and promotion.
8. Identify health issues and describe effective methods/strategies in health education advocacy.
9. Describe and discuss the future trends and issues in the professional preparation and practice of professional health educators. 1
10. Demonstrate effective and appropriate oral and written communication skills for health education professionals.

PHLS 3220. Foundations of Public Health
3 Credits (3)
The course will focus on principles and major areas of public health, including ecological concepts of healthcare systems and epidemiological approaches to disease promotion and control. Equivalent to PHLS 2120 for prerequisites.
Learning Outcomes
1. Describe public health, including key terms, functions, and services.
2. Compare the differences between personal health and public health.
3. Describe analytical methods of public health, including basic principles of epidemiology and identify sources of statistics and data in public health.
4. Describe determinants of health from a global perspective, including environmental, social, cultural, behavioral, and biological factors.
5. Discuss concepts for prevention, detection, and control of infectious and chronic conditions.
6. Discuss the organization, financing, and delivery of medical and population-based US services with roles of quality, cost, access, and organizational structure in influencing population health.
7. Explain the most important health problems and issues facing our society.

PHLS 4130. Environmental Health
3 Credits (3)
Introduction to environmental health designed to address public health issues. Restricted to: PH,PHL majors.
Learning Outcomes
1. Define the major sources and types of environmental agents.
2. Discuss the transport and fate of these agents in the environment.
3. Identify the carriers or vectors that promote the transfer of these agents from the environment to the human.
4. Describe how these agents interact with biological systems and the mechanisms by which they exert adverse health effects.
5. Analyze public health problems using environmental health knowledge.
6. Evaluate and identify environmental health-related issues.

PHLS 4210. Methods of Community Health Education
3 Credits (3)
Responsibilities of health educators, analysis of social forces affecting health needs, application of wide range of health education methods and instructional media, and program implementation skills. Restricted to: Public Health majors.
Prerequisite: PHLS 3220 or PHLS 2120.
Learning Outcomes
1. Integrate two health education theories or models into community health education practice.
2. Identify two steps for conducting a training needs assessment.
3. Analyze training with different delivery methods.
4. Compare advocacy approaches for health issues.
5. Demonstrate methods for the preparation of materials to reach different audiences.

PHLS 4310. Biometrics and Health Research
3 Credits (3)
Critical analysis of community health research and related methodologies. Restricted to: Public Health majors.
Prerequisite: (MATH 1350G) or MATH 2350G or A ST 311.
Learning Outcomes
1. Compare and contrast a population versus a sample.
2. Explore data using appropriate graphs, charts, and tables.
3. Analyze data using descriptive statistics.
4. Formulate and test statistical hypotheses about population means and proportions.
5. Perform an ANOVA to compare multiple population means.
6. Compute and interpret the correlation between two continuous variables.
7. Distinguish between parametric and non-parametric methods.
8. Explain when to use non-parametric methods and why.

PHLS 4320. Epidemiology
3 Credits (3)
Epidemiologic approaches to disease prevention and control. Factors influencing health status. Restricted to: PHL majors.
Prerequisite: PHLS 3220 or PHLS 2120.

Learning Outcomes

1. Define key epidemiological terms and concepts, such as incidence, prevalence, morbidity, and mortality, and apply these concepts to analyze patterns and trends in disease occurrence and distribution.
2. Design and conduct basic epidemiological studies, including cohort, case-control, and cross-sectional studies, and interpret the results to assess associations between exposures and health outcomes.
3. Demonstrate proficiency in using statistical methods to analyze epidemiological data, including calculating measures of association (relative risk, odds ratio) and understanding their implications for public health research.
4. Critically evaluate epidemiological research articles, identify potential biases and limitations, and discuss the implications for public health practice and policy.

PHLS 4410. Administration of Health Programs
3 Credits (3)
Covers administrative responsibilities, organizational theory, strategic planning, and systems theory as applied to the administration of a variety of health programs. Restricted to: PHL majors.
Prerequisite: PHLS 3220, PHLS 2120, or consent of instructor.
Learning Outcomes

1. Compare types of public health leadership, motivation, and management skills needed for today's work environment.
2. Identify operational responsibilities, including processes for hiring, budgets, motivation, and performance management.
3. Discuss various systems thinking tools for strategic planning.
4. Develop systems planning strategies for a health program promoting collaborative efforts.
5. Compare the characteristics of the United States of America health system and health systems in other countries.

PHLS 4420. Health Program Planning
3 Credits (3)
Planning and development of community health education interventions for behavior change at the individual, family, social network levels of practice. Emphasis on applying program-planning models and designs into a grant-writing project. Restricted to: Public Health majors.
Prerequisite: PHLS 3210 or PHLS 2120 and PHLS 4430.
Learning Outcomes

1. Describe the foundational principles and history of health promotion and education, including the roles of planning in public health program development.
2. Conduct (and use data from) a comprehensive needs assessment to identify and plan to address health problems, risk factors, and priorities within a target population.
3. Apply health behavior theories and models, as well as a logic model or conceptual framework, to guide the planning process and design intervention strategies across individual, interpersonal, organizational, and community levels.
4. Discuss the roles of cultural competency and inclusivity in health programs, considering health literacy, social determinants, and community engagement.
5. Identify key stakeholders and build coalitions to support program planning, resource acquisition, and long-term sustainability.
6. Draft a written health program plan proposal integrating all components of the planning process, including budget and resource plans, timeline and implementation plans, staffing, and logistical considerations.

PHLS 4430. Theoretically-Based Interventions
3 Credits (3)
Identifying and developing interventions to problematic health-related behaviors. Restricted to: Public Health majors.
Prerequisite: PHLS 3220 or PHLS 2120.
Learning Outcomes

1. Describe the foremost behavioral theories.
2. Identify the main concepts contained in each of the foremost behavioral theories.
3. Design health promotion programs based on behavioral theory.
4. Identify the use of behavioral theories in product marketing, social marketing, and public service announcements.
5. Identify the necessary links among theory, research, and health promotion practice.

PHLS 4440. Health Program Evaluation and Research
3 Credits (3)
Covers the application of research and evaluation models for decision-making program and policy development of community health education interventions. Focus on the individual, family, and social network levels of practice.
Prerequisite: PHLS 4420.
Learning Outcomes

1. Discuss the concepts, language, methods, and applications of evaluation research.
2. Demonstrate the ability to search, review, and critically appraise evaluation research.
3. Develop a logic model for an intervention to guide evaluation.
4. Formulate clear and answerable research questions for evaluation.
5. Identify, modify, and/or develop appropriate measures of outcomes that are valid, reliable, and feasible.
6. Discuss ethical issues and potential bias in evaluation.
7. Describe how program evaluation results can be used to influence or impact policy.

PHLS 4510. Public Health Seminar in Community Health Education
1 Credit (1)
Critical analysis of issues in CHE and health care. Readings focus on social, economic, cultural, and political issues as they affect the profession and practice. Emphasis on future, local, national, and international health trends. Restricted to: Public Health majors. May be repeated up to 1 credit.
Prerequisite: PHLS 4320, PHLS 4420, and PHLS 4430 or consent of instructor.

PHLS 4515. Approaches to Community-Focused Public Health
3 Credits (3)
Introductory issues-focused course offering reading, writing, and active learning opportunities (including volunteering). Designed to challenge students toward innovative directions in community-focused public health. Select theories and professional practice areas will be emphasized, and students will practice public-friendly strategies relevant for our complex field.
Learning Outcomes

1. Articulate why, and how, a community problem of concern to them should be viewed as a public health issue (including applying a public health theory or model).
2. Discuss at least one way community-focused public health professionals approach identifying and working on public health issues.

3. Identify credible resources, including peer-reviewed sources as well as governmental and organizational reports and websites, and accurately and effectively use and share information from them with a variety of audiences.

PHLS 4610. Health Disparities: Determinants and Interventions
3 Credits (3)
Investigates: descriptions of health disparities and measurement issues; physical environmental factors, behavioral and emotional variables; impact of aging of the populations, increased racial and ethnic diversity, and technological developments; intervention strategies and evaluation results.
Learning Outcomes
1. Examine the impact of structural racism on health in the United States of America.
2. Identify populations who have systematically experienced greater obstacles to health based on their race or ethnicity, religion, socioeconomic status, gender, age, mental health, cognitive, sensory, or physical disability, sexual orientation or gender identity, geographic location, or other characteristics historically linked to discrimination or exclusion in the United States of America.
3. Identify social and structural determinants of health that influence health and health equity.
4. Examine the role that public health professionals can play in advancing health equity.
5. Examine social and structural barriers to health care access and utilization.
6. Explain cultural competence, cultural humility, cultural safety, and structural competence.
7. Discuss research and program designs in health equity research and practice.
8. Examine the role of social determinants of health in achieving health equity.
9. Advocate for policies that advance health equity.

PHLS 4620V. Cross-Cultural Aspects of Health
3 Credits (3)
An examination of health practices from a variety of cultural perspectives: communication, observation, research, and assimilation. Issues to be addressed will be examined from a number of viewpoints, such as individual, family, community, and professional roles. May be repeated up to 3 credits.

PHLS 4630. International Health Problems
3 Credits (3)
Comparison of domestic health programs and problems with those in other parts of the world; emphasis on political parameters and delivery processes. Additional attention is focused on the health issues of the U.S.-Mexico border. Taught with PHLS 5630.
Learning Outcomes
1. Identify many of the current authoritative sources of information about global health, as a potential aid for future educational, training, and research endeavors.
2. Cite examples of specific issues and case studies in global health.
3. Identify key features of global health.
4. Explain the complexities of global health issues.
5. Explain intervention strategies being used to attack problems in global health.

PHLS 4640. Rural Health Issues
3 Credits (3)
Comprehensive overview of rural health services with Southwestern United States and New Mexico focus. Taught with PHLS 5640.
Learning Outcomes
1. Compare and contrast the major perspectives on rural health.
2. Analyze the social, biological, psychological, and societal factors affecting the health of rural residents.
3. Critically analyze contemporary controversies, such as environmental contamination.
4. Evaluate current empirical research in understanding rural health challenges and resources.

PHLS 4650. Coping with Loss and Grief: A Cross-Cultural Perspective
3 Credits (3)
A cross-cultural perspective to death, loss and grief. Hospice philosophy of caring for the dying will be included. Taught with PHLS 5650.
Learning Outcomes
1. Compare and contrast the major theories in thanatology.
2. Analyze the biological, psychological, social, and societal factors affecting the dying process and attitudes towards death and dying.
3. Critically analyze contemporary controversies, for example, physician-assisted suicide.
4. Evaluate current empirical research in thanatology.

PHLS 4660. U.S.-Mexico Border Health Issues
3 Credits (3)
Interdisciplinary analysis of the impact of living conditions and health issues of communities along the U.S.-Mexico border and of the strategies and initiatives to address these issues. Problem-based learning, case analysis, lecture, guest speakers, computer based instruction, and field trips. Taught with PHLS 5660.
Learning Outcomes
1. Analyze the social, economic, cultural, and environmental determinants of health affecting communities along the U.S.–Mexico border using an interdisciplinary framework.
2. Evaluate public health strategies, binational policies, and community-based initiatives aimed at addressing health disparities and improving living conditions in border regions.
3. Develop evidence-informed recommendations for collaborative interventions that incorporate diverse stakeholder perspectives and respect cultural and contextual factors unique to the U.S.–Mexico border.

PHLS 4670. American Indian Health
3 Credits (3)
Critical health issues facing American Indians in the contemporary world.
Learning Outcomes
1. Compare and contrast the major perspectives on Native American health.
2. Analyze the social, biological, psychological, and societal factors affecting the health of Indigenous populations.
3. Critically analyze contemporary controversies, e.g., governmental oversight of sovereign nations.
4. Evaluate current empirical research in understanding Native American health status.

PHLS 4680. Hispanic Health Issues
3 Credits (3)
The course will familiarize public health students with social determinants of health contributing to Hispanic health disparities and the impact that health and immigration policies have on Hispanics' access

to insurance and healthcare utilization, with a spotlight on different Hispanic subgroups. Recommendations for policy and research are also discussed.

Learning Outcomes

1. Explain the historical, ancestral, and national origins contributing to the diversity of the U.S. Hispanic population.
2. Assess obstacles researchers have encountered in explaining the Hispanic Epidemiological Paradox and the ethics surrounding them.
3. Compare and contrast health care coverage and access to health care in Hispanics relative to other racial/ethnic groups.
4. Describe factors contributing to health disparities in chronic and infectious diseases among Hispanics.
5. Explain how U.S. health policies negatively impact Hispanics.

PHLS 4710. Introduction to Gerontology
3 Credits (3)
Social, psychological, and physiological aspects of aging, with an interdisciplinary emphasis on health promotion. Demographic characteristics of the aging population. Taught with PHLS 5710. May be repeated up to 3 credits.

PHLS 4720. Health Promotion for the Older Adult
3 Credits (3)
Common health concerns and lifestyle issues relevant to older adults. Facts about the content area, health behaviors, and practices to promote health and prevent disease; program development strategies applicable to a variety of settings. Taught with PHLS 5720. May be repeated up to 3 credits.

PHLS 4730. Adulthood and Aging
3 Credits (3)
Normal transitions in later life; those occurring from 40 years of age to the end of life are discussed. Changes in interpersonal relationships and adaptations commonly made by individuals and meeting those alterations are presented through research findings, case studies, and autobibliographies. Taught with PHLS 5730. May be repeated up to 3 credits.

PHLS 4740. Aging and Public Policy
3 Credits (3)
Exploration of public policies relating to elders, historical development, current status and trends in public policy for this age group. Impact of political behavior of elders on policy making and implementing processes. May be repeated up to 3 credits.

PHLS 4810. Infectious and Noninfectious Disease Prevention
3 Credits (3)
History, etiology, and prevention of diseases affecting humans. Taught with PHLS 5810.
Prerequisite: PHLS 3220, PHLS 2120, PHLS 4320, or consent of instructor.

Learning Outcomes

1. Describe historical context of disease and health.
2. Identify the role of public health, past and present, in the control of communicable and chronic disease.
3. Identify and evaluate the characteristics of major chronic and communicable diseases.
4. Define, classify, and describe the etiology, incidence, and prevalence of major diseases.
5. Describe risk factors related to gender, race, ethnicity, and lifestyle for major diseases.
6. Identify the major diagnostic and treatment protocols for common diseases of humans.
7. Assess psychosocial influences upon diseases including diet, physical activity, rest, and related lifestyle variables.
8. Determine the impact of major diseases on the quality of life for the patient family.

PHLS 4820. Health Informatics
3 Credits (3)
The application of technology to engage communities and individuals in behavioral and environmental change processes. The course will focus on the use of technology to describe the magnitude of health problems and their sources; analyze risk factors; identify community strengths from which strategies may be defined and tools created to intervene, prevent problems, and promote health and well-being; and continuously evaluate, refine, and implement what works. Taught with PHLS 5820. Restricted to: Restricted to Public Health majors.
Prerequisite: PHLS 3220 or PHLS 2120 or consent of instructor.

Learning Outcomes

1. Identify and list the concepts of informatics and its domains.
2. Explain how major theories and models apply to the adoption and use of health information systems.
3. Use project management tools to plan and monitor progress on an informatics project.
4. Describe basic ethical, legal, and policy-related issues in informatics.
5. Develop approaches to communicate and advocate for the use of technologies to address public health issues.

PHLS 4996. Special Topics
3 Credits (3)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits.

Learning Outcomes

1. Varies

PHLS 4997. Independent Study
1-6 Credits (1-6)
Individual studies with prior approval of department head. May be repeated up to 12 credits.

Learning Outcomes

1. Varies

PHLS 4998. Applied Practice Experience
1-6 Credits (1-6)
Senior-standing BPH majors will integrate and apply various concepts related to actual public health practice. Experience aims to prepare students to integrate CEPH foundational competencies and responsibilities of community health education specialists. Approximately 42 hours at a field agency are required per credit hour. Restricted to: BPH majors. May be repeated up to 6 credits.
Prerequisite: PHLS 4210 or concurrent enrollment.

Learning Outcomes

1. Varies.

PHLS 5110. Community and Psychosocial Aspects of Public Health
3 Credits (3)
This course examines the major social and behavioral theories that seek to explain and predict human behaviors. Such theories not only serve to explain health behavior but also serve as guidelines for the development of health promotion and public health programs and interventions and their evaluation. The social determinants of health and health disparities, theoretical models of health behavior change, and intervention/behavior change strategies and tools are explored.

Learning Outcomes

1. Discuss behavioral, social and cultural factors associated with health and illness.
2. Describe major behavioral theories and models.
3. Identify the main concepts/constructs/components of each of the major behavioral theories and models.
4. Design or adapt a public health program applying one of the major behavioral theories/models.
5. Discuss the necessary links of theory public health practice and research.

PHLS 5120. Biostatistical Applications in Public Health
3 Credits (3)
Quantitative methods for public health students including tabular, graphical, and numerical descriptive methods, random sampling, principles of statistical inference, confidence intervals, statistical tests of hypothesis through analysis of variance and regression. Restricted to MPH majors.

Learning Outcomes

1. Prepare data for analysis.
2. Analyze data using descriptive statistical methods.
3. Analyze data using inferential statistical methods (t-tests, ANOVA, regression).
4. Formulate and test statistical hypotheses about population means and proportions.
5. Explain how findings relate to hypotheses or research questions based on statistical results.
6. Use statistical results to draw conclusions.

PHLS 5130. Epidemiological Approaches to Disease Control and Prevention
3 Credits (3)
Basic epidemiological principles applicable to infectious and noninfectious disease. Descriptive techniques and analytic designs, and application of statistical and epidemiological investigation methods included. Restricted to MPH majors.

Learning Outcomes

1. Define basic epidemiologic (EPI) terms used in the measurement of health and disease.
2. Summarize the modes of disease transmission.
3. Calculate and restate basic measures of disease frequency, association, and potential impact.
4. Distinguish between the major sources of epi data.
5. Describe patterns of disease and disease determinants by person, place, and time.
6. Compare the basic PH research designs, their strengths and limitations, including potential sources of bias, and inferences that can be drawn from each.
7. Restate disease causation concepts and the meaning of statistical significance in practice.
8. Explain epi principles of screening for disease and risk factors.
9. Describe basic ethical and legal principles involved in the study of human subjects.

PHLS 5140. Health Services System: Administration and Organization
3 Credits (3)
This course focuses on using a systems approach to identify and analyze factors and interrelationships that influence the operation of health services organizations. Specific attention is to administrative structures and operations, finance and quality among public health departments, hospitals, multi-institutional systems, integrated health systems and strategic alliances.

Learning Outcomes

1. Identify the main components of the organization for health care delivery and health care system in the U.S.
2. Compare health care systems in the U.S. and other developed countries.
3. Discuss resources and the principles of resources management in health care delivery.
4. Apply essential management functions (planning, organizing, staffing, leading, and controlling) to health services organizations.
5. Apply leadership and motivation concepts to the management of health services organizations.
6. Apply the principles and models of decision-making, communication, and managing change to address organizational challenges.
7. Demonstrate the knowledge and skills inherent in interprofessional work
8. Discuss how systems thinking works for healthcare delivery systems.

PHLS 5150. Environmental Public Health Issues
3 Credits (3)
This graduate-level course is primarily designed for Master of Public Health (MPH) students. It aims to provide a comprehensive overview of key areas within environmental health as a public health discipline. The course is intended to enhance your understanding of how environmental issues impact your role as a public health practitioner. Restricted to MPH majors.

Learning Outcomes

1. Define and discuss the history of environmental health.
2. Gain a basic knowledge of science that is fundamental to understanding environmental health issues.
3. Discuss the association between population growth and dissemination of environmental pollutants.
4. Describe methods used in toxicology to assess environmental exposures and hazards.
5. Identify chemical, physical, and microbial agents that originate in the environment and can impact human health.
6. Identify challenges and propose potential ways to deal with them in environmental health practices, with particular attention to issues of environmental justice and equity.

PHLS 5160. Public Health Policy Analysis
3 Credits (3)
This graduate-level course presents the key aspects of the policymaking process in the United States. The course introduces students to the steps necessary to formulate, implement, and modify healthcare policies. Economic, cultural, institutional, and social factors influencing policymaking will be explored. The evolution of federal health policy, including major healthcare reform efforts, will be presented. Students will be provided with the necessary tools to comprehend and explain policymaking. The class will primarily focus on federal-level health policymaking, but several examples of state-level policies will be discussed.

Learning Outcomes

1. Define and describe key health policy concepts: health, health determinants, public policy, and health policy.
2. Appreciate the significance of the Patient Protection and Affordable Care Act (ACA) and other major healthcare reform efforts and laws.

3. Describe the Longest Conceptual Model of the Public Policymaking Process and its key components of policy formulation, implementation, and modification.
4. Articulate the roles played by legislators, interest groups, researchers, and citizens in shaping and influencing health policy.
5. Summarize the roles of the three levels of government in making health policy.
6. Identify major health policy issues currently facing U.S. healthcare.

PHLS 5170. Qualitative Methods in Public Health
3 Credits (3)
This course introduces students to the principles and practices of qualitative research in public health. It emphasizes the value of qualitative inquiry for understanding complex health behaviors, cultural contexts, and social determinants of health. The course covers key methodologies including interviews, focus groups, ethnography, and content analysis. Students will develop skills in qualitative research design, data collection, coding, thematic analysis, and ethical considerations. Students will learn to apply qualitative methods to address public health challenges and to complement quantitative approaches in mixed-methods research.

Learning Outcomes

1. Design qualitative research studies to explore public health issues, including the development of research questions, selection of appropriate methods, and ethical considerations.
2. Conduct qualitative data collection using techniques such as in-depth interviews, focus groups, and participant observation, adhering to principles of cultural competence and research ethics.
3. Analyze qualitative data through coding and thematic analysis, utilizing software tools where appropriate, to identify patterns and derive meaningful insights. Critically evaluate qualitative research for methodological rigor, credibility, and relevance to public health practice and policy.
4. Critically evaluate qualitative research for methodological rigor, credibility, and relevance to public health practice and policy.
5. Communicate qualitative research findings effectively in written and oral formats to diverse audiences, integrating findings into public health strategies and interventions.

PHLS 5210. Foundations & Techniques of Public Health Education
3 Credits (3)
Social, behavioral, and educational aspects of disease prevention and health promotion. Includes history and theoretical basis of health education. May be repeated up to 3 credits.

Learning Outcomes

1. Explain, demonstrate, and apply health communication, education, and promotion knowledge and skill competencies.
2. Discuss the means by which structural biases, social inequities, and other social determinants of health undermine health and create challenges to achieving health equity at interpersonal, organizational, community, societal, cultural, and legal and policy levels.
3. Explain and demonstrate ways in which health communication, education, and promotion techniques can be utilized to increase health equity and reduce health disparities.
4. Utilize health behavior change theories to develop health communication, education and promotion materials, processes, and goals.
5. Identify best practices and evidence-based strategies and programs for use in health communication, education, and promotion.

PHLS 5220. Techniques of Health Communication/Education
3 Credits (3)
Application of a wide range of communication and education theories/methods, including program planning and evaluation, in public health programming. Restricted to: MPH majors. May be repeated up to 3 credits.
Prerequisite: PHLS 5110.

PHLS 5230. Community Organization in Public Health
3 Credits (3)
Strategies for identifying and involving community leaders, community needs assessment, small area analysis and planning, and community-level development strategies. Restricted to: MPH majors. May be repeated up to 3 credits.
Prerequisite: PHLS 5110.

PHLS 5240. Health Program Planning
3 Credits (3)
Covers process of successful public health education program planning and grant writing. Restricted to: MPH majors.

Learning Outcomes

1. Explain, demonstrate, and apply health program planning knowledge and skill competencies.
2. Explain, demonstrate, and design strategies and multi-level planned interventions.
3. Explain, demonstrate, and apply health program proposal writing and presentation knowledge and skills.

PHLS 5250. Evaluative Approaches in Public Health
3 Credits (3)
Survey and analyses of health testing and evaluation procedures, uses and limitations of knowledge and attitude tests, behavioral inventories, check lists, questionnaires, interviews, and other techniques. Restricted to: MPH majors.

Learning Outcomes

1. Understand the foundations of program evaluation.
2. Identify multiple program evaluation methods used to assess public health programs.
3. Examine the appropriate use of each evaluation design (process, outcome evaluation, impact monitoring) in relation to evaluating public health programs.
4. Design program logic models for various public health programs.
5. Gain knowledge related to the selection, design, and implementation of quantitative and qualitative research methods in program evaluation.
6. Understand practical issues in designing and implementing health program evaluation.
7. Assess challenges inherent to program evaluation and be able to describe strategies for navigating these challenges.
8. Explore the roles of program evaluators operating at the community and research levels and as external and internal evaluators.

PHLS 5260. Research and Resources in Community Health
3 Credits (3)
This course introduces the fundamentals of and examines the necessary concepts and skills required for research design, implementation, data analysis, statistical testing, and results reporting. The course explores a variety of approaches to ethical issues in conducting research. Restricted to MPH majors.

Learning Outcomes

1. Understand and critique research as described both in technical reports for example, professional journals and in the popular media for example, newspapers, magazines, TV.
2. Identify and critically review quantitative health science research study designs.
3. Discuss problems associated with methodology and logistics of conducting research.
4. Develop the essential elements for a research plan.
5. Plan, design, and carry out a variety of different research projects.
6. Prepare and present a professional quality research plan.
7. Develop the essential elements for a research plan.

PHLS 5310. Principles of Health Program Management
3 Credits (3)

This course prepares the student to assume a supervisory role in the management of health and human services programs. The course will cover essential management functions such as leadership, organizational assessment, planning, decision-making, organizational structure, budgeting, marketing, and human resource management.

Learning Outcomes

1. Discuss organizational and human resources management in public health activities.
2. Demonstrate the knowledge and skills inherent in budgeting.
3. Apply leadership and motivation concepts to the management of public health activities.
4. Apply the concepts, principles, and theories in management to public health settings.

PHLS 5320. Health Services Organization and Delivery
3 Credits (3)

This course includes the framework of the United States healthcare system; organization and administration of health services; alternate ways of organizing and financing health systems; the roles of the government and free market on health care services; and the barriers to health services delivery. May be repeated up to 3 credits.

PHLS 5330. Public Health Finance and Budget Management
3 Credits (3)

Introduces health care accounting and finance to non-financial students. Students are exposed to the financial structure of health care organizations and the environment within which they operate. Instruction also introduces the use of accounting and financial information in investor-owned and not-for-profit organizations in the health care industry. Topics include understanding the creation and interpretation of financial statements, financial accounting and reporting requirements, financial analysis, budgeting, and resource allocation.

Learning Outcomes

1. Discuss the healthcare environment in which health services providers operate.
2. Analyze basic financial statements: balance sheet, income statement, statement of changes in equity, and statement of cash flows.
3. Assess the financial condition of health services organizations based on the analysis of their financial statements.
4. Apply financial concepts, principles, and models to financial analyses for managerial accounting.
5. Demonstrate familiarity with budgeting processes and assess the financial performance of the organization using variance analysis.
6. Evaluate the financing and capital investment decisions of the organization.

PHLS 5340. Public Health Law and Ethics
3 Credits (3)

This course examines major legal and ethical concepts and their impact on public health policy and practice. The course examines governmental authority, at various jurisdictional levels, to improve public health. This course will focus on public health law in the United States. Restricted to: MPH majors.

Learning Outcomes

1. Discuss legal and ethical concepts underlying (or related to) public health policy and practice.
2. Articulate ethics-related ideas, from documents such as the American Public Health Association's Public Health Code of Ethics, as they apply to contemporary public health issues.
3. Examine national, regional, state, and local government entities in terms of their authority to use legal and ethical concepts and foundations to improve public health.
4. Design or present a case study to support practitioners' or the public's understanding of the legal and ethical underpinnings of public health policy and practice.

PHLS 5410. Human-Animal Interactions in Environmental Contexts
3 Credits (3)

This MPH course will cover foundational concepts of human-animal interactions as they occur in a wide variety of environmental contexts and biomes. Modules of the course will include foci on zoonotic diseases, the impacts of invasive species, climatic shifts, emergent diseases, and companion animals.

Learning Outcomes

1. Describe the One Health approach to global health and the health of humans, animals, environments, and biomes.
2. Recognize the role of human impacts on environments and biomes as they impact human, animal, and environmental health.
3. Be attuned to the global patterning of increased contact between wild animals and humans and the implications for emergent diseases.
4. Analyze how human-animal interactions positively and negatively impact the health of humans, animals, and environments with emphases on wild, domesticated, companion, and service animals.
5. Make a case for the importance of addressing human-animal interactions, the global climate crisis, and environmental degradation and enhancements as part of a comprehensive public health strategy.
6. Demonstrate how transdisciplinary efforts, policies, and programs can be integrated to address current and emergent public health problems.

PHLS 5420. Global Health: One Health, Climate Change, Human Migration
3 Credits (3)

This MPH course will cover foundational concepts of One Health, impacts of the climate crisis on human, animal, and environmental health, the impacts of global human and animal migration and displacement on global health, social and behavioral science theories, and evidence-based prevention and intervention programs aimed at promoting health of individuals, groups, communities and populations.

Learning Outcomes

1. Describe the One Health approach to global health and the health of humans, animals, environments, and biomes.

2. Recognize the role of social and behavioral factors and the natural history of animals in shaping global mortality and morbidity.
3. Be attuned to the global patterning of public health problems and their implications for solutions.
4. Analyze how human-animal interactions positively and negatively impact the health of humans, animals, and environments.
5. Make a case for the importance of addressing human-animal interactions, the global climate crisis, and environmental degradation and enhancements as part of a comprehensive public health strategy.
6. Demonstrate how transdisciplinary efforts, policies, and programs can be integrated to address current and emergent public health problems.

PHLS 5610. Health Disparities: Determinants and Interventions
3 Credits (3)
Investigates: descriptions of health disparities and measurement issues; physical environmental factors, behavioral and emotional variables; impact of aging of the populations, increased racial and ethnic diversity, and technological developments; intervention strategies and evaluation results. Taught with: PHLS 4610.

Learning Outcomes

1. Examine the impact of structural racism on health in the United States of America.
2. Identify populations who have systematically experienced greater obstacles to health based on their race or ethnicity, religion, socioeconomic status, gender, age, mental health, cognitive, sensory, or physical disability, sexual orientation or gender identity, geographic location, or other characteristics historically linked to discrimination or exclusion in the United States of America.
3. Identify social and structural determinants of health that influence health and health equity.
4. Examine the role that public health professionals can play in advancing health equity.
5. Examine social and structural barriers to health care access and utilization.
6. Explain cultural competence, cultural humility, cultural safety, and structural competence.
7. Discuss research and program designs in health equity research and practice.
8. Examine the role of social determinants of health in achieving health equity.
9. Advocate for policies that advance health equity.

PHLS 5620. Cross-Cultural Aspects of Health
3 Credits (3)
An examination of health practices from a variety of cultural perspectives; communication, observation, research, and assimilation. Issues to be addressed will be examined from a number of viewpoints, such as individual, family, community, and professional roles. May be repeated up to 3 credits.

PHLS 5630. International Health Problems
3 Credits (3)
Comparison of domestic health programs and problems with those in other parts of the world; emphasis on political parameters and delivery processes. Additional attention is focused on the health issues of the U.S.-Mexico border. Taught with: PHLS 4630.

Learning Outcomes

1. Identify many of the current authoritative sources of information about global health, as a potential aid for future educational, training, and research endeavors.
2. Cite examples of specific issues and case studies in global health.
3. Identify key features of global health.
4. Explain the complexities of global health issues.
5. Explain intervention strategies being used to attack problems in global health.

PHLS 5635. International Health Practicum
1-3 Credits (1-3)
Intensive examination of health practices and beliefs from a cultural perspective. Focus on health structure, index of diseases, morbidity, mortality and epidemiological approaches to planning. Required travel (personal travel, lodging, and related expenses are extra). May be repeated up to 3 credits.

PHLS 5640. Rural Health Issues
3 Credits (3)
Comprehensive overview of rural health services with southwestern United States and New Mexico focus. Taught with: PHLS 4640.

Learning Outcomes

1. Compare and contrast the major perspectives on rural health.
2. Analyze the social, biological, psychological, and societal factors affecting the health of rural residents.
3. Critically analyze contemporary controversies, for example, environmental contamination.
4. Evaluate current empirical research in understanding rural health challenges and resources.

PHLS 5650. Coping with Loss and Grief: A Cross-Cultural Perspective
3 Credits (3)
A cross-cultural perspective to death, loss and grief. Hospice philosophy of caring for the dying will be included. Taught with: PHLS 4650.

Learning Outcomes

1. Compare and contrast the major theories in thanatology.
2. Analyze the biological, psychological, social, and societal factors affecting the dying process and attitudes towards death and dying.
3. Critically analyze contemporary controversies, physician-assisted suicide.
4. Evaluate current empirical research in thanatology.

PHLS 5660. U.S.-Mexico Border Health Issues
3 Credits (3)
Interdisciplinary analysis of the impact of living conditions and health issues of communities along the U.S.-Mexico border and of the strategies and initiatives to address these issues. Problem-based learning, case analysis, lecture, guest speakers, computer based instruction, and field trips. Taught with: PHLS 4660.

Learning Outcomes

1. Analyze the social, economic, cultural, and environmental determinants of health affecting communities along the U.S.–Mexico border using an interdisciplinary framework.
2. Evaluate public health strategies, binational policies, and community-based initiatives aimed at addressing health disparities and improving living conditions in border regions.
3. Develop evidence-informed recommendations for collaborative interventions that incorporate diverse stakeholder perspectives and

respect cultural and contextual factors unique to the U.S.–Mexico border.

PHLS 5670. American Indian Health
3 Credits (3)
Critical health issues facing American Indians in the contemporary world. May be repeated up to 3 credits.

PHLS 5680. Hispanic Health Issues
3 Credits (3)
The course will familiarize public health students with social determinants of health contributing to Hispanic health disparities and the impact that health and immigration policy has on Hispanics' access to insurance and health care utilization, with a spotlight on different Hispanic subgroups. Recommendations for policy and research are also discussed. Taught with PHLS 4680.
Learning Outcomes
1. Explain the historical, ancestral, and national origins contributing to the diversity of the U.S. Hispanic population.
2. Assess obstacles researchers have encountered in explaining the Hispanic Epidemiological Paradox and the ethics surrounding them.
3. Compare and contrast health care coverage and access to health care in Hispanics relative to other racial and ethnic groups.
4. Describe factors contributing to health disparities in chronic and infectious diseases among Hispanics.
5. Explain how U.S. health policies negatively impact Hispanics.

PHLS 5710. Introduction to Gerontology
3 Credits (3)
Social, psychological, and physiological aspects of aging with an interdisciplinary emphasis on health promotion. Demographic characteristics of the aging population. May be repeated up to 3 credits.

PHLS 5720. Health Promotion for the Older Adult
3 Credits (3)
Common health concerns and lifestyle issues relevant to older adults. Facts about the content area, health behaviors, and practices to promote health and prevent disease; program development strategies applicable to a variety of settings. May be repeated up to 3 credits.

PHLS 5730. Adulthood and Aging
3 Credits (3)
Normal transitions in later life; those occurring from 40 years of age to the end of life are discussed. Changes in interpersonal relationships and adaptations commonly made by individuals and meeting those alterations are presented through research findings, case studies, and autobibliographies. May be repeated up to 3 credits.

PHLS 5810. Infectious and Noninfectious Disease Prevention
3 Credits (3)
History, etiology, and prevention of diseases affecting humans. Taught with PHLS 4810.
Prerequisite: PHLS 3220, PHLS 2120, PHLS 4320, or Consent of Instructor.
Learning Outcomes
1. Describe historical context of disease and health.
2. Identify the role of public health, past and present, in the control of communicable and chronic disease.
3. Identify and evaluate the characteristics of major chronic and communicable diseases.
4. Define, classify, and describe the etiology, incidence, and prevalence of major diseases.
5. Describe risk factors related to gender, race, ethnicity, and lifestyle for major diseases.
6. Identify the major diagnostic and treatment protocols for common diseases of humans.
7. Assess psychosocial influences upon diseases including diet, physical activity, rest, and related lifestyle variables.
8. Determine the impact of major diseases on the quality of life for the patient family.

PHLS 5820. Health Informatics
3 Credits (3)
The application of technology to engage communities and individuals in behavioral and environmental change processes. The course will focus on the use of technology to describe the magnitude of health problems and their sources; analyze risk factors; identify community strengths from which strategies may be defined and tools created to intervene, prevent problems, and promote health and well-being; and continuously evaluate, refine, and implement what works.
Learning Outcomes
1. Identify and list the concepts of informatics and its domains.
2. Explain how major theories and models apply to the adoption and use of health information systems.
3. Use project management tools to plan and monitor progress on an informatics project.
4. Describe basic ethical, legal, and policy-related issues in informatics.
5. Develop approaches to communicate and advocate for the use of technologies to address public health issues.

PHLS 5830. Public Health Preparedness and Response
3 Credits (3)
This course is designed to teach students about the role of public health in emergency preparedness and response. It focuses on the nature of public emergencies as well as the role various sectors have in responding to them. One purpose of this online course is to introduce students to the basics of disaster preparedness and responding to disasters, and to build a base for further development in responder training. The course provides training and resources for a basic understanding of the Incident Command System (ICS) and National Incident Management System (NIMS). May be repeated up to 3 credits.

PHLS 5995. Integrative Learning Experience
1-3 Credits (1-3)
Integrative Learning Experience (ILE) is the culminating experience for MPH students. The course is designed to integrate and apply public health knowledge acquired across the PHLS curriculum through a practice-based or policy-oriented project. Under the supervision of a faculty advisor, students will develop a high-quality written product and present their findings in a public or semi-public forum. The ILE requires students to demonstrate synthesis of at least three CEPH Foundational Competencies and one Concentration-Specific Competency.
Learning Outcomes
1. Synthesize and apply CEPH Foundational and Concentration-Specific Competencies to address a public health problem.
2. Apply evidence-based reasoning and appropriate methodologies to solve a practice- or policy-based public health issue.
3. Produce a professional-quality written deliverable suitable for a public health agency, policymaker, or stakeholder group.
4. Demonstrate effective oral communication in a public or semi-public presentation of project findings.

5. Engage in ethical, professional collaboration with academic and/or community partners throughout the project process.

PHLS 5996. Special Topics
3 Credits (3)
Specific subjects to be announced in the Schedule of Classes. Restricted to: MPH majors. May be repeated up to 12 credits.
Learning Outcomes
1. Varies

PHLS 5997. Independent Study
1-6 Credits (1-6)
Individual studies with prior approval of department head. Consent of Instructor required. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

PHLS 5998. Applied Practice Experience
1-4 Credits (1-4)
Student will work in a public health setting under the supervision of an experienced public health professional and will use acquired knowledge and skills to conduct a project which addresses a specific public health problem or program need. Projects are agreed upon by the student and faculty. Consent of the instructor is required. Restricted to MPH majors.
Learning Outcomes
1. Varies.

PHLS 5999. Master's Thesis
1-6 Credits (1-6)
Minimum of 4 credits required but may be repeated for a maximum of 6 credits. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

Name: Department of Public Health Sciences Office

Office Location: HSS room 326

Phone: (575) 646-4300

Website: http://publichealth.nmsu.edu/ (http://publichealth.nmsu.edu)

Public Health - Bachelor of Public Health

Departmental Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework. You are required to complete the following Public Health Sciences core courses.

Prefix	Title	Credits
General Education		
Area I: Communications		*10*
English Composition - Level 1 [1]		
English Composition - Level 2 [1]		
Oral Communication [1]		
Area II: Mathematics		*3*
MATH 1130G	Survey of Mathematics	
MATH 1220G	College Algebra	
MATH 1511G	Calculus and Analytic Geometry I	
MATH 1511H	Calculus and Analytic Geometry I Honors	
MATH 1430G	Applications of Calculus I	
MATH 1250G	Trigonometry & Pre-Calculus	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10-11*
PHLS 1110G	Personal Health & Wellness	
or PHLS 1110H	Personal Health and Wellness Honors	
Area III: Laboratory Sciences Course (4 credits) [1]		
Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences (4 or 3 credits) [1]		
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective [1]		*3-4*
Viewing a Wider World Courses [3]		**6**
Departmental/College Requirements		
Prerequisite Courses		
PHLS 2110	Foundations of Health Education	
or PHLS 3210	Foundations of Community Health Education	
PHLS 2120	Essentials of Public Health	
or PHLS 3220	Foundations of Public Health	
MATH 1350G	Introduction to Statistics	
or MATH 2350G	Statistical Methods	
Public Health Education Core		
PHLS 4820	Health Informatics	3
PHLS 4420	Health Program Planning	3
PHLS 4210	Methods of Community Health Education	3
PHLS 4810	Infectious and Noninfectious Disease Prevention	3
PHLS 4440	Health Program Evaluation and Research	3
PHLS 4998	Applied Practice Experience	6
PHLS 4510	Public Health Seminar in Community Health Education	1
PHLS 4515	Approaches to Community-Focused Public Health	3
Public Health Core		
PHLS 4320	Epidemiology	3
PHLS 4310	Biometrics and Health Research	3
PHLS 4130	Environmental Health	3
PHLS 4410	Administration of Health Programs	3
PHLS 4430	Theoretically-Based Interventions	3
Cultural Foundations Course Requirements		
Select 3 credits from the following:		3
PHLS 4610	Health Disparities: Determinants and Interventions	
PHLS 4620V	Cross-Cultural Aspects of Health	
PHLS 4630	International Health Problems	
PHLS 4640	Rural Health Issues	
PHLS 4650	Coping with Loss and Grief: A Cross-Cultural Perspective	
PHLS 4660	U.S.-Mexico Border Health Issues	
PHLS 4670	American Indian Health	
PHLS 4680	Hispanic Health Issues	
Departmental Electives		
Elective PHLS courses [4]		24
Second Language: (not required)		

Electives, to bring the total credits to 120 [5]	**13-15**
Total Credits	**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. MATH 1350G Introduction to Statistics or MATH 2350G Statistical Methods or A ST 311 (https://catalogs.nmsu.edu/search/?search=A+ST+311) Statistical Applications is required for the degree but students may first need to take any prerequisites needed to enter MATH 1350G or MATH 2350G or A ST 311 (https://catalogs.nmsu.edu/search/?search=A+ST+311)
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
4. Students are encouraged to select additional PHLS courses to satisfy the elective requirement. Students with an associate degree in an allied health field may transfer up to 24 credit hours of electives.
5. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Additional Requirements

All students are required to complete an exit survey please see the department for more information.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1215 Intermediate Algebra and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
MATH 1215	Intermediate Algebra	3
Area III: Laboratory Science Course [2]		4
Area VI: Creative and Fine Arts Course [2]		3
Elective Course		1
	Credits	**15**
Semester 2		
Choose from one of the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Choose from one of the following (C- grade or better):		3
MATH 1350G	Introduction to Statistics	
MATH 2350G or A ST 311	Statistical Methods or Statistical Applications	
PHLS 1110G or PHLS 1110H	Personal Health & Wellness or Personal Health and Wellness Honors	3
Area V: Humanities Course [2]		3
Elective Course		3
	Credits	**15**
Second Year		
Semester 1		
PHLS 3210	Foundations of Community Health Education	3
Area III: Laboratory Science Course OR Area IV: Social and Behavioral Science Course [2]		3-4
General Education Elective Course [2]		3-4
Elective Course		3
Elective Course		3
	Credits	**15-17**
Semester 2		
PHLS 3220	Foundations of Public Health	3
Choose from one of the following:		3
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
Elective Course		3
VWW: Viewing a Wider World Course [3]		3
Elective Course		3
	Credits	**15**
Third Year		
Semester 1		
PHLS 4320	Epidemiology	3
PHLS 4430	Theoretically-Based Interventions	3
PHLS 4820	Health Informatics	3
PHLS Cultural Foundations Course (4610 - 4680 course number)		3
Elective Course		3
	Credits	**15**
Semester 2		
PHLS 4310	Biometrics and Health Research [1]	3
PHLS 4420	Health Program Planning	3
PHLS 4810	Infectious and Noninfectious Disease Prevention	3
VWW: Viewing a Wider World Course [3]		3
Elective Course		3
	Credits	**15**
Fourth Year		
Semester 1		
PHLS 4130	Environmental Health [1]	3
PHLS 4210	Methods of Community Health Education	3
PHLS 4410	Administration of Health Programs [1]	3
PHLS 4510	Public Health Seminar in Community Health Education [1]	1
Elective Course		3
Elective Course		3
	Credits	**16**
Semester 2		
PHLS 4515	Approaches to Community-Focused Public Health	3
PHLS 4440	Health Program Evaluation and Research	3
PHLS 4998	Applied Practice Experience	6
Elective Course (as needed to fulfill 120 credit hour degree requirement)		2
	Credits	**14**
	Total Credits	**120-122**

[1] These courses may have prerequisites and/or co-requisites, and it is the student's responsibility to check and fulfill those prerequisites and corequisites.
[2] See the General Education (p. 262) section of the catalog for a full list of courses.
[3] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Gerontology - Undergraduate Minor

All courses for this minor are offered online

The Undergraduate Minor in Gerontology requires a grade of C- or higher in all courses taken to complete the requirements of the minor.

Prefix	Title	Credits
Required Courses		
PHLS 4710	Introduction to Gerontology	3
PHLS 4720	Health Promotion for the Older Adult	3
PHLS 4740	Aging and Public Policy	3
PHLS 4730	Adulthood and Aging	3
PHLS 4650	Coping with Loss and Grief: A Cross-Cultural Perspective	3
PHLS 4996	Special Topics (Aging in a Multicultural Society)	3
Total Credits		**18**

Public Health Sciences - Undergraduate Minor

The Undergraduate Minor in Public Health requires a grade of C- or higher in all courses used to meet the requirements of the minor.

Prefix	Title	Credits
Public Health Core Courses (12 credits)		
PHLS 2110	Foundations of Health Education	3
or PHLS 3210	Foundations of Community Health Education	
PHLS 3220	Foundations of Public Health	3
PHLS 4320	Epidemiology	3
PHLS 4410	Administration of Health Programs	3
Select one course from the following (3 credits)		*3*
PHLS 3110V	Human Sexuality	
PHLS 3120V	Women's Health Issues	
Select one course from the following (3 credits)		*3*
PHLS 4610	Health Disparities: Determinants and Interventions	
PHLS 4620V	Cross-Cultural Aspects of Health	
PHLS 4630	International Health Problems	
PHLS 4640	Rural Health Issues	
PHLS 4650	Coping with Loss and Grief: A Cross-Cultural Perspective	
PHLS 4670	American Indian Health	
PHLS 4680	Hispanic Health Issues	
Total Credits		**18**

[1] All public health minors must complete MATH 1350G Introduction to Statistics or MATH 2350G Statistical Methods with a B- or better before taking PHLS 4320 Epidemiology.

U.S.-Mexico Border Health Issues - Undergraduate Minor

A grade of C- or better is required for all minor requirements.

Prefix	Title	Credits
Core Requirements		
The course below (3 credits) is required for the minor:		3
PHLS 4660	U.S.-Mexico Border Health Issues	
Select five courses (15 credits) from the following:		15
PHLS 4610	Health Disparities: Determinants and Interventions	
PHLS 4620V	Cross-Cultural Aspects of Health	
PHLS 4630	International Health Problems	
PHLS 4640	Rural Health Issues	
PHLS 4670	American Indian Health	
PHLS 4680	Hispanic Health Issues	
PHLS 4996	Special Topics (when subtitle relates to US-Mexico Border Health)	
Total Credits		**18**

School of Teacher Preparation, Administration and Leadership (TPAL)

School of Teacher Preparation, Administration, and Leadership

The NMSU College of Health, Education, and Social Transformation's School of Teacher Preparation, Administration, and Leadership (TPAL) is devoted to the preparation of master educators, administrators and leaders for public, private, and governmental institutions. Graduates are prepared to serve as teachers, directors of instruction and curriculum, subject matter specialists, supervisors of student teaching, educational leaders, and university professors. The School of TPAL offers multiple undergraduate and graduate degree programs and pathways within several academic units, including Curriculum and Instruction, Educational Leadership and Administration, Special Education, and the Teacher Education Program.

Vision

We serve the State of New Mexico, borderlands, and global communities with socially responsive scholarship, innovative programs, and collaborative initiatives in education that foster and enhance the capacity of educators and communities to advance equity, democracy, and social justice in education and society.

Mission

As a School within a land-grant and Hispanic Serving Institution, we support and advocate for equitable education for all, especially historically marginalized and multicultural/multilingual communities and students with exceptionalities. We accomplish this through teaching,

scholarship, public service, the preparation of teachers and leaders, and collaborations across the disciplines and with our constituents.

TPAL Undergraduate Programs

Freshmen Admission Requirements

First Steps – Admission to NMSU

To earn a license to teach, one must complete a bachelor's degree, so the first step is to apply to the university and declare a major (Undergraduate Admissions (http://admissions.nmsu.edu/)). Our undergraduate students are advised by the Center for Academic Advising and Student Support (https://advising.nmsu.edu/), and students have several choices of majors. To apply for undergraduate admission and to see complete admissions information, please see NMSU's Undergraduate Admissions (https://admissions.nmsu.edu/how-to-apply/first-time-freshmen/)page. First-time freshmen are eligible for regular admission to NMSU if they are a graduate of an accredited high school and meet one of the following Freshman Admission Requirements listed below:

- A cumulative high school GPA of 2.75, or
- ACT composite score of 21 or SAT score of 1060, or
- Ranked in the top 20 percent of their graduating class

Bachelor Programs with Teacher Licensure

The primary function of the undergraduate programs in the School of TPAL is the preparation of licensed teachers for early childhood, elementary and secondary schools. This process includes a broad general education, professional education, and teaching specializations.

Undergraduate Teaching Majors in the School of TPAL include the Bachelor of Science in Education with majors in:

- Early Childhood Education – Age 3 to 3rd grade (https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ece.html)
- Elementary Education – K to 8th grade (https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-eed.html)
- Secondary Education: 7th to 12th grade (https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-sed.html) with programs in Science, Language Arts, Math Education, and Social Studies
- Special Education: Pre-K to 12th grade (https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-sped.html) with elementary specialization or secondary specialization with programs in Science, Language Arts, Math Education, and Social Studies

TEACHER EDUCATION PROGRAM (TEP)

Undergraduate teaching majors who approach the completion of 60 credits are eligible to apply for the Teacher Education Program (https://tpal.nmsu.edu/admissions/tep-admission.html) (TEP). To complete the degree (and become licensed to teach), undergraduate students must be admitted to the competitive TEP (https://tpal.nmsu.edu/admissions/tep-admission.html). Applicants who successfully complete the minimum requirements for TEP admission must submit a professional portfolio to be reviewed by the TEP Admission Committee.

The following minimum criteria must be met:

- GPA of 2.75 or higher
- Earn a C- or better in TEP prerequisites (see the packet for a complete list)
- The candidate can apply to TEP as early as their 2nd semester of sophomore year. Candidates may submit their electronic portfolio during the semester in which they are enrolled in the last of the prerequisites.
- Candidates need to have completed at least 60 credits to start TEP coursework but can apply when finishing the last of those 60 credits.
- The candidate must get a current degree check with a current date and signature from Dr. Margo Trevino-Torres in the College of Health, Education, and Social Transformation Educational Support & Resource Center office in O'Donnell Hall #121 (call for an appointment – 575 646-3404).

The Undergraduate TEP Packet, explaining the components of the portfolio that are necessary to be considered for admission by the TEP (https://tpal.nmsu.edu/admissions/tep-admission.html) Admission Committee, does not ensure admittance into any teaching program. Applicants are encouraged to develop a strong student portfolio, achieve the highest GPA possible and present the portfolio in a professional manner. Packets are also available at the Undergraduate Advisement Office of the College of Health, Education, and Social Transformation located in O'Donnell Hall, Room 121. Portfolio submission takes place twice a year 3rd Friday of September for the Fall and 3rd Friday of February for the Spring semester. For specific dates each semester, contact the Teacher Education Program office at (575) 646-2669 or the Undergraduate Advisement Office at (575) 646-3404. Applicants should be aware that admission to the TEP is competitive and admission is based upon available faculty resources.

STUDENT TEACHING

Student Teaching is the final semester of the degree, and is a requirement for licensure. Student Teaching (https://tpal.nmsu.edu/degree-programs/undergraduate-programs/stia.html) (STEP) portfolios are submitted one semester prior to the actual student teaching semester, and students must be admitted to the TEP in order to apply for student teaching. STEP Portfolio deadlines are 1st Friday in October for fall student teaching and 1st Friday in March for spring student teaching. STEP Portfolios are submitted electronically to the Teacher Education Program (TEP) office. For more information, visit the Student Teaching (https://tpal.nmsu.edu/degree-programs/undergraduate-programs/stia.html) website.

Bachelor of Applied Studies (Early Childhood Education Zero-Four Non-Licensure)

An additional Bachelor degree is available to undergraduate students who do not wish to obtain teacher licensure.There is an identified need for prepared educators to serve young children from birth to four years of age in settings outside of the public school in childcare centers, Head Start, and other agencies. The School of TPAL offers a non-licensure concentration, with the Bachelor of Applied Studies degree for the Zero to Four years old Early Childhood Tract (https://catalogs.nmsu.edu/nmsu/health-education-social-transformation/tpal/applied-studies-ztf-bas/). This non-licensure concentration serves private and public childcare, early intervention programs, and Head Start.

The entry requirements and early coursework for the ECED Licensure and ECED Non-Licensure tracts are identical. During the first two years of the ECED programs, students concentrate on their general education requirements while also taking early childhood education classes. This professional education component acquaints students with the psychological, social, cultural, developmental, and cognitive aspects of early childhood. Students also begin to take field experience courses with child study requirements. Once students reach the 60 credit threshold, they can either opt for the Licensure tract by applying to the TEP or continue on with the Non-Licensure coursework.

Applied Studies students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. All ECED courses must be successfully completed with a grade of C- or better. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Undergraduate Minors

In addition to the Bachelor degrees, the School of TPAL also offers the following three undergraduate minors:

- Educational Leadership – Undergraduate Minor (p. 1450)
- Early Childhood Education – Undergraduate Minor (https://catalogs.nmsu.edu/nmsu/health-education-social-transformation/tpal/early-childhood-education-ug-minor/)
- Secondary Education - Undergraduate Minor (p. 1450)

School of TPAL Graduate Programs

The School of TPAL offers numerous graduate programs and pathways for post-baccalaureate students. The following programs are listed in the order of Master of Arts degrees, Graduate Certificates, and Doctoral degrees.

Master of Arts Degrees

Master of Arts in Education

- MA/MAT in Education Programs Page (General information)
  - Master of Arts in Education Plus Licensure Concurrently (earn a teaching license in the areas of **Early Childhood**, **Elementary** or **Secondary Education** while earning a Master of Arts in Education degree)
  - Alternative Licensure
  - Master of Arts in Education (For licensed PK-12 teachers)
  - Master of Arts in Education (Non-Licensure)
    - Concentrations (for Non-Licensure):
      - Bilingual Education (BLED)
      - Early Childhood Education (ECED)
      - Education and Design with Learning Technology (EDLT)
      - Elementary Mathematics & Science Specialist (EMSS)
      - Multicultural Education (MCED)
      - Language, Literature and Culture (LLAC)
      - Teaching English to Speakers of Other Languages (TESOL)

Master of Arts in Special Education

- Master of Arts in SPED

Master of Arts in Educational Administration

- Master of Arts (M.A.) PLUS Licensure Program in Educational Administration- PK-12 program
- Master of Arts (M.A.) in Educational Administration – Community College and University Administration program

Master of Arts in Teaching

Concentration:

- Spanish

Graduate Certificates

Alternative Licensure

Graduate Certificate in Education and Design in Learning Technology

Visual Impairment Program

Graduate Certificate in Autism

Graduate Certificate in Autism

PK-12 licensure program

Doctoral Degrees

Doctor of Education

- Educational Administration (with concentration areas):
  - PK-12
  - Higher Education & University / Community College

Doctor of Philosophy

- Curriculum and Instruction (with concentration areas):
  - Bilingual Education
  - Multicultural Education
  - Early Childhood Education
  - Education and Design in Learning Technology
  - Language, Literature and Culture
  - Teaching English to Speakers of Other Languages (TESOL)
  - Special Education
- Educational Administration (with concentration areas):
  - PK-12
  - Higher Education & University / Community College

Degrees for the Department

Bachelor Degree(s)

- Applied Studies (Zero-to-Four (Early Childhood)) - Bachelor of Applied Studies (p. 1418)
- Early Childhood Education - Bachelor of Science in Education (p. 1421)
- Elementary Education (Language Arts K-8) - Bachelor of Science in Education (p. 1423)
- Elementary Education (Math K-8) - Bachelor of Science in Education (p. 1425)
- Elementary Education (Science K-8) - Bachelor of Science in Education (p. 1427)
- Elementary Education (Social Studies K-8) - Bachelor of Science in Education (p. 1428)
- Secondary Education (Secondary Education General Science) - Bachelor of Science in Education (p. 1429)
- Secondary Education (Secondary Education Language Arts) - Bachelor of Science in Education (p. 1432)

- Secondary Education (Secondary Education Math) - Bachelor of Science in Education (p. 1434)
- Secondary Education (Secondary Education Social Studies) - Bachelor of Science in Education (p. 1437)
- Special Education (Elementary Education) - Bachelor of Science in Education (p. 1439)
- Special Education (Secondary Education) - Bachelor of Science in Education (p. 1441)

Master Degree(s)

- Education (Bilingual Education) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-bilingual-education-master-arts-online/)
- Education (Curriculum & Instruction) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-curriculum-instruction-ma-online/)
- Education (Early Childhood Education Plus Licensure) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-early-childhood-ed-plus-licensure-ma-online/)
- Education (Early Childhood Education) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-early-childhood-ed-ma-online/)
- Education (Educational Learning Technologies) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-educational-learning-technologies-ma-online/)
- Education (Elementary Licensure Prep) - Master of Arts (p. 146)
- Education (Elementary Licensure Prep) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-elementary-licensure-prep-ma-online/)
- Education (Elementary Mathematics and Science) - Master of Arts (p. 148)
- Education (Language, Literacy & Culture) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-language-literacy-culture-ma-online/)
- Education (Secondary Licensure Prep) - Master of Arts (p. 149)
- Education (Secondary Licensure Prep) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-secondary-licensure-prep-ma-online/)
- Education (Spanish) - Master of Arts in Teaching (https://catalogs.nmsu.edu/nmsu/graduate-school/education-spanish-master-arts-teaching/)
- Education (Teaching English to Speakers of Other Languages) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/education-teaching-english-speakers-other-languages-master-arts-online/)
- Educational Leadership & Administration (Higher Education Administration) - Master of Arts (p. 151)
- Educational Leadership & Administration (Higher Education Administration) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/educational-leadership-administration-higher-ed-admin-ma-online/)
- Educational Leadership & Administration (Pk-12 Administration) - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/educational-leadership-administration-pk12-admin-ma-online/)
- Reading - Specialist in Education (p. 244)
- Special Education - Master of Arts (p. 193)
- Special Education - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/special-education-ma-online/)

Doctorate Degree(s)

- Curriculum and Instruction - Doctor of Philosophy (p. 213)
- Curriculum and Instruction - Doctor of Philosophy (Online) (https://catalogs.nmsu.edu/global/nmsu-global/curriculum-instruction-phd-online/)
- Educational Leadership & Administration (Higher Education Administration) - Doctor of Education (p. 215)
- Educational Leadership & Administration (Higher Education) - Doctor of Philosophy (p. 216)
- Educational Leadership & Administration (Pk-12 Administration) - Doctor of Education (p. 217)
- Educational Leadership & Administration (Pk-12 Education) - Doctor of Philosophy (p. 218)

Minors for the Department

- Africana Studies - Undergraduate Minor (p. 1449)
- Early Childhood Education - Undergraduate Minor (p. 1450)
- Educational Administration (Doctoral) - Graduate Minor (p. 255)
- Educational Administration (Higher Ed.) - Graduate Minor (p. 255)
- Educational Administration (Pk-12) - Graduate Minor (p. 255)
- Educational Leadership and Administration - Undergraduate Minor (p. 1450)
- Secondary Education - Undergraduate Minor (p. 1450)
- Special Education - Graduate Minor (p. 262)
- Special Education - Graduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/special-education-graduate-minor-online/)

Graduate Certificate(s)

- Autism and Spectrum Disorders - Graduate Certificate (p. 245)
- Autism and Spectrum Disorders - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/autism-spectrum-disorders-gr-certificate-online/)
- Bilingual Education - Graduate Certificate (p. 245)
- Bilingual Education - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/bilingual-education-gr-certificate-online/)
- Early Childhood Alternative Licensure - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/early-childhood-alt-licensure-gr-cert-online/)
- Elementary Education Alternative Licensure - Graduate Certificate (p. 247)
- Online Teaching and Learning - Graduate Certificate (p.)
- Online Teaching and Learning - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/online-teaching-learning-gr-certificate-online/)
- Principal Licensure - Graduate Certificate (p. 249)
- Secondary Education Alternative Licensure - Graduate Certificate (p. 251)
- Special Education Alternative Licensure - Graduate Certificate (https://catalogs.nmsu.edu/nmsu/graduate-school/special-education-alternative-licensure-graduate-certificiate/)

- Teaching English to Speakers of Other Languages - Graduate Certificate (p. 252)
- Teaching English to Speakers of Other Languages - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/tesol-gr-certificate-online/)

School of Teacher Preparation, Administration, and Leadership (TPAL):

Associate Professor, Leanna Lucero, Ph.D., Interim Director, School of Teacher Preparation, Administration, and Leadership
Professor, Blanca Araujo, Ph.D., Interim Associate Director, School of Teacher Preparation, Administration, and Leadership

Professors: Araujo, Baptiste, Campbell, Fahrenbruck, Flores Carmona, Haynes Writer, A. Hernandez, ***Associate Professors:*** Guillaume, Huerta-Charles, Kew, Lucero, Parra, Rutledge, Salas; ***Assistant Professors:*** Alvidrez, Armijo Romero, Becknell, Chatterjee, Dodson, Gray, Ibarra Johnson, Martinez, Matute-Chavarria, Pedraza, Peel, Thomas, Warr, Wiegand; **College Professor:**; *Gorham Blanco;* ***College Associate Professors:*** Moreno; ***College Assistant Professors:*** Henderson, Mason, Owens; **College Instructors:**; **Emeritus Professors:** Armendáriz, Cahill, Chavez-Chavez, Dominguez, González, Ivory, Reyes, Torres, Townley, Wiburg

M. Alvidrez, *Ph.D.(University of Texas at El Paso) - mathematics education, Teacher education, Latina,o,e students in mathematics and computer science, errors as learning opportunities in mathematics and computer science*; ***B. Araujo,*** *Ph.D. (New Mexico State University) - teacher education, social studies, bilingual education;* ***M. Armijo Romero***, Ph.D. (*University of New Mexico)* specializes in bilingual education and transnational Indigenous Intercultural secondary education in México and US Southwest, translanguaging, border theory, decolonial studies, and visual literacy practices; ***H. P. Baptiste****, Ed.D. (Indiana University) – science elementary;* ***C.E. Becknell, Jr.,*** *Ph.D. (University of New Mexico) channels his research focus into a critical race, class, and gender analysis of Africana Studies, advocating for the integration of the Africana Studies Framework throughout the K–20 educational continuum. His work aims to drive transformative shifts in policy and curriculum that promote justice, equity, and inclusivity, empowering educators and students to deeply engage with issues of identity, history, and social justice. Through these efforts, he aspires to create an empathetic, inclusive, and liberatory educational landscape where Black experiences and knowledge are honored, valued, and celebrated;* ***S. Chatterjee,*** *Ph.D. (New Mexico State University) STEM education, teacher education, and technology focusing on instructional design for transformative teaching and learning;* ***G. Dodson****,* Ph.D. *(University of South Florida)* studies writing instruction, composition processes, and their connection to oral discourse. Particularly, she is interested in the ways teachers use storytelling, improvisation, and process drama as part of writing instruction. Underlying all of this is a commitment to promoting anti-racist writing pedagogy and researching the ways teacher language, counter narratives, racial literacy, and culturally authentic literature may contribute to that goal*; **M.L. Fahrenbruck,*** *Ph.D. (University of Arizona) – language, reading & culture;* ***J. Flores Carmona****, Ph.D. (University of Utah) - culture and society, sociology of education;* ***T. Gorham Blanco,*** *Ph.D. (University of Wyoming) - mathematics education and pre-service teacher preparation;* ***P. Gray****, Ed.D. (University of Texas-San Antonio) - principalship, culturally responsive leadership, race and leadership;* ***R. Guillaume****, Ph.D. (New Mexico State University) - student development theory, biracial/ multicultural identity development, higher education administration; for distance education students;* ***J.L. Haynes Writer****, Ph.D. (University of New Mexico) – critical multicultural & social justice education, Indigeneity, Native American education teacher preparation;* ***V. Henderson***, Ph.D. (New Mexico State University)-teacher education; language, literacy, and culture; bilingual education; ***A. Hernandez****, (Stanford University) – elementary literacy, sociolinguistics, biliteracy-multiliteracy, and teacher professional development;* ***L. Huerta-Charles****, Ph.D. (New Mexico State University) – multicultural/bilingual education;* ***S. Ibarra-Johnson,*** *Ph.D. (University of New Mexico) - bilingual education, bi/multilingual development, translanguaging pedagogy;* ***K. Kew****, Ph.D. (Boston College) – educational change and reform, educational leadership, school culture, micro-politics;* ***L. Lucero*** *(University of Texas-El Paso) – teaching, learning, and culture, with a concentration in math/science, technology/LGBTQ+studies;* ***N. Martinez,*** Ph.D. *(University of New Mexico)* - specializes in Indigenous education in the United States. Her research includes critical analyses of schooling, policy, and curriculum; ***L. Mason****, Ed.D. (University of Northern Colorado) - visual impairment, orientation and mobility, literacy;* ***M. Matute-Chavarria,*** *Ph.D. (University of Nevada, Las Vegas) - special education, culturally responsive practices, and the intersections of race, disability, and family;* ***Y. Moreno,*** *Ph.D. (New Mexico State University) - low incidence disabilities, Autism, classroom management, and transition****;*** ***A. Owens****, Ph.D. (University of Texas at El Paso) - literacy/bi-literacy, educational equity in special education awareness for teachers and principals;* ***J.L. Parra****, Ed.D. (Pepperdine University) – online teaching & learning; technology integration; teacher/ faculty professional development, innovative & transformative education;* ***C. A. A. Pedraza,*** *Ph.D. (New Mexico State University) - Asians and Asian Americans in higher education, reflexivity and positionality, racial and ethnic identity construction, and master narratives;* ***A. Peel****, Ph.D. (*University of Missouri) - Science education, computational thinking (CT) integration, and socio-scientific issues teaching and learning; ***D. Rutledge, Ph.D.*** *(University of Colorado-Boulder) – learning technologies, international education, bilingual education/ TESOL;* ***L. Salas****, Ph.D. (New Mexico State University) – bilingual and multicultural special education, early childhood special education;* ***R. Thomas,*** *Ph.D. (University of Missouri-Kansas City) - early childhood education, critical literacy; auto-ethnography;* ***M. Warr,*** *Ph.D. (Arizona State University) - teacher education, design, creativity, and technology;* ***S. Wiegand,*** *Ph.D. (University of Georgia) - autism spectrum disorder, early intervention, and professional development*

Emeritus Professors
A.L. Armendáriz*, Ph.D. (University of New Mexico - emeritus)– school administration, leadership development, organizational theory;* ***E. Cahill,*** *Ph.D. (Kent State University)– early childhood education, community education;* ***R. Chavez Chavez,*** *Ph.D. (New Mexico State University - emeritus)*– curriculum theory, foundations, and multicultural education; ***R. Dominguez,*** *Ph.D. (New Mexico State University - emeritus)- educational administration, higher education, community college administration, leadership development;* ***M.L. González****, Ph.D. (New Mexico State University)– leadership in public school administration, multicultural organizations;* ***L.V. Reyes,*** *Ph.D. (New Mexico State University - emeritus)– early childhood education and critical pedagogy;* ***C.T. Townley****, Ph.D. (University of Michigan - emeritus)– knowledge management, higher education;* ***M. Torres, Ph.D.*** *(University of New Mexico - emeritus)– critical theory, research as praxis;* ***K. Wiburg, Ed.D.*** *(International University - emeritus)– technology, learning design, mathematics education.*

Early Childhood Education Courses

ECED 1110. Child Growth, Development, and Learning
3 Credits (3)
This basic course in the growth, development, and learning of young children, prenatal through age eight, provides students with the theoretical foundation for becoming competent early childhood professionals. The course includes knowledge of how young children grow, develop and learn. Major theories of child development are integrated with all domains of development, including biological-physical,

social, cultural, emotional, cognitive and language. The adult's role in supporting each child's growth, development and learning is emphasized. May be repeated up to 3 credits.

Learning Outcomes

1. Incorporate understanding of developmental stages, processes, and theories of growth, development, and learning into developmentally appropriate practice. A.one
2. Demonstrate knowledge of the interaction between maturation and environmental factors that influence physical, social, emotional, cognitive, and cultural domains in the healthy development of each child. A.two
3. Demonstrate knowledge of the significance of individual differences in development and learning.
4. Demonstrate knowledge of how certain differences may be associated with rate of development and developmental patterns associated with developmental delays and/or specific disabilities. A.three
5. Demonstrate knowledge of the similarities between children who are developing typically and those with diverse abilities. A.four
6. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years. A.seven
7. Demonstrate knowledge of the developmental sequence of language and literacy, including the influence of culture and home factors. A.eight
8. Demonstrate knowledge of how children acquire and use verbal, non-verbal, and alternative means of communication. A.nine
9. Demonstrate knowledge of the relationship among emotions, behaviors, and communication skills to assist children in identifying and expressing their feelings in appropriate ways. A.ten 1
10. Use appropriate guidance to support the development of self-regulatory capacities in young children. A.eleven

ECED 1115. Health, Safety, and Nutrition
2 Credits (2)

This course provides information related to standards and practices that promote children's physical and mental well-being sound nutritional practices, and maintenance of safe learning environments. It includes information for developing sound health and safety management procedures for indoor and outdoor learning environments for young children. The course examines the many scheduling factors that are important for children's total development, healthy nutrition, physical activity, and rest. May be repeated up to 2 credits.

Learning Outcomes

1. Recognize and respond to each child's physical health, intellectual and emotional well-being, and nutritional and safety needs. B.one
2. Articulate an understanding of indoor and outdoor learning environments that provide opportunities for children to put into practice healthy behaviors (physically, socially and emotionally). B.two
3. Use appropriate health appraisal and management procedures and makes referrals when necessary. B.three
4. Recognize signs of emotional distress, child abuse, and neglect in young children and use procedures appropriate to the situation, such as initiating discussions with families, referring to appropriate professionals,and, in cases of suspected abuse or neglect, reporting to designated authorities. B.four
5. Establish an environment that provides opportunities and reinforcement for children's practice of healthy behaviors that promote appropriate nutrition and physical and psychological well-being. B.five
6. Provide a consistent daily schedule for rest/sleep, as developmentally appropriate. B.six
7. Implement health care and educational activities for children and families based on health and a.nutritional information that is responsive to diverse cultures. B.seven
8. Assist young children and their families, as individually appropriate, in developing decision-making and interpersonal skills that enable them to make healthy choices and establish health-promoting behaviors. B.eight

ECED 1120. Guiding Young Children
3 Credits (3)

This course explores various theories of child guidance and the practical applications of each. It provides developmentally appropriate methods for guiding children and effective strategies and suggestions for facilitating positive social interactions. Strategies for preventing challenging behaviors through the use of environment, routines and schedule will be presented Emphasis is placed on helping children become self- responsible, competent, independent, and cooperative learners and including families as part of the guidance approach. May be repeated up to 3 credits.

Learning Outcomes

1. Apply knowledge of cultural and linguistic diversity and the significance of socio-cultural and political contexts for development and learning and recognize that children are best understood in the contexts of family, culture and society. A.six
2. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years. A.seven
3. Demonstrate knowledge of the relationship among emotions, behaviors, and communication skills to assist children in identifying and expressing their feelings in appropriate ways. A.ten
4. Use appropriate guidance to support the development of self-regulatory capacities in young children. A.eleven
5. Recognize and respond to each child's physical health, intellectual and emotional well-being, and nutritional and safety needs. B.one
6. Demonstrate knowledge and skill in building positive, reciprocal relationships with families. C.one
7. Demonstrate knowledge of and respect for variations across cultures, in terms of family strengths,expectations, values, and child-rearing practices. C.four
8. Demonstrate the ability to incorporate the families' desires and goals for their children into classroom or intervention strategies. C.seven
9. Demonstrate knowledge and skills in developmentally appropriate guidance techniques and strategies that provide opportunities to assist children in development positive thoughts and feelings about themselves and others through cooperative interaction with peers and adults. E.three 1
10. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.seven 1
11. Demonstrate knowledge of assessment techniques, interpretation of assessment information in the application of this

ECED 1125. Assessment of Children and Evaluation of Programs
3 Credits (3)

This basic course familiarizes students with a variety of culturally appropriate assessment methods and instruments, including systematic observation of typically and non-typically developing children. The course addresses the development and use of formative and summative assessment and evaluation instruments to ensure comprehensive quality of the total environment for children, families, and the community. Students will develop skills for evaluating the assessment process and involving other teachers, professionals and families in the process. May be repeated up to 3 credits.
Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H or ENGL 1110M).
Learning Outcomes

1. Demonstrate ability to choose valid tools that are developmentally, culturally, and linguistically appropriate; use the tools correctly; make appropriate referrals; and interpret assessment results, with the goal of obtaining valid, useful information to inform practice and decision making. F.one
2. Demonstrate knowledge of maintaining appropriate records of children's development and behavior that safeguard confidentiality and privacy. F.two
3. Demonstrate knowledge of the educator's role as a participating member of the assessment process as described and mandated by state and federal regulations for Individual family service plans (IFSP) and individual education plans (IEP). F.three
4. Demonstrate understanding of the influences of environmental factors, cultural/linguistic differences, and diverse ways of learning on assessment outcomes. F.four
5. Involve the family and, as appropriate, other team members in assessing the child's development, strengths, and needs in order to set goals for the child. F.five
6. Articulate an understanding of the distinctions and definitions of assessment concepts (e.g., screening, diagnostic assessment, standardized, testing, accountability assessment). F.six
7. Apply understanding of assessment concepts toward selection of appropriate formal assessment measures, critiquing the limitations of inappropriate measures, and discussing assessment issues as part of interdisciplinary teams. F.seven
8. Articulate an understanding that responsible assessment is legally and ethically grounded and guided by sound professional. It standards is collaborative and open with the goal of supporting diverse children and families. F.eight
9. Demonstrate knowledge of assessment techniques, interpretation of assessment information in the Application of this data to curriculum development and/or intervention planning. F.nine 1
10. Demonstrate knowledge of a variety of techniques and procedures to evaluate and modify program goals for young children and their families. F.ten 1
11. Demonstrate knowledge and use of program evaluation to ensure comprehensive quality of the total Environment for children, families, and the community. F.eleven 1
12. Use both self and collaborative evaluations as part of ongoing program evaluations. F.twelve

ECED 1130. Family and Community Collaboration
3 Credits (3)
This beginning course examines the involvement of families and communities from diverse cultural and linguistic backgrounds in early childhood programs. Ways to establishes collaborative relationships with families in early childhood settings is discussed. Families' goals and desires for their children will be supported through culturally responsive strategies. May be repeated up to 3 credits.
Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H or ENGL 1110M).
Learning Outcomes

1. Demonstrate knowledge and skill in building positive, reciprocal relationships with families. C.one
2. Articulate an understanding of a safe and welcoming environment for families and community members. C.two
3. Develop and maintain ongoing contact with families through a variety of communication strategies. C.three
4. Demonstrate knowledge of and respect for variations across cultures, in terms of family strengths, expectations, values, and child-rearing practices. C.four
5. Articulate understanding of the complexity and dynamics of family systems. C.five
6. Demonstrate understanding of the importance of families as the primary educator of their child. C.six
7. Involve families and community members in contributing to the learning environment. C.nine
8. Demonstrate ability to communicate to families the program's policies, procedures, and those procedural safeguards that are mandated by state and federal regulations. C.eleven
9. Apply knowledge of family theory and research to understand family and community characteristics including socioeconomic conditions; family structures, relationships, stressors, and supports (including the impact of having a child with diverse abilities); home language and ethnicity. C.twelve 1
10. Demonstrate knowledge of and skill to access community resources that assist families and contribute directly or indirectly to children's positive development such as mental health services, health care, adult education, English language instruction, and economic assistance. C.thirteen 1
11. Demonstrate effective written and oral communication skills when working with children, families, and early care, education, and family support professionals. E.fourteen 1
12. Demonstrate a commitment to leadership and advocacy for excellence in programs and services for young children and their families. G.six

ECED 2110. Professionalism
2 Credits (2)
This course provides a broad-based orientation to the field of early care and education. Early childhood history, philosophy, ethics and advocacy are introduced. Basic principles of early childhood systems are explored. Multiple perspectives on early care and education are introduced. Professional responsibilities such as cultural responsiveness and reflective practice are examined. May be repeated up to 2 credits.
Learning Outcomes

1. Recognize signs of emotional distress, child abuse, and neglect in young children and use procedures appropriate to the situation, such as initiating discussions with families, referring to appropriate professionals, and, in cases of suspected abuse or neglect, reporting to designated authorities. B.four
2. Demonstrate ability to communicate to families the program's policies, procedures, and those procedural safeguards that are mandated by state and federal regulations. C.eleven
3. Use both self and collaborative evaluations as part of ongoing program evaluations. F.twelve

4. Demonstrate ability to adhere to early childhood professional codes of ethical conduct and issues of confidentiality. G.one
5. Demonstrate awareness of federal, state, and local regulations, and public policies regarding programs and services for children birth through eight years of age. G.two
6. Demonstrate understanding of conditions of children, families, and professionals; the historical and current issues and trends; legal issues; and legislation and other public policies affecting children, families, and programs for young children and the early childhood profession. G.three
7. Demonstrate critical reflection of one's own professional and educational practices from community, state, national, and global perspectives. G.four
8. Demonstrate understanding of the early childhood profession, its multiple historical, philosophical, and social foundations, and how these foundations influence current thought and practice. G.five
9. Demonstrate knowledge in technology resources to engage in ongoing professional development. G.seven

ECED 2115. Introduction to Language, Literacy, and Reading
3 Credits (3)
This course is designed to prepare early childhood professionals for promoting children's emergent literacy and reading development. Through a developmental approach, the course addresses ways in which early childhood professionals can foster young children's oral language development, phonemic awareness, and literacy problem solving skills, fluency, vocabulary, and comprehension. . This course provides the foundation for early childhood professionals to become knowledgeable about literacy development in young children. Instructional approaches and theory-based and research based strategies to support the emergent literacy and reading skills of native speakers and English language learners will be presented. May be repeated up to 3 credits.
Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H, or ENGL 1110M).
Learning Outcomes
1. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years. A.seven
2. Demonstrate knowledge of the developmental sequence of language and literacy, including the influence of culture and home factors. A.eight
3. Demonstrate knowledge of how children acquire and use verbal, non-verbal, and alternative means of communication. A.nine
4. Develop partnerships with family members to promote early literacy in the home. C.eight
5. Establish partnerships with community members in promoting literacy. C.ten
6. Demonstrate knowledge of the reading and writing components of emergent literacy at each developmental level. D.four
7. Provide and use anti-bias materials/literature and experiences in all content areas of the curriculum. D.seven
8. Create and manage a literacy-rich environment that is responsive to each child's unique path of development. E.nine
9. Use a variety of strategies during adult-child and child-child interactions and facilitate communication and dialogue of expressive language and thought. E.ten 1
10. Demonstrate a variety of developmentally appropriate instructional strategies that facilitate the development of literacy skills. E.eleven

ECED 2120. Curriculum Development through Play Birth through Age 4 (PreK)
3 Credits (3)
The beginning curriculum course places play at the center of curriculum in developmentally appropriate early childhood programs. It addresses content that is relevant for children birth through age four in developmentally and culturally sensitive ways of integrating content into teaching and learning experiences. Information on adapting content areas to meet the needs of children with special needs and the development of IFSPs is included. Curriculum development in all areas, including literacy, numeracy, the arts, health, science, social skills, and adaptive learning for children, birth through age four, is emphasized. Consent of instructor required. May be repeated up to 3 credits.
Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H or ENGL 1110M).
Corequisite: ECED 2121.
Learning Outcomes
1. Use appropriate guidance to support the development of self-regulatory capacities in young children. A.eleven
2. Demonstrate knowledge of relevant content for young children and developmentally appropriate ways of integrating content into teaching and learning experiences for children from birth to four years of age. D.one
3. Demonstrate the integration of knowledge of how young children develop and learn with knowledge of the concepts, inquiry tools, and structure of content areas appropriate for different developmental levels. D.two
4. Adapt content to meet the needs of each child, including the development of individualized family service plans (IFSP) or individualized education plans (IEP) for children with diverse abilities through the team process with families and other team members. D.six
5. Demonstrate knowledge of varying program models and learning environments that meet the individual needs of all young children, including those with diverse abilities. E.one
6. Create environments that encourage active involvement, initiative, responsibility, and a growing sense of autonomy through the selection and use of materials and equipment that are suitable to individual learning, developmental levels, diverse abilities, and the language and cultures in New Mexico. E.two
7. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four
8. Demonstrate understanding that each child's creative expression is unique and can be encouraged through diverse ways, including creative play. E.five
9. Plan blocks of uninterrupted time for children to persist at self-chosen activities, both indoors and outdoors. E.six 1
10. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.seven 1
11. Use and explain the rationale for developmentally appropriate methods that include play, small group projects, open-ended questioning, group discussion, problem solving, cooperative learning and inquiry experiences to help young children develop intellectual curiosity, solve problems, and make decisions. E.eight 1

12. Demonstrate a variety of developmentally appropriate instructional strategies that facilitate the development of emergent literacy skills. E.eleven 1
13. Demonstrate knowledge of assessment techniques, interpretation of assessment information in the application of this data to curriculum development of intervention planning. F.

ECED 2121. Curriculum Development through Play Birth through Age 4 (PreK) Practicum
2 Credits (2)
The beginning practicum course is a co-requisite with the course Curriculum Development through Play – Birth through Age 4. The field based component of this course will provide experiences that address curriculum content that is relevant for children birth through age four in developmentally and culturally sensitive ways of integrating content into teaching and learning experiences. Information on adapting content areas to meet the needs of children with special needs and the development of IFSPs is included. Curriculum development in all areas, including literacy, numeracy, the arts, health, science, social skills, and adaptive learning for children, birth through age four, is emphasized. Consent of instructor required. May be repeated up to 2 credits.
Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H or ENGL 1110M).
Corequisite: ECED 2120.
Learning Outcomes
1. Provide a variety of activities that facilitate development of the whole child in the following areas: Physical/motor, social/emotional, language/cognitive and adaptive/living skills. A.five
2. Develop, implement and evaluate an integrated curriculum that focuses on children's development and interests, using their language, home experiences, and cultural values. D.five
3. Provides and uses anti-bias materials and literature, and experiences in all content areas of the curriculum. D.seven
4. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four
5. Demonstrate understanding that each child's creative expression is unique and can be encouraged through diverse ways, including creative play. E.five
6. Plan blocks of uninterrupted time for children to persist at self-chosen activities, both indoors and outdoors. E.six
7. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.seven
8. Use and explain the rationale for developmentally appropriate methods that include play, small group projects, open-ended questioning, group discussion, problem solving, cooperative learning and inquiry experiences to help young children develop intellectual curiosity, solve problems, and make decisions. E.eight

ECED 2130. Curriculum Development and Implementation Age 3 (PreK) through Grade 3
3 Credits (3)
The curriculum course focuses on developmentally appropriate curriculum content in early childhood programs, age 3 through third grade. Development and implementation of curriculum in all content areas, including literacy, numeracy, the arts, health and emotional wellness, science, motor and social skills, is emphasized. Information on adapting content areas to meet the needs of children with special needs and the development of IEP's is included. Consent of instructor required. May be repeated up to 3 credits.
Prerequisite: ECED 1110, ECED 2120 and ECED 2121 (ENGL 1110G or ENGL 1110H or ENGL 1110M).
Corequisite: ECED 2131.
Learning Outcomes
1. Use appropriate guidance to support the development of self-regulatory capacities in young children. A.Eleven
2. Demonstrate the integration of knowledge of how young children develop and learn with knowledge of the concepts, inquiry tools, and structure of content areas appropriate for different developmental levels. D.Two
3. Demonstrate knowledge of what is important in each content area, why it is of value, and how it links with early and later understandings within and across areas. D.Three
4. Demonstrate knowledge of the language, reading and writing components of emergent literacy at each developmental level. D.Four
5. Adapt content to meet the needs of each child, including the development of individualized family service plans (IFSP) or individualized education plans (IEP) for children with diverse abilities through the team process with families and other team members. D.Six
6. Demonstrate knowledge of varying program models and learning environments that meet the individual needs of all young children, including those with diverse abilities. E.One
7. Create environments that encourage active involvement, initiative, responsibility, and a growing sense of autonomy through the selection and use of materials and equipment that are suitable to individual learning, developmental levels, diverse abilities, and the language and cultures in New Mexico. E.Two
8. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.Four
9. Demonstrate understanding that each child's creative expression is unique and can be encouraged through diverse ways, including creative play. E.Five 1
10. Plan blocks of uninterrupted time for children to persist at self-chosen activities, both indoors and outdoors. E.Six 1
11. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.Seven 1
12. Demonstrate knowledge of developmentally appropriate uses of technology, including assistive technology. E.Twelve 1
13. Demonstrate knowledge of assessment techniques, interpretation of assessment information in the application of this data to curriculum development of intervention planning. F.Nine

ECED 2131. Curriculum Development and Implementation Age 3 (PreK) through Grade 3 Practicum
2 Credits (2)
The beginning practicum course is a co-requisite with the course Curriculum Development and Implementation: Age 3 through Grade 3. The field based component of this course will provide experiences that address developmentally appropriate curriculum content in early childhood programs, age 3 through third grade. Development and implementation of curriculum in all content areas, including literacy, numeracy, the arts, health and emotional wellness, science, motor and social skills is emphasized. Information on adapting content areas to

meet the needs of children with special needs and the development of IEPs is included. Consent of instructor required. May be repeated up to 2 credits.
Prerequisite: ECED 1110 (ENGL 1110G or ENGL 1110H or ENGL 1110M), ECED 2120, and ECED 2121.
Corequisite: ECED 2130.

Learning Outcomes

1. Provide a variety of activities that facilitate development of the whole child in the following areas: Physical/motor, social/emotional, language/cognitive and adaptive/living skills. A.Five
2. Develop, implement and evaluate an integrated curriculum that focuses on children's development and interests, using their language, home experiences, and cultural values. D.Five
3. Provides and uses anti-bias materials and literature, and experiences in all content areas of the curriculum. D.Seven
4. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.Four
5. Demonstrate understanding that each child's creative expression is unique and can be encouraged through diverse ways, including creative play. E.Five
6. Plan blocks of uninterrupted time for children to persist at self-chosen activities, both indoors and outdoors. E.Six
7. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.Seven
8. Use and explain the rationale for developmentally appropriate methods that include play, small group projects, open-ended questioning, group discussion, problem solving, cooperative learning and inquiry experiences to help young children develop intellectual curiosity, solve problems, and make decisions. E.Eight

ECED 2140. Effective Program Development for Diverse Learners and their Families
3 Credits (3)
This course addresses the role of a director/administrator in the implementation of family-centered programming that includes individually appropriate and culturally responsive curriculum in a healthy and safe learning environment for all children and their families. May be repeated up to 3 credits.

Learning Outcomes

1. Describe important aspects of leadership that an administrator in an early childhood setting must demonstrate.
2. Identify and describe ways in which classrooms can have a multicultural environment.
3. Observe a classroom and identify, using photographs good practice with classroom environment.
4. Describe important aspects of a good early childhood curriculum
5. Describe how culture and socioeconomic factors influence classroom environment.

ECED 2141. Effective Program Development for Diverse Learners and their Families Practicum
2 Credits (2)
Provides opportunities for students to apply knowledge gained from Curriculum for Diverse Learners and their Families in a practicum setting. Consent of instructor required. Restricted to ECED majors. May be repeated up to 2 credits.
Corequisite: ECED 2140.

Learning Outcomes

1. Describe the requirements to maintain and enhance the physical and mental health, safety, and nutrition components of a program: Demonstrate knowledge of facility management to include evaluation, maintenance, security, and meeting applicable codes; Demonstrate knowledge of planning for appropriate indoor and outdoor environments; Identify ways to support early childhood educators in the selection of appropriate materials and equipment for the environment; Demonstrate knowledge of the impact of the environment on children's learning and development.
2. Demonstrate knowledge of early care and education curriculum that is individually, culturally, linguistically, and developmentally responsive: Describe a variety of curriculum goals and teaching strategies; Describe the importance of ongoing curriculum assessment and planning, and collaboration with teachers, families and community entities; Identify ways to support early childhood educators in curriculum assessment and planning.
3. Demonstrate knowledge of family/community involvement in effective program development: Describe the importance of supporting families as partners in early care and education program development; Describe both informal and formal communication systems with families that encourage information sharing and joint decision making; Identify strategies for resolving conflicts and supporting families with diverse backgrounds and parenting expectations; Identify the range of family needs including transitional periods; Identify within the community the network to support families with their special needs; Describe a "family friendly" inclusive philosophy
4. Demonstrate knowledge of a director's role as an educational leader in an inclusive setting: Describe what a director does in supporting the instructional component of the program for children, staff, and families; Identify resources that a director might use to keep current with information relating to the instructional component of the program; Describe ways to involve teachers in instructional decision making.

ECED 2215. Program Management
3 Credits (3)
This course emphasizes the technical knowledge necessary to develop and maintain an effective early care and education program. It focuses on sound financial management and vision, the laws and legal issues that affect programs, and state and national standards such as accreditation. Consent of instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Develop a comprehensive program philosophy.
2. Demonstrate the ability to develop systems that are effective for quality program operation.
3. Create a program budget and understand the Income and Expense sides and what affects each part.
4. Model best practices that integrate various leadership styles.

ECED 2280. Professional Relationships
3 Credits (3)
This course addresses staff relations that will foster diverse professional relationships with families, communities and boards. Topics of staff recruitment, retention, support and supervision will lay the foundation for positive personnel, family and community relationships. Consent of instructor required. May be repeated up to 3 credits.
Corequisite: ECED 2281.

Learning Outcomes

1. Interview an administrator and write a paper describing personnel management, staff support, supervision, and professional development.
2. Identify and describe ethical and legal requirements in maintaining a professional relationship with subordinates, the community, clients, and fellow administrators.
3. Identify and describe technologies which may be used in an early childhood setting.
4. Identify and describe legal and ethical considerations in the employment of others.

ECED 2281. Professional Relationships Practicum
2 Credits (2)
Practical experience in the development of staff relationship that will foster professional relationships with families, communities and boards. Issues of staff recruitment, retention, support and supervision will lay a foundation for positive personnel management. Consent of instructor required. Restricted to ECED majors.
Corequisite(s): ECED 2280.
Learning Outcomes

1. Demonstrate knowledge of personnel management, staff support, supervision, and professional development within a diverse and inclusive organization: Describe methods for recruiting and retaining a diverse staff; Describe job descriptions for each position; Review a sampling of personnel policies and procedures; Review a variety of staff handbooks; Explain why on-going system of supervision should include regular meetings for professional goal setting, self-assessment, and feedback; Review program needs to effectively manage the work of the program including scheduling, covering ratios, initial orientation, in-service, staff meeting, etc.
2. Demonstrate an awareness of appropriate communication and collaboration skills: Improve written and oral communication skills; Describe strategies for resolving conflicts; Explain how to promote consensus building as a decision making process.
3. Demonstrate knowledge that promotes effective professional relationships with families, communities, and board members: Describe methods for demonstrating respect, understanding, and appreciation for all people; Identify the aspects of culture that facilitate relationship building among people; Describe how to build a common vision and develop long range program plans with parents, staff, board, and the community; Communicate program goals to visitors, prospective parents, volunteers, and board members; Describe how public relations and marketing strategies can impact programs; Review assessment tools that identify needs for early care, education and family support; Develop a personal professional development plan; Describe methods to work effectively with a board and advisory group.
4. Demonstrate knowledge of technology uses and skill acquisition: Describe how to use technology resources to engage in ongoing professional development and lifelong learning; Describe how you will use technology to communicate and collaborate in your leadership role

ECED 3110. Research in Child, Growth, Development and Learning
3 Credits (3)
This advanced course in child growth, development, and learning builds upon the foundational material covered in the basic course in child growth, development, and learning. An integration of major theories of child development is provided by focusing on contemporary research in all aspects of development, including bio-ecological, social-affective, cognitive, language, and the methodological aspects of research in early childhood development and education. Restricted to ECED majors (TEP and Zero-to-Four) and ECED minors. May be repeated up to 3 credits.
Prerequisite: ECED 1110;.
Learning Outcomes

1. Incorporate understanding of developmental stages, processes and theories of growth, development, and learning into developmentally appropriate practice. (I.A)
2. Demonstrate knowledge of the interaction between maturation and environmental factors that influence physical, social, emotional, cognitive, and cultural domains in the healthy development of each child

ECED 3120. Family, Language, and Culture
3 Credits (3)
This course analyzes the interrelationships between family, language, and culture as connected to children's development and learning. In this course, language is understood as a human activity and higher mental process which build on the children's families, community, and cultural background. Restricted to: ECED majors (TEP and Zero-to-Four) and ECED minors.
Prerequisite: ECED 1130.
Corequisite: ECED 3110, ECED 4110, ECED 4120.
Learning Outcomes

1. Apply knowledge of cultural and linguistic diversity and the significance of socio-cultural and political contexts for development and learning and recognize that children are best understood in the contexts of family, culture, and society.
2. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years.

ECED 3210. Emergent Literacy
3 Credits (3)
This advanced course is designed to prepare early childhood professionals to study literacy development, specifically oral language, writing and reading. This course focuses on children from birth through age 4, including children with special needs. Through a developmental approach, the course addresses: 1) recent theory and research that translates into practical strategies, assessment materials and preparation of rich literacy environments, 2) the socio-cultural contexts in which children develop literacy, 3) culturally, linguistically and developmentally appropriate literacy curricula, 4) processes used to determine the appropriateness of various literacy strategies, 5) assessment, evaluation, and accountability and 5) literacy leadership. Restricted to: Zero-to-Four majors. May be repeated up to 3 credits.
Prerequisite: ECED 2115.
Learning Outcomes

1. Demonstrate knowledge of the developmental sequence of language and literacy, including the influence of culture and home factors. A. eight
2. Knowledge of how children acquire and use verbal, non-verbal and alternative means of communication. A. nine
3. Develop partnerships with family members to promote early literacy in the home. C. eight
4. Establish partnerships with community members in promoting literacy. C.ten
5. Knowledge of the language, reading and writing components of emergent literacy at each developmental level. D. four
6. Create and manage a literacy-rich environment that is responsive to each child's unique path of development. E. nine

7. Use a variety of language strategies during adult-child and child-child interactions and facilitate dialogue of expressive language and thought. E. ten
8. A variety of developmentally appropriate instructional strategies that facilitate the development of emergent literacy skills. E. eleven
9. Demonstrate and facilitate conceptual understanding of family roles in the development of their infant and toddler, including support for family acquisition of knowledge concerning infant and toddler's growth, learning and development and cultural and linguistic diversity represented within the home setting. H. one 1
10. Apply theoretical knowledge f and ability to provide screening and assessment unique for infants and toddlers. H. two 1
11. Articulate and demonstrate conceptual understanding of respectful, responsive, and reciprocal interactions that serve as basis for infant/toddler curriculum and learning environments. H. five 1
12. An understanding and applications of flexible teaching approaches that span a continuum from child-initiated to adult-directed and from free exploration to scaffolded support or teacher modeling. I. three 1
13. Link child characteristics, needs, and interests with informal opportunities to build children's language, concept development, and skills. I. five 1
14. Establish priorities for high-quality and meaningful language and pre-literacy experiences across the developmental continuum, using language, pre-reading and pre-writing to facilitate skill development while strengthening children's cultural identity. I. eleven 1
15. Knowledge of second- language acquisition and bilingualism including the diversity of home language environments. I. tweleve Conceptual knowledge of the principles and standards derived from professional organizations for curriculum decision- making. I. fifteen

ECED 3996. Special Topics
1-3 Credits (1-3)
Each course will be identified by a qualifying subtitle. A maximum of 3 credits in any one semester and a grand total of 6 credits. May be repeated up to 6 credits.
Learning Outcomes
1. Engage in the study of an ECED topic.

ECED 4110. Young Children with Diverse Abilities
3 Credits (3)
Addresses competencies for working with young children with exceptionalities, ages three-eight, and their families. Public school, private school, Head Start and other models are included. Taught with ECED 5110. Restricted to ECED majors (TEP and Zero-to-Four) and ECED Minors. May be repeated up to 3 credits.
Prerequisite: SPED 3105.
Corequisite: ECED 4120.
Learning Outcomes
1. Demonstrate knowledge of the significance of individual differences in development and learning.
2. Demonstrate knowledge of how certain differences may be associated with rate of development and developmental patterns associated with developmental delays or specific disabilities.
3. Demonstrate knowledge of the similarities between children who are developing typically and those with diverse disabilities.

ECED 4120. Assessment of Young Children, Birth-Eight
3 Credits (3)
Covers instruments and procedures for assessing young children and their families in order to determine atypical development. Screening, diagnosis, program planning, placement and evaluation issues are covered. Restricted to ECED Majors (TEP and Zero-to-Four) and ECED Minors.
Prerequisite: SPED 3105.
Corequisite: ECED 3110, ECED 3120, ECED 4110.
Learning Outcomes
1. Understand the technical aspects of early childhood assessments.
2. Conduct and utilize assessments.
3. Collaborate with other professionals.

ECED 4210. Integrated Early Childhood Curriculum
4 Credits (4)
This advanced course focuses on developmentally appropriate content, learning environments, and curriculum implementation for children birth through age 4. It emphasizes integration of content areas (the arts, literacy, math, health/emotional wellness, science, social studies, motor, and adaptive living skills) and the development of rich learning environments for infants, toddlers, and preschool children. Restricted to: Zero-to-Four majors. May be repeated up to 4 credits.
Prerequisite: ECED 1115, ECED 2120, ECED 2121, ECED 2130, ECED 2131, ECED 2110, and ECED 1120.
Corequisite: ECED 4211.
Learning Outcomes
1. Develop, implement and evaluate an integrated curriculum that focuses on children's development and interests, using their language, home experiences, and cultural values. D.five
2. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four

ECED 4211. Integrated Curriculum Practicum
2 Credits (2)
The advanced practicum course is a field based course that will provide opportunities for the integration of content areas (the arts, literacy, math, health/emotional wellness, science, social studies, motor, and adaptive living skills) and the development of rich learning environments for infants, toddlers, and preschool children. Restricted to Zero-to-Four majors. May be repeated up to 2 credits.
Prerequisite: ECED 1115, ECED 2120, ECED 2121, ECED 2130, ECED 2131, ECED 2110, ECED 1120.
Corequisite: ECED 4210.
Learning Outcomes
1. Develop, implement and evaluate an integrated curriculum that focuses on children's development and interests, using their language, home experiences, and cultural values. D.five
2. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four
3. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.seven
4. Use and explain the rationale for developmentally appropriate methods that include play, small group projects, open-ended questioning, group discussion, problem solving, cooperative learning and inquiry experiences to help young children develop intellectual curiosity, solve problems, and make decisions. E.eight
5. Demonstrate an understanding and application of flexible teaching approaches that span a continuum from child-initiated to adult-

directed and from free exploration to scaffolded support or teacher modeling. I.three

ECED 4220. Advanced Caregiving for Infants and Toddlers
3 Credits (3)
The advanced field-based course is intended to assist students to define and implement advanced elements of quality programming for all infants, toddlers in safe, healthy, responsive caring environments. The experiences in the approved setting will support strong nurturing relationships, cultural competence, diverse learning needs and styles of every child, appropriate guidance techniques and partnership with the families, cultures, and community represented. Students are assisted through the course in advancing their ability to observe, discuss, and implement elements of quality programming for infants and toddlers in home, small-group or whole-group care situations. Restricted to: Zero-to-Four majors. May be repeated up to 3 credits.
Prerequisite: ECED 2120 and ECED 2121; ECED 2130 and ECED 2131.
Learning Outcomes
1. The primary goal of your participation in this course is to develop an increased understanding of infant/toddler (Birth through age three) development and developmentally appropriate care/education practices.

ECED 4250. Teaching and Learning Math and Science
4 Credits (4)
Standards, principles, and practices in teaching mathematics and science to young children in preschool through grade 3. An emphasis is placed on developing a content-rich integrated math and science curriculum that focuses on children's development and interests, includes appropriate content, processes, environment, and materials with an emphasis on problem-solving as the major means of constructing basic concepts. Field experience required. Restricted to: TEP-ECED majors.
Corequisite: ECED 4310, ECED 4260, ECED 4320.
Learning Outcomes
1. The arithmetic of real numbers and their subsets of rational numbers, integers, and whole numbers including a large repertoire of interpretations of the four basic operations and ways they can be applied, and an understanding of place value and its implications for ordering numbers and estimation.
2. Three dimensional geometry based on the concept of distance, and two dimensional geometry as a method of drawing plans and representing three dimensional objects.
3. Measurement of length, perimeter, area, time, weights, and temperature.
4. Handling money problems such as cost and unit price.
5. Demonstrate understanding and skill in the constructions of solids, measurements of their volumes and surface areas, drawing their projections, and making plans for their construction; defining relevant variables and writing formulas describing their relationships in problem-solving activities; and using measurement tools and appropriate techniques for recording data and displaying results.
6. Facilitate curriculum with open-ended activities that promote children's expansion of the material learned, and in which children learn to use a variety of mathematical skills and concepts, including problem solving, reasoning, and logic.
7. Provide opportunities for children to learn how to use tools, technology, and manipulatives in problem solving.
8. Establish a classroom environment of respect for cultural diversity and gender equity in which all children develop skills in communicating, discussing, and displaying mathematical ideas.
9. Demonstrate understanding and apply the fundamental concepts in the subject matter of science including physical, life, and earth and space sciences as well as concepts in science and technology, science in personal and social perspectives, the history and nature of science, the unifying concepts of science, and the inquiry process scientists use in discovery of new knowledge to build a base for scientific inquiry. 1
10. Apply the scientific method to develop children's abilities to identify and communicate a problem, and to design, implement, and evaluate a solution. 1
11. Demonstrate the ability to integrate a variety of technologies into planned science activities. 1
12. Establish a classroom environment of respect for cultural diversity and gender equity where all children participate fully in science learning and support play in young children's learning and development from age Pre-K-grade three. 1
13. Demonstrate sound knowledge and skills in using technology as a teaching and learning tool. 1
14. Demonstrate the ability to analyze and critique early childhood curriculum experiences in terms of the relationship of the experiences to the research base and professional standards. 1
15. Facilitate family involvement so that families are engaged with curriculum planning, assessing of children's learning, and planning for children's transitions to new programs. 1
16. Demonstrate conceptual knowledge of the principles and standards derived from professional content organizations (zero to three, NAEYC, DEC) for curriculum-decision making. 1
17. Demonstrate the use of reflective practice.

ECED 4260. Teaching and Learning Social Studies, Fine Arts and Movement
3 Credits (3)
The course focuses on the aims, scope, and integration of methods of teaching social studies, the fine arts and movement across the curriculum. This course emphasizes an integrated approach to teaching the what and why of social studies; assessing student learning; planning units, lessons, and activities; effective instructional strategies; and knowledge of social studies content. Concepts of expressive art include the visual arts, music, movement and drama. Restricted to: TEP-ECED majors.
Corequisites: ECED 4310, ECED 4250, ECED 4320.
Learning Outcomes
1. Demonstrate an understanding of the principles of teaching and learning processes that underscore social studies concepts and can translate these into meaningful learning activities focusing on inquiry, authenticity, and collaboration.
2. Demonstrate understanding that social studies encompass history, geography, anthropology, archeology, economics, political science, psychology, sociology, and the interdisciplinary relationship of all facets of social studies.
3. Demonstrate understanding that the definition of social studies requires that children be socially aware of and are active participants in local, state, national, and global issues; and that children recognize and respect diverse local and global perspectives concerning cultures other than their own.
4. Implement a variety of teaching strategies to assist children to use multiple resources including primary (documents, artifacts/regalia, direct observation, human resources, personal background) and secondary (e.g., books, newspapers, internet) as part of the inquiry/research process.

5. Create curriculum experiences that provide opportunities for children to appreciate the historical development of democratic values, institutions, nations, and cultures.
6. Demonstrate the ability to plan for and engage children in activities that require them to formulate, analyze, synthesize, and critique issues by using well-reasoned, clearly supported arguments, policies, and positions.
7. Demonstrate the ability to plan for and engage children in the presentation of social studies knowledge using a variety of sign systems including writing, charts, graphs, maps, art, music, drama, dance, and technology.
8. Demonstrate an understanding and implementation of arts activities such as history, art making, appreciation, and criticism through dance, music, theater, and the visual arts, appropriate to young children's developmental levels interests.
9. Demonstrate knowledge of the distinctions, connections, and integration between arts disciplines and arts experiences and encourages study and active participation that leads to skill development and appreciation. 1
10. Facilitate curriculum in which children communicate at a basic level in the four (4) art disciplines of dance, music, theater, and visual arts, including knowledge and skills in the use of basic vocabularies, materials, tools, techniques, and thinking processes of each discipline. 1
11. Create a classroom environment with exemplary works of art from a variety of cultures and historical periods and provide opportunities for students to discuss and respond to them.1
12. Demonstrate an understanding of motor skill development in young children and apply knowledge of age and developmentally appropriate psychomotor and cognitive activities. 1
13. Create and use appropriate instructional cues and prompts for motor skills, rhythms, and physical activity. 1
14. Apply an understanding of child development knowledge coupled with child performance data to make informed instructional decisions. 1
15. Support play in young children's learning and development from age Pre-K - grade three. 1
16. Demonstrate sound knowledge and skills in using technology as a teaching and learning tool. 1
17. Demonstrate the ability to analyze and critique early childhood curriculum experiences in terms of the relationship of the experiences to the research base and professional standards. 1
18. Facilitate family involvement so that families are engaged with curriculum planning, assessing of children's learning, and planning for children's transitions to new programs. 1
19. Demonstrate conceptual knowledge of the principles and standards derived from 139 professional content organizations (zero to three, NAEYC, DEC) for curriculum decision making. 2
20. Demonstrate the use of reflective practice.

ECED 4310. Early Primary Field Placement
2 Credits (4P)
The field practicum is a co-requisite course with Teaching and Learning Reading and Writing; Teaching and Learning Math and Science; Teaching and Learning Social Studies, Fine Arts and Movement. The field based component will provide experiences that address curriculum content and practice teaching that is relevant for early primary children in developmentally and culturally sensitive ways. Graded: S/U Grading (S/U, Audit). Restricted to: TEP-ECED majors. May be repeated up to 2 credits.
Corequisite: ECED 4250, ECED 4260, ECED 4320.
Learning Outcomes
1. Demonstrate the ability to work collaboratively with educational assistants, volunteers, and others to individualize the curriculum and to meet program goals.
2. Demonstrate skill in collaboration with professionals from other disciplines (e.g., mental health, psychology, speech and language) when planning curriculum and teaching strategies for young children with diverse abilities.
3. Demonstrate an understanding and application of flexible teaching approaches that span a continuum from child-initiated to an adult-directed and from free exploration to scaffolded support or teacher modeling.
4. Apply an understanding of young children's need for balance, order, depth, variety, and challenge through curriculum planning, routines, and scheduling (e.g., daily, weekly, and longer-term).
5. Link child characteristics, needs, and interests with informal opportunities to build children's language, concept development, and skills.
6. Apply knowledge to create environments that enrich and extent children's play including intervention strategies (i.e., questioning), respect of cultural diversity and gender equity. Support play in young children's learning and development from age Pre-K - grade three.
7. Demonstrate the ability to promote positive social interactions and engage children in learning activities while actively working to increase social and emotional competence of all children.
8. Demonstrate the ability to analyze and critique early childhood curriculum experiences in terms of the relationship of the experiences to the research base and professional standards.
9. Facilitate family involvement so that families are engaged with curriculum planning, assessing of children's learning, and planning for children's transitions to new programs. 1
10. Demonstrate conceptual knowledge of the principles and standards derived from professional content organizations (zero to three, NAEYC, DEC) for curriculum-decision making. Demonstrate the use of reflective practice.

ECED 4320. Teaching and Learning Reading and Writing
3 Credits (3)
The foundation of this course is on understanding the reading process including the relationship between reading, writing, listening, and speaking; individual needs and abilities in reading instruction; and how to organize classrooms and select materials to support literacy development. Concepts of phonemic awareness, phonic instruction, vocabulary development, fluency and comprehension are integrated with the developmentally appropriate use of authentic assessment techniques, language/literacy immersion, and multicultural children's literature. Restricted to: TEP-ECED majors.
Prerequisite: ECED 2115.
Corequisite: ECED 4310, ECED 4250, ECED 4260.
Learning Outcomes
1. This course will focus on the following New Mexico early childhood teacher education competencies and New Mexico State University's conceptual framework for teacher preparation.
2. Articulate an understanding of developmental theories and processes and their implications for appropriate methods of teaching reading in the K-third grade classroom.
3. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework.

4. Provide and use anti-bias literacy materials and experiences, including primary language materials.
5. Plan appropriate whole group, small group, and individual activities that include appropriate accommodations for working with children with special needs.
6. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer.
7. Understand the role of family in literacy development.
8. Respect and promote the use of the child's home language for learning.
9. Demonstrate knowledge of, and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need. 1
10. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society. Our focus will be on rigorous inquiry about literacy education in U.S. schools and methods of literacy instruction. We will be examining how invisible cultural, historical, political, and social contexts have influenced and continue to influence teachers and schools. In your observations of reading and literacy education in your field experience it is critical that you become aware of these subtle but pervasive influences. To achieve this, we will focus our inquiry this semester on the following questions: What is literacy in early childhood education? ; Is that different from literacy outside of school?; How do young children use and pursue literacy? How do I promote literacy for all the children with whom I work?

ECED 4810. Student Teaching/Seminar Early Childhood
3 Credits (3)
Discussion of early childhood school issues related to student teaching.
Corequisite(s): SPED 4810.
Learning Outcomes
1. Synthesis of knowledge and skills appropriate to teaching in PreK - 3rd grade educational settings.

ECED 4996. Topics
3 Credits (3)
Offered under various subtitles which indicate the subject matter to be covered. May be repeated up to 9 credits.
Learning Outcomes
1. Engage in the study of an ECED topic.

ECED 4998. Field Experience (Infants Pre-K)
1 Credit (1)
Supervised field experiences in early childhood settings: infants, toddlers, and pre-K programs. May be repeated up to 1 credit.
Learning Outcomes
1. Engage in an ECED field experience.

ECED 5110. Working with Young Children with Special Needs, Ages 3-8
3 Credits (3)
Addresses competencies for working with young children with exceptionalities, ages three eight, and their families. Public school, private school, Head Start and other models are included. Taught with ECED 4110 with differentiated assignments for graduate students. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate knowledge of the significance of individual differences in development and learning.
2. Demonstrate knowledge of how certain differences may be associated with rate of development and developmental patterns associated with developmental delays or specific disabilities. A.three
3. Demonstrate knowledge of the similarities between children who are developing typically and those with diverse disabilities. A.four
4. Demonstrate knowledge of how children acquire and use verbal, non-verbal, and alternative means of communication. A.nine
5. Demonstrate understanding of the importance of families as the primary educator of their child. C.six
6. Demonstrate the ability to incorporate the families' desires and goals for their children into classroom or intervention strategies. C.seven
7. Demonstrate ability to communicate to families the program's policies, procedures, and those procedural safeguards that are mandated by state and federal regulations. C.eleven
8. Apply knowledge of family theory and research to understand family and community characteristics including socioeconomic conditions, family structures, relationships, stressors, and supports (including the impact of having a child with divers abilities), home language, and ethnicity. C.tweleve
9. Adapt content to meet the needs of each child, including the development of individualized family service programs (IFSP) or individualized education programs (IEP) for children with diverse abilities through the team process with families and other team members. D.six 1
10. Create environments that encourage active involvement, initiative, responsibility, and a growing sense of autonomy through the selection and use of materials and equipment that are suitable to individual learning, developmental levels, diverse abilities, and the language and cultures in New Mexico. E.two 1
11. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four 1
12. Demonstrate knowledge of developmentally appropriate uses of technology, including assistive technology. E.tweleve 1
13. Demonstrate knowledge of maintaining appropriate records of children's development and behavior that safeguards confidentiality and privacy. F.two 1
14. Demonstrate knowledge of the educator's role as a participating member of the assessment process as described and mandated by state and federal regulations for individual family service programs (IFSP) and individual service programs (IEP). F.three 1
15. Articulate an understanding that responsible assessment is legally and ethically grounded and guided by sound professional standards. It is collaborative and open with the goal of supporting diverse children and families. F.eight 1
16. Demonstrate knowledge of a variety of techniques and procedures to evaluate and modify program goals for young children and their families. F.ten 1
17. Demonstrate ability to work collaboratively as an advocate with families and IFSP and IEP team members to provide developmentally supportive environments. H.three 1
18. Demonstrate content knowledge (e.g., art, music, movement, science, math, literacy, social studies, and technology) and familiarity with a wide variety of resources in academic disciplines and apply that knowledge in the development, implementation, and evaluation of curriculum. I.one

ECED 5120. Assessment of Young Children, Birth Eight
3 Credits (3)
Covers instruments and procedures for assessing young children and their families in order to determine atypical development. Screening, diagnosis, program planning, placement and evaluation issues are covered. Same as ECED 4120. May be repeated up to 3 credits.
Prerequisite: ECED 5110 or consent of instructor.
Learning Outcomes
1. UNDERSTAND THE TECHNICAL ASPECTS OF EARLY CHILDHOOD ASSESSMENTS -Define and understand the benefits and concerns of assessment, types of assessment, and best practices for early childhood assessments and their targeted populations.
2. CONDUCT AND UTILIZE ASSESSMENTS- Demonstrate proficiency in using a variety of assessment tools to: screen children; assess current skill levels; determine strengths and weaknesses; supplement assessments when warranted; and incorporate data for instructional plans.
3. COLLABORATE WITH OTHER PROFESSIONALS – Utilize transdisciplinary practices with all vested participants when conducting screenings, evaluations, and making recommendations.
4. COLLABORATE WITH FAMILIES- Demonstrate proficiency in obtaining information from parents about their expectations, needs, and priorities when assessing and making early childhood instructional recommendations.
5. EVALUATE PROGRAMS- Implement best practices in program design, advocate for children's services, and articulate/safeguard student IFSP/IEPs according to each child's developmental needs.

ECED 5130. Working with Parents of Young Children
3 Credits (3)
Techniques for setting up home and classroom visitations, communicating with parents, and establishing special programs. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate a deep understanding of the theory, philosophy and goals of multicultural education
2. Develop a knowledge base of the essential concepts to address language, culture, class, gender, and exceptionalities within the theoretical constructs of multicultural education.
3. Develop a personal and social astuteness to the characteristics of culturally, linguistically, and ethnically distinct students while keeping in mind the uniqueness of their persona within a contextually rich school and community milieu.
4. Explore multicultural education strategies that well enhance one's future pedagogical repertoire.
5. Provide learning opportunities to develop multicultural and cross-cultural perspectives for application into future learning environments.
6. Develop an active sense of commitment to collaborative efforts in order to best meet our goals as committed learners and educators who will teach with and facilitate multicultural curriculum in a variety of pluralistic settings.
7. Develop an array of perspective skills in order to accommodate the dynamics of culture change, pluralism, cultural sensitivity, and cultural democracy that occur within classrooms.
8. Demonstrate growth in the dispositions identified in the "Teacher Candidate Disposition" document.

ECED 5210. Leadership and Advocacy in Early Childhood
3 Credits (3)
The course explores a multidisciplinary approach to early childhood educational leadership, advocacy and change. The course focuses on leadership in its many forms: in teaching, administration, policy, research, and ethics. In addition, we will examine the theory and practice of change to gain an understanding of what contributes to advocating for policy and community change. Students will gain a deeper understanding of themselves as leaders, and ways to improve early education to promote social justice in programs and systems serving families and young children. May be repeated up to 3 credits.
Learning Outcomes
1. Examine and evaluate a multidisciplinary approach to early childhood educational leadership.
2. Examine leadership in its many forms: in teaching, administration, policy, research, and ethics.
3. Utilize theory and practice of advocacy leadership for policy and community change.
4. Develop a statement of leadership philosophy.

ECED 5220. Play in the Early Childhood Curriculum
3 Credits (3)
Advanced exploration of the development of curriculum based on children's play. A means of exploring and learning the patterns of human living, communications, and experiences congruous with developing interests and capacities. Restricted to majors. May be repeated up to 3 credits.
Learning Outcomes
1. Incorporate understanding of play stages, development, and theories of play in early childhood education into developmentally appropriate practice. (I.A)
2. Demonstrate knowledge of the different types of play (sociodramatic, constructive, rough tumble, games with rule) and their uses in classrooms to promote learning. (I.B)
3. Demonstrate knowledge of the significance of guiding young children's play to enhance learning in early childhood classrooms. (I.C)
4. Demonstrate knowledge of social influences on play and young children's development of gender identity. Provide and use anti-bias materials and experiences in all areas of the curriculum. (I.D)
5. Provide a variety of play activities that facilitate development of the whole child in all areas, physical/motor, social/emotional, language/cognitive and adaptive/living skills. (I.E)
6. Apply knowledge of cultural and play diversity and the significance of socio-cultural political contexts for development and learning and recognize that children are best understood in the contexts of family, culture, and society. (I.F)
7. Demonstrate knowledge of the many functions play serves in the cognitive, social, and emotional aspects of development in the formative years.
8. Develop and demonstrate skills in selecting quality play activities for young children. (I.G)
9. Demonstrate knowledge of the developmental sequences of play development, including the influence of culture and home factors. (I.H) 1
10. Demonstrate knowledge of how young children acquire and use technology play to promote learning. (I.I) 1
11. Demonstrate knowledge of how play is used to support standards and assessment in early childhood education. (I.J)

ECED 5230. Curriculum in Early Childhood Education
3 Credits (3)

Development and implementation of curriculum and materials for teaching young children. May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement appropriate ECED curriculum.

ECED 5310. Issues in Early Childhood Education
3 Credits (3)

Examines current trends and problems through readings of theoretical, empirical, and applied literature. May be repeated up to 3 credits.

Learning Outcomes

1. Examine the foundations of literacy development in early childhood.
2. Analyze sociocultural and critical perspectives in early literacy research, theory, and practice.
3. Apply grounded perspectives on topical issues in literacy development in early childhood.
4. Evaluate the literacies embedded in your own teaching/learning and the ones embedded in the communities in which they work.
5. Create sound theoretical and methodological frameworks in an early literacy project. Identify and use various genres in children's literature.

ECED 5410. Seminar on Child Development, Assessment and Well-being of Young Children
3 Credits (3)

This course will reintroduce you to the world of young children in a variety of early childhood settings. It focuses on early childhood development, observation of young children and evaluation of classrooms, child well-being, and the many ways in young children learn. Sessions will bridge theory to practice as we explore your internship experiences and gain deeper understanding of your role as an early care and education professional. May be repeated up to 3 credits.

Learning Outcomes

1. Incorporate understanding of developmental stages, process, and theories of growth, development, and learning into developmentally appropriate practice.
2. Demonstrate knowledge of the interaction between maturation and environmental factors that influence physical, social, emotional, cognitive, and cultural domains in the healthy development of each child.
3. Demonstrate knowledge of the similarities between children who are developing typically and those with special needs.
4. Provide a variety of activities that facilitate development of the whole child in the following areas: physical/motor, social/emotional, language/cognitive, and adaptive/living skills. (I.E)
5. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years. (I.G)
6. Demonstrate knowledge of the developmental sequence of language and literacy, including the influence of culture and home factors. (I.H)
7. Recognize signs of emotional distress, child abuse, and neglect in young children and use procedures appropriate to the situation, such as initiating discussions with families, referring to appropriate professionals, and, in cases of suspected abuse or neglect, reporting to designated authorities. B.four
8. Demonstrate ability to adhere to early childhood education professional codes of ethical conduct and issues of confidentiality. G.one
9. Demonstrate awareness of federal, state, and local regulations, and public policies regarding programs and services for children birth through eight years of age. G.two 1
10. Demonstrate critical reflection of one's own professional and educational practices from community, state, national, and global perspectives. G.four 1
11. Demonstrate knowledge in technology resources to engage in ongoing professional development. G.seven 1
12. Articulate an understanding of indoor and outdoor learning environments that provide opportunities for children to put into practice healthy behaviors (physically, socially, and emotionally). B.two 1
13. Use appropriate health appraisal and management procedures and make referrals when necessary. B.three 1
14. Establish an environment that provides opportunities and reinforcement for children's practice of healthy behaviors that promote appropriate nutrition and physical and psychological well-being. B.five 1
15. Implement health care and educational activities for children and families based on health and nutritional information that is responsive to diverse cultures. B.seven

ECED 5420. Science/Math Curriculum
3 Credits (2+2P)

Methods and materials for developmentally appropriate practices in teaching science and math for young children. May be repeated up to 3 credits.

Learning Outcomes

1. Synthesis of knowledge and skills appropriate to teaching in PreK - third grade educational settings.

ECED 5510. Advanced Teaching and Learning of Literacy
3 Credits (3)

This advanced graduate early literacy course reviews the reading process including the relationship between reading, writing, listening, and speaking; individual needs and abilities in reading instruction; and how to organize classrooms and select materials to support literacy development. Concepts of phonemic awareness, phonic instruction, vocabulary development,fluency and comprehension are integrated with the developmentally appropriate use of authentic assessment techniques, language/literacy immersion, and multicultural children's literature.

Learning Outcomes

1. This course will focus on the following New Mexico early childhood teacher education competencies and New Mexico State University's conceptual framework for teacher preparation.
2. Articulate an understanding of developmental theories and processes and their implications for appropriate methods of teaching reading in the K-third grade classroom.
3. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework.
4. Provide and use anti-bias literacy materials and experiences, including primary language materials.
5. Plan appropriate whole group, small group, and individual activities that include appropriate accommodations for working with children with special needs.
6. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer.
7. Understand the role of family in literacy development.
8. Respect and promote the use of the child's home language for learning.

9. Demonstrate knowledge of, and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need. 1
10. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society. Our focus will be on rigorous inquiry about literacy education in U.S. schools and methods of literacy instruction. We will be examining how invisible cultural, historical, political, and social contexts have influenced and continue to influence teachers and schools. In your observations of reading and literacy education in your field experience it is critical that you become aware of these subtle but pervasive influences. To achieve this, we will focus our inquiry this semester on the following questions: What is literacy in early childhood education? Is that different from literacy outside of school? How do young children use and pursue literacy? How do I promote literacy for all the children with whom I work?

ECED 5520. Literacy Development in Early Childhood
3 Credits (3)
Advanced theory, research, and practice relating to early childhood reading. May be repeated up to 3 credits.
Learning Outcomes
1. This course will focus on the following New Mexico early childhood teacher education competencies and New Mexico State University's conceptual framework for teacher preparation.
2. Articulate an understanding of developmental theories and processes and their implications for appropriate methods of teaching reading in the K-third grade classroom.
3. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework.
4. Provide and use anti-bias literacy materials and experiences, including primary language materials.
5. Plan appropriate whole group, small group, and individual activities that include appropriate accommodations for working with children with special needs.
6. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer.
7. Understand the role of family in literacy development.
8. Respect and promote the use of the child's home language for learning.
9. Demonstrate knowledge of, and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need. 1
10. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society. Our focus will be on rigorous inquiry about literacy education in U.S. schools and methods of literacy instruction. We will be examining how invisible cultural, historical, political, and social contexts have influenced and continue to influence teachers and schools. In your observations of reading and literacy education in your field experience it is critical that you become aware of these subtle but pervasive influences. To achieve this, we will focus our inquiry this semester on the following questions: What is literacy in early childhood education? Is that different from literacy outside of school? How do young children use and pursue literacy? How do I promote literacy for all the children with whom I work?

ECED 5810. Student Teaching/Seminar
3 Credits (3)
Provides student teaching experience in a variety of settings with young children ages birth 8. Restricted to: TEP-ECED majors. Students must be Admitted into student teaching to enroll. May be repeated up to 3 credits.
Learning Outcomes
1. Our mission is to serve the people of New Mexico through education, research, extension education, and public service with specific emphasis on innovative practices, overcoming barriers to learning, international activities, technology, and literacy for the diverse populations of New Mexico, surrounding states and border communities.

ECED 6110. History and Philosophy of Early Childhood Education
3 Credits (3)
Critical analysis of the historical development and philosophical underpinnings of the field of early childhood education as it relates to current practice. Restricted to doctoral-level students of any major. May be repeated up to 3 credits.
Learning Outcomes
1. Examine the historical figures in early childhood education that have influenced current practices and discourses.
2. Identify theoretical, scientific, and philosophical foundations in early childhood education that have defined childhood learning and development.
3. Critically examine the history of institutions and federal policies of early childhood education within the context of multiculturalism

ECED 6996. Selected Topics in Early Childhood Education
1-6 Credits (1-6)
Offered under various subtitles. May be repeated up to 6 credits.
Learning Outcomes
1. Engage in the study of an ECED topic.

Education Courses

EDUC 1110. Freshman Orientation
1 Credit (1)
Introduction to the university and to the College of Education. Discussion of planning for individualized education program and field experience. Restricted to Las Cruces campus only. May be repeated up to 1 credit.
Learning Outcomes
1. Demonstrates knowledge of and uses theories, approaches, methods, and techniques for teaching, reading, writing, and other academic skills in English and the native language.
2. Demonstrates knowledge of and applies management techniques appropriate to classrooms containing students who have varying levels of proficiency and academic experience in both languages.
3. Community/Family Involvement- The bilingual teacher: (a)Recognizes the importance of parental and community involvement for facilitating the learner's successful integration to his/her school environment. (b) Demonstrates knowledge of the teaching and learning patterns of the students' home environment and incorporates these into the instructional areas of program.
4. Assessment- The bilingual teacher: (a) Assesses oral and written language proficiency in academic areas in both languages utilizing the results for instructional placement, prescription, and evaluation. (b) Evaluates the growth of the learner's native and second language in the context of the curriculum. (c) Continuously assesses and adjusts her or his own language use in the classroom in order to maximize learner comprehension and verbal participation

EDUC 1120. Introduction to Education
2 Credits (2)

Introduction to the historical, philosophical, sociological foundations of education, current trends, and issues in education; especially as it relates to a multicultural environment. Students will use those foundations to develop effective strategies related to problems, issues and responsibilities in the field of education. Restricted to Las Cruces campus only. May be repeated up to 2 credits.

Learning Outcomes

1. Describe the teaching and learning of various American education settings including early childhood, elementary, middle school, high school, and special education.
2. Describe how teachers use educational theory and the results of research of students' learning.
3. Explain the techniques for establishing a positive and supportive environment in the classroom
4. Identify and describe instructional strategies supported by current research to promote thinking skills of all learners.
5. Recognize the teachers' role and responsibilities in an increasingly diverse, multicultural society.

EDUC 1140. Math for Paraprofessionals
3 Credits (3)

Applied math skills for paraprofessionals working with children. May be repeated up to 3 credits.

Prerequisite: CCDM 103 N.

Learning Outcomes

1. Students will plan developmentally appropriate math activities for young children.
2. Students will plan adaptations to math activities for children with diverse abilities.
3. Students will demonstrate understanding of recent research in methods of teaching mathematics.
4. Students will demonstrate understanding of early childhood theories as they relate to the teaching of mathematics.
5. Students will demonstrate understanding of unique needs of children from diverse economic or cultural backgrounds.

EDUC 1150. Math for Paraprofessionals II
3 Credits (3)

Applied math skills for paraprofessionals working under the direction of a teacher. May be repeated up to 3 credits.

Prerequisite: EDUC 1140.

Learning Outcomes

1. Students will plan developmentally appropriate math activities for young children.
2. Students will plan adaptations to math activities for children with diverse abilities.
3. Students will demonstrate understanding of recent research in methods of teaching mathematics.
4. Students will demonstrate understanding of early childhood theories as they relate to the teaching of mathematics.
5. Students will demonstrate understanding of unique needs of children from diverse economic or cultural backgrounds.

EDUC 1185. Introduction to Secondary Education and Youth
3 Credits (3)

Introductory course for students considering a career in secondary education. Includes historical, philosophical, and sociological foundations, program organization, critical dispositions, and understanding the context of schools and youth. Practicum required. Restricted to: Secondary Ed majors. Traditional Grading with RR.

Learning Outcomes

1. Articulate the attributes of an education professional entering the field.
2. Differentiate and summarize the major educational philosophies and historical events that have influenced the progression of educational practice.
3. Describe the role of law in education with emphasis on the rights and responsibilities of teachers and learners.
4. Develop a preliminary personal philosophy of teaching and learning.
5. Discuss the characteristics and roles of the teacher, the student, and the school in today's education.
6. Identify effective teaching methods, instructional strategies and learning styles.
7. Evaluate the Lesson Planning Process using various lesson planning templates, formats, and rubrics.
8. Explain classroom management techniques.
9. Identify different types of diversity in the classroom environment, particularly in high-needs schools. 1
10. Describe how learning differences are manifested in schools, particularly in high-needs schools. 1
11. Describe how teachers use multiple methods of assessment to engage learners in their own growth, to monitor learner progress. 1
12. Describe how teachers use multiple methods of assessment to modify instruction and inform decision making. 1
13. Identify the role of Standards and High Stakes Testing in the life of an educational professional. 1
14. Complete 24 hours internship in a classroom, preferably a bilingual classroom in a high-needs school. 1
15. Document and reflect on your observations throughout your internship. 1
16. Construct an individualized map to teacher licensure in the State of New Mexico.

EDUC 1995. Field Experience I
1 Credit (1)

Introduction to public school teaching, school visits, classroom observations and discussion seminar. May be repeated up to 1 credit.

Learning Outcomes

1. Demonstrate an understanding of personal attitudes and motivations for entering the field of education.
2. Identify effective teaching strategies that enhance student learning outcomes.
3. Identify classroom management techniques and learning styles.
4. Develop observational skills and reflective thinking skills.
5. Evaluate instructional methods that enhance upper level thinking skills in children.

EDUC 1996. Special Topics in Education
1 Credit (1)

Supervised study in a specific area of interest. Each course shall be designated by a qualifying subtitle. May be repeated up to 9 credits.

Learning Outcomes

1. Varies

EDUC 1998. Internship I
3 Credits (3)

Supervised experience in elementary education settings. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

EDUC 2710. Pre-Teacher Preparation
3 Credits (3)
Assists students in developing the necessary competencies needed for acceptance to the Teacher Education Program. Course content includes basic skill development, test taking skills, and completion of teacher preparation packet. May be repeated up to 6 credits.

Learning Outcomes

1. Investigate the process and requirements of the Teacher Education Program
2. Read critically about teacher's experiences and write brief reactions
3. Discuss philosophies of education and draft a written personal philosophy of education
4. Discuss the nature of education for students with diverse languages, cultures and abilities
5. Draft personal position statements concerning education for students with disabilities and diverse cultures

EDUC 2998. Internship II
3 Credits (3)
Supervised experience in junior high settings. May be repeated up to 3 credits.
Prerequisite: must be a co-op student.

Learning Outcomes

1. Varies

EDUC 3110V. Multicultural Issues in Society
3 Credits (3)
Conceptual manifestations of culture, race, ethnicity, class, gender, exceptionalities, language, and bilingualism within and across society. May be repeated up to 3 credits.

Learning Outcomes

1. Understand what is meant by "multicultural education" and respond to the issues and challenges involved as learners, educators, and education stakeholders;
2. Reflect on definitions of power and privilege, critique understandings of difference, and examine the multi-faceted ways in which multicultural education can be enacted in pedagogy, curriculum, and educational organizations;
3. Examine the intersections between race, class, gender, sexuality, language, and citizenship status and try to assess their impact on teaching and learning;
4. Evaluate their own identities, biases, and position in the curricula and schooling experience.

EDUC 3120. Multicultural Education
3 Credits (2+2P)
The conceptual manifestations of culture, race and ethnicity, class, gender, sexual orientation, exceptionalities, language, bilingualism, and global citzenship within the schooling process. May be repeated up to 3 credits.

Learning Outcomes

1. Understand what is meant by "multicultural education" and respond to the issues and challenges involved as learners, educators, and education stakeholders;
2. Reflect on definitions of power and privilege, critique understandings of difference, and examine the multi-faceted ways in which multicultural education can be enacted in pedagogy, curriculum, and educational organizations;
3. Examine the intersections between race, class, gender, sexuality, language, and citizenship status and try to assess their impact on teaching and learning;
4. Evaluate their own identities, biases, and position in the curricula and schooling experience.

EDUC 3210. Sheltered English Instruction for the ESL Classroom
3 Credits (3)
Addresses the acquisition of English proficiency by speakers of other languages. May be repeated up to 3 credits.

EDUC 3220. Language, Literacy, and Culture in the ESL Classrooms
3 Credits (3)
Framework and strategies for developing the written abilities of second language learners. May be repeated up to 3 credits.

EDUC 3996. Special Topics in Education
1-3 Credits (1-3)
Offered under various subtitles in the Schedule of Classes. May be taken for a maximum of 3 cr. per semester and a total of 6 credits overall. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of a specific education topic.

EDUC 3997. Secondary Field Experience
3 Credits (2+2P)
Develop professional skills, dispositions, and understanding of secondary bilingual youth, content, and pedagogy through discussion seminar and interactions with public education mentor teachers. Focused observations, study of classroom language and culture, introduction to lesson planning and student assessment. Requires 32 hours of practicum field experience. Taught with: BLED 3110. May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement effective practices in secondary education.

EDUC 3998. Secondary Education Practicum
1 Credit (1P)
Develop professional skills, dispositions, and understanding of secondary youth, content, and pedagogy through discussion seminar and practicum with public education mentor teachers. Practicum includes focused observations, study of classroom language and culture, introduction to lesson planning and student assessment. Requires 45 hours of practicum field experience. Placements are coordinated between NMSU Teacher Education Program and NM School Districts. Students are required to secure their own transportation to and from the field experience school site. May be repeated up to 3 credits.
Corequisite: EDUC 3997.

Learning Outcomes

1. Students will attain at least an Effective rating (3 average) for a 45-hour secondary classroom practicum.
2. Students will portray the high-yield strategies for teaching during their own teaching episodes.
3. Students will interact with public school teachers to discover strategies for remote teaching and learning.
4. Students will synthesize field experiences through focused observation and follow-up reporting.
5. Students will produce lesson plans that include appropriate objectives, standards, teaching strategies, differentiation techniques, and aligned assessment.

6. Students will teach secondary classes under supervision of the course instructor and university supervisor.
7. Students will interpret teaching evaluations in order to self-assess overall teaching performance.

EDUC 4310. Methods of Teaching Elementary School Science
3 Credits (2+2P)
Methods and materials for teaching elementary school science. Includes components of lessons and the use of multimedia.Students must complete 9 hours of science from biology, chemistry, physics, and earth sciences, with no more than 3 hours from any one department. Restricted to: TEP-EED majors. May be repeated up to 3 credits.
Learning Outcomes
1. Create, teach, and assess research based, hands-on, elementary science lessons.
2. Create, teach, and assess research based, hands-on, elementary science lessons that meet the diverse needs of all learners in all aspects of science instruction.
3. Develop assessment tools to evaluate learner's science knowledge.
4. Identify and use appropriate NMSTEM Ready State science standards for lesson planning.
5. Integrate science with all subjects.
6. Discuss the advantages and the importance of membership in national/international professional organizations (NSTA) as well as subscribing to professional journals.
7. Identify science educational resources available using a variety of technological tools to enhance learning.
8. Demonstrate competence and confidence in teaching science.
9. Demonstrate basic classroom management skills.

EDUC 4320. Methods of Teaching Elementary School Mathematics
3 Credits (3)
Content, theories of cognition, and instructional approaches for the teaching of mathematics in the elementary grades.
Prerequisite: MATH 1134.
Corequisite: EDUC 4310, SPED 3120, READ 4310.
Learning Outcomes
1. Identify what makes a 'good mathematical task', and how a good task can support students' learning.
2. Understand how children make sense of key mathematics concepts.
3. Understand how tools (including manipulatives, calculators, and other technology) assist children in their thinking and problem solving.
4. Identify your role as a teacher in a math classroom.
5. Practice teaching elementary mathematics activities using a constructivist approach and reflect upon your teaching.
6. Adjust lessons and instruction based on students' needs.
7. Develop a stance of inquiry, explore habits of mind, examine and your own mathematical knowledge and develop the mathematical knowledge needed for effective teaching.
8. Experience mathematics through thinking, reasoning, discourse/communicating, and developing math ideas with understanding so that as teachers you can facilitate learning as you work with students in this process.
9. Begin to develop your knowledge and skills to effectively support ALL learners; in particular students with special needs and bilingual/English Language Learners in mathematics.

EDUC 4330. Methods of Teaching Elementary School Social Studies
3 Credits (2+2P)
Focus on social studies curriculum and instruction including student-centered approaches, active learning, educational technology, nontextual curriculum, integration, multicultural education, authentic assessment, and practical applications. May be repeated up to 3 credits.
Learning Outcomes
1. Understanding of equity and social justice through Social Studies education;
2. Navigating the public-schools and how to integrate Social Studies lessons;
3. Lesson planning and delivering Social Studies instruction;
4. How to evaluate information found online for quality and truth; and
5. Critiquing instructional materials and resources.

EDUC 4410. Teaching Science at the Middle and High School Level
3 Credits (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in science. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of science for students in grades 6-12. Practicum required. Taught with EDUC 5410. May be repeated up to 3 credits.
Learning Outcomes
1. Understand and implement effective practices for teaching and learning in the secondary science classroom.

EDUC 4420. Teaching Mathematics at the Middle and High School Level
3 Credits (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in mathematics. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of mathematics. Practicum required. Taught with EDUC 5420. May be repeated up to 3 credits.
Learning Outcomes
1. Understand and implement effective practices for teaching and learning in the secondary mathematics classroom.

EDUC 4430. Teaching Social Studies at the Middle and High School Level
3 Credits (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in social studies. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of social studies. Practicum required. Taught with EDUC 5430. May be repeated up to 3 credits.
Learning Outcomes
1. Understand and implement effective practices for teaching and learning in the secondary social studies classroom.

EDUC 4440. Teaching Language Arts at the Middle and High School Level
3 Credits (2+2P)
Implications of cognition and language development for appropriate secondary instructional practices. Focus on construction of meaning, student-centered response to literature, writing process, print and oral language development, based on socio-psycholinguistic research and theory. Practicum required. Taught with EDUC 5440. May be repeated up to 3 credits.
Learning Outcomes
1. Students will evaluate ELA and SS resources and synthesize important domains of education, including history, seminal texts, current events/trends, and formative learning theories such as global learning.
2. Students will summarize classroom literacy, language, and culture of ELA/SS classrooms.

3. Students will identify authentic assessment and effective instructional strategies and materials that can be used to deliver engaging lessons in ELA/SS reading, writing, and literature study.
4. Students will justify their personal teaching philosophy in relation to the study of the history of ELA/SS education, literacy learning theories, teaching pedagogy, and field experiences.
5. Students will assemble a professional, culminating reflective portfolio that demonstrates the ability to self-assess strengths and needs based on the NM-Teach standards.

EDUC 4510. Data Literacy and Assessment
3 Credits (3)
Methods for selecting, constructing, and using multiple methods of assessment to monitor learner progress and improve student learning. Students will learn to analyze and use classroom and standardized assessment data to understand patterns and gaps in learning, to guide planning and instruction, and employ technology to support practice. May be repeated up to 6 credits.
Learning Outcomes
1. Understand and implement effective data literacy and assessment procedures.

EDUC 4520. Contemporary Issues in Education
3 Credits (2+2P)
Discussion of contemporary issues including: classroom management, motivation, conferences, professional organizations, professional ethics, community influences, cultural pluralism, reform movements, instructional influences, and educational technology. Requires field experience component in a school or community setting. May be repeated up to 3 credits.
Learning Outcomes
1. Understand important issues and practices in contemporary education.

EDUC 4530. Science for Educators
3 Credits (3)
This course will focus on the exploration of key central science concepts and how to connect learners to resources, tools of inquiry, and collaborative problem solving related to authentic local and global issues in classroom, lab, and digital science environments. Topics include: The nature of science, Physical Science, Life Science, Earth and Space Science.
Learning Outcomes
1. Understand primary science content and knowledge for K-12 classrooms.

EDUC 4540. Teaching History
3 Credits (3)
Philosophical and practical issues of teaching history and social studies are explored. Designed to help prospective teachers at all levels clarify their views about studying history and social studies. A variety of pedagogical strategies for teaching history and social studies are explored. This course offers a review of the New Mexico Social Studies Standards for teaching.
Learning Outcomes
1. Rethink and teach students to rethink history through multiple perspectives.
2. Utilize Bloom's Taxonomy and level of questioning.
3. Build essential questioning versus comprehensive questioning.
4. Utilize Webb's Depth of Knowledge.
5. Develop strong objectives for teaching and learning.
6. Initiate discussion in a classroom setting.
7. Build a Google classroom.
8. Create unit-based assigned on a topic in history (lesson and assessment development).
9. Utilize web resources that will include Open Education Resources or OER's. 1
10. Appraise the NM standards for Social Studies to develop lessons that actualize the standards.

EDUC 4810. Elementary Student Teaching
9 Credits (9)
Synthesis of knowledge and skills appropriate to teaching in elementary schools. May be repeated up to 9 credits.
Corequisite: EDUC 4811.
Learning Outcomes
1. Synthesis of knowledge and skills appropriate to teaching in PreK - 3rd grade educational settings.

EDUC 4811. Elementary Student Teaching Seminar
3 Credits (3)
Discussion of elementary school issues related to student teaching. Taken concurrently with EDUC 4810. May be repeated up to 3 credits.
Corequisite: EDUC 4810.
Learning Outcomes
1. Candidates demonstrate an understanding of the critical concepts and principles in their discipline and of the pedagogical content knowledge necessary to engage students' learning of concepts and principles in the discipline.
2. Candidates create and implement learning experiences that motivate K-8 students, establish a positive learning environment, and support K-8 students' understanding of the central concepts and principles in the content discipline.
3. Candidates design, adapt, and select a variety of valid and reliable assessments and employ analytical skills necessary to inform ongoing planning and instruction, as well as to understand, and help students understand their own, progress and growth.
4. Candidates engage students in reasoning and collaborative problem solving related authentic local, state, national, and global issues, incorporating new technologies and instructional tools appropriate to such tasks.
5. Candidates design and implement appropriate and challenging learning experiences, based on an understanding of how children learn and develop and they ensure inclusive learning environments that encourage and help all K-8 students reach their full potential across a range of learner goals.
6. Candidates work with K-8 students and families to create classroom cultures that support individual and collaborative learning and encourage positive social interaction, engagement in learning, and independence.
7. Candidates build strong relationships with students, families, colleagues, other professionals, and community members, so that all are communicating effectively and collaborating for student growth, development, and well-being.
8. Candidates reflect on their personal biases and access resources that deepen their own understanding of cultural, ethnic, gender, sexual orientation, language, and learning differences to build stronger relationships and to adapt practice to meet the needs of each learner.
9. Candidates use research and evidence to continually evaluate and improve their practice, particularly the effects of their choices and

actions on others, and they adapt their teaching to meet the needs of each learner.

EDUC 4820. Secondary Student Teaching
9 Credits (9)
Synthesis of knowledge and skills appropriate to teaching in secondary schools. May be repeated up to 9 credits.
Learning Outcomes
1. Carry out effective student teaching in a secondary classroom.

EDUC 4821. Middle and High School Student Teaching Seminar
3 Credits (3)
Discussion of secondary school issues related to student teaching. Taken concurrently with EDUC 4820. May be repeated up to 3 credits.
Corequisite(s): EDUC 4820.
Learning Outcomes
1. Carry out effective student teaching in a secondary classroom.

EDUC 4992. Directed Study Courses in Education
1-3 Credits (1-3)
Each course shall be identified by a qualifying subtitle. Maximum of 3 credits in any one semester and a grand total of 6 credits. May be repeated up to 6 credits.
Learning Outcomes
1. Engage in the study of a specific education topic.

EDUC 4996. Topics
1-3 Credits (1-3)
Offered under various subtitles which indicate the subject matter to be covered. A maximum of 3 credits in any one semester and a grand total of 3 credits. May be repeated up to 3 credits.
Learning Outcomes
1. Engage in the study of a specific education topic.

EDUC 4998. Secondary Education Advanced Practicum
1 Credit (1P)
Develop professional skills, dispositions, and understanding of secondary youth, content, and pedagogy through discussion seminar and practicum with public education mentor teachers. Practicum includes focused observations, study of classroom language and culture, introduction to lesson planning and student assessment. Requires 45 hours of practicum field experience. Placements are coordinated between NMSU Teacher Education Program and NM school districts. Students are required to secure their own transportation to and from the field experience school site. May be repeated up to 3 credits.
Learning Outcomes
1. Students will attain at least an Effective rating (3 average) for a 45-hour secondary classroom practicum.
2. Students will portray the high-yield strategies for teaching during their own teaching episodes.
3. Students will interact with public school teachers to discover strategies for remote teaching and learning.
4. Students will synthesize field experiences through focused observation and follow-up reporting.
5. Students will produce lesson plans that include appropriate objectives, standards, teaching strategies, differentiation techniques, and aligned assessment.
6. Students will teach secondary classes under supervision of the course instructor and university supervisor.
7. Students will interpret teaching evaluations in order to self-assess overall teaching performance.

EDUC 5110. Exploration in Education
3 Credits (3+3P)
Overview of elementary and secondary schooling. Includes opportunities to gain teaching experience in diverse settings.
Learning Outcomes
1. Explore important concepts and knowledge necessary to carry out effective practices in K-12 classroom settings.

EDUC 5120. Multicultural Education
3 Credits (2+2P)
Conceptual manifestations of culture, race, and ethnicity, class, gender, exceptionalities, language and bilingualism within the schooling process. Taught with EDUC 3120 with differentiated assignments for graduate students. May be repeated up to 3 credits.
Learning Outcomes
1. Analyze the influence on learning of such social identities as race, class, sexual orientation, language, and gender.
2. Deconstruct tacit knowledges about learners and the learning process.
3. Distinguish among the structural and discursive forces that hamper particular students' educational attainment.
4. Evaluate one's own personal response to oppression in educational settings.
5. Support a pedagogical perspective and school level strategies targeted towards a more just and equitable education in your classroom.

EDUC 5130. Technology and Pedagogy
3 Credits (3)
Critical analysis, design, and evaluation of computer-based technologies in teaching and learning for diverse communities. Students must be in Graduate standing. May be repeated up to 3 credits.
Learning Outcomes
1. Understand the relationship between curriculum and pedagogy.

EDUC 5140. Research in Curriculum and Pedagogy
3 Credits (3)
An introduction to qualitative and quantitative designs for research in curriculum and instruction, with emphasis on action research. May be repeated up to 3 credits.
Learning Outcomes
1. Locate metrics useful for evaluating the quality of published research;
2. Identify the claims and supportive evidence presented in published empirical research;
3. Weigh the evidence presented in published empirical research;
4. Analyze the alignment of methods used in published empirical research with associated frameworks and research questions;
5. Synthesize a narrow body of literature in their field of interest.

EDUC 5150. Classroom Management
3 Credits (3)
Strategies for managing classroom settings and determining appropriate modification of instructional approaches to meet changing classroom situations. May be repeated up to 3 credits.
Learning Outcomes
1. Understand effective practices in K-12 classroom management.

EDUC 5160. Curriculum and Pedagogy
3 Credits (3)
Introduction, reconstruction, and other connections among historical, philosophical, sociocultural, psychological, and theoretical foundations

of curriculum and pedagogy and their application to culturally and linguistically diverse teaching and learning settings. May be repeated up to 3 credits.

Learning Outcomes

1. Describe the historical development of standards, curriculum, and assessment in the USA;
2. Critically analyze the major influences on the historical development of standards, curriculum, and assessment:
3. Explain the positive and negative impacts these major influences have had on current standards, curriculum, and assessment;
4. Students will be able to express attainable planned actions to advocate for socially just and equitable systems within their school, district, community, and profession;
5. Construct a coherent pedagogical perspective that draws on the theories and perspectives discussed throughout the course;
6. Create a plan for a lesson that puts into action the curricular and pedagogical perspectives that place value in, and make space for, the diversity of individual social development within and between cultures.

EDUC 5170. Action Research Projects
3 Credits (3)

Deeper explorations and connections among foundations of curriculum and pedagogy and their application to culturally and linguistically diverse teaching and learning settings through action research projects, approaches to assessment, and agency. May be repeated up to 3 credits.

Learning Outcomes

1. Understanding of Action Research
2. Develop an Action Research plan: Question Development; Data collection plan; Analysis
3. Analysis to Action for teaching: Applying data results to planning; Decision-making for changes in teaching
4. Presentation of Research: Research writing process

EDUC 5210. Sheltered English Instruction for the ESL Classroom
3 Credits (3)

Addresses the acquisition of English proficiency vie the SIOP (Sheltered Instruction Observational Protocol)a research validated model for lesson planning and implementation that provides English learners with access to grade-level standards.

EDUC 5220. Language, Literacy and Culture in the ESL Classrooms
3 Credits (3)

Framework and strategies for developing the written abilities of second language learners. Explore different theories of language, culture and literacy by analyzing the interconnections between language, culture and literacy.

EDUC 5310. Methods of Teaching Elementary School Science
3 Credits (2+2P)

Methods and materials for teaching elementary school science. Includes components of lessons, planning and teaching lessons in schools, and multimedia. Students should have 9 hours of science from biology, chemistry, physics, and earth science with no more than 3 hours from any one department to enroll in this course. Taught with EDUC 4310 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Corequisite: ECED 5810; EDUC 5320; READ 5310.

Learning Outcomes

1. Create, teach, and assess research based, hands-on, elementary science lessons;
2. Create, teach, and assess research based, hands-on, elementary science lessons that meet the diverse needs of all learners in all aspects of science instruction;
3. Develop assessment tools to evaluate learner's science knowledge;
4. Identify and use appropriate NMSTEM Ready!State science standards for lesson planning;
5. Integrate science with all subjects;
6. Discuss the advantages and the importance of membership in national/international professional organizations(e.g. NSTA) as well as subscribing to professional journals;
7. Identify science educational resources available using a variety of technological tools to enhance learning;
8. Demonstrate competence and confidence in teaching science;
9. Demonstrate basic classroom management skills.

EDUC 5320. Methods of Teaching Elementary School Mathematics
3 Credits (2+2P)

Content, theories of cognition, and instructional approaches for the teaching of mathematics in the elementary grades. Taught with EDUC 4320 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Prerequisite: MATH 1134.

Corequisite: ECED 5810; EDUC 5310; READ 5310.

Learning Outcomes

1. Identify what makes a 'good mathematical task', and how a good task can support students' learning;
2. Understand how children make sense of key mathematics concepts;
3. Understand how tools (including manipulatives, calculators, and other technology) assist children in their thinking and problem solving;
4. Identify your role as a teacher in a math classroom;
5. Practice teaching elementary mathematics activities using a constructivist approach and reflect upon your teaching;
6. Adjust lessons and instruction based on students' needs;
7. Develop a stance of inquiry, explore habits of mind, examine and your own mathematical knowledge and develop the mathematical knowledge needed for effective teaching;
8. Experience mathematics through thinking, reasoning, discourse/communicating, and developing math ideas with understanding so that as teachers you can facilitate learning as you work with students in this process;
9. Begin to develop your knowledge and skills to effectively support ALL learners; in particular students with special needs and bilingual/English Language Learners in mathematics

EDUC 5330. Methods of Teaching Elementary School Social Studies
3 Credits (2+2P)

Focus on social studies curriculum and instruction including student-centered approaches, active learning, educational technology, nontextual curriculum, integration, multicultural education, authentic assessment, and practical applications. Taught with EDUC 4330 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Corequisite: READ 5320.

Learning Outcomes

1. Understanding of equity and social justice through Social Studies education;
2. Navigating the public-schools and how to integrate Social Studies lessons;
3. Lesson planning and delivering Social Studies instruction;

4. How to evaluate information found online for quality and truth; and
5. Critiquing instructional materials and resources.

EDUC 5410. Teaching Science at the Middle and High School Level
3 Credits (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in science. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of science for student in grades 6-12. Practicum required. Same as EDUC 463 with differentiated assignments for graduate students. TEP required May be repeated up to 3 credits.
Prerequisite: EDUC 5120 & EDUC 5110.
Learning Outcomes
1. Understand and implement effective practices for teaching and learning in the secondary science classroom.

EDUC 5420. Teaching Mathematics at the Middle and High School Level
3 Credits (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in mathematics. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of students in 6-12 setting settings for mathematics. Same as EDUC 4420 with differentiated assignments for graduate students. TEP required May be repeated up to 3 credits.
Prerequisite: EDUC 5120 & EDUC 5110.
Learning Outcomes
1. Understand and implement effective practices for teaching and learning in the secondary mathematics classroom.

EDUC 5430. Teaching Social Studies at the Middle and High School Level
3 Credits (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in social studies. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of social studies for student in grades 6-12. Practicum required. Same as EDUC 4430 with differentiated assignments for graduate students. TEP required May be repeated up to 3 credits.
Prerequisite: EDUC 5120 & EDUC 5110.
Learning Outcomes
1. Understand and implement effective practices for teaching and learning in the secondary social studies classroom.

EDUC 5440. Teaching Language Arts at the Middle and High School Level
3 Credits (2+2P)
Implications of cognition and language development for appropriate secondary instructional practices. Focus on construction of meaning, student-centered response to literature, writing process, print and oral language development, based on socio-psycholinguistic research and theory. Practicum required. Same as EDUC 4440 with differentiated assignments for graduate students. TEP required. May be repeated up to 3 credits.
Prerequisite: EDUC 5120 & EDUC 5110.
Learning Outcomes
1. Students will evaluate ELA and SS resources and synthesize important domains of education, including history, seminal texts, current events/trends, and formative learning theories such as global learning.
2. Students will summarize classroom literacy, language, and culture of ELA/SS classrooms.
3. Students will identify authentic assessment and effective instructional strategies and materials that can be used to deliver engaging lessons in ELA/SS reading, writing, and literature study.
4. Students will justify their personal teaching philosophy in relation to the study of the history of ELA/SS education, literacy learning theories, teaching pedagogy, and field experiences.
5. Students will assemble a professional, culminating reflective portfolio that demonstrates the ability to self-assess strengths and needs based on the NM-Teach standards.

EDUC 5510. Elementary Science Development
3 Credits (3)
Understanding of the research on elementary development of science and its application in the classroom. Focus on how elementary students come to understand topics in the physical sciences, life sciences, and earth and space sciences. Includes applications to engineering and technology. Course assignments require working with elementary students. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.
Learning Outcomes
1. To put current research on elementary students' development of science into practice.
2. To analyze student thinking to construct models of cognitive structures.
3. To select, sequence, and administer tasks to test models of students' cognitive structures.
4. To develop and facilitate a classroom lesson plan to build on models of students' cognitive structures.
5. To reflect on observations of student learning in relation to current research on elementary students' development of science.

EDUC 5520. Elementary Mathematics Development I
3 Credits (3)
Understanding of the research on elementary development of mathematics and its application in the classroom. Focus on how elementary students come to understand counting, the base 10 number system, and connections between early number understanding, geometric representations, fractions, and operations in later grades. Course assignments require working with elementary students. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.
Learning Outcomes
1. To put current research on elementary students' development of mathematics into practice.
2. To analyze student thinking to construct models of cognitive structures.
3. To select, sequence, and administer tasks to test models of students' cognitive structures.
4. To develop and facilitate a classroom lesson plan to build on models of students' cognitive structures.
5. To reflect on observations of student learning in relation to current research on elementary students' development of mathematics.

EDUC 5530. Elementary Mathematics Development 2
3 Credits (3)
Understanding of the research on elementary development of mathematics and its application in the classroom. Focus on how elementary students develop multiplicative reasoning from a foundation of additive reasoning, connections to geometric representations, and how multiplicative reasoning supports development of understanding of fractions, ratios, and rate—which leads to proportional reasoning. Course assignments require working with elementary students. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.

Learning Outcomes

1. To put current research on elementary students' development of science into practice.
2. To analyze student thinking to construct models of cognitive structures.
3. To select, sequence, and administer tasks to test models of students' cognitive structures.
4. To develop and facilitate a classroom lesson plan to build on models of students' cognitive structures.
5. To reflect on observations of student learning in relation to current research on elementary students' development of science.

EDUC 5540. Leadership Advocacy in Elementary Mathematics and Science
3 Credits (3)

This course focuses on development of elementary mathematics and science specialists' leadership qualities necessary to promote and advocate for positive change through active participation with other professionals and in their own professional growth that draws upon current research in their respective fields, development of professional development programs, evaluation of educational structures that impact equitable access to high quality instruction, and communication with stakeholders directly and indirectly associated with education institutions. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.

Learning Outcomes

1. To leverage current research on elementary students' development of mathematics science to enact change in teaching practice and education policy.
2. To make use of leadership skills to facilitate discussion with education stakeholders, school and district administrators, and teaching professionals.
3. To make use of leadership skills to collaborate with education stakeholders, school and district administrators, and teaching professionals.
4. To examine current mathematics and science teaching practice within a school or district and create a professional development plan that aligns with current research on best practices.
5. To examine current mathematics and science teaching practice within a school or district and create a professional development plan that aligns with district and/or school mission and vision.

EDUC 5810. Student Teaching
6 Credits (6)

Integrated with EDUC 5811. Student is assigned to an elementary or secondary classroom for 14-16 weeks. Elementary or secondary.
Corequisite: EDUC 5811.

Learning Outcomes

1. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.
4. The teacher candidate understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.
5. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
6. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues
7. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
8. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.
9. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways. 1
10. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

EDUC 5811. Teaching Methods Laboratory
3 Credits (3)

Practical application of previously learned content. Students must have a Bachelors degree and admission to the Graduate School and departmental special program. May be repeated up to 3 credits.

Learning Outcomes

1. Candidates demonstrate an understanding of the critical concepts and principles in their discipline and of the pedagogical content knowledge necessary to engage students' learning of concepts and principles in the discipline;
2. Candidates create and implement learning experiences that motivate K-8 students, establish a positive learning environment, and support K-8 students' understanding of the central concepts and principles in the content discipline;
3. Candidates design, adapt, and select a variety of valid and reliable assessments and employ analytical skills necessary to inform ongoing planning and instruction, as well as to understand, and help students understand their own, progress and growth;
4. Candidates engage students in reasoning and collaborative problem solving related authentic local, state, national, and global issues, incorporating new technologies and instructional tools appropriate to such tasks. Candidates use research and evidence to continually evaluate and improve their practice, particularly the effects of their choices and actions on others, and they adapt their teaching to meet the needs of each learner;
5. Candidates design and implement appropriate and challenging learning experiences, based on an understanding of how children learn and develop. They ensure inclusive learning environments that

encourage and help all K-8 students reach their full potential across a range of learner goals;
6. Candidates work with K-8 students and families to create classroom cultures that support individual and collaborative learning and encourage positive social interaction, engagement in learning, and independence;
7. Candidates build strong relationships with students, families, colleagues, other professionals, and community members, so that all are communicating effectively and collaborating for student growth, development, and well-being;
8. Candidates reflect on their personal biases and access resources that deepen their own understanding of cultural, ethnic, gender, sexual orientation, language, and learning differences to build stronger relationships and to adapt practice to meet the needs of each learner.

EDUC 5990. Master's Thesis
1-6 Credits (1-6)
Thesis. A minimum of four credits and a maximum of six credits (thesis hours) can be counted toward the MA degree. The thesis hours require the permission of the course instructor. May be repeated up to 15 credits. May be repeated up to 15 credits.
Learning Outcomes
1. Graduate students at the Master of Arts level pursuing a research focus degree learn how to prepare for basic research study.
2. Graduate students at the Master of Arts level pursuing a research focus degree learn how to submit IRB for a research study.
3. Graduate students at the Master of Arts level pursuing a research focus degree learn how to conduct a comprehensive study.
4. Graduate students at the Master of Arts level pursuing a research focus degree learn how to summarize the research and write the results in a thesis.
5. Graduate students at the Master of Arts level pursuing a research focus degree learn how to present results from research and defend the results.

EDUC 5991. Special Research Programs
1-3 Credits (1-3)
Individual investigations either analytical or experimental. Maximum of 3 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits.
Learning Outcomes
1. Engage in a specific research topic.

EDUC 5992. Directed Study Courses in Education
1-3 Credits (1-3)
Each course will be identified by a qualifying subtitle. Maximum of 3 credits in any one semester and a total of 6 credits overall. May be repeated up to 6 credits.
Learning Outcomes
1. Engage in a specific education topic.

EDUC 5993. Secondary Education Graduate Practicum
1 Credit (1P)
Develop professional skills, dispositions, and understanding of secondary youth, content, and pedagogy through discussion seminar and practicum with public education mentor teachers. Practicum includes focused observations, study of classroom language and culture, introduction to lesson planning and student assessment. Requires 45 hours of practicum field experience. Placements are coordinated between NMSU Teacher Education Program and NM school districts. Students are required to secure their own transportation to and from the field experience school site. May be repeated up to 3 credits.
Learning Outcomes
1. Students will attain at least an Effective rating (3 average) for a 45-hour secondary classroom practicum.
2. Students will portray the high-yield strategies for teaching during their own teaching episodes.
3. Students will interact with public school teachers to discover strategies for remote teaching and learning.
4. Students will synthesize field experiences through focused observation and follow-up reporting.
5. Students will produce lesson plans that include appropriate objectives, standards, teaching strategies, differentiation techniques, and aligned assessment.
6. Students will teach secondary classes under supervision of the course instructor and university supervisor.
7. Students will interpret teaching evaluations in order to self-assess overall teaching performance.

EDUC 5996. Special Topics
1-3 Credits (1-3)
Course subtitled in the Schedule of Classes. A maximum of 3 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits.
Learning Outcomes
1. Engage in the study of a specific education topic.

EDUC 5997. Capstone Research Project
1-3 Credits (1-3)
Capstone project. Maximum of 3 credits per semester and a total of 6 credits overall. Consent of Instructor required. Restricted to: Admittance into the Master of Arts in Education: Elementary Mathematics and Science program.
Learning Outcomes
1. To investigate a problem or issue in education.
2. To communicate results of the investigation in a scholarly manner.

EDUC 5998. Social Studies/Language Arts Methods Internship
3 Credits (3)
Elementary alternative licensure process course designed to introduce intern licensed teachers to methods of instruction of social studies and language arts. University supervision provided simultaneously with EDUC 5998. Restricted to CI and HSS non-degree students. May be repeated up to 3 credits.
Learning Outcomes
1. Carry out a successful intership in social studies and language arts teaching methods.

EDUC 6110. Curriculum for a Diverse Society
3 Credits (3)
Builds upon knowledge of the foundations of curriculum and professional experience in an educational setting. Focus on the role of the curriculum leader in understanding curriculum theory, designing curriculum, and implementing curriculum in various settings. May be repeated up to 3 credits.
Learning Outcomes
1. Reflect on the significance of the teachers' professional role in schools;
2. Analyze the notion of curriculum in a broader sense along with the concepts of culture and diversity;
3. Develop understanding of the fundamental theoretical constructs in organizing the way we interact and live in our society;

4. Assume the commitment to challenge the taken for granted assumptions that have led schools to be places where inequities have been perpetuated;
5. Take on the challenge of transforming schools into public social spheres where hope is promoted, looked for, and risks are taken and faced.

EDUC 6120. Pedagogy of Learning in a Diverse Society
3 Credits (3)
Builds upon knowledge of the foundations of instruction and professional experience in teaching and learning. Focus on diverse theories of instruction with relevant practices in pluralistic settings and multicultural interactions of teaching and learning. May be repeated up to 3 credits.
Learning Outcomes
1. Instill a personal discipline that will establish clarity into your plan of studies to operationalize the direction of your research project;
2. Develop a deeper and thicker knowledge base, language facility, and chronological understanding that impact contemporary theoretical/philosophical paradigms;
3. Create a critical reflection on many of the contemporary issues/findings of recent brain research, its implications for pedagogy and andragogy and central to teaching and learning;
4. Articulate several of the diverse historical forces that legitimate certain teaching and learning practices, theories/issues in contemporary schooling life, and delegitimize other theories/issues just as easily;
5. Create a sense of collegiality and community with your seminar colleagues inside and outside of this course

EDUC 6210. Curricular Mediation for Democratic Communities
3 Credits (3)
Problematization of the various relationships, roles, and leadership considerations which emerge within educational institutions, their structures, and their culturally democratic practices in the classroom, community, and society. Restricted to doctoral-level students of any major. Same as BLED 6210. May be repeated up to 3 credits.

EDUC 6220. Praxis and Reflexivity
3 Credits (3)
The cyclical research processes of continuous self and systemic (re)evaluation vis-a-vis classroom, community, and society with an eye toward reflection, growth, change, and larger forms of social agency. Restricted to doctoral-level students of any major. Same as BLED 6220, READ 6220. May be repeated up to 3 credits.
Learning Outcomes
1. Students develop a more sound understanding of their research agenda.
2. Students will gain a better understanding of research in society, generally, and in education, specifically.
3. Students will work as a community of learners that struggles to understand our influence on educational policy and practice.
4. Students will synthesize reading material and create discussion opportunities for the entire class.
5. Students will complete writing assignments the social, ethical, legal, and human issues surrounding the use of technology uses, data literacy, and PreK-12 schools and apply that knowledge into future research.

EDUC 6230. Research in Praxis: Qualitative Research II
3 Credits (3)
This course offers a more in-depth view of research and research paradigms, theories, methods, approaches, and tools and is a sequential next step beyond Qualitative Research I. Concepts are developed to encourage research from problem formulation to interpretation of results as reflected by students' own scholarly engagements. Course activities can include alternative community-or-school-based research aimed at investigating and transforming educational realities with the participants for their own scholarly growth and development. Students will experience the dynamic between research theory and practice in education.
Learning Outcomes
1. Develop processes required for research problems within educational settings, design relevant qualitative research strategies.
2. Examine research problems, determine relevant sources, practice data collection/analysis methods, and assess the results of such efforts.

EDUC 6310. Critical Theory and Pedagogy
3 Credits (3)
Covers the various schools of thought on pedagogy, the historical and philosophical foundations embedded in these schools, and their impact on educational settings. Restricted to doctoral-level students of any major. Same as BLED 6310. May be repeated up to 3 credits.

EDUC 6320. Social Justice Issues in Education
3 Credits (3)
Covers the systems of oppression located within the constructs of power and hegemony and their impact on schooling. Restricted to doctoral-level students of any major. Same as BLED 6320. May be repeated up to 3 credits.

EDUC 6330. Critical Race Theory & Storytelling in Educational Spaces
3 Credits (3)
An upper-level doctoral course focusing on the philosophical, theoretical, and methodological origins and practices of CRT and the sister frameworks that emerged from CRT, i.e., AsianCrit, BlackCrit, FemCrit, LatCrit, QueerCrit, TribalCrit, and WhiteCrit within educational spaces. May be repeated up to 3 credits.
Learning Outcomes
1. Articulate the major tenets and assumptions of critical race theory (CRT);
2. Evaluate CRT's usefulness in educational research and what makes a CRT analysis unique or different from other analyses;
3. Synthesize research conduced by CRT scholars and the effect of racial injustice on students of color;
4. Analyze and disrupt majoritarian narratives (stories) that perpetuate racial injustice in the U.S., with a focus on institutions that intersect with educational systems.

EDUC 6340. Theoretical Frameworks and Research Design Topics
3 Credits (3)
This course offers an in-depth view of research and research paradigms, theories, methods, approaches, and tools. This course strives to encourage development of a research paradigm from problem formulation to interpretation of results. May be repeated up to 3 credits.
Learning Outcomes
1. Identify frameworks of research including affordances and challenges based on research goals.
2. Develop concepts related to previous explorations of research paradigms, approaches, methods, and tools reflect on your own research activity.
3. Conceptualize the tasks and processes of research problems within educational settings, design relevant research strategies.

4. Examine problems via heuristics to consider select pertinent data sources, data collection methods, and data analysis methods.

EDUC 6410. Current Research in Educational Practice
3 Credits (3)
A seminar for doctoral and education specialist students emphasizing current research and educational practices. May be repeated up to 3 credits.
Learning Outcomes
1. Engage in the study of a specific education research topic.

EDUC 6420. Evaluation of Quantitative Research in Education
3 Credits (3)
A doctoral-level exploration of a broad range of quantitative research designs and methodologies for collection and analysis of data as applied to critical review of the literature. May be repeated up to 3 credits.
Learning Outcomes
1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts.

EDUC 6430. Advanced Statistics
3 Credits (3)
An intermediate course focusing on more advanced theories and techniques of inferential statistics as applied to education and psychology. Includes ANOVA, planned contrasts, ANCOVA, simple regression, and non-parametrics. A computer package will be the primary tool for data analysis.
Prerequisite: EDUC 6420 or equivalent course work.
Learning Outcomes
1. Demonstrates knowledge of and uses theories, approaches, methods, and techniques for research in education.
2. Demonstrates knowledge of and applies research techniques appropriate to a research problem.

EDUC 6440. Qualitative Research I
3 Credits (3)
This course offers an examination of qualitative research approaches used in educational and social settings, with a focus upon research design, field relations, data collection and analysis, and writing from a qualitative perspective. May be repeated up to 3 credits.
Learning Outcomes
1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts.

EDUC 6910. Dissertation Seminar
3 Credits (3)
Dissertation seminar course for doctoral students utilizing a qualitative research design. May be repeated up to 3 credits.
Learning Outcomes
1. To investigate a problem or issue in education.
2. Prepare the first three chapters of a dissertation.

EDUC 6990. Practicum
2-6 Credits (2-6)
Provision for field inquiries and experiences designed to prepare the doctoral student for assuming responsibilities in the areas of curriculum and instruction. Students must be in post-master's standing. May be repeated up to 6 credits.
Learning Outcomes
1. Plan course of study with with faculty advisor or instructor.
2. Set practicum expectations for semester.

EDUC 6991. Doctoral Research
1-15 Credits (1-15)
Research. May be repeated up to 88 credits.
Learning Outcomes
1. Engage in a specific research topic.

EDUC 6996. Selected Topics
1-6 Credits (1-6)
Offered under various subtitles which indicate the subject matter covered. May be repeated up to 99 credits.
Learning Outcomes
1. Engage in the study of an ECED topic.

EDUC 6997. Independent Study Topics
1-3 Credits (1-3)
A problem and seminar course for those pursuing an advanced graduate degree. Course subtitled in the Schedule of Classes. May be repeated up to 99 credits.
Learning Outcomes
1. Plan course of study with with faculty advisor or instructor
2. Set course expectations.

EDUC 6998. Internship in Curriculum and Instruction
3-6 Credits (3-6)
For those pursuing an advanced graduate degree to meet the requirement for field work. Each course to bear an appropriate subtitle. May be repeated up to 6 credits.
Learning Outcomes
1. Complete an educational internship.

EDUC 6999. Ed.S. Thesis
1-15 Credits (1-15)
Offered primarily for those pursuing the research requirements for the Ed.S. degree. Course may be repeated up to a maximum allowed for this degree. Each research project will be designated by a qualifying subtitle. May be repeated up to 88 credits.
Learning Outcomes
1. To investigate a problem or issue in education.
2. Prepare the a complete doctoral project.

EDUC 7000. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation. May be repeated up to 88 credits.
Learning Outcomes
1. Complete all phases of dissertation.
2. Defend dissertation

Educational Learning Technology Courses

EDLT 2110. Integrating Technology with Teaching
3 Credits (3)
Considers impact of technology on communication and knowledge development; engages students in the design of technology-integrated lessons with a constructivist approach.
Prerequisite: ENGL 1110G.

Learning Outcomes

1. Students will demonstrate a sound understanding of technology operations and concepts.
2. Students will plan and design effective learning environments and experiences supported by technology.
3. Students will implement curriculum plans that include methods and strategies for applying technology to maximize learning.
4. Students will apply technology to facilitate a variety of effective assessment and evaluation strategies.
5. Students will use technology to enhance their productivity and professional practice.
6. Students will better understand the social, ethical, legal, and human issues surrounding the use of technology on PreK-12 schools and apply that knowledge into future practice.

EDLT 3110. Integrating Technology with Teaching
3 Credits (3)
Considers impact of technology on communication and knowledge development; engages students in the design of technology-integrated lessons with a constructivist approach. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate a sound understanding of technology operations and concepts.
2. Students will plan and design effective learning environments and experiences supported by technology.
3. Students will implement curriculum plans that include methods and strategies for applying technology to maximize learning.
4. Students will apply technology to facilitate a variety of effective assessment and evaluation strategies.
5. Students will use technology to enhance their productivity and professional practice.
6. Students will better understand the social, ethical, legal, and human issues surrounding the use of technology on PreK-Tweleve schools and apply that knowledge into future practice.

EDLT 5110. Foundations of Learning Design & Technology
3 Credits (3)
This course covers how to access, use, design, and evaluate instructional resources on the Internet, for blended and online learning environments. May be repeated up to 3 credits.

Learning Outcomes

1. Provide a rationale for using a systematic approach to learning design. Identify and summarize the major elements commonly included in instructional development models.
2. Define terms used to describe the phases and strategies of the learning design process.Conduct a needs assessment.
3. Demonstrate the following competency in the completion of an instructional development project: a) identify an instructional problem, b) analyze learners and learning contexts, c) plan and implement a goal analysis, d) specify terminal and enabling learning objectives, e) design criterion measures, f) prepare appropriate testing instruments and procedures, g) select appropriate instructional strategies, h) select appropriate instructional media (delivery systems), i) construct a prototype product, j) plan and conduct formative evaluations, and k) specify revisions resulting from formative evaluation.
4. Compare and contrast various instructional design perspectives and philosophies. Develop effective and efficient instructional products.

EDLT 5120. Critical Digital Literacy
3 Credits (3)
Explore, evaluate and use a variety of multimedia authoring tools including website, video, audio, image editing and apps (iOS/Android) for educational applications. May be repeated up to 3 credits.

Learning Outcomes

1. Considers impact of technology on communication and knowledge development; engages students in the design of technology-integrated lessons with a constructivist approach.

EDLT 5130. Technology and Language Learning
3 Credits (3)
Use of technology to enhance second language and dual language programs. Organized around technology enhanced communicative and interactive language learning environments. May be repeated up to 3 credits.

Learning Outcomes

1. Considers use of technology to enhance second language and dual language programs. Organized around technology enhanced communicative and interactive language learning environments

EDLT 5140. Fostering Online Learning Communities
3 Credits (3)
Examines theoretical and practical aspects of communication and collaboration and their impact on the formation of online learning communities for those teaching adults in higher education, business, or government settings. May be repeated up to 3 credits.

Learning Outcomes

1. Examine theoretical and practical aspects of communication and collaboration and their impact on the formation of online learning communities for those teaching adults in higher education, business, or government settings.

EDLT 5210. Social Media in Blended and Online Learning Environments
3 Credits (3)
This course will explore the role of social media in online and blended learning environments through practical hands-on activities, critical dialogue, and collaborative projects which will prepare you to utilize social media personally and pedagogically. May be repeated up to 3 credits.

Learning Outcomes

1. Describe and give examples of social media for use in your blended and online learning environments.
2. Actively engage, communicate and collaborate using social media, both inside the classroom and in appropriate social media-based learning environments.
3. Evaluate, analyze, and synthesize readings, research, and other information about social media in education.
4. Access, utilize, design, evaluate, and assess learning activities using social media.

EDLT 5220. Culturally Responsive Teaching with Technology
3 Credits (3)
This course explores the use of critical pedagogy, culturally sustaining pedagogy, and project-based learning supported by computer-based applications. May be repeated up to 3 credits.

Learning Outcomes

1. Explain the primary concepts of critical pedagogy based on the writing of Paulo Freire.
2. Describe theories and practices that support culturally responsive and sustaining pedagogies.

3. Evaluate the connections and tensions between critical pedagogy, culturally sustaining pedagogies, and the use of technology.
4. Plan a culturally sustaining project-based unit of study using digital technology.

EDLT 5230. Designing and Organizing Online Learning Environments
3 Credits (3)
Explores the theories, models, approaches, technologies, and methods of online teaching and adult learning. Provides a foundation for examining the roles and characteristics of the online teacher and learner for those teaching adults in higher education, business, or government settings. May be repeated up to 3 credits.
Learning Outcomes
1. Design and organize effective online learning.

EDLT 5240. Online Teaching and Learning
3 Credits (3)
This course provides a survey of theories, models and methods used to design and deliver online education through the use of technologies in K-12, higher education, business/industry, and continuing education. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate an awareness of equity social justice issues related to online education.
2. Critique and reflect upon diverse design frameworks,
3. Develop online resources for use in your professional and personal educational pursuits,
4. Explore and participate in the use of emerging technologies for online education.
5. Identify and discuss the impact of different technological innovations on society with particular emphasis on education,
6. Analyze and evaluate the use of technologies for teaching and learning in culturally relevant and responsive ways.

EDLT 5250. Tools and Techniques for Online Teaching
3 Credits (3)
Examines the theoretical and practical implications of various asynchronous and synchronous tools and their impact on teaching and learning through research and hands-on experience. May be repeated up to 3 credits.
Learning Outcomes
1. Implement effective online teaching.

EDLT 5310. Design and Implementation of Synchronous Online Instruction
3 Credits (3)
This course provides hands-on experiences as well as the theoretical and research basis for synchronous online instruction including web conferencing. May be repeated up to 3 credits.
Learning Outcomes
1. Evaluate best practices, based on research and theoretical foundation, of interaction and engagement in the design and delivery of synchronous online instruction.
2. Demonstrate the skillful use of the technology tools and strategies for synchronous online instruction.
3. Design, develop, and implement the delivery of a web conference event, first with a partner or team and then individually by the end of the course.
4. Use self- and peer-evaluation for continuous improvement of synchronous online instruction with a focus on web conferencing events.

EDLT 5320. Universal Design in Online Course Design
3 Credits (3)
Examines theory, practical application of strategies, and global and policy implications of universal design (UD)in online learning environments. May be repeated up to 3 credits.
Learning Outcomes
1. Understand and implement universal design.

EDLT 5330. Emerging Technology Tools and Techniques
3 Credits (3)
This course examines the theory, research, and practice of emerging technologies for educational practice and their impact on online teaching and learning. May be repeated up to 3 credits.
Learning Outcomes
1. Implement effective techniques.

EDLT 5992. Directed Study
3 Credits (3)
Supervised academic work. Consent of Instructor required. May be repeated up to 3 credits.
Learning Outcomes
1. Engage in the study of an EDLT topic.

EDLT 5999. Capstone
3 Credits (3)
The capstone course provides an opportunity to demonstrate teaching and learning in blended and fully online environments. Demonstrate competencies with best practices in culturally responsive teaching, learning/educational technology, online pedagogy, portfolio creation, and curriculum development for blended and online delivery using emerging technologies. May be repeated up to 3 credits.
Learning Outcomes
1. Apply teaching and learning standards to review blended or online courses for learning environments.
2. Demonstrate proficiency using the tools of learning management systems.
3. Apply best practices in instructional design for blended/online courses
4. Explain how research and practice inform your course instructional design decisions.
5. Create a blended or online learning course that meets online teaching standards
6. Demonstrate participation in an online learning community.

EDLT 6110. Foundations of Learning Design & Technology
3 Credits (3)
This course covers how to access, use, design, and evaluate instructional resources on the Internet, for blended and online learning environments. Includes a theoretical and research component for doctoral students. May be repeated up to 3 credits.
Learning Outcomes
1. Provide a rationale for using a systematic approach to learning design. Identify and summarize the major elements commonly included in instructional development models.
2. Define terms used to describe the phases and strategies of the learning design process. Conduct a needs assessment.

3. Demonstrate the following competency in the completion of an instructional development project: a) identify an instructional problem, b) analyze learners and learning contexts, c) plan and implement a goal analysis, d) specify terminal and enabling learning objectives, e) design criterion measures, f) prepare appropriate testing instruments and procedures, g) select appropriate instructional strategies, h) select appropriate instructional media (delivery systems), i) construct a prototype product, j) plan and conduct formative evaluations, and k) specify revisions resulting from formative evaluation.
4. Compare and contrast various instructional design perspectives and philosophies. Develop effective and efficient instructional products.

EDLT 6120. Emerging Models for Learning Design & Technology
3 Credits (3)
Integration of technology into content areas. May be repeated up to 3 credits.
Learning Outcomes
1. Understand emerging EDLT models.

EDLT 6210. Current Research in Learning and Technology
3 Credits (3)
Explores models and methods for examining and researching the impact of technology on learning and education. May be repeated up to 3 credits.
Learning Outcomes
1. Understand current technology research.

EDLT 6220. Multimedia, Authoring and Curriculum Design
3 Credits (3)
Explore, evaluate and use a variety of multimedia authoring tools including website, video, audio, image editing and apps (iOS/Android) for educational applications. Includes additional theoretical research component for doctoral students. May be repeated up to 3 credits.
Learning Outcomes
1. Facilitate effective technology learning environments.

EDLT 6230. Technology, Society, and Education
3 Credits (3)
Investigates models of the change process, examines speculations related to the directions and dynamics of change in an era of electronic technologies, explores shifts in the cultural and personal activities and relations of humans, and speculates on concomitant educational implications. May be repeated up to 3 credits.
Learning Outcomes
1. Understand technology and pedagogy.

EDLT 6240. Online Teaching and Learning
3 Credits (3)
This course provides a survey of theories; models and methods used to design and deliver online education through the use of technologies in K-12, higher education, business/industry, and continuing education. Topics covered include accreditation, assessment, culturally responsive course design, current trends and best practices, hybrid and blended learning, learning management systems, online support services, social justice issues in online education, learner engagement, and retention.
Learning Outcomes
1. Implement effective digital pedagogy.

EDLT 6998. Advanced Fieldwork
3 Credits (3)
Fieldwork in learning technologies provides opportunities to integrate theory and practice through research, teaching and/or development. May be repeated up to 3 credits.
Learning Outcomes
1. Examine the historical figures in early childhood education that have influenced current practices and discourses. Identify theoretical, scientific, and philosophical foundations in early childhood education that have defined childhood learning and development. Critically examine the history of institutions and federal policies of early childhood education within the context of multiculturalism

Educational Leadership Administration Courses

ELAD 2210. Leadership and Change in Education
3 Credits (3)
This course will introduce students to the challenges and key strategies in initiating, implementing, and sustaining educational change and reform. In the first part of the course, participants will learn about the challenges of educational change in the United States and the role that they as school leaders play in facilitating change and reform. The course continues with an examination of how culture, micro-politics, and power structures support or impede national and global change initiatives. The last part of the course offers suggestions for change agents including community organizing, culture building, and embracing sustainable leadership practices. Participants will learn how to apply the change theories and concepts introduced in the course to practice through course readings, online discussions with the instructor and colleagues, group work, active examination of daily practice in schools, and personal reflection. May be repeated up to 3 credits.
Learning Outcomes
1. Students will be able to communicate in clear manners that articulate, convey and deepen the understandings others have of issues affecting their communities.
2. Students will be able to collaborate on democratic processes.
3. Students will be able to communicate engage in critical social analysis and how the status quo fits into a larger movement for social change.

ELAD 2340. Multicultural Leadership in Education
3 Credits (3)
Introduction to the social and cultural constructions of gender, class, and race. Students will critically apply theoretical constructs to everyday life and discuss the intersection of gender and race with class inequality in national and global contexts. Using a social justice framework, readings, and assignments integrate a variety of racial/ethnic groups while considering the effects of historically uneven resource distribution, unearned privilege, forms of domination and subordination, immigration status, and cultural representation and ideologies. Participants will learn how to apply the change theories and concepts introduced in the course to practice through course readings, online discussions with the instructor and colleagues, group work, active examination of daily practice in schools, and personal reflection. May be repeated up to 3 credits.
Learning Outcomes
1. Students will develop awareness of their own social identities.
2. Students will recognize differences among various communities, perspectives, and world-views.
3. Students will describe how privilege and biases impact our communities and systems.
4. Students will create meaningful peer-to-peer relationships.
5. Students will understand the impact of their actions on community members.

6. Students will identify their leadership skills to shape social change on and off campus.
7. Students will act on opportunities to promote social change.
8. Students will use academic resources including advising, computers, printing, library, and space.

ELAD 2996. Special Topics in Educational Leadership
1-3 Credits (1-3)
Special topics course in education for undergraduate students. Course will be identified by a subtitle. May be repeated up to 12 credits.
Learning Outcomes
1. Students will be able to engage in systems thinking which aids in seeing how individual situations are shaped by a broader contexts
2. Students will be able to understand how to apply theoretical frameworks for understanding social problems.
3. Students will be able to help develop leadership capacity in others.
4. Students will be able to gain an understanding of cultural competence, which recognizes that diverse perspectives strengthen the dialogue and approaches to solving social problems.

ELAD 3110V. Introduction to Educational Leadership in a Global Society
3 Credits (3)
Multinational educational systems covered through knowledge of the U.S. system of education promoting critical leadership roles every citizen plays in the success of educational systems. May be repeated up to 3 credits.
Learning Outcomes
1. Students will share reflections on issues of national and global importance in the field of educational leadership.

ELAD 3210. Current Issues In Educational Leadership
3 Credits (3)
This course addresses issues such as the rise in international education, education's costs, social media's role and influence, changes in state and national funding trends, student and faculty/staff diversity, among others. The focus of this course is centered on the actions and responses of administrators to the current issues they are facing. May be repeated up to 3 credits.
Learning Outcomes
1. Students will identify the overarching issues that leaders in educational institutions are or will be facing;
2. Students will articulate a more multicultural perspective through which to view the possible impact of these current issues on both those within the institution and those who are impacted by these institutions;
3. Students will reconstruct their perspective to allow for a greater awareness of the how these current issues might differentially impact culturally, linguistically, and socio-economically diverse populations;
4. Students will criticize inequitable examples of unfair educational policy and explore ways in which to develop culturally responsive practices when addressing current issues

ELAD 3996. Special Topics in Education
1-3 Credits (1-3)
Special topics course in education for undergraduate students. Course will be identified by a subtitle. May be repeated up to 12 credits.
Learning Outcomes
1. Objectives change based on course content.

ELAD 4110. Management of Student Services
3 Credits (3)
History and overview of student services (e.g., admissions, counseling, registration, financial aid, housing, food services, student organizations) for early entry level positions. This course will provide students with an examination of foundations and principals of student services. Important theories and essential competencies needed in order to be successful will be explored through a social justice perspective of leadership. May be repeated up to 3 credits.
Learning Outcomes
1. Explain the origins of student services concerning social and historical events programs.
2. Describe the theoretical foundations and development of student services.
3. Evaluate the organizational and administrative models for the delivery of student services
4. Critique inequity issues in student services as they relate to institutions of higher education and how social justice action might improve or eliminate such inequities.
5. Explain the primary legal foundations, ethical standards, and daily operation of student services programs.

ELAD 4120. Principles of Education Law and Policy
3 Credits (3)
Overview of the use of law and policy in schools and higher education. May be repeated up to 3 credits.
Learning Outcomes
1. Analyze the options on policy issues using the statutes, cases, regulations, and legislative history as their tools.
2. Evaluate legal developments in higher education.
3. Synthesis legal trends in their particular area of professional interest.
4. Compare and contrast how higher education law differs between private and public higher education.

ELAD 4130. Principles of Education Budgeting and Finance
3 Credits (3)
Analysis of budget and finance practices in education. Restricted to: E AD majors. May be repeated up to 3 credits.
Learning Outcomes
1. Identify opportunities to use research and individual projects to explore issues related to topics of interest to them
2. Describe ways in which budget and finance skills are important to administrators in college and university settings
3. Distinguish how financial and budgetary issues vary with respect to state, private, and various funding sources within higher education

ELAD 4410. Foundation for School Library Specialists
3 Credits (3)
Elements of librarianship. Introduction to the history, purpose, and role of the school library. Overview of current issues and legislation affecting school libraries. Taught with ELAD 5410. May be repeated up to 3 credits.
Learning Outcomes
1. Understand basic competencies for library specialists.

ELAD 4420. Administration of the School Library
3 Credits (3)
Principles and practices related to the function, structure, and management of school libraries. May be repeated up to 3 credits.
Learning Outcomes
1. Understand basic competencies for library administration.

ELAD 4510. Elements of Research
3 Credits (3)

This course provides students with a foundation for understanding educational research. The course will also provide grounding in proper writing format for use in the education profession. Students will be introduced to various research paradigms and the symbiosis of theory and practice. Besides introducing students to the symbiosis of theory and practice, students will complete assignments and activities that demonstrate the use of that symbiosis. Ultimately, students will be able to use the knowledge they gain through the course to be able to critique educational research. May be repeated up to 3 credits.

Learning Outcomes

1. Define what good research entails
2. Critique journal articles dealing with educational leadership
3. Use proper APA format in writing papers and written discussion
4. Use ethical standards for decision making in research

ELAD 4998. Internship
3 Credits (3)

The undergraduate Educational Leadership major requires that students complete two internships. Internships provide students with either experience working in an area of administration that is different from the student's regular job or experience conducting research for a program or project. Each internship placement site and scope of work is determined through consultation with the course instructor. Students must complete 120 hours of work with the selected internship site. Student must be an E AD major and be within (at least) one year of graduation. May be repeated up to 6 credits.

Learning Outcomes

1. Students will gain experience in a work/administrative setting under the supervision of a experienced administrator.

ELAD 5110. The Principalship
3 Credits (3)

Key issues surrounding the role of school-site leaders. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better; .

Learning Outcomes

1. Students will examine the complexities of school leadership.
2. Students will create a school culture representative of their own core values.
3. Students will assess the role and importance of the principal in facilitating change, managing conflict, promoting an active anti-racist environment, celebrating diversity, and establishing accountability for all students' learning.

ELAD 5120. Leadership and Administration of Bilingual Education
3 Credits (3)

Concepts and practical approaches to improving the education of English languages learners through higher education. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or higher; .

Learning Outcomes

1. Examine the complexity and overarching issues encompassing the role of the school leader as it pertains to the broader and narrower goals of bilingual education
2. Develop critical understandings of educating equitably, involving the development and sustainability of bilingual education programs which focus on making schooling meaningful and comprehensible for the millions of children whose home languages are different from the dominant language of school and society

ELAD 5130. Basing Decision on Data: Pk-12
3 Credits (3)

Analysis of accountability data and other evidence to support educational decision making. Disaggregating and interpreting assessment data to guide improvement of instruction. Moving from evidence to plans for action. The course must be passed with a grade of "B" or higher. Consent of instructor is required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Identify various types of data and their uses in decision-making
2. Identify federal and state assessment programs, as well as local assessment requirements, and the policies that drive them
3. Explain how data from multiple sources is used to inform decision making about student achievement

ELAD 5140. Educational Financial Management
3 Credits (3)

Educational finance and business applications. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better; .

Learning Outcomes

1. Understand and be able to use and explain to lay people the technical language used to discuss education finance issues.
2. Analyze, interpret, and present financial data, trends, and issues to various publics served by the schools and outline possible actions and their implications

ELAD 5150. Public School Law
3 Credits (3)

Legal processes of education, major court decisions, and the legislative process will be studied. The course must be passed with a grade of "B" or better. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better; .

Learning Outcomes

1. Understand the critical issues involved in applying the law fairly and justly
2. Understand the complex nature of the federal, state, and local authority levels as they relate to applying statutory and constitutional law

ELAD 5160. Management of Educational Change: Public Schools
3 Credits (3)

Leadership in implementing innovations in education. The course must be passed with a grade of "B" or higher. Consent of instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Students will gain insight into how the structure of schools in the United States impacts the success of failure of educational change and reform.
2. Students will understand the role of implementing or resisting educational change efforts

ELAD 5170. Special Education Administration
3 Credits (3)

Competencies for the administration of special education programs with an emphasis upon New Mexico public school standards. The course must be passed with a grade of "B" or better. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or better.
Learning Outcomes

1. Knowledge of interactive systems and sub-systems and the influence of internal and external environments on the supervisory and improvement processes.
2. Understanding of research and effective professional development practices tied to curriculum, improvement of instructional delivery and student achievement.

ELAD 5180. Internship Public Schools Part I
3 Credits (3)
First half of a practical internship in Pk-12 schools under supervision of school administrator. The course must be passed with a grade of "B" or higher. Consent of Instructor required. 3 years of Pk-12 teaching experience required. Restricted to: E AD majors. . May be repeated up to 3 credits.
Prerequisite: 18 cr. of ELAD course work; 3.0 GPA or better.
Learning Outcomes

1. A clear understanding of the roles and responsibilities of the school leader in an adaptive, culturally diverse and changing environment
2. Provide a platform for prospective leaders to analytically reflect on the complexity of ethical cases in which the school administrator is likely to confront in the scope of his/her administrative career in public education

ELAD 5185. Internship: Public Schools Part II
3 Credits (3)
Second half of a practical internship in Pk-12 administrative setting under supervision of experienced higher education administrator. Internship site determined by class instructor and graduate student. The class must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to: E AD majors. May be repeated up to 3 credits.
Prerequisite: ELAD 5180; 3.0 GPA or better.
Learning Outcomes

1. A understanding of the roles and responsibilities of the school leader in an adaptive, culturally diverse and changing environment.
2. Provide a platform for prospective leaders to analytically reflect on the complexity of ethical cases in which the school administrator is likely to confront in the scope of his/her administrative career in public education.

ELAD 5210. Community College Administration
3 Credits (3)
An overview of the history, role, objectives and patterns governing the effectiveness of the community college. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or better; .
Learning Outcomes

1. Understand the purpose of higher education and how this purpose has changed and affected various types of community colleges and universities and groups of people;
2. Consider how organization, governance, and finance in higher education vary by institutional type, control, and mission;

ELAD 5215. Higher Education Administration
3 Credits (3)
This course provides an overview of higher education in the United States including history, mission, and governance, in the context of organizational theory. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or better.
Learning Outcomes

1. Understand the purpose of higher education and how this purpose has changed and affected various types of community colleges and universities and groups of people
2. Consider how organization, governance, and finance in higher education vary by institutional type, control and mission
3. Gain familiarity with major issues facing U.S. higher education

ELAD 5220. Management of Educational Change: Higher Education
3 Credits (3)
Leadership in implementing innovations in education in higher education. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to: E AD majors.
Prerequisite: 3.0 GPA or better.
Learning Outcomes

1. Student will gain the insight into how the structure of schools in the United States impacts the success or failure of educational change.
2. Student will understand the role of implementing or resisting educational change efforts

ELAD 5230. Higher Education Finance and Funding
3 Credits (3)
This course examines the impact and process of financing and funding higher education. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or better.
Learning Outcomes

1. Identify opportunities to use research and individual projects to explore issues related to issues of topics of interest
2. Describe the ways in which budget and finance skills are important to administrators in college and university settings
3. Distinguish how financial and budgetary issues vary with respect to state, private, and various funding sources within higher education

ELAD 5240. Management of Student Services in Higher Education
3 Credits (3)
History and overview of student services (e.g., admissions, counseling, registration, financial aid, housing, food services, student organizations) and a review of management components used in student services. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or better.
Learning Outcomes

1. Explain the origins of student services in relationship to social and historical events
2. Describe the theoretical foundations and development of student services.
3. Evaluate the organizational and administrative models for the delivery of student services programs.

ELAD 5250. Higher Education Law
3 Credits (3)

This course is designed to review the impact of the legal process and the judiciary on higher education. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or better.
Learning Outcomes
1. Analyze the options on policy issues using the statues, cases, regulations, and legislative history as their tool.
2. Evaluate legal developments in higher education.
3. Synthesis legal trends in their particular area of professional interest.

ELAD 5260. Administration of Adult and Continuing Education
3 Credits (3)
Administration of programs in public schools, higher education, community and nontraditional educational settings. The class must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Learning Outcomes
1. Analyze adult education theory and the intersection of social justice to inform adult education program planning.
2. Assess the needs of specific populations for adult education programming

ELAD 5270. Basing Decision on Data: Higher Education.
3 Credits (3)
Analysis of accountability data and other evidence to support educational decision making. Disaggregating and interpreting assessment data to guide improvement of instruction. Moving from evidence to plans for action. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Learning Outcomes
1. Participants will understand the importance of using assessment data in decision-making and identify reasons why these skills are important to educational leaders in college and university settings.
2. Participants will evaluate the assessment structure of one institution or department in higher education, using a criteria-based measurement tool (rubric).
3. Participants will reflect on possibilities of using assessment data to further social justice outcomes in higher education.

ELAD 5280. Internship: Higher Education Part I
3 Credits (3)
First half of practical internship in administrative setting under supervision of experienced higher education administrator. Internship site determined by class instructor and graduate student. The course must be passed with a grade of "B" or higher. Restricted to: E AD majors. May be repeated up to 3 credits.
Prerequisite: 15 credits of ELAD coursework and consent of instructor; .
Learning Outcomes
1. Understand the roles and responsibilities of the school leader in an adaptive, culturally diverse and changing environment
2. Will provide a platform for leaders to analytically reflect on the complexity of ethical cases in which the administrator will confront in the scope of administrative role

ELAD 5285. Internship: Higher Education Part II
3 Credits (3)
Second half of a practical internship in an administrative setting under supervision of an experienced higher education administrator. Internship placement determined by class instructor and graduate student. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to: E AD majors. May be repeated up to 3 credits.
Learning Outcomes
1. Enhance knowledge and practice of higher education administration, keeping in mind that experiences should provide opportunities for thoughtful examination of the diversity of the ways and manners in which office supervisors and staff conduct their work.
2. Provide practical experience and opportunity to examine and apply learned theoretical concepts within a supportive, supervised environment.
3. Develop skills related to higher education management and leadership.

ELAD 5310. Leadership for Social Justice and Equity
3 Credits (3)
Examine cultural diversity and how appropriate understanding, leadership and instructional strategies can be used to reach all learners. Enhances understanding of what it means to be an educator in culturally diverse contexts. The course must be passed with a grade of "B" or higher. Consent of instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or better, .
Learning Outcomes
1. Acquired knowledge of multicultural issues as they relate to race, ethnicity, class, and gender and how these factors intersect with current educational leadership trends;
2. Developed a more multicultural perspective which will lead to greater awareness of the needs of culturally, linguistically, and socio-economically diverse students and an ability to develop/enhance an educational leadership lens designed to promote equity and access for all students;

ELAD 5320. Educational Leadership, Supervision, and Evaluation
3 Credits (3)
Leadership, supervision, and evaluation in Pk-12 and post secondary education. The course must be passed with a grade of "B" or better. Consent of Instructor required. Restricted to E AD majors May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or higher; .
Learning Outcomes
1. To acquire a basic knowledge of the processes, persons, and practices of educational leadership and supervision.
2. To develop personalized understandings of leadership and supervisory roles.
3. To relate leadership and supervision theory to practice.
4. To develop a concept of good administrative/supervisory practice.
5. To develop a diverse awareness of leadership and supervisory issues and techniques.

ELAD 5410. Foundation for School Library Specialists
3 Credits (3)
Elements of librarianship. Introduction to the history, purpose, and role of the school library. Overview of current issues and legislation affecting school libraries. Same as ELAD 4410. May be repeated up to 3 credits.
Learning Outcomes
1. Understand basic competencies for library specialists.

ELAD 5510. Elements of Research
3 Credits (3)

Survey and analysis of research methods and designs focusing on sound educational research and its presentation. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or better; .
Learning Outcomes
1. Explain the purpose of research
2. Analyze the need for research by practicing educational administrators
3. Describe the differences between qualitative research and quantitative research

ELAD 5992. Special Problems.
1-3 Credits (1-3)
Offered under various subtitles which indicate the subject matter covered. May be taken for a maximum of 3 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits.
Learning Outcomes
1. Objectives will vary based on course content.

ELAD 5996. Special Topics
1-6 Credits (1-6)
Offered under various subtitles which indicate the subject matter covered. May be taken for a maximum of 6 credits. May be repeated up to 6 credits.
Learning Outcomes
1. Objectives change based on course content.

ELAD 5997. Independent Studies
1-3 Credits (1-3)
Individual investigation in special topic areas. Requires prior approval of project advisor. May be repeated up to 9 credits.
Learning Outcomes
1. Objectives change based on course content.

ELAD 6110. Organizational Theory
3 Credits (3)
The overarching objectives of this class is to prepare educational leaders who comprehend the complexities of educational organizations, especially those with significant underrepresented populations; to initiate or maintain leaders' commitment to educational programs that embrace all learners; and to promote within leaders an understanding of the necessity of upholding social justice, primarily as it applies to issues, such as race, ethnicity, class, ability, religion, and gender. Consent of Instructor required. Restricted to: E AD majors.
Learning Outcomes
1. Understand and implement organizational theory.

ELAD 6120. Elements of Research
3 Credits (3)
Advanced survey and analysis of research methods and designs focusing on sound educational research and its presentation. Consent of Instructor required. May be repeated up to 3 credits.
Learning Outcomes
1. Evaluate self within educational research, Analyze what good research entails
2. Use proper APA (7th ed.) format in writing papers and in written discussions
3. Synthesize scholarly literature, Understand social justice in research and practice
4. Work on small pieces of active research to gain an understanding of what it entails

ELAD 6210. Quantitative Research I
3 Credits (3)
Explores quantitative research methods, the rationale and assumptions that guide statistical decisions, beginning level statistical analyses, and how all of these are applied in the field of educational leadership. May be repeated up to 3 credits.
Learning Outcomes
1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts.

ELAD 6220. Qualitative Research I
3 Credits (3)
Explores qualitative research methods and models and their application in the field of educational leadership. May be repeated up to 3 credits.
Learning Outcomes
1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts.

ELAD 6310. Concepts of Leadership in Education
3 Credits (3)
Survey of concepts of leadership in general and educational leadership in particular. Consideration of implications for practice. May be repeated up to 3 credits.
Learning Outcomes
1. Understand and implement important concepts central to effective educational leadership

ELAD 6320. Foundations of Educational Administration
3 Credits (3)
Advanced course about the political, economic, and social forces on policy making and governance of Pk-12 and postsecondary education. May be repeated up to 3 credits.
Learning Outcomes
1. Students will gain an understanding of the concepts of school leadership, and the political, social and economic contexts that impact schools.

ELAD 6410. Quantitative Research II
3 Credits (3)
Intermediate quantitative methods of research, statistical analyses, and their application in the field of educational leadership. Restricted to Doctoral students only. May be repeated up to 3 credits.
Prerequisite: ELAD 6210.
Learning Outcomes
1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts in more detail than in Qualitative Research I.
2. Students will conduct a mini study to prepare for dissertation seminar.

ELAD 6510. Qualitative Research II
3 Credits (3)
Advanced qualitative methods of research and implementation in the field of educational leadership. May be repeated up to 3 credits.
Prerequisite: ELAD 6220.
Learning Outcomes
1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts in more detail than in Qualitative Research I.
2. Students will conduct a mini study to prepare for dissertation seminar.

ELAD 6520. Public School Law
3 Credits (3)
Advanced course in which the legal processes of education, major court decisions, and the legislative process will be studied. Consent of Instructor required. May be repeated up to 3 credits.
Learning Outcomes
1. The student will articulate an understanding of basic legal concepts through examination and discussion of relevant court cases.

ELAD 6525. Higher Education Law
3 Credits (3)
This advanced course is designed to review the impact of the judiciary on higher education. The legal standing of institutions of higher education on issues of staff rights, student rights, and tort liability will be addressed. In addition, the impact of local ordinances, state and federal laws and regulations will be examined. Consent of Instructor required. May be repeated up to 3 credits.
Learning Outcomes
1. Consider CRT's usefulness in educational research and what makes a CRT analysis unique or different from other analyses.

ELAD 6610. Scholarly Writing and the Southwest Border
3 Credits (3)
This course is designed to provide doctoral-level students with an opportunity to engage with scholarly and academic writing in a meaningful manner. Scholarly writing and academic writing are often used interchangeably. They will be used in that manner for this course. Generally defined, academic writing refers to a particular style of expression that researchers use to define the intellectual boundaries of their disciplines and their areas of expertise. Scholarly writing is the specific genre of writing that is used in all academic fields. For this course, the scholarly writing is contained to the context of the Southwest Border and Borderland issues. This is designed in consideration of and relates to the Department and Program's mission, which takes into account social justice and border education issues. Additionally, the course will cover topics associated with scholarly writing that include, but not limited to: formal language, tone, precision, clarity, word choice, and assumptive statements versus research-supported rationale. Consent of Instructor required. Restricted to: E AD majors.
Learning Outcomes
1. Understand and implement place-based writing through and about the Southwest Border.

ELAD 6620. Evaluation Design in Education
3 Credits (3)
Advanced course that focuses on evaluation and accountability models; application to educational programs. Consent of Instructor required. May be repeated up to 3 credits.
Learning Outcomes
1. Objectives change based on course content.

ELAD 6630. Educational Financial Management
3 Credits (3)
This advanced course offers an overview of economic and financial concerns relating to the public school system of the United States. Consent of Instructor required. May be repeated up to 3 credits.
Learning Outcomes
1. Students will gain an understanding of the basic concepts of school budgeting and finance practices.

ELAD 6635. Higher Education Finance and Funding
3 Credits (3)
This advanced course examines the impact and process of financing and funding higher education. The course is an examination of higher education finance as it relates to operational budgets, capital budgets, and policy issues which impact the financing of higher education. Consent of Instructor required. May be repeated up to 3 credits.
Learning Outcomes
1. Students will study the impact of the higher education budget on various departments and services at the university level.

ELAD 6710. The Professoriate
3 Credits (3)
The purpose of this course is to explore the body of scholarly knowledge and research appropriate for the study of American higher education, the context in which teaching and learning occurs, and faculty's roles in the process. We will discuss the number, variety, and purpose of the various types of institutions; the different roles that faculty members play within these institutions; how faculty work is assessed and valued within the outside of the university; administrative regulations related to faculty work; current issues related to the general state of the professoriate; as well as how does one prepare to enter the professoriate.

ELAD 6910. Dissertation Seminar
3 Credits (3)
Same as CEPY 6450. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Consent of Instructor required. May be repeated up to 3 credits.
Learning Outcomes
1. Formulate a research purpose and driving question about a specific topic.

ELAD 6991. Doctoral Research
1-15 Credits (1-15)
Research. Consent of Instructor required. Thesis/Dissertation Grading. May be repeated up to 88 credits.
Learning Outcomes
1. Objectives for this course include submitting a pre-proposal, proposal, and final copy of the dissertation for committee consideration.

ELAD 6996. Selected Topics
1-6 Credits (1-6)
Offered under various subtitles which indicate the subject matter covered. May be repeated up to 99 credits.
Learning Outcomes
1. Objectives change based on course content.

ELAD 6998. Advanced Internship
1-6 Credits (1-6)
For those pursuing an advanced degree to meet the field work requirement. To bear an appropriate subtitle. May be repeated up to 6 credits.
Learning Outcomes
1. Students will gain experience in a work/administrative setting under the supervision of a experienced administrator.

ELAD 7000. Doctoral Dissertation
1-9 Credits (1-9)
Dissertation. Minimum of 3 credits per regular semester. May be taken for a maximum of 36 credits. Consent of instructor required. May be repeated up to 36 credits.
Learning Outcomes
1. Objectives for this course include submitting a pre-proposal, proposal, and final copy of the dissertation for committee consideration.

Health Education Courses

HLED 1110. American Heart Association Heartsaver First Aid CPR/AED
1 Credit (1)
A video-based, instructor-led course that teaches students critical skills needed to respond to and manage an emergency until emergency medical services arrives. Skills covered in this course include first aid; choking relief in adults, children, and infants; and what to do for sudden cardiac arrest in adults, children, and infants. Upon successful completion of the course, students will become eligible for AHA Heartsaver® First Aid & CPR/AED certification. May be repeated up to 1 credit.
Learning Outcomes
1. Demonstrate the skills necessary to efficiently perform one (1) and two (2) rescuer CPR for adult, child, and infant victims of cardiac arrest at the Basic Life Support level.
2. Demonstrate the skills necessary to safely and effectively operate an automated external defibrillator (AED).
3. Demonstrate the skills necessary to intervene and care for an adult, child, or infant choking victim and be able to administer first-aid to this population.

Reading Courses

READ 3110. Instruction for Special Reading Needs
3 Credits (3)
Emphasizes appropriate techniques for teaching reading to learners with special needs. Restricted to: TEP. EED, ECED, SED, and SPED majors.
Learning Outcomes
1. Students will demonstrate basic knowledge of the five domains of reading.
2. Students will demonstrate knowledge of characteristics of reading disabilities (including dyslexia) and the cognitive and linguistic difficulties that may underlie these disabilities.
3. Students will recognize the cultural, environmental and social factors that can impact reading success.
4. Students will explore instructional practices in phonological awareness, phonics, spelling, vocabulary and comprehension that are consistent with current scientific research findings.
5. Students will use or analyze informal and/or criterion-based assessments for determining students' skills in phonological awareness, word identification, and reading fluency and for determining appropriate instructional goals for students.
6. Students will be able to develop a Professional Learning Community by researching and sharing the effectiveness of various strategies/methods/commercial programs for different domains of reading.

READ 3996. Special Topics
1-3 Credits (1-3)
Each course will be identified by a qualifying subtitle. A maximum of 3 credits in any one semester and a grand total of 6 credits. May be repeated up to 6 credits.
Learning Outcomes
1. Engage in the study of a specific literacy topic.

READ 4310. Elementary School Literacy I
3 Credits (2+2P)
Reading development, curriculum, and instruction in the elementary grades. Required of all elementary education majors. May be repeated up to 3 credits.
Corequisite: EDUC 4310, EDUC 4320, SPED 3120.
Learning Outcomes
1. Articulate an understanding of developmental theories and processes and their implication for appropriate methods of teaching reading.
2. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework.
3. Provide and use anti-bias literacy materials and experiences, including primary language materials.
4. Plan appropriate whole group, small group and individual activities that include culturally and linguistically responsive instruction and appropriate accommodations for working with children with special needs.
5. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer.
6. Understand the role of family and community in literacy development and respect and promote the use of the child's home language for learning.
7. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society.
8. Demonstrate knowledge of and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need.

READ 4320. Elementary School Literacy II
3 Credits (2+2P)
Reading development in curriculum and instruction with assessment and evaluation in the elementary grades (K 8). May be repeated up to 3 credits.
Prerequisite: READ 4310.
Corequisite: EDUC 4330.
Learning Outcomes
1. Engage in reflection on current theoretical perspectives on the reading process, such as understanding linguistics, psycholinguistics, sociolinguistics and their relationships in the reading process, and the role of literacy in schools and our society.
2. Apply knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework to include culturally and linguistically responsive instruction and appropriate accommodations for working with children with special needs.
3. Evaluate instructional materials in terms of their approach to reading, consider their possible use with children, and adapt the materials so

that they reflect an appreciation for child-centeredness and cultural diversity in learning.
4. Use miscue analysis and other literacy assessment tools to understand, describe, and evaluate students' reading strategies and formulate an instructional plan tied to assessment.
5. Utilize children's literature, including multicultural, multilingual children's literature to plan, implement and reflect on innovative strategies for literacy scaffolding.
6. Define oneself as a literate person and revalue readers and writers, and users of language.

READ 4330. Content Area Literacy
3 Credits (2+2P)
Surveys integrated reading/writing/discursive practices in middle/secondary content areas. Taught with READ 5330. Restricted to: TEP-SED majors. May be repeated up to 3 credits.

Learning Outcomes
1. Analyze literacy processes, as they pertain to adolescent learners.
2. Discuss current trends and issues in content area literacy instruction with a specific focus on practices that promote achievement and equity.
3. Evaluate instructional practices that help students use reading, writing, speaking, listening, viewing and visually representing to learn the content areas.
4. Illustrate ethical reasoning and decision making in your approach to content area literacy education.
5. Integrate research, reflection, and best practices that positively impact students in a diverse society.

READ 4530. Teaching Secondary ELA & Social Studies Using Primary Sources, Memoir & Autobiography
3 Credits (3)
This course prepares future language arts and social studies educators to teach structured literacy effectively at the secondary level, with a focus on social studies content for cross-disciplinary instruction. Students will explore reading development and the five essential components of reading—phonemic awareness, phonics, vocabulary, comprehension, and fluency—with particular attention to systematic instruction of vocabulary, comprehension, and fluency strategies relevant to secondary texts. Through engagement with primary and secondary sources, memoirs/autobiographies, and historical fiction, students will develop instructional approaches to support real-world reading applications, text analysis, inquiry, and historical thinking.

Learning Outcomes
1. Explain the five components of evidence-based reading instruction and their relevance at the secondary level.
2. Design lessons that build Tier 2 (cross-disciplinary) and Tier 3 (discipline-specific) vocabulary knowledge in social studies contexts.
3. Develop instructional strategies to support comprehension and critical thinking through practices such as activating prior knowledge, questioning texts, making inferences, and synthesizing information.
4. Create activities that promote oral reading fluency with an emphasis on prosody, pacing, and expression.
5. Execute a lesson plan that integrates social studies texts—including primary and secondary sources, memoirs/autobiographies, and historical fiction—into reading instruction to foster cross-disciplinary instruction in the humanities.

READ 5210. Language and Literacy Acquisition
3 Credits (3)
Framework and strategies of language and literacy acquisition with attention to bilingual learners and the interrelationship among reading, writing, and oral language. May be repeated up to 3 credits.

READ 5220. Sociopsycholinguistics of Reading
3 Credits (3)
Examines current research on reading process, learning to read, and teaching children to read and evaluates current programs and materials. May be repeated up to 3 credits.

READ 5310. Elementary School Literacy I
3 Credits (2+2P)
Reading development, curriculum, and instruction in the elementary grades. Same as READ 4310 with differentiated assignments for graduate students. May be repeated up to 3 credits.
Corequisite: ECED 5810, EDUC 5310, and EDUC 5320.

Learning Outcomes
1. Articulate an understanding of developmental theories and processes and their implication for appropriate methods of teaching reading;
2. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework;
3. Provide and use anti-bias literacy materials and experiences, including primary language materials;
4. Plan appropriate whole group, small group and individual activities that include culturally and linguistically responsive instruction and appropriate accommodations for working with children with special needs;
5. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer;
6. Understand the role of family and community in literacy development and respect and promote the use of the child's home language for learning;
7. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society;
8. Demonstrate knowledge of and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need.

READ 5320. Elementary School Literacy II
3 Credits (2+2P)
Reading development in curriculum and instruction with assessment and evaluation in the elementary grades (K-8). Same as READ 4320 with differentiated assignments for graduate students. May be repeated up to 3 credits.
Prerequisite: READ 5310.
Corequisite: EDUC 5330.

Learning Outcomes
1. Engage in reflection on current theoretical perspectives on the reading process, such as understanding linguistics, psycholinguistics, sociolinguistics and their relationships in the reading process,and the role of literacy in schools and our society;
2. Apply knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework to include culturally and linguistically responsive instruction and appropriate accommodations for working with children with special needs;
3. Evaluate instructional materials in terms of their approach to reading, consider their possible use with children, and adapt the materials so

that they reflect an appreciation for child-centeredness and cultural diversity in learning;
4. Use miscue analysis and other literacy assessment tools to understand, describe, and evaluate students' reading strategies and formulate an instructional plan tied to assessment;
5. Utilize children's literature, including multicultural, multilingual children's literature to plan, implement and reflect on innovative strategies for literacy scaffolding;
6. Define oneself as a literate person and revalue readers and writers, and users of language.

READ 5330. Content Area Literacy
3 Credits (3)
Surveys integrated reading/writing/discursive practices in middle/secondary content areas. "Master' plus Secondary Licensure students Only" and "TEP admission required" May be repeated up to 3 credits.
Prerequisite: SPED 5105, EDUC 5120, EDUC 5110.
Learning Outcomes
1. Define the purpose of schooling begin to articulate the implications for the teacher, youth, teaching, and learning.
2. Explore the historical dimensions of reading instruction in secondary education.
3. Explore the quality and character of life in schools along with the implications for all stakeholders.
4. Explore the roles of reading, writing, listening, and speaking in the content areas.
5. Discuss general pedagogical considerations that extend across all subject matter.
6. Promote the concept that learning in all areas is more authentic and meaningful when knowledge of diverse youth and their communities, content, and pedagogy are valued.
7. Practice strategies that integrate literacy, content, and knowledge of youth.
8. Explore literature in the content area.
9. Develop lesson plans that combine reading, writing, listening, and speaking in the content area that support diversity, integrate technology, and promote effective communication 1
10. Examine the needs of struggling readers. 1
11. Examine the Common Core Standards. 1
12. Engage in research and writing that supports the development of your professional identity as an educator and graduate-level student.

READ 5340. Literacy Assessment and Evaluation
3 Credits (3)
Theoretical and practical aspects of using formal and informal assessment and evaluation procedures in literacy curriculum and instruction. May be repeated up to 3 credits.
Learning Outcomes
1. Students will be able to understand and implement various strategies for assessing and evaluating the literacy practices and knowledge of students.

READ 5350. Adult and Family Literacy
3 Credits (3)
Principles, practices, and instructional materials for adult and family literacy. May be repeated up to 3 credits.
Learning Outcomes
1. Students will be able to understand and implement various strategies for engaging students and their families through literacy practices in a variety of classroom and home settings.

READ 5360. Digital Literacies
3 Credits (3)
Digital Literacies study focuses on the multiple relationships between how we express ourselves to one another and the multiple technological systems and networks that provide context, meaning, and shape to those expressions in both social and academic spaces. This course is designed to examine new literacies theory as it applies to teaching applications and current research on digital literacies within K-12 education. As 21st Century practitioner scholars, we are concerned with both the social aspects of literacy practices, understanding that school-based operations are inseparable from the sociocultural contexts in which they are enacted. Must be an NMSU graduate student to participate in this course.
Prerequisite: READ 5340 with a B- or better.
Learning Outcomes
1. Critically assess K-12 implementation of digital literacies across content area curriculum and instruction.
2. Examine seminal and current research on digital literacies' theory, pedagogy, and practice.
3. Determine the level of cultural relevance in schools and pedagogies for 21st Century students.
4. Interpret how social categories relevant to digital literacy contribute to construction of identity.
5. Develop a critical digital pedagogy that addresses the literacy practices of all learners.

READ 5410. Theory and Pedagogy of Literature for Children and Adolescents
3 Credits (3)
This course provides an in-depth exploration of pedagogy and theory related to literature for adolescents. Students must be in Graduate Standing. May be repeated up to 3 credits.
Learning Outcomes
1. Analyze literacy processes, as they pertain to adolescent learners.
2. Discuss current trends and issues in content area literacy instruction with a specific focus on practices that promote achievement and equity.
3. Evaluate instructional practices that help students use reading, writing, speaking, listening, viewing and visually representing to learn the content areas.
4. Illustrate ethical reasoning and decision making in your approach to content area literacy education.
5. Integrate research, reflection, and best practices that positively impact students in a diverse society.

READ 5420. Theory and Pedagogy of Writing
3 Credits (3)
This course is designed to examine critical writing theory and pedagogy for K-12 teaching and learning, including inclusive and multicultural approaches, with an emphasis in constructive, collaborative practices, and the integration of digital tools across several genres of writing. Through sequential, thematic units, coursework will emphasize: 1) the study of formative theories along with the development of instructional practices to promote achievement and equity in writing education; 2) the application of these skills through pedagogy and curriculum building, and 3) the construction of broad understandings of craft within the

context of the current policies and standards which impact education both regionally and nationally.

Learning Outcomes

1. Critically assess writing curriculum and instruction in K-12 learning environments.
2. Develop a critical writing pedagogy that addresses the literacy practices of all learners.
3. Measure the alignment of writing structures in schools with students' cultural literacies.
4. Interpret how social categories relevant to education contribute to construction of identity.
5. Formulate engaging strategies that develop writers who are competent in multiple genres.

READ 5530. Teaching Secondary ELA & Social Studies Using Primary Sources, Memoir & Autobiography
3 Credits (3)

This course prepares future language arts and social studies educators to teach structured literacy effectively at the secondary level, with a focus on social studies content for cross-disciplinary instruction. Students will explore reading development and the five essential components of reading—phonemic awareness, phonics, vocabulary, comprehension, and fluency—with particular attention to systematic instruction of vocabulary, comprehension, and fluency strategies relevant to secondary texts. Through engagement with primary and secondary sources, memoirs/autobiographies, and historical fiction, students will develop instructional approaches to support real-world reading applications, text analysis, inquiry, and historical thinking.

Learning Outcomes

1. Explain the five components of evidence-based reading instruction and their relevance at the secondary level.
2. Design lessons that build Tier 2 (cross-disciplinary) and Tier 3 (discipline-specific) vocabulary knowledge in social studies contexts.
3. Develop instructional strategies to support comprehension and critical thinking through practices such as activating prior knowledge, questioning texts, making inferences, and synthesizing information.
4. Create activities that promote oral reading fluency with an emphasis on prosody, pacing, and expression.
5. Design and execute a lesson plan that integrates social studies texts—including primary and secondary sources, memoirs/autobiographies, and historical fiction—into reading instruction to foster cross-disciplinary instruction in the humanities.

READ 5990. Practicum in Literacy Education
1-6 Credits (1-6)

Supervised laboratory experience with children with reading difficulties. The student implements a program of specific procedures to aid the disabled reader. May be repeated up to 6 credits.

Prerequisite: READ 5340.

Learning Outcomes

1. Students will be able to understand and implement various strategies for assessing and evaluating the literacy practices and knowledge of students.

READ 5992. Special Studies in Literacy
1-6 Credits (1-6)

Each study will be designated by a qualifying subtitle. Taught with READ 6992. May be repeated up to 99 credits.

Learning Outcomes

1. Engage in a specific literacy topic.

READ 5996. Selected Topics in Literacy
1-6 Credits (1-6)

Offered under different subtitles in the Schedule of Classes. Taught with READ 6996 with differentiated subjects for doctoral students. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of a specific literacy topic.

READ 6110. Critical Issues in Literacy Education
3 Credits (3)

Critical issues from historical to current perspectives. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the multiple critical issues central to literacy education from both a historical and contemporary perspective.

READ 6120. Multiple Critical Literacies
3 Credits (3)

An exploration of the multiple literacies that operate on the individual, classroom, community, cultural and societal levels. Same as BLED 6120. May be repeated up to 3 credits.

READ 6130. Multiculturalism, Literature, and Inquiry
3 Credits (3)

Advanced exploration and examination of critical multicultural language education vis-a-vis children's adolescent, young adult, and adult literature, with an eye toward problematizing assumptions about literacy, articulating issues of social justice and enacting transactive, transformative pedagogy. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the theories and approaches necessary for conducting inquiry reading and writing.

READ 6210. Ethnography of Reading and Writing
3 Credits (3)

Covers the dynamics of data interpretation and critical analysis in the study of literacy. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the theories and approaches necessary for conducting ethnographic studies in reading and writing.

READ 6320. Praxis and Reflexivity
3 Credits (3)

The cyclical research processes of continuous self and systemic (re)evaluation vis-a-vis classroom, community, and society with an eye toward reflection, growth, change, and larger forms of social agency. Restricted to doctoral-level students of any major. Same as BLED 6220, EDUC 6220. May be repeated up to 3 credits.

READ 6991. Doctoral Research in Literacy
1-15 Credits (1-15)

Research on topic of interest. May be repeated up to 88 credits.

Learning Outcomes

1. Engage in the study of a specific literacy topic at the doctoral level.

READ 6992. Special Studies in Literacy
1-6 Credits (1-6)

Offered under different subtitles in the Schedule of Classes. Taught with READ 5992 with differentiated assignments for doctoral students. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of a specific literacy topic at the doctoral level.

READ 6996. Selected Topics in Literacy
1-6 Credits (1-6)
Offered under various subtitles that indicate the subject matter. Same as READ 5996. May be repeated up to 99 credits.
Learning Outcomes
1. Engage in the study of a specific literacy topic at the doctoral level.

READ 6997. Independent Study Topics in Reading
1-6 Credits (1-6)
A problem and seminar course for those pursuing an advanced degree. Each course will have an appropriate subtitle. May be repeated up to 99 credits.
Learning Outcomes
1. Engage in the study of a specific literacy topic at the doctoral level.

READ 6999. Research Project
1-15 Credits (1-15)
Offered primarily for those pursuing the research requirement for the Ed.S. degree. Each research project will be designated by a qualifying subtitle. May be repeated up to 88 credits.
Learning Outcomes
1. Engage in the study of a specific literacy topic at the doctoral level.

Special Education Courses

SPED 2996. Topics
3 Credits (3)
Offered under various subtitles that indicate the subject matter to be covered. May be repeated up to 9 credits.
Learning Outcomes
1. Varies

SPED 3105. Introduction to Special Education in a Diverse Society
3 Credits (3)
Characteristics, identification, and educational needs of exceptional learners. Attention is given to the various types of programs serving exceptional learners. Designed for all professional personnel who work with exceptional learners. May be repeated up to 3 credits.
Learning Outcomes
1. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
3. Explain the major components of an IEP and its processes, as well as the roles of learners, families and professionals on the team.
4. Discuss the different service delivery models and discuss the principles, practices, and pragmatics of inclusion co-teaching.
5. Analyze the disability categories under (IDEA, 2004), (characteristics, etiology, and diagnostic criteria).
6. Examine educational considerations for exceptional learners (educational approaches [Universal design and differentiated instruction], assistive technology, accommodations/modifications, and related supports and services).
7. Employ culturally responsive evidence-based practices to create family/school/community partnerships to promote academic achievement and prepare students for their post-school transitions.
8. Evaluate and synthesize research literature on a selected topic from current special education research.

SPED 3110. Bilingual/Multicultural Special Education
3 Credits (3)
Introduction to issues related to the provision of services to culturally and linguistically diverse students with exceptionalities.
Learning Outcomes
1. Students will identify implicit and explicit biases.
2. Students will discuss the cultural characteristics of families from culturally and linguistically diverse backgrounds and the barriers of parent engagement in their child's education.
3. Students will identify how privilege, power, and inequities exist in the school system and how it impacts the academic achievement of students from culturally linguistically diverse (CLD) backgrounds.
4. Students will identify culturally relevant strategies to employ in the classroom to meet the individual learner needs of students from culturally and linguistically diverse backgrounds.
5. Students will develop a lesson plan that embeds culturally responsive pedagogy that addresses the individual needs of students from culturally and linguistically diverse backgrounds.

SPED 3120. Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society
3 Credits (3)
Curriculum theory and development for special education programs. Various teaching methods utilized with elementary exceptional learners and techniques involved in identifying, adapting, and developing materials will be addressed.
Corequisite: EDUC 4310, EDUC 4320, READ 4310.
Learning Outcomes
1. Evaluate historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Describe the RTI process and its role in determining eligibility for special education services.
3. Discuss learner diversity (ability, exceptionality, developmental level, learning style, language, gender, ethnicity, etc.) and employ individualized evidence-based culturally responsive instructional practices that build on learners' strengths and interests.
4. Create safe, inclusive, culturally responsive learning environments to engage learners with exceptionalities in meaningful learning activities and social interactions that develop communication, emotional well-being, positive social interactions, and self-determination.
5. Apply classroom management techniques that support learners and focus, on routines, procedures, rules, and positive behavior supports to address behavior.
6. Apply culturally responsive instructional practices to individualize learning for learners with exceptionalities; taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences for learners with exceptionalities.
7. Design differentiated lesson plans that employ the tenets of universal design.

SPED 4110. Low Incidence Disabilities in a Diverse Society
3 Credits (3)
Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations.
Learning Outcomes
1. Analyze Low Incidence Disabilities (characteristics, etiology, and diagnostic criteria) (IDEIA, 2004).

2. Identify the types of related supports and services—assistive technology, environmental and Instructional accommodations/ modifications, and related services—available to students with low incidence disabilities to maximize participation in inclusive settings.
3. Apply culturally responsive instructional practices to individualize learning for learners with low incidence disabilities, taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences of learners with low incidence disabilities in inclusive environment.
4. Employ culturally responsive strategies for creating effective family, school, community partnerships.
5. Discuss culturally responsive strategies that promote collaboration between families, schools, and community agencies/organizations during the student's transition planning process.
6. Identify current educational issues impacting students with low incidence disabilities.

SPED 4120. High Incidence Disabilities in a Diverse Society
3 Credits (3)
Examines those areas of disability that most frequently occur in the special education population, including intellectual disabilities, learning disabilities, communication disorders, and behavioral and emotional disorders.
Learning Outcomes
1. Describe and compare the major approaches to identifying, placement, assessing, planning for instruction, and classifying high incidence disabilities.
2. Identify and discuss school-based, sociological, cultural, and economic differences as they relate to etiology and identification of mild disabilities.
3. Describe and critically evaluate classroom instructional practices that can improve the educational success of students with high incidence disabilities.
4. Describe and critically evaluate classroom management practices that can improve the educational success of students with high incidence disabilities.
5. Describe how the educational experiences of persons with mild disabilities is shaped by their cognitive, perceptual, language, academic, and social / emotional characteristics.

SPED 4130. Reading for Elementary Exceptional Learners in a Diverse Society, K-6
3 Credits (3)
Emphasizes reading diagnosis and materials for students with special developmental and learning problems. Taught with SPED 5130. May be repeated up to 3 credits.
Learning Outcomes
1. Evaluate the sources of reading difficulty
2. Evaluate the characteristics exhibited by children with reading difficulties and reading disabilities.
3. Demonstrate how to use non-biased, culturally responsive assessments and progress monitoring data to monitor and evaluate reading performance to drive instruction.
4. Discuss the stages in literacy development and the factors that influence development of student literacy in reading, writing, speaking, viewing, and listening, including phonological, orthographic, semantic, and syntactic processing.
5. Implement research-based reading strategies and instruction to promote the development of print awareness, phonological and phonemic awareness, fluency, vocabulary, spelling, comprehension, reading, and writing for learners with reading difficulties.
6. Evaluate research-based strategies, methods, and commercial programs for different domains of reading.
7. Create a lesson plan and teach an elementary level reading lesson.

SPED 4140. Reading for Elementary Exceptional Learners in a Diverse Society, 7-12
3 Credits (3)
Extends information covered in SPED 5130, which covers grades K 6. Strategies and materials are addressed. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate a knowledge of the major component of the reading process.
2. Increase their repertoire of reading instruction procedures which may be used with students of differing reading abilities and from diverse backgrounds at the middle and secondary levels.
3. Increase their knowledge of theory and related discipline-specific learning strategies designed to assist middle and secondary students in reading and learning through research based practices.
4. Participate in discussion of current literacy issues.
5. Explore the presentation of new teaching and learning strategies as they are related to content area literacy.

SPED 4150. Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society
3 Credits (3)
Curriculum theory and development for elementary special education programs. Various teaching methods utilized with secondary exceptional learners and techniques for identifying, adapting, and developing materials will be addressed. Taught with SPED 5150.
Learning Outcomes
1. Discuss learner diversity (ability, exceptionality, developmental level, learning style, language, gender, ethnicity).
2. Apply effective methods for planning and implementing culturally responsive secondary differentiated content area instruction for exceptional learners in inclusive settings.
3. Identify demands of learning environments of secondary exceptional learners.
4. Identify basic classroom management theories and strategies for individuals with diverse learning needs in secondary environments.
5. Employ culturally responsive evidence-based practices to create family/school/community partnerships to promote academic achievement and prepare students for their post-school transitions.

SPED 4210. Introduction to Assessment of Diverse Exceptional Learners
3 Credits (3)
Theory and use of norm and criterion-referenced instruments and learning theories in the classroom; planning of prescriptive instructional programs. May be repeated up to 3 credits.
Learning Outcomes
1. Compare and contrast the different types of assessment and their purposes.
2. Identify legislation and litigation, which has impacted assessment.
3. Explain the applications and uses of assessments results.
4. Identify widely used (common) measures of psycho-educational assessment and their appropriate application.
5. Identify a variety of techniques for obtaining information regarding students' academic functioning and learning techniques.

6. Identify techniques for assessing students' socio-emotional functioning.
7. Outline the process for identifying exceptional learners and subsequent educational planning utilizing learning theories.
8. Analyze and identify assessment strategies for specific populations (Culturally and Linguistically Diverse, Preschool, Elementary School, etc.)
9. Integrate information gathered through comprehensive assessment procedures into a whole picture of the student's areas of strength, weakness and needs.

SPED 4220. Classroom Management for Diverse Learners
3 Credits (3)
Behavior-change strategies for exceptional learners. May be repeated up to 3 credits.
Learning Outcomes
1. Plan the organization of a classroom illustrating optimum use of instructional resources (computers, books, writing materials, reference material, manipulatives, creative constructive materials, etc.) that facilitates efficiency and effectiveness of access, use, maintenance, and storage of such resources.
2. Manage student progress data electronically for visual representation of performance for individual students and whole class averages.
3. Design the organization of the physical aspects of a classroom (furniture, areas, etc) for ease of transition, use, safety and traffic flow based on effective designs presented in the literature.
4. Establish classroom procedures and expectation (rules) to promote a positive, effective and efficient learning environment.
5. Construct the organization of a classroom schedule/time management plan that includes various content areas, instructional strategies, grouping strategies, levels of energy use, etc. Within large blocks of time or for an entire day school day.
6. Demonstrate knowledge and skill of affective domain-based theoretical models for (1) setting and managing the emotional tone of a classroom, (2) managing the psycho-social atmosphere of the classroom and individual students, and (3) managing motivation of students to succeed in learning academic content, social skills, self-responsibility skills, and inter-relationship skills with other class members.
7. Analyze a given classroom situation for legal, ethical and professional issues and concerns, by applying legal, ethical, and professional reactions to the situation and provide resolutions to align the classroom legally, ethically, and professionally. This will include all legal bases (state and federal) involving all students, including students with disabilities, ESL and at-risk students.
8. Observe, analyze and document student behavior to match an appropriate intervention strategy to change behavior in a desired direction. This will also include the successful implementation of behavior management strategies for entire classes, small groups, and individual students along with development and maintenance of electronic data collection graphing and analysis.

SPED 4310. Introduction to Autism
3 Credits (3)
This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Taught with SPED 5310 and SPED 6310. May be repeated up to 3 credits.
Learning Outcomes
1. Analyze Autism Spectrum Disorders ASD (characteristics, etiology, co-morbid conditions, differential diagnosis).
2. Describe the criteria used to screen and diagnose ASD.
3. Examine evidence-based practices used to effectively support students with ASD in accessing general education and grade level standards (classroom structure, differentiated instruction, peer mediated supports, structured teaching, and emotional supports).
4. Describe strategies related to promoting a successful transition from school to adult life for individuals with ASD.
5. Examine the strategies for effective collaboration and communication with families of children with ASD and key stakeholders for the purpose of information sharing and collaborative planning with families.
6. Identify and investigate current educational issues impacting students with ASD.

SPED 4320. Behavior and Autism
3 Credits (3)
This course will cover the first of the triad of impairments. Students will gain an understanding of the behaviors of children with autism. Students will examine several behavior management philosophies and research based interventions and how they can be applied in the educational setting. Attention will also be given to play skills. The family perspective and participation in the proactive behavior management process will be incorporated throughout the course. Taught with SPED 532 with differentiated assignments. May be repeated up to 3 credits.
Prerequisite/Corequisite: SPED 4310 or SPED 5310 or SPED 6310.
Learning Outcomes
1. Explain the definition of Autism Spectrum Disorder (ASD) and associated characteristics of students with ASD as measured by required readings, discussions, and article reviews.
2. Explain behavior impairments and characteristics associated with students with ASD as measured by required readings, discussions, and article reviews
3. Explain Applied Behavior Analysis strategies as measured by completion of required paper(s) summarizing peer-reviewed journal article related to diversity, behavior management interventions, and/or behavior analysis.
4. Explain information related to individuals with ASD and behavior challenges as measured by participation in online chat with instructor or group power point presentation.
5. Discuss evidence-based treatment approaches that are useful in improving behavior management skills of students with ASD as measured by participation in required readings and discussions

SPED 4330. Social Skills and Autism
3 Credits (3)
This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 5330 and SPED 6330 with differentiated assignments. May be repeated up to 3 credits.
Prerequisite/Corequisite: SPED 4310 or SPED 5310 or SPED 6310.
Learning Outcomes
1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).

2. Evaluate Social Skills characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess Social Skills problems in children with ASD.
4. Use assessment results to identify the Social Skills needs of children with ASD
5. Analyze the types of evidence-based practices used to address the Social Skills needs of children with ASD.
6. Design an intervention plan to address the Social Skills needs of a child with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.
8. Employ data collection procedures to evaluate the effectiveness of evidence-based practices for students with ASD.

SPED 4340. Communication and Autism
3 Credits (3)
This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 5340 and SPED 640 with differentiated assignments. May be repeated up to 3 credits.
Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.
Learning Outcomes
1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate communication characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess communication problems in children with ASD.
4. Analyze the types of interventions used to address the communication needs of children with ASD.
5. Design an intervention plan to address the communication needs of a child with ASD.
6. Employ data collection procedures to evaluate the effectiveness of research-based interventions for students with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.

SPED 4810. Early Childhood SPED Student Teaching
9 Credits (9P)
Synthesis of knowledge and skills appropriate to teaching in PreK - 3rd grade educational settings. Restricted to: TEP-ECED majors. Grading (S/U, Audit). Students must be Admitted into student teaching.
Corequisite: ECED 4810.
Learning Outcomes
1. Varies.

SPED 4811. Practicum in Education, Equity and Cultural Diversity
3 Credits (3)
This is a supervised experience in providing special education services to local preK-12 students. In the context of the public school classroom, teacher candidates are guided to apply content knowledge from the seminar meetings and from prior coursework. Restricted to: SPED majors.
Prerequisite: SPED 3105 and SPED 3120 or consent of instructor.
Learning Outcomes
1. Candidates demonstrate an understanding of the critical concepts and principles in their discipline and of the pedagogical content knowledge necessary to engage students' learning of concepts and principles in the discipline.
2. Candidates create and implement learning experiences that motivate K-8 students, establish a positive learning environment, and support K-8 students' understanding of the central concepts and principles in the content discipline.
3. Candidates design, adapt, and select a variety of valid and reliable assessments and employ analytical skills necessary to inform ongoing planning and instruction, as well as to understand, and help students understand their own, progress and growth.
4. Candidates engage students in reasoning and collaborative problem solving related authentic local, state, national, and global issues, incorporating new technologies and instructional tools appropriate to such tasks.
5. Candidates design and implement appropriate and challenging learning experiences, based on an understanding of how children learn and develop and they ensure inclusive learning environments that encourage and help all K-8 students reach their full potential across a range of learner goals.
6. Candidates work with K-8 students and families to create classroom cultures that support individual and collaborative learning and encourage positive social interaction, engagement in learning, and independence.
7. Candidates build strong relationships with students, families, colleagues, other professionals, and community members, so that all are communicating effectively and collaborating for student growth, development, and well-being.
8. Candidates reflect on their personal biases and access resources that deepen their own understanding of cultural, ethnic, gender, sexual orientation, language, and learning differences to build stronger relationships and to adapt practice to meet the needs of each learner.
9. Candidates use research and evidence to continually evaluate and improve their practice, particularly the effects of their choices and actions on others, and they adapt their teaching to meet the needs of each learner.

SPED 4820. Student Teaching SPED
9 Credits (9)
Supervised teaching in a special education classroom and participation in a required seminar. Students must be admitted to student teaching program in order to enroll. Restricted to: SPED majors.
Prerequisite: SPED 4811.
Learning Outcomes
1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

SPED 4830. Special Education/Elementary Student Teaching Seminar
3 Credits (3)
Discussion of elementary Special Education school issues related to student teaching.
Prerequisite: SPED 4811.
Corequisite: SPED 4820.
Learning Outcomes
1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.
4. The teacher candidate understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.
5. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.
6. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
7. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.
8. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.
9. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner. 1
10. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

SPED 4840. Special Education/ Secondary Student Teaching Seminar
3 Credits (3)
Discussion of secondary school issues related to student teaching.
Prerequisite: SPED 4821.
Corequisite: SPED 4820.
Learning Outcomes
1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.
4. The teacher candidate understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.
5. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.
6. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
7. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.
8. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.
9. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner. 1
10. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

SPED 4992. Directed Study courses in Special Education
1-3 Credits (1-3)
Each course shall be identified by a qualifying subtitle. A maximum of 3 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits.
Learning Outcomes
1. Varies

SPED 4996. Topics
3 Credits (3)
Offered under various subtitles which indicate the subject matter to be covered. May be repeated up to 9 credits.
Learning Outcomes
1. Varies

SPED 5105. Introduction to Special Education in a Diverse Society
3 Credits (3)
This course introduces the field of special education to regular educators. May be repeated up to 3 credits.

Learning Outcomes

1. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
3. Explain the major components of an IEP and its processes, as well as the roles of learners, families and professionals on the team.
4. Discuss the different service delivery models and discuss the principles, practices, and pragmatics of inclusion co-teaching.
5. Analyze the disability categories under (IDEA, 2004), (characteristics, etiology, and diagnostic criteria).
6. Examine educational considerations for exceptional learners (educational approaches [Universal design and differentiated instruction], assistive technology, accommodations/modifications, and related supports and services).
7. Employ culturally responsive evidence-based practices to create family/school/community partnerships to promote academic achievement and prepare students for their post-school transitions.
8. Evaluate and synthesize research literature on a selected topic from current special education research.

SPED 5110. Low Incidence Disabilities in a Diverse Society
3 Credits (3)

Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations. Taught with SPED 6110 with differentiated assignments. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze Low Incidence Disabilities (characteristics, etiology, and diagnostic criteria) (IDEIA, 2004).
2. Identify the types of related supports and services—assistive technology, environmental and Instructional accommodations/modifications, and related services—available to students with low incidence disabilities to maximize participation in inclusive settings.
3. Apply culturally responsive instructional practices to individualize learning for learners with low incidence disabilities, taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences of learners with low incidence disabilities in inclusive environment.
4. Employ culturally responsive strategies for creating effective family, school, community partnerships.
5. Discuss culturally responsive strategies that promote collaboration between families, schools, and community agencies/organizations during the student's transition planning process.
6. Identify current educational issues impacting students with low incidence disabilities.

SPED 5120. High Incidence Disabilities in a Diverse Society
3 Credits (3)

Examines those areas of disability that most frequently occur in the special education population, including intellectual disabilities, learning disabilities, communication disorders, and behavioral and emotional disorders. May be repeated up to 3 credits.

Learning Outcomes

1. Describe and compare the major approaches to identifying, placement, assessing, planning for instruction, and classifying high incidence disabilities.
2. Identify and discuss school-based, sociological, cultural, and economic differences as they relate to etiology and identification of mild disabilities.
3. Describe and critically evaluate classroom instructional practices that can improve the educational success of students with high incidence disabilities.
4. Describe and critically evaluate classroom management practices that can improve the educational success of students with high incidence disabilities.
5. Describe how the educational experiences of persons with mild disabilities is shaped by their cognitive, perceptual, language, academic, and social / emotional characteristics.

SPED 5130. Reading for Elementary Exceptional Learners in a Diverse Society, K-6
3 Credits (3)

Emphasizes reading diagnosis and materials for students with special developmental and learning problems. Taught with SPED 4130. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate the sources of reading difficulty
2. Evaluate the characteristics exhibited by children with reading difficulties and reading disabilities.
3. Demonstrate how to use non-biased, culturally responsive assessments and progress monitoring data to monitor and evaluate reading performance to drive instruction.
4. Discuss the stages in literacy development and the factors that influence development of student literacy in reading, writing, speaking, viewing, and listening, including phonological, orthographic, semantic, and syntactic processing.
5. Implement research-based reading strategies and instruction to promote the development of print awareness, phonological and phonemic awareness, fluency, vocabulary, spelling, comprehension, reading, and writing for learners with reading difficulties.
6. Evaluate research-based strategies, methods, and commercial programs for different domains of reading.
7. Create a lesson plan and teach an elementary level reading lesson.

SPED 5140. Reading for Secondary Exceptional Learners in a Diverse Society, 7-12
3 Credits (3)

Extends information covered in SPED 5130, which covers grades K 6. Strategies and materials are addressed. Taught with SPED 4140. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate a knowledge of the major component of the reading process.
2. Increase their repertoire of reading instruction procedures which may be used with students of differing reading abilities and from diverse backgrounds at the middle and secondary levels.
3. Increase their knowledge of theory and related discipline-specific learning strategies designed to assist middle and secondary students in reading and learning through research based practices.
4. Participate in discussion of current literacy issues.
5. Explore the presentation of new teaching and learning strategies as they are related to content area literacy.

SPED 5150. Curriculum, Methods, and Materials for Secondary Special Education
3 Credits (3)

Curriculum theory and development for elementary special education programs. Various teaching methods utilized with secondary exceptional learners and techniques for identifying, adapting, and developing materials will be addressed. May be repeated up to 3 credits.

SPED 5160. Technology and Exceptionality in a Diverse Society
3 Credits (3)
This class will address the unique educational needs of learners with exceptionalities, and will provide information and practice in addressing those needs through the use of technology-based interventions. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate familiarity in variety of assistive technology devices and services that are abailable for students with diverse range of disabilities
2. Demonstrate an understanding of functional approaches to the assessment of assistive technology needs.
3. Describe and implement inter disciplinary approaches to the assessment, selection and the use of technolgy to meet the educational and transitional demands of individuals with diverse range of disabilities.
4. Identify and describe the function of the range of assistive technology devices and services in diverse settings.
5. Demonstrate an understanding of the legal obligations of different entities in providing training and services that are relevant to assistive technologies.

SPED 5210. Introduction to Assessment of Diverse Exceptional Learners
3 Credits (3)
Required for students seeking licensure at graduate level. Theory and use of norm-and criterion-referenced instruments and learning theories in the classroom; planning of prescriptive instructional programs with differentiated assignments for graduate students. Restricted to: SPED majors.

SPED 5220. Classroom Management for Diverse Learners
3 Credits (3)
Behavior-change strategies for exceptional learners. Taught with SPED 4220 with differentiated assignments for graduate students. May be repeated up to 3 credits.

SPED 5230. Advanced Curriculum for Diverse Exceptional Learners
3 Credits (3)
Strategies for developing curricula appropriate to handicapped and gifted learners. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Describe the RTI process and its role in determining eligibility for special education services.
3. Discuss learner diversity (ability, exceptionality, developmental level, learning style, language, gender, ethnicity, etc.) and employ individualized evidence-based culturally responsive instructional practices that build on learners' strengths and interests.
4. Create safe, inclusive, culturally responsive learning environments to engage learners with exceptionalities in meaningful learning activities and social interactions that develop communication, emotional well-being, positive social interactions, and self-determination.
5. Apply classroom management techniques that support learners and focus, on routines, procedures, rules, and positive behavior supports to address behavior.
6. Apply culturally responsive instructional practices to individualize learning for learners with exceptionalities; taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences for learners with exceptionalities.
7. Design differentiated lesson plans that employ the tenets of universal design.

SPED 5310. Introduction to Autism
3 Credits (3)
This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Taught with SPED 4310 and SPED 6310. Differentiated Assignments. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (characteristics, etiology, co-morbid conditions, differential diagnosis).
2. Describe the criteria used to screen and diagnose ASD.
3. Examine evidence-based practices used to effectively support students with ASD in accessing general education and grade level standards (classroom structure, differentiated instruction, peer mediated supports, structured teaching, and emotional supports).
4. Describe strategies related to promoting a successful transition from school to adult life for individuals with ASD.
5. Examine the strategies for effective collaboration and communication with families of children with ASD and key stakeholders for the purpose of information sharing and collaborative planning with families.
6. Identify and investigate current educational issues impacting students with ASD.

SPED 5320. Behavior and Autism
3 Credits (3)
This course will cover the first of the triad of impairments. Students will gain an understanding of the behaviors of children with autism. Students will examine several behavior management philosophies and research based interventions and how they can be applied in the educational setting. Attention will also be given to play skills. The family perspective and participation in the proactive behavior management process will be incorporated throughout the course. Taught with SPED 4320 and SPED 6320 with differentitated assignments. May be repeated up to 3 credits.
Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Explain the definition of Autism Spectrum Disorder (ASD) and associated characteristics of students with ASD as measured by required readings, discussions, and article reviews.
2. Explain behavior impairments and characteristics associated with students with ASD as measured by required readings, discussions, and article reviews
3. Explain Applied Behavior Analysis strategies as measured by completion of required paper(s) summarizing peer-reviewed journal article related to diversity, behavior management interventions, and/or behavior analysis.
4. Explain information related to individuals with ASD and behavior challenges as measured by participation in online chat with instructor or group power point presentation.

5. Discuss evidence-based treatment approaches that are useful in improving behavior management skills of students with ASD as measured by participation in required readings and discussions

SPED 5330. Social Skills and Autism
3 Credits (3)
This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 4330 and SPED 6330 with differentiated assignments. May be repeated up to 3 credits.
Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.
Learning Outcomes
1. Understand and explore the foundations of TESOL instruction.
2. Analyze the sociocultural theory of teaching English as a second/foreign language.
3. Demonstrate an understanding of culturally responsive pedagogy in language teaching and academic achievement.
4. Evaluate principles of best practices instruction and applications of TESOL methods.
5. Explore assessment issues and concepts related to English Language Learners.
6. Examine the impact of polices, national laws, school and community partnerships, and personal professional development on TESOL instruction.
7. Develop, select, and implement second language teaching methods.

SPED 5340. Communication and Autism
3 Credits (3)
This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 4340 and SPED 6340 with differentiated assignments. May be repeated up to 3 credits.
Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.
Learning Outcomes
1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate communication characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess communication problems in children with ASD.
4. Analyze the types of interventions used to address the communication needs of children with ASD.
5. Design an intervention plan to address the communication needs of a child with ASD.
6. Employ data collection procedures to evaluate the effectiveness of research-based interventions for students with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.

SPED 5405. Foundations of Visual Impairment
3 Credits (3)
This course provides an overview of the history and theory of teaching students with visual impairments, including those with additional disabilities. The impact of educational, legislative, and societal trends on the psychosocial adjustment, quality of life, and post-school outcomes of individuals with visual impairments is explored. May be repeated up to 3 credits.
Learning Outcomes
1. Differentiate between the impact that visual impairment (both congenital and adventitious) has on a child's/youth's cognitive, language, communication, motor, social-emotional, and autonomous development.
2. Predict the impact that familial, societal, cultural, and professional attitudes have on the self-esteem/self-identity of a child/youth who has a visual impairment and propose culturally responsive strategies to combat low self-esteem/lack of self-acceptance.
3. Identify appropriate educational adaptations, including universal design for learning principles, for teaching students with visual impairments based on predominant sensory channel(s).
4. Describe the prevalence and incidence of visual impairment, educational and legal classifications, service delivery options and regulations, and the roles of educational staff.
5. Analyze how historical foundations shape current issues and trends in the education of students who are visually impaired.
6. Locate sources of specialized materials, service networks, consumer/parent organizations, and professional associations and publications.

SPED 5410. Functional Implications of Low Vision
3 Credits (3)
This course examines the structure and function of the visual system in relation to associated diseases and syndromes with an emphasis on measuring functional vision and determining appropriate educational adaptations. Consent of Instructor required. May be repeated up to 3 credits.
Prerequisite: SPED 5405.
Learning Outcomes
1. Use basic terminology to describe the structure and functions of the visual system and describe how the visual system typically develops.
2. Identify the etiology and characteristics of the most common eye conditions and their impact on the development and education of individuals who have these conditions.
3. Describe effects of medications on the visual system and on visual performance, Select, adapt, and use appropriate instruments for assessing functional vision, Follow legal, ethical, and technical procedures while conducting vision screenings or functional vision evaluations in order to determine educational services (including eligibility) and supports.
4. Interpret the results of vision screenings, eye reports, and functional vision evaluations in ways that help students, families and other members of the educational team understand the impact the visual impairment has on learning, experience, and social-emotional well-being.
5. Select individualized strategies for the enhancement of visual/sensory efficiency (including the use of environmental modifications, print material adaptations, optical aids, and non-optical aids) based on performance/assessment data

SPED 5420. Strategies for Teaching Students with Visual and Multiple Impairments
3 Credits (3)
This course defines the roles and responsibilities of the teacher of students with visual impairments as part of the transdisciplinary team that serves students with visual impairments and additional disabilities. Emphasis is on assessment, curricula (both academic and functional), communication, behavior management, assistive technologies, inclusion, transition, and independent living. Consent of Instructor required. May be repeated up to 3 credits.
Prerequisite: SPED 5410.
Learning Outcomes
1. Describe the impact that a concomitant visual impairment and additional disability has on a child's/youth's cognitive, language, communication, motor, social-emotional, autonomous, and sensory development.
2. Recommend appropriate educational and environmental adaptations, including access technologies, for students with concomitant disabilities (including a visual impairment) related to the core curriculum (especially literacy) that are based on their unique needs, which transcend the effects of each individual disability.
3. Recommend appropriate educational and environmental adaptations, including access technologies, for students with concomitant disabilities (including a visual impairment) related to the expanded core curriculum that are based on their unique needs, which transcend the effects of each individual disability.
4. Choose specialized assessment tools appropriate for learners with visual impairments and additional disabilities.
5. Summarize special considerations related to eligibility determination, educational placement, and service delivery models for students with visual impairments and additional disabilities.
6. Describe special considerations related to effective collaboration with educators, related service providers, educational assistants, community agencies, and families of students with visual impairments and additional disabilities

SPED 5430. Braille I: Literacy for Students with Visual Impairments
3 Credits (3)
This course facilitates an in depth study of the Uncontracted and Contracted Literary Braille codes as well as methods of teaching pre-braille, braille reading, and braille writing skills to tactual learners. Consent of Instructor required. May be repeated up to 3 credits.
Prerequisite: SPED 5450.
Learning Outcomes
1. Transcribe print content into Unified English Braille following appropriate formatting rules.
2. Read, interline, and proof materials transcribed in Unified English Braille.
3. Read, interline, and proof materials produced in English Braille American Edition.
4. Transcribe, print content into a foreign language using the appropriate braille code.
5. Read, interline, and proof materials produced in foreign language braille.
6. Transcribe a simple score in music braille.
7. Read and interline a simple score in music braille.
8. Produce braille materials using various tools, including a Perkins Brailler, slate and stylus, and six-key keyboard entry.
9. Delineate the ways that congenital and adventitious visual impairments impact literacy and the unique instructional strategies used with each of these groups. 1
10. Identify pre-braille activities that develop essential tactual, motor, and reading readiness skills. 1
11. Compare language arts and braille curricula/assessments for different types of tactual learners. 1
12. Identify sources for obtaining braille resources, services and supports

SPED 5440. Braille II: Numeracy for Students with Visual Impairments
3 Credits (3)
This course facilitates an indepth study of the Nemeth Braille Code for Mathematics and Science Notation as well as instructional strategies for using the abacus and developing numeracy. Specialized braile codes for computers, music, and foreign languages will be introduced. Consent of Instructor required. May be repeated up to 3 credits.
Prerequisite: SPED 5430.
Learning Outcomes
1. Transcribe mathematical and scientific notation into Nemeth Braille following appropriate rules.
2. Read, and proof materials transcribed in Nemeth Braille
3. Transcribe, print content into a foreign language using the appropriate braille code.
4. Read, interline, and proof materials produced in foreign language braille.
5. Transcribe a simple score in music braille.
6. Read and interline a simple score in music braille.
7. Produce braille materials, including tactile graphics, using various tools, including a Perkins Brailler, six-key keyboard entry, braille translation software, and tactile graphics.
8. Create different task analysis on computational steps for solving problems with the Cranmer abacus using both the counting and indirect methods for beginning abacus users and aligning them to numeracy standards.
9. Delineate the ways that visual impairment impacts literacy and numeracy and describe adapted instructional and assessment materials and resources that make math meaningfully accessible. 1
10. Delineate the ways that visual impairment impacts scientific understandings and describe adapted instructional and assessment materials and resources that make science and social studies meaningfully accessible. 1
11. Delineate the ways that visual impairment impacts understanding of health and sexuality and describe adapted instructional and assessment materials and resources that make health and sex education meaningfully accessible

SPED 5450. Strategies for Teaching Students with Visual Impairments
3 Credits (3)
This course covers individualized educational programming in both the core and expanded core curriculums for children and youth with visual impairments with an emphasis on assessment, curricular adaptions, IFSP/IEP/ITP planning, and evidence-based practices. Restricted to: SPED majors. Consent of Instructor required. May be repeated up to 3 credits.
Prerequisite: SPED 5410.
Learning Outcomes
1. The learner will analyze core curriculum standards and benchmarks in order to determine necessary instruction in the expanded core curriculum so that learners with visual impairments can meaningfully participate in the common core curriculum.

2. The learner will describe professional roles and ethical responsibilities of the teacher of students with visual impairments in relation to effective collaboration with all members of the educational team (particularly families, para educators, and general educators).
3. The learner will select, adapt, and use appropriate assessments for determining effective and efficient primary and secondary learning modalities, literacy media, and access technologies needed for reading and writing.
4. The learner will follow legal, ethical, and technical procedures while conducting learning media assessments and access technology evaluations, reporting findings, and making recommendations regarding necessary educational services and supports.
5. The learner will demonstrate the procurement and use of different access technologies needed to make educational materials and learning activities accessible to learners with visual impairments

SPED 5460. Introduction to Orientation and Mobility
3 Credits (3)
This course provides an overview of the history and theory of formalized orientation and mobility instruction as it relates to the ability to live independently. The impact of visual impairment and concomittant impairments on the development of spatial concepts and motor skills in relation to independent locomotion is emphasized. Topics covered include mobility aids; navigation, familiarization, and protective techniques; structured pre-cane assessment and instruction; the development and use of tactual maps; and the relationship of orientation and mobility to other areas of the expanded core curriculum. Consent of Instructor required. Restricted to: SPED,EDUC majors. Consent of Instructor required. May be repeated up to 3 credits.
Prerequisite: SPED 5420.
Learning Outcomes
1. Describe components of orientation and mobility, the role of the certified orientation and mobility specialist, and the role of the teacher of students with visual impairments/developmental vision specialist in teaching travel skills to students who are blind and visually impaired, including those with additional disabilities.
2. Describe significant historical events and legal provisions related to the formalized profession of orientation and mobility and how this affects the provision of orientation and mobility services.
3. Identify the pros, cons, and prerequisite skills related to different modes of mobility and use of different mobility aids and transportation systems.
4. Describe the impact of impaired vision on cognitive, motor, language, social, and self-help skills and effective interventions that promotes the development of independent locomotion and personal autonomy.
5. Execute (and teach the execution of) basic orientation and mobility techniques under conditions that simulate various degrees of visual and additional impairments using all available sensory information (with and without optical aids) in a variety of environments.
6. Task analyze and adapt activities of daily living to allow individuals with visual impairments to lead productive and healthy lifestyles.
7. Identify sources of adapted products and specialized assessments related to the Expanded Core Curriculum that facilitate participation in home, work, and community activities for employment, self-care, and leisure

SPED 5470. Beginning Orientation and Mobility
3 Credits (3)
This course provides an overview of the profession of orientation and mobility and how sensory, motor, and psychosocial function affects movement and spatial orientation. Consent of Instructor required. Restricted to: SPED majors. May be repeated up to 3 credits.
Prerequisite: SPED 5460.
Learning Outcomes
1. Describe how perception and movement develops and is used to enhance safe and independent travel
2. Describe how a traveler is able to acquire, maintain and improve orientation
3. Describe the most common functional mobility problems for students with low vision and what a COMS should consider when providing OM instruction to students with low vision.
4. Describe how development impacts movement and describe issues that impact gait and posture. Describe ways to support and improve sensorimotor development.
5. Describe the psychosocial factors that impact behavior as one learns how to travel and describe ways to teach travelers to deal with
6. Describe the fundamentals of hearing including principles of sound, audition, localization and traffic sounds. Describe ways to develop and improve orientation using hearing
7. Describe the origins of the OM profession and its progression into the present, how OM services are provided around the world and the fundamentals of research in the profession.
8. Evaluate and synthesize literature (publications, research literature) on a selected topic of their choice

SPED 5480. Intermediate Orientation and Mobility
3 Credits (3)
This course focuses on strategies and methods for conducting assessments and appropriately sequencing skill acquisition for learners across the lifespan who may or may not have additional disabilities. Adaptive technology and other aids that assist with travel in a variety of environmental conditions using different mobility systems will also be covered. Consent of Instructor required. Restricted to: SPED majors. May be repeated up to 3 credits.
Prerequisite: SPED 5470.
Learning Outcomes
1. Determine how to modify orientation and mobility instruction, depending on the age of the students, in the following ways: A) describe ways to teach OM to very young children; B) describe ways to teach OM to school age children; C) describe ways to teach OM to adults; and D) describe ways to teach OM to older adults.
2. Demonstrate an understanding of mobility systems and adaptations used by blind and visually impaired travelers in the following ways: A) describe how adaptive technology is used in travel; B) describe how dog guides are used in travel; C) describe orientation aids that can be used for students with vision loss; D) describe issues around environmental accessibility for student with vision loss; and E) describe how to teach OM in adverse weather conditions
3. Demonstrate understanding of how to teach OM to students who have different disabilities in the following ways: A) describe ways to teach OM to learners with vision and hearing loss; B) describe ways to teach OM to learners with vision, physical and health impairments; C) describe ways to teach OM to learners with cognitive impairments and vision loss; D) describe ways to teach OM to learners with cortical visual impairments; and E) describe how to teach travel skills to learners with nonvisual disabilities
4. Conduct an OM assessment and teach OM in the following ways: A) describe the components of a comprehensive OM assessment; B) describe creative ways to provide OM instruction; C) describe

theories and best practices for teaching orientation and mobility; and D) describe ways to teach concepts creatively

SPED 5490. Advanced Orientation and Mobility
3 Credits (3)
This course focuses on the development and monitoring of cane skills needed for safe and efficient travel in indoor, residential, and business districts, including the use of public transportation systems. Development, administration, and supervision of orientation and mobility services is also covered. Consent of Instructor required. Restricted to: SPED majors. May be repeated up to 3 credits.
Prerequisite: SPED 5480.
Learning Outcomes
1. Use orientation and mobility techniques to travel independently, safely and efficiently in a variety of environments including indoor, residential, small business and business areas while blindfolded or under low vision simulator.
2. Provide appropriate and safe orientation and mobility instruction to fellow students, who are blindfolded or wearing low vision simulators, while traveling in indoor, residential, small business and business areas
3. Describe modifications to traditional OM techniques for diverse learners of various ages with different degrees of visual functioning and with a variety of additional disabilities
4. Use public transportation while blindfolded or under low vision simulatorand provide instruction to fellow students who are blindfolded or wearing low vision simulators in the use of public transportation
5. Critically analyze one's teaching and monitoring through self-observation and reflective practices

SPED 5810. Student Teaching SPED
6 Credits (6)
Culminating course required for graduate level students seeking initial licensure. Students must have completed a Bachelor's degree and be admitted to student teaching program to enroll. Restricted to: SPED majors.
Prerequisite: SPED 5811.
Learning Outcomes
1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

SPED 5811. Field Experience in Education, Equity & Cultural Diversity
3 Credits (3)
This is a supervised experience in providing special education services to local preK-12 students. In the context of the public school classroom, teacher candidates are guided to apply content knowledge from the seminar meetings and from prior coursework. This experience is designed for both the practicing general education classroom teacher pursuing special education licensure and for graduate teacher candidates pursuing initial special education licensure. Restricted to: SPED majors.
Prerequisite: SPED 3105 and SPED 3120, or SPED 5105 and SPED 5230, or consent of instructor.
Learning Outcomes
1. Learners will demonstrate critical thinking skills and critical reflection and use current special education research to make and evaluate instructional decisions across the full range of learning tasks (including identifying appropriate learning objectives, selecting methods and materials, assessing student progress in relation to learning objectives, making classroom management decisions, and evaluating the results of decisions and implementation of lessons).
2. Learners will create access to grade level general education curriculum for a broad range of students with diverse learning needs. This will be accomplished by using grade level standards and extended standards (as appropriate), following the requirements expressed in IEP's, and designing and implementing appropriate instruction that addresses students' needs, learning styles, motivation, and cultural and linguistic differences. Universal design, differentiation, accommodation, and modification will be used to address diverse learning needs.
3. Learners will further develop, refine, and demonstrate the dispositions necessary to enter student teaching, with the ultimate goal of entering and advancing the teaching profession. This includes a) building rapport, positive communication, and a cooperative work environment with students, families, teachers, supervisors, instructors, educational/instructional assistants, service providers, and others in the school community b) demonstrating respectful and responsive attitudes toward individuals with exceptionalities from diverse backgrounds, as well as their families and service providers c) demonstrating responsible task performance d) adhering to the CEC code of ethics and university/site policies and procedures.
4. Learners will select and use appropriate technology to support student learning.
5. Learners will apply knowledge of the historical background and current laws and procedures within the field of special education to contextualize, explain, and evaluate special education services.

SPED 5820. Masters Degree Seminar
3 Credits (3)
Capstone review of current issues in special education. Each student will participate in a practice comprehensive oral exam. May be repeated up to 3 credits.
Learning Outcomes
1. Varies

SPED 5830. Special Education/Elementary Student Teaching Seminar
3 Credits (3)
Discussion of elementary Special Education school issues related to student teaching.
Prerequisite: SPED 5811.
Corequisite: SPED 5810.
Learning Outcomes
1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage

positive social interaction, active engagement in learning, and self-motivation.

SPED 5840. Special Education/Secondary Student Teaching Seminar
3 Credits (3)
Discussion of secondary Special Education school issues related to student teaching.
Prerequisite: SPED 5811.
Corequisite: SPED 5810.
Learning Outcomes
1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

SPED 5850. Current Research in Special Education
3 Credits (3)
Current investigations and research techniques. May be repeated up to 3 credits.
Learning Outcomes
1. Evaluate current research in special Education.
2. Read and evaluate original research articles published in peer reviewed academic journals.
3. Describe the elements of research.
4. Analyze the designs, methods, and applications of quantitative research in special education
5. Analyze the designs, methods, and applications of qualitative research in special education
6. Examine ethical issues and guidelines for conducting special education research.
7. Evaluate the elements of a research proposal.

SPED 5860. Current Issues in Special Education for Teaching in Culturally Responsive Society
3 Credits (3)
Theoretical and empirical bases for special education practices. Skill development in critical thinking, reading, and writing in relation to contemporary problems. Taught with SPED 6860. May be repeated up to 3 credits.
Learning Outcomes
1. Students will learn several concepts, issues, and theories in contemporary special education in order to be a more intelligent consumer of information about special education.
2. Students will analyze, evaluate, and make decisions concerning complex contemporary issues in special education.
3. Students will demonstrate communications skills, both written and oral, in order to enhance their effectiveness in expressing their view on the issues related to special education.
4. Students will examine issues related to the human experience as it relates to diversity and a culturally and linguistically diverse world.
5. Students will debate the pros and cons of current special education issues

SPED 5870. Early Childhood SPED Student Teaching
6 Credits (6)
A student teaching experience designed for students studying early childhood special education. Restricted to TEP-ECED majors. Students must be admitted to student teaching to enroll. May be repeated up to 9 credits.
Learning Outcomes
1. Our mission is to serve the people of New Mexico through education, research, extension education, and public service with specific emphasis on innovative practices, overcoming barriers to learning, international activities, technology, and literacy for the diverse populations of New Mexico, surrounding states and border communities.

SPED 5990. Practicum in Reading Disabilities
3 Credits (3)
Supervised experience in assessing a student with reading disability, developing and intervention plan, and implementing and monitoring the interventions across time. May be repeated up to 3 credits.
Learning Outcomes
1. Varies

SPED 5991. Special Research Problems
1-3 Credits (1-3)
Individual investigation either analytical or experimental. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

SPED 5996. Topics in Special Education
1-3 Credits (1-3)
Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

SPED 5999. Master's Thesis
1-15 Credits (1-15)
Thesis. May be repeated up to 88 credits.
Learning Outcomes
1. Varies

SPED 6110. Low Incidence Disabilities
3 Credits (3)
Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations. Taught with SPED 5110 with differentiated assignments. May be repeated up to 3 credits.
Learning Outcomes
1. Analyze Low Incidence Disabilities (characteristics, etiology, and diagnostic criteria) (IDEIA, 2004).
2. Identify the types of related supports and services—assistive technology, environmental and Instructional accommodations/modifications, and related services—available to students with low incidence disabilities to maximize participation in inclusive settings.
3. Apply culturally responsive instructional practices to individualize learning for learners with low incidence disabilities, taking into consideration individual abilities, interests, learning environments,

and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences of learners with low incidence disabilities in inclusive environment.
4. Employ culturally responsive strategies for creating effective family, school, community partnerships.
5. Discuss culturally responsive strategies that promote collaboration between families, schools, and community agencies/organizations during the student's transition planning process.
6. Identify current educational issues impacting students with low incidence disabilities.

SPED 6120. High Incidence Disabilities in a Diverse Society
3 Credits (3)
Examines those areas of disability that most frequently occur in the special education population, including mental retardation, learning disabilities, communication disorders, and behavioral and emotional disorders. Taught with SPED 5120. Master's Degree. Restricted to SPED and C D majors. May be repeated up to 3 credits.
Learning Outcomes
1. Describe and compare the major approaches to identifying, placement, assessing, planning for instruction, and classifying high incidence disabilities.
2. Identify and discuss school-based, sociological, cultural, and economic differences as they relate to etiology and identification of mild disabilities.
3. Describe and critically evaluate classroom instructional practices that can improve the educational success of students with high incidence disabilities.
4. Describe and critically evaluate classroom management practices that can improve the educational success of students with high incidence disabilities.
5. Describe how the educational experiences of persons with mild disabilities is shaped by their cognitive, perceptual, language, academic, and social / emotional characteristics.

SPED 6160. Technology and Exceptionality in a Diverse Society
3 Credits (3)
This class will address the unique educational needs of learners with exceptionalities, and will provide information and practice in addressing those needs through the use of technology-based interventions. Taught with SPED 5160.
Learning Outcomes
1. Carry out effective practicum practices for using technology with diverse learners.

SPED 6170. School Intervention and Organization in a Diverse Society
3 Credits (3)
Introduces public school organization and laws and the psycho-sociological perspective of education. Curriculum and theory, teaching methods and materials will be presented and operationalized through a psycho-educational point of view. May be repeated up to 3 credits.
Learning Outcomes
1. Understand and implement effective interventions in a variety of classroom and organizational settings.

SPED 6310. Introduction to Autism
3 Credits (3)
This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Differentiated Assignments.Taught with SPED 5310 and SPED 4310. May be repeated up to 3 credits.
Learning Outcomes
1. Analyze Autism Spectrum Disorders ASD (characteristics, etiology, co-morbid conditions, differential diagnosis).
2. Describe the criteria used to screen and diagnose ASD.
3. Examine evidence-based practices used to effectively support students with ASD in accessing general education and grade level standards (classroom structure, differentiated instruction, peer mediated supports, structured teaching, and emotional supports).
4. Describe strategies related to promoting a successful transition from school to adult life for individuals with ASD.
5. Examine the strategies for effective collaboration and communication with families of children with ASD and key stakeholders for the purpose of information sharing and collaborative planning with families.
6. Identify and investigate current educational issues impacting students with ASD.

SPED 6330. Social Skills and Autism
3 Credits (3)
This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 4330 and SPED 5330 with differentiated assignments. May be repeated up to 3 credits.
Prerequisite/Corequisite: SPED 4310 or SPED 5310 or SPED 6310.
Learning Outcomes
1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate Social Skills characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess Social Skills problems in children with ASD.
4. Use assessment results to identify the Social Skills needs of children with ASD
5. Analyze the types of evidence-based practices used to address the Social Skills needs of children with ASD.
6. Design an intervention plan to address the Social Skills needs of a child with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.
8. Employ data collection procedures to evaluate the effectiveness of evidence-based practices for students with ASD.

SPED 6340. Communication and Autism
3 Credits (3)
This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 4340 and SPED 5340 and differentiated assignments. May be repeated up to 3 credits.

Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate communication characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess communication problems in children with ASD.
4. Analyze the types of interventions used to address the communication needs of children with ASD.
5. Design an intervention plan to address the communication needs of a child with ASD.
6. Employ data collection procedures to evaluate the effectiveness of research-based interventions for students with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.

SPED 6810. Doctoral Seminar
1-4 Credits (1-4)
The seminar will engage doctoral students in scholarly dialogue and production. It will assist in preparing them for future careers in leadership roles. May be repeated up to 4 credits.

Learning Outcomes

1. Varies

SPED 6830. Current Research in Special Education
3 Credits (3)
Required for students seeking the Ed.D./Ph.D. M.A. degree. Restricted to majors. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate current research in special Education.
2. Read and evaluate original research articles published in peer reviewed academic journals.
3. Describe the elements of research.
4. Analyze the designs, methods, and applications of quantitative research in special education
5. Analyze the designs, methods, and applications of qualitative research in special education
6. Examine ethical issues and guidelines for conducting special education research.
7. Evaluate the elements of a research proposal.

SPED 6840. Current Issues in Special Education for Teaching in a Culturally Responsive Society
3 Credits (3)
Required for students seeking the Ed.D./Ph.D. May be repeated up to 3 credits.

SPED 6991. Doctoral Research
1-15 Credits (1-15)
Research. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

SPED 6996. Selected Topics in Special Education
1-6 Credits (1-6)
Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

SPED 6997. Independent Study Topics in Special Education
1-6 Credits (1-6)
A problem and seminar course for those pursuing an advanced graduate degree. Each course to bear an appropriate subtitle. May be repeated up to 99 credits.

Learning Outcomes

1. Varies

SPED 6998. Internship in Special Education
1-6 Credits (1-6)
Each course bears a qualifying subtitle. Maximum of 6 credits per semester. May be repeated up to 99 credits.

SPED 7000. Dissertation
1-9 Credits (1-9)
Credit may be earned by students who have successfully completed their doctoral comprehensive exams and presented their dissertation proposals to their committees. At least 18 credits are required during the course of dissertation study. May be repeated up to 24 credits.

Learning Outcomes

1. Varies

Name: School of Teacher Preparation, Administration and Leadership (TPAL)

Office Location: O'Donnell Hall, Suite 302

Mailing Address: P.O. Box 30001, MSC 3TPAL, Las Cruces, NM 88003

Physical Mailing Address: 1220 Stewart Street; O'Donnell Hall Rm 302, Las Cruces, NM 88003

Phone: (575) 646-3825 / 646-4820

Email: schooloftpal@nmsu.edu

Website: http://tpal.nmsu.edu (https://tpal.nmsu.edu/)

Applied Studies (Zero-to-Four (Early Childhood)) - Bachelor of Applied Studies

There is an identified need for prepared educators to serve young children birth to four years of age in settings outside of the public school in childcare centers, Head Start, and other agencies. The School of Teacher Preparation, Administration, and Leadership offers a non-licensure concentration, with the Bachelor of Applied Studies degree for the Zero to Four years old early childhood track. This non-licensure concentration serves private and public childcare, early intervention programs, and Head Start.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. All ECED courses must be successfully completed with a grade of C- or better. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2221G	Writing in the Humanities and Social Science	3
Oral Communication		
Choose one from the following:		3
COMM 1130G	Public Speaking	
COMM 1115G	Introduction to Communication	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 2134G	Fundamentals of Elementary Math II	3
Area III/IV: Laboratory Sciences and Social Behavioral Sciences		
CEPY 1120G	Human Growth and Behavior	3
Choose two for a total of 8 credits (must be from two different areas) [1]		8
ASTR 1120G	The Planets Lecture & Laboratory	
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 1190G	Contemporary Problems in Biology	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
ENVS 1110G	Environmental Science I	
GEOG 1110G	Physical Geography	
GEOL 1110G	Physical Geology	
or HNRS 2116G	Earth, Time and Life	
PHYS 1115G	Survey of Physics with Lab	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1125G	Physics of Music	
Area V: Humanities		
Choose one from the following:		3
ENGL 1410G	Introduction to Literature	
ENGL 2520G	Film as Literature	
ENGL 2310G	Introduction to Creative Writing	
ENGL 2650G	World Literature I	
HIST 1130G	World History I	
or HIST 1140G	World History II	
HIST 1160G	Western Civilization II	
HIST 1110G	United States History I	
or HIST 1120G	United States History II	
HIST 2250G	East Asia to 1600	
or HIST 2251G	East Asia since 1600	
HIST 2245G	Islamic Civilizations to 1800	
PHIL 1145G	Philosophy, Law, and Ethics	
PHIL 1115G	Introduction to Philosophy	
PHIL 1140G	Philosophy and World Religions	
PHIL 2230G	Philosophical Thought	
PHIL 1120G	Logic, Reasoning, & Critical Thinking	
Area VI: Creative and Fine Arts		
Choose one from the following:		3
ARTH 1115G	Orientation in Art	
ARTS 1145G	Visual Concepts	
DANC 1110G	Dance Appreciation	
MUSC 1130G	Music Appreciation: Western Music	
MUSC 1110G	Music Appreciation: Jazz	
THEA 1110G	Introduction to Theatre	
General Education Elective		
Choose one additional Area V: Humanities Course from the list above		3
Viewing A Wider World [2]		**6**
School of TPAL/College Requirements		
ECED 1110	Child Growth, Development, and Learning	3
ECED 1115	Health, Safety, and Nutrition	2
ECED 1130	Family and Community Collaboration	3
ECED 2115	Introduction to Language, Literacy, and Reading	3
ECED 1125	Assessment of Children and Evaluation of Programs	3
ECED 1120	Guiding Young Children	3
EDUC 3120	Multicultural Education	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
ECED Courses for Major:		
ECED 2120	Curriculum Development through Play Birth through Age 4 (PreK)	3
ECED 2121	Curriculum Development through Play Birth through Age 4 (PreK) Practicum	2
ECED 2130	Curriculum Development and Implementation Age 3 (PreK) through Grade 3	3
ECED 2131	Curriculum Development and Implementation Age 3 (PreK) through Grade 3 Practicum	2
ECED 2110	Professionalism	2
ECED 3110	Research in Child, Growth, Development and Learning (Spring only)	3
ECED 3120	Family, Language, and Culture (Spring only)	3
ECED 3210	Emergent Literacy (Summer only)	3
ECED 4210	Integrated Early Childhood Curriculum (Fall only)	4
ECED 4211	Integrated Curriculum Practicum (Fall only)	2
ECED 4110	Young Children with Diverse Abilities (Spring only)	3
ECED 4120	Assessment of Young Children, Birth-Eight (Spring only)	3
ECED 4220	Advanced Caregiving for Infants and Toddlers (Summer only)	3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 1134	Fundamentals of Elementary Mathematics I (MATH 1215 is prerequisite)	3
Choose two courses from the following:		6
ANTH 1115G	Introduction to Anthropology	
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
GEOG 1120G	World Regional Geography	
or GEOG 1130G	Human Geography	

POLS 1120G	American National Government	
or POLS 1110G	Introduction to Political Science	
SOCI 1110G	Introduction to Sociology	
GNDR 2110G	Introduction to Women, Gender, and Sexuality Studies	
or GNDR 2120G	Representing Women Across Cultures	
Second Language: (required)		**0-8**
Spanish or Sign-Language preferred [3]		
Electives, to bring the total credits to 120 [4]		**5-13**
Electives: Minimum of 6 upper division (300-400) elective credits		
Total Credits		**120**

1 See the General Education (p. 262) section of the catalog for a full list of courses

2 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

3 All ECED (Non-Licensure) majors must complete two semesters of language courses, preferably American Sign Language or Spanish. (However, if students have fluency in an Indigenous language or wish to take something different than Spanish or Sign Language, please see Director of ECED for permission and/or process).

4 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1134 Fundamentals of Elementary Mathematics I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
CEPY 1120G	Human Growth and Behavior	3
ECED 1110	Child Growth, Development, and Learning	3
ECED 1115	Health, Safety, and Nutrition	2
First Course in Second Language Series		3-4
	Credits	**15-16**
Semester 2		
MATH 1134	Fundamentals of Elementary Mathematics I [1]	3
ECED 1130	Family and Community Collaboration [1]	3
Area IV: Social and Behavioral Science Course for the Requirements tab [3]		3
Area V: Humanities Course [2]		3
Next Course in Second Language Series [1]		3-4
	Credits	**15-16**
Second Year		
Semester 1		
ENGL 2221G	Writing in the Humanities and Social Science [1]	3
MATH 2134G	Fundamentals of Elementary Math II [1]	3
ECED 2115	Introduction to Language, Literacy, and Reading	3
ECED 1125	Assessment of Children and Evaluation of Programs	3
Area III: Laboratory Science Course [1]		4
	Credits	**16**
Semester 2		
ECED 2120 & ECED 2121	Curriculum Development through Play Birth through Age 4 (PreK) and Curriculum Development through Play Birth through Age 4 (PreK) Practicum	5
ECED 1120	Guiding Young Children	3
An additional Area V: Humanities Course [2]		3
Area VI: Fine Arts Course [2]		3
Area III: Laboratory Sciences Course [2]		4
	Credits	**18**
Third Year		
Semester 1		
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
EDUC 3120	Multicultural Education	3
ECED 2130 & ECED 2131	Curriculum Development and Implementation Age 3 (PreK) through Grade 3 and Curriculum Development and Implementation Age 3 (PreK) through Grade 3 Practicum	5
ECED 2110	Professionalism	2
Upper-Division Elective Course		3
	Credits	**16**
Semester 2		
SPED 3105	Introduction to Special Education in a Diverse Society	3
VWW: Viewing a Wider World Course [4]		3
Area IV: Social/Behavioral Sciences Course from the Requirements tab [3]		3
Upper-Division Elective Course		3
Elective course		1
	Credits	**13**
Fourth Year		
Summer		
ECED 4220	Advanced Caregiving for Infants and Toddlers (Summer only)	3
ECED 3210	Emergent Literacy (Summer only))	3
	Credits	**6**
Semester 1		
Fall Semester		
ECED 4210	Integrated Early Childhood Curriculum (Fall only)	4
ECED 4211	Integrated Curriculum Practicum (Fall only)	2
Students who need to enroll in 15 credits for Financial Aid purposes will need to take additional electives		
	Credits	**6**
Semester 2		
Spring Semester		
ECED 3110	Research in Child, Growth, Development and Learning (Spring only)	3
ECED 3120	Family, Language, and Culture (Spring only)	3

ECED 4110	Young Children with Diverse Abilities (Spring only)	3
ECED 4120	Assessment of Young Children, Birth-Eight (Spring only)	3
VWW: Viewing a Wider World Course [4]		3
	Credits	**15**
	Total Credits	**120-122**

[1] These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

[2] See the General Education (p. 262) section of the catalog for a full list of courses.

[3] **Area IV: Social/Behavioral Sciences Courses:**

- ANTH 1115G Introduction to Anthropology
- ECON 1110G Survey of Economics
- ECON 2110G Macroeconomic Principles
- ECON 2120G Principles of Microeconomics Honors
- GEOG 1120G World Regional Geography
- GEOG 1130G Human Geography
- POLS 1120G American National Government
- POLS 1110G Introduction to Political Science
- GNDR 2110G Introduction to Women, Gender, and Sexuality Studies
- GNDR 2120G Representing Women Across Cultures

[4] See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Early Childhood Education - Bachelor of Science in Education

All students wishing to complete a degree in Early Childhood Education (licensure track) must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of Health, Education, and Social Transformation Educational Support and Resource Center or on the departmental websitehttps://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ece.html. A 2.75 minimum GPA is required for admission to the Teacher Education Program and graduation. Students must pass ENGL 1110G Composition I, ENGL 2221G Writing in the Humanities and Social Science, Area II, Prerequisite courses, and Early Childhood Core courses with a grade of C- or better.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 122 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2221G	Writing in the Humanities and Social Science	3
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 2134G	Fundamentals of Elementary Math II	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CEPY 1120G	Human Growth and Behavior	
Area III: Laboratory Science Courses(must be from two different areas), for 8 credits:		
Area V: Humanities		
Choose one of the following		*3*
HIST 1130G	World History I	
HIST 1140G	World History II	
HIST 1150G	Western Civilization I	
HIST 1160G	Western Civilization II	
Area VI: Creative and Fine Arts		
Choose one from the following:		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
General Education Elective		
HIST 1110G	United States History I	3
or HIST 1120G	United States History II	
Viewing a Wider World Courses (from two different colleges) [1]		**6**
School of TPAL Requirements		
Professional Education Courses		
ECED 1110	Child Growth, Development, and Learning [2]	3
ECED 1115	Health, Safety, and Nutrition [2]	2
ECED 1130	Family and Community Collaboration [2]	3
ECED 2115	Introduction to Language, Literacy, and Reading [2]	3
ECED 1125	Assessment of Children and Evaluation of Programs [2]	3
ECED 1120	Guiding Young Children [2]	3
EDUC 3120	Multicultural Education [2,3]	3
EDLT 3110	Integrating Technology with Teaching [2]	3
SPED 3105	Introduction to Special Education in a Diverse Society [2]	3
Early Childhood Core Courses		
ECED 2120	Curriculum Development through Play Birth through Age 4 (PreK) [2]	3
ECED 2121	Curriculum Development through Play Birth through Age 4 (PreK) Practicum	2
ECED 2130	Curriculum Development and Implementation Age 3 (PreK) through Grade 3	3
ECED 2131	Curriculum Development and Implementation Age 3 (PreK) through Grade 3 Practicum	2
ECED 2110	Professionalism	2
ECED Spring Block		
ECED 3110	Research in Child, Growth, Development and Learning	3
ECED 3120	Family, Language, and Culture	3
ECED 4110	Young Children with Diverse Abilities [4]	3

ECED 4120	Assessment of Young Children, Birth-Eight [4]	3
ECED Teaching Methods Fall Block		
ECED 4310	Early Primary Field Placement [4]	2
ECED 4250	Teaching and Learning Math and Science [4]	4
ECED 4260	Teaching and Learning Social Studies, Fine Arts and Movement [4]	3
ECED 4320	Teaching and Learning Reading and Writing [4]	3
Student Teaching		
ECED 4810	Student Teaching/Seminar Early Childhood	3
SPED 4810	Early Childhood SPED Student Teaching	9
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 1134	Fundamentals of Elementary Mathematics I	3
Choose two courses from the following for additional licensure requirements:		6
ANTH 1115G	Introduction to Anthropology	
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
GEOG 1120G or GEOG 1130G	World Regional Geography Human Geography	
POLS 1120G or POLS 1110G	American National Government Introduction to Political Science	
SOCI 1110G	Introduction to Sociology	
Electives, to bring the total credits to 122		**0**
Total Credits		**122**

1 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
2 Courses are pre/corequisites for Teacher Education Program (TEP)
3 EDUC 3120 Multicultural Education must be taken prior to TEP portfolio submission.
4 Courses require admission to the TEP

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1215 Intermediate Algebra and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
ECED 1110	Child Growth, Development, and Learning	3
ECED 1115	Health, Safety, and Nutrition	2
Area VI: Creative and Fine Arts Course [2]		3
Licensure Required: Social and Behavioral Science Course [3]		3
	Credits	**15**
Semester 2		
MATH 1134	Fundamentals of Elementary Mathematics I [1]	3
CEPY 1120G	Human Growth and Behavior	3
HIST 1110G or HIST 1120G	United States History I or United States History II	3
ECED 1130	Family and Community Collaboration	3
Licensure Required: Social and Behavioral Science Course [3]		3
	Credits	**15**
Second Year		
Semester 1		
ENGL 2221G	Writing in the Humanities and Social Science [1]	3
MATH 2134G	Fundamentals of Elementary Math II [1]	3
ECED 2115	Introduction to Language, Literacy, and Reading	3
ECED 1125	Assessment of Children and Evaluation of Programs	3
Area III: Laboratory Science Course [2]		4
	Credits	**16**
Semester 2		
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
ECED 2120	Curriculum Development through Play Birth through Age 4 (PreK)	3
ECED 2121	Curriculum Development through Play Birth through Age 4 (PreK) Practicum	2
ECED 1120	Guiding Young Children	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
EDUC 3120	Multicultural Education	3
	Credits	**17**
Third Year		
Semester 1		
APPLY TO TEACHER EDUCATION PROGRAM (TEP)		
HIST 1130G or HIST 1140G	World History I or World History II	3
ECED 2130	Curriculum Development and Implementation Age 3 (PreK) through Grade 3	3
ECED 2131	Curriculum Development and Implementation Age 3 (PreK) through Grade 3 Practicum	2
EDLT 3110	Integrating Technology with Teaching	3
ECED 2110	Professionalism	2
Area III: Laboratory Science Course [2]		4
	Credits	**17**
Semester 2		
APPLY TO STUDENT TEACHING		
ECED 3110	Research in Child, Growth, Development and Learning (Spring Only)	3
ECED 3120	Family, Language, and Culture (Spring Only)	3
ECED 4110	Young Children with Diverse Abilities (Spring Only)	3
ECED 4120	Assessment of Young Children, Birth-Eight (Spring Only)	3
VWW: Viewing a Wider World Course [4]		3
	Credits	**15**
Fourth Year		
Semester 1		
SUBMIT STEP PACKET		
ECED 4250	Teaching and Learning Math and Science (Fall Only)	4
ECED 4260	Teaching and Learning Social Studies, Fine Arts and Movement (Fall Only)	3
ECED 4320	Teaching and Learning Reading and Writing (Fall Only)	3
ECED 4310	Early Primary Field Placement (Fall Only)	2

VWW: Viewing a Wider World Course [4]		3
	Credits	**15**
Semester 2		
ECED 4810	Student Teaching/Seminar Early Childhood	3
SPED 4810	Early Childhood SPED Student Teaching	9
	Credits	**12**
	Total Credits	**122**

1 These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

3 Additional Social/Behavioral Science Courses to fulfill licensure requirements, choose from the following courses:

- ANTH 1115G Introduction to Anthropology
- ECON 1110G Survey of Economics
- ECON 2110G Macroeconomic Principles
- ECON 2120G Principles of Microeconomics Honors
- GEOG 1120G World Regional Geography
- GEOG 1130G Human Geography
- POLS 1110G Introduction to Political Science
- POLS 1120G American National Government
- SOCI 1110G Introduction to Sociology

4 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Elementary Education (Language Arts K-8) - Bachelor of Science in Education

General education and professional education are similar for all degree programs in the College of Health, Education, and Social Transformation (HEST). The B.S. Elementary Education degree embeds the Language Arts Teaching Field/Concentration and the Bilingual/TESL endorsements. ***Note: For certification in the State of New Mexico the Bilingual/TESL endorsements require 6 credits of a language other than English.*** Additional teaching fields/concentrations in Social Studies, Science, and Math are available but will require credits beyond 120. Students should meet with the College's Educational Support and Resource Center to discuss additional teaching fields/concentration requirements.

All students wishing to complete a degree in Elementary Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of HEST Educational Support and Resource Center or the departmental website (https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ece.html). A 2.75 minimum GPA is required for admission to the Teacher Education Program, and a 2.75 minimum GPA must be maintained for graduation. *Students must earn a "C-" or better in all education, TEP prerequisite, endorsement, and teaching field courses.*

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, it but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Courses		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I [2]	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2221G	Writing in the Humanities and Social Science [1, 2]	3
or ENGL 2130G	Advanced Composition	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication [1]	
COMM 1130G	Public Speaking [1]	
HNRS 2175G	Introduction to Communication Honors [1]	
Area II: Mathematics		
MATH 2134G	Fundamentals of Elementary Math II [2]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
Area III: Laboratory Sciences Course [3]		
Choose two different subjects from the following:		8
ASTR 1120G	The Planets Lecture & Laboratory	
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 1120G	Human Biology	
BIOL 1190G	Contemporary Problems in Biology	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
ENVS 1110G	Environmental Science I	
GEOL 1110G	Physical Geology	
or HNRS 2116G	Earth, Time and Life	
GEOG 1110G	Physical Geography	
PHYS 1115G	Survey of Physics with Lab	
PHYS 1230G	Algebra-Based Physics I	
PHYS 1230L	Algebra-Based Physics I Lab	
PHYS 1240G	Algebra-Based Physics II	
PHYS 1240L	Algebra-Based Physics II Lab	
Area IV: Behavioral Sciences		
CEPY 1120G	Human Growth and Behavior	3
Area V: Humanities		
HIST 1110G	United States History I	3
or HIST 1120G	United States History II	
Area VI: Creative and Fine Arts		
Choose one from the following:		3
ARTH 1115G	Orientation in Art	

DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
General Education Elective		
HIST 1130G	World History I	3
or HIST 1140G	World History II	
Viewing a Wider World [5]		**6**
Must be from two different colleges		
School of TPAL Requirements		
ENGL 363	Literature for Children and Young Adults [1]	3
CEPY 2110	Learning in the Classroom [2]	3
EDLT 3110	Integrating Technology with Teaching [2]	3
BLED 1110	Introduction in Bilingual Education/ESL [2]	3
EDUC 3120	Multicultural Education [2,6]	3
SPED 3105	Introduction to Special Education in a Diverse Society [2]	3
Student Teaching Courses		
EDUC 4810	Elementary Student Teaching [7]	9
EDUC 4811	Elementary Student Teaching Seminar [7]	3
Elementary Education Teaching Methods Courses		
Block A		
BLED 3130	Language, Literacy, and Culture in the ESL Classrooms [4,7]	3
EDUC 4310	Methods of Teaching Elementary School Science [7]	3
EDUC 4320	Methods of Teaching Elementary School Mathematics [7]	3
READ 4310	Elementary School Literacy I [1,7]	3
SPED 3120	Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society [7]	3
Block B		
BLED 4110	Second Language Acquisition [4,7]	3
BLED 3120	Sheltered English Instruction for the ESL Classroom [4,7]	3
EDUC 4330	Methods of Teaching Elementary School Social Studies [7]	3
READ 4320	Elementary School Literacy II [1,7]	3
READ 3110	Instruction for Special Reading Needs [1,7]	3
Bilingual/TESL Education Endorsement Courses		
BLED 2110	Bilingual Methods [2,4]	3
LING 302V	Language and Society [1, 4]	3
SPED 3110	Bilingual/Multicultural Special Education [4,7]	3
BLED 3140	Issues in Schooling for Bilingual Learners [4,7]	3
Non-Departmental Requirements		
MATH 1134	Fundamentals of Elementary Mathematics I [2]	3
LING 2110G	Introduction to the Study of Language and Linguistics	3
Choose one course from the following for additional licensure requirements:		3
GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
POLS 1120G	American National Government	
POLS 1110G	Introduction to Political Science	
Second Language: (for certification in the State of New Mexico, the Bilingual endorsement requires six credits taught in a language other than English, and for the TESOL endorsement, six credits of a language other than English is required.) [8]		
Electives, to bring the total credits to 120 [9]		**0**
Total Credits		**120**

1. Language Arts Concentration/Teaching Field Course
2. Courses are pre/corequisites for Teacher Education Program (TEP)
3. See the General Education (p. 262) section of the catalog for a full list of courses
4. Bilingual/TESOL Endorsement course
5. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
6. EDUC 3120 Multicultural Education must be completed prior to TEP portfolio submission.
7. Courses require admission to the TEP
8. For certification in the State of New Mexico the Bilingual/TESOl endorsements require 6 credits of a language other than English.
9. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1134 Fundamentals of Elementary Mathematics I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
CEPY 1120G	Human Growth and Behavior	3
Choose from one of the following:		3
GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
POLS 1110G	Introduction to Political Science	
POLS 1120G	American National Government	
Choose from one of the following:		3
HIST 1110G	United States History I	
HIST 1120G	United States History II	
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Semester 2		
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
MATH 1134	Fundamentals of Elementary Mathematics I [1]	3
Choose from one of the following:		3
HIST 1130G	World History I	
HIST 1140G	World History II	
BLED 2110	Bilingual Methods	3
BLED 1110	Introduction in Bilingual Education/ESL	3
	Credits	**15**

Second Year		
Semester 1		
ENGL 2221G or ENGL 2130G	Writing in the Humanities and Social Science or Advanced Composition	3
MATH 2134G	Fundamentals of Elementary Math II [1]	3
LING 2110G	Introduction to the Study of Language and Linguistics	3
CEPY 2110	Learning in the Classroom	3
Students who need to enroll in 15 credits for Finanical Aid purposes may need to enroll in additional credits		
	Credits	**12**
Semester 2		
ENGL 363	Literature for Children and Young Adults	3
EDUC 3120	Multicultural Education	3
EDLT 3110	Integrating Technology with Teaching	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Area III: Laboratory Science Course [2]		4
	Credits	**16**
Third Year		
Semester 1		
APPLY TO TEACHER EDUCATION PROGRAM (TEP)		
BLED 3140	Issues in Schooling for Bilingual Learners (Fall Only)	3
LING 302V	Language and Society	3
Area III: Laboratory Science Course [2]		4
VWW: Viewing a Wider World Course [3]		6
Students who need to enroll in 15 credits for Financial Aid purposes will need to take additional electives		
	Credits	**16**
Semester 2		
APPLY TO STUDENT TEACHING		
BLED 3130	Language, Literacy, and Culture in the ESL Classrooms (Spring only) [1]	3
EDUC 4310	Methods of Teaching Elementary School Science (Spring Only) [1]	3
EDUC 4320	Methods of Teaching Elementary School Mathematics (Spring Only) [1]	3
SPED 3120	Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society (Spring Only) [1]	3
READ 4310	Elementary School Literacy I	3
SPED 3110	Bilingual/Multicultural Special Education	3
	Credits	**18**
Fourth Year		
Semester 1		
SUBMIT STEP PACKET		
READ 3110	Instruction for Special Reading Needs	3
BLED 4110	Second Language Acquisition	3
BLED 3120	Sheltered English Instruction for the ESL Classroom	3
EDUC 4330	Methods of Teaching Elementary School Social Studies	3
READ 4320	Elementary School Literacy II	3
	Credits	**15**
Semester 2		
EDUC 4810	Elementary Student Teaching [1]	9
EDUC 4811	Elementary Student Teaching Seminar	3
	Credits	**12**
	Total Credits	**120**

1. These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Elementary Education (Math K-8) - Bachelor of Science in Education

General education and professional education are similar for all degree programs in the College of Health, Education, and Social Transformation (HEST). The B.S. Elementary Education degree embeds the Match Teaching Field/Concentration and the Bilingual/TESL endorsements. ***Note: For certification in the State of New Mexico the Bilingual/TESL endorsements require 6 credits of a language other than English.*** Additional teaching fields/concentrations in Social Studies, Science, and Language Arts are available but will require credits beyond 120. Students should meet with the College's Educational Support and Resource Center to discuss additional teaching fields/concentration requirements.

All students wishing to complete a degree in Elementary Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of HEST Educational Support and Resource Center or the departmental website (https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ece.html). A 2.75 minimum GPA is required for admission to the Teacher Education Program, and a 2.75 minimum GPA must be maintained for graduation. *Students must earn a "C-" or better in all education, TEP prerequisite, endorsement, and teaching field courses.*

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 136 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G or ENGL 1110H	Composition I [5] Composition I Honors	4
English Composition - Level 2		
ENGL 2221G or ENGL 2130G	Writing in the Humanities and Social Science [5] Advanced Composition	3
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	

Area II: Mathematics		
MATH 2134G	Fundamentals of Elementary Math II [1, 5]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
Choose two different subjects with labs for a total of 8 credits		8
ASTR 1120G	The Planets Lecture & Laboratory	
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 1190G	Contemporary Problems in Biology	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
ENVS 1110G	Environmental Science I	
GEOL 1110G	Physical Geology	
or HNRS 2116G	Earth, Time and Life	
GEOG 1110G	Physical Geography	
PHYS 1115G	Survey of Physics with Lab	
PHYS 1125G	Physics of Music	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
Area IV: Social/Behavioral Sciences		
Choose one from the following:		3
GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
POLS 1110G	Introduction to Political Science	
POLS 1120G	American National Government	
Area V: Humanities		
HIST 1130G	World History I	3
or HIST 1140G	World History II	
Area VI: Creative and Fine Arts		
Choose one from the following:		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
General Education Elective		
HIST 1110G	United States History I	3
or HIST 1120G	United States History II	
Viewing a Wider World [4]		**6**
Must be from two different colleges		
School of TPAL Requirements		
CEPY 1120G	Human Growth and Behavior	3
CEPY 2110	Learning in the Classroom [5]	3
EDLT 3110	Integrating Technology with Teaching [5]	3
BLED 1110	Introduction in Bilingual Education/ESL [2, 5]	3
EDUC 3120	Multicultural Education [5,6]	3
SPED 3105	Introduction to Special Education in a Diverse Society [5]	3
LING 2110G	Introduction to the Study of Language and Linguistics	3
Student Teaching Courses		
EDUC 4810	Elementary Student Teaching [7]	9
EDUC 4811	Elementary Student Teaching Seminar [7]	3
Elementary Education Teaching Methods Courses		
Block A		
BLED 3130	Language, Literacy, and Culture in the ESL Classrooms [2,7]	3
EDUC 4310	Methods of Teaching Elementary School Science [7]	3
EDUC 4320	Methods of Teaching Elementary School Mathematics [1,7]	3
READ 4310	Elementary School Literacy I [7]	3
SPED 3120	Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society [7]	3
Block B		
BLED 3120	Sheltered English Instruction for the ESL Classroom [2,7]	3
BLED 4110	Second Language Acquisition [2,7]	3
EDUC 4330	Methods of Teaching Elementary School Social Studies [7]	3
READ 4320	Elementary School Literacy II [7]	3
READ 3110	Instruction for Special Reading Needs [7]	3
Bilingual/TESL Education Endorsement Courses		
BLED 2110	Bilingual Methods [2,5]	3
SPED 3110	Bilingual/Multicultural Special Education [2,7]	3
LING 302V	Language and Society [2]	3
BLED 3140	Issues in Schooling for Bilingual Learners [2]	3
Concentration/Teaching Field Courses: Math K-8		
MATH 1215	Intermediate Algebra [1]	3
MATH 1220G	College Algebra [1]	3
MATH 1250G	Trigonometry & Pre-Calculus [1]	3
MATH 1350G	Introduction to Statistics [1]	3
MATH 1430G	Applications of Calculus I [1]	3
Non-Departmental Requirements		
MATH 1134	Fundamentals of Elementary Mathematics I [1]	3
ENGL 363	Literature for Children and Young Adults	3
Second Language: [8]		
for certification in the State of New Mexico, the Bilingual endorsement requires six credits taught in a language other than English, and for the TESL endorsement, six credits of a language other than English is required		
Electives, to bring the total credits to 136		**0**
Total Credits		**135**

1. Mathematics Concentration/Teaching Field Course
2. Bilingual/TESOL Endorsement course
3. See the General Education (p. 262) section of the catalog for a full list of courses
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. Courses are pre/corequisites for Teacher Education Program (TEP)

[6] EDUC 3120 Multicultural Education must be completed prior to TEP portfolio submission.
[7] Courses require admission to the TEP
[8] For certification in the State of New Mexico the Bilingual/TESL endorsements require 6 credits of a language other than English.

Elementary Education (Science K-8) - Bachelor of Science in Education

General education and professional education are similar for all degree programs in the College of Health, Education, and Social Transformation (HEST). The B.S. Elementary Education degree embeds the Science Teaching Field/Concentration and the Bilingual/TESL endorsements. ***Note: For certification in the State of New Mexico, the Bilingual/TESL endorsements require 6 credits of a language other than English.*** Additional teaching fields/concentrations are available in Social Studies, Language Arts, and Math but will require credits beyond 120. Students should meet with the College's Educational Support and Resource Center to discuss additional teaching fields/concentration requirements.

All students wishing to complete a degree in Elementary Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of HEST Educational Support and Resource Center or the departmental website (https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ece.html). A 2.75 minimum GPA is required for admission to the Teacher Education Program, and a 2.75 minimum GPA must be maintained for graduation. *Students must earn a "C-" or better in all education, TEP prerequisite, endorsement, and teaching field courses.*

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 136 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I [1]	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2221G	Writing in the Humanities and Social Science [1]	3
or ENGL 2130G	Advanced Composition	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 2134G	Fundamentals of Elementary Math II [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
Choose two different subjects with labs for a total of 8 credits [2]		8
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
ASTR 1120G	The Planets Lecture & Laboratory	
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 1190G	Contemporary Problems in Biology	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
ENVS 1110G	Environmental Science I	
GEOL 1110G	Physical Geology	
or HNRS 2116G	Earth, Time and Life	
GEOG 1110G	Physical Geography	
PHYS 1115G	Survey of Physics with Lab	
PHYS 1125G	Physics of Music	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
Area IV: Social/Behavioral Sciences		
Choose one from the following:		3
GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
POLS 1120G	American National Government	
POLS 1110G	Introduction to Political Science	
Area V: Humanities		
HIST 1130G	World History I	3
or HIST 1140G	World History II	
Area VI: Creative and Fine Arts		
Choose one from the following:		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
General Education Elective		
HIST 1110G	United States History I	3
or HIST 1120G	United States History II	
Viewing a Wider World [3]		**6**
Must be from two different colleges		
School of TPAL Requirements		
CEPY 1120G	Human Growth and Behavior	3
CEPY 2110	Learning in the Classroom [1]	3
EDLT 3110	Integrating Technology with Teaching [1]	3
BLED 1110	Introduction in Bilingual Education/ESL [1]	3
EDUC 3120	Multicultural Education [1,4]	3
SPED 3105	Introduction to Special Education in a Diverse Society [1]	3
LING 302V	Language and Society [5]	3

LING 2110G	Introduction to the Study of Language and Linguistics [5]	3
Student Teaching Courses		
EDUC 4810	Elementary Student Teaching [6]	9
EDUC 4811	Elementary Student Teaching Seminar [6]	3
Elementary Education Teaching Methods Courses		
Block A		
BLED 3130	Language, Literacy, and Culture in the ESL Classrooms [5,6]	3
EDUC 4310	Methods of Teaching Elementary School Science [6]	3
EDUC 4320	Methods of Teaching Elementary School Mathematics [6]	3
READ 4310	Elementary School Literacy I [6]	3
SPED 3120	Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society [6]	3
Block B		
BLED 4110	Second Language Acquisition [5,6]	3
BLED 3120	Sheltered English Instruction for the ESL Classroom [5,6]	3
EDUC 4330	Methods of Teaching Elementary School Social Studies [6]	3
READ 4320	Elementary School Literacy II [6]	3
READ 3110	Instruction for Special Reading Needs [6]	3
Bilingual/TESL Education Endorsement Courses		
BLED 3140	Issues in Schooling for Bilingual Learners	3
BLED 2110	Bilingual Methods [4,5]	3
SPED 3110	Bilingual/Multicultural Special Education [5,6]	3
Concentration/Teaching Field Courses: Science (K-8)		
ASTR Elective Course		3
BIOL Elective Course		3
CHEM or PHYS Elective Course		3
GEOL or Physical GEOG Elective Course		3
Science Elective Course		4
Non-Departmental Requirements		
MATH 1134	Fundamentals of Elementary Mathematics I [1]	3
ENGL 363	Literature for Children and Young Adults	3
Second Language: [7]		
for certification in the State of New Mexico, the Bilingual endorsement requires six credits taught in a language other than English, and for the TESL endorsement, six credits of a language other than English is required		
Electives, to bring the total credits to 136		**0**
Total Credits		**136**

1. Courses are pre/corequisites for Teacher Education Program (TEP)
2. Science Concentration/Teaching Field Course
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
4. EDUC 3120 Multicultural Education must be completed prior to TEP portfolio submission.
5. Bilingual/TESL Endorsement course
6. Courses require admission to the TEP
7. For certification in the State of New Mexico the Bilingual/TESL endorsements require 6 credits of a language other than English.

Elementary Education (Social Studies K-8) - Bachelor of Science in Education

General education and professional education are similar for all degree programs in the College of Health, Education, and Social Transformation (HEST). The B.S. Elementary Education degree embeds the Social Studies Teaching Field/Concentration and the Bilingual/TESL endorsements. ***Note: For certification in the State of New Mexico, the Bilingual/TESL endorsements require 6 credits of a language other than English.*** Additional teaching fields/concentrations are available in Language Arts, Science, and Math but will require credits beyond 120. Students should meet with the College's Educational Support and Resource Center to discuss additional teaching fields/concentration requirements.

All students wishing to complete a degree in Elementary Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of HEST Educational Support and Resource Center or the departmental website (https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ece.html). A 2.75 minimum GPA is required for admission to the Teacher Education Program, and a 2.75 minimum GPA must be maintained for graduation. *Students must earn a "C-" or better in all education, TEP prerequisite, endorsement, and teaching field courses.*

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 132 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits but may be needed to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I [5]	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2221G	Writing in the Humanities and Social Science [5]	3
or ENGL 2130G	Advanced Composition	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 2134G	Fundamentals of Elementary Math II [5]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
Area III: Laboratory Sciences Course(s)		
Choose two different subjects for a total of 8 credits		8
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
ASTR 1120G	The Planets Lecture & Laboratory	
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 1190G	Contemporary Problems in Biology	

BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
ENVS 1110G	Environmental Science I	
GEOL 1110G	Physical Geology	
or HNRS 2116G	Earth, Time and Life	
GEOG 1110G	Physical Geography	
PHYS 1115G	Survey of Physics with Lab	
PHYS 1125G	Physics of Music	
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
Area IV: Social/Behavioral Sciences [2, 3]		
Choose one from the following:		3
GEOG 1120G	World Regional Geography [3]	
GEOG 1130G	Human Geography [3]	
POLS 1110G	Introduction to Political Science [3]	
POLS 1120G	American National Government [3]	
Area V: Humanities		
HIST 1130G	World History I [3]	3
or HIST 1140G	World History II	
Area VI: Creative and Fine Arts		
Choose one from the following:		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
General Education Elective		
HIST 1110G	United States History I [3]	3
or HIST 1120G	United States History II	
Viewing a Wider World [4]		**6**
Must be from two different colleges		
School of TPAL Requirements		
BLED 1110	Introduction in Bilingual Education/ESL [5]	3
CEPY 1120G	Human Growth and Behavior	3
CEPY 2110	Learning in the Classroom [5]	3
EDUC 3120	Multicultural Education [5,6]	3
SPED 3105	Introduction to Special Education in a Diverse Society [5]	3
EDLT 3110	Integrating Technology with Teaching [5]	3
LING 2110G	Introduction to the Study of Language and Linguistics	3
Student Teaching Courses		
EDUC 4810	Elementary Student Teaching [7]	9
EDUC 4811	Elementary Student Teaching Seminar [7]	3
Elementary Education Teaching Methods Courses		
Block A		
BLED 3130	Language, Literacy, and Culture in the ESL Classrooms [1,7]	3
EDUC 4310	Methods of Teaching Elementary School Science [7]	3
EDUC 4320	Methods of Teaching Elementary School Mathematics [7]	3
READ 4310	Elementary School Literacy I [7]	3
SPED 3120	Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society [7]	3
Block B		
BLED 4110	Second Language Acquisition [1,7]	3
BLED 3120	Sheltered English Instruction for the ESL Classroom [1,7]	3
EDUC 4330	Methods of Teaching Elementary School Social Studies [7]	3
READ 4320	Elementary School Literacy II [7]	3
READ 3110	Instruction for Special Reading Needs [7]	3
Bilingual/TESOL Education Endorsement Courses		
BLED 3140	Issues in Schooling for Bilingual Learners	3
BLED 2110	Bilingual Methods [1,5]	3
SPED 3110	Bilingual/Multicultural Special Education [1,7]	3
Concentration Courses: Social Studies (K-8)		
ANTH, ECON, GEOG, POLS, or SOCI Elective Course [3]		9
HIST Elective Course		3
EDUC 4540	Teaching History [3]	3
Non-Departmental Requirements		
MATH 1134	Fundamentals of Elementary Mathematics I [5]	3
ENGL 363	Literature for Children and Young Adults	3
Second Language: [8]		
for certification in the State of New Mexico, the Bilingual endorsement requires six credits taught in a language other than English, and for the TESL endorsement, six credits of a language other than English is required		
Electives, to bring the total credits to 132		**0**
Total Credits		**132**

1. Bilingual/TESOL Endorsement course
2. See the General Education (p. 262) section of the catalog for a full list of courses
3. Social Studies Concentration/Teaching Field Course
4. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
5. Courses are pre/corequisites for Teacher Education Program (TEP)
6. EDUC 3120 Multicultural Education must be completed prior to TEP portfolio submission.
7. Courses require admission to the TEP
8. For certification in the State of New Mexico the Bilingual/TESOL endorsements require 6 credits of a language other than English.

Secondary Education (Secondary Education General Science) - Bachelor of Science in Education

General education and professional education requirements are similar for all degree programs in the College of Health, Education, and Social Transformation. Students should meet with an advisor to plan

appropriate general education courses for a secondary education major. The programs below are labeled as Concentrations in the catalog and on student transcripts but are also recognized as "Teaching Fields" for the Teacher Education Program. Students should meet with the College of HEST Educational Support and Resource Center for degree progress.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 121 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but it may be needed in order to take the necessary English and Mathematics coursework.

All students wishing to complete a degree in Secondary Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of HEST Educational Support and Resource Center or the **departmental website**. A 2.75 minimum GPA is required for admission to the Teacher Education Program and graduation. Students must pass all TEP prerequisites/co-requisites with a C- or better grade.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I (English Composition - Level 1) [1]	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Choose one from the following: [1]		3
ENGL 2130G	Advanced Composition	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra [1, 2]	3-4
or MATH 1250G	Trigonometry & Pre-Calculus	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
CEPY 1120G	Human Growth and Behavior	3
Area V: Humanities		
Choose one from the following		3
HIST 1110G	United States History I	
HIST 1120G	United States History II	
HIST 1130G	World History I	
HIST 1140G	World History II	
HIST 1150G	Western Civilization I	
HIST 1160G	Western Civilization II	
HIST 2245G	Islamic Civilizations to 1800	
HIST 2250G	East Asia to 1600	
HIST 2251G	East Asia since 1600	
Area VI: Creative and Fine Arts		
Choose one from the following: [3]		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
General Education Elective		
Choose one additional Creative and Fine Arts course from above		3
Viewing A Wider World		
LIBR 311V	Information Literacy	3
Choose a science-focused VWW from the list below (3 credits) [4]		
EPWS 380V	Science & Society	
AGRO 303V	Genetics and Society	
ASTR 301V	Revolutionary Ideas in Astronomy	
ASTR 305V	The Search for Life in the Universe	
ASTR 308V	Into the Final Frontier	
ASTR 330V	Planetary Exploration	
GEOL 305V	Fossils and the Evolution of Life	
GEOL 335V	Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present	
PHYS 303V	Energy and Society in the New Millennium	
PHYS 305V	The Search for Water in the Solar System	
CHME 395V	Brewing Science and Society	
HNRS 306V	Science, Ethics and Society	
Departmental/College Requirements		
Education Core Courses		
EDUC 1185	Introduction to Secondary Education and Youth [1, 5]	3
EDUC 3120	Multicultural Education [1]	3
SPED 3105	Introduction to Special Education in a Diverse Society [1]	3
EDLT 3110	Integrating Technology with Teaching [1]	3
EDUC 3997	Secondary Field Experience [1, 5]	3
BLED 3120	Sheltered English Instruction for the ESL Classroom (spring only) [6]	3
EDUC 4510	Data Literacy and Assessment (spring only) [6]	3
EDUC 4520	Contemporary Issues in Education [5,6]	3
EDUC 4410	Teaching Science at the Middle and High School Level (fall only) [5, 6]	3
READ 4330	Content Area Literacy (fall only) [6]	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society (fall only) [6]	3
Student Teaching		
EDUC 4820	Secondary Student Teaching [7]	9
EDUC 4821	Middle and High School Student Teaching Seminar [7]	3
General Science Concentration/Teaching Field Courses		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4

Choose one from the following:		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
Choose one from the following:		4
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab [1]	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
EDUC 4530	Computational Thinking in STEM Education (spring only) [6]	3
Science-focused upper division electives with a prefix of: BIOL, CHEM, and/or PHYS (9 credits)		9
Second Language: (not required)		
Non-Departmental Requirements		
Choose one from the following:		3-4
MATH 1430G	Applications of Calculus I	
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I Calculus and Analytic Geometry I Honors	
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II Calculus and Analytic Geometry II Honors	
MATH 2350G	Statistical Methods	
A ST 311	Statistical Applications	
GEOG 1120G or GEOG 1130G	World Regional Geography Human Geography	3
Choose an additional Area IV from the following		3
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1115G	Introduction to Anthropology	
ANTH 1160G	World Archaeology	
SOCI 1110G	Introduction to Sociology	
SOCI 2310G	Contemporary Social Problems	
Electives, to bring the total credits to 121		**0**
Total Credits		**118-120**

1 Courses are prerequisites/co-requisites for Teacher Education Program (TEP)

2 MATH 1220G College Algebra or MATH 1250G Trigonometry & Pre-Calculus is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G or MATH 1250G first.

3 See the program description for a full list of courses.

4 These selected VWW courses count towards the science teaching field.

5 Courses require Field Experience

6 Courses require admission to the TEP

7 Courses require to admission to TEP and STEP.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
CEPY 1120G	Human Growth and Behavior	3
MATH 1220G	College Algebra [1]	3
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory [1]	4
Students who need to enroll in 15 credits for Financial Aid purposes will need to take additional electives		
	Credits	**14**
Semester 2		
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
MATH 1430G	Applications of Calculus I [1]	3
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors [1]	4
EDUC 1185	Introduction to Secondary Education and Youth	3
GEOG 1120G or GEOG 1130G	World Regional Geography or Human Geography	3
	Credits	**16**
Second Year		
Semester 1		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory [1]	4
ENGL 2221G	Writing in the Humanities and Social Science [1]	3
Area V: Any "G" Course with a HIST Prefix [2]		3
Area VI: Creative and Fine Arts Course [2]		3
Area IV: Social/Behavioral Science Course [2]		3
	Credits	**16**
Semester 2		
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors [1]	4
EDUC 3120	Multicultural Education	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Science-focused VWW		3
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Third Year		
Semester 1		
APPLY TO TEACHER EDUCATION PROGRAM (TEP)		
LIBR 311V	Information Literacy	3
EDLT 3110	Integrating Technology with Teaching	3
EDUC 3997	Secondary Field Experience (Fall Only)	3
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	4

Science-focused upper division elective with prefix: BIOL, CHEM, and/or PHYS		3
	Credits	**16**
Semester 2		
BLED 3120	Sheltered English Instruction for the ESL Classroom (Spring only) [1]	3
EDUC 4510	Data Literacy and Assessment (Spring Only) [1]	3
EDUC 4520	Contemporary Issues in Education (Spring Only) [1]	3
EDUC 4530	Computational Thinking in STEM Education (Spring Only) [1]	3
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II [1]	4
	Credits	**16**
Fourth Year		
Semester 1		
SUBMIT STEP PACKET		
READ 4330	Content Area Literacy (Fall Only) [1]	3
EDUC 4410	Teaching Science at the Middle and High School Level (Fall Only) [1]	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society (Fall only) [1]	3
Science-focused upper division elective with prefix: BIOL, CHEM, and/or PHYS		3
Science-focused upper division elective with prefix: BIOL, CHEM, and/or PHYS		3
	Credits	**15**
Semester 2		
EDUC 4820	Secondary Student Teaching [1]	9
EDUC 4821	Middle and High School Student Teaching Seminar [1]	3
	Credits	**12**
	Total Credits	**121**

1 These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

2 See the program description for a full list of courses.

Secondary Education (Secondary Education Language Arts) - Bachelor of Science in Education

General education and professional education requirements are similar for all degree programs in the College of Health, Education, and Social Transformation. Students should meet with an advisor to plan appropriate general education courses for a secondary education major. The programs below are labeled as Concentrations in the catalog and on student transcripts but are also recognized as "Teaching Fields" for the Teacher Education Program. Students should meet with the College of HEST Educational Support and Resource Center for degree progress.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but it may be needed in order to take the necessary English and Mathematics coursework.

All students wishing to complete a degree in Secondary Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of HEST Educational Support and Resource Center or on the **departmental website**. A 2.75 minimum GPA is required for admission to the Teacher Education Program and graduation. Students must pass all TEP prerequisites/co-requisites with a C- or better grade.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1 [1]		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2 [1]		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2221G	Writing in the Humanities and Social Science	
ENGL 2215G	Advanced Technical and Professional Communication	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
Area II: Mathematics		
MATH 1220G	College Algebra [1]	3-4
or MATH 1250G	Trigonometry & Pre-Calculus	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
Area III: Laboratory Sciences		
Choose two courses (from different subject areas) for 8 credits		8
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
or ASTR 1120G	The Planets Lecture & Laboratory	
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOL 1110G	Physical Geology	
or HNRS 2116G	Earth, Time and Life	
GEOG 1110G	Physical Geography	
or HNRS 2116G	Earth, Time and Life	

Area IV: Social/Behavioral Sciences		
CEPY 1120G	Human Growth and Behavior	3
Area V: Humanities		
HIST 1110G	United States History I	3
or HIST 1120G	United States History II	
Area VI: Creative and Fine Arts		
THEA 1110G	Introduction to Theatre	3
General Education Elective		
HIST 1150G	Western Civilization I	3
or HIST 1160G	Western Civilization II	
Viewing a Wider World		
LIBR 311V	Information Literacy	3
The 2nd VWW requirements will be satisfied with the concentration/teaching field courses [2]		
Departmental/College Requirements		
Education Core Courses		
EDUC 1185	Introduction to Secondary Education and Youth [1, 3]	3
EDUC 3120	Multicultural Education [1]	3
SPED 3105	Introduction to Special Education in a Diverse Society [1]	3
EDLT 3110	Integrating Technology with Teaching [1]	3
EDUC 3997	Secondary Field Experience [1,3]	3
BLED 3120	Sheltered English Instruction for the ESL Classroom (Spring only) [4]	3
EDUC 4510	Data Literacy and Assessment (Spring only) [4]	3
EDUC 4520	Contemporary Issues in Education (Spring only) [3,4]	3
EDUC 4440	Teaching Language Arts at the Middle and High School Level (Fall only) [3,4]	3
READ 4330	Content Area Literacy (Fall only) [4]	3
READ 4530	Teaching Secondary ELA & Social Studies Using Primary Sources, Memoir & Autobiography (Spring only)	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society (Fall only) [4]	3
Student Teaching		
EDUC 4820	Secondary Student Teaching [5]	9
EDUC 4821	Middle and High School Student Teaching Seminar [5]	3
Language Arts Concentration/Teaching Field Courses		
ENGL 2610G	American Literature I	3
or ENGL 2620G	American Literature II	
ENGL 2630G	British Literature I	3
or ENGL 2640G	British Literature II	
Choose one from the following:		3
ENGL 339V	Chicana/o Literature	
ENGL 380V	Women Writers	
ENGL 394V	Southwestern Literature	
Choose one from the following:		3
ENGL 405	Chaucer	
ENGL 442	Modern and Contemporary American Poetry	
ENGL 458	Latino/a Literature and Culture	
ENGL 469	Advanced Study in American Literature	
ENGL 481	Women's Literature	
ENGL 408	Shakespeare I	3
or ENGL 409	Shakespeare II	
Select one from the following:		3
ENGL 310	Critical Writing	
ENGL 412	Writing in the Workplace	
ENGL 431	Technical Editing	
ENGL 449	Advanced Study in Writing	
ENGL 479	Computers and Writing	
ENGL 416	Approaches to Literature	3
ENGL 470	Approaches to Composition	3
ENGL Elective 400/4000+		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 1130G	Survey of Mathematics	3
or MATH 1430G	Applications of Calculus I	
JOUR 105G	Media and Society	3
Choose one from the following:		3
ANTH 1115G	Introduction to Anthropology	
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1160G	World Archaeology	
GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
POLS 1120G	American National Government	
POLS 1110G	Introduction to Political Science	
POLS 1130G	Issues in American Politics	
POLS 2120G	International Relations	
SOCI 1110G	Introduction to Sociology	
SOCI 2310G	Contemporary Social Problems	
Second Language: (not required)		
Electives, to bring the total credits to 120		**0**
Total Credits		**120-121**

1. Courses are prerequisites/co-requisites for Teacher Education Program (TEP)
2. The 9 credits of Upper-Division ENGL courses that are a part of the Concentration/Teaching Field coursework will meet the 2nd VWW requirement.
3. Courses require Field Experience
4. Courses require admission to the TEP
5. Courses require admission to TEP and STEP.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G	Composition I [1]	4
or ENGL 1110H	or Composition I Honors	
CEPY 1120G	Human Growth and Behavior	3
MATH 1220G	College Algebra [1]	3-4
or MATH 1250G	or Trigonometry & Pre-Calculus	
JOUR 105G	Media and Society	3
THEA 1110G	Introduction to Theatre	3
	Credits	**16-17**

Semester 2		
COMM 1115G or COMM 1130G or HNRS 2175G	Introduction to Communication or Public Speaking or Introduction to Communication Honors	3
MATH 1130G or MATH 1430G	Survey of Mathematics [1] or Applications of Calculus I	3
HIST 1150G or HIST 1160G	Western Civilization I or Western Civilization II	3
EDUC 1185	Introduction to Secondary Education and Youth	3
ENGL 2610G or ENGL 2620G	American Literature I or American Literature II	3
	Credits	**15**
Second Year		
Semester 1		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2221G	Writing in the Humanities and Social Science	
ENGL 2215G	Advanced Technical and Professional Communication	
HIST 1110G or HIST 1120G	United States History I or United States History II	3
ENGL 2630G or ENGL 2640G	British Literature I or British Literature II	3
Area III: Laboratory Science Course [2]		4
An ANTH/GEOG/POLS/SOCI Course [2]		3
	Credits	**16**
Semester 2		
EDUC 3120	Multicultural Education	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Choose from one of the following:		3
ENGL 339V	Chicana/o Literature	
ENGL 380V	Women Writers	
ENGL 394V	Southwestern Literature	
Area III: Laboratory Science Course [2]		4
LIBR 311V	Information Literacy	3
	Credits	**16**
Third Year		
Semester 1		
APPLY TO TEACHER EDUCATION PROGRAM (TEP)		
EDLT 3110	Integrating Technology with Teaching	3
EDUC 3997	Secondary Field Experience	3
ENGL 470	Approaches to Composition	3
400-Level English Literature Course [2]		3
ENGL 408	Shakespeare I	3
	Credits	**15**
Semester 2		
BLED 3120	Sheltered English Instruction for the ESL Classroom (Spring Only) [1]	3
EDUC 4510	Data Literacy and Assessment [1]	3
EDUC 4520	Contemporary Issues in Education (Student Motivation (Spring Only))	3
ENGL 416	Approaches to Literature (Spring Only)	3
READ 4530	Teaching Secondary ELA & Social Studies Using Primary Sources, Memoir & Autobiography	3
	Credits	**15**
Fourth Year		
Semester 1		
SUBMIT STEP PACKET		
READ 4330	Content Area Literacy (Fall Only) [1]	3
EDUC 4440	Teaching Language Arts at the Middle and High School Level (Fall Only) [1]	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society (Fall Only) [1]	3
400-Level English Literature Elective Course		3
Choose from one of the following:		3
ENGL 310	Critical Writing	
ENGL 412	Writing in the Workplace	
ENGL 431	Technical Editing	
ENGL 449	Advanced Study in Writing	
ENGL 479	Computers and Writing	
	Credits	**15**
Semester 2		
EDUC 4820	Secondary Student Teaching	9
EDUC 4821	Middle and High School Student Teaching Seminar	3
	Credits	**12**
	Total Credits	**120-121**

1. These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
2. See program requirements for a full list of courses.

Secondary Education (Secondary Education Math) - Bachelor of Science in Education

General education and professional education requirements are similar for all degree programs in the College of Health, Education, and Social Transformation. Students should meet with an advisor to plan appropriate general education courses for a secondary education major. The programs below are labeled as Concentrations in the catalog and on student transcripts but are also recognized as "Teaching Fields" for the Teacher Education Program. Students should meet with the College of HEST Educational Support and Resource Center for degree progress.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but it may be needed in order to take the necessary English and Mathematics coursework.

All students wishing to complete a degree in Secondary Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of HEST Educational Support and Resource Center or on the **departmental website**. A 2.75 minimum GPA is required for admission to the Teacher Education Program and graduation. Students must pass all TEP prerequisites/co-requisites with a C- or better grade.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1 [1]		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
or ENGL 1110M	Composition I	
English Composition - Level 2		
Choose one from the following: [1]		3
ENGL 2130G	Advanced Composition	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [2]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
Choose one from the following:		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Choose one from the following:		4
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
CEPY 1120G	Human Growth and Behavior	3
Area V: Humanities		
HIST 1110G	United States History I	3
or HIST 1120G	United States History II	
Area VI: Creative and Fine Arts		
Choose one from the following:		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
General Education Elective		
HIST 1150G	Western Civilization I	3
or HIST 1160G	Western Civilization II	
Viewing a Wider World		
LIBR 311V	Information Literacy	3
The 2nd VWW requirements will be satisfied with the concentration/teaching field courses [3]		
Departmental/College Requirements		
Education Core Courses		
EDUC 1185	Introduction to Secondary Education and Youth [1, 4]	3
EDUC 3120	Multicultural Education [1]	3
SPED 3105	Introduction to Special Education in a Diverse Society [1]	3
EDLT 3110	Integrating Technology with Teaching [1]	3
EDUC 3997	Secondary Field Experience [1,4]	3
BLED 3120	Sheltered English Instruction for the ESL Classroom (Spring only) [5]	3
EDUC 4510	Data Literacy and Assessment (Spring only) [5]	3
EDUC 4520	Contemporary Issues in Education (Spring only) [4,5]	3
EDUC 4530	Computational Thinking in STEM Education (Spring only)	3
EDUC 4420	Teaching Mathematics at the Middle and High School Level (Fall only) [4,5]	3
READ 4330	Content Area Literacy (Fall only) [5]	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society (Fall only) [5]	3
Student Teaching		
EDUC 4820	Secondary Student Teaching [6]	9
EDUC 4821	Middle and High School Student Teaching Seminar [6]	3
Math Concentration/Teaching Field Courses		
MATH 2530G	Calculus III	3
CSCI 1110	Computer Science Principles	4
MATH 1531	Introduction to Higher Mathematics	3
MATH 2415	Introduction to Linear Algebra	3
STAT 3110	Statistics for Engineers and Scientists	3
or A ST 311	Statistical Applications	
Math elective 300/3000+		3
Math elective 300/3000+		3
Math elective 300/3000+		3
Non-Departmental Requirements		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Choose one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
Choose one from the following:		3
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1115G	Introduction to Anthropology	
ANTH 1160G	World Archaeology	
GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
POLS 1120G	American National Government	
POLS 1110G	Introduction to Political Science	
POLS 1130G	Issues in American Politics	
POLS 2120G	International Relations	
SOCI 1110G	Introduction to Sociology	
SOCI 2310G	Contemporary Social Problems	
Second Language: (not required)		
Electives, to bring the total credits to 120		**0**
Total Credits		**120**

[1] Courses are prerequisites/co-requisites for Teacher Education Program (TEP)

[2] MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G first.
[3] The 9 credits of Upper-Division MATH courses that are apart of the Concentration/Teaching Field coursework will meet the 2nd VWW requirement.
[4] Courses require Field Experience
[5] Courses require admission to the TEP
[6] Courses require admission to TEP and STEP.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1511G Calculus and Analytic Geometry I and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
CEPY 1120G	Human Growth and Behavior	3
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I [1] or Calculus and Analytic Geometry I Honors	4
HIST 1110G or HIST 1120G	United States History I or United States History II	3
Students who need to enroll in 15 credits for Financial Aid purposes will need to take additional electives		1
	Credits	**15**
Semester 2		
COMM 1115G or HNRS 2175G or COMM 1130G or ACOM 1130G	Introduction to Communication or Introduction to Communication Honors or Public Speaking or Effective Leadership and Communication in Agriculture	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II [1] or Calculus and Analytic Geometry II Honors	4
EDUC 1185	Introduction to Secondary Education and Youth	3
Choose one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Second Year		
Semester 1		
Choose one from the following:		3
ENGL 2130G	Advanced Composition	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science [1]	
MATH 2530G	Calculus III	3
PHYS 1230G or PHYS 1310G	Algebra-Based Physics I [1] or Calculus -Based Physics I	3
PHYS 1230L or PHYS 1310L	Algebra-Based Physics I Lab [1] or Calculus -Based Physics I Lab	1
HIST 1110G or HIST 1120G	United States History I or United States History II	3
An ANTH/GEOG/POLS/SOCI Course [2]		3
	Credits	**16**
Semester 2		
PHYS 1240G or PHYS 1320G	Algebra-Based Physics II [1] or Calculus -Based Physics II	3
PHYS 1240L or PHYS 1320L	Algebra-Based Physics II Lab [1] or Calculus -Based Physics II Lab	1
EDUC 3120	Multicultural Education	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
CSCI 1110	Computer Science Principles	4
LIBR 311V	Information Literacy	3
	Credits	**17**
Third Year		
Semester 1		
APPLY TO TEACHER EDUCATION PROGRAM (TEP)		
EDLT 3110	Integrating Technology with Teaching	3
EDUC 3997	Secondary Field Experience	3
MATH 1531	Introduction to Higher Mathematics	3
MATH 2415	Introduction to Linear Algebra	3
A ST 311	Statistical Applications	3
	Credits	**15**
Semester 2		
BLED 3120	Sheltered English Instruction for the ESL Classroom (Spring Only) [1]	3
EDUC 4510	Data Literacy and Assessment (Spring Only) [1]	3
EDUC 4520	Contemporary Issues in Education (Spring Only) [1]	3
EDUC 4530	Computational Thinking in STEM Education	3
Upper-Division MATH Elective Course [1]		3
	Credits	**15**
Fourth Year		
Semester 1		
SUBMIT STEP PACKET		
READ 4330	Content Area Literacy (Fall Only) [1]	3
EDUC 4420	Teaching Mathematics at the Middle and High School Level (Fall Only) [1]	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society (Fall Only) [1]	3
Upper-Division MATH Elective Course [1]		3
Upper-Division MATH Elective Course [1]		3
	Credits	**15**
Semester 2		
EDUC 4820	Secondary Student Teaching	9
EDUC 4821	Middle and High School Student Teaching Seminar	3
	Credits	**12**
	Total Credits	**121**

[1] These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
[2] See the program requirements for a full list of courses.

Secondary Education (Secondary Education Social Studies) - Bachelor of Science in Education

General education and professional education requirements are similar for all degree programs in the College of Health, Education, and Social Transformation. Students should meet with an advisor to plan appropriate general education courses for a secondary education major. The programs below are labeled as Concentrations in the catalog and on student transcripts but are also recognized as "Teaching Fields" for the Teacher Education Program. Students should meet with the College of HEST Educational Support and Resource Center for degree progress.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but it may be needed in order to take the necessary English and Mathematics coursework.

All students wishing to complete a degree in Secondary Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of HEST Educational Support and Resource Center or the departmental website (https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ece.html). A 2.75 minimum GPA is required for admission to the Teacher Education Program and graduation. Students must pass all TEP prerequisites/co-requisites with a C- or better grade.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1 [1]		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Choose one from the following: [1]		3
ENGL 2130G	Advanced Composition	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra [1, 2]	3
or MATH 1250G	Trigonometry & Pre-Calculus	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
Area III: Laboratory Sciences		
Choose two courses from two different subject areas below:		8
ASTR 1115G	Introduction to Astronomy Lecture & Laboratory	
or ASTR 1120G	The Planets Lecture & Laboratory	
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	
BIOL 1190G	Contemporary Problems in Biology	
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	
CHEM 1120G	Introduction to Chemistry Lecture and Laboratory (non majors)	
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	
GEOL 1110G	Physical Geology	
or HNRS 2116G	Earth, Time and Life	
GEOG 1110G	Physical Geography	
Area IV: Social/Behavioral Sciences		
CEPY 1120G	Human Growth and Behavior	3
Area V: Humanities		
HIST 1130G	World History I	3
or HIST 1140G	World History II	
Area VI: Creative and Fine Arts [3]		
Choose one from the following:		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
General Education Elective		
HIST 2250G	East Asia to 1600	3
or HIST 2251G	East Asia since 1600	
Viewing a Wider World		
LIBR 311V	Information Literacy	3
The 2nd VWW requirements will be satisfied with the concentration/teaching field courses [4]		
School of TPAL Requirements		
Education Core Courses		
EDUC 1185	Introduction to Secondary Education and Youth [1, 5]	3
EDUC 3120	Multicultural Education [1]	3
SPED 3105	Introduction to Special Education in a Diverse Society [1]	3
EDLT 3110	Integrating Technology with Teaching [1]	3
EDUC 3997	Secondary Field Experience [1,5]	3
BLED 3120	Sheltered English Instruction for the ESL Classroom (Spring only) [6]	3
EDUC 4510	Data Literacy and Assessment (Spring only) [6]	3
EDUC 4520	Contemporary Issues in Education (Spring only) [5,6]	3
EDUC 4430	Teaching Social Studies at the Middle and High School Level (Fall only) [5,6]	3
READ 4330	Content Area Literacy (Fall only) [6]	3
READ 4530	Teaching Secondary ELA & Social Studies Using Primary Sources, Memoir & Autobiography ((Spring only))	3

SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society (Fall only) [6]	3
Student Teaching		
EDUC 4820	Secondary Student Teaching [7]	9
EDUC 4821	Middle and High School Student Teaching Seminar [7]	3
Social Studies Core Courses		
ECON 2110G	Macroeconomic Principles	3
or ECON 2120H	Principles of Microeconomics Honors	
GEOG 2130	Map Analysis & Interpretation	3
HIST 1150G	Western Civilization I	3
or HIST 1160G	Western Civilization II	
HIST 1110G	United States History I	3
HIST 1120G	United States History II	3
EDUC 4540	Teaching History (Fall only)	3
HIST 386	New Mexico History	3
HIST Elective 300+		3
HIST Elective 300+		3
Non-Departmental Requirements		
MATH 1130G	Survey of Mathematics	3
or MATH 1430G	Applications of Calculus I	
GEOG 1130G	Human Geography	3
POLS 1120G	American National Government	3
or POLS 1110G	Introduction to Political Science	
Second Language: (not required)		
Electives, to bring the total credits to 120		**0**
Total Credits		**120**

1. Courses are prerequisites/co-requisites for Teacher Education Program (TEP)
2. MATH 1220G College Algebra or MATH 1250G Trigonometry & Pre-Calculus is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G or MATH 1250G first.
3. See the program descriptio for a full list of courses
4. The 9 credits of Upper-Division HIST courses that are apart of the Concentration/Teaching Field coursework will meet the 2nd VWW requirement.
5. Courses require Field Experience
6. Courses require admission to the TEP
7. Courses require admission to TEP and STEP.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1220G College Algebra and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G	Composition I [1]	4
or ENGL 1110H	or Composition I Honors	
CEPY 1120G	Human Growth and Behavior	3
MATH 1220G	College Algebra [1]	3-4
or MATH 1250G	or Trigonometry & Pre-Calculus	
POLS 1120G	American National Government	3
or POLS 1110G	or Introduction to Political Science	
HIST 1130G	World History I	3
or HIST 1140G	or World History II	
	Credits	**16-17**
Semester 2		
COMM 1115G	Introduction to Communication	3
or HNRS 2175G	or Introduction to Communication Honors	
MATH 1130G	Survey of Mathematics [1]	3
or MATH 1430G	or Applications of Calculus I	
GEOG 1130G	Human Geography	3
EDUC 1185	Introduction to Secondary Education and Youth	3
HIST 1110G	United States History I	3
	Credits	**15**
Second Year		
Semester 1		
ENGL 2221G	Writing in the Humanities and Social Science [1]	3
Area III: Laboratory Science Course [2]		4
ECON 2110G	Macroeconomic Principles	3
or ECON 2120H	or Principles of Microeconomics Honors	
ECON 2120H	Principles of Microeconomics Honors	
HIST 1150G	Western Civilization I	3
or HIST 1160G	or Western Civilization II	
HIST 1120G	United States History II	3
	Credits	**16**
Semester 2		
EDUC 3120	Multicultural Education	3
HIST 2250G	East Asia to 1600	3
or HIST 2251G	or East Asia since 1600	
SPED 3105	Introduction to Special Education in a Diverse Society	3
Area III: Laboratory Sciences Course [2]		4
LIBR 311V	Information Literacy	3
	Credits	**16**
Third Year		
Semester 1		
APPLY TO TEACHER EDUCATION PROGRAM (TEP)		
EDLT 3110	Integrating Technology with Teaching	3
EDUC 3997	Secondary Field Experience (Fall Only)	3
GEOG 2130	Map Analysis & Interpretation	3
Area VI: Creative and Fine Arts Course [2]		3
EDUC 4540	Teaching History	3
READ 4530	Teaching Secondary ELA & Social Studies Using Primary Sources, Memoir & Autobiography	3
	Credits	**18**
Semester 2		
BLED 3120	Sheltered English Instruction for the ESL Classroom (Spring only) [1]	3
EDUC 4510	Data Literacy and Assessment (Spring Only) [1]	3
EDUC 4520	Contemporary Issues in Education (Spring Only) [1]	3
HIST 386	New Mexico History	3
	Credits	**12**
Fourth Year		
Semester 1		
SUBMIT STEP PACKET		

READ 4330	Content Area Literacy (Fall Only) [1]	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society (Fall Only) [1]	3
EDUC 4430	Teaching Social Studies at the Middle and High School Level (Fall only) [1]	3
300-Level HIST Elective Course		3
300-Level HIST Elective Course		3
	Credits	**15**
Semester 2		
EDUC 4820	Secondary Student Teaching [1]	9
EDUC 4821	Middle and High School Student Teaching Seminar [1]	3
	Credits	**12**
	Total Credits	**120-121**

1 These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

2 See the program requirements for a full list of courses.

Special Education (Elementary Education) - Bachelor of Science in Education

The undergraduate special education program is an CAEP accredited program designed to prepare teacher candidates for dual licensure in special education and elementary education. The B.S. Special Education (Elementary Education) degree embeds the Language Arts Teaching Field/Concentration and the Bilingual/TESL endorsements. **Note: For certification in the State of New Mexico the Bilingual/TESL endorsements require 6 credits of a language other than English.** Students graduate with the preparation to teach in environments across the continuum of special education services. In addition to special education coursework, students complete an academic teaching field within their major.

All students wishing to complete a degree in Special Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of Education Educational Support and Resource Center or on the departmental website (https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ece.html). A 2.75 minimum GPA is required for admission to the Teacher Education Program, and a 2.75 minimum GPA must be maintained for graduation. *Students must earn a "C-" or better in all education, TEP prerequisite, endorsement, and teaching field courses.*

Students should meet with the College of Health, Education, and Social Transformation (HEST) Undergraduate Resource Center to plan appropriate general education courses for a special education major. See "General Requirements" in the "College of Health, Education, and Social Transformation (p. 1229)" section. Students must be admitted to the Teacher Education Program as a condition for enrolling in courses that lead to licensure. Students must pass ENGL, MATH, all education, and teaching field/concentration courses with a C- or better.

Teaching Field: Language Arts

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 129 credits with 48 credits in courses numbered 3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I [1]	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2221G	Writing in the Humanities and Social Science [1, 2]	3
or ENGL 2130G	Advanced Composition	
Oral Communication		
COMM 1115G	Introduction to Communication [2,3]	3
or HNRS 2175G	Introduction to Communication Honors	
or COMM 1130G	Public Speaking	
Area II: Mathematics		
MATH 2134G	Fundamentals of Elementary Math II [1]	3
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*11*
CEPY 1120G	Human Growth and Behavior	
Area III: Laboratory Sciences Course (8 credits) [4]		
Area V: Humanities		
HIST 1130G	World History I	3
or HIST 1140G	World History II	
Area VI: Creative and Fine Arts		
Choose one from the following courses		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
General Education Elective		
HIST 1110G	United States History I	3
or HIST 1120G	United States History II	
Viewing the Wider World [5]		**6**
Departmental/College Requirements		
Education Core Requirements		
BLED 1110	Introduction in Bilingual Education/ESL [1, 6]	3
SPED 3105	Introduction to Special Education in a Diverse Society [1]	3
EDLT 3110	Integrating Technology with Teaching [1]	3
SPED 4220	Classroom Management for Diverse Learners	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	3
SPED 4120	High Incidence Disabilities in a Diverse Society [3]	3
SPED 4110	Low Incidence Disabilities in a Diverse Society [3]	3
SPED 4811	Practicum in Education, Equity and Cultural Diversity [3]	3
Student Teaching		
SPED 4820	Student Teaching SPED [2]	9
SPED 4830	Special Education/Elementary Student Teaching Seminar	3
Elementary Education Teaching Methods		
Block A		

BLED 3130	Language, Literacy, and Culture in the ESL Classrooms [3,6]	3
EDUC 4310	Methods of Teaching Elementary School Science [3]	3
EDUC 4320	Methods of Teaching Elementary School Mathematics [3]	3
READ 4310	Elementary School Literacy I [2,3]	3
SPED 3120	Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society [3]	3
Block B		
BLED 3120	Sheltered English Instruction for the ESL Classroom [3,6]	3
EDUC 4330	Methods of Teaching Elementary School Social Studies [3]	3
BLED 4110	Second Language Acquisition [3,6]	3
READ 4320	Elementary School Literacy II [2,3]	3
READ 3110	Instruction for Special Reading Needs [2,3]	3
Remaining Bilingual/TESOL Courses		
BLED 2110	Bilingual Methods [1, 6]	3
BLED 3140	Issues in Schooling for Bilingual Learners [6]	3
LING 2110G	Introduction to the Study of Language and Linguistics (recommended for Language Arts Teaching Field/Bilingual TESOL endorsement) [2,6]	3
LING 302V	Language and Society [2, 6]	3
SPED 3110	Bilingual/Multicultural Special Education [3,6]	3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
ENGL 363	Literature for Children and Young Adults [2]	3
MATH 1134	Fundamentals of Elementary Mathematics I [1]	3
Choose one from the following:		3
GEOG 1120G	World Regional Geography	
or GEOG 1130G	Human Geography	
POLS 1120G	American National Government	
or POLS 1110G	Introduction to Political Science	
Second Language: (not required)		
Electives, to bring the total credits to 129		
Total Credits		**129**

1. Courses are pre/co-requisites for Teacher Education Program (TEP)
2. Course counts toward the Language Arts Teaching Field
3. Course requires admission to the Teacher Education Program (TEP)
4. See the General Education (p. 262) section of the catalog for a full list of courses
5. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.
6. Course counts toward the Bilingual/TESL endorsement

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1215 Intermediate Algebra and ENGL 1110G Composition I. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
CEPY 1120G	Human Growth and Behavior	3
Choose one from the following:		3
GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
POLS 1110G	Introduction to Political Science	
POLS 1120G	American National Government	
HIST 1110G or HIST 1120G	United States History I or United States History II	3
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16**
Semester 2		
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
MATH 1134	Fundamentals of Elementary Mathematics I [1]	3
HIST 1130G or HIST 1140G	World History I or World History II	3
BLED 1110	Introduction in Bilingual Education/ESL	3
BLED 2110	Bilingual Methods	3
	Credits	**15**
Second Year		
Semester 1		
ENGL 2221G	Writing in the Humanities and Social Science [1]	3
MATH 2134G	Fundamentals of Elementary Math II [1]	3
LING 2110G	Introduction to the Study of Language and Linguistics	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
Area III: Laboratory Science Course [2]		4
	Credits	**16**
Semester 2		
APPLY TO TEACHER EDUCATION PROGRAM (TEP)		
EDLT 3110	Integrating Technology with Teaching	3
SPED 4220	Classroom Management for Diverse Learners	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	3
LING 302V	Language and Society	3
SPED 4110	Low Incidence Disabilities in a Diverse Society (Student must be admitted to TEP to take; usually enroll in during Summer)	3
Area III: Laboratory Sciences Course [2]		4
	Credits	**19**
Third Year		
Semester 1		
BLED 3120	Sheltered English Instruction for the ESL Classroom (Fall Only)	3
EDUC 4330	Methods of Teaching Elementary School Social Studies (Fall Only)	3
BLED 4110	Second Language Acquisition (Fall Only)	3
READ 4320	Elementary School Literacy II (Fall Only)	3
READ 3110	Instruction for Special Reading Needs (Fall Only)	3
SPED 4120	High Incidence Disabilities in a Diverse Society (Fall Only)	3
	Credits	**18**

Semester 2		
APPLY TO STUDENT TEACHING		
BLED 3130	Language, Literacy, and Culture in the ESL Classrooms (Spring Only)	3
EDUC 4310	Methods of Teaching Elementary School Science	3
EDUC 4320	Methods of Teaching Elementary School Mathematics (Spring Only)	3
READ 4310	Elementary School Literacy I (Spring Only)	3
SPED 3120	Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society (Spring Only)	3
SPED 3110	Bilingual/Multicultural Special Education (Spring Only)	3
	Credits	**18**
Fourth Year		
Semester 1		
SUBMIT STEP PACKET		
ENGL 363	Literature for Children and Young Adults	3
BLED 3140	Issues in Schooling for Bilingual Learners (Fall Only)	3
SPED 4811	Practicum in Education, Equity and Cultural Diversity	3
VWW: Viewing a Wider World Course [3]		6
	Credits	**15**
Semester 2		
SPED 4820	Student Teaching SPED	9
SPED 4830	Special Education/Elementary Student Teaching Seminar	3
	Credits	**12**
	Total Credits	**129**

1. These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.
2. See the General Education (p. 262) section of the catalog for a full list of courses.
3. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

Special Education (Secondary Education) - Bachelor of Science in Education

The undergraduate special education program is a CAEP-accredited program designed to prepare teacher candidates for dual licensure in special education and elementary education. The B.S. Special Education (Secondary Education) degree embeds the Secondary Teaching Field/Concentration selected by the student: Language Arts, Math, Science, or Social Studies. **Note: For certification in the State of New Mexico the Bilingual/TESL endorsements require 6 credits of a language other than English.** Students graduate with the preparation to teach in environments across the continuum of special education services. In addition to special education coursework, students complete an academic teaching field within their major.

All students wishing to complete a degree in Special Education must apply to the Teacher Education Program. Additional information on the application process can be obtained from the College of HEST's Educational Support and Resource Center or the departmental website (https://tpal.nmsu.edu/degree-programs/undergraduate-programs/ug-ece.html). A 2.75 minimum GPA is required for admission to the Teacher Education Program, and a 2.75 minimum GPA must be maintained for graduation. *Students must earn a "C-" or better in all education, TEP prerequisite, endorsement, and teaching field courses.*

Students should meet with the College of HEST Undergraduate Resource Center to plan appropriate general education courses for a special education major. See "General Requirements" in the "College of Health, Education, and Social Transformation (p. 1229)" section. Students must be admitted to the Teacher Education Program as a condition for enrolling in courses that lead to licensure. Students must pass ENGL, MATH, all education, and teaching field/concentration courses with a C- or better.

Teaching Field: Language Arts

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 132 credits with 48 credits in courses numbered 3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but it may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I [1]	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		*3*
Oral Communication		
Choose one from the following:		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II Mathematics		
MATH 1220G	College Algebra [1, 3]	3
or MATH 1250G	Trigonometry & Pre-Calculus	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
CEPY 1120G	Human Growth and Behavior	3
Area III: Laboratory Science Course(s) [4]		8
Area V: Humanities		
HIST 1160G	Western Civilization II	3
Area V: Creative and Fine Arts		
THEA 1110G	Introduction to Theatre (Language Arts Teaching Field/Concentration)	3
General Education Elective		
HIST 1110G	United States History I	3
or HIST 1120G	United States History II	
Viewing the Wider World		
LIBR 311V	Information Literacy	3
The 2nd VWW requirements will be satisfied with the concentration/teaching field courses [5]		
Departmental/College Requirements		
Secondary Education Requirements		
EDUC 1185	Introduction to Secondary Education and Youth [1, 6]	3

SPED 3105	Introduction to Special Education in a Diverse Society [1]	3
EDLT 3110	Integrating Technology with Teaching (Pre/Co-requisite for TEP admission) [1]	3
BLED 3120	Sheltered English Instruction for the ESL Classroom [2]	3
EDUC 4510	Data Literacy and Assessment [2]	3
EDUC 4440	Teaching Language Arts at the Middle and High School Level [2,6]	3
READ 4330	Content Area Literacy [2]	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society [2]	3
Student Teaching		
SPED 4820	Student Teaching SPED [2]	9
SPED 4840	Special Education/ Secondary Student Teaching Seminar	3
Special Education Core Requirements		
SPED 4220	Classroom Management for Diverse Learners	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	3
SPED 4120	High Incidence Disabilities in a Diverse Society [2]	3
SPED 4110	Low Incidence Disabilities in a Diverse Society [2]	3
SPED 4811	Practicum in Education, Equity and Cultural Diversity (Not with EDUC 4996) [2, 6,7]	3
READ 3110	Instruction for Special Reading Needs [2]	3
EDUC 4996	Topics (Dual License Practicum; Prerequisite EDUC 4440) [2, 6,7]	3
Language Arts Teaching Field/Concentration Requirements		
For the teaching field/concentration both (COMM 1130G or COMM 1115G) and (ENGL 2130G or ENGL 2210G) will count towards General Education as well		
ENGL 2610	American Literature I	3
or ENGL 2620	American Literature II	
ENGL 2630	British Literature I	3
or ENGL 2640	British Literature II	
ENGL 310	Critical Writing	3
ENGL 408	Shakespeare I	3
or ENGL 409	Shakespeare II	
ENGL 416	Approaches to Literature	3
ENGL 470	Approaches to Composition	3
ENGL 400+ Literature Elective		3
Choose one from the following:		3
ENGL 339V	Chicana/o Literature	
ENGL 380V	Women Writers	
ENGL 394V	Southwestern Literature	
Choose one from the following courses		3
ENGL 405	Chaucer	
ENGL 442	Modern and Contemporary American Poetry	
ENGL 458	Latino/a Literature and Culture	
ENGL 469	Advanced Study in American Literature	
ENGL 481	Women's Literature	
Choose one from the following courses		3
ENGL 412	Writing in the Workplace	
ENGL 431	Technical Editing	
ENGL 449	Advanced Study in Writing	
ENGL 479	Computers and Writing	
Non-Departmental Requirements (in addition Gen.Ed/VWW)		
MATH 1430G	Applications of Calculus I	3
or MATH 1130G	Survey of Mathematics	
JOUR 105G	Media and Society	3
One additional Area IV: Social/Behavioral Sciences Course (must be a different subject area than the course selected above) [4]		3
Second Language: (not required)		
Electives, to bring the total credits to 132		**0**
Total Credits		**132**

1. Course prerequisite for the Teacher Education Program (TEP) admission
2. Course requires admission to the Teacher Education Program (TEP)
3. MATH 1220G College Algebra or MATH 1250G Trigonometry & Pre-Calculus is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G or MATH 1250G first.
4. See the General Education (p. 262) section of the catalog for a full list of courses
5. The 9 credits of Upper-Division ENGL courses that are apart of the Concentration/Teaching Field coursework will meet the 2nd VWW requirement.
6. Course requires field experience
7. SPED 4811 requires 90 practicum hours; EDUC 4996 requires 100 practicum hours

Teaching Field: Math

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 131 credits with 48 credits in courses numbered 3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but it may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education Requirements		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I [1]	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Choose one from the following courses		3
ENGL 2130G	Advanced Composition	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science [1]	
Oral Communication		
Choose one from the following courses		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
Area II: Mathematics		
MATH 1511G	Calculus and Analytic Geometry I [2]	4
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
CEPY 1120G	Human Growth and Behavior	3
Choose one from the following:		4

PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Choose one from the following:		4
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
Area V: Humanities		
HIST 1150G	Western Civilization I	3
or HIST 1160G	Western Civilization II	
Area VI: Creative and Fine Arts		
Choose one from the following courses		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
General Education Elective		
MATH 1521G	Calculus and Analytic Geometry II	4
or MATH 1521H	Calculus and Analytic Geometry II Honors	
Viewing the Wider World		
LIBR 311V	Information Literacy	3
The 2nd VWW requirements will be satisfied with the concentration/teaching field courses [3]		
Departmental/College Requirements		
Secondary Education Core Requirements		
EDUC 1185	Introduction to Secondary Education and Youth [1,4]	3
SPED 3105	Introduction to Special Education in a Diverse Society [1]	3
EDLT 3110	Integrating Technology with Teaching (Pre/Co-requisite for admission to TEP) [1]	3
BLED 3120	Sheltered English Instruction for the ESL Classroom [5]	3
EDUC 4510	Data Literacy and Assessment [5]	3
EDUC 4420	Teaching Mathematics at the Middle and High School Level [4,5]	3
READ 4330	Content Area Literacy [5]	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society [5]	3
Student Teaching		
SPED 4820	Student Teaching SPED [5]	9
SPED 4840	Special Education/ Secondary Student Teaching Seminar	3
Special Education Requirements		
SPED 4220	Classroom Management for Diverse Learners	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	3
SPED 4120	High Incidence Disabilities in a Diverse Society [5]	3
SPED 4110	Low Incidence Disabilities in a Diverse Society [5]	3
SPED 4811	Practicum in Education, Equity and Cultural Diversity (Not with EDUC 4996) [4,5,6]	3
READ 3110	Instruction for Special Reading Needs [5]	3
EDUC 4996	Topics (Dual License Practicum; Prerequisite EDUC 4420) [4,5,6]	3
Math Education Teaching Field/Concentration Requirements		
MATH 2530G	Calculus III	3
CSCI 1110	Computer Science Principles	4
E T 182	Introduction to Digital Logic	2
MATH 1531	Introduction to Higher Mathematics	3
MATH 2415	Introduction to Linear Algebra	3
STAT 371	Statistics for Engineers and Scientists	3
or A ST 311	Statistical Applications	
MATH elective numbered 300+		3
MATH elective numbered 300+		3
MATH elective numbered 300+ [7]		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
HIST 1110G	United States History I	3
or HIST 1120G	United States History II	
Choose one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
Choose one from the following:		3
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1115G	Introduction to Anthropology	
ANTH 1160G	World Archaeology	
GEOG 1120G	World Regional Geography	
GEOG 1130G	Human Geography	
POLS 1120G	American National Government	
POLS 1110G	Introduction to Political Science	
POLS 1130G	Issues in American Politics	
POLS 2120G	International Relations	
SOCI 1110G	Introduction to Sociology	
SOCI 2310G	Contemporary Social Problems	
Second Language: (not required)		
Electives, to bring the total credits to 131		**0**
Total Credits		**131**

1. Prerequisite for admission to Teacher Preparation Program (TEP)
2. MATH 1511G Calculus and Analytic Geometry I is required for the degree but students may need to take any prerequisites needed to enter MATH 1511G Calculus and Analytic Geometry I first.
3. The 9 credits of Upper-Division MATH courses that are apart of the Concentration/Teaching Field coursework will meet the 2nd VWW requirement.
4. Course requires field experience
5. Course requires admission to Teacher Education Program (TEP)
6. SPED 4811 requires minimum of 90 practicum hours; EDUC 4996 requires a minimum of 100 practicum hours
7. If students take a MATH 300+ course instead of a A ST this course will also count as the second VWW requirement. If they take the A ST course they will need to take either an additional MATH course or an additional VWW course.

Teaching Field: Science

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 130 credits with 48 credits in courses numbered 3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I [1]	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Choose one from the following courses		3
ENGL 2130G	Advanced Composition	
ENGL 2215G	Advanced Technical and Professional Communication	
ENGL 2221G	Writing in the Humanities and Social Science [1]	
Oral Communication		
Choose one from the following courses		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
Area II: Mathematics		
MATH 1220G	College Algebra [1, 2]	3
or MATH 1250G	Trigonometry & Pre-Calculus	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory (Teaching Field/ Concentration Course(s))	4
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory (Teaching Field/ Concentration Course(s))	4
CEPY 1120G	Human Growth and Behavior	3
Area V: Humanities		
Choose one from the following courses		3
HIST 1110G	United States History I	
HIST 1120G	United States History II	
HIST 1130G	World History I	
HIST 1140G	World History II	
HIST 1150G	Western Civilization I	
HIST 1160G	Western Civilization II	
HIST 2245G	Islamic Civilizations to 1800	
HIST 2250G	East Asia to 1600	
HIST 2251G	East Asia since 1600	
Area VI: Creative and Fine Arts		
Choose one from the following:		3
ARTH 1115G	Orientation in Art	
ARTS 1145G	Visual Concepts	
DANC 1110G	Dance Appreciation	
MUSC 1130G	Music Appreciation: Western Music	
MUSC 1110G	Music Appreciation: Jazz	
THEA 1110G	Introduction to Theatre	
General Education Elective		
GEOG 1120G	World Regional Geography	3
or GEOG 1130G	Human Geography	
Viewing the Wider World		
LIBR 311V	Information Literacy	3
	The 2nd VWW requirements will be satisfied with the concentration/teaching field courses [3]	
Departmental/College Requirements		
Secondary Education Core Requirements		
EDUC 1185	Introduction to Secondary Education and Youth [1,4]	3
SPED 3105	Introduction to Special Education in a Diverse Society [1]	3
EDLT 3110	Integrating Technology with Teaching (Pre/Co-requisite for admission to TEP) [1]	3
BLED 3120	Sheltered English Instruction for the ESL Classroom [5]	3
EDUC 4510	Data Literacy and Assessment [5]	3
EDUC 4410	Teaching Science at the Middle and High School Level [4,5]	3
READ 4330	Content Area Literacy [5]	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society [5]	3
Student Teaching		
SPED 4820	Student Teaching SPED [5]	9
SPED 4840	Special Education/ Secondary Student Teaching Seminar	3
Special Education Core Requirements		
SPED 4220	Classroom Management for Diverse Learners	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	3
SPED 4120	High Incidence Disabilities in a Diverse Society [5]	3
SPED 4110	Low Incidence Disabilities in a Diverse Society [5]	3
SPED 4811	Practicum in Education, Equity and Cultural Diversity (Not with EDUC 4996) [4,5,6]	3
READ 3110	Instruction for Special Reading Needs [5]	3
EDUC 4996	Topics (Dual License Practicum; Prerequisite EDUC 4410) [4,5,6]	3
Science Education Teaching Field/Concentration Requirements		
CHEM 1215G	General Chemistry I Lecture and Laboratory for STEM Majors	4
or CHEM 1216	General Chemistry I Lecture and Laboratory for CHEM Majors	
CHEM 1225G	General Chemistry II Lecture and Laboratory for STEM Majors	4
or CHEM 1226	General Chemistry II Lecture and Laboratory for CHEM Majors	
Choose one from the following courses		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 2230G & PHYS 2230L	General Physics for Life Science I and Laboratory to General Physics for Life Science I	
Choose one from the following courses		4
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	

PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
BIOL 301	Principles of Ecology	3
BIOL 305	Principles of Genetics	3
BIOL 467	Evolution	3
BIOL 300+ Plant Science Elective		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 1430G	Applications of Calculus I	3
or MATH 1511G	Calculus and Analytic Geometry I	
or MATH 1511H	Calculus and Analytic Geometry I Honors	
Choose one from the following:		3
ANTH 1140G	Introduction to Cultural Anthropology	
ANTH 1115G	Introduction to Anthropology	
ANTH 1160G	World Archaeology	
SOCI 1110G	Introduction to Sociology	
SOCI 2310G	Contemporary Social Problems	
One additional Area V/VI: Humanities or Creative & Fine Arts Course (must be a different subject area than the course selected above) [7]		3
Second Language: (not required)		
Electives, to bring the total credits to 130		**0**
Total Credits		**130**

1. Prerequisite for admission to Teacher Preparation Program (TEP)
2. MATH 1220G College Algebra or MATH 1250G Trigonometry & Pre-Calculus is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G or MATH 1250G first.
3. The 9 credits of Upper-Division BIOL courses that are apart of the Concentration/Teaching Field coursework will meet the 2nd VWW requirement.
4. Course requires field experience
5. Course requires admission to Teacher Education Program (TEP)
6. SPED 4811 requires minimum of 90 practicum hours; EDUC 4996 requires a minimum of 100 practicum hours

Teaching Field: Social Studies

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 135 credits with 48 credits in courses numbered 3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I [1]	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2221G	Writing in the Humanities and Social Science [1]	3
Oral Communication		
Choose one from the following courses		3
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
ACOM 1130G	Effective Leadership and Communication in Agriculture	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		
MATH 1220G	College Algebra [1,3]	3-4
or MATH 1250G	Trigonometry & Pre-Calculus	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		
CEPY 1120G	Human Growth and Behavior	3
Area III: Laboratory Sciences Course(s)		8
Area V: Humanities		
HIST 1130G	World History I	3
or HIST 1140G	World History II	
Area VI: Creative and Fine Arts [4]		*3*
General Education Elective		
HIST 2250G	East Asia to 1600	3
or HIST 2251G	East Asia since 1600	
Viewing the Wider World		
LIBR 311V	Information Literacy	3
The 2nd VWW requirements will be satisfied with the concentration/teaching field courses [5]		
Departmental/College Requirements		
Secondary Education Core Requirements		
EDUC 1185	Introduction to Secondary Education and Youth [1,6]	3
SPED 3105	Introduction to Special Education in a Diverse Society [1]	3
EDLT 3110	Integrating Technology with Teaching (Pre/Co-requisite for TEP admission) [1]	3
BLED 3120	Sheltered English Instruction for the ESL Classroom [2]	3
EDUC 4510	Data Literacy and Assessment [2]	3
EDUC 4430	Teaching Social Studies at the Middle and High School Level [2]	3
READ 4330	Content Area Literacy [2]	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society [2]	3
Student Teaching		
SPED 4820	Student Teaching SPED [2]	9
SPED 4840	Special Education/ Secondary Student Teaching Seminar	3
Special Education Core Requirements		
SPED 4220	Classroom Management for Diverse Learners	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	3
SPED 4120	High Incidence Disabilities in a Diverse Society [2]	3
SPED 4110	Low Incidence Disabilities in a Diverse Society [2]	3
SPED 4811	Practicum in Education, Equity and Cultural Diversity (Not with EDUC 4996) [2,6,7]	3
READ 3110	Instruction for Special Reading Needs [2]	3
EDUC 4996	Topics (Dual License Practicum; Prerequisite EDUC 4430) [2,6,7]	3
Social Studies Teaching Field/Concentration Requirements		
ECON 2110G	Macroeconomic Principles	3
ECON 2120G	Principles of Microeconomics Honors	3
GEOG 2130	Map Analysis & Interpretation	3
HIST 1150G	Western Civilization I	3
or HIST 1160G	Western Civilization II	
HIST 1110G	United States History I	3
HIST 1120G	United States History II	3

HIST 386	New Mexico History [8]	3
EDUC 4540	Teaching History	3
HIST Elective 300+		3
HIST Elective 300+		3
Non-Departmental Requirements (in addition to Gen.Ed/VWW)		
MATH 1130G	Survey of Mathematics	3
or MATH 1430G	Applications of Calculus I	
GEOG 1120G	World Regional Geography	3
POLS 1120G	American National Government	3
or POLS 1110G	Introduction to Political Science	
Second Language: (not required)		
Electives, to bring the total credits to 135		**0**
Total Credits		**132-133**

1 Prerequisite for admission to Teacher Preparation Program (TEP)
2 Course requires admission to Teacher Education Program (TEP)
3 MATH 1220G College Algebra or MATH 1250G Trigonometry & Pre-Calculus is required for the degree but students may need to take any prerequisites needed to enter MATH 1220G or MATH 1250G first.
4 See the General Education (p. 262) section of the catalog for a full list of courses
5 The 9 credits of Upper-Division HIST courses that are apart of the Concentration/Teaching Field coursework will meet the 2nd VWW requirement.
6 Course requires field experience
7 SPED 4811 requires minimum of 90 practicum hours; EDUC 4996 requires a minimum of 100 practicum hours
8 Students who complete Survey of New Mexico History at another campus/university will need to take an additional 3 credit course at the 300+ level in ECON, GEOG, GOVT, or HIST to meet state licensure requirements.

A Suggested Plan of Study for Students

This roadmap assumes student placement in ENGL 1110G Composition I and the MATH course listed in Semester 1 of the First Year of each Teaching Field roadmap. The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Teaching Field: Language Arts

First Year		
Semester 1		**Credits**
ENGL 1110G	Composition I [1]	4
or ENGL 1110H	or Composition I Honors	
CEPY 1120G	Human Growth and Behavior	3
MATH 1220G	College Algebra [1]	3
or MATH 1250G	or Trigonometry & Pre-Calculus	
JOUR 105G	Media and Society	3
THEA 1110G	Introduction to Theatre	3
	Credits	**16**
Semester 2		
COMM 1115G	Introduction to Communication	3
or HNRS 2175G	or Introduction to Communication Honors	
MATH 1130G	Survey of Mathematics [1]	3
or MATH 1430G	or Applications of Calculus I	
HIST 1160G	Western Civilization II	3
EDUC 1185	Introduction to Secondary Education and Youth	3
ENGL 2610	American Literature I	3
or ENGL 2620	or American Literature II	
	Credits	**15**
Second Year		
Semester 1		
ENGL 2210G	Professional and Technical Communication [1]	3
or ENGL 2210H	or Professional and Technical Communication	
HIST 1110G	United States History I	3
or HIST 1120G	or United States History II	
ENGL 2630	British Literature I	3
or ENGL 2640	or British Literature II	
SPED 3105	Introduction to Special Education in a Diverse Society	3
LIBR 311V	Information Literacy	3
Area III: Laboratory Science Course [1]		4
	Credits	**19**
Semester 2		
EDLT 3110	Integrating Technology with Teaching	3
ENGL 310	Critical Writing	3
Choose one from the following:		3
ENGL 339V	Chicana/o Literature	
ENGL 380V	Women Writers	
ENGL 394V	Southwestern Literature	
SPED 4220	Classroom Management for Diverse Learners	3
BLED 3120	Sheltered English Instruction for the ESL Classroom	3
Area III: Laboratory Sciene Course [1]		4
	Credits	**19**
Third Year		
Semester 1		
READ 3110	Instruction for Special Reading Needs	3
ENGL 408	Shakespeare I (Fall Only)	3
or ENGL 409	or Shakespeare II	
SPED 4120	High Incidence Disabilities in a Diverse Society (Fall Only)	3
ENGL 470	Approaches to Composition (Fall Only)	3
400-Level ENGL Literature Elective Course		3
One additional Area IV: Social/Behavioral Science Course [1]		3
	Credits	**18**
Semester 2		
EDUC 4510	Data Literacy and Assessment	3
EDUC 4996	Topics	3
ENGL 416	Approaches to Literature (Spring Only)	3
SPED 4110	Low Incidence Disabilities in a Diverse Society (Spring Only)	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners (Spring Only)	3
	Credits	**15**
Fourth Year		
Semester 1		
READ 4330	Content Area Literacy (Fall Only)	3
EDUC 4440	Teaching Language Arts at the Middle and High School Level (Fall Only)	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society (Fall Only)	3

SPED 4811	Practicum in Education, Equity and Cultural Diversity	3
Choose one from the following:		3
ENGL 412	Writing in the Workplace	
ENGL 431	Technical Editing	
ENGL 449	Advanced Study in Writing	
ENGL 479	Computers and Writing	
400-Level ENGL Literature Elective Course [2]		3
	Credits	**18**
Semester 2		
SPED 4820	Student Teaching SPED	9
SPED 4840	Special Education/ Secondary Student Teaching Seminar	3
	Credits	**12**
	Total Credits	**132**

[1] See the General Education (p. 262) section of the catalog for a full list of courses

[2] 400 - level elective courses:

- ENGL 405 Chaucer
- ENGL 442 Modern and Contemporary American Poetry
- ENGL 458 Latino/a Literature and Culture
- ENGL 469 Advanced Study in American Literature
- ENGL 481 Women's Literature

Teaching Field: Math

First Year

Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
CEPY 1120G	Human Growth and Behavior	3
MATH 1511G or MATH 1511H	Calculus and Analytic Geometry I or Calculus and Analytic Geometry I Honors	4
Choose one from the following:		3
ECON 1110G	Survey of Economics	
ECON 2110G	Macroeconomic Principles	
ECON 2120G	Principles of Microeconomics Honors	
Choose one from the following:		3
ARTH 1115G	Orientation in Art	
DANC 1110G	Dance Appreciation	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
	Credits	**17**
Semester 2		
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
HIST 1110G or HIST 1120G	United States History I or United States History II	3
MATH 1521G or MATH 1521H	Calculus and Analytic Geometry II or Calculus and Analytic Geometry II Honors	4
EDUC 1185	Introduction to Secondary Education and Youth	3
CSCI 1110	Computer Science Principles	4
	Credits	**17**

Second Year

Semester 1		
ENGL 2221G	Writing in the Humanities and Social Science	3
E T 182	Introduction to Digital Logic	2
SPED 3105	Introduction to Special Education in a Diverse Society	3
Choose from one of the following:		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
Area IV: ANTH, GEOG, POLS or SOCI "G" Course		3
	Credits	**15**
Semester 2		
EDLT 3110	Integrating Technology with Teaching	3
MATH 1531	Introduction to Higher Mathematics	3
SPED 4220	Classroom Management for Diverse Learners	3
LIBR 311V	Information Literacy	3
Choose from one of the following:		4
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
	Credits	**16**

Third Year

Semester 1		
READ 3110	Instruction for Special Reading Needs	3
MATH 2415	Introduction to Linear Algebra	3
MATH 2530G	Calculus III	3
SPED 4120	High Incidence Disabilities in a Diverse Society	3
STAT 371 or A ST 311	Statistics for Engineers and Scientists or Statistical Applications	3
300-Level MATH Elective Course		3
	Credits	**18**
Semester 2		
BLED 3120	Sheltered English Instruction for the ESL Classroom	3
EDUC 4510	Data Literacy and Assessment	3
EDUC 4996	Topics	3
SPED 4110	Low Incidence Disabilities in a Diverse Society	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	3
300-Level MATH Elective Course		3
	Credits	**18**

Fourth Year

Semester 1		
READ 4330	Content Area Literacy	3
EDUC 4420	Teaching Mathematics at the Middle and High School Level	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society	3
SPED 4811	Practicum in Education, Equity and Cultural Diversity	3
HIST 1150G or HIST 1160G	Western Civilization I or Western Civilization II	3
300-Level MATH Elective Course		3
	Credits	**18**

Semester 2		
SPED 4820	Student Teaching SPED	9
SPED 4840	Special Education/ Secondary Student Teaching Seminar	3
	Credits	**12**
	Total Credits	**131**

Teaching Field: Science

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
CEPY 1120G	Human Growth and Behavior	3
MATH 1220G or MATH 1250G	College Algebra or Trigonometry & Pre-Calculus	3-4
Choose one from the following:		3
ARTH 1115G	Orientation in Art	
ARTS 1145G	Visual Concepts	
DANC 1110G	Dance Appreciation	
MUSC 1110G	Music Appreciation: Jazz	
MUSC 1130G	Music Appreciation: Western Music	
THEA 1110G	Introduction to Theatre	
Area V: Any HIST "G" Course		3
	Credits	**16-17**
Semester 2		
BIOL 2110G & BIOL 2110L	Principles of Biology: Cellular and Molecular Biology and Principles of Biology: Cellular and Molecular Biology Laboratory	4
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
MATH 1430G or MATH 1511G	Applications of Calculus I or Calculus and Analytic Geometry I	3-4
EDUC 1185	Introduction to Secondary Education and Youth	3
CHEM 1215G or CHEM 1226	General Chemistry I Lecture and Laboratory for STEM Majors or General Chemistry II Lecture and Laboratory for CHEM Majors	4
	Credits	**17-18**
Second Year		
Semester 1		
ENGL 2221G	Writing in the Humanities and Social Science	3
CHEM 1225G or CHEM 1226	General Chemistry II Lecture and Laboratory for STEM Majors or General Chemistry II Lecture and Laboratory for CHEM Majors	4
BIOL 2610G & BIOL 2610L	Principles of Biology: Biodiversity, Ecology, and Evolution and Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory	4
SPED 3105	Introduction to Special Education in a Diverse Society	3
LIBR 311V	Information Literacy	3
Area IV: ANTH or SOCI "G" Course		3
	Credits	**20**
Semester 2		
EDLT 3110	Integrating Technology with Teaching	3
Choose from one of the following:		4
PHYS 1230G & PHYS 1230L	Algebra-Based Physics I and Algebra-Based Physics I Lab	
PHYS 2110 & 2110L	Mechanics and Experimental Mechanics	
PHYS 1310G & PHYS 1310L	Calculus -Based Physics I and Calculus -Based Physics I Lab	
PHYS 2230L & 2230L	Laboratory to General Physics for Life Science I and Laboratory to General Physics for Life Science I	
BIOL 301	Principles of Ecology	3
SPED 4220	Classroom Management for Diverse Learners	3
READ 3110	Instruction for Special Reading Needs	3
	Credits	**16**
Third Year		
Semester 1		
BIOL 305	Principles of Genetics	3
SPED 4120	High Incidence Disabilities in a Diverse Society	3
BIOL 467	Evolution	3
Choose from one of the following:		4
PHYS 1240G & PHYS 1240L	Algebra-Based Physics II and Algebra-Based Physics II Lab	
PHYS 2140 & 2140L	Electricity and Magnetism and Electricity & Magnetism Laboratory	
PHYS 1320G & PHYS 1320L	Calculus -Based Physics II and Calculus -Based Physics II Lab	
PHYS 2240G & PHYS 2240L	General Physics for Life Science II and Laboratory to General Physics for Life Science II	
GEOG 1120G or GEOG 1130G	World Regional Geography or Human Geography	3
	Credits	**16**
Semester 2		
BLED 3120	Sheltered English Instruction for the ESL Classroom	3
EDUC 4510	Data Literacy and Assessment	3
EDUC 4996	Topics	3
SPED 4110	Low Incidence Disabilities in a Diverse Society	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	3
One additional Area V/VI: Humanites or Creative and Fine Arts Course		3
	Credits	**18**
Fourth Year		
Semester 1		
READ 4330	Content Area Literacy	3
EDUC 4410	Teaching Science at the Middle and High School Level	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society	3
SPED 4811	Practicum in Education, Equity and Cultural Diversity	3
300-Level BIOL Plant Science Elective Course		3-4
	Credits	**15-16**
Semester 2		
SPED 4820	Student Teaching SPED	9
SPED 4840	Special Education/ Secondary Student Teaching Seminar	3
	Credits	**12**
	Total Credits	**130-133**

Teaching Field: Social Studies

First Year		
Semester 1		**Credits**
ENGL 1110G or ENGL 1110H	Composition I [1] or Composition I Honors	4
CEPY 1120G	Human Growth and Behavior	3
MATH 1220G or MATH 1250G	College Algebra [1] or Trigonometry & Pre-Calculus	3-4
HIST 1110G	United States History I	3
Area VI: Creative and Fine Arts Course [2]		3
	Credits	**16-17**
Semester 2		
COMM 1115G or HNRS 2175G	Introduction to Communication or Introduction to Communication Honors	3
HIST 1130G or HIST 1140G	World History I or World History II	3
ECON 2120G or ECON 2110G	Principles of Microeconomics Honors or Macroeconomic Principles	3
EDUC 1185	Introduction to Secondary Education and Youth	3
Area III: Laboratory Science Course [2]		4
	Credits	**16**
Second Year		
Semester 1		
ENGL 2221G	Writing in the Humanities and Social Science [1]	3
POLS 1110G or POLS 1120G	Introduction to Political Science or American National Government	3
SPED 3105	Introduction to Special Education in a Diverse Society	3
HIST 1150G or HIST 1160G	Western Civilization I or Western Civilization II	3
LIBR 311V	Information Literacy	3
ECON 2110G or ECON 2120G	Macroeconomic Principles or Principles of Microeconomics Honors	3
	Credits	**18**
Semester 2		
EDLT 3110	Integrating Technology with Teaching	3
HIST 2245G	Islamic Civilizations to 1800	3
SPED 4220	Classroom Management for Diverse Learners	3
EDUC 4540	Teaching History (See EDUC Teaching History)	3
GEOG 1120G	World Regional Geography	3
HIST 1120G	United States History II	3
	Credits	**18**
Third Year		
Semester 1		
READ 3110	Instruction for Special Reading Needs	3
SPED 4120	High Incidence Disabilities in a Diverse Society	3
GEOG 2130	Map Analysis & Interpretation	3
MATH 1130G or MATH 1430G	Survey of Mathematics [1] or Applications of Calculus I	3
EDUC 4996	Topics	3
300-Level HIST Elective Course		3
	Credits	**18**
Semester 2		
BLED 3120	Sheltered English Instruction for the ESL Classroom	3
EDUC 4510	Data Literacy and Assessment	3
SPED 4110	Low Incidence Disabilities in a Diverse Society	3
SPED 4210	Introduction to Assessment of Diverse Exceptional Learners	3
HIST 2250G or HIST 2251G	East Asia to 1600 or East Asia since 1600	3
300-Level HIST Elective Course		3
	Credits	**18**
Fourth Year		
Semester 1		
READ 4330	Content Area Literacy	3
EDUC 4430	Teaching Social Studies at the Middle and High School Level	3
SPED 4150	Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society	3
SPED 4811	Practicum in Education, Equity and Cultural Diversity	3
HIST 386	New Mexico History	3
Area III: Laboratory Science Course [2]		4
	Credits	**19**
Semester 2		
SPED 4820	Student Teaching SPED	9
SPED 4840	Special Education/ Secondary Student Teaching Seminar	3
	Credits	**12**
	Total Credits	**135-136**

1 These courses may have prerequisites and/or co-requisites, and it is the students responsibility for checking and fulfilling all those requirements.

2 See the General Education (p. 262) section of the catalog for a full list of courses.

Africana Studies - Undergraduate Minor

Prefix	Title	Credits
Required Core Courses		
AFST 1110G	Introduction to Africana Studies	3
AFST 2110G	African American History	3
AFST 2140G	Black Women in the African Diaspora	3
AFST 4110V	Race, Culture, and Education	3
Electives		
Choose 6 credits from the following:		6
BEST 1110G	Introduction to Borderlands and Ethnic Studies	
EDUC 3120	Multicultural Education	
EDUC 3110V	Multicultural Issues in Society	
EDUC 3996	Special Topics in Education (Africana Studies)	
HIST 361	African American History to 1877	
HIST 362	African American History, 1865-present	
Total Credits		**18**

Semester 1		**Credits**
AFST 1110G	Introduction to Africana Studies	3
	Credits	**3**
Semester 2		
AFST 2110G	African American History	3
	Credits	**3**

Semester 3		
AFST 2140G	Black Women in the African Diaspora	3
	Credits	**3**
Semester 4		
AFST 4110V	Race, Culture, and Education	3
	Credits	**3**
Semester 5		
One of Two Elective Courses [1]		3
	Credits	**3**
Semester 6		
Two of Two Elective Courses [1]		3
	Credits	**3**
	Total Credits	**18**

[1] Elective course options include the following courses: BEST 1110G, EDUC 3120, EDUC 3110V, EDUC 3996, HIST 361, and HIST 362.

Early Childhood Education - Undergraduate Minor

The primary function of the undergraduate programs in the Department of Curriculum and Instruction is the preparation of licensed teachers for early-childhood settings and elementary and secondary schools. This process includes a broad general education, professional education and teaching specializations.

Prefix	Title	Credits
Early Childhood Education Minor		
Select a minimum of 9 credits in lower division courses		*9*
ECED 1110	Child Growth, Development, and Learning	
ECED 1115	Health, Safety, and Nutrition	
ECED 1130	Family and Community Collaboration	
ECED 2115	Introduction to Language, Literacy, and Reading	
ECED 2110	Professionalism	
ECED 1125	Assessment of Children and Evaluation of Programs	
ECED 1120	Guiding Young Children	
FCST 2110	Infancy Through Middle Childhood in the Family	
CEPY 2120	The Preschool Child	
Select a minimum of 9 credits in upper division courses		*9*
ECED 3210	Emergent Literacy	
ECED 4220	Advanced Caregiving for Infants and Toddlers	
SPED 3105	Introduction to Special Education in a Diverse Society	
ECED 4110	Young Children with Diverse Abilities	
ECED 4120	Assessment of Young Children, Birth-Eight	
EDUC 3120	Multicultural Education	
FCST 3230	Parenting and Child Guidance	
FCST 3110V	Introduction to Child Advocacy	
SOCI 3250	Sociology of Childhood	
Total Credits		**18**

Educational Leadership and Administration - Undergraduate Minor

A minor in educational leadership and administration is available to a student receiving a bachelor's degree from another department in the university. The minor in educational leadership and administration is designed to be useful to the undergraduate who is preparing to work as a teacher or staff member in educational organizations such as primary schools, community colleges and universities.

Prefix	Title	Credits
Required Courses		
ELAD 2340	Multicultural Leadership in Education	3
ELAD 2210	Leadership and Change in Education	3
ELAD 3210	Current Issues In Educational Leadership	3
ELAD 3996	Special Topics in Education	3
ELAD 4120	Principles of Education Law and Policy	3
ELAD 4130	Principles of Education Budgeting and Finance	3
Total Credits		**18**

How To Apply

If you wish to complete a minor in Educational Leadership and Administration (ELA), you should complete the ELA minor application/verification form and return it to the School of Teacher Preparation, Administration, and Leadership (TPAL) during the semester in which you will be completing your ELA minor coursework. This form notifies the registrar of your intention. It insures that if you complete the requirements for the minor, it will be officially recorded in your transcript.

Secondary Education - Undergraduate Minor

Students not earning a bachelor's degree in Secondary Education could be eligible for a minor in Secondary Education. Students must have a degree area related to one of the secondary licensure options of English Language Arts, Social Studies, Mathematics, or Science. Students must complete all 27 credits from the courses listed below with grades of C- or higher and maintain a cumulative GPA of at least 2.75. All 27 credits are considered upper division. Students must complete a Teacher Education Program (TEP) online portfolio in order to be accepted into TEP. The TEP prerequisite courses include EDUC 3120 Multicultural Education, SPED 3105 Introduction to Special Education in a Diverse Society, and EDUC 3997 Secondary Field Experience. Additionally, students must submit a STEP Packet to be admitted into the final semester of student teaching. For completion of the minor, students must pass the approved state licensure portfolio and must complete a full semester of student teaching internship. Students interested in the Minor in Secondary Education must contact the program director to determine eligibility.

Prefix	Title	Credits
Pre-TEP Courses		
EDUC 3120	Multicultural Education [1]	3
SPED 3105	Introduction to Special Education in a Diverse Society [1]	3
EDUC 3997	Secondary Field Experience [1, 2]	3
TEP Required Courses [3]		
READ 4330	Content Area Literacy [4]	3
Content Area Teaching Methods Course		*3*

EDUC 4410	Teaching Science at the Middle and High School Level [2, 4]	
EDUC 4420	Teaching Mathematics at the Middle and High School Level [2, 4]	
EDUC 4430	Teaching Social Studies at the Middle and High School Level [2, 4]	
EDUC 4440	Teaching Language Arts at the Middle and High School Level [2, 4]	
Student Teaching Internship (requires STEP application) [5]		
EDUC 4820	Secondary Student Teaching [6]	9
EDUC 4821	Middle and High School Student Teaching Seminar [6]	3
Total Credits		**27**

1. TEP prerequisites/co-requisites
2. Courses require field experience
3. TEP application information available on the TPAL website (https://tpal.nmsu.edu/admissions/tep-admission.html)
4. Course requires admission to TEP
5. STEP application information available on the TPAL website (https://tpal.nmsu.edu/degree-programs/undergraduate-programs/stia.html)
6. Courses require successful evaluation of STEP application

This roadmap suggests that a student starts their Minor as early as the first semester of Sophomore year. If a student starts later, then more than one course may be taken during a semester following the same order of courses.

Semester 1		**Credits**
EDUC 3120	Multicultural Education [1]	3
	Credits	**3**
Semester 2		
SPED 3105	Introduction to Special Education in a Diverse Society [1]	3
	Credits	**3**
Semester 3		
Apply to TEP [2]		
EDUC 3997	Secondary Field Experience [1, 3]	3
	Credits	**3**
Semester 4		
READ 4330	Content Area Literacy [4]	3
	Credits	**3**
Semester 5		
Submit STEP packet [5]		
Content Area Methods Course (Fall only)		3
EDUC 4410	Teaching Science at the Middle and High School Level [3, 4]	
EDUC 4420	Teaching Mathematics at the Middle and High School Level [3, 4]	
EDUC 4430	Teaching Social Studies at the Middle and High School Level [3, 4]	
EDUC 4440	Teaching Language Arts at the Middle and High School Level [3, 4]	
	Credits	**3**
Semester 6		
Student Teaching Semester [6]		
EDUC 4820	Secondary Student Teaching [7]	9
EDUC 4821	Middle and High School Student Teaching Seminar (must be taken concurrently with EDUC 4820) [7]	3
	Credits	**12**
	Total Credits	**27**

1. Courses are prerequisites/co-requisites for the Teacher Education Program (TEP)
2. TEP application available on the TPAL website (https://tpal.nmsu.edu/admissions/tep-admission.html)
3. Courses require Field Experience
4. Courses require admission to TEP
5. STEP application information available on the TPAL website (https://tpal.nmsu.edu/degree-programs/undergraduate-programs/stia.html)
6. Must be last semester before graduation unless major degree program requires a Senior project be completed in the last semester
7. Courses require successful evaluation of STEP application

Social Work

Undergraduate Program Information

The BSW degree (CSWE accredited) allows you to join a profession dedicated to helping people in personal and social situations. As a unique and challenging field, social work addresses the complexity of human behavior and the ever-present needs and potential of people. From rural communities to inner cities, social workers work in social service agencies, mental health centers, hospitals, schools, neighborhood organizations, probation offices, and private agencies. Social work roles are varied and flexible. Social workers practice in areas such as child abuse, community organization, direct services with individuals and families, mental health, group work, and the administration, planning, and development of social programs. With each consumer group and in every agency setting, social workers help to correct the causes or alleviate the results of poverty, racism, poor health, mental illness, or any condition that prohibits people from reaching their potential. The School of Social Work offers the undergraduate program in Las Cruces and Online leading to the Bachelor of Social Work (BSW) degree.

Graduate Program Information

The School of Social Work offers full-time and part-time Master of Social Work (MSW) graduate study options. These are available in Las Cruces as well as through our online Global Campus. The program provides academic and practicum education focusing on Advanced Generalist Practice with an emphasis on Populations of the Southwest. It is fully accredited by the Council on Social Work Education (CSWE).

Admission to the program follows the general regulations of the Graduate School, which require applicants to have a completed undergraduate degree from an accredited institution. Applicants must apply separately to both the Graduate School and the School of Social Work. The School of Social Work application specifies additional admission requirements, including an internal application, a written statement, a current resume, and personal references. Before starting the MSW program, applicants must complete a Basic Statistics course and a course covering Human Biology content. The program does not award academic credit for work or life experience as a substitute for social work courses or practicum education.

The School of Social Work is committed to ensuring a culturally diverse student population to enhance the social work profession at both state

and national levels. To meet this goal of diversity, the school makes an effort to recruit from historically underrepresented groups.

Applicants who qualify for advanced standing may complete the program with 30 credits rather than 60 credits. Admission to the advanced-standing program is for highly qualified applicants who have a Bachelor of Social Work degree (BSW) from a social work program accredited by the CSWE and earned within five years of beginning the advanced standing program, a cumulative GPA of at least 3.0 and a minimum GPA of 3.5 in core Undergraduate Social Work courses.

Degrees for the School

Bachelor Degree(s)

- Social Work - Bachelor of Social Work (p. 1461)
- Social Work - Bachelor of Social Work (Online) (https://catalogs.nmsu.edu/global/nmsu-global/social-work-bsw-online/)

Master Degree(s)

- Master of Public Health/Master of Social Work - Dual Degree (https://catalogs.nmsu.edu/nmsu/graduate-school/master-public-health-master-social-work-dual-degree/)
- Social Work - Master of Social Work (Full-Time Advanced) (p. 188)
- Social Work - Master of Social Work (Full-Time Advanced) (Online) (https://catalogs.nmsu.edu/global/nmsu-global/social-work-msw-full-time-advanced-online/)
- Social Work - Master of Social Work (Full-Time) (p. 187)
- Social Work - Master of Social Work (Full-Time) (Online) (https://catalogs.nmsu.edu/global/nmsu-global/social-work-msw-online/)
- Social Work - Master of Social Work (Part-Time) (p. 189)
- Social Work - Master of Social Work (Part-Time) (Online) (https://catalogs.nmsu.edu/global/nmsu-global/social-work-msw-part-time-online/)

Graduate Certificate(s)

- School Social Work: Special Education Related Services - Graduate Certificate (p. 250)
- School Social Work: Special Education Related Services - Graduate Certificate (Online) (https://catalogs.nmsu.edu/global/nmsu-global/school-social-work-special-education-related-services-graduate-certificate-online/)

Director: Mary Nienow, PhD, LISW

Professor Díaz ***Associate Professor*** de la Rosa, Finno-Velasquez, Gergerich, Gherardi ***Assistant Professor*** Knox, Lopez, Sanchez ***College Assistant Professors*** Brown, Facio, Nieto, Nunez, Palomino Pantoja, Stracener, Tellez ***College Associate Professor*** Montoya

M. Nienow, PhD (Minnesota), LISW**-** policy, advocacy, research, analysis and community organizing**,** macro practice**; H. Diaz,** PhD (Illinois)- social welfare policy and community socio-economic development**; I. de la Rosa,** PhD (Michigan), LMSW-program evaluation, research; **M. Finno-Velasquez**, PhD (California), LMSW-child welfare, immigration; **E. Gergerich**, PhD (Arkansas), LCSW-gerontology; **S. Gherardi**, PhD (Illinois), LCSW-school social work; **K. Knox**, PhD (New Mexico), LCSW- special education; **A. Lopez**, PhD (Massachusetts, Mexico)-Latino immigrant families and children; **L. Sanchez,** DSW (New Orleans), LCSW-clinical, research and administration/leadership**,** psychotherapy practice; **S. Brown**, DBH (Arizona), LCSW- behavioral health, severe mental illness, psychotherapist; **S. Facio**, MSW (New Mexico), LMSW- medical healthcare, mental health care, grief adjustment and counseling; **T. Nieto**, MSW (Las Cruces), LCSW-public schools and private practice; **M. Nunez**, MSW, LCSW- medical and rehabilitation; **P. Palomino Pantoja**, MSW (New Mexico) LMSW- health care and private practice**; M. Stracener**, DrPH, LCSW- mental health, crisis assessor, policy practice; **M. Tellez,** MSW (New Mexico)- serious mental illness, criminal justice system; **M. Montoya**, MSW (New Mexico), LCSW- child welfare.

Please see faculty page for full faculty bios: https://socialwork.nmsu.edu/staff-resources1/directory1.html

Social Work Courses

SOWK 2110G. Introduction to Human Services & Social Work
3 Credits (3)
This course is for students who are interested in social welfare issues and/or are considering entering a social service profession. The course presents an overview of social problems, issues and trends, and the network of social agencies developed to address these concerns. The course examines the influence of personal and professional values and ethics on the helping relationship. The concept of social welfare will be discussed from a social work perspective (with an emphasis on social justice), and students will gain a basic understanding of social work in U.S. society, social work career opportunities, and contemporary issues facing social workers. Approaches relevant to work with individuals, families, groups and communities are presented, with special emphasis on Hispanic and Indigenous populations of New Mexico and the Southwest. May be repeated up to 3 credits.
Learning Outcomes

1. Explain the interactions of social institutions, cultural factors, dimensions of identity, and environment with the human development and behavior of individuals.
2. Demonstrate knowledge of the social work profession's focus on addressing contemporary social issues in the United States.
3. Describe the mission and services provided by social service agencies at the regional, national, and global levels.
4. Demonstrate a basic understanding of the social work profession, its history, career opportunities, and contemporary issues facing social workers in the United States today.
5. Recognize how students' knowledge, skills, and attitudes impact their competence as helping professionals.

SOWK 3110. Sociocultural Concepts
3 Credits (3)
Theoretical and sociohistorical perspectives on racism, sexism, ageism, heterosexism, classism, ableism, and other forms of discrimination and oppression. Cultural diversity, strengths, and Southwest and border issues are examined. May be repeated up to 3 credits.
Learning Outcomes

1. Examine the role culture, gender, sexual orientation, and socio-economic class play in the way people think, feel, and behave.
2. Examine how diverse populations have been oppressed and exploited by dominant groups throughout U.S. history.
3. Analyze the effects of stereotypes, fallacies, and misconceptions about groups that experience oppression such as the LGBTQIA2S + community, the Elderly, People with Disabilities, BIPOC and people from low socio economic backgrounds and other socially marginalized groups.
4. Recognize theoretical models that describe various forms of discrimination, oppression, privilege and power.

5. Be familiar with relevant knowledge regarding the Southwest, border issues, Native American and Latinx/Chicanx/Hispanic content.
6. Recognize and implement anti racist, anti oppressive, and practice decolonization/indigenization and cultural humility in social work practice and social justice.

SOWK 3120. Human Behavior and the Social Environment I
3 Credits (3)
Major theories of human behavior and the life span from conception to adolescence.
Learning Outcomes
1. Students demonstrate knowledge of human development, diversity, and identity formation.
2. Students will explain how racism and oppression impact human behavior and the social environment.
3. Students will examine environmental systems (families, groups, organizations, and communities) and the complex interplay of biological, psychological, social, spiritual, and cultural dimensions that impact the social work engagement process.
4. Students will assess developmental theories to assess the complex interplay of biological, psychological, social, spiritual, and cultural.
5. Students will apply knowledge of major theories of infancy, childhood, and adolescent development to social work interventions.

SOWK 3130. Human Behavior and the Social Environment II
3 Credits (3)
Continuation of SOWK 3120. Major theories of human behavior and the life span from young adulthood through old age. Restricted to: S WK majors.
Prerequisite: SOWK 3120.
Learning Outcomes
1. Assess human behavior and the environment at the micro, mezzo, and macro levels to understand clients needs.
2. Critique the major theories of human behavior and development processes in the social environment.
3. Apply knowledge of major theories of human behavior and development processes in the social environment.
4. Demonstrate cultural sensitivity and humility for human diversity in micro, mezzo, and macro practice.
5. Apply knowledge of biological, psychological, and sociological aspects of human development and the social environment.

SOWK 3140V. Introduction to Social Policy: History
3 Credits (3)
Historical overview of the economic, political, and cultural impact on social welfare policy, institutions, and professions with international content. May be repeated up to 3 credits.
Learning Outcomes
1. Students will use reflection and self- regulation to manage personal values as they engage in discussion and written reflection around underlying values in social welfare.
2. Students will apply and communicate understanding of the importance of diversity and difference in shaping life experiences in practice at the macro level through written reflection.
3. Students will apply self-awareness and self-regulation to manage the influence of personal biases and values in working with diverse clients and constituencies through self-reflective discussions.
4. Students will apply their understanding of social, economic, and environmental justice to analyze social policy and advocate for just policies.
5. Through policy analysis and review of policy research, students will Identify social policy at the local, state, and federal level that impacts well-being, service delivery, and access to social services; assess how social welfare and economic policies impact the delivery of and access to social services, and apply critical thinking to analyze, formulate, and advocate for policies that advance human rights and social, economic, and environmental justice.

SOWK 3150. Social Work Research
3 Credits (3)
This undergraduate course is designed to prepare students to be effective consumers of research and to evaluate their own practice. Students will learn to read, critically evaluate and use the research of others to select interventions that are based on evidence of effectiveness. Students will demonstrate the knowledge, values and skills to be critical consumers of research for effective and ethical practice as well as possess the basic skills necessary to evaluate their own social work professional practice. Restricted to Social Work majors.
Prerequisite: MATH 1350G or STAT 2350G.
Learning Outcomes
1. Demonstrate a) understanding of core principles or scientific research and b) methods of analyzing and applying scientific research in social work practice.
2. Demonstrate and apply the integration of social work values and ethics within application of research principles and practices.

SOWK 3210. Social Work Practice Skills
3 Credits (3)
Introduction to generalist social work practice. Interpersonal skills, values, and ethics required in the helping relationship. Taught in a small-group format. Restricted to: S WK majors.
Learning Outcomes
1. Students will explain the role of ethics, values, and principles in generalist social work practice.
2. Students will demonstrate promotion of human rights and social justice in the generalist social work context.
3. Students will demonstrate social work skills of engagement.
4. Students will demonstrate social work skills of assessment with clients.
5. Students will demonstrate social work skills of intervention with clients.
6. Students will demonstrate social work skills of evaluation of practice with clients.

SOWK 3220. Social Work Practice with Individuals
3 Credits (3)
Generalist social work practice theory and skills in engagement, information gathering, assessments, planning, interventions, evaluation, and termination with individual client systems. Restricted to: S WK majors.
Prerequisite: SOWK 3210.
Learning Outcomes
1. Apply skills in ethical and professional standards of the NASW Code of Ethics.
2. Exercise social work direct practice skills of engagement (for example, person-in-environment, human behavior, interprofessional conceptual frameworks, and interpersonal skills).
3. Assess the human behavior, environment, and culture of clients and constituents to understand needs.

4. Critically select appropriate interventions to meet client and constituent needs.
5. Evaluate the results of interventions and goals for change.

SOWK 3230. Social Work Practice with Families
3 Credits (3)
Generalist social work practice theory and skills in engagement, information gathering, assessments, planning, interventions, evaluation, and termination with multicultural family systems.
Prerequisite: SOWK 3210.
Learning Outcomes
1. Students will engage in critical reflection around the value base of social work and its ethical standards as they are applied to work with families.
2. Students will describe how personal experiences in their families of origin impact their professional judgement and behavior.
3. Students will explain how engagement is an ongoing component of the dynamic process of social work with families.
4. Students will demonstrate strategies for engagement with diverse families in order to advance practice effectiveness.
5. Students will demonstrate strategies for assessment with diverse families in order to advance practice effectiveness.
6. Students will demonstrate strategies for intervention with diverse families in order to advance practice effectiveness.

SOWK 4110. Social Welfare Policy: Legislation
3 Credits (3)
Policy practice related to the formation of current social welfare policies that promote social and economic justice. Emphasis is on the development and influences of social policy, policy analysis, and the policy change process. Restricted to: S WK majors. May be repeated up to 3 credits.
Learning Outcomes
1. Describe the social policy development and influence process.
2. Apply a framework for the analysis of current and proposed social policy.
3. Identify and discuss current legislation which addresses social and economic justice.
4. Articulate gaps and/or problems in existing social welfare policies and in social welfare programs.
5. Identify strategies which are appropriate to baccalaureate level practice that may influence policymakers on behalf of people in need.

SOWK 4210. Generalist Social Work Practice with Organizations and Communities
3 Credits (3)
This course focuses on generalist social work values, knowledge and skills regarding practice with larger systems. Course content will include theories of community and organizational assessment and intervention. Strategies for advocacy and change, leadership for community and organizational change. May be repeated up to 3 credits.
Learning Outcomes
1. Analyze various macro theories and apply two or more to a particular issue within a local community or organization.
2. Describe the historical context/foundation of macro practice in social work and identify its application in the community.
3. Identify ethical principles related to macro practice.
4. Describe the use of macro level practice in empowering diverse and oppressed populations
5. Describe an evidence-based practice framework for social work intervention with communities and organizations.

SOWK 4220. Generalist Social Work Practice with Groups
3 Credits (3)
Generalist social work practice skills with group client systems focusing on the planned change process and the empowerment of oppressed populations. Restricted to: S WK majors. May be repeated up to 3 credits.
Learning Outcomes
1. Students will compare foundational concepts of group work practice in social work.
2. Students will examine how diversity shapes clients life experiences in group practice at the micro, mezzo, and macro levels.
3. Students will differentiate the group process in social work, including group development, roles, norms, and dynamics.
4. Students will apply generalist social work practice knowledge, values, and skills when engaging diversity and difference in practice with group client systems.
5. Students will demonstrate skills of engagement, planning, intervention, and evaluation with group client systems.

SOWK 4230. Family and Child Welfare Practice
3 Credits (3)
Current issues and interventions in child protection, foster care, family preservation and support, family reunification, adoption and permanency planning. Course required for Child Welfare Scholarship Program students.
Learning Outcomes
1. Self-assess professional strengths and limitations as a helping professional.
2. Critically examine biases and assumptions through reflective practices.
3. Describe child welfare practices and trends.
4. Apply trauma-informed engagement practices with diverse child welfare populations.
5. Conduct trauma-informed and culturally responsive assessment and intervention with diverse child welfare population.

SOWK 4240. Professionalism in the Field of Social Work
3 Credits (3)
Students will use the field experience as the backdrop for assessing their own progress toward entry level generalist social work practice; to integrate coursework and field experience to develop their professional foundation. Restricted to: S WK majors.
Corequisite: SOWK 4321.
Learning Outcomes
1. Demonstrate professional demeanor in behavior; appearance; and oral, written and electronic communication.
2. Use technology ethically and appropriately to facilitate practice outcomes.
3. Use reflection and self-regulation to manage personal values and maintain professionalism in practice situations.
4. Apply and communicate understanding of the importance of diversity and difference in shaping life experiences in practice at the micro, mezzo, and macro levels.
5. Apply self-awareness and self-regulation to manage the influence of personal biases and values in working with diverse clients and constituencies.

6. Apply their understanding of social, economic, and environmental justice to advocate for human rights at the individual and system levels.
7. Use and translate research evidence to inform and improve practice, policy, and service delivery.
8. Identify social policy at the local, state, and federal level that impacts well-being, service delivery, and access to social services.
9. Apply critical thinking to analyze, formulate, and advocate for policies that advance human rights and social, economic, and environmental justice. 1
10. Apply knowledge of human behavior and the social environment, person-in-environment, and other multidisciplinary theoretical frameworks to engage with clients and constituencies. 1
11. Collect and organize data, and apply critical thinking to interpret information from clients and constituencies. 1
12. Critically choose and implement interventions to achieve practice goals and enhance capacities of clients and constituencies. 1
13. Select and use appropriate methods for evaluation of outcomes. 1
14. Apply evaluation findings to improve practice effectiveness at the micro, mezzo and macro levels.

SOWK 4310. Practicum I
3 Credits (3)
Supervised professional practice in a community social service agency, providing experiential learning and instruction. 240 clock hours required. Restricted to: S WK majors.
Corequisite: SOWK 4311.
Learning Outcomes

1. Make ethical decisions by applying the standards of the NASW Code of Ethics, relevant laws and regulations, models for ethical decision-making, ethical conduct of research, and additional codes of ethics as appropriate to context.
2. Use reflection and self-regulation to manage personal values and maintain professionalism in practice situations.
3. Demonstrate professional demeanor in behavior; appearance; and oral, written, and electronic communication.
4. Use technology ethically and appropriately to facilitate practice outcomes.
5. Use supervision and consultation to guide professional judgment and behavior.
6. Apply their understanding of social, economic, and environmental justice to advocate for human rights at the individual and system levels.
7. Engage in practices that advance social, economic, and environmental justice.
8. Apply and communicate understanding of the importance of diversity and difference in shaping life experiences in practice at the micro, mezzo, and macro levels.
9. Apply self-awareness and self- regulation to manage the influence of personal biases and values in working with diverse clients and constituencies. 1
10. Use practice experience and theory to inform scientific inquiry and research. 1
11. Apply critical thinking to engage in analysis of quantitative and qualitative research methods and research findings. 1
12. Use and translate research evidence to inform and improve practice, policy, and service delivery. 1
13. Identify social policy at the local, state, and federal level that impacts well-being, service delivery, and access to social services. 1
14. Assess how social welfare and economic policies impact the delivery of and access to social services. 1
15. Apply critical thinking to analyze, formulate, and advocate for policies that advance human rights and social, economic, and environmental justice. 1
16. Apply knowledge of human behavior and the social environment, person-in- environment, and other multidisciplinary theoretical frameworks to engage with clients and constituencies. 1
17. Use empathy, reflection, and interpersonal skills to effectively engage diverse clients and constituencies. 1
18. Collect and organize data, and apply critical thinking to interpret information from clients and constituencies. 1
19. Apply knowledge of human behavior and the social environment, person-in- environment, and other multidisciplinary theoretical frameworks in the analysis of assessment data from clients and constituencies. 2
20. Critically choose and implement interventions to achieve practice goals and enhance capacities of clients and constituencies. 2
21. Apply knowledge of human behavior and the social environment, person-in- environment, and other multidisciplinary theoretical frameworks in interventions with clients and constituencies. 2
22. Use inter-professional collaboration as appropriate to achieve beneficial practice outcomes. 2
23. Negotiate, mediate, and advocate with and on behalf of diverse clients and constituencies. 2
24. Facilitate effective transitions and endings that advance mutually agreed-on goals. 2
25. Select and use appropriate methods for evaluation of outcomes. 2
26. Apply knowledge of human behavior and the social environment, person-in- environment, and other multidisciplinary theoretical frameworks in the evaluation of outcomes. 2
27. Critically analyze, monitor, and evaluate intervention and program processes and outcomes. 2
28. Apply evaluation findings to improve practice effectiveness at the micro, mezzo, and macro levels.

SOWK 4311. Practicum Seminar I
3 Credits (3)
The practicum seminar course will provide students the opportunities to integrate coursework and field practice experience learning to develop social work competencies. Restricted to: S WK majors.
Corequisite: SOWK 4310.
Learning Outcomes

1. Identify real-world applications of social work competencies.
2. Develop individualized learning goals for your practicum experience that align with the social work competencies.
3. Demonstrate evidence of ethical and professional behaviors in your practicum experience that are aligned with the social work competencies.
4. Reflect on the practice skills of professional social workers in your practicum setting.
5. Valuate the development of your personal practice skills in your practicum setting.

SOWK 4320. Practicum II
3 Credits (3)

This course is a continuation of a supervised professional practice in a community social service agency, providing experiential learning and instruction. 240 clock hours required. Restricted to: S WK majors.
Corequisite: SOWK 4321.

Learning Outcomes

1. Recognize course expectations, practicum requirements and procedures.
2. Recognize social work competencies, and requirements of learning contract goals.
3. Develop learning goals as related to Practicum.
4. Demonstrate Ethical and professional behavior.
5. Critically reflect on their practicum experience.
6. Explain the importance of ethics in social work.
7. Utilize knowledge of culture and background as it relates to documentation and reflection.
8. Articulate how differences in culture impact social work.

SOWK 4321. Practicum Seminar II
3 Credits (3)
The practicum seminar course will provide students the opportunities to integrate coursework and field practice experience learning to demonstrate social work competencies. Restricted to: S WK majors.
Corequisite: SOWK 4320.

Learning Outcomes

1. Make ethical decisions by applying the standards of the National Association of Social Workers Code of Ethics, relevant laws and regulations, models for ethical decision making, ethical conduct of research, and additional codes of ethics within the profession as appropriate to the context; The Nine Social Work Competencies 2022 Educational Policy and Accreditation Standards.
2. Demonstrate professional behavior; appearance; and oral, written, and electronic communication.
3. Use technology ethically and appropriately to facilitate practice outcomes.
4. Use supervision and consultation to guide professional judgment and behavior.
5. Apply research findings to inform and improve practice, policy, and programs.
6. Identify ethical, culturally informed, anti-racist, and anti-oppressive strategies that address inherent biases for use in quantitative and qualitative research methods to advance the purposes of social work.
7. Demonstrate anti-racist and anti-oppressive social work practice at the individual, family, group, organizational, community, research, and policy levels.
8. Demonstrate cultural humility by applying critical reflection, self-awareness, and self-regulation to manage the influence of bias, power, privilege, and values in working with clients and constituencies, acknowledging them as experts of their own lived experiences.
9. Advocate for human rights at the individual, family, group, organizational, and community system levels. 1
10. Engage in practices that advance human rights to promote social, racial, economic, and environmental justice. 1
11. Select and use culturally responsive methods for evaluation of outcomes. 1
12. Critically analyze outcomes and apply evaluation findings to improve practice effectiveness with individuals, families, groups, organizations, and communities. 1
13. Use social justice, anti-racist, and anti-oppressive lenses to assess how social welfare policies affect the delivery of and access to social services. 1
14. Apply critical thinking to analyze, formulate, and advocate for policies that advance human rights and social, racial, economic, and environmental justice. 1
15. Apply knowledge of human behavior and person-in-environment, as well as interprofessional conceptual frameworks, to engage with clients and constituencies. 1
16. Use empathy, reflection, and interpersonal skills to engage in culturally responsive practice with clients and constituencies. 1
17. Apply theories of human behavior and person-in-environment, as well as other culturally responsive and interprofessional conceptual frameworks, when assessing clients and constituencies. 1
18. Demonstrate respect for client self-determination during the assessment process by collaborating with clients and constituencies in developing a mutually agreed-upon plan. 1
19. Engage with clients and constituencies to critically choose and implement culturally responsive, evidence-informed interventions to achieve client and constituency goals. 2
20. Incorporate culturally responsive methods to negotiate, mediate, and advocate with and on behalf of clients and constituencies.

SOWK 4510. Family and Child Welfare Policy
3 Credits (3)
This course is designed to provide students with an understanding of the history and evolution of child welfare policies, initiatives and factors that influence advocacy and practices within the child welfare system. Child welfare policies and services specific to the state of New Mexico are infused throughout the course. May be repeated up to 3 credits.

SOWK 4996. Special Topics
3 Credits (3)
Specific subjects to be announced in the Schedule of Classes. May be used as a mandatory practice elective. Junior or above standing, majors or consent of instructor. Restricted to: S WK majors. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

SOWK 4997. Independent Study
1-6 Credits (1-6)
Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

SOWK 5110. Sociocultural Concepts and Populations of the Southwest
3 Credits (3)
Theoretical and sociohistorical perspectives on racism, sexism, ageism, heterosexism, classism, ableism, and other forms of discrimination and oppression. Cultural diversity, strengths, and Southwest and border issues emphasized. This course examines the social and cultural landscape of the U.S. Southwest, with a focus on the diverse populations that call this region home. The historical and contemporary experiences of marginalized communities, analyzing the impact of discrimination, oppression, and economic deprivation on their lives will be explored.

Learning Outcomes

1. Correlate the implications of cultural diversity and competent Social Work practice.

2. Apply theories and perspectives on oppression within diverse individuals, groups, and populations.
3. Discuss cultural identities and how intersectionality of social factors affects individuals.
4. Articulate the importance of a cultural competency perspective in Social Work practice.
5. Reflect on your individual cultural identity and experiences and how they influence your approach to culturally grounded Social Work practice.

SOWK 5135. Human Behavior in the Social Environment
3 Credits (3)
The major theories of human behavior and the life span from conception through adolescence, adulthood, and old age. Focuses both on the areas of concern and risk for client systems and on the opportunities and strengths in the social environment.
Learning Outcomes
1. Apply knowledge of human behavior and the social environment, person-in-environment, and other multidisciplinary theoretical frameworks.
2. Evaluate the functioning of individuals, families, and groups through biological, psychological, spiritual, and cultural dimensions.
3. Apply conceptual/theoretical frameworks to assess the functioning of individuals (children, adolescents, and adults), families, groups, organizations and communities.
4. Analyze the ways in which social systems facilitate or impede health and well-being of individuals and families.
5. Evaluate the complex interplay of the environment (family, groups, communities, and organizations) and developmental factors on infants, children, adolescents, and adults of diverse communities.
6. Evaluate theories and their role in assessment with children, adolescents, adults, families, groups, organizations, and communities.

SOWK 5155. Social Policy Issues, Analysis and Change
3 Credits (3)
An overview of social and economic problems in the United States and the historical and current social welfare policies aimed at alleviating these problems. Emphasis on developing an awareness and ability to create, analyze, and change policies that impact vulnerable populations.
Learning Outcomes
1. Comprehend the values, institutional, political, and economic forces that drive social problems and social welfare policy in the US.
2. Analyze past, current, and future social policies developed to respond to social problems from a lens that considers the historical, social, cultural, economic, organizational, environmental, and global influences on social problems and the impact on diverse populations of the Southwest.
3. Evaluate how social work values, ethics, and research impact social policy development, evaluation, and implementation of social policy.
4. Apply a multilevel policy advocacy framework to advocate for policies that promote human rights, social and economic justice and addresses culturally influenced barriers to services presented by practitioners, organizations, and larger systems for populations of the Southwest.

SOWK 5165. Generalist Social Work Practice
3 Credits (3)
An introduction to generalist social work practice skills, focusing on the theoretical foundations of social work as a profession and implementing the planned change process with individual, family, group, community, and organizational client systems within a social work values and ethics framework.
Learning Outcomes
1. Explain the just practice framework for social work practice.
2. Analyze the value of critical self-reflection as a foundation for social work practice.
3. Apply the ethical principles and standards in the NASW code of ethics to frameworks for ethical decision making.
4. Critically select theoretical orientations to address client needs.
5. Apply the planned change process to a range of client systems (individuals, groups, families, communities, and organizations).
6. Demonstrate skills for engagement and assessment with single-client systems.
7. Evaluate the results of intervention/action and evaluation plans of change.

SOWK 5180. Generalist Practicum Experience I
3 Credits (3)
Supervised professional practice in a community social service agency, providing experiential instruction and learning. 225 clock hours required. Seminar required. Restricted to: MSW majors.

SOWK 5181. Generalist Practicum Seminar I
3 Credits (3)
This practicum seminar assists students in integrating knowledge, skills, values, and ethical principles gained in practice and theory courses into social work practice settings. This seminar also aids students in integrating social work practice processes in service planning and delivery. Students explore skills of collaboration and consultation by presenting practicum case examples.
Corequisite: SOWK 5180.
Learning Outcomes
1. Increase awareness of personal strengths and challenges as a developing social work practitioner.
2. Employ knowledge, skills, values, and ethical principles from practice and theory courses in social work practice.
3. Demonstrate application of research findings to social work practice.
4. Collaborate and consult effectively with peers and practicum liaison.
5. Generalize the Council on Social Work Education's core competencies to social work practice.

SOWK 5190. Generalist Practicum Experience II
3 Credits (3)
Supervised professional practice in a community social service agency. 225 clock hours required. Seminar required. Restricted to: MSW majors.
Prerequisite: SOWK 5180.

SOWK 5191. Generalist Practicum Seminar II
3 Credits (3)
This practicum seminar builds on learning from Generalist Practicum Seminar I and assists students in integrating knowledge, skills, values, and ethical principles gained in practice and theory courses into social work practice settings. This seminar also aids students in integrating social work practice processes in service planning and delivery. Students explore skills of collaboration and consultation by presenting practicum case examples.
Prerequisite: SOWK 5180 and SOWK 5181.
Corequisite: SOWK 5190.

Learning Outcomes

1. Increase awareness of personal strengths and challenges as a developing social work practitioner.
2. Employ knowledge, skills, values, and ethical principles from practice and theory courses in social work practice.
3. Demonstrate application of research findings to social work practice.
4. Collaborate and consult effectively with others.
5. Generalize the Council on Social Work Education's core competencies to social work practice.

SOWK 5210. Core Components for Trauma Informed Practice
3 Credits (3)

This course facilitates students' acquisition of the knowledge, skills, and attitudes necessary to effectively use 12 common trauma-informed practice elements in interventions for and the treatment of traumatized children and their families. The course conceptualizes a trajectory of intervention that considers the impact of trauma, intervention objectives, and the practice elements needed to facilitate the intervention objectives. This course is taught using an inquiry-based learning (IBL) pedagogy to enhance students' engagement and learning using full-length cases to exemplify a range of different clients a clinician might encounter.

Learning Outcomes

1. Demonstrate cultural humility by applying critical reflection, self-awareness, and self-regulation to manage the influence of bias, power, privilege, and values in working with clients and constituencies, acknowledging them as experts regarding their own lived experiences.
2. Apply knowledge of human behavior and person-in-environment, as well as interprofessional conceptual frameworks to engage with clients and constituencies.
3. Demonstrate respect for client self-determination during the assessment process by collaborating with clients and constituencies in developing mutually agreed-on goals.
4. Engage with clients and constituencies to critically choose and implement culturally responsive, evidenced-informed interventions to achieve mutually agreed-on plans and increase the capacities of clients and constituencies.

SOWK 5230. Applied Social Work Research
3 Credits (3)

Introduction to skills for research-informed practice and practice-informed research, including problem formulation, research designs, measurement, instrumentation, data collection and analysis, use of human participants in research, and application of research knowledge and professional ethics to social work practice. Focus on the critical analysis, interpretation, and application of existing research and use of data to inform practice and advance the field across a range of client systems.

Learning Outcomes

1. Describe key concepts, theories, and methodologies used in social work research, including qualitative and quantitative approaches.
2. Apply ethical and cultural considerations in social work research and how these apply to working with vulnerable populations.
3. Critically evaluate existing social work research, identifying potential biases, limitations, and areas for improvement.
4. Develop comprehensive research, integrating theory, ethical standards, and appropriate methods to address real-world social work problems.

SOWK 5240. Leadership in Public Health Social Work
3 Credits (3)

This course explores the integrated application of Public Health Social Work (PHSW) models and theories of practice, addressing community and organizational assessment and intervention, interpretation of contexts of power and influence, capacity for conflict and alliances, and strategies for advocacy to promote community and organizational transformation. This course will emphasize assessing and sustaining culturally-sustaining, critical trauma theory-informed rural, tribal, and border area systems response to critical PHSW issues. This course is also designed to prepare students graduating in May 2022 for their MSW Final Program Examination and MPH Competency Exams.

Learning Outcomes

1. Apply Public Health Social Work competencies to social work and public health practice settings.
2. Demonstrate culturally humble, trauma informed public health social work knowledge, skills and values in social work and public health practice settings.
3. Examine culturally- and identity-relevant public health social work practice considerations when serving in border area, tribal and rural communities.
4. Design and implement community and organizational assessment through an integrated public health social work framework.

SOWK 5260. Leadership Action Project
1 Credit (1)

This skills-based course prepares MSW students for management in government and nonprofit organizational contexts, including how to prepare and analyze organizational budgets, develop grant proposals and reports and develop a leadership platform.

Learning Outcomes

1. Identify a problem that can be addressed through new programming, policy change, or collective action.
2. Assess needs and assets through the collection and/or analysis of multiple data sources.
3. Create a proposal to address an identified problem through policy, programming, or collective action.
4. Demonstrate leadership to persuade stakeholders of the relevance and feasibility of a proposal.

SOWK 5270. Social Work Ethics
1 Credit (1)

A bridge course for Advanced Standing students intended to provide a firm foundation in ethical practice before entry into the advanced year. May be repeated up to 2 credits.

Prerequisite: SOWK 5180 and SOWK 5190.
Corequisite: SOWK 5281.

Learning Outcomes

1. Learners will analyze the social work code of ethics.
2. Learners will apply frameworks for ethical decision making.

SOWK 5271. Social Work Policy
1 Credit (1)

A bridge course for Advanced Standing students intended to provide a firm foundation in policy practice before entry into the advanced year. May be repeated up to 2 credits.

Prerequisite: SOWK 5180 and SOWK 5190.
Corequisite: SOWK 5281.

Learning Outcomes

1. Learners will describe key policies impacting social work practice.
2. Learners will analyze policy.

3. Learners will articular policy recommendations and steps for engagement in policy practice.

SOWK 5272. Social Work Research
1 Credit (1)
A bridge course for Advanced Standing students intended to provide a firm foundation research-informed practice and practice-informed research before entry into the advanced year. May be repeated up to 2 credits.
Prerequisite: SOWK 5180 and SOWK 5190.
Corequisite: SOWK 5281.
Learning Outcomes
1. Learners will critically analyze existing research for application to practice.
2. Learners will demonstrate skills for collecting data to inform practice.

SOWK 5280. Advanced Generalist Practicum Experience I
3 Credits (3)
Supervised professional practice in a community social service agency providing experiential learning in advanced generalist practice. 250 clock hours required. Seminar required. Restricted to: MSW majors.
Prerequisite: SOWK 5190.

SOWK 5281. Advanced Generalist Practicum Seminar I
2 Credits
This practicum seminar builds upon students' knowledge, skills, values, and cognitive and affective processes attained in their generalist year to apply, analyze and evaluate advanced generalist social work service planning and delivery with diverse populations. Students develop professional social work practice knowledge in micro, mezzo, macro, and multidisciplinary settings.
Prerequisite: SOWK 5190 and SOWK 5191.
Corequisite: SOWK 5280.
Learning Outcomes
1. Incorporate the Council on Social Work Education's core competencies with social work practice skills and behaviors.
2. Analyze and evaluate the efficacy of social work interventions.
3. Perform critical reflectivity and skills of cultural humility to serve diverse populations competently.
4. Integrate complex critical thinking with various theories and interventions to address complex and diverse practice contexts.

SOWK 5290. Advanced Generalist Practicum Experience II
3 Credits (3)
Supervised professional practice in a community social service agency providing experiential learning in advanced generalist practice. 250 clock hours required. Seminar required. Restricted to: MSW majors.
Prerequisite: SOWK 5280.

SOWK 5291. Advanced Generalist Practicum Seminar II
2 Credits
This practicum seminar builds on learning from Advanced Practicum Seminar I and students' knowledge, skills, values, cognitive and affective processes attained in their generalist year to apply, analyze and evaluate advanced generalist social work service planning and delivery with diverse populations. Students develop knowledge of professional social work practice in micro, mezzo, macro, and multidisciplinary settings.
Prerequisite: SOWK 5280 and SOWK 5281.
Corequisite: SOWK 5290.
Learning Outcomes
1. Incorporate the Council on Social Work Education's core competencies with social work practice skills and behaviors.
2. Analyze and evaluate the efficacy of social work interventions.
3. Perform critical reflectivity and skills of cultural humility to serve diverse populations competently.
4. Integrate complex critical thinking with various theories and interventions to address complex and diverse practice contexts.

SOWK 5310. Social Work Mental Health Practice
3 Credits (3)
This course is designed to add to the practice sequence for Masters Level students in Social Work. It addresses social work assessment of major mental health issues across the life span with an emphasis on resiliency and coping skills. Culturally responsive practices are applied to the major issues of mental health. Basic psychopharmacology, neurobiology and the ways in which Social Workers interact with clients to aid education and effective treatment of medical interventions will be a prominent part of this course. Evidence-based practices useful for work in various disorders will be incorporated.
Learning Outcomes
1. Critically analyze the concepts of mental health and psychopathology.
2. Assess social, political, and economic conditions which interfere with mental health, focusing on populations at risk for discrimination and oppression.
3. Conduct assessments of mental and emotional functioning using approved models and tools.
4. Apply DSM 5 criteria across a range of diverse populations.
5. Differentiate culturally based behaviors from psychopathology.
6. Recognize connections between psychopharmacological interventions, symptom reduction, and side effects.
7. Identify evidence-based practices for work with clients exhibiting a range of mental disorders.

SOWK 5320. Advanced Practice with Individuals
3 Credits (3)
This class builds on Foundation Year Practice courses by integrating theory and practice, and advancing skills in selecting, applying and evaluating practice interventions in a culturally sensitive manner with individuals.
Prerequisite: SOWK 5165.
Learning Outcomes
1. Demonstrate professional behavior, appearance, and oral, written, and electronic communication.
2. Apply cultural understanding, intersectionality, and anti-oppressive social work theories to direct practice with individuals.
3. Assess individuals through the lenses of client self-determination, theories of human behavior, person-in-environment, and culturally responsive conceptual frameworks.
4. Provide culturally responsive, evidence-informed interventions in direct practice with individuals.
5. Evaluate principles of direct practice with individuals.

SOWK 5330. Advanced Practice with Groups
3 Credits (3)
This course will address the knowledge, values and skills needed to work effectively with diverse populations in group settings. The course will build on Foundation Year courses by integrating theory and practice, and advancing skills in selecting, applying and evaluating practice interventions in a culturally sensitive manner with social work groups.
Prerequisite: SOWK 5165.

Learning Outcomes

1. Demonstrate the ability to conduct a group.
2. Apply a theoretically informed knowledge base of group development as it is executed across systems.
3. Demonstrate knowledge of the variety of roles that group leaders and participants need to address in accomplishing the successful mission of the group.
4. Establish a process that encourages clients to embrace the mutual aid function of groups, embracing an attention to multiple helping relationships.
5. Advocate for a democratic process within all groups, encouraging a mutual emphasis on empowerment.
6. Apply skills for social work assessment to group assessments.

SOWK 5340. Advanced Practice with Families
3 Credits (3)

This class builds on Foundation Year Practice courses by integrating theory and practice, and advancing skills in selecting, applying, and evaluating practice interventions in a culturally sensitive manner with families. Restricted to: MSW majors.

Prerequisite: SOWK 5165.

Learning Outcomes

1. Demonstrate professional behavior, ethical conduct, and effective communication in all aspects of family practice.
2. Apply cultural humility and intersectionality to assess and engage with diverse family systems.
3. Conduct comprehensive family assessments using person-in-environment and systems-based approaches.
4. Implement evidence-based interventions that address the unique needs of diverse family systems.
5. Reflect on and evaluate professional practice to ensure growth and improve client outcomes.

SOWK 5350. Advanced Practice with Communities and Organizations
3 Credits (3)

This class builds on Foundation Year Practice courses by integrating theory and practice, and advancing skills in selecting, applying, and evaluating practice interventions in a culturally sensitive manner with organizations and communities. Restricted to: MSW majors.

Prerequisite: SOWK 5165.

Learning Outcomes

1. Integrate professional values, ethical standards, relevant laws and regulations into practice at the micro, mezzo, and macro levels, involving ethical decision-making and principles of critical thinking in practice, research, and policy.
2. Apply frameworks to understand their role in relationship to other professions, leaders and connectors in engaging in interprofessional teams in various settings.
3. Use self-reflection and self-awareness while engaging with diverse client populations using a range of social work practice roles in ethnically diverse communities.
4. Identify at-risk populations to determine their needs within community and organizational settings and determine what social and economic forces affect those persons at risk.
5. Analyze communities from both systems and ecological perspectives and apply ethnographic methods to conduct a community assessment project.
6. Apply policy knowledge and macro practice skills to advance human rights and social justice within practice settings at the micro, mezzo, and macro levels.
7. Identify at-risk populations to determine their needs in community and organizational settings and determine what social and economic forces influence those persons at risk.
8. Engage effectively in “asset mapping” that identifies existing and needed services for populations in a community settings and organizations.

SOWK 5510. Family and Child Welfare Policy
3 Credits (3)

This course will enhance students’ ability to offer child welfare services that respect cultural differences, reflect current policy knowledge concerning child maltreatment, build on the advocacy and protective capacities of individuals, families and communities and encourage permanency for children and preservation of families. Required basic knowledge of child welfare and assessment skills. Outside majors require instructor permission. May be repeated up to 3 credits.

SOWK 5530. Family/Child Welfare Practice
3 Credits (3)

Current issues and interventions in child protection, foster care, family preservation and support, family reunification, adoption and permanency planning.

Learning Outcomes

1. Students will identify and analyze approaches to child protection, foster care, family preservation and support, family reunification, adoption and permanency planning.

SOWK 5540. Introduction to School Social Work Practice in Diverse Communities
3 Credits (3)

An introduction to school social work in diverse communities beginning with systems of service for children with disabilities ages 0-3, continuing into early childhood and emphasizing services in pk-12 settings. The course explores school social work history and roles, ethics for school-based practice, Family support engagement, theoretical frameworks for school-based practice including critical disability theory, major education policies which impact school social work, schoolwide approaches to supporting student wellbeing, and approaches to targeted behavior interventions in schools. Emphasis is placed on culturally and linguistically relevant approaches to practice with diverse communities throughout.

Learning Outcomes

1. Critically analyze the role of the school social worker and how it is distinct from other social work roles.
2. Analyze the role of key federal, state, and district policies on school social work ethics and practice.
3. Apply critical disability theory to analyze approaches to school social work practice and intervention.
4. Describe and evaluate key approaches to school social work practice for students aged birth to twenty one.
5. Analyze the role of culturally and linguistically responsive family engagement and advocacy in school social work practice.

SOWK 5560. Advanced School Social Work Practice: Diverse Students and Families with Special Needs
3 Credits (3)

Advanced policy and practice for school social workers supporting students receiving special education services beginning in early childhood and continuing through primary and secondary school

settings. The curriculum will include culturally and linguistically appropriate knowledge, assessment, and interventions for diverse children and families with disabilities. The curriculum that is to be developed will include culturally relevant interventions for students with disabilities, special education policy, writing IEP reports and goals, and engaging in culturally and linguistically engaged family support and advocacy based on scientifically based information. The course will also provide a strong focus on special education specific policy and regulations. Assignments will be created to align with competency knowledge and application (Prerequisite SOWK 5540).
Prerequisite: SOWK 5540.
Learning Outcomes

1. Understand the roles and responsibilities of Related Service Providers (RSP) working with diverse populations.
2. Apply special education policy to practice in schools.
3. Connect culturally responsive advocacy skills and practices to related service social work.
4. Illustrate EBP to engage and assess needs of diverse children with disabilities and their families.
5. Implement and Evaluate EBP for diverse children with disabilities and their families.

SOWK 5994. Final Exit Project
1 Credit (1)
Final Exit Project. This 1-credit course is the School of Social Work's competency examination. The final exit project is non-thesis summative examination of students' ability to apply the Council on Social Work Education's core competencies to a case study. Students may only enroll in this course during the final semester of their MSW Program. May be repeated up to 2 credits.
Prerequisites: 45 Credit Hours and SOWK 5190.
Learning Outcomes

1. Apply Council on Social Work Education's core competencies to a case study.

SOWK 5996. Special Topics
1-3 Credits (1-3)
Specific subjects to be announced in the Schedule of Classes. Open to graduate students in related disciplines and to community professionals in related disciplines and to community professionals in related fields. May be repeated up to 99 credits.
Learning Outcomes

1. Varies

SOWK 5997. Independent Study
1-3 Credits (1-3)
Individual study to augment depth of knowledge in area related to course of study. May be repeated up to 6 credits.
Learning Outcomes

1. Varies

SOWK 5999. Graduate Thesis
1-6 Credits (1-6)
Required for thesis option. May be repeated up to 6 credits.
Learning Outcomes

1. Varies

Office Location: Health and Social Services Bldg. Suite 210

Phone: (575) 646-2143

Website: http://socialwork.nmsu.edu

Social Work - Bachelor of Social Work

The Bachelor of Social Work (BSW) program prepares you for entry-level professional generalist social work practice with an understanding and appreciation of the cultural diversity of the Southwest.

To be admitted as a Bachelor of Social Work (BSW) candidate, you must formally apply for admission to the program. A 2.5 grade-point average is required for the application. Consult with the School of Social Work Academic Advisor, located in the School of Social Work. The program is fully accredited by the Council on Social Work Education (CSWE).

General Education Requirements

Students need to complete the New Mexico State University general education requirements before applying to the Bachelor of Social Work program. The School of Social Work requirements include SOWK 2110G Introduction to Human Services & Social Work.

Once accepted into the program, students also need to meet a Cultural Emphasis requirement (6 credits). Viewing a Wider World classes can not count toward the Cultural Emphasis requirement. Highly recommended electives for social work students include courses in anthropology, child development, communication disorders, criminal justice, economics, English, family life, global languages, history, political science, public health, sociology, and Spanish history, Spanish, psychology, family life, child development. Electives must be sufficient to bring total credits to 120, including 48 upper-division credits, for graduation.

Departmental Requirements

Preparation for entry-level professional social work requires a thorough knowledge of theory and skills; therefore, the high number (57) of core social work credits is required. A grade of C- or better is required for all social work courses.

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements (6 credits), and elective credits to total a minimum of 120 credits with 48 credits in courses numbered 300/3000 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
ENGL 2210G	Professional and Technical Communication	3
or ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication [1]		*3*
Area II: Mathematics [2]		
MATH 1350G	Introduction to Statistics [3]	3
or MATH 2350G	Statistical Methods	
SOCI 3160	Sociological Research: Analysis [3]	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences [4]		
SOWK 2110G	Introduction to Human Services & Social Work	3

Either an Area III/IV: Laboratory Sciences Course or Social/Behavioral Sciences Course (4 or 3 credits) [1]		3-4
BIOL 1120G & BIOL 1120L	Human Biology and Human Biology Laboratory	4
or BIOL 1130G	Introductory Anatomy & Physiology (non-majors)	
Area V: Humanities [1]		*3*
Area VI: Creative and Fine Arts [1]		*3*
General Education Elective		
CEPY 1120G	Human Growth and Behavior	3
Viewing A Wider World [5]		**6**
Departmental/College Requirements		
SOWK 3110	Sociocultural Concepts	3
SOWK 3120	Human Behavior and the Social Environment I	3
SOWK 3130	Human Behavior and the Social Environment II	3
SOWK 3140V	Introduction to Social Policy: History	3
SOWK 3150	Social Work Research	3
SOWK 3210	Social Work Practice Skills	3
SOWK 3220	Social Work Practice with Individuals	3
SOWK 3230	Social Work Practice with Families	3
SOWK 4110	Social Welfare Policy: Legislation	3
SOWK 4210	Generalist Social Work Practice with Organizations and Communities	3
SOWK 4220	Generalist Social Work Practice with Groups	3
SOWK 4240	Professionalism in the Field of Social Work	3
SOWK 4310	Practicum I	3
SOWK 4311	Practicum Seminar I	3
SOWK 4320	Practicum II	3
SOWK 4321	Practicum Seminar II	3
Second Language Requirement		**6-8**
Electives, to bring the total credits to 120 [6]		**25-28**
Total Credits		**120**

1. See the General Education (p. 262) section of the catalog for a full list of courses
2. Either MATH 1350G Introduction to Statistics, A ST 311 Statistical Applications, SOCI 3160 Sociological Research: Analysisor MATH 2350G Statistical Methods is required for the degree.
3. SOCI 3160 Sociological Research: Analysis may not fulfill General Education Requirements. The course requires pre-requisites and students should consult with the School of Social Work Academic Advisor prior to registration
4. The Area III: Laboratory Science General Education requirement (BIOL 1120G Human Biology BIOL 1120L Human Biology Laboratory or BIOL 1130G Introductory Anatomy & Physiology (non-majors)) must be completed before starting the SOWK program and requires a grade of C- or better.
5. See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses
6. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However, students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

Second Language Requirement

For the Bachelor of Social Work, there is a one-year second language requirement. The number of credits a student needs to take may vary depending on their fluency in another language. Please speak with an advisor for more information regarding the second language requirement for this degree.

Option 1:

Prefix	Title	Credits
Complete one of the following sequences:		
FREN 1110 & FREN 1120	French I and French II	4-8
GRMN 1110 & GRMN 1120	German I and German II	4-8
JAPN 1110 & JAPN 1120	Japanese I and Japanese II	4-8
SPAN 1110 & SPAN 1120	Spanish I and Spanish II	4-8
PORT 1110 & PORT 1120	Portuguese I and Portuguese II	3-6
SIGN 1110	American Sign Language I	3
SIGN 1120	American Sign Language II	3
For Heritage Speakers:		
SPAN 1210 & SPAN 1220	Elementary Spanish for Heritage Learners I and Spanish for Heritage Learners II	3-6
or SPAN 2210	Spanish for Heritage Learners III	
Heritage speakers may take a 3-credit 3000-level or higher upper division course taught in a foreign language offered by the Department of Language and Linguistics to meet the requirement		3

A Suggested Plan of Study for Students

This roadmap assumes student placement in either A ST 311 Statistical Applications, MATH 1350G Introduction to Statistics, SOCI 3160 Sociological Research: Analysis or MATH 2350G Statistical Methods and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and English. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

Freshman

Fall		**Credits**
ENGL 1110G or ENGL 1110H	Composition I or Composition I Honors	4
One from the following: [1]		4
BIOL 1120G & BIOL 1120L or BIOL 1130G	Human Biology or Introductory Anatomy & Physiology (non-majors)	
Oral Communication Course [2]		3
Second Language Requirement Course		3-4
Elective Course [3]		1
	Credits	**15-16**
Spring		
One from the following: [4]		3
MATH 1350G	Introduction to Statistics	
MATH 2350G	Statistical Methods	
SOCI 3160	Sociological Research: Analysis	
CEPY 1120G	Human Growth and Behavior [5]	3
Second Language Course		3-4
SOWK 2110G	Introduction to Human Services & Social Work [5]	3
Elective Course [3]		3
	Credits	**15-16**

Sophomore		
Fall		
Area V: Humanities Course [2]		3
Area VI: Creative and Fine Arts Course [2]		3
Select one from the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Either an Area III/IV: Laboratory Science Course or Social/Behavioral Sciences Course [2]		3-4
Elective Course [3]		3
	Credits	**15-16**
Spring		
Viewing a Wider World Course [6]		3
Viewing a Wider World Course [6]		3
Elective Course [3]		3
Elective Courses [3]		6
	Credits	**15**
Junior		
Fall		
Elective Course [3]		3
SOWK 3210	Social Work Practice Skills	3
SOWK 3110	Sociocultural Concepts	3
SOWK 3120	Human Behavior and the Social Environment I	3
SOWK 3140V	Introduction to Social Policy: History	3
	Credits	**15**
Spring		
Elective Course [3]		3
SOWK 3130	Human Behavior and the Social Environment II	3
SOWK 3220	Social Work Practice with Individuals	3
SOWK 3150	Social Work Research	3
SOWK 4220	Generalist Social Work Practice with Groups	3
	Credits	**15**
Senior		
Fall		
Elective Course [3]		3
SOWK 4310	Practicum I	3
SOWK 4311	Practicum Seminar I	3
SOWK 4210	Generalist Social Work Practice with Organizations and Communities	3
SOWK 4110	Social Welfare Policy: Legislation	3
	Credits	**15**
Spring		
Elective Course [3]		3
SOWK 4320	Practicum II	3
SOWK 4240	Professionalism in the Field of Social Work	3
SOWK 4321	Practicum Seminar II	3
SOWK 3230	Social Work Practice with Families	3
	Credits	**15**
	Total Credits	**120-123**

1 BIOL 1120G Human Biology/ BIOL 1120L Human Biology Laboratory or BIOL 1130G Introductory Anatomy & Physiology (non-majors) must be completed before starting the S WK program and require a grade of C- or better.

2 See the General Education (p. 262) section of the catalog for a full list of courses

3 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

4 Either MATH 1350G Introduction to Statistics, MATH 2350G Statistical Methods or SOCI 3160 Sociological Research: Analysis. Additional prerequisites may be required for SOCI 3160 Sociological Research: Analysis

5 CEPY 1120G Human Growth and Behavior and SOWK 2110G Introduction to Human Services & Social Work: must be completed before starting the S WK program and require a grade of C- or better.

6 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses

NOTE: Students need to submit a formal application packet to the School of Social Work to be accepted into the program before they may take junior or senior year courses.

A grade of C- or better is required for all social work courses.

Sociology

Undergraduate Program Information

The undergraduate major in sociology is broad in scope. It prepares students for various public and private sector employment opportunities, including market research, personnel management, data analytics, computational sociology, human relations, law enforcement, health services, etc. Successful students often use their major as pre-professional preparation for advanced degrees in law, business, education, counseling, and other social science-based careers. Courses are offered both online and on campus.

Graduate Program Information

The program is designed to prepare students for doctoral study in sociology as well as employment in research and applied areas of the field. In addition to the on-campus program, we also offer an online MA for students who cannot attend in person. Through small seminars, on-campus graduate students engage in discussions of subjects that often result in thesis and internship topics. In online seminars, small classes allow for in-depth discussions that can generate ideas for research as well as knowledge for applied work environments. In both online and on-campus settings, faculty members and students work toward the mutual goal of developing each student's full potential.

The Southwest and Border Region

Our unique location attracts faculty and students who are interested in peoples of the southwest, particularly Hispanic/Latinx and Native Americans. In addition, our proximity to the U.S.-Mexico border provides an ideal laboratory for examining such issues as globalization, transnational migration, and the consequences of border development.

Social Inequality

Our faculty members examine the intersection of race, class, and gender oppression in their teaching and research, with special attention to educational, rural/urban, ecological, and global disparities. This

examination addresses social problems such as poverty and racial/ethnic inequality.

Program Options and Requirements

Students seeking a master's degree in sociology should have taken undergraduate courses in methods and statistics or their equivalent. Students who have not taken these courses are encouraged to complete them before beginning their graduate study or in consultation with the sociology graduate director as soon as possible.

Graduate students in sociology have two program options, thesis or non-thesis. Faculty consider the students special interests and career plans in advising regarding their choice of program options. The thesis option is typically selected by students who intend to pursue a Ph.D. degree, while the non-thesis option is commonly pursued by those desiring immediate employment in research and applied areas in business, government, education, social welfare, and health. The non-thesis, coursework only option is currently the only option available for online MA students. All students must pass a final master's examination.

Degrees for the Department

Bachelor Degree(s)

- Sociology - Bachelor of Arts (p. 1474)
- Sociology - Bachelor of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/sociology-ba-online/)

Master Degree(s)

- Sociology - Master of Arts (p. 190)
- Sociology - Master of Arts (Online) (https://catalogs.nmsu.edu/global/nmsu-global/sociology-ma-online/)

Minors for the Department

- Sociology - Graduate Minor (p. 261)
- Sociology - Undergraduate Minor (p. 1476)
- Sociology - Undergraduate Minor (Online) (https://catalogs.nmsu.edu/global/nmsu-global/sociology-ug-minor-online/)

Academic Department Head - David G. Ortiz, Ph.D.

Professors - LoConto, Rice; ***Associate Professors*** - Ortiz, Pelak, Steinkopf, Taylor, Way; ***Assistant Professors*** - Arnett, Bermúdez Tapia, Harper, Newby, Rouhana; ***Emeritus Professor*** - Hoffman, Loustaunau

S. Arnett, Ph.D. (University of Notre Dame)– education, race and ethnicity, social inequalities; B. Bermúdez Tapia, Ph.D. (University of Colorado, Boulder)– international migration, race and ethnicity, qualitative methodology; H. Harper, Ph.D. (University of California, San Diego)– political sociology, policy design and development, computational analysis; D. LoConto, Ph.D. (Oklahoma State University)– classical American social thought, popular culture, social psychology; C. A. Newby, Ph.D. (University of Texas at Austin)– race/ethnicity/minority relations, immigration, demography; D. Ortiz, Ph.D. (University of Notre Dame)– social movements, political sociology, Latin America; C. Pelak, Ph.D. (Ohio State University)– social inequalities, race and ethnicity, sociology of sport; J. Steinkopf-Rice, Ph.D. (Washington State University)– gender, globalization, communities; J.C. Rice, Ph.D. (Washington State University)– environment, society and technology, political sociology; T. Rouhana, Ph.D. (University of California, Santa Cruz)– political sociology, social movements, computational methods; M. Taylor, Ph.D. (University of Notre Dame)- computational/quantitative methods, culture, cognitive sociology; S. Way, Ph.D. (University of Arizona)– education, gender, juvenile delinquency.

Sociology Courses

SOCI 1110G. Introduction to Sociology
3 Credits (3)
This course will introduce students to the basic concepts and theories of sociology, as well as to the methods utilized in sociological research. The course will address how sociological concepts and theories can be utilized to analyze and interpret our social world, and how profoundly our society and the groups to which students belong influence them. Students will be given the opportunity to challenge their "taken-for-granted" or "common sense" understandings about society, social institutions, and social issues. Special attention will also be paid to the intimate connections between their personal lives and the larger structural features of social life. In addition, the implications of social inequalities, such as race/ethnicity, gender, and social class will be central to the course's examination of social life in the United States.
Learning Outcomes
1. Define sociological perspectives and the contributions that sociological knowledge can bring to the social sciences.
2. Understand the sociological imagination and explain the relationships between social structures, social forces and individuals.
3. Demonstrate the ability to apply the perspectives of symbolic interactionist theory, conflict theory, and structural-functionalist theory to qualitative and/or quantitative data.
4. Understand and explain intersectionality and the connections between race, class, gender, disability, sexual identity and other forms of structural inequality.

SOCI 2230. Sociology of Sexuality
3 Credits (3)
This course explores all aspects of human sexuality from a sociological perspective. Topics include, but are not limited to, sex work, intimate relationships, sexual response, political movements, power, and the social construction of sexuality. The course also considers how various social statuses such as ethnicity, gender, and social class intersect with sexuality.
Learning Outcomes
1. Identify the central research questions, theories, and methodologies used in the study of human sexuality.
2. Identify and describe biological, cultural, social, and psychological sexual behaviors and response across the lifespan.
3. Identify and describe trends and changes that influence sexual attitudes and values in the U.S. and globally.
4. Describe how sexuality is influenced by contextual factors, such as race/ethnicity, gender, socioeconomic status, disability, and nationality.

SOCI 2240. Sociology of Intimate Relationships and Family
3 Credits (3)
This course provides an overview of contemporary intimate relationships and families from sociological perspectives. We will examine intimate relationships and families as social constructions whose meanings have changed over time and from place to place. This course will aid students in developing a greater understanding of intimate relationships and families as institutions in contemporary U.S. society. Intersections of race, class, gender, sexual orientation, nationality, and other factors within these institutions will be addressed. Community Colleges only. May be repeated up to 3 credits.

Learning Outcomes

1. Explain the sociological approaches to researching intimate relationships and families.
2. Describe important sociological research findings concerning intimate relationships and families.
3. Explain how intimate and familial relationships are affected by multiple intersecting inequalities and ongoing events in other social institutions.

SOCI 2261. Issues in Death and Dying
3 Credits (3)
Major personal and social issues related to the process of dying in our culture. Community Colleges only.

Learning Outcomes

1. be able to understand the diversity of the death experience and the various options available in coping with death and bereavement as shown by the student's participation in class discussions and field trips.
2. better understand death and dying as social phenomena as shown by the student's reaction papers.
3. have taken an in-depth look at her or his own death with a researched paper. Comprehension will be shown by the student's grade on the paper.

SOCI 2310G. Contemporary Social Problems
3 Credits (3)
This course studies the nature, scope, and effects of social problems and their solutions. The course will concentrate on sociological perspectives, theories, and key concepts when investigating problems, such as inequality, poverty, racism, alienation, family life, sexuality, gender, urbanization, work, aging, crime, war and terrorism, environmental degradation, and mass media. This course is designed to build students' sociological understanding of how sociological approaches attempt to clarify various issues confronting contemporary life, as well as how sociologists view solutions to these problems.

Learning Outcomes

1. Identify and explain major social problems in the United States, and how social problems become constructed as problems.
2. Describe and analyze policy related solutions associated with social problems from various perspectives.
3. Critically examine social problems through the use of sociological theories, methods, and empirical techniques.
4. Identify connections, both national and global, between social problems and social inequalities (e.g., social class, race/ethnicity, and gender/sexuality).

SOCI 3110V. Sociology of Religion
3 Credits (3)
Provides an overview of old and new methods and theories for the study of religion. Exposure to the ways groups of people in diverse cultural systems construct and change their religious traditions to serve practical and meaningful ends. May be repeated up to 3 credits.

SOCI 3120V. Introduction to Population Studies
3 Credits (3)
Determinants and consequences of changes in fertility, mortality and migration patterns. Introduction to techniques of demographic analysis. Focus on U.S. and world population issues and their relation to social, cultural, and economic systems. May be repeated up to 3 credits.

SOCI 3150. Social Research: Methods
3 Credits (3)
An introduction to research design and data collection strategies commonly employed in the social sciences. Topics include experiments, survey research and various other quantitative and qualitative methods. May be repeated up to 3 credits.
Prerequisite: SOCI 1110G.

SOCI 3160. Sociological Research: Analysis
3 Credits (3)
Elementary data analysis class emphasizing descriptive and inferential statistical techniques commonly employed in the social sciences. Topics range from one variable analysis through regression and correlation analysis of two variables. May be repeated up to 3 credits.
Prerequisite: SOCI 1110G.

Learning Outcomes

1. Critically evaluate understand social statistics from various common sources such as TV, newspapers, research reports, and scholarly articles. --Assessed via discussion, assignments and exams.

SOCI 3165. Sociological Theory
3 Credits (3)
Analysis of the main historical themes underlying contemporary sociological theory. May be repeated up to 3 credits.
Prerequisite: SOCI 1110G.

SOCI 3240. Sociology of the Family
3 Credits (3)
Family patterns, dynamics, and processes in North American and other contemporary families. Emphasis on diversity. May be repeated up to 3 credits.

Learning Outcomes

1. Family patterns, dynamics, and processes in North American and other contemporary families. Emphasis on diversity.

SOCI 3245V. Comparative Family Systems
3 Credits (3)
A comparative analysis of family forms and characteristics in various societies. An examination of the diversity of family practices among ethnic and class groups in the United States. May be repeated up to 3 credits.

SOCI 3250. Sociology of Childhood
3 Credits (3)
This course examines theories, methods, and empirical research in several areas of the sociology of childhood. Major themes are: (1) how social structure constrains children's lives, (2) how children negotiate, share, and create culture, and (3) how children's experiences vary within and across societies. May be repeated up to 3 credits.

SOCI 3255. Youth and Society
3 Credits (3)
Comparative historical analysis of social, economic and cultural forces affecting young people. Emphasis on organizational and institutional effects on the well being of children and young adults. May be repeated up to 3 credits.

SOCI 3270. Gender and Society
3 Credits (3)
Overview of issues related to gender, including how gender is constructed and reproduced in our society. Gender is examined from social psychological and institutional perspectives. May be repeated up to 3 credits.

SOCI 3310V. Social Issues in the Rural Americas
3 Credits (3)

Discussion of the major social issues facing the rural United States and borderland areas. Topics include the social history, governmental policies, water rights, land issues and labor. May be repeated up to 3 credits.

SOCI 3315. Urban Society in a Global World: Problems, Prospects, and Promises
3 Credits (3)
Identification and analysis of the causes and consequences of social issues in urban environments including poverty, crime, terrorism, urban social policy, suburban flight, disinvestment, and deindustrialization. Special emphasis on global forces affecting global urban environments around the world. May be repeated up to 3 credits.

SOCI 3330. Environmental Sociology
3 Credits (3)
This course provides a sociological examination of the interconnections of human social organization and the biophysical environment. The goal is to make sense of these complex interconnections between society and the environment--including examination of potential causes and solutions to environmental problems in real world settings. May be repeated up to 3 credits.

SOCI 3340V. Social Change
3 Credits (3)
Explanations of autonomous and directed social change as occurring at the individual, organizational, societal, and international levels. Case studies from around the world. May be repeated up to 3 credits.

SOCI 3410. Race and Ethnic Relations
3 Credits (3)
Dynamics of racial prejudice and patterns of racial and ethnic interaction in the United States. May be repeated up to 3 credits.

SOCI 3415. Social Inequality
3 Credits (3)
Analysis of the social distinctions arising from sex, age, occupation, and ethnicity. Emphasis on indicators of social class and patterns of social mobility. May be repeated up to 3 credits.

SOCI 3510. Crime and Society
3 Credits (3)
Analysis of crime at the interpersonal, organizational, and social structure levels in society. Exploration of contemporary images of crime in mass media. Examination of connections between race, class, gender, and crime in U.S. society. May be repeated up to 3 credits.

SOCI 3520. Juvenile Delinquency
3 Credits (3)
Nature, extent, and causes of juvenile delinquency; juvenile justice; modern methods of treatment; programs of prevention. May be repeated up to 3 credits.

SOCI 3610V. Sociology of Pop Culture
3 Credits (3)
This course will provide students with a sociological look at creation, distribution, and effects of popular culture that have shaped, preserved, and conveyed distorted images of social class, race, gender and history to unwary consumers. May be repeated up to 3 credits.

SOCI 3620V. Sports and Society: A Global Perspective
3 Credits (3)
A critical examination of sports in a global context, emphasizing the social and cultural factors that shape the world of sports and the consequences of sports for societies. Course examines issues of social inequality, violence, media and corporate influence, religion and sports, and the student-athlete experience. May be repeated up to 3 credits.

SOCI 3630. Culture and Social Life
3 Credits (3)
What exactly does culture look like, and how precisely does it shape---and is shaped by---social behavior? These are the core questions in the sociology of culture and will be the focus of this course. The course begins with an overview of the various ways that culture has been defined in sociological theory and research. The course will then focus on various topics within the contemporary sociology of culture, including, but not limited to, culture and cognition, the production of culture, culture and politics, and culture and inequality.
Learning Outcomes
1. Finish the course with an understanding of the different ways that culture is defined in sociological research.
2. Understand the various ways that culture affects social behavior and how social behavior shapes and changes culture.
3. Finish the course with a sociological imagination that is expanded to included cultural theory.
4. Finish the course with the ability to formulate research projects that involve cultural theories.

SOCI 3635V. Food and Society
3 Credits (3)
This course explores how food and food products are produced, prepared, and consumed. We examine social and structural inequalities, economics, the food-health crisis, and the environmental, political, cultural, and symbolic dimensions of food systems and food-related behaviors. We also discuss the impact of race, class, gender, and socioeconomic matters on food-related issues and investigate how social problems in the food system reflect an ongoing tension between individuals and the power of social institutions.
Learning Outcomes
1. Discuss food, food systems, and food-related topics using sociological terms, concepts, and theories using empirically-based and scholarly research.
2. Demonstrate how sociological perspectives regarding food, food systems, and eating practices can be viewed as social issues and socially constructed.
3. Apply food as a lens to study opportunities and patterns of consumption, distribution, and production, which reflect existing social inequalities.
4. Apply a sociological perspective to students' eating habits, food environments, and food cultures.
5. Identify themselves as competent social actors exploring ways they can make positive contributions to society and be catalysts for change.
6. Develop and express interpretation and analysis of sociological principles through formal and informal writing.

SOCI 3640. Sociology of Digital Media
3 Credits (3)
This course explores how the social, political-economic, and cultural landscape is changing in relation to digital media and information technologies.
Learning Outcomes
1. Develop analytical tools for understanding the complex information society.
2. Examine how the cultural, political, and social environments are changing with the emergence of new media and digital technologies.
3. Place the relationship between society and new media in context – what is interesting about these "new" technologies?

4. Successfully develop, conduct, and present a final project.
5. Understand a central and contemporary issue within the study of social media from a sociological perspective.

SOCI 3645. Music in Society
3 Credits (3)
This course reviews historical, contemporary, and emerging forms of music. We will analyze the fascinating interplay between music and society, delving into how music reflects and shapes cultural attitudes and beliefs. Our focus views music as a primary source of meaning in our lives, exploring individual experiences and collective behavior and analyzing the central role of music in social life and society.
Learning Outcomes
1. Discuss music and its social and individual impact using sociological terms, concepts, and theories.
2. Apply a sociological perspective (using sociological theories and methods) to ask/answer questions about music and music-related topics.
3. Analyze the tremendous influence music has on our understanding and expressions of race, class, gender, sexual orientation, socioeconomic status, and contemporary culture.
4. Examine diversity and culture as they intersect with music in both historical and contemporary contexts.
5. Illustrate the role of music in collective identity and social movements.
6. Identify themselves as competent social actors exploring ways they can make positive contributions to society and be catalysts for change.

SOCI 3650. Film in Society
3 Credits (3)
Using historical, cultural, and social perspectives, this course analyzes the comprehensive scope of classic and contemporary films. It uses examples from a variety of films to discuss how meaning is socially constructed and presented and its overall function in society. We explore the topics of identity, race, social class, gender, sexuality, education, courtship and marriage, religion, and many other elements of society.
Learning Outcomes
1. Express a working knowledge of sociological inquiry and sociological terms, concepts, and the major theoretical approaches that sociologists use to understand the complexities of film in society.
2. Explain how the human experience, personal values, and ideas are shaped and expressed by films at both individual and structural levels.
3. Illustrate expressions of intersectionality and the presentation expressed in contemporary film.
4. Apply a broad, sociological perspective to understand the complex issues involved in the social construction and perpetuation of contemporary social problems.
5. Evaluate the power of classical and contemporary film and their influence on human experience, personal identity, social values and ethics, and American culture.
6. Identify ourselves as competent social actors exploring ways we can make positive contributions to society and be catalysts for change.
7. Develop and express interpretation and analysis of sociological principles through formal and informal writing.

SOCI 4150. Networked and Connected
3 Credits (3)
Introduction to social network analysis in sociology. First half of the course focuses on understanding the structure of social networks. Second half of the course involves examining real-world social networks ranging from romantic relationships to political parties.
Learning Outcomes
1. Finish the course with the ability to interpret, question, and discuss network science theories and methods.
2. Understand which type of network method is appropriate for different kinds of research questions.
3. Finish the course with basic programming and network analysis skills in the R statistical computing environment.

SOCI 4155. Textual Analysis of Digital and Social Media
3 Credits (3)
Introduction to some of the methods that social scientists use to analyze digital and social media. Focus is on developing the fundamentals for designing and conducting text analysis projects.
Learning Outcomes
1. Finish the course with the ability to interpret, question, and discuss text analysis methods accurately.
2. Understand which type of text analysis method is appropriate for different kinds of research questions.
3. Finish the course with basic programming and data analysis skills in the R statistical computing environment.

SOCI 4160. Visualizing Social Life
3 Credits (3)
Introduction to how to communicate sociological findings using graphics. Emphasis is on finding meaningful trends in real-world social science data and creating graphics that best communicate those associations or trends.
Learning Outcomes
1. Finish the course with the ability to create, interrogate, and interpret data visualization.
2. Understand which type of graphic is appropriate for different kinds of social science data.
3. Finish the course with basic programming and data visualization skills in the R statistical computing environment, especially with the ggplot2 package.

SOCI 4240V. Comparative Global Family Systems
3 Credits (3)
The study of families around the world. The comparison will include how capitalism and power differentials have affected the course of family history, gender relations, and family life today. May be repeated up to 3 credits.

SOCI 4270. Sex and Gender
3 Credits (3)
This course is an advanced exploration of gender from a sociological perspective. Topics include cultural constructions of gender, socialization and identity formation. In addition, the course examines how gender is relevant within the institutions of family, work, education, religion and politics, with particular focus on how gender is linked to inequality.
Learning Outcomes
1. Differentiate between biological, psychological and sociological perspectives on sex and gender.
2. Demonstrate an understanding of the social construction of gender.
3. Demonstrate an understanding of gender as it intersects with other social identities such as sexuality, race, ethnicity, religion, and class.

4. Identify the role of culture and socialization in the development of gender.
5. Apply a sociological understanding to how gender is relevant within the institutions of family, work, education, religion, the media and politics.

SOCI 4310. Community Development
3 Credits (3)
This is a holistic view of community development with an emphasis upon how economic development efforts can become more inclusive and sustainable. Topics include examining what 'community' means, community development versus economic development, and alternative economic activities. May be repeated up to 3 credits.
Prerequisite: SOCI 1110G.

SOCI 4315. Public Sociology
3 Credits (3)
This course examines both the theory and practice of public sociology. The course begins by examining the theoretical aspects, challenges, and critiques informing public sociology. After setting these foundations the remainder of the course examines different ways of applying public sociology, whether in the K-12 classroom, through community engagement activities such as nonprofit work, or other endeavors that seek to make the world a better place.
Learning Outcomes
1. Understand the theoretical foundations and debates within public sociology 2)Understand various ways public sociology can be practiced outside academia

SOCI 4317. Social Transformation
3 Credits (3)
This course examines various components of social change. The primary intention of this course is to help students better understand how the United States, and the world, has changed and continues to change. The course begins by examining how social change influences one's personal life, then focuses upon how social change influences inequalities in the United States. The course concludes by examining how individuals can engage in creating social change.
Learning Outcomes
1. Identify how social change has influenced, and continues to influence, their personal lives.
2. Identify the causes and patterns of social change.
3. Identify how different sociological theoretical paradigms and theories explain different facets of social change.
4. Apply these various theoretical perspectives learned to various types of social change.

SOCI 4320. Social Movements and Activism
3 Credits (3)
An overview and exploration of the key concepts of collective behavior and social movements as they apply to both historical and contemporary trends and movements. We examine also social movement tactics and their effectiveness in shaping policy and social norms. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate understanding of social movement theory and how it applies to particular cases.
2. Identify and analyze how social movements emerge and the conditions that their success depends on.
3. Analyze the role that movements play in transitions to and consolidations of democracy.
4. Critically examine how: a) State repression incites or threatens the development of movements, and b) which strategies movements use for communicating with the larger society.
5. Demonstrate knowledge of a specific social movement and its relations to broader questions of social, economic, political, and cultural transformations.

SOCI 4325. Digital Media and Activism
3 Credits (3)
This course introduces the study of social movements and activism and their relationship with digital and social media.
Learning Outcomes
1. Understand the most relevant theories of social movements and how these have been affected by the new digital media ecology.
2. Critically examine how the qualities and attributes of digital media contribute to the operation, growth, and success of contemporary activism around the world.
3. Place the relationship between social movements and new media in context.
4. Understand a central and contemporary social movement and its use of social media to further its goals.

SOCI 4335V. Advanced Environmental Sociology
3 Credits (3)
Advanced examination of societal responses to environmental problems including social adjustments to natural and technological hazards, sociocultural aspects of technological risk and impact assessment, and emergence of environmental social movements. May be repeated up to 3 credits.

SOCI 4337. Human Society and the Environment
3 Credits (3)
This course explores the relationship between human societies and the natural environment, with an emphasis on both sustainable human and environmental relationships. May be repeated up to 3 credits.
Prerequisite: SOCI 1110G.

SOCI 4410. Diversity in Alternative Families
3 Credits (3)
Cross-cultural examination of diversity among and within families: analysis of family diversity includes consideration of the theoretical frameworks, ideological commitments, personal experiences, and methodological approaches to examine family life. May be repeated up to 3 credits.

SOCI 4420. Sociology of Latinos/as in the United States
3 Credits (3)
In-depth examination and comparative analysis of political and economic issues affecting Latino/a culture and behavior. Includes the Chicano/a and larger Latino/a movements, the border, immigration, language policies, education, religion, labor, and Latina women s issues. Recommended preparatory courses: SOCI 1110G, SOCI 3410, or HIST 367. May be repeated up to 3 credits.

SOCI 4430. International Migration
3 Credits (3)
This course examines international migration as a social process, focusing on the American experience. Students will examine historical and comparative literature on immigration that puts contemporary questions about policy and immigrant assimilation into a broader sociological perspective. May be repeated up to 3 credits.
Prerequisite: SOCI 1110G.

SOCI 4450. Power and Politics in America
3 Credits (3)
This course provides an introduction to the study of Political Sociology with a focus on the United States. Political Sociology studies the social bases of politics and political systems and facilitates the understanding of the processes and consequences of power distributions in the United States. May be repeated up to 3 credits.
Prerequisite: SOCI 1110G.

SOCI 4455. Inequality and Public Policy
3 Credits (3)
This course explores the reciprocal relationship between inequality and public policy, with a particular focus on poverty and anti-poverty policy in the contemporary United States.
Learning Outcomes
1. Understand and compare different ways in which poverty has been historically measured and understood
2. Understand and apply various types of social inequality
3. Critically read and evaluate empirical research measuring, and policy proposals addressing, poverty and inequality
4. Write your own policy evaluation including empirically grounded policy recommendations
5. More effectively participate in policy debates regarding inequality and poverty

SOCI 4460. Globalization
3 Credits (3)
Analysis of the globalization process. Covers theories of globalization, the global economy, political globalization, global culture, transnational social movements, transnational migration and world labor market, global cities, and local-global linkages. Same as POLS 469. May be repeated up to 3 credits.

SOCI 4510. Social Deviance
3 Credits (3)
Theoretical approaches to the study of social deviance with emphasis on critical theories. Exploration of forms of deviance in society. Examination of social construction of deviance within mass media and systems of social control. May be repeated up to 3 credits.

SOCI 4555. Sociology of Education
3 Credits (3)
Socio-political and economic factors that shape the structure and operation of educational institutions in modern complex societies. Socio-historical development of the school as a microcosm of society, with examples from American and other school systems. May be repeated up to 3 credits.

SOCI 4992. Directed Readings
1-3 Credits (1-3)
Individual readings or research for either majors or nonmajors. Consent of Instructor required. May be repeated up to 6 credits.

SOCI 4996. Special Topics
3 Credits (3)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes
1. Varies

SOCI 4998. Internship
1-6 Credits (1-6)
Supervised participation in an appropriate community setting. Taught with SOCI 5998. May be repeated up to 9 credits.

SOCI 4999. Sociology Senior Seminar
3 Credits (3)
The main goal of this course is to provide Sociology students the opportunity to integrate the knowledge acquired from the classroom with personal real-world experiences in order to explore how a sociological perspective can be applied to one's everyday life and work. Students must be in senior standing to enroll in this course. May be repeated up to 3 credits.
Prerequisite: SOCI 1110G.
Learning Outcomes
1. Refine and demonstrate students' sociological imaginations.
2. Engage in critical self-reflection by practicing sociological mindfulness on a regular basis.
3. Have the opportunity to apply sociological concepts to a real-world setting.
4. Have the opportunity to critically apply and evaluate the utility of select social theories to a real-world setting.
5. Refine critical writing and thinking skills through class discussions.

SOCI 5110. Perspectives on Sociology
3 Credits (3)
Overview of Sociology and development of students' sociological imaginations. Understanding the place of sociology in career development and the application of Sociology and sociological concepts to the real world. May be repeated up to 3 credits.
Learning Outcomes
1. Refine students' sociological imaginations.
2. Engage in critical self-reflection by practicing sociological mindfulness on a regular basis.
3. Have the opportunity to apply sociological concepts to the real world.
4. Explore how students can utilize sociology in achieving their career goals.
5. Refine students' critical writing and thinking skills through class discussions.

SOCI 5150. Seminar in Social Networks
3 Credits (3)
Advanced introduction to social network methods. First half of the course focuses on understanding the structure of social networks. Second half of the course involves examining real-world social networks ranging from romantic relationships to political parties. Includes hands-on experience with the R statistical computing environment
Learning Outcomes
1. Finish the course with the ability to interpret, question, and discuss network science theories and methods.
2. Understand which type of network method is appropriate for different kinds of research questions.
3. Finish the course with basic programming and network analysis skills in the R statistical computing environment.

SOCI 5153. Seminar in Sociological Research
3 Credits (3)
Exploration of research methods, issues, and practical application. Students must be in graduate standing.
Learning Outcomes
1. Develop the ability to use terms and concepts employed in quantitative social science research methodologies.
2. Understand and critically assess findings published in academic journals and in the public sphere based on your knowledge of research design, for example, the fit of methods, data, and argument.

3. Finish the course with the ability to plan and carry out quantitative research projects on topics relevant to a variety of academic disciplines.

SOCI 5155. Seminar in Text Analysis for the Social Sciences
3 Credits (3)
Advanced exploration into some of the methods that social scientists use to analyze digital and social media. Focus is on developing the fundamentals for designing and conducting text analysis projects. Includes hands-on experience with the R statistical computing environment.
Learning Outcomes
1. Finish the course with the ability to interpret, question, and discuss text analysis methods accurately.
2. Understand which type of text analysis method is appropriate for different kinds of research questions.
3. Finish the course with basic programming and data analysis skills in the R statistical computing environment.

SOCI 5157. Seminar in Qualitative Research Methods
3 Credits (3)
This course provides an in-depth examination of qualitative research methods, including the logic, time, and purpose of using such methods. Students must be in Graduate standing.

SOCI 5158. Seminar in Visual Ethnographic Methodology
3 Credits (3)
This course focuses on the potential and the qualities of visual data collection in research and will start with a review of the diversity of research strategies and ethics that incorporate visual data. We will discuss different ways of using visual methods in research alongside epistemological theory of understanding what it means to look at the world. We will use our own experiences of looking and feeling to consider what visual methods can contribute to effective ethnographic research. Students must be graduate students to enroll.
Learning Outcomes
1. Learn the basic fundaments of visual qualitative inquiry.
2. Learn the concept of ethics and reflexivity in qualitative research.
3. Learn how to design visual qualitative research.
4. Understand the different methods used in visual qualitative research.
5. Select and use appropriate visual qualitative methods to answer research questions.

SOCI 5160. Seminar in Data Visualization
3 Credits (3)
Advanced exploration into how to communicate sociological findings using graphics. Emphasis is on finding meaningful trends in real-world social science data and creating graphics that best communicate those associations or trends. Includes hands-on experience with the R statistical computing environment, especially the ggplot2 package.
Learning Outcomes
1. Finish the course with the ability to create, interrogate, and interpret data visualization.
2. Understand which type of graphic is appropriate for different kinds of social science data.
3. Finish the course with basic programming and data visualization skills in the R statistical computing environment, especially with the ggplot2 package.

SOCI 5163. Issues in Advanced Quantitative Analysis
3 Credits (3)
Advanced methods of sociological analysis are examined in detail. May be repeated up to 3 credits.
Learning Outcomes
1. Finish the course with the ability to interpret, question, and discuss social statistics and their applications.
2. Understand which type of statistical method/analysis is appropriate for different kinds of research questions.
3. Finish the course with basic programming and data analysis skills in a statistical computing environment.

SOCI 5165. Foundations of Social Theory
3 Credits (3)
Analysis of classical social thought within the discipline. Restricted to: Sociology majors. May be repeated up to 3 credits.
Learning Outcomes
1. Know and have an understanding of the history of social thought in Sociology.
2. Know and have an understanding of the fundamental underlying assumptions of many social theories.
3. Be able to effectively write showing an understanding of the theorists/theories as they apply to social phenomena.
4. Be able to openly discuss with confidence the various tenets of social theory.

SOCI 5166. Seminar in Contemporary Theory
3 Credits (3)
This course equips students with the ability to critically analyze contemporary social theory (post World War II) with a particular focus on how these texts apply theoretical frameworks to pressing issues of our time.
Learning Outcomes
1. Understand the main conceptual and theoretical frameworks that have influenced social research post World War II.
2. Improve critical thinking through cross-cultural and cross-disciplinary analyses of social forces.
3. Identify one's own work and interests within/and in relation to these perspectives.
4. Comprehend and evaluate sociology as a discipline that has been shaped by diverse sets of social phenomena.

SOCI 5170. Seminar in Individual and Society
3 Credits (3)
Examines reciprocal relationship between individual and society. Topics include socialization, social influence and persuasion, group structure and performance, altruism, aggression, interpersonal attraction, group cohesion and conformity, and intergroup conflict. May be repeated up to 3 credits.
Learning Outcomes
1. Know and understand the theoretical antecedents for Social Psychology.
2. Know and understand the fundamental underlying assumptions of Social Psychology approaches in Sociology.
3. Know and understand the history and development of Social Psychological Theories.
4. Be able to effectively write a literature review addressing specific topics utilizing Social Psychology as an underlying framework.
5. Understand the relationship between the individual and society, particularly addressing the relationship between structure and agency.

SOCI 5175. Seminar in Symbolic Interaction
3 Credits (3)
This seminar will provide you a backdrop on Symbolic Interactionism, focusing on the direct and indirect antecedents of the theory, as well as current research and theoretical development up to the present. May be repeated up to 3 credits.
Learning Outcomes
1. Know and understand the theoretical antecedents for Symbolic Interaction.
2. Know and understand the fundamental underlying assumptions of Symbolic Interaction.
3. Know and understand the history and development of Symbolic Interaction.
4. Be able to effectively write a literature review addressing specific topics utilizing Symbolic Interaction as an underlying framework.
5. Be able to openly discuss the various tenets of Symbolic Interaction with confidence.

SOCI 5270. Seminar in Sex and Gender
3 Credits (3)
Comprehensive examination of current gender identity and gender stratification issues. May be repeated up to 3 credits.
Learning Outcomes
1. Gain an understanding of gender from a sociological perspective.
2. Critically examine how gender shapes and is shaped by personal interaction and meaning and how it is embedded in the structure of our social institutions.
3. Understand the relationship between gender, the body, media and violence.
4. Gain competence in discussing the biological and psychological explanations of gender differences as well as in discussing cultural and gender socialization and identity formation.
5. Examine how gender is relevant within the institutions of family, work, and education with particular focus on how gender is linked to inequality.

SOCI 5310. Seminar in Community Development
3 Credits (3)
This is in an advanced seminar addressing a holistic view of community development with an emphasis upon how economic development efforts can become more inclusive and sustainable. Students must be in a graduate student to enroll. May be repeated up to 3 credits.
Learning Outcomes
1. Define community development.
2. Apply the different theoretical approaches to community development to an issue.
3. Identify the major challenges confronting various communities today.
4. Understand emerging and radical community development initiatives in both theory and practice.

SOCI 5315. Seminar in Public Sociology
3 Credits (3)
This course examines both the theory and practice of public sociology. The course begins by examining the theoretical aspects, challenges, and critiques informing public sociology. After setting these foundations the remainder of the course examines different ways of applying public sociology, whether in the K-12 classroom, through community engagement activities such as nonprofit work, or other endeavors that seek to make the world a better place.
Learning Outcomes
1. Understand the theoretical foundations and debates within public sociology
2. Understand various ways public sociology can be practiced outside academia

SOCI 5317. Seminar in Social Transformation
3 Credits (3)
This is in an advanced seminar addressing various components of social change. The primary intention of this course is to help students better understand how the United States, and the world, has changed and continues to change. The course begins by examining how social change influences one's personal life, then focuses upon how social change influences inequalities in the United States. The course concludes by examining how individuals can engage in creating social change.
Learning Outcomes
1. Identify how social change has influenced, and continues to influence, their personal lives.
2. Identify the causes and patterns of social change.
3. Identify how different sociological theoretical paradigms and theories explain different facets of social change.
4. Apply these various theoretical perspectives learned to various types of social change.

SOCI 5320. Seminar in Social Movements and Activism
3 Credits (3)
An advanced exploration of the key concepts of collective behavior and social movements as they apply to both historical and contemporary trends and movements. We examine also social movement tactics and their effectiveness in shaping policy and social norms. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate comprehensive understanding of social movement theory and how it applies to particular cases.
2. Identify and analyze how social movements emerge and the conditions that their success depends on.
3. Analyze the role that movements play in transitions to and consolidations of democracy.
4. Critically examine how: a) State repression incites or threatens the development of movements, and b) which strategies movements use for communicating with the larger society.
5. Exhibit scholarly professionalization by successfully developing, conducting and presenting a research project.
6. Demonstrate in-depth knowledge of a specific social movement and its relations to broader questions of social, economic, political, and cultural transformations.

SOCI 5325. Seminar in Digital Media and Activism
3 Credits (3)
This seminar will investigate the interaction between digital media, social movements, and social change.
Learning Outcomes
1. Demonstrate comprehensive understanding of the most relevant theories of social movements and how these have been affected by the new digital media ecology.
2. Critically examine how the specific qualities and attributes of digital media contribute to the operation, growth, and success of contemporary social movements and activism around the world.
3. Place the relationship between social movements and new media in context – what is interesting about these "new" technologies?

4. Exhibit scholarly professionalization by successfully developing, conducting and presenting a research project.
5. Demonstrate in-depth knowledge of a central and contemporary social movement and its use of social media to further its goals.

SOCI 5335. Seminar Environmental Sociology
3 Credits (3)
Advanced examination of societal responses to environmental problems including social adjustments to natural and technological hazards, sociocultural aspects of technological risk and impact assessment, and emergence of environmental social movements. May be repeated up to 3 credits.

SOCI 5337. Seminar in Human Society and the Environment
3 Credits (3)
This is an advanced seminar exploring the relationship between human societies and the natural environment, with an emphasis on both sustainable human and environmental relationships. May be repeated up to 3 credits.
Prerequisite: Graduate Student Status.

SOCI 5410. Seminar in Race and Ethnic Relations
3 Credits (3)
In-depth analysis of the dynamics of prejudice/discrimination and patterns of intergroup interaction in the U.S. May be repeated up to 3 credits.
Learning Outcomes
1. Identify a diverse set of critical sociological approaches to studying race, ethnicity, and racism within the United States.
2. Understand the social construction of race, racialized modernity, and the unequal distribution of racialized power and privilege in local, regional, national, and transnational contexts.
3. Examine the racialized structures of US society and give special consideration to how processes, discourses, and structures of white supremacy and racialization intersect with other systems of inequality, particularly gender, class, sexuality, nation, and settler colonialism.

SOCI 5415. Seminar in Social Stratification
3 Credits (3)
Advanced examination of theories of stratification and current methods of stratification research. Focus on differences by ethnicity, race, class and gender. May be repeated up to 3 credits.
Learning Outcomes
1. Gain an appreciation of the role of stratification as a powerful determinant of the opportunities that individuals experience in modern societies.
2. Critically consider the functions and repercussions of stratification for the individual and society.

SOCI 5420. Seminar in Sociology of Latinos/as in the United States
3 Credits (3)
In-depth examination and comparative analysis of political and economic issues affecting Latino/a culture and behavior. Topics include the Chicano/a and larger Latina/o movements, the border, immigration, language policies, education, religion, labor and Latina women s issues. May be repeated up to 3 credits.
Learning Outcomes
1. Examine the challenges currently facing the Latino population in the U.S. with special attention to three Latino subgroups: Puerto Ricans, Mexican-Americans, and Cubans.
2. Identify that latina/o experiences and identities are far from homogenous.
3. Understand how then has a sense of "Latino community" been created if this is the case? What is a Latina/o? And, how are individual identities among the many Latina/o identities shaped by difference?
4. Know the major Latino peoples, their immigration, migration and settlement patterns, identity formation, socioeconomic and labor conditions, politics, gender relations, and bilingualism.

SOCI 5430. Seminar in International Migration
3 Credits (3)
This course examines international migration as a social process, focusing on the American experience. Students will examine historical and comparative literature on immigration that puts contemporary questions about policy and immigrant assimilation into a broader sociological perspective. Students must be Graduate students to enroll. May be repeated up to 3 credits.
Learning Outcomes
1. Acquire in-depth knowledge, and develop a broad understanding of the historical and theoretical development, of the sociological sub-field of immigration.
2. Develop an ability to examine the processes involved in international migration, and the socioeconomic trajectories of different immigrant groups in the United States, analytically, critically, and comparatively.
3. Develop an understanding of how various social constructs (such as national origin, nativity, generation, length of time spent in the United States, citizenship, legal status, class, race, ethnicity, gender, and religion) influence immigrants' social positions and organize their daily lives.

SOCI 5440. Seminar in Sociological Perspectives on the U.S.-Mexico Border
3 Credits (3)
Theoretical perspectives and current research on U.S.-Mexico border region, including migration, identity, health, gender, and environment. May be repeated up to 3 credits.
Learning Outcomes
1. Use history, sociology, geography, anthropology, and other disciplines as a framework for understanding the border and analyzing border lives and structural dynamics.
2. Understand border identities, including nationality, ethnicity, and class, and apply them to analyzing border lives.
3. Understand border orientations (nationalist/binationalist; unicultural/bicultural) and apply them to analyzing border lives.
4. Recognize and analyze multiple, often conflicting, perspectives on border issues.
5. Apply the "multiple perspective" approach to U.S.-Mexico migration and know objective facts, humanistic understandings, and policy options for that issue.
6. Use the tools of "culture" and "social structure" to understand border working people, especially those facing poverty, low wages, low or no benefits, and discrimination in public.
7. Use comparisons to other borders to understand two important topics: (a) Border symbols and politics; (b)Border consumption, commerce, smuggling, and other cross-border transactions.

SOCI 5450. Seminar in Power and Politics in the United States
3 Credits (3)
This is an advanced seminar addressing the study of Political Sociology with a focus on the United States. Political Sociology studies the social

bases of politics and political systems. it facilitates an understanding of the processes and consequences of power distributions in the United States. Students must be Graduate students to enroll. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate comprehensive understanding of the most relevant theories of political sociology and how these apply to current political issues of the United States.
2. Critically examine the role that civil society plays in shaping contemporary political processes in the United States.
3. Critically examine the role that civil society plays in shaping contemporary political processes in the United States.
4. Exhibit scholarly professionalization by successfully developing, conducting and presenting a research project.
5. Demonstrate in-depth knowledge of a central and contemporary political issue and its relations to broader questions of social, economic and cultural transformations in America.

SOCI 5455. Seminar in Inequality and Public Policy
3 Credits (3)

This course explores the reciprocal relationship between inequality and public policy, with a particular focus on poverty and anti-poverty policy in the contemporary United States.

Learning Outcomes

1. Understand and compare different ways in which poverty has been historically measured and understood.
2. Understand and apply various types of social inequality.
3. Critically read and evaluate empirical research measuring, and policy proposals addressing, poverty and inequality.
4. Write your own policy evaluation including empirically grounded policy recommendations.
5. More effectively participate in policy debates regarding inequality and poverty.

SOCI 5460. Advanced Issues in Globalization
3 Credits (3)

Analysis of the globalization process. Covers theories of globalization; global economy; political globalization; global culture; transnational social movements; transnational migration and world labor market; global cities; local-global linkages. Same as POLS 569. May be repeated up to 3 credits.

SOCI 5510. Issues in Social Deviance
3 Credits (3)

Selected forms of deviant behavior, social issues, and social problems. May be repeated up to 3 credits.

SOCI 5515. Sociology of Organizations
3 Credits (3)

Sociological models of formal organizations relevant to business, education, government, healthcare, military, and religion. Focus on internal organizational structure and dynamics plus the reciprocal relationship between organizations and their operating environment. May be repeated up to 3 credits.

SOCI 5555. Advanced Sociology of Education
3 Credits (3)

Socio-political and economic factors that shape the structure and operation of educational institutions in modern complex societies. Socio-historical development of the school as a microcosm of society, with examples from American and other school systems. May be repeated up to 3 credits.

SOCI 5610. Seminar in Popular Culture
3 Credits (3)

This course delves into Popular Culture and how Sociologists define and evaluate Popular Culture in the world today. Students will learn about diverse forms of Popular Culture, their meanings, and how social theory is applied to how Popular Culture is commodified and consumed. Students must be a graduate student to enroll.

Learning Outcomes

1. Explain and show an advanced understanding of the relationship of popular to culture.
2. Have an in-depth knowledge of Critical Theory as it applies to the culture industry.
3. Understand the relationship of the individual and social issues to both popular culture and technologically driven cultural changes.
4. Apply critical thinking about the popular culture experienced in your day-to-day existence and its meaning to everyday life.
5. Read empirical and theoretical writings, summarize and expand upon their core ideas.
6. Be able to discuss as well as compare and contrast various issues associated with popular culture.

SOCI 5630. Seminar in Culture and Social Life
3 Credits (3)

What exactly does culture look like, and how precisely does it shape---and is shaped by---social behavior? These are the core questions in the sociology of culture and will be the focus of this course. The course begins with an overview of the various ways that culture has been defined in sociological theory and research. The course will then focus on various topics within the contemporary sociology of culture, including, but not limited to, culture and cognition, the production of culture, culture and politics, and culture and inequality.

Learning Outcomes

1. Finish the course with an understanding of the different ways that culture is defined in sociological research.
2. Understand the various ways that culture affects social behavior and how social behavior shapes and changes culture.
3. Finish the course with a sociological imagination that is expanded to included cultural theory.
4. Finish the course with the ability to formulate research projects that involve cultural theories.

SOCI 5640. Seminar in Sociology of Digital Media
3 Credits (3)

This course explores how the social, political-economic, and cultural landscape is changing in relation to digital media and information technologies. Seminar participants work together to explore frameworks, methods, and tools for understanding networked society in the digital media ecology.

Learning Outcomes

1. Develop analytical tools for understanding the complex information society.
2. Examine how the cultural, political, and social environments are changing with the emergence of new media and digital technologies.
3. Place the relationship between society and new media in context – what is interesting about these “new” technologies?
4. Exhibit scholarly professionalization by successfully developing, conducting and presenting a final project.
5. Demonstrate in-depth knowledge of a central and contemporary issue within the study of social media from a sociological perspective.

SOCI 5991. Special Research Problems
1-3 Credits (1-3)
Individual analytic or experimental investigations. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

SOCI 5996. Graduate Special Topics
3 Credits (3)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 99 credits.
Learning Outcomes
1. Varies

SOCI 5998. Internship
1-6 Credits (1-6)
Supervised participation in appropriate occupational setting. Taught with SOCI 4998 with additional work required at the graduate level. May be repeated up to 12 credits.
Learning Outcomes
1. Various

SOCI 5999. Master's Thesis
1-6 Credits (1-6)
Thesis. Consent of instructor required. Restricted to Sociology majors. May be repeated up to 88 credits.
Learning Outcomes
1. Various

SOCI 6998. Dissertation Research Design in CSS
3 Credits (3)
Design and development of dissertation research project proposal drafts individually and/or in direct collaboration with advisors, peers, and/or community partners.
Learning Outcomes
1. Describe and articulate the topic and questions for the dissertation research proposal.
2. Describe and articulate the methodology and data analysis plan for the dissertation research proposal.
3. Write a completed draft of the dissertation research proposal.
4. Develop a complete draft of the dissertation proposal oral defense slide deck.
5. Prepare for the written and oral comprehensive examination.

SOCI 7000. Dissertation
1-15 Credits
Completion of major research project on a significant aspect that demonstrates expertise in computational social science. Dissemination of findings in academic and community forums. Students must have approval from their doctoral committee to enroll. Students must have completed 36 credits in the Computational Social Science PhD Program and have approval from their doctoral committee to enroll. May be repeated up to 36 credits.
Prerequisite: SOCI 5110, SOCI5150, SOCI5155, SOCI 5166, SOCI 5163, SOCI 6998 and either CS 453 or CS 458 with a grade of B- or better.
Learning Outcomes
1. Completion of a significant and in-depth research project in an area that demonstrates expertise in computational social science.
2. Presentation of findings in academic conferences.
3. Preparation of publishable work from the dissertation research.
4. Dissemination of findings in alternative formats for community partners and the general public.

Phone: (575) 646-3448
Website: http://sociology.nmsu.edu
Email: sociology@nmsu.edu

Sociology - Bachelor of Arts

Departmental Requirements

Students must complete all University degree requirements, which include: General Education requirements, Viewing a Wider World requirements, and elective credits to total at least 120 credits with 48 credits in courses numbered 300 or above. Developmental coursework will not count towards the degree requirements and/or elective credits, but may be needed in order to take the necessary English and Mathematics coursework.

Prefix	Title	Credits
General Education		
Area I: Communications		
English Composition - Level 1		
ENGL 1110G	Composition I	4
or ENGL 1110H	Composition I Honors	
English Composition - Level 2		
Select one from the following:		3
ENGL 2210G	Professional and Technical Communication	
or ENGL 2210H	Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Oral Communication		
Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area II: Mathematics		*3*
MATH 1130G	Survey of Mathematics (Recommended) [1]	
Area III/IV: Laboratory Sciences and Social/Behavioral Sciences		*10*
SOCI 1110G	Introduction to Sociology (Departmental Requirement)	
Area III: Laboratory Sciences Course (4 credits) [2]		
An additional Area IV: Social/Behavioral Sciences Course (3 credits) [2]		
Area V: Humanities [2]		*3*
Area VI: Creative and Fine Arts [2]		*3*
General Education Elective [2]		*3-4*
Viewing a Wider World [3]		**6**
Departmental/College Requirements		
SOCI 3165	Sociological Theory	3
SOCI 3150	Social Research: Methods [4,5]	3
SOCI 3160	Sociological Research: Analysis [4]	3
SOCI 4999	Sociology Senior Seminar	3
Departmental Electives		
SOCI courses of any level		6
SOCI courses that are Upper-Division		6
SOCI courses 4000-level (excluding SOCI 4999) [6]		6
Second Language: (not required)		

Electives, to bring the total credits to 120 [7]	**52**
18 credits of the electives must be Upper-Division	
Total Credits	**120-121**

1. MATH 1130G Survey of Mathematics is recommended for the degree but students may need to take any prerequisites needed to enter MATH 1130G first.
2. See the General Education (p. 262) of the catalog to view the full list of courses that can be selected to complete this requirement.
3. See the Viewing a Wider World (p. 266) Section of the catalog to view the full list of courses that can be selected to complete this requirement.
4. Criminal Justice/Sociology double majors may be permitted to substitute CJUS 300 Introduction to Criminal Justice Research for SOCI 3150 Social Research: Methods and CJUS 301 Advanced Research Methods for SOCI 3160 Sociological Research: Analysis.
5. Government/Sociology double majors may be permitted to substitute POLS 300 Political Research Skills for SOCI 3150 Social Research: Methods upon approval of appropriate substitution/waiver forms.
6. The six credits of SOCI 4000 electives does not include SOCI 4999 Sociology Senior Seminar. SOCI 4992 Directed Readings can be applied to this requirement. A maximum of six credits of SOCI 4992 Directed Readings is allowed. In addition, for those in the Master's Accelerated Program, SOCI 5000 electives can be used to meet the six credit requirement.
7. Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

In addition, substitution/waivers for courses may be available upon consultation with the Department Head in the Department of Sociology. In all cases, the total number of sociology credits (courses with SOCI prefix) must be a minimum of 33.

Second Language

For the Bachelor of Arts in Sociology there is no second language requirement for the degree.

A Suggested Plan of Study for Students

This roadmap assumes student placement in MATH 1130G Survey of Mathematics and ENGL 1110G Composition I . The contents and order of this roadmap may vary depending on initial student placement in mathematics and english. It is only a suggested plan of study for students and is not intended as a contract. Course availability may vary from fall to spring semester and may be subject to modification or change.

First Year

Fall		**Credits**
ENGL 1110G or ENGL 1110H	Composition I (C- or better) or Composition I Honors	4
MATH 1130G	Survey of Mathematics (C- or better) [1]	3
SOCI 1110G	Introduction to Sociology (C- or better) [2]	3
Area V: Humanities Course [3]		3
Elective Course [4]		3
	Credits	**16**

Spring

Select one from the following:		3
ACOM 1130G	Effective Leadership and Communication in Agriculture	
COMM 1115G	Introduction to Communication	
COMM 1130G	Public Speaking	
HNRS 2175G	Introduction to Communication Honors	
Area III: Laboratory Science Course [3]		4
Area IV: Social/Behavioral Sciences Course [3, 5]		3
General Education Elective Course [4]		3-4
Elective Course [4]		3
	Credits	**16-17**

Second Year

Fall

Select one from the following:		3
ENGL 2210G or ENGL 2210H	Professional and Technical Communication or Professional and Technical Communication	
ENGL 2221G	Writing in the Humanities and Social Science	
Area VI: Creative and Fine Arts Course [3]		3
Elective Course [4]		3
Elective Course [4]		3
Elective Course [4]		3
	Credits	**15**

Spring

Sociology- Any Level Elective Course (C- or better)		3
Elective Course [4]		3
Elective Course [4]		3
Elective Course [4]		3
Elective Course [4]		3
	Credits	**15**

Third Year

Fall

VWW - Viewing a Wider World Course [6]		3
SOCI 3150	Social Research: Methods (C- or better) [7]	3
SOCI 3160	Sociological Research: Analysis (C- or better) [7]	3
Elective - Upper Division [4]		3
Elective- Upper Division [4]		3
	Credits	**15**

Spring

VWW - Viewing a Wider World Course [6]		3
SOCI 3165	Sociological Theory (C- or better)	3
Sociology - Upper Division Elective (C- or better)		3
Elective - Upper Division [4]		3
Elective Course [4]		3
	Credits	**15**

Fourth Year

Fall

Sociology - Any Level Elective (C- or better)		3
Sociology - Upper Division Elective (C- or better)		3
SOCI - 4000 level Elective (C- or better) [8]		3
Elective - Upper Division [4]		3
Elective - Upper Division [4]		3
	Credits	**15**

Spring

SOCI 4999	Sociology Senior Seminar (C- or better)	3
SOCI - 4000 level Elective (C- or better) [8]		3

Elective - Upper Division [4]	3
Elective Course [4]	3
Elective Course [4]	1
Credits	**13**
Total Credits	**120-121**

1 MATH 210G Mathematics Appreciation is required for the degree but students may need to take any prerequisites needed to enter MATH 210G first.

2 SOCI 1110G counts as an Area IV General Education requirement and towards the major.

3 See the General Education (p. 262) section of the catalog for a full list of courses.

4 Elective credit may vary based on prerequisites, dual credit, AP credit, double majors, and/or minor coursework. The amount indicated in the requirements list is the amount needed to bring the total to 120 credits and may appear in variable form based on the degree. However students may end up needing to complete more or less on a case-by-case basis and students should discuss elective requirements with their advisor.

5 SOCI 2310G Contemporary Social Problems may count as an Area IV General Education requirement and towards the major.

6 See the Viewing a Wider World (p. 266) section of the catalog for a full list of courses.

7 **Criminal Justice/Sociology double majors:** may be permitted to substitute CJUS 300 Introduction to Criminal Justice Research for SOCI 3150 Social Research: Methods and CJUS 301 Advanced Research Methods for SOCI 3160 Sociological Research: Analysis. **Government/Sociology double majors:** may be permitted to substitute POLS 300 Political Research Skills for SOCI 3150 Social Research: Methods upon approval of appropriate substitution/waiver forms.

8 The six credits of SOC 400 electives does not include SOCI 4999 Sociology Senior Seminar. SOCI 4992 Directed Readings can be applied to this requirement. A maximum of six credits of SOCI 4992 Directed Readings is allowed. In addition, for those in the Master's Accelerated Program, SOC 500 electives can be used to meet the six credit requirement.

Sociology - Undergraduate Minor

Students who earn a Bachelor of Arts in Sociology may not also earn a minor in Sociology. Students earning the minor must pass 18 credits with grades of C- or higher. Students may count S grades only in courses in which all grades are S/U. Students may substitute an upper division social research methods course for the required SOCI 3150 Social Research: Methods from the Departments of Criminal Justice and Government. Additional research methods courses may be considered. Please contact the Department Head of the Department of Sociology for further consideration. Students making this substitution must still pass 18 total credits in Sociology in order to earn this minor.

Prefix	Title	Credits
Required Courses		
SOCI 1110G	Introduction to Sociology	3
SOCI 3150	Social Research: Methods	3
SOCI 3165	Sociological Theory	3
Additional Sociology credits, of which at least 6 are upper division		9
Total Credits		**18**

NMSU Global Campus

NMSU Global Campus (**https://global.nmsu.edu**)

NMSU Global Campus (https://global.nmsu.edu) includes 100% online undergraduate and graduate degrees, doctorates, certificates, and microlearning courses. NMSU Global Campus serves students who need the flexibility of anytime, anywhere learning to pursue their education and career goals. There are 90+ programs and 500+ courses available to prepare students for careers and graduate study.

Visit **NMSU Global Campus** or contact globaladmissions@nmsu.edu or (575) 232-3718.

William Conroy Honors College (Undergraduate)

Dean – Dr. Phame Camarena

Associate Dean – Dr. Anne Hubbell

Associate Professor (Fellowship Office) – Dr. Lori Keleher

Associate Professor – Center for Undergraduate Research & Creativity – Dr. Tracey Miller-Tomlinson

Associate Professor – Dr. Judith Flores Carmona

Director - McNair Scholars Program – Marko Mohlenhoff

Executive Administrative Assistant – Leann Rodriguez

Crimson Scholars Coordinator – Roman Gutierrez

William Conroy Honors Center

Phone: (575) 646-2005

E-mail: honors@nmsu.edu

Website: https://honors.nmsu.edu/ (http://honors.nmsu.edu)

Mission of the William Conroy Honors College

The mission of the New Mexico State University Honors College is to serve the citizens and state of New Mexico by providing an enriching environment for diverse, academically talented, and motivated students. The Honors College also seeks to create a community of scholars and mentors that fosters personal growth, critical thinking, leadership, independence, curiosity, and social responsibility. The college aspires to cultivate student potential to broadly understand and positively impact communities, organizations, and the larger world. The Honors College aims to focus campus attention on excellence in undergraduate education while strengthening the university's reputation as the university of choice in New Mexico.

In support of this mission, the Honors College integrates the following objectives:

- Provide students with an interdisciplinary, intellectually challenging curriculum that integrates active learning;
- Promote university-wide undergraduate research and experiential opportunities, linking students with faculty mentors;

- Encourage, mentor and guide students seeking postgraduate scholarships and fellowships;
- Offer students opportunities for developing leadership skills;
- Create a residential community that combines learning inside and outside the classroom.

In small classes taught by master teachers, students in the Honors College engage in lively discussion and collaborative investigation of interdisciplinary topics. By taking honors courses, students may also work toward completing general education requirements and disciplinary requirements in the major.

Students in the Honors College are 'dual citizens', meaning they enroll in both the college(s) of their major/minor and the Honors College. The Honors College does not offer a degree instead, it offers students the opportunity to graduate with various levels of honors distinction (described below).

Admission to the Honors College

Students admitted to the Honors College are designated as Crimson Scholars, the following eligibility criteria apply:

Automatic Eligibility. Entering freshmen are automatically eligible for admission to the Honors College and Crimson Scholars by meeting one of the following criteria:

- composite ACT score of 26 (or 1240 SAT score); or
- high school GPA of 3.75 or higher

Admission by Petition. Entering freshmen who have an ACT score of at least 24 (or 1200 SAT score) or a high school GPA of 3.50 may submit a written petition for provisional admission to the Honors College using a form provided by the Honors College office upon the request of the student.

Transfer and Continuing Students. Transfer and continuing students who have earned at least 3 college credit hours will be eligible for admission to the college on the basis of a cumulative college GPA that meets eligibility requirements for continuing students (see below).

Eligibility for Continuing Membership. The eligibility criteria for continuing membership in the Honors College is the same as for continuing Crimson Scholars status. The basic requirement is (more information is available in the Crimson Scholar Program section):

- Cumulative GPA of 3.50 at the end of most current semester

Appeals. Students who fall below the designated GPAs and lose their eligibility for Honors College status due to extraordinary circumstances may petition the Honors College Dean.

Enrolling in Honors Courses

All Crimson Scholars may enroll in Honors courses. The eligibility requirements to enroll in lower-division honors courses are the same as those pertaining to admission to the college and continuance in the college. For upper-division courses, the requirement is a cumulative 3.5 GPA. Students lacking these requirements may petition the Honors College Dean for permission on a case-by-case basis.

Graduating with University Honors

The Honors College offers two program options:

1. Graduating with University Honors Distinction or
2. The Honors Certificate

Each option has separate eligibility requirements, benefits and forms of recognition for the student. Almost all honors courses fulfill university general education and viewing a wider world requirements.

Any student who attains an overall GPA of 3.2-4.0 and who completes 6 credits of honors course work, with at least 3 credits at the 300 level or higher, is eligible to graduate with the Honors Certificate.

Any student who attains an overall GPA of 3.2-4.0 and who completes 15 credits of honors coursework, with at least 6 credits at the 300 level or higher, and the honors capstone, is eligible to graduate with the University Honors Distinction. To have these courses count toward one of these programs, a student must earn at least a B. Students should plan to take 12-15 credits in official Honors College classes but may take up to 6 credits in Contract or Master's Accelerated Classes. Contract classes must be at the 300 level or higher and in a student's major (VWW courses do not count). The final 3 credits to graduate with the University Honors Distinction is in the form of an Internship Capstone course or a Research/Creative Activity Capstone course. Both options involve the completion and dissemination of a capstone project.

University Honors Course Options

Honors credits may be earned through both HNRS and H designated courses. Regular Honors course options include Gen Ed, VWW, and Departmental Honors options. The Honors Program is designed to maximize student flexibility and also includes the opportunity to complete 6 credits of Honors Contracts or Master's Accelerated Program courses in the student's field of study. Honors credit may also be earned from education abroad and structured service experiences. Honors internship, directed research, and independent study options also ensure students can tailor their training to personal needs while building a resume of experience.

To complete the Honors Program, all students must propose and complete an Honors Capstone Project which includes an Honors Thesis (Research or Creative Project) or Internship Capstone. Students may petition to substitute a capstone project from their major field of study, in advance, with an additional Honors component of their work.

Detailed information on earning Honors credits and procedures for the Honors Capstone options can be found at the Honors College web pages: https://honors.nmsu.edu/ (http://honors.nmsu.edu)

Senior Capstone

The University is an academic community where new knowledge is created, the boundaries of creative expression are expanded, and standards for best professional practice are enhanced. In recognition of these important processes, all students that wish to graduate with the University Honors Distinction are required to participate in a capstone experience that features one of these activities:

Thesis — The thesis is an independent scholarly or scientific research project that is undertaken with the advice and direction of a member of the university faculty. The thesis does not need to be on a topic in the student's major field, but must meet the guidelines and protocols of the discipline in which it is written. The student's faculty advisor will review the student's thesis and determine a final grade. (HNRS 400 or approved substitution)

Creative Arts or Performance Project — The Senior Creative Arts/Performance project may take the form of an exhibition, written piece, performance, recital or other event deemed appropriate by the faculty advisor and the Dean of the Honors College. In addition to the performance or exhibition, the student must complete a written report, artist statement, or description of the project that is approved by the faculty advisor, to be filed with the Honors College. (HNRS 400 or approved substitution)

Capstone Internship with Project — The Honors Capstone Internship shall be undertaken under the auspices and supervision of an agency approved by the Dean of the Honors College and earn Honors internship credits. A NMSU advisor must approve the project and monitor its progress. To qualify as an Honors Capstone, this work must be more than simply a certain number of hours in service to an agency. It must also involve an original project that meets a need for the agency or promotes the student's professional development beyond the hours of work documented. The results of this project should include some form of written report along with a presentation to the appropriate audience. A log and journal, including a reflective component, shall be kept and submitted by the student. (HNRS 410 or approved substitution)

The Capstone is normally completed during the senior year and may be undertaken only if the student meets the eligibility requirements for graduation from the College (3.5 minimum GPA and the required courses). The Capstone carries 3 graded credit hours.

- Before beginning the final project, the student must choose a faculty advisor and file with the College a proposal that is approved by the faculty advisor and the Dean of the Honors College. The final project is graded by the faculty advisor, who submits a final grade to the Dean of the Honors College.
- Candidates for graduation with University Honors Distinction are expected to make presentations of their final projects at one or more of the following:
  - The Undergraduate Research and Creative Arts Symposium held every Spring Semester,
  - Research and Creative Week presentation in the Fall term,
  - A department seminar,
  - A seminar sponsored by the Honors College,
  - A public reading or exhibition,
  - A meeting of the agency board of directors,
  - Or any other method of presentation deemed appropriate for the discipline and format of the project.
- The written component of the final project shall be filed with the Honors College.

Although most students will earn Honors Capstone Credit through HNRS (400, 410, 420), students may petition, in advance, to substitute capstone equivalent work from another department but are expected to meet the same standards for proposal, work submitted, and presentation as the Honors Capstone requirements.

The capstone options are designed to be flexible, however, they are not all inclusive. Students that wish to propose an alternate capstone strategy that meets the principles and goals of this work, are encouraged to meet with the Dean of the Honors College.

Updated proposal and application materials for Honors Capstone work is available on the Honors College website https://honors.nmsu.edu/ (http://honors.nmsu.edu).

Community Service Options

The Honors College encourages its students to perform volunteer public service. Under certain circumstances, public service may be used as an alternative to completing some of the requirements for graduation from the Honors College. The following guidelines apply:

During the sophomore, junior or senior year, a student with at least a 3.5 GPA may undertake community service with an agency or organization in Doña Ana County (or an agency outside the area approved by the Honors College Dean) to earn a waiver of up to 3 of the hours required for University Honors (not including the Final Project). A minimum of 15 hours of community service per week, per semester is required for each honors credit hour to be waived. Community service hours must be verified by a supervisor of the agency or organization on a form approved by the Honors College. On-campus activities are not included under this option. The student must also certify that the community service hours are not being used for any course or degree requirement. Approval of the Dean of the Honors College must be obtained prior to beginning volunteer service to be eligible for this option.

International Study Option

Students in the Honors College are strongly encouraged to participate in an international experience. An NMSU honors student with at least a 3.5 GPA may earn a waiver of up to 3 credit hours required for University Honors for such international study (not including the Capstone). This waiver will be awarded for college credit earned while participating in any international study program approved by the Honors College. One honors hour will be waived for each 3 semester credit hours earned with a grade of 'A', 'B', or 'S'. Permission to use this option must be approved in advance by the Honors College.

Note: Waiver of university honors credit for service learning or international study does not reduce or affect in any way the total number of hours required for graduation. Waiver of honors credit for service learning or international study cannot be applied toward the capstone requirement.

Honors Certificate Program

Sophomores, juniors and seniors with a cumulative grade-point average of 3.2 are eligible for the Honors Certificate Program. A student who completes at least two 300- or 400-level honors seminars will be given a Certificate of Distinction at graduation and special recognition in the commencement program.

Crimson Scholars Program

The Crimson Scholars Program is a benefits and recognition program for academically superior students who have a cumulative 3.5 GPA and are taking three or more credits per semester. Crimson Scholars receive a number of benefits, including:

- Automatic eligibility for all Honors courses
- Early registration
- Extended library check-out privileges
- Special advising
- The option to live in the Honors Living Learning Community in our residence hall.
- Students who earned at least 75% of their credits from New Mexico State University with Crimson Scholar status[1] at the time of

graduation receive a "Crimson Scholar Graduate" notation on their transcript.
- Students who complete 75% of their credits as Crimson hours[1] from New Mexico State University at the time of applying for their degree, receive recognition in the commencement program and are eligible to purchase a Crimson Scholar cord for graduation.
- Students who have maintained Crimson Scholars status for 24 Crimson hours[1] from New Mexico State University earn a Crimson scholar pin.

To be eligible for the Crimson Scholars Program, applicants must be degree seeking.

- Entering freshmen must have either:
  - a minimum ACT standard composite score of 26;
  - a 3.75 or better high school GPA; *or*
  - a minimum SAT score of 1240; or
  - a 3.75 or better high school GPA
- Currently enrolled students must have a minimum cumulative GPA of 3.5 for 75% of the credits[1] at NMSU
- Transfer students must have a 3.5 cumulative GPA from their previous institution(s) or complete 3 or more credits[1] at NMSU for eligibility.

To maintain Crimson Scholar status:

- Freshmen entering on an ACT score must maintain a cumulative GPA of 3.5 and complete three or more credits per semester to continue in the program.
- Sophomores, juniors and seniors must maintain a minimum cumulative GPA of 3.5 and be currently enrolled in a total of 3 or more credits[1] per semester at NMSU or any NMSU community college to retain their Crimson Scholars status.
- Crimson Scholars whose GPA drops below the required cumulative 3.5 or drop below the three credit minimum will be dropped from the program. If in the following semester, the student's cumulative GPA and credits again meet the minimum requirement, the student will *automatically* be reinstated.

In recognition of the student's academic achievement, a statement designating "Crimson Scholar Graduate" is placed on the student's transcript after completion of 75% of credits earned at NMSU as Crimson hours[1] at the time of graduation and a minimum cumulative GPA of 3.5. To be designated in the commencement program as a Crimson Scholar graduate, a student must complete a minimum 75% of credits earned at NMSU as Crimson hours[1] at the time of applying for their degree. Crimson Scholars receive recognition in the commencement program and are eligible to purchase a Crimson Scholar cord for graduation. Students who complete 24 Crimson hours[1] from New Mexico State University earn a Crimson Scholar pin. Crimson Scholars are entitled to early registration and library privileges. Additional information is available from the Crimson Scholars Office, located in the Conroy Honors Center.

NOTE: Crimson Scholars interested in work-study positions must submit a yearly Free Application for Federal Student Aid (FAFSA) and complete a financial aid file with the NMSU Office of Financial Aid.

[1] does not include I or audit course designations at NMSU

The Honors Living and Learning Community (HLLC)

The New Mexico State University Honors Living and Learning Community (HLLC) is an educational initiative that links in-class and out-of-class learning experiences for honors students. The goals of the Honors Living and Learning Community are to:

1. supplement classroom learning experiences with co-curricular programming;
2. foster the development of an honors community that includes honors students, faculty, and staff; and
3. create a supportive environment for honors students.

Above all, the Honors Living and Learning Community aims to develop a small-college environment within the context of a large research university, thus giving students the benefits of both. Honors students, especially first-year students, are encouraged to take advantage of this special opportunity. The Honors Living and Learning Community is comprised of three components:

The Conroy Honors Center — is the academic home of the Honors College. This historic building was designed by the renowned southwestern architect Henry C. Trost and built in 1907 to house the campus chapter of the YMCA. The Conroy Center houses the administrative offices of the program along with three seminar rooms, a student commons area, a kitchen and a computer lab.

The Honors Residence Hall — is the focus of NMSU's vibrant honors community. It is a place where honors students live among a community of excellent students with outstanding academic records and who are interested in getting the most out of the academic opportunities offered to them at a large research institution. It also hosts many social and extracurricular academic activities.

The Honors Residence Hall is equipped with an electronic classroom, where some introductory honors courses may be taught. The honors faculty participate in residence hall programming and frequently attend residence hall floor meetings with students. The Honors Residence Hall is open to all First Year Crimson Scholars.

Honors College information:

Honors College, MSC 3HON
New Mexico State University
P O Box 30001
Las Cruces, NM 88003-8001

Phone: (575) 646-2005
E-mail: honors@nmsu.edu

Crimson Scholars Program information:

Crimson Scholars Program, MSC 3HON
New Mexico State University
P O Box 30001
Las Cruces, NM 88003-8001

Phone: (575) 646-2542
Roman Gutierrez: rgtz129@nmsu.edu

Student Resources

Aggie Health & Wellness Center

The university maintains a well-equipped integrated health center on campus, providing comprehensive medical and acute care, laboratory, pharmacy, student counseling services, psychiatric evaluation & medication management, limited workers compensation care and health education services. Hospitalization and emergency services are available in the community. Undergraduate and graduate students are eligible for services at the Center. Main Campus undergraduate students enrolled in 12 or more credits (6 in a summer session) and graduate students enrolled in 9 or more credits may access the Center without an office visit fee as fees have been paid through full-time enrollment. Students enrolled for less than 12 credits (5 in summer session) may choose to pay the semester health fee of $105 or a $35 office visit fee for medical care. The Center accepts payment for medical, laboratory and pharmacy services through cash, credit card, and student account. Filing for insurance reimbursement can be done as well.

Counseling services at Aggie Health & Wellness provide students and the campus with individual, crisis intervention, outreach programs, and consultation. We assist students who are dealing with issues such as relationship concerns, depression, anxiety, stress management, trauma and self-esteem and more. In addition, the Aggie Health & Wellness also has services and resources that support harm reduction. These services include information concerning the decisions that surround alcohol use, sexual assault, and violence prevention.

The Aggie Health & Wellness Center is open Monday- Friday from 8:00 am - 11:30 am & 1:00pm - 5:00 pm. The Center is closed during the lunch hour from 11:30 am-1pm. The Center is located on the corner of Breland and Stewart St (3080 Breland Drive) and offers both in-person and telehealth appointments.

Students enrolled in at least 1 credit and degree seeking at NMSU also have free access to TimelyCare, 24/7 virtual care services at timelycare.nmsu.edu. Services include:

- MedicalNow: On-demand support for common health issues, including cold, flu, and allergies.
- TalkNow: 24/7, on-demand emotional support to talk about anything, including anxiety, relationships, depression, and school-related stressors.
- Scheduled Medical: Choose the day, time, and medical provider that best works for you.
- Scheduled Counseling: Choose the day, time, and mental health provider that best works for you. (12 visits per year)
- Health Coaching: Develop healthy lifestyle behaviors, including nutrition, sleep habits, time management, and mindfulness.
- Psychiatry: Appointments are available through referrals.
- Self-Care Content: Visit the “Explore” page within TimelyCare (https://timelycare.com/nmsu/) for guided self-care content, including yoga and meditation sessions, as well as group conversations with our providers on a variety of health and well-being topics.
- Basic Needs Support: Access to low or reduced-cost community resources, including food and housing assistance, transit support, childcare, and finances.
- Students have access to TimelyCare (https://timelycare.com/nmsu/) services 365 days a year. That means you have access during breaks, after-hours, and any time you need support!

For more information, please call (575) 646-1512 or visit the website at **wellness.nmsu.edu**.

Campus Dining

Food Services Options

We offer a variety of dining options across our beautiful campus to include a residential dining hall, national and local retail locations, convenience stores, a mobile food cart and the latest addition to campus dining – Robot Food Delivery! We also offer customizable catering for events large and small. Please feel free to contact us in person at our office in Corbett Center Student Union in room 130 next to Taos Dining Hall or give us a call at 575-646-4801. Food can be purchased by utilizing Dining Dollars, Aggie Cash, a credit/debit card or cash. Food service locations and hours are available at nmsudining.com. For additional information, please contact the Parking & ID Card Office at (575) 646-2306, via email: idsvs@nmsu.edu, by visiting idcard.nmsu.edu or by visiting the office located in the Follett Bookstore between 8:00am - 4:30pm, Monday through Friday. Here is a link to our campus dining map.

Meal Plan Information

First-year, on campus freshmen are defined as resident students who have been required to attend Aggie Welcome Orientation and include recent high school graduates with any college credits. These students have the choice between the Premium Platinum, Classic Crimson or *Hometown Aggies Plans. The Meal Plan is mandatory for one academic year (unless applying for the Spring Semester only) and will be billed to the student's university account which allows for you to purchase now and pay the balance later or over time!

Any registered student is welcome to participate in the Meal Plan program whether living on or off campus to include continuing, commuter, as well as Graduate students. A variety of Meal Plan choices are available to suit anyone's needs.

To purchase a meal plan or to review policies and procedures, please visit https://dining.nmsu.edu. You may also contact the Parking & ID Card Services Offices at (575)646-4835 or connect via e-mail at idsvs@nmsu.edu.

To enhance your meal plan, you can visit nmsudining.com to add brand new “+plus Packages” that will provide you with deals on beverages, amenities, and concessions! You can also add Dining Dollars with a 10% discount through nmsudining.com

*Hometown Aggies plan is only available for students that live in Dona Ana County.

Campus Tutoring Services

Campus Tutoring Services offers NMSU students unlimited, accessible and convenient tutoring options to supplement their academic experience for our most in-demand courses on campus. Campus Tutoring offers individual and small group tutoring in-person and online via NMSU Zoom.

Campus Tutoring Services, led through a peer tutor model, enhances student’s self-belief, giving students control over learning processes and developing confidence and commitment to learning. Campus Tutoring offers a strong and integrated academic support service to students led by experienced and nationally accredited peer

tutors. CTS Peer Tutors are the only College Reading and Learning Association (CRLA) certified tutors that serve the entire NMSU campus.

For more information on Campus Tutoring Services, please visit us in Corbett Center Student Union, Room 206, call (575) 646-6050, or review our services at campustutoring.nmsu.edu

Career Exploration and Job Search

Aggie Career Studio supports students in exploring career options, gaining hands-on experience, and preparing for meaningful employment after graduation. Through personalized guidance and innovative career resources, students are equipped to make informed decisions about their academic and professional paths.

Students have access to Handshake, NMSU's online career management platform, which connects them to job and internship opportunities, career fairs, employer information, and career development resources.

Career opportunities and services include:

- On-Campus Employment: Part-time and graduate-level positions, including work-study opportunities, that allow students to gain experience while balancing their academic commitments.
- Off-Campus Employment: Part-time and full-time job opportunities with local and regional employers across a wide range of industries.
- Cooperative Education & Internships: Structured, hands-on learning experiences with businesses, nonprofit organizations, and government agencies that enhance academic learning and career readiness.
- Career Fairs & Employer Events: Opportunities to connect with employers, explore career options, and learn about internships and full-time positions.
- Career Exploration & Advising: Individualized advising to help students explore majors and careers, develop professional materials, and build effective job search strategies.

Aggie Career Studio ensures students graduate with the skills, experience, and confidence needed to succeed in today's workforce.

Center for Academic Advising and Student Support

The Center for Academic Advising and Student Support (CAASS) provides centralized academic advising and coordinated student support services designed to promote student success, persistence, and timely degree completion.

Located in Educational Services, Suite 200, CAASS advisors teach undergraduate students how to define and achieve their academic, personal, and career goals for college. Although academic advisors help students plan for registration each semester, the primary focus of advising is supporting students as they navigate the university by explaining degree requirements, clarifying policies and procedures, and informing students of resources that will support their success. All undergraduate degree-seeking students will be assigned a CAASS academic advisor. Students can find contact information for their advisor via Navigate (https://advising.nmsu.edu/) or by visiting Educational Services, Suite 200 or by calling 575-646-2941. Current NMSU students can use Navigate (https://nmsu.navigate.eab.com) to schedule academic advising appointments with their advisor. Both advising and walk-in services are available in-person or virtually via Microsoft Teams.

Cooperative Education and Internship Program

The Cooperative Education and Internship Program, administered through Aggie Career Studio, provides students with structured, hands-on learning experiences that complement academic coursework and support career readiness. The program allows students to apply classroom knowledge in professional settings while gaining valuable experience prior to graduation.

Experiential learning opportunities are available with employers in business, industry, government, and nonprofit organizations and are designed to strengthen professional skills, clarify career goals, and enhance employability.

Program Highlights

- Pre-Graduation Participation: Cooperative education and internship assignments are available to continuing, full-time students and must be completed prior to graduation.
- Official Transcript Notation: Successful completion of an approved cooperative education or internship experience is permanently noted on the student's official academic transcript. All required documentation must be submitted by designated deadlines.
- Full-Time Academic Status: Students participating in a full-time cooperative education or internship experience maintain full-time academic status with the university, preserving eligibility for financial aid, scholarships, and other student benefits.

Program Options

Full-Time Cooperative Education or Internship
Students can register for one or more full-time work experiences lasting an academic semester (fall, spring, or summer). Opportunities may be located throughout the United States and provide immersive, career-focused learning.

Part-Time (Parallel) Cooperative Education or Internship
Students work approximately 20 hours per week while remaining enrolled full-time in academic coursework. Employers are typically located within commuting distance of the university.

Registration and Requirements

Students interested in participating must register with the Cooperative Education and Internship Program and complete the following requirements:

- Access and maintain an active NMSU Handshake account
- Complete a required online orientation

- Submit all required documentation, including enrollment forms, mid-semester updates, and student and employer evaluations

International Students

International students must obtain approval through the Curricular Practical Training (CPT) process with the Office of International Student and Scholar Services in addition to completing all Cooperative Education and Internship Program requirements.

Contact Information

For additional information, contact the Cooperative Education and Internship Program:

Location: Garcia Center, Room 224
Phone: (575) 646-4115
Email: coop@nmsu.edu
Website: careerstudio.nmsu.edu

Corbett Center Student Union

Corbett Center Student Union (CCSU) serves as the center for campus life, providing programs and services for students and other members of the university community. CCSU is a place to study, relax, meet with student groups, eat, work or play, CCSU offers students, faculty, staff and visitors a variety of services and activities. The student union is home to several student focused administrative offices including Student Involvement & Leadership Programs, Conference Services, Associated Students of NMSU (ASNMSU), Housing & Residential Life, Campus Dining Services, Dean of Students, LGBT + programs, the Tutoring Center, Black programs, the student operated radio station, KRUX-FM, Military and Veterans Programs, Disability Access services, and the Round Up newspaper. Services offered at CCSU include an auditorium, meeting rooms, multiple dining facilities, ATMs, a computer lab, E-Sports lab, study areas, post office, and game room.

For more information contact:

Corbett Center Information Desk
MSC CC, PO Box 30001
Las Cruces, NM 88003
Phone: (575) 646-4411
Email: ccsu@nmsu.edu or http://ccsu.nmsu.edu

Edgar R. Garrett Speech and Hearing Center

Combining instruction, evidence-based practice, state of the art technology, and service, the Edgar R. Garrett (ERG) Speech and Hearing Center provides training for students in Communication Disorders and renders service to the community. Students have opportunities to participate in diagnostic evaluations and to provide therapy in the areas of speech, language, hearing, cognition, feeding and swallowing for clients across the lifespan.

Referrals are accepted from all sources (self, medical, school, nonprofessionals). The ERG Speech and Hearing Center is a fee-for-service clinic where university students, staff, faculty, and their immediate family receive a reduced rate. All services are supervised by speech-language pathologists who are licensed in New Mexico and hold the Certificate of Clinical Competence in Speech-Language Pathology or Audiology from the American Speech-Language-Hearing Association. Services are available in English and Spanish and are offered both in person and remotely.

For further information, contact:

Edgar R. Garrett Speech and Hearing Center
MSC 3SPE, PO Box 30001
Las Cruces, New Mexico 88003-8001
Phone: (575) 646-3906
TTY: (575) 646-6191
web: http://spedcd.education.nmsu.edu/cd/shc/

Education Abroad

Education Abroad, a unit within the Office of International Programs and Compliance,assistscolleges and departments with integrating education abroad into the undergraduate and graduate curriculum. Education Abroad provides support services for outbound study abroad students and inbound international exchange students. Education Abroad coordinates all international partner exchange agreements, intensive language immersion programs, faculty-led international programs, international student teaching programs (ISTP), all credit-bearing international research,serviceand internships. The unit also sponsors the Education Abroad Ambassadors Club, a chartered student organization that provides support to international exchange students at NMSU.

All NMSU students, including community college students, may apply to study abroad while maintaining NMSU student status to receive regular course credit through faculty-led international programs, intensive Spanish language credit (graded A+ through F), and teacher education credit (graded A+ through F), and/or receive transfer credit (graded CR) per regular NMSU transfer credit guidelines for all other programs. To be eligible, students must have completed at least 28 credits (sophomore standing),maintaineda 2.5+ grade-point-average, be at least 18 years of age when they begin a program application, and be in good academic and disciplinary standing at NMSU. International Business majors must receive approval from their department for study abroad to count asrequiredin their degree plan. Completing an Education Abroad program of at least four weeks, involving study or university coursework and earning 3 credits in a foreign country, may waive 3 credits of the "Viewing the Wider World" requirement (see https://educationabroad.nmsu.edu)

Grades and credit hours earned at the host institution become part of the official NMSU transcript upon approval of the academic department and records officer. Grades are recorded according to the NMSU grading system.

To learn more about the Office of International Programs and Compliance, please visit https://ipc.nmsu.edu.

Housing and Residential Life

Living on campus is an investment in a student's academic and social success and overall experience as an Aggie. Residents are instantly part of the campus community -- classes, the student union, activity center, library, bookstore, special events, golf course and many other campus resources are all located within walking distance. Studies show that compared to their off-campus peers, students who live on campus are more likely to: maintain higher grade point averages, use campus resources, interact more with peers and professors, and ultimately graduate within the typical four-year span.

Residency Requirement

All incoming first-time, first-year students must reside in university-operated housing or be approved for a first-year residency exemption as part of the campus enrollment process. First-year students will live in the designated first-year residential communities and must reside for two consecutive semesters to satisfy this requirement (Fall/Spring). However, there are a few reasons approved by the Board of Regents for students to be exempted from this requirement:

- The student is living in a structured environment provided by a parent, legal guardian, or immediate family member (defined as a grandparent or aunt/uncle). Living with an adult sibling is not included in this exemption.
- Students residing with a spouse, domestic partner, and/or dependent child(ren).
- A student is 21 years or older, enrolled exclusively in distance education, or is active military or a military veteran.
- Other extenuating circumstances include financial hardship or special medical accommodation.

Students are required to submit specific documentation to support each of the reasons presented above when applying for an exemption. Please visit housing.nmsu.edu/exemptions for more information.

Application Procedures and Acceptance

To qualify for housing, the student agrees to be enrolled continuously at least half-time or more at either the undergraduate or graduate level during the fall or spring

semesters as degree-seeking. Completed applications for housing should be submitted as early as possible, preferably one regular semester in advance. Submission of housing application indicates acceptance of the terms and conditions of the applicable agreement. Housing applications require a deposit and fee at the time of application submission.
Certain qualifications must be met to apply for summer, single-student apartment, and family housing. To view the various housing options visit http://housing.nmsu.edu/options (http://housing.nmsu.edu/options/) or contact the housing office at (575) 646-3202, housing@nmsu.edu or Housing and Residential Life MSC 3BB, PO Box 30001, Las Cruces NM 88003-8001.

Housing has a March 1 priority deadline for first-year housing applications where students will be assigned with either a roommate or residential community they have requested.

The university will assign accommodations subject to available space. Assignments to a particular building, type of accommodation, specific room or apartment, single room or roommate(s) are not guaranteed.

- The university reserves the right to change or cancel assignments in the interest of order, health, safety or discipline with appropriate written notice.
- The university reserves the right to deny housing to any student.

Examples of reasons for denial include, but are not limited to:

- Individuals who have felony criminal convictions that present a concern to the university community
- Individuals who have behavioral problems which may, in the opinion of the university, negatively impact the group-living environment
- Individuals who have been previously terminated from campus housing, or individuals who have poor rental histories

Student behavior expectations, rights, and responsibilities related to living in university-operated housing can be found at https://housing.nmsu.edu/current-residents/housing-policies.html

Availability of Units for Students with Disabilities

There is a limited number of specially equipped residential community rooms, single-student apartments and family housing units available to students with disabilities who wish to reside in campus housing. These are assigned on a first-come, first-served basis. Specific needs or requirements (i.e., roll-in showers, special door openers, etc.) should be discussed with the Disability Access Services on an individual basis prior to submitting an application. Disability Access Services can be reached at (575)646-6840 or by email at das@nmsu.edu.

Residence Halls

Residential communities offer furnished, mostly suite-style rooms, large lobbies and plenty of outdoor space. Each residential community has its unique character and environment, offering students a variety of choices while providing amenities, social interaction and academic support. Living Learning Communities (LLCs) are a benefit for members who live in the same hall and on the same floor with other students who share common interests. Some LLCs require enrollment in one or more academic courses and/or may have additional requirements for eligibility.

More information on the extensive offerings of LLCs can be found at housing.nmsu.edu/llc. Inclusive Housing is offered in the residential community for students who wish to participate in a living environment where a student can room with any other student regardless of sex, gender, gender identity/expression or sexual orientation. Alcohol is not permitted in any of the first-year residential communities.

Apartments and Houses

Available for second-year through graduate and advanced degree seeking students, on-campus apartments as well as single student houses have the benefits of on-site staff, prompt maintenance, and laundry facilities. Apartment options include efficiencies (studio), one-, two-, and four-bedrooms. Single-student houses only exist in a two-bedroom format. All apartments and houses include a refrigerator and stove. All options are fully furnished, and the semester rate includes utilities, streaming TV, and WiFi internet connectivity. Additionally, campus apartments feature a select number of co-ed housing options where students may share with

other student(s) of any gender identity. A limited number of campus houses are available for single students without a roommate and include two bedrooms, a kitchen, a living room, and bathroom. All apartment options provide the opportunity to room with a student at second-year level or above and preferences are considered during Fall placement.

Student Family Housing

Completed applications for Student Family Housing should be submitted at least six weeks in advance, so please call as early as possible to being the procress. Family Housing occupants are assigned once the application process is completed. Applications are considered incomplete and cannot be processed if requested information and supporting documents are not provided and payment of the associated fees is not received. Family Housing agreements are per academic year and require a thirty (30) day notice to vacate or request for renewal, prior to the expiration of the agreement.

Family units include married couples, married couples with children, single parents with dependent children, adult siblings, and domestic

partners (as defined by NMSU Policy at https://benefits.nmsu.edu/hr-benefits/other1/domestic-partner.html.

Consideration is also given to veterans and non-traditional dependent family units. As part of the application process, a criminal history check will be conducted for all adult occupants over the age of 18. Current residents and adult occupants over the age of 18 will undergo a criminal history check no less than once a year. In addition, a rental payment history will also be conducted. By signing the application, the applicant authorizes New Mexico State University to conduct these processes.

Results of the criminal history checks and rental payment history may be shared with the applicant. Single-family houses include two bedrooms, a bath, kitchen, living room, and a backyard. Four-bedroom apartment units include two bathrooms, a kitchen, living room, but no backyard. All units offer a stove and refrigerator and are unfurnished. The semester rate includes utilities, streaming TV service, and WiFi internet connectivity. Some pets are allowed in parts of Student Family Housing, reference the pet policy at https://housing.nmsu.edu/current-residents/housing-policies.html.

Community Development

Housing and Residential Life develops safe and engaged communities which support students' efforts to achieve academic success and strong social connections at New Mexico State University.

Our live-in students (Resident Assistants) and professional staff members (Resident Directors) work to meet students' needs, and create a fun, positive experience for our residents. Residents can expect to have meaningful conversations with student staff members; enjoy myriad social, educational, and recreational events; and engage in community meetings and health and safety inspections.

Residents are encouraged to join organizations such as Community Councils, Residence Hall Association (RHA) and the National Residence Hall Honorary, or other student organizations to help shape the community experience and learn more about leadership skills. Additionally, as part of our commitment to developing a safe and engaged community in campus housing, we hold students accountable in accordance with the Student Social Code of Conduct and the NMSU Resident Handbook.

Books, Supplies, Parking and Transportation

The New Mexico State University bookstore and parking office are both conveniently located at the corner of Jordan Street and University Avenue. The bookstore provides an avenue for students to obtain assistance with purchasing required books and supplies, along with spirit wear and numerous tech and specialty items. The Parking & Transportation office assists with parking permits and transportation services questions.

ID Card Services

The NMSU Aggie ID Card/Mobile ID is the official identification that provides access to services offered at NMSU. The Aggie ID Card/Mobile ID is utilized to access meals, Aggie Dining Dollars, Aggie Cash, Aggie Print, as a key to the residential halls, access to various buildings, proof of eligibility for access to athletic events and allows for other student services. This information is added to Aggie ID Card/Mobile ID after registration for classes. Please visit idcard.nmsu.edu for more information.

Aggie Cash is a pre-paid account that allows you to use your Aggie ID Card to make purchases at locations all over campus. The Parking & ID Card Services Office is located on the second floor of the NMSU Bookstore. For more information, please contact us at (575) 646-2306.

Information Technology

Information Technology (IT) provides the university community with computing and communication resources and services that support the educational, research, and public service missions of the university. These resources include NMSU's central computing systems and the network that supports the systems and the wired and wireless functionality through which the Internet is accessed. IT operates the student computer labs found throughout the Las Cruces campus; maintains and manages laptop, camera, and projector checkout and rental for students; provides network registration of internet connected devices that is required for access to the NMSU network; and provides student printing, which is known as Aggie print. Information about specific resources is available at https://studenttech.nmsu.edu/ IT also provides support for all NMSU technology users through the IT Help Desk.

For further information, contact:

Information Technology (IT)
MSC 3AT, PO Box 30001
Las Cruces, NM 88003-8001
Phone: (575) 646-1840
email: help@nmsu.edu

IT's web homepage can be found at http://it.nmsu.edu. ICT's Helpdesk webpage can be found at http://help.nmsu.edu/. The helpdesk is located in room 105 of the Hardman and Jacobs Undergraduate Center. IT's Student Technology and Planning Department's webpage can be found at https://studenttech.nmsu.edu/.

National Student Exchange Program

National Student Exchange (NSE), a unit within Education Abroad in the Office of International Programs & Compliance, offers undergraduate student programs at-over 180 colleges or universities across the United States, Puerto Rico, Guam, U.S. Virgin Islands, and Canada. Undergraduate students pay NMSU tuition and study for a semester or academic year at an NSE campus. NSE allows students to broaden their academic, social, and cultural awareness through study in different geographical settings. Students must have completed at least 28 credits (sophomore standing),maintained#a 2.5+ grade-point-average, be at least 18 years of age when they begin a program application, and be in good academic and disciplinary standing at NMSU. There is a priority deadline of February 15th for the following academicyear,#however, many NSE colleges and universities accept students on a rolling admission basis.

Grades and credit hours earned at the host institution become part of the official NMSU transcript upon approval of the academic department and records officer. Grades are recorded according to the NMSU grading system.

To learn more about the Office of International Programs and Compliance, please visit https://ipc.nmsu.edu.

New Mexico State University Library

The New Mexico State University Library, centrally located on campus, is an invaluable resource for students, offering access to research and general collections across two library facilities: Zuhl and Branson

libraries. These libraries house millions of items and provide electronic access to a vast array of scholarly journals, databases, and digital collections, supporting both general academic and discipline-specific research.

A dedicated team of professional faculty and staff is committed to student success, offering reference assistance and research support. The library also provides a variety of study environments, including quiet work areas, collaborative group spaces, and private study rooms, all designed to create a safe and conducive atmosphere for study and research.

The Emerging Technology Lab in Branson Library is equipped with state-of-the-art- computers, a Podcast Studio, and Video Wall. Additionally, students have access to desktop computers, scanners, printers, laptops, and other essential resources. For those marathon study sessions, the Zuhl Fuel café offers a perfect spot to recharge.

The Archives and Special Collections Department at Branson Library holds unique research archives and rare books, focusing on the history and cultural heritage of New Mexico, the U.S./Mexico border region and the Southwest, as well as the original records of the university.

NMSU Library is more than just a place to find books; it's a hub of knowledge, innovation, and community that plays a crucial role in the academic journey, providing students with the tools and support they need to succeed.

For more information visit the NMSU Library in person or online at https://library.nmsu.edu/.

Office of Experiential Learning

Aggie Career Studio (ACS)

Aggie Career Studio (ACS) at New Mexico State University is your go-to destination for career development and hands-on learning. We help Aggies explore career options, gain real-world experience, and confidently prepare for life after graduation.

Through personalized advising, experiential learning opportunities, and strong employer and community partnerships, Aggie Career Studio connects what you learn in the classroom to meaningful careers.

Programs and Services

Aggie Career Studio supports students through three integrated focus areas:

Career Development & Employer Engagement

We help students prepare for and pursue career opportunities with confidence. Services include:

- Career exploration and major-to-career guidance
- One-on-one career advising
- Resume and cover letter development
- Mock interviews and interview preparation
- LinkedIn profile optimization
- Career fair and employer event preparation
- Job and internship search strategies
- Connections with employers and recruiters

Cooperative Education & Internships

Gain valuable, real-world experience while still in school. This program connects students to paid and unpaid opportunities that build skills, clarify career goals, and strengthen employability, including:

- Internships
- Cooperative education (co-op) experiences
- Career-related work opportunities

Community Engagement & Outreach

- Apply your learning beyond campus while making a difference. Through service-learning and volunteer experiences, students develop essential career-ready skills such as:
- Problem-solving and critical thinking
- Leadership and teamwork
- Professional communication
- Civic engagement and social responsibility
- These experiences help students grow personally and professionally while contributing positively to their communities.

Our Commitment to Your Success

Aggie Career Studio continuously develops innovative programs and partnerships to ensure Aggies are career-ready, community-minded, and prepared to succeed in an ever-changing workforce.

Contact Aggie Career Studio

Garcia Center, Room 224
Phone: (575) 646-1631
Email: aggiecareers@nmsu.edu
Website: careerstudio.nmsu.edu

Office of Student Involvement and Leadership Programs (SILP)

The Office of Student Involvement and Leadership Programs (SILP) supports student success and offers involvement outside the classroom. SILP collaborates with campus and community partners to create opportunities for student engagement, individual and group

leadership development, and a wide variety of campus traditions including Aggie Camp, First Year Walk, Crimson Kickoff, Homecoming Parade, Halloween Howl, Noche de Luminarias, and Aggie Remembrance Day. SILP staff train and support recognized student organizations on topics ranging from event planning to personal and professional development to funding and fiscal responsibility, manages the recognition and event registration processes, and helps all students determine where and how they can get involved at NMSU through Crimson Connection.

Areas contained within SILP include ASNMSU, Fraternity and Sorority Life, Leadership, Engagement, & Traditions, Campus Programs, and Student Media (KRUX 91.5FM and The Round Up), as well as administrative support for all other 200+ student organizations.

Parking Office

NMSU requires a parking permit to park in campus parking lots or curbside on streets. Parking meters require payment. Free parking is available near the Pan American Center. Parking regulations are enforced 24 hours a day with the exception of a required permit between the hours of 7:30am - 4:30pm. Disabled parking spaces, emergency/fire zones, service zones, yellow curbs and permitted housing areas are enforced 24 hours a day. The campus parking map and Parking Regulations are available at park.nmsu.edu.

Information on purchasing a parking permit is also available by phone at 575-646-2306, by emailing parking@nmsu.edu, online at park.nmsu.edu or at the Parking & ID Card Services Department located on the second floor of the NMSU Bookstore Monday through Friday from 8am- 4:00pm. All parking permits must be purchased online at https://services.nmsu.edu/parking/online-permits.html.

When visiting the Parking & ID Services office, you may park for free in designated spots just south of the building. Aggie Transit is a free campus shuttle service available to all students. Bus route maps are available at park.nmsu.edu.

Transportation and Parking & ID Card Services is responsible for issuing parking permits and developing parking lots.

NMSU Police Department is responsible for enforcing NMSU parking regulations.

Disability Access Services

In compliance with the federal regulations outlined in Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 2008, NMSU is committed to providing reasonable accommodations and academic adjustments to ensure equitable access for students with disabilities. Students who wish to request an accommodation or academic adjustment for face-to-face and online classes, practicums and internships must follow the established procedures for self-identification by completing the application and interactive process with Disability Access Services (DAS). Our office also receives and processes housing accommodation requests for students residing in campus housing. Our office provides test proctoring services through our testing center and offers a student resource area for studying and networking with other students on campus.

To submit an application for accommodations or for more information, please visit our website at das.nmsu.edu or come by the DAS office in Corbett Center Student Union:

Room. 204
MSC 4149, PO Box 30001
Las Cruces, NM 88003-0001
(575) 646-6840
Email: das@nmsu.edu
http://das.nmsu.edu

Student Success Centers

The Student Success Center provides services to assist NMSU students in reaching their academic potential. The Student Success Center provides study skills assistance in such areas as: time management; memory; concentration; note taking; reading; test preparation; test taking; speed reading; critical thinking; financial wellness, as well as graduate school preparation. In addition, the Student Success Center provides career-focused services such as resume/cover letter reviews, mock interviews, and assistance with completing Handshake profiles. The services are available to students in the following formats:

- Individualized consultations are provided to any student who walks in at the Student Success Center
- Learning strategies, study-skills and career-focused workshops provide quick assistance in one-hour presentations offered throughout the semester.
- Professional and graduate school workshops provide development in such areas as speed reading and preparing for graduate school.
- Student Success Center staff provide outreach presentations on learning, study-skills and career-focused topics to classes, programs and organizations on campus.
- Individual and group financial wellness services are provided through the Nusenda Center for Financial Capability which is housed in the Student Success Center.

For comprehensive information on all programs and services offered by the Student Success Center please visit us at the Hardman and Jacobs Undergraduate Learning Center Room 128, call (575) 646-3136, or review our services online at http://ssc.nmsu.edu.

Testing Services

The Dona Ana Community College Testing Center is a comprehensive and certified test facility that caters to DACC students, as well as those from other higher education institutions and community members year-round. Our Proctor Request Form allows instructors to easily schedule exam appointments for students through our dedicated DACC Testing Center webpage. The Testing Center also serves as a PearsonVue Authorized Center.

Our testing center offers the Math Placement Exam (MPE) year-round for all DACC students, with scores available immediately after testing. For students applying to DACC's radiology program, the ATI TEAS entrance exam is available every year within the months of March and April. Accuplacer is available strictly for Dual Credit and Early College Highschool students. Additionally, the DACC Testing Center provides two options for High School Equivalency Exams – the GED and the HiSET exams. We also offer CLEP exams, which allow students to earn college credit for their prior learning experiences.

The TOEFL ITP (Test of English as a Foreign Language) is available for prospective international students to evaluate their English-language proficiency when applying to NMSU.

For any additional questions, the DACC Testing Center can be reached at Testing@dacc.nmsu.edu or at (575) 528-7294.

TRIO Student Support Services Program

The TRIO Student Support Services program offers academic and social support to ensure that program participants succeed at New Mexico State University. TRIO SSS uses a holistic approach in providing essential services to participants. Services include tutoring, mentoring, and strategies to assist participants in reaching their academic potential. Tutors and Mentors are certified by the College Reading and Learning Association and offer services such as tutoring, developing study strategies, adjusting to college, learning and using campus resources, developing effective study skills, accessing financial aid, using academic peer pre-advising, staying motivated and dealing with personal issues associated with college.

To qualify for the program, students must be a first-generation college student (neither parent received a four-year baccalaureate degree), meet income guidelines set by the US Department of Education, demonstrate an academic need or have a learning or physical disability. Admission to the TRIO Student Support Services is highly competitive with only 350 slots available for eligible students.

For comprehensive information regarding services offered by the TRIO Student Support Services Program please visit us at the Student Success Center located in the Hardman and Jacobs Undergraduate Learning Center Room 128, call (575) 646-1336, or visit our website at http://triosss.nmsu.edu

TRIO STEM-H Program

The TRIO STEM-H program at New Mexico State University is committed to providing comprehensive academic and social support for students pursuing degrees in STEM and health science fields. By offering a wide range of services, TRIO STEM-H helps students develop the skills and resources they need to succeed academically and professionally. These services include tutoring, mentoring, and personalized strategies to foster student success.

TRIO STEM-H tutors and mentors are certified by the College Reading and Learning Association and assist students with subject-specific tutoring, improving study strategies, navigating college life, utilizing campus resources, enhancing time management skills, accessing financial aid resources, receiving academic peer pre-advising, staying motivated, and addressing challenges associated with the college experience.

Eligibility for TRIO STEM-H requires students to meet specific criteria, such as being a first-generation college student (neither parent has earned a four-year degree), meeting income guidelines set by the U.S. Department of Education, demonstrating academic need, or having a learning or physical disability. Due to the program's competitive nature, a limited number of spots are available for eligible students each year. For more information about TRIO STEM-H services, visit the TRIO STEM-H office in the Hardman and Jacobs Undergraduate Learning Center, Room 128, call (575) 646-2452, or visit our website at https://stemh.nmsu.edu/

Undergraduate Research Programs

New Mexico State University hosts a variety of faculty-mentored undergraduate research opportunities through which students demonstrate knowledge gained in the classroom and apply it to scholarly research projects. As a part of the curriculum, students may work individually with a faculty member on an independent study project or Honors capstone project. In some majors, course-based undergraduate research experience courses, or CURE courses, prepare students for advanced research projects.

The following NMSU programs engage undergraduates in faculty-mentored research:

- ACES Undergraduate Research Program
- Avian Migration Research Program
- Discovery Scholars Program
- Enhancement Research Program in Ecological Sciences
- Fred Hutchinson Partnership for the Advancement of Cancer Research Project (PACR)
- iCREDITS Center for Smartgrid Technologies
- McNair Post-Baccalaureate Achievement Program
- New Mexico Alliance for Minority Participation (AMP)
- New Mexico Space Grant Consortium
- NM IDeA Network for Biomedical Research Excellence (INBRE)
- NSF-REU: Jornada Basin Long-Term Ecological Research
- NMSU U-RISE in Biomedical Research

The Aggie Innovation Space & Workshop, a makerspace in Engineering Complex 2, provides access to state-of-the-art resources and technology for students to work on innovative projects. Undergraduate students seeking guidance on how to engage with the research, scholarship, and creative work of the university are encouraged to contact the Center for Undergraduate Research and Creativity at https://honors.nmsu.edu/curca.html.

The NMSU Community Colleges

NMSU's Community College campuses make two years of college education available to students in their home environment. The community colleges provide a high quality program of education for all full-time and part-time students; provide occupational education; and provide noncredit community education courses.

A student attending any NMSU Community College campus is enrolled as a New Mexico State University student and may change campuses without completing additional admission procedures.

Associate Degree Graduation Requirements

Associate degree programs are offered at the NMSU Community College campuses for those desiring specialized training for employment. Community, junior, and technical college transfer students may be admitted and classified on the basis of acceptable credits at two-year institutions. The Associate in Prebusiness degree, administered by the College of Business, is available to NMSU Community College campus students completing the requirements as outlined in the "College of Business" section of this catalog.

Math requirements in associate degree and certificate programs vary. ENGL 1110G Composition I and all developmental studies courses in English, math and reading must be completed with a grade of C- or better. Please refer to your NMSU Community College campus catalog for details. Fifteen semester credits for an associate degree must be taken in residence at NMSU or one of the NMSU Community Colleges. Degree requirements remain in effect for eight years; however, please review individual program requirements for any variations. The designation,

Meritorious Graduate, is awarded to the top 15 percent of the students receiving associate degrees within each college in any one academic year, provided 45 or more credits have been completed at NMSU and/or a NMSU Community College with computable grades.

Certificate Programs

In addition to the regular degree programs offered by the NMSU Community College campuses, certificate programs are available. Students should contact the NMSU Community College campus for information on available certificate programs.

NMSU Community College Campus Information

Information concerning NMSU Community College campus programs, class schedules, catalogs, registration and other data may be obtained from the NMSU Community College campus administration.

NMSU-Alamogordo Community College
2400 N. Scenic Dr.
Alamogordo, New Mexico 88310
Alamogordo Course Catalog (https://catalogs.nmsu.edu/alamogordo/)
(575) 439-3600

NMSU-Doña Ana Community College
Box 30001, Dept. 3DA
Las Cruces, New Mexico 88003
Dona Ana Course Catalog (https://catalogs.nmsu.edu/dona-ana/)
(575) 527-7506

NMSU-Grants Community College
1500 Third Street
Grants, New Mexico 87020
Grants Course Catalog (https://catalogs.nmsu.edu/grants/)
(505) 287-6678

Recognition of Academic Achievement

NMSU has a number of university-wide programs that recognize academic achievement. These include

- The Honors College and graduating with Honors
- The Crimson Scholars Program
- The Dean's Report of Academic Achievement

In addition, many colleges and departments have their own programs and awards that recognize the academic achievement of their students.

The Honors College, Graduation with University Honors Distinction

The Honors College provides motivated undergraduate students with opportunities to broaden and enrich their academic programs. In small classes taught by master teachers, honors students engage in lively discussion and collaborative investigation of interdisciplinary topics. By taking honors courses, students may also work toward completing general education requirements and disciplinary requirements in their major. There are two program options available to students: University Honors Distinction (18 credits) or the Honors Certificate (6 credits). Each option has separate eligibility requirements, benefits, and forms of recognition for the student. For details concerning eligibility and requirements, see the Honors College section of the catalog.

Crimson Scholars Program

Crimson Scholars is a recognition program for academically superior students who achieve and maintain a Grade Point Average (GPA) of 3.5 or better. Crimson Scholars receive a number of benefits, including:

- Automatic eligibility for all Honors courses
- Early registration
- Recognition in the commencement program
- Regalia for Commencement that acknowledges the Crimson Scholar designation
- Permission to live in the Honors Residential Community

For eligibility criteria, see the Honors College (p. 1476) section of the catalog.

Dean's Report of Academic Achievement

Following the close of the semester, each college dean publishes a list of students who have achieved honor standing in grades for the previous semester. To be eligible, a student must have been enrolled in 12 or more semester credits with a computable grade in each. The top 15 percent of eligible students by college for that semester will be named to the Dean's Honor List.

College Graduation with Honors

Each academic college awards eligible students with academic honors. A student can receive this recognition in the college(s) where they are a major. To be eligible for a four-year degree with college honors, a student must have earned at least 60 semester credits in computable grades while in residence at New Mexico State. Courses taken in the Honors College may be counted as a part of the minimum of 60 credits. The number of students at graduation, by college, receiving degrees with honors in any one year shall not exceed 15 percent. To receive high honors, a student must be in the top 1.5 percent of the graduating class by college. One person from each college will receive the highest honors. In case of a tie, the student with the greatest numbers of credits earned at NMSU with computable grades will be awarded highest honors for each college. Of the students receiving highest honors from the fall and spring commencements, the student with the highest grade-point average and the greatest number of credits earned at NMSU with computable grades will be awarded the Class of 1919 Scholarship Plaque.

Course Listings

New Mexico State University is currently undergoing a renumbering initiative to align with a State regulatory change. While this process is occurring courses will appear in two ways, a four-digit number or a three-digit number.

Course Numbering:

Four-digit Course

ASTR 1120G The Planets Lecture & Laboratory (4 credits (3+3P))

- **Course Prefix-** the four letter code that represents the subject of the course and where the course can be located in the Courses A-Z list below.
- **Course number-** (1120) indicates the course is a freshman course.

- **Course Title-** will appear after the prefix and number
- **Suffix-** will appear at the end of the number
  - *Suffix (G)*- indicates a New Mexico statewide General Education course.
  - *Suffix (V)*- indicates a Viewing a Wider World course.
  - *Suffix (H)*- indicates an Honors courses outside of the Honors prefix.
  - *Suffix (L)*- indicates a Laboratory course.
  - *Suffix (M)*- indicates a Multicultural course.
- **Credits -** The unit of university credit is the semester hour. In the example the course can be taken and will be charged for 4 credits. The numbers that appear in the parenthesis indicate the number of credits for lecture hours (3) and the number of credits for practicum/ laboratory hours (3).

Three-digit Course

AERT 105 Aerospace Engineering PLTW (4 credits (2+4P))

- **Course Prefix-** the four letter code that represents the subject of the course and where the course can be located in the Courses A-Z list below.
- **Course number-** (105) indicates the course is a freshman course.
- **Course Title-** will appear after the prefix and number
- **Suffix-** will appear at the end of the number
  - *Suffix (G)*- indicates a New Mexico statewide General Education course.
  - *Suffix (V)*- indicates a Viewing a Wider World course.
  - *Suffix (H)*- indicates a Honors courses outside of the Honors prefix.
  - *Suffix (L)*- indicates a Laboratory course.
  - *Suffix (M)*- indicates a Multicultural course.
  - *Suffix (N)* - indicates when the course credits are not applicable to the baccalaureate and specified associate degrees and is only added to developmental coursework.
- **Credits -** The unit of university credit is the semester hour. In the example the course can be taken and will be charged for 4 credits. The numbers that appear in the parenthesis indicate the number of credits for lecture hours (2) and the number of credits for practicum/ laboratory hours (4).

Designation

- 100-299/1000-2999 – Lower Division (Las Cruces and Community College Campuses)
- 300-499/3000-4999 – Upper Division (Las Cruces Campus)
  - 450-499/4500-4999 – Senior and graduate courses (Las Cruces Campus)
- 500-799/5000-7999 – Graduate courses (Las Cruces Campus)

All undergraduate students must demonstrate Basic Academic Skills in both English and mathematics before enrolling in any upper-division course (numbered 300/3000 or higher). These requirements ensure that each student in the upper-division courses has the ability to succeed without compromising the learning experience of other students.

Course Descriptions:

The course description will follow the prefix, number and credit hours. The description will explain what the course entails and will display any restrictions that the course may have that will be enforced during the registration process.

ASTR 1115G. Introduction Astro (lec+lab)
4 Credits (3+2P)
This course surveys observations, theories, and methods of modern astronomy. The course is predominantly for non-science majors, aiming to provide a conceptual understanding of the universe and the basic physics that governs it. Due to the broad coverage of this course, the specific topics and concepts treated may vary. Commonly presented subjects include the general movements of the sky and history of astronomy, followed by an introduction to basic physics concepts like Newton's and Kepler's laws of motion. The course may also provide modern details and facts about celestial bodies in our solar system, as well as differentiation between them – Terrestrial and Jovian planets, exoplanets, the practical meaning of "dwarf planets", asteroids, comets, and Kuiper Belt and Trans-Neptunian Objects. Beyond this we may study stars and galaxies, star clusters, nebulae, black holes, and clusters of galaxies. Finally, we may study cosmology--the structure and history of the universe. The lab component of this course includes hands-on exercises that work to reinforce concepts covered in the lecture, and may include additional components that introduce students to the night sky.

A

- A E-AEROSPACE ENGINEERING (p. 1491)
- A EN-AGRICULTURAL ENGINEERING (p. 1494)
- A ST- APPLIED STATISTICS (p. 1494)
- ACCT-ACCOUNTING (p. 1497)
- ACES-AGRI, CONSUMER & ENV SCIE (p. 1500)
- ACOM-AG COMMUNICATIONS (p. 1501)
- AEEC-AGRICULTURAL ECON/ECON (p. 1504)
- AERO-AEROSPACE STUDIES (p. 1511)
- AERT-AEROSPACE TECHNOLOGY (p. 1511)
- AFST-AFRICANA STUDIES (p. 1514)
- AGRO-AGRONOMY (p. 1515)
- ANSC-ANIMAL SCIENCE (p. 1518)
- ANTH-ANTHROPOLOGY (p. 1528)
- ARCH-ARCHITECTURE (p. 1543)
- ARSC-ARTS & SCIENCES (p. 1547)
- ARTH-ART HISTORY (p. 1547)
- ARTS-ART STUDIO (p. 1551)
- ASTR-ASTRONOMY (p. 1561)
- AUTO-AUTOMOTIVE TECHNOLOGY (p. 1564)
- AXED-AGRICULTURAL EXTN EDUC (p. 1571)

B

- B A-BUSINESS ADMINISTRATION (p. 1576)
- BCHE-BIOCHEMISTRY (p. 1577)
- BCIS-BUSINESS COMPUTER SYSTEMS (p. 1580)
- BEST-BORDERLAND & ETHNIC STUDIES (p. 1585)
- BFIN-BUSINESS FINANCE (p. 1590)
- BIOL-BIOLOGY (p. 1595)
- BLAW-BUSINESS LAW (p. 1605)
- BLED-BILINGUAL EDUCATION (p. 1606)
- BMGT-BUSINESS MANAGEMENT (p. 1610)
- BUSA-BUSINESS ADMINISTRATION (p. 1614)

C

- C E-CIVIL ENGINEERING (p. 1615)
- CCDE-DEVELOPMENTAL ENGLISH (p. 1622)
- CCDM-DEVELOPMENTAL MATHEMATICS (p. 1622)
- CCDR-DEVELOPMENTAL READING (p. 1622)
- CCDS-DEVELOPMENTAL SKILLS (p. 1622)
- CCST-CHICANA/O STUDIES (p. 1623)
- CEPY-COUNSELING & EDUCATIONAL PSYCHOLOGY (p. 1625)
- CHEF-CULINARY ARTS (p. 1644)
- CHEM-CHEMISTRY (p. 1650)
- CHIN-CHINESE (p. 1657)
- CHME-CHEMICAL & MATERIALS ENGR (p. 1658)
- CHSS - COMM HEALTH/SOC SRVCS (p. 1670)
- CJUS-CRIMINAL JUSTICE (p. 1671)
- CNST-CONSTRUCTION (p. 1676)
- COMM-COMMUNICATION (p. 1680)
- CSCI-COMPUTER SCIENCE (p. 1686)
- CTEC-CYBER TECHNOLOGY (p. 1703)
- CTFM-CLTHNG/TXTLS/FSHN MRCHDSG (p. 1704)

D

- DANC-DANCE (p. 1705)
- DHYG-DENTAL HYGIENE/HYGIENIST (p. 1712)
- DRFT-DRAFTING (p. 1717)

E

- E E-ELECTRICAL ENGINEERING (p. 1723)
- E T-ENGINEERING TECHNOLOGY (p. 1739)
- ECDV-ECONOMIC DEVELOPMENT (p. 1753)
- ECED-EARLY CHILDHOOD EDUCATION (p. 1754)
- ECON-ECONOMICS (p. 1767)
- EDLT-EDUCATION (p. 1770)
- EDUC-EDUCATION (p. 1773)
- ELAD-EDUCATIONAL LEADERSHIP ADMINISTRATION (p. 1784)
- ELT - ELECTRONICS TECHNOLOGY (p. 1791)
- ELTR-ELECTRICAL (p. 1794)
- ENGL-ENGLISH (p. 1796)
- ENGR-ENGINEERING (p. 1809)
- ENTR-ENTREPRENEURSHIP AND INNOVATION (p. 1812)
- ENVE-ENVIRONMENTAL ENGINEERING (p. 1812)
- ENVS-ENVIRONMENTAL SCIENCE (p. 1814)
- EPWS-ETMLGY/PLNT PTHLGY/WD SCI (p. 1816)

F

- FCSC-FAMILY & CONSUMER SCI (p. 1822)
- FCST-FAMILY AND CHILD STUDIES (p. 1823)
- FDMA-FILM & DIGITAL MEDIA ARTS (p. 1829)
- FIRE-FIRE INVESTIGATION (p. 1844)
- FREN-FRENCH (p. 1849)
- FSTE-FOOD SCIENCE & TECHNOLOGY (p. 1852)
- FWCE-FISH,WILDLF,CONSERV ECOL (p. 1857)
- FYEX-FIRST YEAR EXPERIENCE (p. 1865)

G

- G S-GRADUATE STUDIES (p. 1867)
- GENE-GENETICS (p. 1868)
- GEOG-GEOGRAPHY (p. 1869)
- GEOL-GEOLOGY (p. 1881)
- GNDR-GENDER AND SEXUALITY STUDIES (p. 1885)
- GPHY-GEOPHYSICS (p. 1889)
- GREX-GRAD CROSS UNIV EXCH (p. 1889)
- GRMN-GERMAN (p. 1889)

H

- HESC - HEALTH EQUITY SCIENCES (p. 1891)
- HIST-HISTORY (p. 1893)
- HLED-HEALTH EDUCATION (p. 1906)
- HMRT-HUMAN RIGHTS (p. 1906)
- HMSV-HUMAN SERVICES (p. 1908)
- HNRS-HONORS (p. 1908)
- HORT-HORTICULTURE (p. 1918)
- HOST-HOSPITALITY AND TOURISM (p. 1922)
- HRTM-HOTEL/RESTRNT/TOURISM MGT (p. 1926)

I

- I B-INTERNATIONAL BUSINESS (p. 1938)
- I E-INDUSTRIAL ENGINEERING (p. 1939)
- ICT-INFO &COMMUNICATION TECH (p. 1947)
- INST-INSTRUMENT & CONTROL TECH (p. 1951)
- INTR-INTERDISCIPLINARY STUDIES (p. 1952)

J

- JAPN-JAPANESE (p. 1952)
- JOUR-JOURNALISM (p. 1953)

L

- L SC-LIBRARY SCIENCE (p. 1959)
- LANG-LANGUAGE (p. 1960)
- LAWE-LAW ENFORCEMENT (p. 1960)
- LIBR-LIBRARY SCIENCE (p. 1962)
- LING-LINGUISTICS (p. 1962)

M

- M E-MECHANICAL ENGINEERING (p. 1963)
- MAT-AUTOMATION & MANUFACTURING (p. 1970)
- MATH-MATHEMATICS (p. 1971)
- MGMT-MANAGEMENT (p. 1983)
- MKTG-MARKETING (p. 1988)
- MLSL-MILITARY SCIENCE (p. 1996)
- MOLB-MOLECULAR BIOLOGY (p. 2001)
- MUSC-MUSIC (p. 2002)

N

- NATV-NATIVE AMERICAN STUDIES (p. 2016)
- NAV-NAVAJO (p. 2018)
- NGEC-NATURAL GAS ENGINE COMP (p. 2018)
- NMNC-NEW MEXICO NURSING EDUCATION CONSORTIUM (p. 2019)
- NURS-NURSING (p. 2022)
- NUTR-NUTRITION (p. 2045)

O

- OECS-COMPUTER TECHNOLOGY (p. 2052)
- OETS-TECHNICAL STUDIES (p. 2053)

P

- PHED-PHYSICAL EDUCATION (p. 2054)
- PHIL-PHILOSOPHY (p. 2055)
- PHLS-PUBLIC HEALTH SCIENCES (p. 2058)
- PHYS-PHYSICS (p. 2068)
- PL-S-PARALEGAL SERVICES (p. 2079)
- PLEN-PLANT,ENVRMTL SCIENCES (p. 2081)
- POLS-POLITICAL SCIENCE (p. 2083)
- PORT-PORTUGUESE (p. 2091)
- PSYC-PSYCHOLOGY (p. 2092)

R

- RADT-RADIOLOGIC TECHNOLOGY (p. 2097)
- READ-READING (p. 2102)
- RESP - RESPIRATORY THERAPY (p. 2105)
- RGSC-RANGE SCIENCE (p. 2108)
- RXPP-PRESCRIP PRIV PRAC PSYCH (p. 2113)

S

- SIGN-SIGN LANGUAGE (p. 2115)
- SMET-SCIENCE/MATH/ENG/TECH (p. 2117)
- SOCI-SOCIOLOGY (p. 2117)
- SOIL-SOIL (p. 2127)
- SOWK-SOCIAL WORK (p. 2129)
- SPAN-SPANISH (p. 2138)
- SPED-SPECIAL EDUCATION (p. 2150)
- SPHS-SPEECH & HEARING SCIENCE (p. 2164)
- SPMD-SPORTS MEDICINE (p. 2172)
- STAT-STATISTICS (p. 2186)
- SUR-SURVEYING (p. 2188)

T

- TBGD-TRANSBORDER & GLOBAL HUMAN DYNAMICS (p. 2191)
- TCEN-ENVIRONMENTAL/ENERGY TECH (p. 2192)
- THEA-THEATER (p. 2194)
- TOX-TOXICOLOGY (p. 2199)

U

- UNIV-UNIVERSITY STUDIES (p. 2199)

W

- WATR-WATER UTILITIES (p. 2200)
- WELD-WELDING TECHNOLOGY (p. 2203)
- WSAM-WATER SCIENCE & MGT (p. 2205)

A E-AEROSPACE ENGINEERING

A E 339. Aerodynamics I
3 Credits (3)
Fluid properties, conservation equations, incompressible 2-dimensional flow; Bernoulli's equation; similarity parameters; subsonic aerodynamics: lift and drag, analysis and design of airfoils.
Prerequisite: C- or better grades in ENGR 234 and (M E 228 or MATH 3160).
Learning Outcomes
1. Ability to understand fundamental concepts of incompressible flows.
2. Ability to use Bernoulli equation to solve flow problems under specific conditions.
3. Ability to understand and use potential flow theory for canonical flows.
4. Ability to derive and use similarity parameters to design experiments and simulations.
5. An ability to understand fundamental concepts of lift and drag forces and their coefficients.

A E 362. Orbital Mechanics
3 Credits (3)
Dynamics of exoatmospheric flight of orbiting and non-orbiting bodies; 2-body orbital dynamics and Kepler's laws; orbits in 3 dimensions; orbit determination; orbit design and orbital maneuvers; lunar and interplanetary trajectories.
Prerequisite: C- or better grades in (M E 228 or MATH 3160), ENGR 234, and M E 261.
Learning Outcomes
1. Ability to understand dynamics of exo-atmospheric flight of orbiting and non-orbiting bodies; 2-body orbital dynamics and Kepler's laws; orbits in 3 dimensions; orbit determination; orbit design and orbital maneuvers; lunar and interplanetary trajectories.
2. Ability to identify, formulate, and solve engineering problems on orbital mechanics.
3. Ability to use the techniques, skills, and modern tools for orbital mechanics and engineering practice.

A E 363. Aerospace Structures
3 Credits (3)
Advanced concepts of stress and strain, introduction to the analysis of aero structures, complex bending and torsion, thin walled sections and shells, computational techniques. May be repeated up to 3 credits.
Prerequisite: C- or better grades in C E 301.
Learning Outcomes
1. An ability to formulate and solve some fundamental linearly-elastic problems.
2. Application of basic failure theory and perform thermal shock analysis for composite materials.
3. An ability to perform simplified dynamic loading analysis on aerospace structures.
4. Calculation of various area properties for nonhomogeneous cross-sections of a beam, and their principal values and directions.

5. Understanding of the formulations of stresses and strains in a beam under various loading and boundary conditions.

A E 364. Flight Dynamics and Controls
3 Credits (3)
Standard atmosphere and various definitions of altitudes, static and dynamic flight performance evaluations, 6-degree-of-freedom aircraft flight dynamics, static and dynamic flight stability and controls.
Prerequisite: C- or better grades in (M E 228 or MATH 3160), ENGR 234, and M E 261.
Learning Outcomes
1. Ability to evaluate static and dynamic flight performance.
2. Ability to understand static stability design for longitudinal / lateral/ directional flights.
3. Ability to use the 6-degree-of-freedom, rigid body equations of motion of aircraft.
4. Evaluation of longitudinal / lateral / directional dynamic stabilities of aircraft.

A E 400. Undergraduate Research
1-3 Credits (1-3)
Performed with the direction of a department faculty member. May be repeated for a maximum of 6 credits.
Prerequisite(s): Consent of faculty member.

A E 405. Special Topics
3 Credits (3)
Topics of modern interest to be offered by the departmental staff. Consent of instructor required.

A E 419. Propulsion
3 Credits (3)
Propulsion systems, thermodynamic cycles, combustion, specific impulse; principles of gas turbines, jet engines, and rocket propulsion systems. May be repeated up to 3 credits.
Prerequisite: C- or better grades in A E 439.
Learning Outcomes
1. Knowledge of relevant fluid and thermodynamics.
2. Understanding of jet engine operating principles.
3. Ability to carry out parametric analysis of jet engine and turbomachinery.
4. Knowledge of how to analyze rocket propulsion systems.

A E 424. Aerospace Systems Engineering
3 Credits (3)
Basic principles of top down systems engineering and current practice; preliminary and detailed design of aircraft and space vehicles, including requirement, subsystem interaction, and integration, tradeoffs, constraints and non-technical aspects. May be repeated up to 3 credits.
Prerequisite: C- or better grades in A E 362.
Learning Outcomes
1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

A E 428. Aerospace Capstone Design
3 Credits (3+2P)
Team Project-analysis, design, hands-on build test, evaluate. May be repeated up to 3 credits.
Prerequisite: A E 363.
Corequisite: A E 424.
Prerequisite/Corequisite: A E 447.
Learning Outcomes
1. An ability to function as mechanical engineer within an engineering design and development group.
2. An ability to complete a real-life design task, to transform a client's needs into a tangible, tractable project definition, and to see the project through to completion.
3. An ability to understand and use a formal engineering design method, with emphasis on building concurrent engineering procedures into the basic design method.
4. Proficiency in collaboratively preparing and reviewing formal technical design package related to an engineering design including final design binder and report.

A E 439. Aerodynamics II
3 Credits (3)
Principles of compressible flow, momentum and energy conservation; thermal properties of fluids; supersonic flow and shock waves; basics of supersonic aerodynamics; lift and drag for airfoils and wings under incompressible and compressible flow conditions. May be repeated up to 3 credits.
Prerequisite: C- or better grades in (A E 339 or M E 338), M E 240, and (M E 328 or PHYS 395).
Learning Outcomes
1. Understanding of fundamentals of compressible flow.
2. An ability to solve 1D and 2D compressible flow problems including isentropic flow, shock wave and expansion wave flow problems.
3. An ability to understand and solve Fanno-line flow and Rayleigh-line flow problems.
4. Calculation of lift and drag coefficients of airfoils and wings under flow regimes.

A E 447. Aerofluids Laboratory
3 Credits (2+3P)
Use of subsonic and hypersonic wind tunnels and other flow facilities to study basic flow phenomena and methods of fluid measurement and visualization. May be repeated up to 3 credits.
Prerequisite: M E 345 or PHYS 325.
Prerequisite/Corequisite: A E 439.
Learning Outcomes
1. An ability to design fluid experiments using similarity law.
2. An ability to design and conduct fluid experiments in low-speed and hypersonic wind tunnel with various flow measurement and visualization techniques.
3. Use of data acquisition systems to acquire experimental data and conduct data processing, including particle image velocimetry.
4. An ability to write professional technical reports.

A E 451. Aircraft Design
3 Credits (3)

Conceptual design of aircraft based on existing designs, empirical relationships, and theory. Dimensioning, structural design, and performance analysis of major subcomponents such as fuselage, wing, and propulsion system. Static stability and control analysis. May be repeated up to 3 credits.
Prerequisite: (A E 339 and A E 363) or consent of instructor.
Learning Outcomes
1. Ability to design aircraft for specific mission and to carry out all necessary analyses.
2. Familiarization with different design options for various aircraft components.
3. Understanding of multi-disciplinary nature of conceptual aircraft design and tradeoffs in airplane design, and of how contradicting design requirements will lead to design compromises.
4. Ability to work as part of a team to accomplish the stated objectives of a design project.
5. Knowledge of how to use spreadsheets and engineering analysis methods for conceptual aircraft design.
6. Ability to carry out airfoil aerodynamic analysis using XFLR5 and to create a visual representation of an aircraft using OpenVSP.

A E 452. Control System Design
3 Credits (3)
Introduction to the control of dynamical systems, with a focus on mechanical and aerospace systems, including basic systems theory, controllability / observability, feedback and stabilization, PID controls, root-locus plot, and Bode diagram. May be repeated up to 3 credits.
Prerequisite: M E 261, M E 328 and ENGR 234.
Learning Outcomes
1. Construction of a block diagram of control systems to find a transfer function for a dynamical system.
2. Analysis of control systems by utilizing various linear control theories such as root-locus design method, bode, and lead / lag compensation techniques.
3. Design and simulation of PID control systems for mechanical / aerospace engineering applications.
4. Derivation of state space representation of a dynamical systems.

A E 464. Advanced Flight Dynamics and Controls
3 Credits (3)
Advanced airplane flight dynamics and stability control system design, longitudinal and lateral autopilots, missile/rocket control systems, and guidance systems.
Prerequisite: A E 364 or consent of instructor.
Learning Outcomes
1. An ability to construct a block diagram to find a transfer function for a dynamical system.
2. An ability to perform a control systems design by utilizing various linear control theories such as root-locus design method, bode / Nyquist plots, and lead / lag compensation techniques.
3. Understanding of longitudinal / directional / lateral dynamic flight stability controls associated with airplane designs.
4. Design and analysis of autopilot systems of an airplane with some knowledge in flight instrumentation.

A E 469. Hypersonic Aerothermodynamics
3 Credits (3)
Challenges of hypersonic flight. Large Mach number approximations. High-temperature effects. Vibrational and chemical non-equilibrium. Viscous high-temperature flows. Taught with A E 569. May be repeated up to 3 credits.
Prerequisite/Corequisite: A E 439.
Learning Outcomes
1. Awareness of challenges of hypersonic flight.
2. Understanding of vibrational and chemical non-equilibrium effects.
3. Governing equations for viscous high-temperature flows.

A E 509. Individualized Study
3 Credits (3)
Individualized study covering specialized topics in aerospace engineering. Consent of instructor required. Restricted to A E & M E majors.

A E 510. Special Topics
1-6 Credits (1-6)
Topics in aerospace engineering. May be repeated for a maximum of 6 credits. Consent of instructor required.

A E 512. Vibrations
3 Credits (3)
Free and forced vibrations for discrete and continuous systems with single or multiple degrees of freedom. Introduction to nonlinear and random vibration and solution techniques for such systems.
Prerequisite: M E 511 or consent of instructor.
Learning Outcomes
1. Ability to derive equations of motion of single- and multi-degree-of-freedom (DOF) systems.
2. Ability to analyze free and forced vibrations of single- and multi-DOF systems.
3. Ability to perform modal analysis of single- and multi-DOF systems.
4. Ability to derive equations of motion of continuous systems including beams, strings, and rods.
5. Ability to solve the governing equations of motion for several dynamical systems.

A E 527. Linear Systems Theory
3 Credits (3)
Introduction to control of linear multi-input-multi-output (MIMO) systems. Topics include representation of system dynamics using the state-space model, linearization, internal and input-to-output stability, controllability, observability, optimal control, linear quadratic regulator, and observer. May be repeated up to 3 credits.
Prerequisite: M E 452 or A E 452 or consent of instructor.
Learning Outcomes
1. Modeling of linear dynamical systems using state space methods.
2. Analysis of stability, controllability, and observability of linear systems.
3. Design of controllers and observers for linear systems using pole placement methods.

A E 530. Intermediate Fluid Mechanics
3 Credits (3)
Application of exact and empirical solutions to fundamental flow problems, including viscous and inviscid behavior. These applications establish a theoretical basis for the origin and physical role of common terms in the governing equations.
Prerequisite: M E 338 or A E 339 or consent of instructor.

Learning Outcomes

1. A basic knowledge of incompressible, viscous flows of Newtonian fluids, boundary layers and boundary layer behavior, vortex dynamics and 1D isentropic compressible flows, shocks and expansion waves.

A E 533. Numerical Methods for Fluid Mechanics and Heat Transfer
3 Credits (3)
Development of numerical techniques for the solution of ordinary and partial differential equations that arise in heat transfer and fluid mechanics; classification of equations, methods of solutions, examples.
Prerequisite: M E 530 or consent of instructor.
Learning Outcomes

1. An ability to understand fundamental aspects of solving differential equations using finite difference methods.
2. An ability to understand fundamental concepts such as stability, accuracy, consistency, systematic errors (phase/amplitude errors), artificial diffusion, etc.
3. An ability to implement and test algorithms for the solution of ordinary and partial differential equations.
4. An ability to develop ability to analyze numerical results and report results in a meaningful way.

A E 564. Advanced Flight Dynamics and Controls
3 Credits (3)
Advanced airplane flight dynamics and stability control system design, longitudinal and lateral autopilots, missile / rocket control systems, and guidance systems. May be repeated up to 3 credits.
Prerequisite: A E 364 or consent of instructor.
Learning Outcomes

1. An ability to construct a block diagram to find a transfer function for a dynamical system.
2. An ability to perform a control systems design by utilizing various linear control theories such as root-locus design method, bode / Nyquist plots, and lead / lag compensation techniques.
3. Understanding of longitudinal / directional / lateral dynamic flight stability controls associated with airplane designs.
4. Design and analysis of autopilot systems of an airplane with some knowledge in flight instrumentation.

A E 575. Propulsion
3 Credits (3)
Propulsion systems, thermodynamic cycles, combustion, specific impulse; principles of gas turbines, jet engines, and rocket propulsion systems. May be repeated up to 3 credits.
Prerequisite: A E 439 or consent of instructor.
Learning Outcomes

1. Knowledge of relevant fluid and thermodynamics.
2. Understanding of jet engine operating principles.
3. Ability to carry out parametric analysis of jet engine and turbomachinery.
4. Knowledge of how to analyze rocket propulsion systems.

A E 598. Special Research Programs
1-3 Credits (1-3)
Individual investigations, either analytical or experimental. May be repeated for a maximum of 6 credits. Restricted to A E & M E majors.

A E 599. Master's Thesis
1-15 Credits (1-15)
Thesis. Graded: Thesis/Dissertation.

A E 600. Doctoral Research
1-15 Credits (1-15)
This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination. Graded: Thesis/Dissertation.

A E 700. Doctoral Dissertation
15 Credits (15)
Dissertation. Graded: Thesis/Dissertation.

A EN-AGRICULTURAL ENGINEERING

A EN 459. Groundwater, Wells & Pumps
3 Credits (3)
Occurrence and movement of groundwater; design of water wells; selection and specification of pumps and power units. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 382 or consent of instructor.
Learning Outcomes

1. Understand the occurrence and movement of groundwater in aquifers, and extraction of it.
2. Ability to interpret pump specifications and data.
3. Select and detail power units for pumping systems.

A EN 478. Irrigation and Drainage Engineering
3 Credits (2+3P)
Design and operation of surface and sprinkler irrigation systems; pumping and conveyances; introduction to principles and practices of drainage systems and wells. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 382 or consent of instructor.
Learning Outcomes

1. Students will be able analyze and design irrigation systems.

A EN 498. Special Topics
1-3 Credits
Special topics in agricultural engineering. May be repeated up to 3 credits.
Prerequisite: consent of instructor.
Learning Outcomes

1. Students will develop knowledge related to the specific agricultural engineering special topic selected for study.

A ST-APPLIED STATISTICS

A ST 311. Statistical Applications
3 Credits (3)
Techniques for describing and analyzing economic and biological data; estimation, hypothesis testing, regression and correlation; basic concepts of statistical inference. May be repeated up to 3 credits.
Prerequisite: MATH 1215 or higher.
Learning Outcomes

1. Describe a data set with graphical tools and computed measures.
2. Explain the relationship between two numerical variables using correlation and regression.
3. Understand how probability and sampling methods are used to make statistical inferences.
4. Draw inference from a sample to a population using confidence intervals and hypothesis tests.
5. Understand the relationship between population parameters and sample statistics.

6. Understand the basic procedure of data production with sampling and experimental design.

A ST 450. Special Topics
1-4 Credits
Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

A ST 465. Statistical Analysis I
3 Credits (3)
An analytic introduction to the theory and methods of statistical inference. Sampling, frequency distributions (z, t, x2, F), estimation, testing, and simulation. Crosslisted with: A ST 565.
Prerequisite(s): MATH 2530G or consent of instructor.

A ST 466. Statistical Analysis II
3 Credits (2+2P)
Continuation of A ST 465. An analytic introduction to the theory and methods of statistical inference. Sampling, frequency distributions (z, t, x2, F), estimation, testing, and simulation. Crosslisted with: A ST 566.
Prerequisite(s): A ST 465 or consent of instructor.

A ST 498. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with prior approval of the department head. Maximum of 3 credits per semester and a grand total of 3 credits.

A ST 503. SAS Basics
3 Credits (2+2P)
An introduction to the statistical software package, SAS, and its utilization in an interactive computing environment, primarily PC/SAS. Provides a fundamental understanding of the structure of SAS, its data management capabilities, and how to invoke a variety of descriptive and simple statistical SAS procedures.
Corequisite(s): A ST 505.

A ST 504. Statistical Software Applications
1 Credit (1)
Optional Computing course to accompany A ST 506. Computer analysis of topics covered in A ST 505 and A ST 506.
Prerequisite(s): A ST 503.
Corequisite(s): A ST 506.

A ST 505. Statistical Inference I
4 Credits (3+2P)
A qualitative introduction to the concepts and methods of statistical inference. Sampling, frequency distributions (z, t, x2, F), estimation, and testing. One-way analysis of variance. Simple linear regression.
Prerequisite: consent of the instructor.

A ST 506. Statistical Inference II
3 Credits (2+2P)
Introduction to multiple regression; the analysis of variance for balanced studies; multiple comparisons, contrasts, factorials, experimental designs through split plots. May be repeated up to 3 credits.
Prerequisite: A ST 505 and the ability to use a standard computer package such as SAS (may be satisfied by A ST 503) or consent of instructor.
Learning Outcomes
1. Formulate models, construct ANOVA tables for balanced designs, and conduct complete analyses accounting for factorial treatment structures, and standard experimental design structures, including the completely randomized design, the randomized complete block design, completely randomized design with subsampling, the completely randomized design with a covariate, and the split-plot design.
2. Assess model adequacy including assessing constancy of variance and normality assumptions.
3. Choose an appropriate multiple comparisons procedure to control the experiment wise or family wise Type I error rate.
4. Use contrasts to conduct pre-planned comparisons.
5. Identify the experimental unit(s) in an experiment; formulate a model and conduct an analysis appropriately accounting for the experimental unit(s).
6. Conduct a complete analysis of data from a designed experiment and interpret findings.

A ST 507. Advanced Regression
3 Credits (3)
Examination of multiple regression; residual analysis, collinearity, variable selection, weighted least squares, polynomial models, and nonlinear regression: linearizable and intrinsically nonlinear models. May be repeated up to 3 credits.
Prerequisite: A ST 505 or consent of instructor.
Learning Outcomes
1. Understand the fundamental philosophy behind regression.
2. Conduct a proper regression analysis, including making inferences and predictions.
3. Address common pitfalls in regression, including model assumption and collinearity issues.
4. Use the R language to perform regression analysis.

A ST 509. Statistical Models for Complex Data Structures
3 Credits (3)
Statistical models for data that are not normally distributed or data with correlated observations. Covers generalized linear models for discrete and mixed models for correlated data structures. Analysis of data with unbalanced and missing cells.
Prerequisite: A ST 507 with a grade of B- or higher.
Learning Outcomes
1. Analyze data using classical regression and generalized linear models.
2. Derive quantities of interest from fitted models.
3. Formulate the appropriate hierarchical model for different analytical goals and data structures.
4. Use statistical software to fit hierarchical models and assess the adequacy of the model.
5. Interpret summaries of fitted hierarchical models.

A ST 511. Statistical Methods for Data Analytics
3 Credits (3)
Statistics fundamentals, with an emphasis on inferential methods, linear regression, and practical applications to data analytics. A ST majors should not take this course if they have already completed A ST 505.
Learning Outcomes
1. Understand descriptive and inferential methods commonly used in data analytics
2. Formulate linear regression models and fit models using statistical software
3. Properly interpret the results of statistical analyses
4. Effectively communicate statistical methods and results orally and in writing

A ST 512. Quantitative Analysis for Business Decisions
3 Credits (3)
Identification, collection, and analysis of an organization's data both internal and external, and use of the resultant information in managerial decision making.
Learning Outcomes
1. Understand statistical methods commonly used in business.
2. Identify statistical considerations in the design of studies.
3. Properly interpret the results of statistical analyses and use results to make decisions regarding business problems.
4. Effectively communicate business decisions orally and in writing, using statistics to defend decisions, as appropriate.

A ST 515. Statistical Analysis with R
3 Credits (3)
Introduction to R data types, basic calculations and programming, data input and manipulation, one and two sample tests, ANOVA, regression, diagnostics, graphics, probability distributions, and basic simulations in the R software environment.
Prerequisite(s): A ST 505 or equivalent with consent of instructor.

A ST 540. Predictive Analytics
3 Credits (3)
This course covers data analytic techniques that can be used to predict and classify observations outside of the original data. Material includes linear and nonlinear regression models, linear and nonlinear classification models, and classification and regression trees. Students will gain hands-on experience using modern software packages to build predictive models and quantify the accuracy of these models.
Prerequisite(s): A ST 507 or consent of instructor.

A ST 550. Special Topics
1-4 Credits
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

A ST 554. Practicum in Statistics
3 Credits (3)
Practical experience in data analysis and the reporting of results; selecting and using statistical methods to analyze and interpret real-world problems; written and oral communication of findings
Prerequisite: A ST 503, A ST 506, A ST 507, and A ST 566.
Learning Outcomes
1. Work with real data to gain substantial experience in data analysis, writing, and presentation.
2. Research and apply a variety of statistical methods, some of which students may not have encountered in prior coursework.
3. Apply knowledge and skills gained throughout the program of study, integrating content from across the MS in A ST curriculum.

A ST 555. Applied Multivariate Analysis
3 Credits (3)
Multivariate analysis of linear statistical models, including MANOVA and repeated measures. Analysis of correlation and covariance structures, including principal components, factor analysis, and canonical correlation. Classification and discrimination techniques. May be repeated up to 3 credits.
Prerequisite: A ST 506 and A ST 504.
Learning Outcomes
1. Understand the details of various multivariate techniques, emphasizing connections to univariate techniques where applicable.
2. Select appropriate multivariate techniques for a given data set and problem.
3. Use statistical software to perform multivariate analyses.
4. Correctly interpret, write about, and present the results of multivariate analyses.

A ST 565. Statistical Analysis I
3 Credits (3)
An analytic introduction to the theory and methods of statistical inference. Sampling, frequency distributions (z, t, x2, F), estimation, testing, and simulation. Taught with A ST 465.
Prerequisite(s): MATH 1521G or consent of instructor.
Learning Outcomes
1. To learn and understand the analysis in the theory and methods of statistical inference including sampling, frequency distributions (z, t, x2, F), estimation, testing, and simulation.

A ST 566. Statistical Analysis II
3 Credits (2+2P)
Continuation of A ST 565. Crosslisted with: A ST 466.
Prerequisite(s): A ST 565 or consent of instructor.

A ST 568. Applied Linear Models II
3 Credits (3)
The relation of full to less-than-full rank linear models; complex data structures, including messy data, empty cells, and components of variance: extensions to categorical data analysis and nonparametric methods. Continues some emphasis on computational aspects.
Prerequisite: A ST 567.

A ST 596. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with prior approval by department head. May be repeated for a maximum of 3 credits.
Prerequisite: consent of instructor.

A ST 598. Special Research Problems
1-6 Credits
Individual analytical or experimental projects. Restricted to majors. Graded S/U.

A ST 599. Master's Thesis
1-6 Credits
Thesis.

A ST 609. Linear Model Theory
3 Credits (3)
Theoretical treatment of linear models. Covers fixed effects and mixed effects models; models that are full rank, less than full rank, and over-parametrized. Prior to enrollment students should have a basic understanding of undergraduate-level matrix algebra.
Prerequisite: A ST 565, A ST 566, A ST 506, and A ST 509.
Learning Outcomes
1. Derive estimators of model parameters using design matrices, including models that are full rank, less than full rank, and over-parameterized.
2. Derive the expectation vector and variance matrix of a linear transformation of a random data vector.
3. Derive common test statistics and their distributions for fixed effects and mixed effects models with a balanced design.
4. Understand the mathematical properties of variance-covariance matrices and their implications for model estimation and inference.
5. Derive and interpret diagnostics for linear models.

A ST 616. Computational Statistics
3 Credits (3)

An introduction to topics in computational statistics including: methods for generating random variables, large scale hypothesis testing, resampling, bootstrapping, permutation tests, the Expectation-Maximization algorithm, Markov chain Monte Carlo methods, and computational approaches in Bayesian inference. Includes some applications of computational statistics in the sciences. Previous experience with programming, while helpful, is not required.
Prerequisite: A ST 505 and A ST 566.
Learning Outcomes
1. Conduct large-scale hypothesis testing
2. Generate random numbers and random variables
3. Implement Markov chain Monte Carlo methods for conducting Bayesian inference
4. Import and manipulate data using R
5. Employ bootstrapping methods for making inferences and conduct statistical hypothesis testing using permutation tests

A ST 645. Time Series Methods
3 Credits (3)
Theory and methods for analyzing, modeling, and forecasting time series. Covers ARIMA models, spectral analysis, filtering, and state-space models. Previous experience using the R programming language is helpful but not required. Students should have a basic understanding of undergraduate-level matrix algebra and trigonometry.
Prerequisite: A ST 565 and A ST 507.
Learning Outcomes
1. Explore time series datasets for autocorrelation, cross-correlation, and stationarity
2. Select appropriate models for analyzing and forecasting time series data
3. Identify regular patterns and frequencies in time series data
4. Fit time series models using statistical software
5. Understand mathematical theory underlying time series models

A ST 665. Bayesian Theory
3 Credits (3)
Provides an overview of theory underlying Bayesian inference. Topics include Likelihood and Sufficiency Principles, concepts from decision theory, construction of prior distributions, Bayesian point estimation, tests and confidence regions.
Prerequisite: A ST 565 and A ST 566.
Learning Outcomes
1. Understand the theoretical justification for using Bayesian methods as a means of statistical inference
2. Apply decision-theoretic principles to evaluate estimators under different loss functions
3. Develop prior distributions using the concepts of entropy, conjugacy, and non-informativeness
4. Derive basic point estimators using Bayesian principles
5. Understand testing and confidence region methods used for Bayesian inference

A ST 700. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation for the Applied Statistics doctoral program. Students must have advancement to candidacy in order to enroll in this course. May be repeated up to 36 credits.
Learning Outcomes
1. Make substantive progress towards completing a dissertation that fulfills the requirements for the Applied Statistics doctoral degree.

ACCT-ACCOUNTING

ACCT 1115. Accounting Principles I
3 Credits (2+2P)
This is an introductory course in the theory and practice of accounting that covers the purpose of accounting, the accounting process, and the various types of ownership structure. Also covered are types of business, career opportunities in accounting, analyzing financial transactions, adjusting entries, accounting worksheets, financial statements, and the closing process. Computerized exercise problems are used to assist student understanding and proficiency. This course is only offered for fall enrollment.

ACCT 1120. Accounting Principles II
3 Credits (2+2P)
This course is a continuation of theory and practice of accounting study began in ACCT 1115. Specialized accounting procedures for a service business and its environment, entrepreneurship, and small businesses are emphasized. Topics covered include the modified cash basis and combination journal, accounting for cash, payroll accounting, employee earnings and deductions, payroll accounting, employer taxes, and reports. Restricted to Community Colleges campuses only.
Prerequisite: ACCT 1115 or ACCT 2110.

ACCT 1150. QuickBooks
3 Credits (2+2P)
An introductory course to QuickBooks Pro accounting software, including setting up a new company and chart of accounts; recording transactions for service and merchandising businesses with customers, vendors and employees; bank reconciliations; payroll; end-of-period procedures; financial reporting; managing lists; and running reports and forms and customizing them. Restricted to Community Colleges campuses only.
Prerequisite: Working knowledge of computers and accounting or consent of instructor.
Learning Outcomes
1. Understand differences and similarities between a manual accounting system and QuickBooks Online.
2. Identify and execute the four levels of operation within QuickBooks: New Company Setup, Lists, Activities, and Reports.
3. Record sales/collections, purchase/payments, inventory, adjusting entries.
4. Set up payroll, record payroll transactions, print paychecks, and view various payroll related reports.
5. Produce a variety of reports and financial statements.
6. Analyze reports to identify and correct errors.

ACCT 1410. Personal Tax Preparation
3 Credits (3)
Introduces basic federal and state tax codes for preparing individual income tax returns. Emphasis on use of tax software. Students will be required to pass a certification exam and assist in preparing individual tax returns for low income and elderly taxpayers.
Learning Outcomes
1. Explain basic personal income tax filing status requirements.
2. Use appropriate tax software to prepare simple income tax returns for individuals.
3. Answer basic tax questions.

4. Demonstrate personal and professional interview skills in an environment that demands confidentiality issues at all levels.

ACCT 200. A Survey of Accounting
3 Credits (3)
Emphasis on financial statement interpretation and development of accounting information for management. For engineering, computer science, and other non business majors. Community Colleges only.
Prerequisite: one C S course or consent of instructor.

ACCT 2110. Principles of Accounting I
3 Credits (3)
An introduction to financial accounting concepts emphasizing the analysis of business transactions in accordance with generally accepted accounting principles (GAAP), the effect of these transactions on the financial statements, financial analysis, and the interrelationships of the financial statements.
Learning Outcomes
1. Analyze business transactions, their effects on the financial statements and the interrelationships of the financial statements involving the following:Cash transactions; Receivables and Net Realizable Value; Operational Assets and Depreciation; Inventory; Current Liabilities; Long-term Liabilities
2. Define, identify and demonstrate the impact of adjusting entries on financial statements.
3. Explain and demonstrate the differences between cash and accrual basis accounting.
4. Define and identify generally accepted accounting principles.

ACCT 2120. Principles of Accounting II
3 Credits (3)
An introduction to the use of accounting information in the management decision making processes of planning, implementing, and controlling business activities. In addition, the course will discuss the accumulation and classification of costs as well as demonstrate the difference between costing systems.
Prerequisite(s): ACCT 2110.
Learning Outcomes
1. Identify the differences between financial and managerial accounting.
2. Illustrate the accumulation of costs in cost accounting systems.
3. Describe the basic elements of the budgeting process, its objectives and budget preparation.
4. Define and classify cost behavior.
5. Perform cost-volume-profit analysis for decision-making.
6. Perform differential (incremental) analysis for business decision making.
7. Explain the cause of the variance and its effect on the income statement.
8. Explain and demonstrate the difference between traditional costing and activity-based costing.

ACCT 2170. Payroll Accounting
3 Credits (2+2P)
Covers payroll accounting procedures and controls, tax and employment laws, and tax reports that form the core of payroll responsibilities. Restricted to Community Colleges campuses only.
Prerequisite: ACCT 2110 or ACCT 1115.
Learning Outcomes
1. Identify payroll terminology and concepts, required payroll records, and various laws and regulations affecting payroll operations.
2. Calculate gross wages and deductions.
3. Record, journalize and post payroll transactions in accordance with GAAP using the appropriate accounting records (payroll registers, employee earnings records, journals, and ledgers).
4. Prepare and accurately complete payroll tax reports for timely filing.

ACCT 2220. Computerized Accounting
3 Credits (3)
This course requires the prior knowledge from Survey of Accounting or Principles of Accounting I (Financial). It employs integrated accounting software for payroll, inventory control, accounts payable, accounts receivable and general ledger functions. Course reviews the accounting cycle.
Prerequisite: ACCT 2110 or ACCT 1120.
Learning Outcomes
1. Set up a computerized accounting system and chart of accounts for a business enterprise.
2. Record sales/collections, purchase/payments, inventory, payroll, and adjusting entries using accounting software.
3. Identify the manual transactions underlying the computerized accounting systems.
4. Produce a variety of reports and financial statements using accounting software.
5. Analyze reports to identify and correct errors.

ACCT 2520. Introduction to Auditing
3 Credits (3)
Surveys auditing concepts and processes used by management and assurance professionals that include audit standards, reports, professional ethics, legal liability, evidence accumulation, audit planning, internal controls, transaction cycles, other engagements and operational auditing. Restricted to Community Colleges campuses only.
Prerequisite: ACCT 1115 or ACCT 2110.
Learning Outcomes
1. Describe the attest function.
2. Identify the professional and regulatory standards that impact the auditing profession.
3. Use audit planning techniques to assess risks, calculate materiality and prepare audit programs.
4. Evaluate factual situations to identify internal control deficiencies, significant deficiencies, and material weaknesses.
5. Identify types of evidence and practice documenting the results of performing audit tests.
6. Use various audit sampling to determine whether sufficient evidence has been obtained.
7. Identify audit procedures performed in the completion of an audit.
8. Select the appropriate audit report for various factual situations.
9. Demonstrate knowledge of other attestation and assurance services performed by CPAs as well as other types of services, which independent auditors may or may not perform.

ACCT 301. Financial Accounting I
3 Credits (3)
Concepts, principles, and practices of financial accounting, stressing the determination of income and financial position. A student who does not pass the class within three attempts will not be allowed to take class for a fourth.
Prerequisite(s): C or better in ACCT 2110 or (OATS 120 and OATS 121) and ACCT 2120.

ACCT 302. Financial Accounting II
3 Credits (3)
A continuation of ACCT 301.
Prerequisite(s): C- or better in ACCT 301.

ACCT 351. Accounting Systems
3 Credits (3)
Covers accounting information systems as processors of data for financial reporting and control of economic organizations.
Prerequisite: C or better in ACCT 2110 or (OATS 120 and OATS 121) and ACCT 2120.

ACCT 353. Cost Accounting
3 Credits (3)
The development and use of cost accounting information for inventory valuation, income determination, and cost control. A student who does not pass the class within three attempts will not be allowed to take class for a fourth.
Prerequisite(s): C or better in ACCT 2110 or (OATS 120 and OATS 121) and ACCT 2120.

ACCT 403. Federal Taxation I
3 Credits (3)
Basic federal income tax laws; emphasis on determination of taxable income of individuals. A student who does not pass the class within three attempts will not be allowed to take class for a fourth.
Prerequisite(s): C or better in ACCT 2110 or (OATS 120 and OATS 121) and ACCT 2120.

ACCT 451. Auditing Theory and Practices
3 Credits (3)
Auditing standards, audit evidence, auditors reports and opinions, and professional responsibilities.
Prerequisite(s): ACCT 351 and C- or better in ACCT 302.

ACCT 455. Federal Taxation II
3 Credits (3)
Federal income tax laws applicable to partnerships, corporations, fiduciaries, tax research, tax planning.
Prerequisite(s): C- or better in ACCT 403 or consent of instructor.

ACCT 456. Accounting for Nonprofit Organizations
3 Credits (3)
Control and reporting problems unique to governmental units and other nonprofit organizations. Fund accounting principles, procedures, and reports.
Prerequisite(s): C- or better in ACCT 302.

ACCT 458. Accounting Data Analytics
3 Credits (3)
Data Analytics in financial and managerial accounting and auditing. Restricted to: Accounting majors.
Prerequisite: C- or Better in ACCT 301.
Learning Outcomes
1. Understand how both financial and managerial accountants as well as auditors can benefit from using data analytics.
2. Understand how data is collected, created, stored, and shared by technology and be able to identify and evaluate the veracity of sources of unstructured and structured data for use in analysis.
3. Create visualizations of data to provide clear insights into associations, relationships, outliers and other data intimations related to accounting anomalies.
4. Understand and be able to identify business risks and ethical issues related to data collection, storage, and use.

ACCT 490. Selected Topics
1-3 Credits
Current topics in accounting. Prerequisites vary according to the seminar offered. May be repeated for a maximum of 12 credits under different subtitles.

ACCT 498. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated up to 3 credits. Consent of Instructor required.
Prerequisite(s): Consent of instructor.

ACCT 500. Concepts in Accounting
1 Credit (1)
Development, interpretation, and use of accounting information for financing, investing, operating, and managerial decision making.
Prerequisite(s): Admitted to MBA program.

ACCT 503. Accounting for Managers
3 Credits (3)
Concepts and principles of financial and managerial accounting. Presents techniques used to measure business transactions, prepare financial statements, techniques for management decision-making, planning, and control. Not open to MAcc students. May be repeated up to 3 credits.
Prerequisite: Graduate students only.
Learning Outcomes
1. Interpret and apply relevant financial accounting information.
2. Understand cost behaviors and perform breakeven analyses.
3. Prepare and analyze budgets and profitability reports.
4. Use accounting information to make management decisions involving activity-based costing and strategic management.
5. Students can think critically to solve problems.
6. Students can understand management issues from a global perspective.

ACCT 510. Technical and Professional Communication for Accountants
3 Credits (3)
Effective writing strategies for professional communications. Students will learn to write with a professional style and proper English usage and to work with a variety of technical and lay audiences. Emphasis on initiation, planning, composition, and evaluation of business and accounting workplace scenarios to develop communication skills used in a business environment. Restricted to: Master of Accountancy majors.

ACCT 530. Advanced Accounting
3 Credits (3)
This course is designed to provide in-depth study of current financial accounting concepts related to business combinations, financial statement consolidations, and foreign currency transactions and translations. Restricted to: Master of Accountancy majors.
Prerequisite(s): ACCT 302 with a grade of C or better.

ACCT 544. Financial Statement Analysis and Valuation
3 Credits (3)
Valuation of firms using financial information, financial statement analysis, and the valuation of individual assets and liabilities. Restricted to: Master of Accountancy majors.
Prerequisite(s): Acct 302; Graduate students only.

ACCT 550. Special Topics
3 Credits (3)

Seminars in current topics in various areas of accounting including financial, managerial, auditing, taxation, systems, and fund accounting. Prerequisites vary according to topic being offered.

ACCT 551. Advanced Auditing Theory and Practice
3 Credits (3)
Understanding and evaluating internal control in an EDP environment. Statistical sampling applications and current issues in auditing. Restricted to: Master of Accountancy majors.
Prerequisite(s): ACCT 451.

ACCT 555. Federal Tax Research
3 Credits (3)
Tax research methodology including case materials, critical judicial decisions, journal articles, and research services. Emphasis on tax planning. Restricted to: Master of Accountancy majors.
Prerequisite(s): ACCT 403.

ACCT 558. Artificial Intelligence in Accounting
3 Credits (3)
This course covers the concepts and applications of artificial intelligence (AI) in accounting. The course topics are automation, machine learning including advanced data analytics and natural language processing, and generative AI. Restricted to Master of Accountancy Students.
Learning Outcomes
1. Explain the main concepts and components of AI and how they relate to accounting.
2. Identify the opportunities and challenges of using AI in accounting.
3. Compare and contrast different types of AI and their applications in accounting.
4. Apply various AI tools to perform accounting tasks and solve accounting problems.
5. Critically assess the ethical, social, and professional implications of using AI in accounting.

ACCT 559. Ethics and Professionalism in Accounting
3 Credits (3)
Introduction to ethical reasoning, integrity, objectivity, independence , and professional accounting issues Students will apply the concepts and theories to accounting-specific cases. Restricted to: Master of Accountancy majors.
Prerequisite(s): C or better in ACCT 451.

ACCT 560. Taxation of Corporations and Shareholders Advanced
3 Credits (3)
Effects of taxation on the organization, operation, and reorganization of corporations and on their shareholders. Restricted to: Master of Accountancy majors.
Prerequisite(s): ACCT 403.

ACCT 564. Financial Accounting Research
3 Credits (3)
Interpretation and application of accounting principles to financial reporting issues of business and nonbusiness organizations. Consent of Instructor required. Restricted to: Master of Accountancy majors.
Prerequisite(s): ACCT 302.

ACCT 580. Professional Accountancy
3 Credits (3)
Prepares students for the accounting profession and professional certification through study of a wide range of topics similar to those a student might encounter in their first year of employment. Restricted to: Master of Accountancy majors.

ACCT 598. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with prior approval of the department head. A maximum of 3 credits may be earned.
Prerequisite: consent of instructor.

ACCT 599. Master's Thesis
15 Credits
Thesis.

ACES-AGRI, CONSUMER & ENV SCIE

ACES 1120. Freshman Orientation
1 Credit (1)
Orientation to University life, including the understanding and utilization of resources that promote University success. Designed to promote success in achieving a career objective and perseverance for degree completion. Promotes a recognition of changes required in moving from high school to the University. Eight weeks in length, required for all freshmen in the College of Agricultural, Consumer and Environmental Science.
Learning Outcomes
1. Orient students to NMSU and to the College of Agricultural, Consumer and Environmental Sciences.
2. Develop an understanding of the personal skill set needed for academic success.
3. Develop awareness of the academic and personal resources available to NMSU students.
4. Help students create a peer network that will support their academic and personal success.
5. Strengthen skills in oral and written communications

ACES 1130. Agricultural Industry Certifications
3 Credits (3)
Provides academic course credit for the successful completion of agricultural industry certifications. The successful completion of one approved agricultural industry certification yields three hours of course credit. The completion of two agricultural industry certifications can yield a maximum course credit of six hours. Any third-party costs associated with completing the agricultural industry certification(s) will be the responsibility of the student. May be repeated up to 6 credits.
Learning Outcomes
1. Students will demonstrate a comprehensive understanding of the key concepts, tools, and techniques specific to the agricultural certification, including both theoretical knowledge and practical applications relevant to the industry.
2. Students will achieve proficiency in technical skills related to modern agricultural practices within their chosen certification area, such as precision agriculture, sustainable farming techniques, and the use of advanced agricultural machinery and technology.
3. Students will develop and apply problem-solving and critical-thinking skills to address real-world challenges in the agricultural sector, utilizing data-driven approaches and industry best practices.
4. Students will demonstrate an understanding of professional and ethical standards within the agricultural industry, including sustainable practices, environmental stewardship, and adherence to safety and regulatory requirements.

ACES 1210. Financial Fitness for College Students
1 Credit (1)
An introduction to personal financial practices in post high school and/or college lives. Emphasis is placed on budgeting, savings, investment, college debt, student loans, credit cards, scams and consumer protection.

Learning Outcomes

1. Discuss the importance of personal financial management during college years.
2. Discuss the essentials of following: a.paying yourself first and budgeting, b.differentiating between needs and wants, c.the significance of building and having good credit, d.managing debt, e.understanding and minimizing student loan debt, f.investing, g.life success principles, e.g., goal setting, time management, stress management.
3. Choose online financial tools to help them succeed financially.

ACES 1220. Academic Excellence
1-3 Credits (1-3)
Academic curriculum of excellence that includes the development of collaborative learning and student success environment, learning diverse learning styles and multiple intelligences, and developing multi-contextual academic communication styles. Restricted to: Open to all ACES majors. Restricted to Las Cruces campus only.
Learning Outcomes

1. Demonstrate an understanding of the relationship between time management and academic success.
2. Express a familiarity with college culture.
3. Communicate a comprehension of study skills and test taking strategies.
4. Apply material learned to other aspects to enhance academic excellence.
5. Develop an academic and career life plan that will highlight goals, taking into account life circumstance
6. Become competent in appropriate professional/academic communication

ACES 301. Agricultural Leadership Development
1-3 Credits (1-3)
This course will introduce the student to skill sets necessary to engage in the process of leadership through an applied project. A broad spectrum of principles and applications associated with the College of Agricultural, Consumer and Environmental Sciences will be employed. The development of a specific project through a collaborative process will be required. Students will be engaged in hands-on, real-time experiences applicable to agriculture. Student must have a 3.5 GPA and above. Consent of Instructor required. May be repeated up to 4 credits.
Learning Outcomes

1. Learn the key student support services available at NMSU.
2. Develop effective oral and written communication skills.
3. Learn elements of effective peer mentorship.

ACES 305. Advanced Leadership and Communication in Agricultural Sciences
1-3 Credits (1-3)
Theory and application of advanced communication techniques, focusing on public speaking and public relations, are emphasized in this course for current and potential college ambassadors.
Learning Outcomes

1. Learn the mission, vision and pillars of the NMSU College of Agricultural, Consumer and Environmental Sciences.
2. Learn the key student support services available in ACES and at NMSU.
3. Understand the importance of professionalism and improve individual leadership skillset.
4. Develop effective oral and written communication skills, and employ these skills in delivery of student recruitment presentations and programs.

ACOM-AG COMMUNICATIONS

ACOM 1110. Introduction to Agricultural Communication
3 Credits (3)
Students will learn about the history and theories of agricultural communications, be introduced to the degree program, explore careers in the field, and examine the role of media in agricultural communications. May be repeated up to 3 credits.
Learning Outcomes

1. Identify classes needed in the degree program and relevant clubs.
2. Recall important times in history of agricultural communication and journalism.
3. Comprehend the communication process and identify its components.
4. Identify effective and efficient media for agricultural communication.
5. Analyze the various roles and uses of media in agriculture communication.
6. Apply theories of communication and journalism to class assignments.

ACOM 1120. Introduction to Graphic Design in Agriculture
3 Credits (3)
This course focuses on introducing students to creating and critiquing visual communication materials in agricultural communications by developing understanding of visual communications, graphic design and branding principles as well as basic skills in using Adobe Illustrator and Photoshop software.
Learning Outcomes

1. Understand and demonstrate the correct use of formats, modes, and resolutions when creating or using graphics for various mediums and audiences.
2. Critique and evaluate graphic and photographic design elements in agricultural communications pieces.
3. Demonstrate a working knowledge of the Adobe Illustrator and Photoshop software and their uses for implementing principles of graphic design and branding.

ACOM 1130G. Effective Leadership and Communication in Agriculture
3 Credits (2+2P)
Theory and practice in leadership and communication for professionals who must work effectively in leadership and supervisory roles with people in agricultural business, industry, government agencies, and education. Course focuses on contemporary leadership theories. Oral communication skills in informative and persuasive speaking, parliamentary procedure, and for small groups are developed. May be repeated up to 3 credits.
Learning Outcomes

1. Understanding Leadership: Definitions of Leadership; Agricultural Education, FFA , Leadership; Leadership Categories; Democratic, Authorization, and Situational Leadership; Personality and Leadership Relations; Developing Leaders; Personal Leadership Development; Ability, Experience, and the Opportunity to Lead; Leadership in the Workplace; Human Relations, Technical, and Conceptual Skills
2. Communication Skills: Communication and Leadership; The Purpose of Communication; Forms of Communication; Communication

Barriers and Styles; Verbal and Nonverbal Communication; Feedback; Self Communication and Interpersonal Communication

3. Leading Individuals and Groups: Group Dynamics and Team Building; Democratic Group Leadership; Importance of Groups; Types of Groups; Organizing Groups; Group Dynamics, Development, and Discussion
4. Conducting Successful Meetings: Skills Developed by Bring an Officer; Basic Meeting Functions; Characteristics of a Good Meetings; Planning and Preparing for Meetings; The Meeting Room; Committees; Informative and Motivational Meetings; Group Member Involvement; Officer and Member Responsibilities; Developing a Program of Activities

ACOM 2120. Photography in Agriculture
3 Credits (1+2P)
This is a field-based course focused on how to students use the camera as a tool to make the rules of photography and design work for the student's style, creativity, and goals pertaining to application of photography in agricultural communications. Students develop and disseminate a photography portfolio through a variety of communications channels.
Learning Outcomes
1. Utilize a DSLR or mirrorless camera to analyze scenarios to effectively curate a body of work that compliments agricultural communications practice
2. Demonstrate working knowledge of camera equipment and photography principles to create visual stories
3. Evaluate and critique imagery for use of photography skills and principles

ACOM 2998. Early Field- Based Experience in Agricultural Communications
1-4 Credits (1-4)
This course is designed to help you understand people and how to communicate with people. The key to all journalism or communications-related courses is to understand the audience well enough to know how to speak like them, to them, and to your stakeholders. The most successful communicators exhibit greatness in themselves and in their peers. Communicators cannot do their job if they do not show up with their best attitude and work ethic. Don't let your audience down, and we will make sure you are equipped to do so. May be repeated up to 6 credits.
Learning Outcomes
1. Explain the role of communications in the agricultural or science industries.
2. Develop a communication campaign for an agriculturally related client.
3. Identify key principles of communication channels including newswriting, radio production, and communication plans.
4. Create effective internship application materials to meet needs in the industry.
5. Design a job portfolio that includes examples of communications experience.

ACOM 3110. Agricultural Communications
3 Credits (3)
Principles and practical experience in news writing, radio production, newsletter design, public meeting presentations, video productions, graphics, and public relations activities, especially as related to the fields of agriculture and family and consumer sciences.

ACOM 3115. Global Issues in Agricultural Communications and Marketing
3 Credits (3)
Global perspectives related to international agricultural communications and marketing. The course will provide real-world settings for students to advance their awareness of international issues influencing marketing and trade in the United States and abroad. The course will expose students to high-impact learning, research skill development, communication skill development with a global mindset, and international travel. May be repeated up to 6 credits.
Learning Outcomes
1. Explain the role of communications and marketing in international agriculture.
2. Develop an awareness of global agricultural issues and how they impact domestic and international trade.
3. Increase awareness of global perspectives in agriculture.
4. Discover cultural similarities and differences within the U.S. and the selected country.
5. Investigate agricultural communications and marketing issues using an applied perspective.
6. Communicate course experiences through reflective analyses, photojournalism blog entries, social media campaigns, and presentations.

ACOM 3125. Website User Experience Design in Agriculture
3 Credits (3)
The purpose of this course is for students acquire user experience development, coding and web design skills in order to create a live personal portfolio website that demonstrates their professional skills and experiences in agriculture.
Learning Outcomes
1. Evaluate websites based on user experience principles
2. Use the fundamentals of HTML and CSS to edit code
3. Implement user experience principles in website design
4. Develop a website using WordPress
5. Explain and justify web design decisions

ACOM 3150. Communications Campaigns in Agriculture
3 Credits (3)
Client-based marketing and communication needs for stakeholders in agricultural and life sciences. Students will learn brand awareness for agricultural stakeholders by developing a campaign of communications and marketing materials using multiple modes (e.g., written, visual, social). Students in this course will gain an overall understanding of the agricultural communications industry by developing portfolio materials, prepare for the job and internship search process, and identify the skills necessary to grow in and contribute to a communications profession.
Learning Outcomes
1. Students will be able to identify communications-related needs with a client or stakeholder in the food, fiber, and natural resources industries.
2. Direct a communications plan with channels, tactics, steps, and timelines for a client.
3. Develop a campaign of communications materials (e.g., written, visual, social) around a client's needs.
4. Manage a client's brand with desired audiences through establishing, promoting, and reinforcing messages.

ACOM 3160V. Communicating Agriculture & Science to the Public
3 Credits (3)

Principles and practical experience in general communications channels (i.e., news writing, radio production, newsletter design, public meeting presentations, video productions, graphics, and public relations activities) related to the fields of agricultural, consumer, or environmental sciences. Students in this course will gain an overall understanding of the agricultural communications industry and identify the skills necessary to grow in and contribute to a communications profession.

Learning Outcomes

1. Explain the role of communications in the agricultural, consumer, or environmental science industries.
2. Develop a communication campaign for an agricultural, consumer, or environmental science related client.
3. Identify key principles of communication channels including news writing, radio production, and communication plans.
4. Design a social media campaign including Instagram, Facebook, Twitter,and/or other emerging platforms.
5. Develop skills in media communications including public relations, conducting radio and television interviews, developing interview skills and identifying the needs of an audience.
6. Create effective internship application materials to meet needs in the industry.
7. Design a job portfolio that includes examples of communications experience.
8. Examine social, ethical, and legal issues related to communicating components related to the agricultural, consumer, and environmental science industries.
9. Conduct an audience analysis of key issue related to the agricultural, consumer, and environmental science industries by analyzing demographics, psychographics, sociographics, and geographics of affiliated audience personas.

ACOM 4115. Agricultural and Scientific Publications
3 Credits (3)

Learn and gain experience with the principles and concepts of designing, writing, editing, producing and distributing a student insert to the ACES Magazine, including practical applications of writing feature articles, magazine design, layout and graphics.

Learning Outcomes

1. Execute the steps necessary to be a freelance writer.
2. Identify feature story ideas, contact sources and develop publishable stories.
3. Compare and contrast the varying types of publication materials (connection/spotlights, feature stories, social media sprints, etc.).
4. Comprehend publication design principles and current practices used in print communication industries.
5. Create, produce, publish and publicize a print magazine.
6. Connect with an audience through soft news.

ACOM 4120. Advanced Graphic Design and Layout in Agriculture
3 Credits (3)

This class provides an in-depth examination of visual communication principles and theories, design applications, and design topics relevant to the agricultural industry. Students will learn how to more deeply evaluate designs and layouts, create effective design pieces for targeted agricultural audiences, and further utilize the Adobe Creative Cloud software.

Learning Outcomes

1. Analyze and apply the principles underlying effective graphic design and layout
2. Recognize and discuss communication and visual theories for developing effective designs and layouts for intended purposes and audiences
3. Demonstrate an extensive working knowledge of Adobe Illustrator, Photoshop, and InDesign to create effective designs for both print and digital platforms

ACOM 4130. Strategic Brand Identity & Design in Agriculture
3 Credits (3)

The purpose of this course is for students to develop extensive understanding of strategic and visual theory and principles specific to branding as a critical aspect of business development in all aspects of agriculture and natural resources. Students will utilize research and Adobe Creative Cloud to design targeted brand strategy, client brief, and design strategy to effectively build a client pitch.

Prerequisite: ACOM 1120.

Learning Outcomes

1. Articulate the significance of utilizing brand identity for differentiation
2. Apply extensive knowledge of visual and brand theory, principles, strategy and application to various contexts in agriculture and natural resources
3. Research, design and pitch a brand strategy, client brief and design strategy

ACOM 4998. Internship in Agricultural Communications
3-12 Credits (3-12)

The experiential learning experience selected by students and approved by their academic advisor will form the basis of this course. Students will apply problem-solving skills, communication skills, and disciplinary knowledge through an internship related to agricultural communications. During the internship, students will gain real-world experience in their specific field of interest within the discipline. May be repeated up to 12 credits.

Learning Outcomes

1. Synthesize discipline-specific knowledge and its application to real-world contexts
2. Design and implement solutions to meet project-related tasks
3. Produce professional-quality deliverables for the employer and for the course
4. Handle a high level of responsibility with professionalism and care in preparation and presentation

ACOM 5115. Global Issues in Agricultural Communications and Marketing
3 Credits (3)

Graduate-level course broadening global perspectives related to international agricultural communications and marketing. The course will provide real-world settings for students to advance their awareness of international issues influencing marketing and trade in the United States and abroad. The course will expose students to high-impact learning, research skill development, communication skill development with a global mindset, and international travel. May be repeated up to 6 credits.

Learning Outcomes

1. Explain the role of communications and marketing in international agriculture.
2. Develop an awareness of global agricultural issues and how they impact domestic and international trade.
3. Increase awareness of global perspectives in agriculture.
4. Discover cultural similarities and differences within the U.S. and the selected country.

5. Investigate communications and marketing issues using an applied perspective.
6. Communicate course experiences through reflective analyses, photojournalism blog entries, social media campaigns, and presentations.
7. Research and dissemination information regarding international issues in agriculture using critical thinking skills.

AEEC-AGRICULTURAL ECON/ECON

AEEC 1110. Introduction to Agricultural Economics and Business
3 Credits (3)
This course is an orientation to agricultural economics and business through the discovery process for the consumer in the food, fiber, and natural resource sectors of the global economy. The course discusses the application of micro-and macro-economic principles as they relate to agricultural economics and business. May be repeated up to 3 credits.
Learning Outcomes
1. Gain a broad understanding of the role of the consumer in the market-place for agricultural commodities, producers, agencies and the global market structure.
2. Apply introductory economic principles to applied global situations.
3. Employ economic concepts in the application of production level decision making.
4. Employ economic principles to the basic and global agricultural community.
5. Understand relationships that exist between producers and consumers.

AEEC 1120. Careers in Food and Agribusiness
1 Credit (1)
This course provides an orientation to careers in agricultural economics and agricultural business. Students will learn about the agricultural supply chain in New Mexico, the United States, and the world. Students will be introduced to faculty and staff within the department, learn about career opportunities available to AEAB graduates, and develop a greater appreciation of current agricultural issues. Freshman status or consent of instructor required. May be repeated up to 1 credit.
Learning Outcomes
1. Become familiar with career opportunities in agricultural economics and agricultural business
2. Understand knowledge and skills desired by employers
3. Become acquainted with faculty and staff in the Department of Agricultural Economics and Agricultural Economics and resources available to students within the Department
4. Refine written and verbal communication skills

AEEC 2110. Principles of Food and Agribusiness Management
3 Credits (3)
This course introduces business management theory and application of theory related to businesses within the food and fiber supply chain. Topics include management and financial principles, market planning, and organization theory. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate, refine and expand written and oral communication skills
2. Develop an understanding of basic financial statements, their use and analysis
3. Understand the roles management and management styles play in modern agribusiness
4. Learn about the history of agribusiness domestically and internationally
5. Integrate the role of technology into modern agribusiness management

AEEC 2120. Introduction to Food and Agribusiness Accounting
3 Credits (3)
This course outlines the purpose and methods of keeping and analyzing farm and ranch records. Course topics include financial statements, efficiency measures, analysis of the business, and tax computations.
Learning Outcomes
1. Understand the terminology and principles used in modern farm and ranch financial management statements.
2. Evaluate capital investments, analyze farm business performance, and develop tools for financial planning and analysis
3. Evaluate farm and ranch cash flows

AEEC 2130G. Survey of Food and Agricultural Issues
3 Credits (3)
Survey of food and agricultural issues, including: geography of food production and consumption; human-agricultural-natural resource relations; agriculture in the United States and abroad; modern agribusiness; food safety; food, agriculture, and natural resources policy; ethical questions; role and impact of technology. Crosslisted with: FSTE 2130G.
Learning Outcomes
1. Understand of global agriculture including production techniques used in various geographical regions, consumption trends, and political and social constraints.
2. Synthesis information about agricultural issues and make informed arguments
3. Articulately discuss modern issues in agriculture
4. Write coherent arguments relative to personal beliefs regarding agricultural issues

AEEC 2140. Technology and Communication for Business Management
3 Credits (2+2P)
This course helps students improve their skills related to data analysis, information management, and communication. Drawing examples from a variety of management, business, technological and research situations, students discover the versatility and functionality of modern computer software. The course emphasizes a 'hands-on' approach. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate an understanding of the terminology used to describe common techniques and concepts in business information systems.
2. Demonstrate a mastery of spreadsheet design and use.

AEEC 2996. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. Consent of instructor required.
Learning Outcomes
1. Varies

AEEC 3110V. World Agriculture and Food Problems
3 Credits (3)
This course examines key concepts and issues relevant to the world's food production systems. Topical highlights include the causes and consequences of hunger, agriculture's economic and environmental

significance, sustainable development, biotechnology, and globalization of agricultural markets. As students learn about these issues from both local and global perspectives they are engaged in the development of both their literacy of economic concepts and their core research and communication skills. We do this through a combination of relevant course readings, in-class discussion exercises, and focused writing assignments on current issues of relevance. Same as GEOG 315V. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate conceptual and systems thinking and design
2. Assess the nutrition and healthfulness of food choices
3. Describe the structure and function of food and agricultural systems
4. Analyze roles of and relationships between food producers, consumers, and policymakers
5. Apply basic economic concepts to describe and interpret food and agricultural issues
6. Explain the environmental context and role of agriculture
7. Articulate key arguments that favor and oppose food biotechnology
8. Recognize several of the benefits and barriers in international trade of food and agricultural products

AEEC 3120V. Natural Resource Economics
3 Credits (3)

This course helps students gain insight into important natural resource problems of our time. Apply economic principles to problems in the preservation, use, and development of agricultural, range, mineral, water, forestry, fishery, and environmental resources. Understand the use of cost-benefit analysis for government natural-resource projects, policies, and programs. Same as ECON 337V. May be repeated up to 3 credits.
Prerequisite: ECON 1110G or ECON 2120G or ECON 2120H.

Learning Outcomes

1. Demonstrate knowledge of economic principles to better understand natural resource issues
2. Document understanding of current and emerging natural resource issues
3. Apply economic principles to guide selected natural resource policy debates
4. Demonstrate the application of economic principles to inform policy debates addressing current water resources issues

AEEC 3130V. Water Resource Economics
3 Credits (3)

This course uses economic principles to evaluate current and emerging issues in water resources. Applications focus on the use of economic methods of analysis to current policy decisions surrounding agricultural, municipal, industrial, and environmental uses of water. Same as ECON 384V. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate knowledge of economic principles to better understand water resource issues
2. Show understanding of current and emerging water issues
3. Apply economic principles to guide selected water resource policy debates
4. Demonstrate the application of economic principles to inform policy debates addressing current water resources issues

AEEC 3140V. Agricultural Policy
3 Credits (3)

This course provides a historical and cultural background of food and agricultural policy in the United States. Analysis of food and agricultural problems, policy-making, and implementation. Economic evaluation of specific U.S. food and agricultural policy instruments, their domestic and international impacts.

Learning Outcomes

1. Apply economic concepts to deepen understanding of agricultural policy, particularly with regard to macroeconomic importance to agriculture
2. Describe inherent tradeoffs and opportunity costs in policy
3. Identify the global impacts of U.S. agricultural policy
4. Explain and describe important agricultural policy issues for a lay audience

AEEC 3210. Marketing and Food Agricultural Products
3 Credits (3)

This course provides a review of marketing principles and techniques used throughout the food and fiber supply chain. The course introduces a broad variety of marketing topics including marketing strategy, consumer behavior, market segmentation, market research, competitive analysis, and the marketing mix. The course serves as a foundation for advanced courses in agricultural marketing. Same as MKTG 305.
Prerequisite: ECON 1110G or ECON 2120G.

Learning Outcomes

1. Articulate how agricultural commodities move through the food and fiber supply chain.
2. Understand the importance of strategic marketing and how organizations within the food and fiber supply chain identify consumers and their preferences.
3. Understand key marketing concepts used by agribusiness marketers, including SWOT analysis, the marketing mix, advertising and public relations.
4. Know the basic outline and components of a marketing plan.

AEEC 3220. Financial Derivative Markets
3 Credits (3)

This course explores the role of financial derivatives in modern business, including income generation, risk management, and price discovery. Derivatives markets covered in the course include futures, options, and swaps. Course content focuses on the fundamentals of trading and hedging in a wide variety of markets, e.g., agriculture, interest rates, exchange rates. Students participate in simulated futures and options trading. Same as AEEC 5220/BFIN 511 with additional coursework required at the graduate level. Cannot receive credit for both AEEC 3220/BFIN 311 and AEEC 5220/BFIN 511. Same as BFIN 311.

Learning Outcomes

1. Understand and explain the concept of risk, list various sources of risks observed in businesses, and identify common methods used to manage risk
2. Demonstrate an understanding of the vocabulary associated with derivatives and derivative markets
3. Articulate the role that derivative markets play in reducing risk and illustrate how they can be used in practice to reduce risk
4. Illustrate how derivative markets can be used to generate income and manage risk through hedging

AEEC 3230. Food and Agricultural Sales
3 Credits (3)

This course reviews the techniques of salesmanship. Course topics include identification and classification of buyer type and different approaches to sales based on client base. Improving oral communication skills through individual and/or group sales presentations. Students must be in Junior or above standing to enroll. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze sales situations and effectively identify pathways to closing the sale.
2. Demonstrate execution of the sales process – prepare, learn, communicate, evaluate.
3. Conduct product and customer analysis to build a sales strategy.
4. Exhibit enhanced relationship management and communication skills.

AEEC 3240. Agricultural and Natural Resource Law
3 Credits (3)
This course discusses the relationship of common-law principles, statutory law and regulatory law to problems involving agriculture with an emphasis on New Mexico issues. Legal problems relevant to agribusiness, torts, fencing laws, liability for agricultural pollution, irrigation water rights, corporations and partnerships, land tenure, farm and ranch tenancy, agricultural labor, farm and ranch management, and taxation. May be repeated up to 3 credits.
Learning Outcomes

1. Understand the complexity of law as it relates to agriculture and natural resources
2. Develop a basic understanding of the legal system in the U.S. including the role of federal and state agencies responsible for agricultural and natural resource regulation
3. Articulate at a layperson's level, the roles of the legislative, judicial, and executive branches of the government as they relate to agriculture and natural resources.

AEEC 3250. Economics of Food and Agricultural Markets
3 Credits (3)
This course focuses on the analysis of supply and demand characteristics of commodities with particular attention to agricultural products. Pays special attention to empirical analysis. Includes institutional aspects of pricing, temporal and spatial price relationships, price forecasting, and the economic consequences of pricing decisions. May be repeated up to 3 credits.
Prerequisite: ECON 2120G, MATH 1430G, and A ST 311 or MATH 1350G.
Learning Outcomes

1. Become familiar with commonly used data analysis methods and tools.
2. Develop an understanding of the factors that influence agricultural prices.
3. Use data to analyze and solve real-world problems related to agricultural prices.

AEEC 3260. Economic Analysis of Food and Agribusiness
3 Credits (3)
This course uses economic and business theory to analyze business decision making. The course includes a discussion of economic, managerial, and financial considerations relevant to modern agribusinesses. May be repeated up to 3 credits.
Prerequisite: ECON 2110G, ECON 2120G.
Learning Outcomes

1. Understand the role of managers within the food and fiber supply chain.
2. Develop an understanding of the applications of managerial economics as they related to businesses within the food and fiber supply chain.
3. Analyze market conditions and assess the position of a business within the market.
4. Identify and articulate optimal business decisions by analyzing economic and business information.

AEEC 3270. Spreadsheet Applications in Food and Agriculture
3 Credits (2+2P)
This course is an advanced course in electronic spreadsheets. Concepts and tools of data analysis and database management within a spreadsheet, emphasizing agricultural applications, are presented. Same as AEEC 5320 with additional work required at the graduate level. Cannot receive credit for both AEEC 3270 and AEEC 5320. May be repeated up to 3 credits.
Prerequisite: AEEC 2140 or consent of instructor.
Learning Outcomes

1. Ability to effectively utilize some of the advanced features in Microsoft Excel by course end.
2. Transforming agricultural and agribusiness problems into spreadsheet models for analysis.
3. Increase critical thinking capacity with respect to solving problems/tasks.
4. Develop creativity in solving problems/tasks.

AEEC 3280. Applied Production Economics
3 Credits (3)
This course introduces students to fundamental economic theories and analytical tools required for managing an agricultural operation. In particular, the principles of microeconomics will be reviewed and applied to the problems faced by farms and ranches. The course focuses only on economic making at the farm or ranch level. May be repeated up to 3 credits.
Prerequisite: (ECON 2120G or ECON 2120H) and (MATH 1430G) and (A ST 311 or MATH 1350G).
Learning Outcomes

1. Analyze production function and calculate the total, average, and marginal products
2. Derive profit-maximizing input and output combinations
3. Evaluate the relationship between production, revenue, and profit functions
4. Analyze crop budgets and determine optimal acreage allocation
5. Measure the impact of risk and uncertainty on agricultural production

AEEC 3998. Internship
1-4 Credits (1-4)
Professional work experience under the supervision of a faculty member. May be repeated up to 6 credits.
Prerequisite: Consent of instructor.

AEEC 4110. Food and Agribusiness Financial Management
3 Credits (3)
This course provides a description and application of techniques and principles of financial management to problem situations faced by agricultural businesses, including financial statement development and analysis, capital budgeting, sources and costs of capital. May be repeated up to 3 credits.
Prerequisite: ECON 2120G or ECON 2120H and ACCT 2110.
Learning Outcomes

1. Understand the time value of money and perform capital investment analysis for agricultural firms
2. Interpret financial statements used by agricultural firms
3. Comprehend farm financial risks and returns
4. Discuss financing options for U.S. farm businesses

AEEC 4410. Senior Seminar
1 Credit (1)
This course focuses on current topics and cases in the agribusiness literature stressing rigorous qualitative analysis of current problems and policy issues. During the course, students provide feedback about their experience within the Department and help identify ways in which the Department can improve. Restricted to: AEAB; NREP majors. Must be Senior standing to enroll. May be repeated up to 1 credit.
Learning Outcomes
1. Illustrate an understanding of economic and business concepts as illustrated and applied in case analyses.
2. Articulate ways in which the Department can improve academically.
3. Prepare future steps in careers, e.g., resumes, cover letters, mock interviews.
4. Develop interpersonal communication skills.

AEEC 451. Food and Agribusiness Market Assessment
3 Credits (3)
This course is an application course in which self-managed teams develop and present marketing plans for agribusiness firms. Emphasis on integrating the marketing mix, particularly promotional elements. May be repeated up to 3 credits. Crosslisted with: AEEC 4510.
Prerequisite(s): AEEC 3210 or MKTG 305 or consent of instructor.
Learning Outcomes
1. Identify, organize ad conduct market research specific to the project
2. Develop an understanding of primary and secondary research collection and analysis
3. Exhibit enhanced relationship management, communication skills, and team building
4. Develop written communication with final deliverable for implementation into the business world

AEEC 4510. Food and Agribusiness Market Assessment
3 Credits (3)
This course is an application course in which self-managed teams develop and present marketing plans for agribusiness firms. Emphasis on integrating the marketing mix, particularly promotional elements. May be repeated up to 3 credits. Crosslisted with: MKTG 451.
Prerequisite(s): AEEC 3210 or MKTG 305 or consent of instructor.
Learning Outcomes
1. Identify, organize ad conduct market research specific to the project.
2. Develop an understanding of primary and secondary research collection and analysis.
3. Exhibit enhanced relationship management, communication skills, and team building.
4. Develop written communication with final deliverable for implementation into the business world.

AEEC 4520. Food and Agribusiness Marketing Plan Development
3 Credits (3)
This course focuses on learning marketing research methods applicable to developing new food and agricultural products and repositioning existing products for new markets. Students will be required to prepare precise written and oral marketing plans to industry standards and will have opportunities to present written and oral plans at national competitions. May be repeated up to 3 credits.
Learning Outcomes
1. Illustrate abilities to make decisions based on market research and analysis, including financial analysis, analysis of consumer trends, and the business environment.
2. Create professional marketing and business presentation.
3. Build effective teams to analyze and present real-world marketing opportunities.
4. Practice business decision making founded on evidence from market research.

AEEC 4530. Case Studies in Food and Agribusiness Management
3 Credits (3)
This course integrates production, marketing, accounting, finance, agricultural policy, human behavior, and business environment concepts in the management of agricultural businesses using a decision case approach. May be repeated up to 3 credits.
Learning Outcomes
1. Exhibit an ability to understand complex and varying business and resource issues, including financial analysis, natural resource issues, and business operations.
2. Provide reasoning and rationale for decision making, identifying the best options from many potential decisions.
3. Practice business writing and communication skills.

AEEC 4540. Economics of Making and Marketing Wine
3 Credits (3)
This course is designed to provide a basic knowledge of the principles of winemaking with emphases on wine production and economics for small wineries and home winemaking. The course also focuses on the investment costs of starting small wineries and the costs of making wine and successful market strategies for small wineries. The class includes a hands-on lab that includes selecting, crushing, fermenting grapes, and all the steps required through bottling the wine. Students must be 21 to enroll in the class. Consent of instructor required. May be repeated up to 3 credits.
Learning Outcomes
1. Identify and evaluate production costs, economics, and marketing strategies for small wineries.
2. Identify current technologies used in the production of wine for home and in a small winery.
3. Identify the processes required to make high-quality wine using hands-on winemaking techniques, sensory analysis, and testing.
4. Learn the basics of Viticulture (wine grape growing) practices.

AEEC 4550. Real Estate Appraisal
3 Credits (2+2P)
This course addresses issues influencing the value of real estate with some emphasis upon rural properties. Topics include courthouse records, property taxes, appraisal methodology, expert courtroom testimony, condemnation, and legal issues. Students will take field trips and write appraisals. Course material is relevant to students in Finance, Accounting, and Pre-Law, as well as Agriculture. Accredited for hours to apply to both pre-licensing and continuing education requirements of the New Mexico Real Estate Commission for both Appraisers and Real Estate Brokers. Crosslisted with BFIN 470.
Learning Outcomes
1. Distinguish between the Income Approach, Cost Approach, and Sales Comparison Approach.
2. Identify market abstracted influences on value.
3. Apply proper appraisal methodology.
4. Demonstrate appraisal knowledge by writing a residential appraisal and a farm appraisal.

AEEC 4997. Special Problems
1-3 Credits

Special problems in agricultural economics or agricultural business of particular interest to the individual student. Maximum of 3 credits per semester. No more than 6 credits toward degree. Consent of instructor required. May be repeated up to 6 credits.

AEEC 4999. Senior Thesis
3 Credits (3)
Develop a thesis project with a faculty advisor. The senior thesis requires students to work creatively to apply business and economic principles to address a problem of concern. May be repeated up to 3 credits. Restricted to AEAB majors.
Prerequisite: consent of department head and have senior standing.

AEEC 5110. Introduction to Quantitative Methods
3 Credits (3)
Introduce students to quantitative tools widely used in applied economic analysis such as regression analysis, statistical tests, and mathematical programming. Restricted to: Agricultural Economics and Business (Masters) majors.
Learning Outcomes
1. Course objectives for the statistics module include helping students master basic statistical tests/methods commonly used in research and business analysis. Specific methods / tests include: One-sample mean hypothesis tests, Two-sample mean hypothesis tests, Analysis of Variance (mean tests for three or more samples), and Nonparametric methods to test proportions.
2. Course objectives for the econometrics/regression module include introducing students to the field of econometrics and helping them master a basic understanding of econometrics and its use in agricultural economics and business. Specific topics that will be covered include: Correlation analysis, Simple least squares regression; and Multiple regression analysis.
3. Course objectives for the math programming module including helping students formulate, specify, build and interpret linear programming models using Microsoft Excel's Solver feature and the specialized software package, GAMS.

AEEC 5120. Microeconomic Theory
3 Credits (3)
A rigorous re-examination of the pricing mechanism in the goods and factor markets. Development of theoretical tools of general applicability. May be repeated up to 3 credits.
Prerequisite: ECON 371 and ECON 457, or consent of instructor.
Learning Outcomes
1. A rigorous re#examination of the structure and function of the price mechanism to guide resource allocation and policy analysis in the goods and factor markets.
2. Introduce the models that economists use to explain the behavior of consumers, firms, and markets.
3. Development of theoretical tools used for economic analysis.

AEEC 5130. Macroeconomic Theory
3 Credits (3)
This course provides contemporary aggregative theory regarding the interrelationships among national income, employment, the price level, money supply and interest rates, and implications of this theory for public policy in a mixed economy. May be repeated up to 3 credits.
Learning Outcomes
1. Develop an in-depth understanding of the IS/LM model.
2. Understand how fiscal and monetary policy affect output, employment, interest rates and prices.
3. Develop and use mathematical models of the economy.
4. Derive the effect of a change in tax rates, government spending, or a change in the money supply, on the nation's output through expenditure multipliers.
5. Understand how fiscal and monetary policy work in an Open economy.
6. Understand the basics of Exogenous and Endogenous Growth Theory.

AEEC 5140. Agricultural Policy
3 Credits (3)
Historical and cultural background of food and agricultural policy in the United States. Analysis of food and agricultural problems, policy-making and implementation. Economic evaluation of specific U.S. food and agricultural policy instruments, their domestic and international impacts. Same as AEEC 3140V with additional work required at the graduate level. Cannot receive credit for both AEEC 3140V and AEEC 5140.
Prerequisite: Consent of instructor.
Learning Outcomes
1. Apply economic concepts to deepen understanding of agricultural policy, particularly regarding the macroeconomic importance to agriculture.
2. Be able to describe inherent tradeoffs and opportunity costs in policy.
3. Acquire an international perspective with respect to food and agricultural policy.
4. Develop an appreciation for history and trajectory of agricultural policy.

AEEC 5150. Economic and Financial Analysis of Agribusiness
3 Credits (3)
This course focuses on common analytical tools used to evaluate the economic and financial performance of businesses operating in the food and fiber supply chain. The course uses a combination of course discussions, assignments, and case studies to present the material critical to the successful management of agribusinesses. Topics include financial statements and analysis, financial planning/modeling, financial risk and risk management, the time value of money, and capital budgeting methods used in agribusiness.
Learning Outcomes
1. Read, understand, and create financial statements used in agribusiness, including income statements, balance sheets, cash flow statements, and owner's equity statements.
2. Describe and conduct financial analysis including comparative analysis, change analysis, and common-size analysis, and ratio analysis.
3. Describe and understand credit in agricultural production and agribusiness.
4. Understand the importance of capital budgeting within agribusiness and be able to conduct capital budgeting.
5. Describe, calculate, and use standard measures of investment return including net present value, internal rate of return, discounted payback period, and simple payback period.

AEEC 5210. International Agricultural Trade Theory and Policy
3 Credits (3)
This course provides a review and analysis of international trade models. Analysis of the effects of trade instruments such as tariffs, quotas, and subsidies on welfare and income distribution. Analysis of bilateral, regional, and multilateral trade agreements and their effect on the agricultural sector from both country-specific and global perspectives. May be repeated up to 3 credits.

Learning Outcomes

1. Understand and be able to describe the importance of international trade to U.S. agriculture.
2. Familiar with commonly used trade models to describe impacts of trade barriers, for example tariffs, quotas, and subsidies.
3. Analyze trade agreements and their impact on economies of different trade partners.

AEEC 5220. Financial Derivative Markets
3 Credits (3)

This course examines advanced futures and options strategies for income generation and risk management. Coverage includes a variety of markets, e.g., interest rates, stock indexes, metals, currencies, livestock, and grains. Both technical and fundamental trading strategies are identified and discussed. Same as AEEC 3220/BFIN 311 with additional coursework required at the graduate level. Cannot receive credit for both AEEC 3220/BFIN 311 and AEEC 5220/BFIN 511. Taught with BFIN 511.

Learning Outcomes

1. Define risk and identify methods of managing risk.
2. Demonstrate understanding of vocabulary associated with derivatives and derivative markets.
3. Identify the role that derivative markets play in reducing risk.
4. Demonstrate a basic understanding of derivative markets including their use in risk management and income generation.

AEEC 5230. Public Sector Economics
3 Credits (3)

Introduction to the economic rationale for government intervention in the economy and the effects of that intervention on economic agents and the economy in general. Emphasis on the expenditure side of government policies. Same as POLS 522. May be repeated up to 3 credits.

Learning Outcomes

1. The focus of Public Sector Economics I, which draws on microeconomic theory, concentrates on the development of analytical tools and their application to key issues relating to the spending activities of government.
2. This course aims to provide students with a solid grounding in the analytical methods that are important for studying the role of government in society.
3. Moreover, it will provide students with an economics perspective of that role and when it is appropriate for governments to intervene in an economy.
4. Once established, students will have a practical way to examine a modern government's programs such as social Security and other welfare programs.

AEEC 5240. Econometrics
3 Credits (3)

An integration of quantitative and statistical techniques for research and management in economics and business. May be repeated up to 3 credits.

Prerequisite: ECON 457 and ECON 405 or A ST 505.

Learning Outcomes

1. This course will cover simple linear regression on cross-sectional data; multiple-regression, data with limited dependent variables (including binary, truncated/censored, and count data); and if time permits, time series econometrics.
2. After this course, you will understand the theories behind these methods, know when to use them, and be able to carry them out in Stata®, a popular commercial software for applied econometricians.

AEEC 5320. Microcomputer Applications in Agriculture
3 Credits (2+2P)

An advanced course in electronic spreadsheets and the concepts and tools of database management emphasizing agricultural applications. Same as AEEC 3270 with additional work required at the graduate level. Cannot receive credit for both AEEC 3270 and AEEC 5320. May be repeated up to 3 credits.

Prerequisite: AEEC 2140G or consent of instructor.

Learning Outcomes

1. Understand and apply descriptive, predictive, and prescriptive analysis to solve business problems.
2. Use Excel spreadsheet formula in modeling agribusiness problems/solutions.
3. Use basic spreadsheet skills to conduct simple business feasibility analyses.
4. Conceptualize and solve a research problem.

AEEC 5330. Agribusiness Marketing
3 Credits (3)

Applications course in which self-managed teams apply marketing theory in the development and presentation of marketing plans for food and agribusiness firms. Course includes analysis of marketing problems with emphasis on strategic marketing issues changing trade policies, and global competiveness. May be repeated up to 3 credits.

Learning Outcomes

1. Estimate consumer demand and supply functions using regression analysis.
2. Measure consumer willingness to pay for food products using conjoint analysis.
3. Evaluate the value of new product attributes using contingent valuation.
4. Conduct market research and present results.

AEEC 5340. Agribusiness Management
3 Credits (3)

Integration of production, marketing, accounting, finance, agricultural policy, human behavior, and business environment concepts in management of agricultural businesses using a decision case approach. May be repeated up to 3 credits.

Learning Outcomes

1. To provide an integrated approach to marketing, financial, and strategic management problems of agribusiness and commercial farm and ranch businesses.
2. To develop a deeper understanding of the agribusiness system through the investigation of selected U.S. agribusinesses.

AEEC 5350. Economics of Water Resource Management and Policy
3 Credits (3)

Focuses on issues, approaches and methods used in the assessment of water resource management and policy problems. Extends and further develops student understanding and comprehension of specific economic concepts and methods that are useful in the assessment and management of water resources, including cost-benefit analysis, welfare economics, non-market valuation, watershed management, and consideration of equity and ethical concerns. Students will develop critical reasoning, communication and analytic skills through active class discussions and assignments that emphasize both quantitative and written products.

Learning Outcomes

1. Describe the major categories of water use and explain their role, function, and economic value of water within natural and human systems.
2. Apply basic economic concepts to the assessment of water quantity and quality issues.
3. Analyze impacts of water management and policy decisions on competing water resource users, public interests, and address their potential for conflict.
4. Demonstrate conceptual and systems thinking applied to water resource problems.
5. Apply quantitative and qualitative reasoning, modeling, and decision-support methods to water resource problems, including Integrated Water Resources Management (IWRM), Cost-Benefit Analysis (CBA), and Economic and Environmental Impact Assessment.
6. Compare analytic methods for watershed assessment, including statistical, optimization, and simulation methods applied to watershed assessment.

AEEC 5360. Production Economics
3 Credits (3)
Application of microeconomic theory to problems and decisions of food and agricultural firms. The theoretical foundation of production economics and the theory of the firm are developed. May be repeated up to 3 credits.
Prerequisite: MATH 1430G, ECON 312, and ECON 457.
Learning Outcomes

1. Students should be able demonstrate an understanding of the microeconomic underpinnings of production economics, as well as how theoretical assumptions are made regarding physical production of agricultural products.
2. Students should be able to examine production decisions by agricultural firms, and determine economically optimal decisions, including under cases of risk and uncertainty.

AEEC 5402. AI Applications in Fiber and Food Systems
3 Credits (3)
Focusing on food and fiber systems, the course includes applications of AI to food processing, food safety, nutrition, and sustainability. Students in the course will explore demand forecasting, labor management, consumer behavior, and other economic and sociocultural aspects of food and fiber systems. The course will incorporate concepts of equitable access, job quality, transparency, data privacy and security, and responsible and ethical use of AI in fiber and food systems.
Learning Outcomes

1. Identify application areas in food and fiber systems for AI opportunities.
2. Evaluate AI tools for nutrition, food processing, food safety, supply chain management, and sustainability in food and fiber systems.
3. Assess the impact of AI tools on demand forecasting, labor management and consumer behavior in food and fiber systems.
4. Apply machine learning and AI methods to enhance decision-making across food and fiber value chains.
5. Develop and evaluate predictive and classification models using real-world data from food and fiber systems.
6. Discuss and apply ethical and responsible AI frameworks to food and fiber systems.

AEEC 5404. Emerging Topics in AI for Food and Agriculture
3 Credits (3)
Analyze emerging applications and uses of AI in food systems, agriculture, and the environment. Project impacts of emerging AI topics to agriculture, the environment, and food and fiber industries. Evaluate new developments in AI for application to food, fiber, agriculture, and the environment. Explore ethical dimensions of AI in agriculture.
Learning Outcomes

1. Analyze emerging applications and uses of AI in food systems, agriculture, and the environment.
2. Describe and discuss how emerging developments in AI can impact food, fiber, and agriculture businesses.
3. Describe and discuss impacts of emerging AI technologies to agriculture, the environment, and food and fiber industries.
4. Evaluate new developments in AI for application to food, fiber, agriculture, and the environment.

AEEC 590. Special Topics
3 Credits (3)
Seminars in selected current topics in the various areas of agricultural economics and economics. Offerings will carry a subtitle.
Prerequisite: consent of instructor.

AEEC 593. Internship
1-6 Credits
Supervised professional on-the-job training experience in policy analysis.

AEEC 594. Internship
1-6 Credits
One semester to six months internship with a regulated firm or public utility commission. A faculty member will direct and evaluate the internship. For AEEC regulatory option students only.

AEEC 595. Internship
3 Credits (3)
Supervised professional on-the-job learning experience.
Prerequisite(s): Consent of instructor.

AEEC 596. Individual Study
1-3 Credits
Individual study programs. Each offering will carry a subtitle. Maximum of 3 credits in a semester and 6 credits in a program.
Prerequisite: consent of instructor.

AEEC 599. Master's Thesis
1-15 Credits
Thesis.

AEEC 5991. Non-Thesis Research Project
1-3 Credits (1-3)
Individual investigations, either analytical or experimental. Maximum of 3 credits per semester. No more than 3 credits toward a degree. May be repeated up to 3 credits.

AEEC 5994. Creative Component Project
3-6 Credits (3-6)
Individual investigations, either analytical or experimental. A minimum of 3 to 6 credits per semester. No more than 6 credits toward degree. Consent of instructor required. May be repeated up to 6 credits.
Prerequisite: Consent of Instructor.

AEEC 5996. Special Topics
3 Credits (3)
Seminars in selected current topics in the various areas of agricultural economics and economics. Offerings will carry a subtitle.
Prerequisite: consent of instructor.

AEEC 5997. Individual Study
1-3 Credits

Individual study programs. Each offering will carry a subtitle. Maximum of 3 credits in a semester and 6 credits in a program.
Prerequisite: consent of instructor.

AEEC 5998. Internship
1-6 Credits
Supervised professional on-the-job training experience in policy analysis.

AEEC 5999. Master's Thesis
1-15 Credits
Thesis.

AERO-AEROSPACE STUDIES

AERO 121. Heritage and Values
2 Credits (1.25+2P)
"Heritage and Values of the United States Air Force," is a survey course designed to introduce students to the United States Air Force and provides an overview of the basic characteristics, missions, and organization of the Air Force. Includes Leadership Lab practicum. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

AERO 122. Heritage and Values II
2 Credits (1.25+2P)
"Heritage and Values of the United States Air Force," is a survey course designed to introduce students to the United States Air Force and provides an overview of the basic characteristics, and organization of the Air Force. Includes Leadership Lab practicum. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

AERO 221. Team and Leadership Fundamentals
2 Credits (1.25+2P)
"Teams and Leadership Fundamentals," focuses on laying the foundation for teams and leadership. The topics include skills that allow cadets to improve their leadership on a personal level and within a team. The courses will prepare cadets for their field training experience where they will be able to put the concepts learned into practice. The purpose is to instill a leadership mindset and to motivate sophomore students to transition from AFROTC cadet to AFROTC officer candidate. Includes Leadership Lab practicum. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

AERO 222. Team and Leadership Fundamentals II
2 Credits (1.25+2P)
"Team and Leadership Fundamentals," focuses on laying the foundation for teams and leadership. The topics include skills that will allow cadets to improve their leadership on a personal level and within a team. The courses will prepare cadets for their field training experience where they will be able to put the concepts learned into practice. The purpose is to instill a leadership mindset and to motivate sophomore students to transition from AFROTC cadet to AFROTC officer candidate. Includes Leadership Lab practicum. May be repeated up to 2 credits. Restricted to Las Cruces campus only.

AERO 223. Air Force Leadership Development
1 Credit (2P)
This course prepares cadets to excel in field training. Cadets are prepared in all facets of field training, including: leadership competency evaluations, the Cadet's Guide to Field Training, individual drill evaluations, attention to detail, dining hall procedures, maintenance of living areas, and the group problem solving process. Restricted to: Main campus only.

AERO 301. Leading People and Effective Communication
4 Credits (3+2P)
"Leading People and Effective Communication," teaches cadets advanced skills and knowledge in management and leadership. Special emphasis is placed on enhancing leadership skills and communication. Cadets have an opportunity to try out these leadership and management techniques in a supervised environment as juniors and seniors. Includes Leadership Lab practicum.
Prerequisite(s): Completion of AERO 121/AERO 122 and AERO 221/AERO 222, or permission of instructor.

AERO 302. Leading People and Effective Communication II
4 Credits (3+2P)
"Leading People and Effective Communication," teaches cadets advanced skills and knowledge in management and leadership. Special emphasis is placed on enhancing leadership skills and communication. Cadets have an opportunity to try out these leadership and management techniques in a supervised environment as juniors and seniors. Include Leadership Lab practicum.
Prerequisite(s): Completion of AERO 121/AERO 122 and AERO 221/AERO 222, or permission of instructor.

AERO 401. National Security, Leadership Responsibilities and Commissioning Preparation
4 Credits (3+2P)
"National Security Affairs/Preparation for Active Duty," is designed for college seniors and gives them the foundation to understand their role as military officers in American society. It is an overview of the complex social and political issues facing the military profession and requires a measure of sophistication commensurate with the senior college level. The final semester provides information that will prepare the cadets for Active Duty. Includes Leadership Lab practicum.
Prerequisite(s): Completion of AERO 121/AERO 122, AERO 221/AERO 222, and AERO 301/AERO 302, or permission of instructor.

AERO 402. National Security, Leadership Responsibilities and Commissioning Preparation II
4 Credits (3+2P)
"National Security Affairs/Preparation for Active Duty," is designed for college seniors and gives them the foundation to understand their role as military officers in American society. It is an overview of the complex social and political issues facing the military profession and requires a measure of sophistication commensurate with the senior college level. The final semester provides information that will prepare the cadets for Active Duty. Includes Leadership Lab practicum.
Prerequisite(s): Completion of AERO 121/AERO 122, AERO 221/AERO 222, AERO 301/AERO 302, and AERO 401 or permission of instructor.

AERO 411. Aerospace Studies Independent Study
1 Credit (1)
This course provides in-depth research on specified topics of the United States Air Force and NMSU's Detachment 505 history. Consent of instructor required.
Prerequisite(s): AERO 301, AERO 302, AERO 401, AERO 402.

AERT-AEROSPACE TECHNOLOGY

AERT 105. Aerospace Engineering PLTW
4 Credits (2+4P)
Introduce the student to Aerospace Engineering (AE) concepts and history. Studied topics include History of Flight, Aerodynamics, Rocket Science, Orbital Physics, Systems Engineering and Life Support/Environmental Systems. Restricted to: Community Colleges only.

AERT 111. Basic Electricity and Electronics
3 Credits (2+2P)

Fundamentals of electricity and electronics, basic circuit devices, meters, transistors, integrated fiber optics, and industrial application topics. Minimum math proficiency of CCDM 103 or CCDM 104 required or math placement into CCDM 114 or higher. Restricted to: Community Colleges only. Crosslisted with: ELT 105

AERT 121. Introduction to the Aerospace Workplace
4 Credits (2+4P)
The course covers space history, regulations, controls, aerospace industry terminology and acronyms as well as hands-on activities related to tools, procedures, and standard practices. Restricted to: Community Colleges only. May be repeated up to 4 credits.

Learning Outcomes

1. Identify problems and advantages of living and working in space.
2. Describe what career opportunities exist for future aerospace technicians.
3. Using industrial equipment, demonstrate various fabrication techniques relative to the aerospace industry.
4. Construct electrical control circuits using various techniques.
5. Identify notable people and their accomplishments in the aerospace industry.

AERT 122. Aerospace Safety and Quality
3 Credits (2+2P)
Covers identification of hazards, personal protective equipment, safe practices, and protection of personnel, property, and equipment in the aerospace environment. Basic principles of quality assurance engineering and quality control relating to work processes will be discussed. Restricted to: Community Colleges only.

AERT 145. Introduction to Drone-UAS Technology
3 Credits (3)
Introduction to drone or Unmanned Aircraft System (UAS) technology and its applications in architecture, engineering, construction, film, media, and other related industries. Best practices, training, permissions, licensing, and documentation requirements will be explored. Obtaining, working with, and managing data obtained by drones will be emphasized. Emerging technologies and future applications will be introduced. Restricted to Dona Ana Campus only.

Learning Outcomes

1. Describe applications of drone technology by industry.
2. Recognize types of drone data.
3. Provide examples of how drone data can be used in project visualization.
4. Identify standard drone features.
5. Utilize related applications, software, and hardware successfully.
6. Demonstrate professional practices.
7. Describe training, permissions, licensing, and documentation requirements.
8. Identify best practices of UAV use.
9. Process and produce imagery and videos from drone data. 1
10. Perform basic data processing. 1
11. Manage point cloud data. 1
12. Create 3D meshes from drone data. 1
13. Explore emerging technologies and future applications.

AERT 195. Introduction to Drone - UAS Equipment Operation and Maintenance
4 Credits (4)
Introduction to drone or Unmanned Aircraft System (UAS) equipment operation and maintenance. Flying and maneuvering drones will be practiced. Pre-flight, in-flight, and post-flight procedures will be emphasized. Drone maintenance will be introduced. Restricted to Dona Ana campus only.
Prerequisite: A grade of C- or better in AERT 145.

Learning Outcomes

1. Describe related safety practices and procedures.
2. Discuss related communications requirements.
3. Demonstrate launch preparation steps.
4. Create a basic flight plan.
5. Demonstrate proper preflight, inflight, and post-flight procedures.
6. Describe standard flight operations.
7. Perform basic drone flight and maneuvers.
8. Identify elements of maintenance and inspection programs.
9. Describe related FAA requirements. 1
10. Demonstrate proper equipment and battery maintenance. 1
11. Describe proper parts and material control.

AERT 211. Electromechanical Devices
4 Credits (2+4P)
Theory and application of electromechanical devices and digital control circuits. Includes AD and DA converters, pneumatics, hydraulics, programmable logic controllers, DC, AC and stepper motors, and servomechanisms. Crosslisted with: MAT 240. May be repeated up to 4 credits.
Prerequisite: ELT 160.

Learning Outcomes

1. Apply the appropriate techniques to connect a multimeter correctly to a circuit or component for measuring voltage, current, microfarads, and resistance.
2. Demonstrate the process of troubleshooting basic electrical circuits.
3. Apply the theories and concepts learned to solve practical problems related to electromechanical devices and digital control circuits.
4. Evaluate the advantages and disadvantages of different control methods, such as pneumatic, hydraulic, or electronic control, for specific scenarios.
5. Classify and compare different types of electromechanical devices and digital control circuits, such as pneumatics, hydraulics, DC/AC motors, and stepper motors.

AERT 212. Materials and Processes (Basic Metallurgy)
3 Credits (2+2P)
Basic Metallurgy of aluminum alloys, magnesium, titanium, copper, stainless steel, surgical steel, superalloys, noble and rare earth will be discussed. Metallurgical Processes of casting, forging, hardening, tempering, annealing and anodizing along with corrosion control will be emphasized. May be repeated up to 3 credits.

Learning Outcomes

1. Explain the Theoretical Theory for hardness testing.
2. Select the proper type of steel for a given application.
3. Describe the failures and deformation of metal.
4. Apply the theoretical principles to interpret hardness testing results.
5. Summarize the various quenching methods of ferrous metals.
6. Put into practice corrosion control applications.
7. Explain the principles of heat treating materials.
8. Explain the difference between ferrous and nonferrous metals.

AERT 213. Aerospace Fluid Systems
3 Credits (2+2P)
This course includes a familiarization of fluid system components, characteristics, and applications. Cryogenic and hypergolic materials and high pressure systems are also covered. Restricted to: Community Colleges only. May be repeated up to 3 credits.
Learning Outcomes
1. Recall the basic knowledge and terminology related to hypergol and cryogenic systems in aerospace programs.
2. Identify the potential hazards associated with hypergol and cryogenic systems and the necessary safety measures, including first aid and personal protective equipment.
3. Apply the foundational knowledge to identify and describe the different hardware components used in hypergol and cryogenic systems.
4. Analyze the interactions and interdependencies between hypergol and cryogenic systems and their impact on aerospace programs.
5. Memorize the key concepts and principles of hypergol and cryogenic subsystem design.
6. Comprehend the properties and characteristics of hypergol and cryogenic materials and soft goods.
7. Utilize the entry-level awareness to assess and address the challenges related to hypergol and cryogenic buildup, including operations and ground interactions.
8. Evaluate the potential risks and hazards associated with hypergol and cryogenic systems and propose appropriate mitigation strategies.

AERT 214. Aerospace Systems
3 Credits (2+2P)
This course provides an introduction to expendable and reusable spacecraft systems including hydraulic, pneumatic, electrical, propulsion, mechanical, HVAC, and ECLSS (Environmental Control and Life Support System). How systems interact with computer and data acquisition systems is also covered. Restricted to: Community Colleges only. May be repeated up to 3 credits.
Learning Outcomes
1. Recall the key contents and information covered in the Space Mission and Design Analyses text.
2. Research the role and importance of mission operations and ground interactions in the context of space missions.
3. Employ the knowledge gained from the Space Mission and Design Analyses text to analyze and evaluate spacecraft and subsystem designs.
4. Analyze the complexities and considerations involved in constellation design and the development of multi-satellite systems.
5. Evaluate strategies and techniques for reducing mission costs and designing low-cost missions.
6. Utilize the entry-level awareness to assess and propose solutions for mission operations and ground interactions.
7. Relate the significance of requirements definition, logistics, and system implementation in space systems.

AERT 221. Inspection Requirements and Planning Metrology
3 Credits (2+2P)
Course teaches the benefits of inspection, quality control, material conditions. Also covers measurements, including temperature, ultrasonic, vibration and more. Restricted to: Community Colleges only. May be repeated up to 3 credits.
Learning Outcomes
1. Understand the purpose and function of quality management in aerospace companies.
2. Perform visual and precision inspections from engineering drawings.
3. Acquire practical understanding of Geometric Dimensions and Tolerances, along with proficiency in using specialized measuring equipment.
4. Develop the capability to conduct inspections for FOD, corrosion, and other relevant conditions.

AERT 222. Electromechanical Systems
3 Credits (2+2P)
Principles and applications of preventive and corrective maintenance procedures on industrial production machines using systems technical and maintenance manuals to develop troubleshooting procedures using systems block and schematic diagrams. Crosslisted with: MAT 245. May be repeated up to 3 credits.
Prerequisite: ELT 160.
Prerequisite/Corequisite: A grade of C- or better in AERT 221 or MAT 240.
Learning Outcomes
1. Recall the key concepts and information presented in the Space Mission and Design Analyses book.
2. Describe the principles and theories behind mission operations and ground interactions.
3. Apply the knowledge gained from the Space Mission and Design Analyses book to analyze and evaluate spacecraft and subsystem designs.
4. Analyze the complexities and considerations involved in constellation design and the development of multi-satellite systems.
5. Memorize the foundational knowledge related to spacecraft and subsystem design.
6. Comprehend the significance of requirements definition, logistics, and the implementation of space systems.
7. Apply the knowledge gained from the Space Mission and Design Analyses book to analyze and evaluate spacecraft and subsystem designs.
8. Evaluate strategies and techniques for reducing mission costs and designing low-cost missions.
9. Comprehend the significance of requirements definition, logistics, and the implementation of space systems.

AERT 224. Aerospace Tests and Measurements
3 Credits (2+2P)
This course covers electrical and mechanical testing procedures (primarily non-destructive testing), equipment, measurements, and instrumentation involved in aerospace systems. Verification of tool and equipment calibration is also covered. Restricted to Community Colleges Only. May be repeated up to 3 credits.
Prerequisite/Corequisite: AERT 221.
Learning Outcomes
1. Identify common material defects and their causes.
2. Understand the theory of various forms of material inspections and perform basic operation on multimeters, and oscilloscopes.
3. Identify common aerospace materials.
4. Apply professional productive work habits.

AERT 225. Cooperative Experience
1-3 Credits (1-3)
Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and

instructor. Consent of instructor required. Graded: S/U. Restricted to: Community Colleges only.

AERT 245. Remote Pilot Certificate Test Preparation
3 Credits (3)
Preparation course for the FAA Unmanned Aircraft General – Small (UAG) aeronautical knowledge exam. Overview of applicable regulations, restrictions, procedures, and operations will be provided. Process for obtaining an FAA Tracking Number (FTN), registering for the FAA Unmanned Aircraft General – Small (UAG) aeronautical knowledge exam, and certificate registration requirements will be explored. Restricted to Dona Ana campus only.
Prerequisite: AERT 195.
Learning Outcomes

1. Demonstrate increased knowledge related to topics covered in the FAA UAG exam.
2. Demonstrate increased skills related to topics covered in the FAA UAG exam.
3. Demonstrate increased abilities related to topics covered in the FAA UAG exam.
4. Describe processes related to obtaining a FAA Unmanned Aircraft General – Small (UAG) aeronautical certificate.
5. Practice certification test-taking skills.

AERT 255. Special Topics
1-4 Credits (1-4)
Specific topics to be announced in the Schedule of Classes. Restricted to: Community Colleges only.

AERT 290. Independent Study
1-3 Credits (1-3)
Individual studies in areas directly related to aerospace. Consent of instructor required. Restricted to: Community Colleges only.

AFST-AFRICANA STUDIES

AFST 1110G. Introduction to Africana Studies
3 Credits (3)
An interdisciplinary course that introduce students to the histories, cultures, and experiences of global people of African descent. NMSU Specific Description This course presents a survey of the experiences of Blacks across the African Diaspora with particular attention given to the experience of Blacks in the United States. This course will examine the experiences of Black people across various disciplines and fields of academic inquiry. African people, and their descendants across the diaspora, have contributed to the political, cultural, economic, and social landscape of the world. This course will assist you in understanding the Black/Africana experience in the U.S. and around the world.
Learning Outcomes

1. Students will carry out critical analysis and engagement with complex, interdependent global systems and legacies (natural, physical, social, cultural, economic, and political) and their implications for people's lives and the earth's sustainability.
2. Students will explore issues/objects/works through collection and analysis of evidence that result in informed conclusions/judgments, understanding and analysis of critical literacy and ethics pertaining to the dynamics of diversity, equity, inclusion and social change.
3. Students will examine habits of mind characterized by the comprehensive exploration of issues, ideas,artifacts and events related to diversity, equity and inclusion before accepting or formulating an opinion or conclusion.
4. Students will demonstrate the capacity to combine or synthesize existing ideas, images, or expertise in original ways.
5. Students will prepare, purposeful presentations designed to increase knowledge, foster understanding, or promote change in listener's values, beliefs, or behaviors pertaining to the dynamics of diversity, equity, inclusion and social change.
6. Students will develop and express ideas in writing and learning in many genres and styles using different writing technologies, mixing texts, data and images that relate to the dynamics of diversity, equity, inclusion and social change.
7. Students will show the ability to reason and solve quantitative problems from a wide array of authentic contexts and everyday life situation.
8. Students will demonstrate the ability to know a need for information or visual literacy and understanding of the dynamics of historic and contemporary inequality and how they shape individual and community power, biases, structural arrangements and social justice bias.
9. Students will enact behaviors and efforts and interact with others on the team to enhance the quality and quantity of contributions made to team discussions. 1
10. Students will design, evaluate and implement strategies to answer open-ended questions in multiple ways. 1
11. Students will work to make a difference in the civic life of communities and develop the combination of knowledge, skills and values and motivation to make a difference. 1
12. Students will develop their cognitive, affective and behavioral skills and characteristics to support effective and appropriate interaction in a variety of cultures. 1
13. Students will develop their ethical self-identity as they practice ethical decision making skills while learning how to describe and analyze positions on ethical issues. 1
14. Students will engage in self-reflection regarding one's own history and position in contemporary U.S. society as well as in a global context. 1
15. Student learners will connect perspectives and integrate relevant experience and academic knowledge from multiple disciplines.

AFST 2110G. African American History
3 Credits (3)
This course surveys the long and turbulent journey of African-Americans, the rich culture they have cultivated, and their persistent struggle for freedom from the perspective, interests, aspirations, possibilities and envisioned destinies of African descended peoples. From African antiquity to the 21stth century, students will study: 1) The African background; 2) The Holocaust of Enslavement; 3) Black Resistance and Abolition; 4) Reconstruction; 5) The Jim Crow Era; 6) Civil Rights and Black Power, and; 7) The Post-Industrial/Post Civil Rights Era. (unique)
Learning Outcomes

1. Demonstrate a full ability to analyze and interpret how enslavement and oppression shape the racial, gendered, social, economic, and political realities of African descended people in the U.S.
2. Recognize and respond to ethical challenges/social justice issues that affect African American people.
3. Acquire a critical understanding of the human condition.

AFST 2140G. Black Women in the African Diaspora
3 Credits (3)
This survey course reviews the contributions of Black women to the Black Diasporic Story. NMSU Specific Description This course critically

surveys Black women's history and experiences across the African Diaspora. Particular attention is given to Black women's experiences in North America. Some of the topics covered include: Black women and the building of nation-states; Black women in the U.S. slave system; Black women in race and gender movements in the U.S. and Latin America; systemic and institutionalized violence against Black women; Black motherhood; Black Latinas and the politics of identity; representations of Black women in popular culture; radical activism and Black lesbian identity, as well as the emergence and growth of Black feminist theory and selected other topics. In addition, students will engage in an autobiographical project on a Black woman they select to study.

Learning Outcomes

1. Students will gain theoretical knowledge of the field of Black feminist thought.
2. Students will explore the relationship between Black feminist theory and the larger more general body of work on feminism.
3. Students will study the historical, political and social experiences of Black women in the Americas.
4. Students will understand the intersecting relationship between race, gender, class and sexuality.
5. Students will critically analyze the representations of Black women in popular culture.

AFST 4110. Race, Culture, and Education
3 Credits (3)

This course deconstructs the history of education through the lens of culture and race. Using a intersectionality framework, the creation of public education, and the impact of historical shifts within the law concerning education will be examined. Special emphasis is placed on the role of ethnicity in the development of the United States and its education system. Includes an overview of multicultural/multilingual curricula with a special focus on culturally / linguistically responsive instruction and assessment practices. This course provides a critical examination of race and culture using multicultural theoretical frameworks to analyze the conditions of education today.

Learning Outcomes

1. Analyze and interpret the historical, philosophical, economic, and sociocultural elements of education as it relates to race and culture.
2. Evaluate and interpret the ways in which education policies influence and are influenced by equity issues.
3. Describe multicultural education initiatives and assumptions about teaching, learning, and knowing.
4. Understand how cultural groups and students' cultural identities affect language learning and education overall.
5. Explain and provide examples of anti-bias teaching strategies and education practices.

AFST 4110V. Race, Culture, and Education
3 Credits (3)

This course examines education through the lens of Africana Studies, highlighting African diasporic knowledge traditions, cultural practices, and social justice movements. Students explore how race, power, and culture shape educational systems, with a focus on how Black communities have challenged and reimagined the schooling system. Drawing on Africana Studies, the course engages pedagogical approaches informed by Africana systems of thought/ways of knowing to affirm identity, develop critical consciousness, and promote liberatory educational practices.

Learning Outcomes

1. Analyze the historical development of educational systems in the United State and the African diaspora through Africana Studies frameworks.
2. Evaluate how race, culture, and power intersect to shape educational institutions, practices, and policies.
3. Apply Africana systems of thought/ways of knowing in educational critique and design.
4. Examine the role of African diasporic epistemologies in shaping liberatory educational thought and practice.
5. Develop strategies for building affirming, justice-centered educational spaces that reflect Black cultural and intellectual traditions.
6. Engage in critical reflection on individual educational experiences and positionalities within larger social and historical contexts.

AGRO-AGRONOMY

AGRO 1110G. Introduction to Plant Science (Lecture & Lab)
4 Credits (3+2P)

This is an introductory course for understanding plant science. Basic biological, chemical, and physical principles of various plants are covered. The focus of this course is on plants/crops used in agriculture production of food and fiber as well as pasture and range plants. Plant taxonomy and soil properties will also be discussed. Same as HORT 1115G.

Learning Outcomes

1. Describe the basic structure of plants including growth and function.
2. Define photosynthesis, respiration, and translocation
3. Utilize plant taxonomy techniques to identify various plants.
4. Classify soils based on their chemical and physical properties.
5. Explain how different soil properties affect plant growth and sustainability.

AGRO 2160. Plant Propagation
3 Credits (2+2P)

Practical methods of propagating horticultural plants by seed, cuttings, layering, grafting, division and tissue culture. Examination of relevant physiological processes involved with successful plant propagation techniques. Crosslisted with HORT 2160.

Learning Outcomes

1. Practical methods of propagating plants by seed, cuttings, layering, grafting, division, and tissue culture through experiential, "hands-on" laboratories.
2. Relevant physiological principles involved in propagating horticultural plants through lecture discussions and readings.

AGRO 2996. Special Topics
1-4 Credits (1-4)

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

Learning Outcomes

1. Varies

AGRO 300. Special Topics
1-4 Credits (1-4)

Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

AGRO 303V. Genetics and Society
3 Credits (3)
Relates the science of genetics with social ramifications. Ways in which genetics and evolution interact with social, political, and economic issues. Includes genetic engineering, gene therapy, DNA finger-printing, ancient DNA, plant and animal improvement, and future prospects. Students required to formulate value judgments on contemporary biological issues that will impact society. Crosslisted with: GENE 303V.
Learning Outcomes
1. Explain foundational genetic concepts and modern biotechnological techniques, including whole genome sequencing and genetic variation.
2. Analyze the implications of genetic technologies, such as cloning, gene therapy, genetic testing, and DNA forensics, to society.
3. Evaluate ethical issues surrounding genetic applications, including genetic discrimination, eugenics, and ownership of genetic information.
4. Develop and defend informed arguments about controversial topics in genetics (cloning and stem cells), using scientific evidence and ethical reasoning.
5. Collaborate on a group project (a term paper) to research and present real-world genetics-related issues and their impact on society.

AGRO 305. Principles of Genetics
3 Credits (3)
Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.
Prerequisite: (BIOL 2610G and BIOL 2110G, or BIOL 2110G and BCHE 140, and either CHEM 1215G or CHEM 1216).
Learning Outcomes
1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

AGRO 311. Introduction to Weed Science
4 Credits (3+2P)
Principles of weed science, with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Identification of local weeds. Taught with AGRO 311. May be repeated up to 4 credits.
Prerequisite: CHEM 1215G, and BIOL 2110G.
Learning Outcomes
1. Describe the environmental conditions and inherent traits that promote the growth and persistence of weed populations in managed and natural ecosystems.
2. Predict causes and consequences of weed management failures in agricultural and natural ecosystems.
3. Apply knowledge of herbicidal, mechanical and cultural weed control to develop integrated strategies for weed problems.
4. Classify herbicides based on injury symptoms, mode of action, site of action, translocation, selectivity, potential uses and potential dangers.
5. Identify common weeds found in southern New Mexico by providing correctly spelled botanical and common names, as well as lifecycles.
6. Demonstrate the ability to safely apply herbicide solutions including: perform the activities and calculations to ensure that a sprayer delivers the appropriate amount of solution over the sprayed area, interpret herbicide labels to identify guidelines for safety, dosage and application procedures, and perform the calculations necessary for determining appropriate amounts of herbicide, carrier and adjuvant to add to a spray tank.

AGRO 365. Principles of Crop Production
4 Credits (3+3P)
Basic principles of crop production including environmental and physiological factors limiting production, plant nutrition and soil science, soil-water management, cropping systems and management, pest management, and economic factors influencing crop production. Taught with HORT 365. May be repeated up to 4 credits.
Prerequisite: AGRO 1110G/HORT 1115G, CHEM 1215G or equivalent and MATH 1215 or equivalent.
Learning Outcomes
1. Analyze and apply core principles of crop production, including environmental, physiological, and climatic factors, to optimize plant growth, yield, and overall production efficiency.
2. Demonstrate understanding of plant biology by identifying structures, growth stages, and functions across the plant life cycle.
3. Evaluate plant propagation and reproduction methods by distinguishing between sexual and asexual techniques, explaining pollination and fertilization processes, and discussing their impact on genetic improvement and crop uniformity.
4. Demonstrate proficiency in seed and equipment technologies, including identification and calibration of farm implements, calculation of seed rates, and evaluation of certified seed quality and planting operations.
5. Apply experiential learning methods to design, manage, and assess crop production systems using real-world data and reflection-based decision-making models (Kolb's learning cycle).

AGRO 377. Introduction to Turfgrass Management
4 Credits (3+3P)
Establishment and maintenance of turfgrass with emphasis on seeding methods, soil and water management, mowing, disease, insects and turfgrass varieties. Consent of instructor required. Crosslisted with: HORT 377
Learning Outcomes
1. Identify the general morphology of grass plants and the characteristics of cool- and warm-season grasses.
2. Explain various turf establishment techniques and procedures.
3. Demonstrate understanding of basic soil science, soil testing, amendments, and fertilization regarding cultural and maintenance procedures as well as seasonal projects to maintain healthy turf.
4. Recognize and identify common turf disturbances including weed, pest, and disease identification.
5. Communicate turf conditions and the rationale for different maintenance processes on the course or field.

AGRO 391. Internship
1-6 Credits
Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of Instructor required. Graded: S/U Grading (S/U, Audit).
Prerequisite(s): Consent of instructor.

AGRO 447. Seminar
1 Credit (1)
Organization, preparation, and presentation of current topics in agronomy, environmental sciences, horticulture, and soil science. Crosslisted with: SOIL 447, HORT 447 and ENVS 447.
Learning Outcomes
1. Develop professional communication skills through teamwork, case study preparation and presentation, data interpretation, and role-playing in mock interviews.
2. Prepare a professional resume, personal statement of goals for graduate school or permanent employment and make a Case Study presentation to faculty and peers.

AGRO 449. Special Problems
1-3 Credits (1-3)
Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

AGRO 450. Special Topics
1-4 Credits (1-4)
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

AGRO 462. Plant Breeding
3 Credits (3)
Principles and practices involved with the genetic improvement of plants.
Prerequisite: ANSC/AGRO/BIOL/HORT/GENE 305, or GENE 320.
Learning Outcomes
1. Determine important plant traits and develop means to obtain trait variation for any plant species.
2. Create a plan for obtaining plant germplasm for any plant species.
3. Synthesize 3-5 breeding objectives that are obtainable for the breeding of any plant species.
4. Propose different breeding methods for use to develop cultivars for any plant species.
5. Work as a team with other students to produce a comprehensive breeding plan to develop cultivars for any plant species.

AGRO 471. Plant Mineral Nutrition
3 Credits (3)
Basic and applied aspects of plant requirements for soil-derived minerals and the processes whereby minerals are acquired, absorbed, translocated, and utilized throughout the plant. Same as HORT 471 and EPWS 471.
Prerequisite/Corequisite: EPWS 314/BIOL 314, or concurrent enrollment, or consent of instructor.
Learning Outcomes
1. Describe essential plant minerals, how each plant mineral is acquired, the function of each plant mineral, and how plants regulate internal mineral content.
2. Diagnose plant mineral disorders and stress.
3. Demonstrate ability to understand plant nutrient analyses, this includes: 1) perform the activities and conversions to understand the analyses and 2) make recommendations based on analyses.
4. Develop and present a fifteen-minute presentation describing aspects of a specific crop including information on 1) fertilizer needs and rates, leaf nutrient values, and nutrient disorders 2) roles and function of a minimum of one specific mineral used by selected plant, and 3) environmental and sustainability issues with managing the fertilization chosen crop.

AGRO 483. Advanced Sustainable Crop Production
4 Credits (3+3P)
Characteristics and objectives of sustainable agricultural systems with application to the production, utilization, and improvement of agronomic and vegetable crops.
Prerequisite: AGRO 365 or HORT 365.
Learning Outcomes
1. Design and evaluate sustainable cropping systems by integrating principles of crop diversification, crop rotation, no-till, and organic practices, and assessing their advantages, challenges, and impact on long-term agricultural sustainability.
2. Analyze and apply crop and soil management strategies using holistic and integrated approaches, including mycorrhizal fungi use in arid environments, IPM (Integrated Pest Management), and the "many little hammers" approach to weed control.
3. Select and recommend crop cultivars and management practices for specific agronomic and horticultural crops using tools such as growing degree days, variety test reports, and region-specific criteria (for New Mexico).
4. Critically review and communicate sustainable agricultural research and practices by analyzing case studies, scientific literature, and peer presentations to evaluate the effectiveness of sustainability-focused strategies.
5. Identify and engage with agricultural support systems and sustainability networks, including agencies like Western SARE, to explore resources for funding, research, and application of sustainable agriculture practices.

AGRO 492. Diagnosing Plant Disorders
3 Credits (2+3P)
Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as EPWS 492 and HORT 492.
Prerequisites: EPWS 303 and EPWS 310.

AGRO 500. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

AGRO 505. Research Orientation
4 Credits (3+2P)
Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: HORT 505, SOIL 505 and ENVS 505.
Learning Outcomes
1. Gain insight into the nature of scientific research and skills vital for graduate research and future careers in science.
2. Navigate graduate school processes and protocols.
3. Demonstrate critical thinking.
4. Generate a scientific hypothesis.
5. Communicate science effectively in written and oral formats, including drafting a proposal for thesis or dissertation research.

AGRO 511. Introduction to Weed Science (f)
4 Credits (3+2P)
Covers the principles of weed science with emphasis on characteristics of invasive plants, methods of integrated weed management, and

current issues impacting weed management. Includes identification of local weeds. Research paper required for graduate credit. Taught with AGRO 511. May be repeated up to 4 credits.
Prerequisite: CHEM 1215G and BIOL 2110G.
Learning Outcomes

1. Describe the environmental conditions and inherent traits that promote the growth and persistence of weed populations in managed and natural ecosystems.
2. Predict causes and consequences of weed management failures in agricultural and natural ecosystems.
3. Apply knowledge of herbicidal, mechanical and cultural weed control to develop integrated strategies for weed problems.
4. Classify herbicides based on injury symptoms, mode of action, site of action, translocation, selectivity, potential uses and potential dangers.
5. Identify common weeds found in southern New Mexico by providing correctly spelled botanical and common names, as well as lifecycles.
6. Demonstrate the ability to safely apply herbicide solutions includes: perform the activities and calculations to ensure that a sprayer delivers the appropriate amount of solution over the sprayed area, interpret herbicide labels to identify guidelines for safety, dosage and application procedures, and perform the calculations necessary for determining appropriate amounts of herbicide, carrier and adjuvant to add to a spray tank.

AGRO 513. Introduction to Scientific Writing
3 Credits (3)
Students will learn how to communicate, through written format, to both the scientific community and diverse audiences. Students will be introduced to new technologies and new genres of scientific writing. Students will also learn basic reviewing and writing skills that underlie efficient preparation of literature reviews, scientific manuscripts, project reports, blog-posts, opinion or perspective pieces for more popular venues, advocacy articles for legislators, and descriptive pieces for popular venues such as newspapers, magazines, and broadcast media. Emphasis will be on the communication of experimental findings in peer-reviewed scientific journals.
Learning Outcomes

1. Students will review the basics of rhetoric and the technology of language.
2. Students will learn how to overcome writing barriers and gain confidence in their writing skills.
3. Students will improve their writing skills so that manuscript preparation becomes more efficient and productive.
4. Students will learn professional standards for the conduct of ethical reporting of scientific results.
5. Students will learn to recognize structural and stylistic elements in scientific articles that help researchers achieve certain communication goals.
6. Students will learn the basics of table, figure, diagram, and image presentation in manuscripts.
7. Literature reviews, framed so that they answer an important question in the field, and lead to peer-reviewed publication, may also be prepared. (With permission of the instructor.)

AGRO 516. Molecular Analysis of Complex Traits
3 Credits (3)
Provide a comprehensive overview of molecular genetic analysis of complex phenotypes, including case histories/experiments in plants, animals and humans. Emphasize technological developments in DNA marker technologies and their application to molecular quantitative genetics. Explore the efficient application of these technologies in the future to complex genetic systems, breeding, and other areas of life sciences. Same as HORT 516.
Prerequisite: AGRO 305 or consent of instructor.

AGRO 525. Scientific Writing- How to be a Productive and Effective Writer
1-3 Credits (1-3)
Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Crosslisted with: HORT 525, EPWS 525, SOIL 525, AGRO 625, HORT 625 and SOIL 625.

AGRO 590. Graduate Seminar
1 Credit (1)
Current research discussions presented by masters level graduate students. Not more than one credit toward the degree. Same as HORT/SOIL 590. Crosslisted with: HORT 590 and SOIL 590.

AGRO 595. Internship
1-6 Credits
Supervised professional on-the-job learning experience. Limited to Master of Agriculture candidates. Not more than 6 credits toward the degree.

AGRO 596. Masters Proposal
1 Credit (1)
Current research proposal written by maters level graduate students. Consent of Instructor required. Crosslisted with: ENVS 596, GENE 596, HORT 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.
Prerequisite(s): Master level graduate students.

AGRO 597. University Teaching Experience
1-3 Credits (1-3)
Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ENVS course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures.

AGRO 598. Special Research Programs
1-6 Credits
Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits towards degree. Same as SOIL 598.

AGRO 599. Master's Thesis
15 Credits
Thesis.

ANSC-ANIMAL SCIENCE

ANSC 1110. Animal Science Careers
1 Credit (1)
Introduction to scientific disciplines and career options in animal-agriculture career skill development, including resume preparation, networking, importance of internships, and leadership experiences in animal agriculture.
Learning Outcomes

1. Increasing the understanding of career opportunities in animal agriculture.
2. Gain a broad experience in the development of creative thinking about the career choices available in animal agriculture.
3. Apply the increased knowledge of career development in the career path and internship directions for each student.

4. Gain leadership experience that will be impactful for the student in their pursuit of a career in animal agriculture.

ANSC 1120. Introduction to Animal Science
3 Credits (3)
Survey of the livestock industry throughout the world. Basic management practices will be covered, including livestock selection, nutrition, reproduction, anatomy and marketing to the consumer. This course will also discuss animal behavior and welfare.
Learning Outcomes
1. Understand the role of farm animals in a global setting.
2. Describe the role of nutrition, breeding, behavior, welfare, and physiology of livestock in the world.
3. Explain the structure and organization of livestock industries.
4. Discuss concepts and terminology of the livestock industries as they relate to the global perspective.
5. Classify the overall management, care, marketing of animals, represented in the various livestock industries.

ANSC 1120H. Introduction to Animal Science Honors
3 Credits (3)
This course is designed to provide an introduction to nutrients and their function in livestock animals. Basic feed identification, evaluation, and diet formulation will be discussed. The anatomy of the digestive tract of animals and their ability to utilize feedstuffs is presented. Classification, digestion, absorption, transport and metabolism of major nutrients required by animals are studied. Additional course work will be required. Restricted to Las Cruces campus only.
Prerequisite(s): Eligibility for membership in honors college.
Learning Outcomes
1. Identify conventional and non-conventional feedstuffs that are fed to livestock animals.
2. Describe various methods for feed processing and storage.
3. Assess the nutritional value of a ration or feed ingredients.
4. Interpret the NRC (Nutrient Requirement Council) guidelines for feeding livestock.
5. List the basic digestive anatomy for all classes of livestock.
6. Describe nutritional deficiencies and digestive disorders common to livestock animals

ANSC 1120L. Introduction to Animal Science Lab
1 Credit (2P)
Students will observe and participate in activities related to farm animal management and will include areas of livestock selection, nutrition, reproductive physiology, animal ID and animal health. This lab is required for animal science majors.
Prerequisite(s)/Corequisite(s): ANSC 1120.
Learning Outcomes
1. To provide the students with an understanding of the principles, concepts and terminology of today's livestock industry

ANSC 1125. Equestrian Team Competition
1 Credit (1)
Basic principles of equestrian team competition, including care and management of the riding horse, equitation equipment, and development of riding skills. Emphasis will be placed competition within the Intercollegiate Horse Show Association. Consent of Instructor required. May be repeated up to 8 credits.
Learning Outcomes
1. Have a general knowledge of horses and basic horsemanship/equitation position.
2. Explain and demonstrate basic techniques of balance, control, and safety skills while being in contact and mounted on a horse.
3. Explain and demonstrate proper handling and safety around horses and the proper care of the stable and tack.
4. Be able to ride unassisted at the walk, jog, and lope in either English or Western tack.
5. Apply general knowledge of horsemanship and equitation to competitive equine events in a safe manner including equitation on the flat, equitation over fences, horsemanship, ranch riding and reining.

ANSC 1130. Western Equitation I
2 Credits (4P)
Basic principles of Western riding, including care and management of the riding horse, equitation equipment, and development of riding skills.
Learning Outcomes
1. Articulate basic horsemanship position and how it is used to communicate with the horse.
2. Implement proper handling and basic techniques of balance, control, and safety while working with or riding a horse.
3. Execute a basic horsemanship pattern at a walk, jog, and lope.
4. Integrate general knowledge of horsemanship to competitive equine events in a safe manner.

ANSC 1140. Introduction to Dairy Science
3 Credits (3)
Introduction to the basic aspects of dairy science and how to apply key concepts to the practical feeding and management of dairy cattle and production of dairy products. Students should also obtain an appreciation for the size and diversity of the dairy industry.
Prerequisite(s)/Corequisite(s): ANSC 1120. Restricted to Las Cruces campus only.
Learning Outcomes
1. Learn key concepts in dairy production and management
2. Be familiar with terms used in production of milk and milk products

ANSC 1160. Introductory Horse Science
3 Credits (2+2P)
The light horse industry; breeds; introduction to feeding, breeding, marketing and management; handling and selecting horses for breeding and performance.
Learning Outcomes
1. Describe and identify breeds of horses, their characteristics and their uses.
2. Demonstrate knowledge of basic physiology of horses by recalling parts of the horse, including bones, muscle, tendons and ligaments. Also, by ageing horses via teeth, body condition scoring and taking vital signs.
3. Demonstrate safe and proper handling of horses.
4. Demonstrate comprehension of basic nutrition and feedstuffs by formulating/correcting diets in clinical and non-clinical situations.
5. Recall aspects of basic reproduction by calculating a stallion book and recalling appropriate procedures for breeding.
6. Create informative articles that seek to educate the lay horse person about a topic covered in class.

ANSC 1170. Introduction to Animal Metabolism
3 Credits (3)
Principles underlying the mechanisms of animal metabolism as they relate to production, maintenance, and health of animals.

Prerequisite: CHEM 1215G.

Learning Outcomes

1. This course provides an introduction to the study of the physiology of life.
2. The first part of the course covers acids and bases and the chemical nature of organic compounds.
3. The second part of the course relates to the chemistry of biomolecules (nutrients) and summarizes the chemical reactions of life (metabolism).

ANSC 1180. Companion Animal in Society
3 Credits (3)

Examination of the historical, current, and potential future roles of companion animals in human society. Topics include animal domestication, breeds, exotic companion animals, the companion animal industry, and competitions and sports involving companion animals. Emphasis is on canine and feline species. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

Learning Outcomes

1. Discuss the theories regarding why, how, and when companion animals became domesticated.
2. Describe how selective breeding has optimized certain physiological and behavioral traits of companion animals in order to fulfill the needs of individual people and society.
3. Explain the concept of human-companion animal interaction (HAI) and the influence this bond has on human behavior, health, society, and government policy/laws.
4. Understand the breadth and economic impact of the rapidly expanding companion animal industry and the recent expenditure trends of pet owners.
5. Discuss the past and present uses of companion animals and theorize regarding the future uses of companion animals in society
6. Be effective in searching for, and critically evaluating, scientific based resources.

ANSC 2120. Equine Management
3 Credits (3)

Introduction and application of the business skills necessary to effectively manage the equine operation. Students will learn how to use strategic thinking and sound business management practices to succeed in the demanding equine industry.

Prerequisite: ANSC 1160.

Learning Outcomes

1. Develop a working knowledge of the business principles needed to operate a successful entrepreneurial enterprise.
2. Increase the awareness of the need for business principles in the aggregate function of an equine operation.
3. Gain a greater perspective of accounting, economic and financial principles in an equine business operation.

ANSC 2130. Western Equitation II
2 Credits (4P)

Intermediate principles of Western riding, including reading horse behavior, limbering-up exercises, and developing riding skills. Introduction to rollbacks, turnarounds and stops.

Prerequisite: consent of instructor.

Learning Outcomes

1. Increasing the understanding of the student relative to equitation practices
2. Increase the students' ability to apply principles of Western Equitation to applied settings across a broad spectrum of outlets
3. Prepare the student to engage equine in a professional manner

ANSC 2140. Introduction to Companion Animal Science
3 Credits (3)

Introduction to the care of common companion animal species. Species specific housing and nutrition are covered in the context of maximizing animal health and well-being and reducing disease. May be repeated up to 3 credits.

Learning Outcomes

1. Accurately use scientific terminology common to the companion animal discipline.
2. Compare and contrast the physiological similarities and differences between the various companion animal species studied in class.
3. Create dietary plans based on the nutritional needs of different companion animal species to optimize animal health and lifespan.
4. Identify symptoms of disease/injury at the early stages of illness in order to obtain Veterinary care and treatment as quickly as possible.
5. Design and construct species specific cages/vivariums to maximize animal well- being and health.
6. Educate others regarding providing the best possible care for a variety of companion animal species.

ANSC 2150. Management of Equine Operations
3 Credits (3)

Introduction and application of business skills necessary to effectively manage the equine operation. Students will learn how to use strategic thinking and sound business management practices to succeed in the demanding equine industry.

Prerequisite(s): ANSC 1160.

Learning Outcomes

1. Acquire a working knowledge of different sectors of the equine industry, including business practices, management and marketing skills.

ANSC 2310. Introduction to Meat Science
3 Credits (2+3P)

Fundamental aspects of the red meat industry. Lecture topics and laboratory exercises include the nutrient value of meat, meat preservation, meat safety, muscle structure and contraction, slaughter and processing of beef, lamb and pork, sausage manufacture, meat curing, meat cookery, and muscle and bone anatomy.

Learning Outcomes

1. Increasing the understanding of meat science applications across animal agriculture.
2. Increase the students' ability to apply principles of production to the industry perspective.
3. Apply the increased knowledge of meat science in a global situation.
4. Gain an understanding of the components involved in the development and processing of the red meat industry.

ANSC 2330. Animal Production
3 Credits (2+2P)

Production and utilization of beef cattle, sheep, and swine; emphasis on feeding, breeding, management problems and marketing; selection of animals for breeding and market

Learning Outcomes

1. Increasing the understanding of meat animal production.
2. Increase the students' ability to apply principles of production to the industry perspective.
3. Apply the increased knowledge of meat animal production to global situations.
4. Gain a broader understanding of the importance of meat animals in the global food system.

ANSC 2340. Genetics in Animal Science
3 Credits (3)
Introduction to genetics and inheritance relative to livestock production. Introduction to procedures for collection and use of performance information in livestock improvement programs.
Prerequisites: BIOL 2610G.
Learning Outcomes

1. Gain a broader understanding of the role genetic impacts in the livestock industry.
2. Employ an increased knowledge of impact of genetics in the food animal industry and the production and economic principles that apply.
3. Recognition of the global impacts of genetics in the food animal industry in a global setting.

ANSC 2996. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.
Learning Outcomes

1. Varies

ANSC 301. Animal and Carcass Evaluation
3 Credits (2+2P)
Determination of the market value of meat animals by relating live animal and carcass traits. Topics include the identification of economically important traits, grading, growth and development, wholesale and retail pricing, and futures and options markets. May be repeated up to 3 credits.
Learning Outcomes

1. Students should have a basic understanding of basic animal internal and external anatomy Yield and quality grades.
2. Students should have a basic understanding of live animal evaluation Carcass evaluation.
3. Students should have a basic understanding of economically important live and carcass traits.

ANSC 303. Livestock, Meat and Wool Evaluation
4 Credits (3+2P)
Selection, classification, grading, and judging of livestock, meat, and wool. May be repeated up to 4 credits.
Learning Outcomes

1. Judge all species of livestock to make decisions on class evaluation.
2. Assess classes of wool and make decisions on placing and be able to determine grade and quality of fleeces.
3. Evaluate and grade classes of meat and be able to make decisions on placing classes.
4. Defend decisions on class placing through written and oral defense.

ANSC 304. Feeds and Feeding
3 Credits (2+2P)
Digestibility of feeds, their nutritive values, grades, and classes, principles of ration formulation and computer ration formulations, and practical feeding of farm animals. May be repeated up to 3 credits.
Prerequisite: CHEM 1215G.
Learning Outcomes

1. Discuss how animals utilize nutrients.
2. Explain why feedstuffs differ in nutritional value.
3. Apply nutritional concepts to the practical feeding of farm animals.
4. Formulate diets that balance nutrient supply with the requirements of farm animals.

ANSC 305. Principles of Genetics
3 Credits (3)
Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.
Prerequisite: (BIOL 2610G and BIOL 2110G, or BIOL 2110G and BCHE 140, and either CHEM 1215G or CHEM 1216).
Learning Outcomes

1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

ANSC 308. Horse Evaluation
4 Credits (2+4P)
Students will acquire a working knowledge of selection and classification of horses, learn criteria for evaluation and selection of breeding and show animals, gain a broad understanding of judging conformation and performance in the horse, and learn effective oral and written communication skills through defense of class placings. This course is considered an introduction to the NMSU Horse Judging Team. May be repeated up to 4 credits.
Learning Outcomes

1. Evaluate the conformation and performance of horses using established criteria and demonstrate proficiency in applying these skills.
2. Formulate decisions confidently and efficiently based on observed data and established selection principles.
3. Apply a working vocabulary of equine industry terminology to accurately describe and discuss horse evaluation and classification.
4. Identify conformational faults in horses and analyze how these faults relate to potential performance or soundness issues.
5. Defend class placings through effective oral and written communication, demonstrating clarity, reasoning, and industry appropriate language.

ANSC 310. Exhibiting Livestock
3 Credits (1+4P)
Fitting and showing beef cattle, dairy cattle, sheep and swine. May be repeated up to 3 credits.
Learning Outcomes

1. Demonstrate proper grooming, fitting, and handling techniques for multiple species of livestock commonly exhibited at fairs and shows.

2. Apply principles of animal selection and evaluation to choose appropriate livestock for exhibition based on conformation, health, and market readiness.
3. Implement best practices in animal care and management to ensure ethical treatment, optimal health, and performance of livestock throughout the exhibition process.
4. Analyze the rules, ethics, and regulations governing youth livestock exhibitions at local, state, and national levels.

ANSC 312V. Companion Animals and the Human- Animal Interaction
3 Credits (3)
The science behind human-animal interactions (HAI). An examination of the interactions between humans and companion animals and the effects on human and animal health and wellness. Cultural differences in HAI will be explored. Topics will include Animal Assisted Activity (AAA), Animal Assisted Therapy (AAT), and service animals. Emerging and future uses of companion animals in HAI will be discussed.
Learning Outcomes
1. Provide an overall description of "Human-Animal Interaction" (HAI).
2. Understand and accurately use terminology common to the discipline of HAI.
3. Be able to demonstrate how HAI has influenced human behavior, health, society, and government policy/laws.
4. Provide examples of how HAI influences human and animal physical and psychological health and well-being.
5. Accurately compare and contrast the different categories of HAI animals (ESA, AAA, AAT, Facility and Service Animals) and the training and laws that apply to each animal's presence in public places with a handler.
6. Provide examples of how the field of HAI is interdisciplinary and applies to both social (sociology, psychology, child development, criminal justice) and physical (physiology, animal behavior) sciences.
7. Theorize the future roles of companion animals in HAI.
8. Be competent in applying the knowledge gained in this class to everyday situations, and educate family, friends and members of society, using factual information, about the roles and benefits of companion animals in HAI.

ANSC 320. Equine Behavior and Training
3 Credits (6P)
Basic principles, methods and philosophies of handling, breaking and training the two-year-old Western horse. May be repeated up to 6 credits.
Prerequisite: ANSC 2130 or consent of instructor.
Learning Outcomes
1. Demonstrate ability to acceptably catch, lead, tie, pick up all four feet, and groom an assigned horse.
2. Develop a means of communication to work a young horse in the round pen to develop confidence in both handler and young horse.
3. Evaluate horse natural abilities to determine its direction of training.
4. Integrate desensitizing techniques in order to saddle and unsaddle a horse safely.

ANSC 321. Advanced Equine Behavior and Training
3 Credits (6P)
Continuation of ANSC 320. Further development of skills required to advance the training of the two-year-old Western horse. Emphasis will be placed on lateral work, lead changes, turn-arounds, obstacles, and making the horse accustomed to ranch and trail riding situations.
Prerequisite: ANSC 320 or consent of instructor.
Learning Outcomes
1. Students will apply knowledge gained on natural behavior of the horse while working horses in the round pen, and all groundwork associated with starting a young horse under saddle.
2. Students will demonstrate the ability to use natural aids as a means of communication while putting the first rides on their assigned horse in a safe environment.
3. Students will demonstrate their understanding of the natural reactions and instincts of a young horse by completing a 5 minute demonstration of their assigned horse at the Horse Preview before the NMSU Horse Sale.

ANSC 350. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

ANSC 351V. Agricultural Animals of the World
3 Credits (3)
Global study of the development and use of animals for production of food and nonfood products. Climatic, cultural, and economic influences on systems of livestock production and species and breeds of livestock utilized will be evaluated.
Learning Outcomes
1. Define fundamental/basic terms related to animal science systems.
2. Reproduce the cycles of reproduction and nutrition related to farm animals.
3. Give examples of animal domestication.
4. Compare and contrast ruminate and non-ruminate farm animals.
5. Identify and list characteristics of common breeds of farm animals.
6. List farm animals used in other parts of the world.

ANSC 360. Meat and Muscle Biology
3 Credits (3)
Course will explore in depth the antemortem and postmortem factors that influence the properties of meat.
Prerequisite: BIOL 2610G.
Learning Outcomes
1. Identify anatomical parts of the animal's muscular system.
2. Employ principles of respiration within muscle contraction and relaxation.
3. Contrast the relationship between biochemistry and physiology in the context of muscle to meat conversion.
4. Explain the influence of stressors on meat quality.
5. Identify campus resources to successfully complement classroom materials.

ANSC 370. System Physiology of Farm Animals
4 Credits (3+2P)
Structure and function of the animal body. Includes studies of the horse, cow, sheep, pig, and comparisons with the human body. May be repeated up to 4 credits.
Prerequisite: CHEM 1215G and BIOL 2610G or BIOL 2110G.
Learning Outcomes
1. The objective of this course is to introduce the basic terminology and concepts of animal anatomy and physiology.
2. The course will stress the understanding of the functions of the entire body.

3. The interaction of different systems and the effect of environmental factors will be emphasized.

ANSC 383. Equine Reproductive Management
3 Credits (1+4P)
Anatomy, physiology, and endocrinology of reproduction of the mare and stallion; training in modern reproductive techniques employed in the horse industry. May be repeated up to 3 credits.
Prerequisite: ANSC 1160, ANSC 2150, and ANSC 370.
Learning Outcomes
1. Develop an equine management plan related to reproduction to improve the health and performance of horses.
2. Recognize behaviors and signs of the mare's estrous cycle and interpret reproductive records to make informed breeding decisions.
3. Identify and explain the anatomy and physiology of the mare's and stallion's reproductive tract.
4. Compare and contrast various breeding methods, including their advantages, challenges, and suitability for specific scenarios.
5. Assess a mare's pregnancy status and calculate expected foaling dates based on diagnostic and observational data.

ANSC 390. Internship
1-3 Credits
Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 3 credits toward a degree. Graded S/U.
Prerequisite: consent of instructor.

ANSC 391. Undergraduate Research Experience
1-3 Credits (1-3)
Formal laboratory, library, or field study of problems related to animal sciences, emphasizing hypothesis development, testing, and reporting results. Projects are preplanned, reviewed, and approved. Students submit periodic written reports and final written and oral reports. May be repeated for a maximum of three credits. Consent of Instructor required.

ANSC 392. Animal Sciences Teaching/Extension Experience
1-3 Credits (1-3)
: Formal teaching experience related to animal sciences supervised by a faculty member. May involve classroom instruction, educational material development, and/or student evaluation and assessment. Students may also be involved in development, implementation, or assessment of adult or youth educational programs related to animal sciences, supervised by a faculty member. Students submit periodic written reports and a final written and oral report. May be repeated for a maximum of three credits. Consent of Instructor required.

ANSC 402. Animal Science Seminar
1 Credit (1)
A seminar course designed to inform students of the career opportunities, develop their interviewing and other interpersonal skills may also include reading, discussions, written reports, and seminar presentations of current relevant literature.
Learning Outcomes
1. Design resume and cover letter.
2. Develop a 30 second elevator speech.
3. Create answers to common interview questions.
4. Outline personal skills for professional settings.

ANSC 402 H. Animal Science Seminar
1 Credit (1)
Taught with ANSC 402 with additional work. Before enrollment, student must meet Honors eligibility and/or Crimson Scholar status.
Learning Outcomes
1. Design resume and cover letter.
2. Develop a 30 second elevator speech.
3. Create answers to common interview questions.
4. Outline personal skills for professional settings.

ANSC 411. Canine and Feline Behavior and Training
3 Credits (3)
The influence of domestication, breeds, genetics, and physiology on the behavior of canine and feline species. Training methods and modification of problem behaviors are examined. The impact of the pet parent on their animal's behavior is addressed.
Prerequisite: Junior or Senior status or consent of the instructor.
Learning Outcomes
1. Provide evidence why the dominance theory and use of punishment are outdated methods of training.
2. Be able to fully describe and provide examples of classical and operant conditioning learning methods.
3. Justify the importance of socialization in puppies and kittens and the impact this has on adult animals.
4. Accurately interpret canine and feline visual and vocal communication.
5. Demonstrate how to use reward-based learning.
6. Assess the most common behavioral issues in dogs and cats and describe in detail the steps to take to redirect and/or modify undesirable behaviors.
7. Be able to demonstrate how a clicker is used including appropriate timing and reward.
8. Critically evaluate, summarize, and effectively articulate information on behavior and training using both verbal and written skills.
9. Be confident in applying the knowledge gained in this class to everyday situations, and educate family, friends and members of society about companion animal behavior and humane training.

ANSC 412. Canine and Feline Health and Diseases
3 Credits (3)
A review of common infectious and non-infectious diseases and the basics of the immune response. Pathophysiology and treatment of these diseases and the role the pet parent plays in pre-disposing their animals to disease.
Prerequisite: ANSC 2140 or consent of instructor.
Learning Outcomes
1. Accurately use scientific terminology common to the canine and feline health and diseases discipline.
2. Describe what a disease is and the difference between non-infectious and infectious disease.
3. Identify normal versus abnormal vital signs in canines and felines and how they differ between the species.
4. Explain how non-specific (innate) and specific (adaptive) immunity defend against disease.
5. Compare and contrast the etiology (cause) and pathophysiology (physical symptoms) of different canine and feline diseases and identify and understand appropriate preventative measures and treatments.
6. Be competent and confident in educating dog and cat owners regarding the important role they play in disease prevention of their animals.

ANSC 421. Physiology of Reproduction
4 Credits (3+2P)
Fertility and the role of hormones, nutrition, selection, management and environment in the maintenance of high reproductive rate. May be repeated up to 4 credits.
Prerequisite: ANSC 370.
Learning Outcomes
1. Debate past, present, and future ethical issues in the animal science industries.
2. Compare relationships between anatomy, physiology, nutrition, genetics, and reproduction among animal species.
3. Examine interrelationships between nutrition, genetics, reproduction, and their effects on animal health and the environment.

ANSC 422. Animal Nutrition
3 Credits (3)
Nutrient utilization and measurement and nutrient requirements for the various body functions. May be repeated up to 3 credits.
Prerequisite: CHEM 313 or ANSC 1170.
Learning Outcomes
1. Compare digestion, absorption and metabolism of nutrients between ruminants and non-ruminants.
2. Demonstrate how animal physiology drives nutrient usage in the body.
3. Integrate animal nutrition concepts to better understand efficient animal production and health.

ANSC 423. Animal Breeding
3 Credits (2+2P)
Mating systems, and selection procedures; calculation of inbreeding coefficients, genetic relationships, and gene frequency. May be repeated up to 3 credits.
Prerequisite: ANSC 2340 or 305.
Learning Outcomes
1. Explain the basic principles of Mendelian and quantitative genetics.
2. Interpret and apply population genetics and selection models to livestock breeding programs.
3. Calculate and analyze genetic parameters such as heritability, repeatability, and breeding values.
4. Evaluate breeding strategies including inbreeding, crossbreeding, and composite formation.
5. Apply molecular genetics tools and genomic concepts to animal breeding.
6. Design simple breeding plans incorporating selection, mating strategies, and reproductive technologies.

ANSC 424. Swine Production
3 Credits (2+2P)
Breeding, feeding, and care of swine. May be repeated up to 3 credits.
Prerequisite: ANSC 304.
Learning Outcomes
1. Identify major livestock production systems in the US.
2. Analyze basic animal physiological adaptations to environmental challenges.
3. Analyze production losses due to environmental challenges.
4. Explain physiological mechanisms resulting in production losses.
5. Research management intervention strategies to mitigate environmental challenges.
6. Solve a production loss scenario using an economically viable management strategy.
7. Generate research article based on thermography research.

ANSC 425. Horse Science and Management
3 Credits (2+2P)
Senior level course requiring students to apply basic knowledge acquired in the previous courses to solve typical problems encountered in the horse industry. Specific topics include genetics and animal breeding, business and legal issues, reproduction, health, nutrition and exercise physiology. May be repeated up to 3 credits.
Prerequisite: ANSC 304 and ANSC 370 or concurrent registration.
Learning Outcomes
1. Demonstrate advanced knowledge of equine genetics, breeding and reproduction.
2. Demonstrate advanced knowledge of equine management.
3. Demonstrate advanced knowledge of equine health, nutrition and exercise physiology.
4. Demonstrate advanced knowledge of equine business and legal issues.
5. Effectively problem solve issues pertaining to management of equine programs and facilities.
6. Develop a comprehensive business and management plan for an equine business such as a breeding farm, training center, boarding facility, etc.

ANSC 426. Beef Production: Cow-Calf Management
3 Credits (2+2P)
Senior level course examining management practices for the cow-calf producers. Specifically focusing on nutrition, reproduction, genetics, marketing, and health. May be repeated up to 3 credits.
Prerequisite: ANSC 304 and (ANSC 2340 or ANSC 305) or concurrent registration.
Learning Outcomes
1. Demonstrate knowledge of the different systems utilized to produce a unit of beef: topics considered will include discussion of breeding, reproduction, nutrition, health, management, and marketing strategies.

ANSC 427. Dairy Production
3 Credits (2+2P)
Breeding, nutrition, physiology and management of dairy cattle. May be repeated up to 3 credits.
Prerequisite: ANSC 304 and (ANSC 2340 or ANSC 305) or concurrent registration.
Learning Outcomes
1. Students will be able to evaluate appropriate housing for production practices.
2. Summarize ethical issues in the dairy industry along with regulations guiding production of the dairy industry.
3. Evaluate popular press and scientific literature related to dairy production practices.

ANSC 428. Sheep and Wool Production
3 Credits (2+2P)
Genetics, nutrition, physiology and management of sheep. Wool grading, shearing, and disease control. May be repeated up to 3 credits.
Prerequisite: ANSC 304, ANSC 370.
Learning Outcomes
1. Enhance knowledge and understanding of the different systems utilized to produce a sheep and wool: topics discussed will include

breeding, nutrition, reproduction, management and marketing strategies.

ANSC 429. Beef Production: Feedlot Management
3 Credits (2P)
Senior level course in feedlot management of beef cattle. Topics of interest include cattle handling and processing, health and nutrition, intake management, and growth. Feed mill operation, marketing strategies, and regulatory concerns associated with finishing cattle production may also be discussed.
Prerequisite: ANSC 304 or Consent of Instructor.
Learning Outcomes
1. Examine requirements necessary to optimize animal health and welfare and growth performance. By the end of the semester, students will be able to plan appropriate management decisions to increase productivity in stocker/feedlot production.
2. Determine selective breeding decisions on productivity of stocker/feeder cattle.
3. Review appropriate scientific and popular press literature to improve management of stocker/feedlot cattle.

ANSC 448. Problems
1-4 Credits
Individual investigation in a specific area of animal science. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

ANSC 458. Livestock Behavior, Welfare and Handling
3 Credits (2+3P)
Principles of animal behavior and evaluation of management practices on animal welfare in confined and rangeland livestock operations. Low stress livestock handling techniques. Design of livestock handling facilities. Crosslisted with: RGSC 458
Prerequisite(s): RGSC 2110 or ANSC 1120.

ANSC 462. Parasitology
3 Credits (3)
Same as EPWS 462.

ANSC 468. Advanced Dairy Herd Management
3 Credits (3)
The course is offered through the Southern Great Plains Dairy Consortium in Clovis, NM, and will include breeding, nutrition, physiology, health and management of large herd dairies of the Southwest. Students must apply for the course through the Consortium, and can take it more than once, as topics vary. Consent of instructor required.
Prerequisite(s): ANSC 304.

ANSC 480. Environmental Physiology of Domestic Animals
3 Credits (3)
Influence of environmental factors on physiological processes of domestic animals.
Prerequisite: ANSC 370.
Learning Outcomes
1. Identify major livestock production systems in the US.
2. Analyze basic animal physiological adaptations to environmental challenges.
3. Analyze production losses due to environmental challenges.
4. Explain physiological mechanisms resulting in production losses.
5. Research management intervention strategies to mitigate environmental challenges.
6. Solve a production loss scenario using an economically viable management strategy.
7. Generate research article based on thermography research.

ANSC 484. Ruminant Nutrition
3 Credits (3)
Energy, nitrogen, and mineral nutrition of ruminants with special emphasis on digestive physiology and metabolism of nonprotein nitrogen compounds.
Prerequisite/Corequisite: ANSC 422.
Learning Outcomes
1. Examine the parts of the ruminant digestive tract and their function in digestion.
2. Integrate ruminal bacteria and their role into fermentation pathways.
3. Appraise fermentation/metabolic modifiers and their role in improving animal performance.
4. Calculate energy and protein requirements.
5. Integrate environmental and physiological impacts on intake and digestibility.
6. Combine animal requirements, feed nutrients, and knowledge of fermentation into feeding recommendations for various classes of ruminants.

ANSC 501. Advanced Animal Nutrition
3 Credits (3)
Emphasis on digestive physiology and metabolism. Basic mechanisms involved in the intake, digestion, and absorption of nutrients studied.
Learning Outcomes
1. Describe how animals utilize nutrients.
2. Explain why feedstuffs differ in nutritional value.
3. Apply nutritional concepts to practical feeding of domestic livestock ('critical thinking' skills).
4. Formulate diets for domestic livestock, with emphasis on mixing feedstuffs to balance nutrient supply with nutrient requirements ('quantitative reasoning' skills).

ANSC 507. Laboratory Techniques in Nutrition
4 Credits (2+6P)
Methodology and experimental procedures in measuring nutrient requirements and value of diets. May be repeated up to 4 credits.
Prerequisite: ANSC 422 or consent of instructor.
Learning Outcomes
1. Orient to the NMSU Animal Science Nutrition Laboratory.
2. Gain an understanding and familiarity with the basic techniques used in nutrition research.
3. Develop critical, scientific thinking.
4. Facilitate use of communication skills.

ANSC 509. Endocrinology of Domestic Animals
3 Credits (3)
The role of hormones in growth, development, metabolism, temperature regulation, lactation, and reproduction of domestic animals, including commercial applications.
Learning Outcomes
1. Explain the mechanisms in which physiological systems are influenced by hormonal regulation and chemical mediators.
2. Describe cellular and whole animal behavior related to endocrine function.
3. Interpret scientific literature related to molecular and endocrine physiology.

4. Articulate in comprehensive and succinct manner written communication specific functions of the endocrine system.

ANSC 510. Range Nutrition Techniques
3 Credits (3)
Animal and plant methods of determining quantity and quality of range forage. Taught with RGSC 510.
Prerequisite: ANSC 484 or consent of instructor.
Learning Outcomes
1. Students will organize a protocol with a description of research techniques needed to answer a research question related to grazing management.
2. Students will be able calculate diet digestibility of a diet using marker data.
3. Students will be able design a set of experiments that utilize a variety of techniques to answer hypothesis related to animal and range interactions.

ANSC 512. Research Methods in Animal Science
4 Credits (3+2P)
Procedures used in animal science research, including planning and conduct of investigations and interpretation of results. May be repeated up to 4 credits.
Learning Outcomes
1. Design rigorous animal science experiments.
2. Apply statistical methods to analyze experimental data.
3. Critically evaluate experimental designs and statistical methods of published research.
4. Communicate experimental statistical findings clearly and effectively.
5. Differentiate among core experimental designs.

ANSC 515. Graduate Seminar
1 Credit (1)
Exploration of current and emerging topics, with subject matter varying based on recent developments and trends. May be repeated up to 4 credits.
Learning Outcomes
1. Design a structured outline for a seminar presentation that reflects clear organization and purpose.
2. Analyze the key elements that contribute to an effective and professionally designed PowerPoint presentation.
3. Evaluate the relevance and appropriateness of content for inclusion in a professional presentation.
4. Create a PowerPoint presentation on a self-selected topic, demonstrating effective visual and informational design.
5. Analyze the content and structure of the presentation to predict potential audience questions.
6. Deliver a professional PowerPoint presentation tailored to a target audience.
7. Assess peer presentations using established criteria for content, design, and delivery.

ANSC 520. Advanced Nutritional Management I: Feedlot
3 Credits (3)
Emphasis on feeding systems for beef cattle from weaning to slaughter. Primary focus on feedlot nutrition and management.
Prerequisite: ANSC 484 or consent of instructor.
Learning Outcomes
1. Explain concepts and applications of nutritional management of feedlot cattle.
2. Critique scientific literature on nutritional management of feedlot cattle.
3. Solve feedlot case studies by analyzing, interpreting, and evaluating real-world cattle feeding scenarios.
4. Create a diet formulation using National Research Council equations to meet feedlot cattle nutrient requirements.

ANSC 521. Advanced Nutritional Management II: Cow Calf/Stocker
3 Credits (3)
Emphasis on nutritional management for cow-calf and stocker operations. Primary focus on applications to range animal nutrition and management.
Prerequisite: ANSC 484 or consent of instructor.
Learning Outcomes
1. Summarize basic nutrient metabolism in ruminants.
2. Identify physiological factors that influence maintenance requirements.
3. Characterize physiological factors that influence reproductive processes.
4. Outline nutrient requirements for calves, cows, steers, heifers, and bulls.
5. Formulate rations for calves, cows, steers, heifers, and bulls.
6. Justify nutritional recommendations that address a real-world scenario.

ANSC 522. Animal Nutrition
3 Credits (3)
Nutrient utilization and measurement; nutrient requirements for the various body functions. Taught with ANSC 422 with additional requirements for graduate students. Recommended for nonmajors.
Learning Outcomes
1. Compare digestion, absorption and metabolism of nutrients between ruminants and non-ruminants.
2. Demonstrate how animal physiology drives nutrient usage in the body.
3. Integrate animal nutrition concepts to better understand efficient animal production and health.

ANSC 560. Rumen Microbiology
3 Credits (3)
Issues in ruminal and gastrointestinal microbiology. Includes physiological and genetic mechanisms in carbohydrate and nitrogen utilization. Taught with FSTE 560.
Prerequisite: ANSC 501.
Learning Outcomes
1. Explain the mechanisms by which the rumen microbial population contributes to rumen function and structure.
2. Illustrate nutrient digestion and metabolism by rumen microbes.
3. Interpret scientific literature related to rumen microbiology.
4. Manage livestock in real world scenarios utilizing skills gained throughout the course.

ANSC 580. Environmental Physiology of Domestic Animals
3 Credits (3)
Influence of environmental factors on physiological processes of domestic animals. Specific focus on fetal and developmental programming, heat and cold stress.

Learning Outcomes

1. Identify major livestock production systems in the US.
2. Analyze basic animal physiological adaptations to environmental challenges.
3. Analyze production losses due to environmental challenges.
4. Explain physiological mechanisms resulting in production losses.
5. Research management intervention strategies to mitigate environmental challenges.
6. Solve a production loss scenario using an economically viable management strategy.
7. Generate research article based on thermography research.

ANSC 598. Special Research Programs
1-4 Credits (1-4)
Individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

ANSC 599. Master's Thesis
1-15 Credits (1-15)
Thesis. Consent of Instructor required. Thesis/Dissertation Grading. May be repeated up to 88 credits.
Learning Outcomes

1. Various

ANSC 600. Research
1-15 Credits
This course is for Ph.D. students before they have completed qualifiers. Consent of Instructor required. Thesis/Dissertation Grading.
Prerequisite(s): ANSC 421 or consent of instructor.

ANSC 602. Advanced Reproductive Physiology
3 Credits (3)
Mechanisms of reproductive function; research methodology.
Prerequisite: ANSC 421 or consent of instructor.
Learning Outcomes

1. Assess the biochemical properties and mechanisms of action for reproductive hormones, including receptor interactions and intracellular signaling.
2. Summarize endocrine regulation in reproduction, mapping the HPG axis and its role in puberty, cycles, and gametogenesis.
3. Compare ovarian and testicular functions including follicular development, ovulation, spermatogenesis, and steroidogenesis.
4. Integrate the physiological steps of fertilization, including gamete transport, capacitation, acrosome reaction, and sperm-egg interactions.
5. Evaluate hormonal and physiological mechanisms in pregnancy, including maternal recognition, implantation, and placental function.
6. Develop a proposal outlining the stages of parturition, including fetal signaling, maternal adaptations, and hormonal control.

ANSC 604. Hypothalamo-Hypophyseal-Pineal Endocrinology (fe)
1 Credit (1)
Hormones and other neurochemicals synthesized and secreted by the hypothalamus, pituitary, and pineal glands. Neuroendocrinology of the hypothalamo-hypophyseal axis.
Prerequisite: ANSC 509.

ANSC 605. Gonadal and Uterine Endocrinology
1 Credit (1)
Endocrinology of mammalian ovaries, testes, and uteri including developing trophoblasts.
Prerequisite: ANSC 509.
Learning Outcomes

1. Explain and evaluate advanced reproductive endocrine concepts of the uterus, ovaries, and testes in domestic animals.
2. Critically analyze and synthesize foundational and modern research literature on gonadal and uterine endocrinology.
3. Effectively communicate complex concepts in reproductive endocrinology through written discussion and abstract composition.
4. Integrate knowledge across modules to evaluate reproductive regulation and dysfunction in livestock.

ANSC 606. Endocrinology of Pregnancy, Parturition, and Lactation (fe)
1 Credit (1)
Hormones and other chemical messengers involved in maintenance of pregnancy, control of parturition, and initiation and maintenance of lactation in farm animals.
Prerequisite: ANSC 509.

ANSC 621. Metabolic Functions and Dysfunctions
3 Credits (3)
Physiological chemistry of ruminants and other domestic animals, with attention to metabolic dysfunctions and nutritional toxicology.
Prerequisite: CHEM 345 and ANSC 501.
Learning Outcomes

1. Explain the cellular and molecular mechanisms that control metabolic function and dysfunction in major organ systems.
2. Analyze the roles of organ systems in maintaining metabolic homeostasis.
3. Evaluate metabolic disorders in terms of pathophysiology, clinical symptoms, and treatments.
4. Integrate knowledge of proper metabolic functions to understand how metabolic dysfunction of one system affects the function of other systems.
5. Design evidence-based management strategies to mitigate common metabolic dysfunctions in livestock.

ANSC 625. Nutrient Metabolism I: Mineral, Vitamin, and Nitrogen Metabolism
4 Credits (4)
Cellular metabolism, physiological function(s), toxicities, and deficiencies of minerals, vitamins and nitrogen in ruminants and nonruminants.
Prerequisite: ANSC 501.
Learning Outcomes

1. To introduce the student to the absorption and disposition of vitamins and minerals in the animal.
2. To provide the student with a basic understanding of the importance of vitamins and minerals in animal metabolism.
3. To introduce the student to the concept of nitrogen metabolism and the partitioning of nitrogen in the animal.

ANSC 626. Nutrient Metabolism II: Carbohydrates, Lipids, and Energetics
4 Credits (4)
Basic principles of carbohydrate, lipid, and energy metabolism; integration of metabolism with emphasis on nutritional and biochemical processes related to efficiency of nutrient use.
Prerequisite: ANSC 501.
Learning Outcomes

1. Varies.

ANSC 698. Special Research Programs
1-4 Credits

Advanced individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

ANSC 700. Doctoral Dissertation
15 Credits
Dissertation. Consent of Instructor required. Thesis/Dissertation Grading.

ANTH-ANTHROPOLOGY

ANTH 1115G. Introduction to Anthropology
3 Credits (3)
Anthropology is the systematic study of the humanity both past and present. The course introduces students to the four subfields of anthropology, which include archaeology, biological, linguistic and cultural anthropology. Students will learn about the concepts and methods that anthropologists use to study our species and gain a broader perspective on the human experience.
Learning Outcomes
1. Describe and summarize terms, approaches, and cultural and biological adaptations in the four subfields of anthropology.
2. Explain and analyze conceptual and ethical arguments in the four subfields of anthropology.
3. Effectively communicate content, perspectives, and ideas in four subfields of anthropology.
4. Critically evaluate sources, approaches, and arguments in the four subfields of anthropology.

ANTH 1135G. Introduction to Biological Anthropology
3 Credits (3)
This course provides a basic introduction to the broad field of biological anthropology. The research interests of biological anthropologists include the history and development of modern evolutionary biology, molecular and population genetics, modern primates, the primate and human fossil record, and modern human biological diversity.
Corequisite: ANTH 1135L.
Learning Outcomes
1. Summarize the basic principles of evolution and recognize how they apply to the human species.
2. Recognize the biological and behavioral continuity of humans with all life, and especially other modern primate species.
3. Identify ways in which the human species is biologically and behaviorally unique.
4. Summarize fossil evidence for human evolution.
5. Distinguish the major Paleolithic industries and outline the behavioral and cognitive changes indicated by the fossil and archeological evidence.
6. Critically evaluate popular accounts of human variation and human evolution.
7. Interpret modern human dilemmas (e.g., overpopulation, co-evolution of disease, and genetic engineering) from an evolutionary perspective.
8. Discuss in class and analyze in writing scholarly arguments concerning course concepts.

ANTH 1135L. Introduction to Biological Anthropology Lab
1 Credit (2P)
This laboratory course expand on the topics covered in lecture course and uses scientific methods and principles to examine evidence for the process of evolution, the nature of heredity, human evolutionary history and family tree relationships, primate ecology and behavior, and modern human diversity. Hands-on experience with fossil and skeletal material will be an important part of the learning process. Corequisite(s): ANTH 1135G
Learning Outcomes
1. Demonstrate an understanding of the scientific method.
2. Employ principles of Mendelian genetics to determine genotype and phenotype probabilities, and calculate gene, genotype, and phenotype frequencies using the Hardy-Weinberg Equilibrium formula.
3. Demonstrate an understanding of cell structure and functions.
4. Use common lab and anthropometric equipment such as a compound microscope and calipers.
5. Discuss primate evolution, and compare and contrast members of the Primate order in terms of structure, behavior, and phylogeny.
6. Classify hominid species based upon selected traits such as anatomical changes associated with bipedalism, changes in the size and structure of the brain, and the development of culture.
7. Locate and describe the major bones of the human skeleton, and identify characteristics of human skeletons or skulls such as gender, age, and ancestry.
8. Discuss current research in genome analysis of various hominid populations.

ANTH 1136. Introduction to Historic Preservation
3 Credits (3)
Introduction to historic preservation, its history, goals, methods, legal basis, and economic importance. Explores public role in decision-making. Community Colleges only.
Learning Outcomes
1. Understand why historic preservation is important;
2. be familiar with what is important to preserve;
3. know who among the general public, state, and federal governments is responsible for preserving the past;
4. Have gained experience in how we all preserve.

ANTH 1140G. Introduction to Cultural Anthropology
3 Credits (3)
This is an introductory course that provides an overview of cultural anthropology as a subfield within the broader discipline of anthropology and as a research approach within the social sciences more generally. The course presents core concepts and methods of cultural anthropology that are used to understand the ways in which human beings organize and experience their lives through distinctive cultural practices. More specifically, this course explores social and cultural differences and similarities around the world through a variety of topics such as: language and communication, economics, ways of making a living, marriage and family, kinship and descent, race, ethnicity, political organization, supernatural beliefs, sex and gender, and globalization. This course ultimately aims to present a broad range of perspectives and practices of various cultural groups from across the globe. May be repeated up to 3 credits.
Learning Outcomes
1. Introduce students to the basic concepts and research methods of cultural anthropology as one of the disciplines of social science, including fundamental concepts, such as culture and society, which form the pillars of the discipline (e.g., cultural relativism, cultural persistence and change, world-view and enculturation).
2. Comprehend the importance of studying cultural anthropology.
3. Demonstrate knowledge of the practice of anthropological research in the modern world that is increasingly multicultural, transnational

and globally interconnected (e.g., globalization and modern world system).
4. Demonstrate an awareness of how students' own cultures shape their experiences and the way they see the world, as well as help them understand and interact with other cultures.
5. Understand how beliefs, values and assumptions are influenced by culture, biology, history, economic, and social structures.
6. Gain a sense of relationship with people possessing different experiences from their own.
7. Gain a deeper understanding and appreciation for cultural anthropology as a broad discipline through learning about its practices, and differentiating cultural anthropology from other disciplines that study people
8. Become more sensitive and engaged global citizens from culturally relative perspectives.

ANTH 1160G. World Archaeology
3 Credits (3)
This course is an exploration of human evolution and cultural development throughout the world. Students will be introduced to basic anthropological methods and theories and will learn how anthropological research has contributed to our understanding of major themes in human prehistory, including human evolution, the origins of culture, migration and colonization, animal and plant domestication, and the rise and fall of civilizations.
Learning Outcomes
1. Describe and explain the major developments in human prehistory.
2. Identify and describe major archaeological cultures throughout the world.
3. Employ critical thinking skills in the evaluation of competing theories about the past.
4. Select and use relevant archaeological evidence to explain how prehistoric populations adapted to their natural and cultural environments.
5. Demonstrate competency in written communication.

ANTH 2140G. Indigenous Peoples of North America
3 Credits (3)
This course is a general survey of the history and ethnology of indigenous groups in North America. The course is designed to give students a comprehensive view of major issues pertaining to the indigenous cultures of North America, such as family structure, social organization, subsistence and contemporary economies, environmental adaptation, Indian-White relations, religious practices, and contemporary issues.
Learning Outcomes
1. Demonstrate familiarity with common elements pertaining to the languages and social organization of indigenous peoples in North America.
2. Recognize fundamental differences and similarities among traditional indigenous cultures.
3. Describe social relations of indigenous peoples in relationship to other ethnic groups.
4. Identify and analyze important ways that European societies and cultures and indigenous societies and cultures interacted from the time of Columbus to the present.
5. Evaluate the impacts of Euroamerican policies and programs on indigenous cultures.
6. Distinguish major social issues facing contemporary indigenous communities in North America.
7. Understand objectives and limitations of cross-cultural analysis in anthropology as they relate to the study of indigenous peoples in North America.
8. Demonstrate research and communication skills as they relate to the study of indigenous peoples in North America.

ANTH 2996. Special Topics in Anthropology
1-4 Credits
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes
1. Varies

ANTH 301. Cultural Anthropology
3 Credits (3)
The course will introduce students to the basic concepts and methods in cultural anthropology, focusing on the critical role of culture in traditional society and in the modern world. We apply the anthropological perspective to study the components of cultural systems, including language and meaning, ways of making a living, kinship, worldview, power and political systems, and socio-cultural inequalities, among others, across different cultures. By "unpacking" culture, we focus on how local knowledge is put to work in grappling with practical problems of everyday life. May be repeated up to 3 credits.
Learning Outcomes
1. Students will explain the core concepts in cultural anthropology, including the complexities, contradictions, dynamics, and implications.
2. Students will identify the important methods of fieldwork, linking theory to application.
3. Students will explain the critical components of cultural systems and how they operate, comparing and contrasting their different manifestations across different cultures. This identification should also address the complexities, dynamics, and implications.
4. Students will develop anthropological field skills in carrying out field projects, analyzing observed practices, symbols, and activities.
5. Students will identify and explain factors that explain cultural persistence and the relevance of culture in the modern world.

ANTH 305V. Contemporary Native Americans
3 Credits (3)
Introduction to contemporary native peoples and cultures of North America. Emphasis on sociocultural and socioeconomic history, sociocultural change and persistence, present day reservation life, and current social and economic goals.
Learning Outcomes
1. Identify the major challenges within American Indian communities.
2. Analyze the components and causes of contemporary issues in Indian country.
3. Understand and be able to define sovereignty and self-determination and the relationship of Native nations to the U.S. government.
4. Develop an awareness of the historical and continuing efforts of resistance, adaptation, and endurance of Native peoples.
5. Integrate learned concepts to address contemporary Native American issues.
6. Possess foundation knowledge as preparation for higher-level coursework in NATV.

ANTH 306V. Peoples of Latin America
3 Credits (3)

The course presents an overview of different cultures in Latin America, covering a range of topics including history, environment, race and ethnicity, religion, health, music, food, popular culture, globalization, and violence. Within this context, the perspective of cultural anthropology looks at the commonality of patterns shared across Latin America, at the same time that we examine the construction of cultural diversity, a diversity that has persisted into the modern era. We also examine how different Latin American peoples use culture, i.e., through their food, music, religion, and politics among other elements, as a way of shaping and conserving their ethnic identity. The class includes a mixture of lecture, discussion, films, music, and good food…

Learning Outcomes

1. Students will explain the major prehistoric Latin American civilizations and their role in shaping distinctive modern cultures today.
2. Students will identify the major ecological zones in Latin America and corresponding cultural adaptations and subsistence strategies.
3. Students will explain the critical role of economic and political history throughout the Colonial Period and Independence in shaping the patterns of cultural diversity, racial boundaries, and ethnic identities.
4. Students will explain the role of cultural practices (such as religion, music, popular culture, and foodways) in supporting indigenous and minority populations' efforts to retain distinct cultural identities.
5. Students will explain the global and historical connections between Latin American and the United States, in particular the role that Latin American culture, migration, and traditions have played in shaping our society's development.

ANTH 312. The Ancient Maya
3 Credits (3)

Archaeological evidence of culture change in the Maya civilizations of Mexico and Central America from 2000 BC to the Spanish Conquest.

ANTH 313V. Ancient Mexico
3 Credits (3)

We will explore the archaeology the Aztecs, Zapotecs, and the Maya of Mexico and Central America from 3000BC up to and including the Spanish invasion of 1519-1521. We will examine how the legacies of these great civilizations were erased from written sources and how Mesoamerican heritage can be preserved and reclaimed for descendant communities and the public using archaeological remains. We will address: (1). the origins of agriculture and traditional food systems in Mesoamerica; (2). the rise of cities and urban centers; (3). writing, religion, social inequality, and the circulation of commodities; (4). Political disintegration, fragmentation, and collapse; (5). the formation and expansion of the Aztec and Tarascan empires; and (6). the consequences of the Spanish invasion and colonialism.

Learning Outcomes

1. Take a position on theories that explain how, when, and why human lifeways changed in ancient Mesoamerica.
2. Select and integrate relevant archaeological evidence to argue for and against a theoretical position.
3. Analyze the significance of sites, structures, artifacts, and ecofacts within their archaeological contexts and explain their relevance for people today.
4. Evaluate how practices in research, conservation, and tourism to archaeological sites promote stewardship of non-renewable archaeological resources and intangible heritage.
5. Critique and reflect on designs for virtual public tours of archaeological sites in Mexico or Central America and suggest improvements to best practices for the preservation and public presentation of archaeological resources.

ANTH 315. Archaeological Method and Theory
3 Credits (3)

This course introduces you to the discipline of archaeology, situating this discipline within the wider field of anthropology. The first part of the course presents a brief history of the discipline, introduces some foundational concepts, and explains common field research methods. The second part of the class takes you through the process of identifying, classifying, and interpreting archaeological materials. The third and final part of the class introduces you to different research areas and types of professional work within archaeology.

Learning Outcomes

1. Identify major figures, sites, and trends in the history of archaeology.
2. Identify and describe common field and laboratory methods used in archaeology.
3. Construct and critically evaluate material culture typologies.
4. Explain and provide examples of different models of archaeological inference.
5. Describe and apply different theoretical approaches to the study of the human past.
6. Identify and describe significant areas of archaeological research and work.

ANTH 318. Historical Archaeology
3 Credits (3)

This survey course explores the development of historical archaeology, its methods and theory, and popular research themes within the discipline. Students will be introduced to the ways that archaeologists identify and analyze historical-period documents, oral histories, features, and artifacts, and how they use these data to deepen our understanding of the recent past. Crosslisted with: ANTH 518.

Learning Outcomes

1. Critically evaluate historical sources.
2. Identify and analyze common historical-period artifacts and features.
3. Utilize historical and archaeological evidence in research.
4. Demonstrate how historical archaeology can be used to draw attention to and highlight the contributions of diverse populations in history.
5. Demonstrate improved oral and written communication skills.

ANTH 320. Anthropological Linguistics
3 Credits (3)

The study of language and culture with particular emphasis on the cultural factors in the communication process.

ANTH 330V. Magic Witchcraft and Religion
3 Credits (3)

Provides an introduction to method and theory for the study of religion, ritual, and spiritual practice. Review and discussion of case studies drawn from around the globe to enhance understanding of the varied ways that people in diverse cultural systems construct and change their religious traditions to serve practical and meaningful ends.

Learning Outcomes

1. Define and identify examples of magic, science, witchcraft, and religion. Develop an understanding of the variation in cultural and behavioral practices associated with each.
2. Develop knowledge and critique early approaches and concepts in the anthropology of religion and its role in explanations of cultural change.

3. Develop knowledge of variation in religion as a cultural system and the experiences of liminality in rites of passage.
4. Identify the statuses and roles of various kinds of religious practitioners and their positionalities vis a vis dominant and resistant ideologies and structural inequality.
5. Develop critical thinking skills that speak to the relevance of different forms of religious thought and ritual practice in our daily lives.

ANTH 345. Introduction to Museology
3 Credits (3)
This course provides a broad introduction to the museum world. Through discussion of readings, examination of case-studies, and practical assignments, students will gain an understanding of the museum as an institution, as well as learn the challenges and responsibilities that museums and their staff encounter. Topics include the history of museums, contemporary debates surrounding the definition of museums, ethical and legal issues, and community connections. The course will cover various types of museums—including art, history, ethnographic, indigenous, and scientific—and discuss how these thematic orientations impact museum practice. Students will also explore common museum processes such as collecting, cataloguing, conservation, exhibition, research, and education through practical exercises using the collections of the University Museum in Kent Hall, as well as through case studies of museums around the world.
Learning Outcomes
1. Describe the major conceptual and practical influences on museums today—including issues of historical development, ethics, missions, and thematic orientations.
2. Critically engage with diverse types of museums as cultural institutions, their practices, and the communities with whom they engage.
3. Implement skills relevant to the museum profession, such as collections management, condition reporting, exhibition and programming planning, and research.

ANTH 349. Museum Anthropology
3 Credits (3)
This course provides an introduction to the methodological and theoretical approaches of museum anthropology. Students will gain experience with all these aspects of museum anthropology in the course by engaging with critical scholarship, analyzing case studies, and practicing collections-based research methods utilizing the collections of the University Museum. Through assignments students will analyze objects in the museum's collections using techniques of close looking, drawing, photography, sequences of making, and external research using scholarly sources. Students will gain skills in primary and secondary research, the analysis of material culture, and the practicalities of navigating research in museums.
Learning Outcomes
1. Describe major theoretical approaches to museum anthropology, and how these have changed over time.
2. Critically engage with the intersections between museums as institutions and the practice of anthropology, including the politics of representation.
3. Implement methodological research skills as a student-scholar by conducting independent research based on museum collections.
4. Convert collections-based research into written and media works characteristic of scholar-facing and public-facing practice in museum anthropology, curatorship, and museum studies.

ANTH 350. Anthropological Theory
3 Credits (3)
This course introduces students to historical and contemporary theory in anthropology with a focus on understanding why theory matters in our discipline. Key questions the course explores include: How have anthropologists thought about the concept of culture in different ways throughout the history of anthropology? What is the relevance of anthropological theory, both inside and outside the discipline? What new and promising trajectories do we see in anthropological theory today? May be repeated up to 3 credits.
Learning Outcomes
1. Trace the history of anthropological theory. You will recognize major figures and schools of thought in anthropological theory and be able to articulate their contributions to the field.
2. Critically analyze anthropological concepts of culture. Throughout the course, you will hone analysis skills through discussing and critiquing various anthropological perspectives on the culture concept.
3. Apply anthropological theory to contemporary anthropological "problems". Throughout the course, you will reflect on the usefulness of anthropological theory to the field and beyond. You will be able to articulate the connections made through writing and class discussion.

ANTH 351. Museum Field Methods
3 Credits (3)
This course introduces students to the fundamental concepts behind the creation of museum exhibitions. Drawing from the extensive collection of the University Museum, students will gain hands-on experience with exhibition development, resulting in the creation of a temporary public exhibition housed in the Museum's gallery space. By turning the museum inside out, this course will be a unique, behind-the-scenes, practical experience. Through readings and discussion, we will also examine historic and contemporary interpretations of exhibitions and collections from the origins of museums in cabinets of curiosity and Wunderkammer, to the surge in modern virtual exhibitions since 2020. Students will engage in practical applications that will prepare them for future academic work in museums studies and/or future employment or volunteer work in museums.
Learning Outcomes
1. Explain the basic concepts and terminology used in designing museum exhibits.
2. Differentiate the kinds of exhibitions and their intended audiences and purposes.
3. Describe the history of museum exhibitions and their evolution over time.
4. Discuss the challenges faced in designing and executing exhibitions, particularly regarding museum collections.
5. Apply the fundamental principles and practices of collections management.
6. Synthesize the fundamental principles and practices of museum exhibition planning and design including the role of the curator.

ANTH 355. Biological Anthropology
3 Credits (3)
An introduction to the fundamentals of the scientific method and organic evolution specific to the study of human origins and contemporary biological variation. Non-human primate diversity and behavior are also considered.

Learning Outcomes

1. Increase scientific literacy.
2. Improve specific skill areas including: Critical thinking; Expository writing; Analytical reading; Oral presentation skills.
3. Establish foundational knowledge as a basis for further study in: Evolutionary theory; Human variation and adaptation; Primatology; Human origins and evolution.

ANTH 356. Forensic Anthropology
3 Credits (3)

Overview of the field of forensic anthropology. Topics covered include basic human osteology; skeletal examination and documentation; skeletal trauma; personal identification; forensic taphonomy and the process of decomposition; archaeology and scene processing; sex, age, stature, and ancestry estimation; and contemporary issues and limitations in the field of forensic anthropology.

Learning Outcomes

1. Learn about the scientific method and how to apply scientific findings to field work.
2. Learn about the history and applications of forensic anthropology.
3. Gain a practical understanding of the methods, applications, and limitations of forensic anthropology as relates to police and other investigations.
4. Learn to identify human bones and the process of building a biological profile of human remains.
5. Learn about decomposition and how forensic anthropologists process and interpret crime scenes.

ANTH 357V. Medical Anthropology
3 Credits (3)

This course introduces students to evolutionary, ecological, interpretive, political-economic, and applied anthropological perspectives on health, illness, and healing to address some of the major questions in the field. How do humans adapt to changing environments that bring with them new illnesses and diseases? How do anthropologists understand the multiple meanings of health and illness cross-culturally? How can anthropologists effectively study health inequalities? What can medical anthropological perspectives contribute to addressing the health issues that we face in our current global context?

Learning Outcomes

1. Explain medical anthropology to someone unfamiliar with the field. Meeting this goal requires that you are able to: Define medical anthropology; Define health, illness, sickness, disease, and healing; Explain basic research methods in medical anthropology; Identify the different perspectives within medical anthropology.
2. Evaluate health problems from medical anthropological perspectives. Meeting this goal requires that you are able to: Accomplish goal
3. Identify different medical anthropological perspectives in research and reporting on health problems; Identify what is missing (based on your knowledge of medical anthropological perspectives) in addition to what is present in research and reporting on health problems.
4. Apply medical anthropological perspectives to current health problems. Meeting this goal requires that you are able to: Accomplish goals 1 and 2; Develop deeper understanding of medical anthropological perspectives by formulating "in your own words" definitions of medical anthropological perspectives; Identify multiple facets of major health issues.

ANTH 360V. Food and Culture Around the World
3 Credits (3)

Study of the interaction between food and human culture from an anthropological perspective. Examines the traditional role of food in local economies, social relations, and identity around the world. Also examines the impact of globalization on traditional food systems and cultures.

Learning Outcomes

1. Explore the evolutionary influences on human diet, eating practices, and cuisines.
2. Describe and compare the variety of food-getting strategies and understand how these lay the foundations for cuisines.
3. Trace the interconnected globalscapes of the food system.
4. Describe and explain the role of cooking in reproducing culture, shaping cultural traditions, and constructing traditional cuisines.
5. Describe the role of recipes and cook books in cuisine and nation-building.
6. Describe the significance of commensality in social relations and construction of cultural identities.
7. Identify the changes in the US food industry and subsequent impacts on consumption, cultural preferences, and health.
8. Detail responses (local food systems, food sovereignty, and ethnic cuisines) to the globalized food system.

ANTH 362V. Environmental Anthropology
3 Credits (3)

This course examines environmental studies from an anthropological perspective. The class focuses on how cultural values mediate environmental management. The class covers topics such as environmental anthropology, large scale development, biodiversity conservation, sustainable development, indigenous groups, consumption, and globalization.

Learning Outcomes

1. Students will define and demonstrate the impact of cultural values on how humans interact with the environment in designated cultures around the world.
2. Students will identify and explain how different cultural perspectives can be used to address environmental problems in specific cultures.
3. Students will critically reflect on their own environmental values, demonstrate how these values are shaped by our own culture, and identify cultural practices that can address environmental challenges.

ANTH 375. Pottery Analysis in Archaeology
3 Credits (3)

This course introduces the basic concepts, methods, and approaches used in the analysis of archaeological pottery. The purpose of the course is first to provide hands-on experience with the full range of analytical techniques routinely applied to ceramic materials recovered from archaeological sites, but to also provide a contextual framework for the interpretation and evaluation of these data. Classes consist of brief introductory lectures, and seminar presentation and discussion of course readings. Lab meetings consist of exercises designed to provide you with practical experience working with the materials and measures covered in lectures and readings. Crosslisted with: ANTH 575.

Learning Outcomes

1. Students will learn the theory underlying pottery analysis as well as some of the methods used to identify and interpret pottery;
2. Students will learn to think about the organization of pottery technology from a behavioral rather than a purely typological framework;
3. Students will have the opportunity to develop and then evaluate a research question or problem statement within a chosen theoretical

framework, as well as have the opportunity to evaluate that question or questions using both qualitative and quantitative analyses;
4. Students will gain the skills needed to assess pottery analysis reports and undertake pottery analyses for senior thesis, M.A. theses, and CRM contexts.

ANTH 376. Lithic Technology Organization
3 Credits (3)
Advanced seminars and laboratory exercises to learn and develop techniques and methods that will help us determine how to interpret behavioral and cultural information from lithic (stone tool) data.
Prerequisite(s): ANTH 315.

ANTH 378. Lab Methods in Archaeology
3 Credits (3)
Introduction to laboratory techniques used in the analysis of archaeological materials.
Learning Outcomes
1. Identify different categories and types of archaeological materials.
2. Employ common methods for analyzing material culture.
3. Explain how research design determines analytical methods and shapes interpretations.
4. Discuss our ethical obligation to preserve collections for future researchers, while recognizing the challenges involved in this endeavor.

ANTH 385. Internship in Anthropology
3-12 Credits (3-12)
Applied or field experience to gain professional expertise. Placements with public agencies, NGOs, or research organizations. Topical focus tailored to student's individual needs through consultation with instructor. May be repeated up to 12 credits.
Prerequisite: Junior status, consent of instructor and GPA 2.8 or better.
Learning Outcomes
1. Student will meet with faculty advisor to set up contract and internship contacts.
2. Student will meet with internship supervisor and in collaboration determine volunteer hours and internship objectives.
3. Student will establish internship contract with faculty advisor that outlines volunteer hours per week and work expectations.
4. Student will complete a weekly log of internship activities that will be submitted to faculty advisor.
5. Student will complete additional readings and meet with faculty advisor, as determined by faculty advisor.
6. Student will complete and submit an internship report, as determined in collaboration with faculty advisor.

ANTH 388. Archaeological Field School
2-6 Credits (2-6P)
Training in archaeological field methods, including excavation of archaeological sites, mapping, and data management and analysis.
Learning Outcomes
1. Map sites/site features using various methods.
2. Identify artifacts, ecofacts, and features in archaeological contexts.
3. Document sites, features, and/or excavation units using appropriate forms.
4. Conduct excavations using arbitrary or natural levels.
5. Process/analyze archaeological materials in field/laboratory settings.
6. Work collaboratively and productively with a team in a challenging field setting.
7. Record your daily field activities, observations, and preliminary interpretations in a field journal.

ANTH 389. Archaeological Mapping
3 Credits (3)
Techniques for mapping archaeological sites and recording spatial distributions of archaeological data using a variety of surveying equipment and computer mapping software. This course will take you through the process of creating a detailed archaeological site plan map and record the information on the NM Cultural Resource Information System (NMCRIS). You will learn how to set up and operate a theodolite and GPS devices (both optical and total station, GNSS receivers). You will record data sufficient to make 1. a feature map; 2. a topographic map; and 3. an artifact density map on our chosen site. You will learn how to calculate horizontal distances and elevations. You will learn about the capabilities and common sources of error in the use of the equipment. You will transform your raw data and draw several kinds of maps using Surfer software.
Learning Outcomes
1. Learn different methods and use of survey instrumentation to create maps of archaeological sites.
2. Learn how to record and process field data needed to create a. a feature map; b. a topographic map; and c. an artifact density map on our chosen site.
3. Learn to calculate horizontal distance and elevation.
4. Use common mapping software – ARCGIS and Surfer to draw your maps.
5. Learn about the capabilities and common sources of error in survey instrumentation.
6. Produce accurate information and site maps needed to complete NMCRIS LA forms.

ANTH 399. Professionalism & Practice in Anthropology
3 Credits (3)
This course serves as a capstone for Anthropology majors. It offers students a writing focused opportunity to hone professional anthropological skills including critical thinking and communication strategies. All communication takes a position; it makes an argument. Students will learn and practice these skills through writing, rewriting and then rewriting again a research paper, a curriculum vitae/resume, employment letters of inquiry, and graduate school letters of inquiry. Restricted to Anthropology Majors. May be repeated up to 3 credits.
Learning Outcomes
1. Learn and practice written communication these skills through writing, rewriting and then rewriting again a research paper,
2. Learn and practice professional verbal and visual communications through research presentations, job interviews and elevator speeches
3. Identify and use anthropologically informed ethical responsibilities that pervade written, verbal and visual communication skills (e.g., goals for use of information, use of accurate information, protection of sources of information, honest attribution of credit to sources of scholarly work, sensitivity to others cultural traditions);

ANTH 402. Contemporary Medical Anthropology
3 Credits (3)
Contemporary Medical Anthropology This advanced seminar in medical anthropology addresses contemporary issues in the field of medical anthropology through theoretical and ethnographic texts. Topics span a wide range of studies in medical anthropology and may include such issues as the social production of health and illness, medical pluralism, discourses of mental health, the practice of complementary

and alternative medicine, health disparities, the political economy of infectious disease, race and biological variation in biomedicine, and implementing biocultural perspectives. Crosslisted with: ANTH 546. **Prerequisite(s):** ANTH 301 or ANTH 355 or ANTH 357V or consent of instructor.

Learning Outcomes

1. Discuss current issues relevant to the study of medical anthropology.
2. Apply medical anthropological concepts and ideas to theoretical and practical health issues.
3. Acquire skills in the critical appraisal of ethnographic literature.

ANTH 414. Archaeology of Magic, Witchcraft, and Religion
3 Credits (3)

The class offers an in-depth introduction to the Archaeology of Religion focusing on the theoretical framework of artifact agency. The course begins with a discussion of the role of material culture in society and religion (artifact agency theory) and then moves through a series of case studies that highlight important themes in the archaeology of religion. These themes include the Religion among the Earliest Paleolithic Cultures, Relationships between Houses and Temples, Sacrifice (Artifact, Animal and Human), New Religious Movements, and Witchcraft Persecution.

Learning Outcomes

1. Students will develop a stronger understanding of the role of religious material culture in anthropology and archaeology.
2. Students will develop strong research skills by applying that knowledge of material culture theory in a term paper that explores artifact agency in an ancient religion.
3. Students will develop strong communication skills through the preparation of a written term paper and class power point presentation of that research.

ANTH 415. Applied Anthropology
3 Credits (3)

Examines the intellectual roots of applied anthropology and early case studies of anthropologists working as administrators. Examines the ethical and methodological approaches that applied anthropologists employ. Examination of case studies that show role of applied anthropologists in improving human service delivery, cultural preservation, planning and implementing programs of participatory change, advocacy, and economic development. Taught with ANTH 515.

Learning Outcomes

1. Students will explain the application of anthropological knowledge, methods, and theoretical approaches to address social problems, issues, and structures.
2. Students will present an overview of the history of applied anthropology, identifying major events in the development of the discipline.
3. Students will explain the similarities and differences between applied anthropology, activist anthropology, and engaged anthropology.
4. Students will conduct research and identify internship opportunities in the applied area of their interests.
5. Students will conduct an interview with an applied anthropologist and document the experiences and training required to become an applied anthropologist.
6. Students will identify an applied professional area of their interest and write a reflective essay, delineating the education, training, and strategies required to attain this professional goal.

ANTH 431V. Nutritional Anthropology
3 Credits (3)

This course provides biological, ecological, and cross-cultural perspectives on human nutrition. Topics covered include human nutritional evolution, dietary adaptation, variation in human foodways and habits, relationships between diet and health, nutrition transitions, and methods for studying human diet and nutrition in field settings.

Learning Outcomes

1. Understand the ways in which biology, culture, and ecology shape human nutritional outcomes and dietary patterns.
2. Be able to identify methods best suited to answering questions about human diet and nutrition in field settings.
3. Be able to develop a research question and basic research strategy.

ANTH 433V. Sex, Gender and Culture
3 Credits (3)

This seminar course introduces students to the anthropological study of gender. We take an integrated approach to the subject, considering the ways that that different kinds of anthropological research, including archaeology, biological anthropology, ethnography, etc.,expand our understanding of the various ways gender is defined across space and time, how it is lived, and what it means to us and others. Students will review the historical context and development of this subject within the field, and will explore such topics as sex versus gender, embodiment and gendered performance, gender hierarchies, the politics of reproduction, and globalization. May be repeated up to 3 credits.

Learning Outcomes

1. Identify and evaluate different anthropological approaches to the study of gender
2. Develop and employ analytical and critical thinking skills
3. Demonstrate proficiency in oral and written communication
4. Integrate and synthesize knowledge of gender-related topics in a research paper

ANTH 435. Human Health and Biological Variation
3 Credits (3)

Overview of contemporary human biological variation and adaptability within a scientific evolutionary and biocultural framework. Special emphasis is placed on human adaptation to the environment and the sociocultural, epidemiological, and evolutionary factors that underlay contemporary issues in human health and disease. Crosslisted with: ANTH 535.

Learning Outcomes

1. Develop critical thinking skills and scientific literacy through discussion, reading, and writing exercises and evaluating scientific theories, data, and research methods.
2. Develop an understanding of evolutionary theory, and how human organic evolution shapes variation, adaptation, and health in contemporary human populations.
3. Learn how human evolutionary history has shaped the global distribution of contemporary human biological diversity.
4. Understand the scientific critique of the biological race concept, and how social inequality, particularly racism, can become embodied.
5. Understand the various ways that humans adapt to the environment on different timescales.
6. Study life course theory and how experiences during development impact health across the life course.
7. Develop specific transferable skills, including written communication, public speaking, and information gathering (research), and for graduate students, research questions development, hypothesis testing, basic data analysis/visualization in Excel.

ANTH 436. Evolutionary Medicine
3 Credits (3)
This course provides an overview of evolutionary medicine, a field that applies evolutionary theory to understanding variation in human biology and health and treating and preventing disease. Topics covered in the course include evolutionary perspectives on diet and nutrition, chronic disease, infectious disease, cancer, stress, mental health, reproductive health, women's health, and child growth and development.
Learning Outcomes
1. Understand the basic principles of evolutionary theory.
2. Understand how anthropologists and medical and public health professionals can apply evolutionary theory to understand human health and disease.
3. Understand both the promise and limits of evolution as an explanatory paradigm for variation in human health and disease.
4. Be able to apply principles of evolutionary medicine to development of a research proposal.
5. Develop collaborative and oral presentation skills through a group presentation.

ANTH 449. Directed Reading
1-6 Credits
Comprehensive reading on selected topics. May be repeated for a maximum of 6 credits.
Prerequisite(s): Upper division anthropology majors with consent of instructor.

ANTH 449 H. Directed Reading Honors
1-3 Credits
Same as ANTH 449. Additional work to be arranged. May be repeated for a maximum of 6 credits.

ANTH 456. Native American Intersections in Museums
3 Credits (3)
This course explores the changing relationships and complex intersections between Native people and museums. We will examine how museum practices of collection and exhibition influence ways in which knowledge is formed and presented, and interrogate the role of museums as crucial sites for discourse around issues of ownership, indigenous knowledge and representation. Case studies revealing shifting meanings of objects, curatorial challenges, the development of tribal museums and repatriation complexities will be used to critically engage with Native responses via art, criticism and legal action. Crosslisted with: ANTH 556.

ANTH 458. Gender and Reproduction
3 Credits (3)
This course examines biocultural variation in reproductive health and birth practices. Human reproductive events like childbirth, contraception, abortion, surrogacy, fertility treatment, and conception, are not only biological in nature, but are also shaped by cultural beliefs and social, medical, and political institutions. Through cross-cultural case studies, we will examine how reproductive experiences are impacted by health-related ideas and medical technologies, and by national and international population policies. We will explore how pregnancy, menstruation, birth, menopause, and fertility control provide sites for gender formation, the reproduction of social inequalities, and state regulation of national populations.
Prerequisite: ANTH 301 or ANTH 355 or ANTH 357V or consent of instructor.
Learning Outcomes
1. Identify the fundamental concepts, modes of analysis, and central questions of the anthropology of reproduction.
2. Gain proficiency in the use of critical thinking skills in their assessment of ethnographic writing.
3. Apply knowledge of peoples' reproductive practices, and gendered identities and sexual lifeways in a range of social contexts.
4. Articulate, in oral and written forms, the central issues in reproduction and culture.

ANTH 463. Cultural Resource Management I
3 Credits (3)
This course introduces you to the field of cultural resource management (CRM) and to the federal and state laws and regulations that govern most archaeology and historic preservation projects conducted today. Class lectures, readings, and written assignments will cover the major relevant US federal laws (NHPA, NEPA, ARPA, NAGPRA); New Mexico state cultural resource laws, regulations, and permitting practices; and major international heritage laws. Particular emphasis will be placed on understanding how to evaluate and nominate cultural resources for listing on the National Register of Historic Places (NRHP). Good oral and written communication skills are essential for success in CRM, so students will be provided with numerous opportunities to develop these skills in class.
Learning Outcomes
1. Explain the goals of cultural resource management (CRM)
2. Describe the major laws and regulations that govern CRM in the United States, in the state of New Mexico, and abroad
3. Identify some common challenges with implementing these laws and regulations
4. Determine the eligibility of cultural resources for listing on the NRHP, and justify this determination

ANTH 464. Curation Crisis in Archaeology
3 Credits (3)
This collection management course will introduce students to collections curation, collections care, and collections-based research. Archaeological collections stewardship begins before an archaeologist steps foot into the field and continues well after the recovered collections reach the repository. This course provides students with an understanding of the curation#"crisis"#using archaeological collections curated at the University Museum as a case study and the responsibilities that archaeologists have to the collections they generate.
Learning Outcomes
1. Learn about the maintenance of archaeological collections
2. Learn about the management of, access to, and use of archaeological collections
3. Learn about the curation crisis at a small museum (e.g., Kent Hall University Museum)
4. Learn about collections-based research
5. Learn about various ways of disseminating archaeological collections to the public
6. Change the perception of the "just digging and we will deal with the collections later" approach.

ANTH 465. Introduction to Paleoethnobotany
3 Credits (3)
Paleoethnobotany, the study of the human use of plants in antiquity, uses plant remains recovered from archaeological sites to address a broad range of topics. Paleoethnobotanical data can be used to investigate social, economic, and environmental issues including the shift from hunting and gathering to farming, adaptations to climate shift, the development of state-level societies, and social hierarchies to

name a few topics. This course introduces the deposition, preservation, sampling, recovery, identification, description, and interpretation of paleoethnobotanical remains. This course is arranged around 1) exploring the major classes of plant remains likely to be encountered in archaeological sites; 2) identifying these remains and organizing the data to make interpretable results; and 3) addressing key issues within the sub-discipline including preservation, analytical methods, sampling, collection, and interpretation.
Prerequisite: ANTH 315 or ANTH 378.
Learning Outcomes
1. Learn about macro and micro botanical analysis of archaeological plant material.
2. Understand the problems and range of archaeological research using paleoethnobotanical data.
3. Gain knowledge of paleoethnobotanical analysis from sampling to interpretation.
4. Consider the broader applications of paleoethnobotanical interpretation, including economics, identity, foodways, politics, symbolism, and historical ecology.
5. Perform basic laboratory analysis.
6. Write a basic report for cultural resource management projects.

ANTH 467. Archaeology of the American Southwest
3 Credits (3)
Description and analysis of the archaeology of the American Southwest including paleo-environmental reconstruction, culture change, and relations with contemporary cultures.
Prerequisite: ANTH 315.
Learning Outcomes
1. Learn the culture history of the American Southwest from the Ice-Age through the Spanish Colonial Period.
2. Students will learn the advances in archaeological method and theory developed in the American Southwest such as Tree-ring dating, Pottery Seriation, Paleoindian Archaeology.
3. Students will develop a research interest in the region through a paper specializing in a theme and subregion e.g. Architectural change in the four corners during the 13th century, the adoption of corn in the Late archaic borderlands of southern New Mexico.

ANTH 468. Applied Medical Anthropology
3 Credits (3)
This course introduces students to applications of medical anthropological perspectives to health care, international development, public health, and health policy.
Learning Outcomes
1. Discuss the usefulness of anthropological perspectives in addressing health issues in a variety of interdisciplinary and professional settings.
2. Assess the health impact of public policy from anthropological perspective.

ANTH 471. Archaeology of Food
3 Credits (3)
Food pervades all aspects of people's lives, from the most basic task of acquiring and consuming food to the intricate social meanings and political roles that we give to food in different social settings. Food is a requirement for life, yet it is always transformed by social meanings in specific cultural contexts. We will look at the theoretical and methodological tools that archaeologists use to study food and foodways in ancient societies from a global anthropological perspective. Together, we will explore how studying food and ancient foodways tells us more than just the methods and techniques of food acquisition, preparation, consumption, and discard, but also gives us a window into economic, symbolic, historic, and political realities of past peoples. This course will focus on the social contexts in which specific food practices occur and the social and cultural meanings that are ascribed, created, and reproduced in those contexts. Topics include why humans share food, feasting, politics, and power; food and identity; cannibalism, transitions in food systems; culture contact and exchange.
Prerequisite: ANTH 1115G, ANTH 1135, ANTH 1140, or ANTH 1160.
Learning Outcomes
1. Understand basic cultural and archaeological food theory.
2. Understand the ways archaeologists recover food remains, how they are analyzed, and how they are interpreted within the broader archaeological context.
3. Identify different theoretical perspectives in archaeological reports.
4. Be able to lead classroom discussions on the day's readings.
5. Be able to identify how food, and our understanding of food history, influences our day-to-day lives.
6. Be able to research the history of a particular food and present the findings.

ANTH 474. Human Osteology
3 Credits (3)
A survey of the functional, developmental, and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. May be repeated up to 3 credits. Crosslisted with: BIOL 424.

ANTH 477. Zooarchaeology
3 Credits (3)
Detailed study and analysis of taphonomic processes affecting animal bone recovered from archaeological and paleontological contexts. May be repeated up to 3 credits.

ANTH 485. Special Research Project
1-3 Credits
Anthropological, archaeological, or museum field work or laboratory experience in academic, private, state, or federal agencies. Must spend 30 hours in a field, museum, or laboratory setting per credit hour earned. May be repeated up to 6 credits.
Prerequisite(s): Complete 12 ANTH credits and consent of instructor.

ANTH 486. Community Engagement and Service Learning
3 Credits (3)
Course combines classroom instruction with a local community service project. Formal instruction component will examine social science research findings and perspectives on a locally relevant social issue or problem. In the service learning component, students will be trained and work on a local community service project. Students will develop field experience and methodological skills in community engagement. Projects and social issues may vary for different semesters.
Learning Outcomes
1. Students will demonstrate background knowledge of the local community service project, through assigned readings and class discussions.
2. Students will work collaboratively in groups to identify local community issues and methods for engaging in community participatory research methods.
3. Students will attend local community or organization meetings and participate in interviews with community members.

4. Students will demonstrate their development of specific field skills, including participant observation, open-ended interviews, and survey techniques.
5. Students will contribute a section to the class report on the local community service project, as outlined in the class project guidelines.

ANTH 488. Advanced Archaeological Field School
2-6 Credits (2-6P)
Additional training in archaeological field methods for students with previous fieldwork experience. Consent of Instructor required.
Learning Outcomes
1. Map sites/site features using various methods.
2. Identify artifacts, ecofacts, and features in archaeological contexts.
3. Document sites, features, and/or excavation units using appropriate forms.
4. Conduct excavations using arbitrary or natural levels.
5. Process/analyze archaeological materials in field/laboratory settings.
6. Work collaboratively and productively with a team in a challenging field setting.
7. Record your daily field activities, observations, and preliminary interpretations in a field journal.

ANTH 497. Special Topics
1-6 Credits (1-6)
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.
Prerequisite(s): Junior or above standing.

ANTH 500. Seminar in Anthropological Theory
3 Credits (3)
Detailed focus on specific areas of anthropological theory. Course subtitled in the Schedule of Classes. Course may be repeated.
Prerequisite(s): graduate standing in Anthropology or consent of instructor.

ANTH 502. Fundamentals of Anthropology
1-4 Credits (1-4)
Review of fundamental knowledge and theories in biological, cultural, or linguistic anthropology or archaeology. May be repeated up to 4 credits.
Learning Outcomes
1. Student meets with graduate advisor to determine undergraduate deficiencies in anthropology.
2. Student contract is established to determine work required to meet undergraduate deficiencies.
3. Student completes work and learning objectives for the designated undergraduate core anthropology course.
4. Undergraduate course instructor of core anthropology class assigns student grade.

ANTH 503. Anthropological Theory
3 Credits (3)
This seminar is designed to introduce graduate students to the major concepts and developments in anthropological theory. Students will develop an understanding of the major principles, contributions, and limitations of anthropological theory from the 1890s to the present. The course will address theoretical developments in biological anthropology, sociocultural anthropology, archaeology, and public and applied anthropology.
Learning Outcomes
1. Articulate the history of theoretical developments in multiple anthropological subfields and explain the holistic connections among them.
2. Explain and critique the major theoretical formulations of the field, including: human biological evolution and variation; cultural relativism; practice theory; life history and formation processes of archaeological, paleontological, and contemporary sites and specimens; historical contingency in culture change and globalization; human ecology and environmental anthropology, past and present; indigenous perspectives, participatory action research, and collaborative research designs; identity and the intersections of gender, sex, race, class, and other categories, past and present; origins and contemporary variation of inequality and socioeconomic disparities; political economy, domination and resistance, past and present; the development and critique of diverse narratives of the past drawn from archaeological/material, visual and performative, documentary, and oral historical media; stewardship of tangible and intangible cultural heritage,
3. Read and practice in the norms of written and verbal expression across multiple theoretical domains in anthropology.

ANTH 505. Issues in Anthropological Practice
3 Credits (3)
This is a course in professional development in which students design their thesis/non-thesis research projects and write a first draft of their capstone research proposal. The purpose is to connect the MA thesis or non-thesis research project to your future career. Professionals in anthropology should demonstrate competency in research and writing by completing an M.A. thesis or qualification equivalent (e.g. internship report, research report, which increasingly include public scholarship and the development of creative digital media). Successful completion of an original research project demonstrates that a student can conduct applied and collaborative research, complete a scope of work according to standards and guidelines of the agency, institution, or organization, and evaluate the research and contributions of colleagues and peers. Anthropologists are all called to participate in the investigation, management, and evaluation of cultural resources (tangible and intangible), address the intersectionalities within organizations and institutions that differentially impact social groups, and work with individuals and communities to achieve shared objectives that enhance engagement.
Learning Outcomes
1. Students will develop and implement a research project in anthropology. We will focus on research design—from defining the research problem, funding, lit review, logistics of fieldwork, analysis, and write-up. Students will move from exploring a topic of interest to developing a proposal for investigation.
2. Students will develop professional skills, ethics, values, and attitudes necessary for developing and implementing a research project and for employment in the field. They will map out a pathway to a career in anthropology. We will examine anthropological practice in academic and applied contexts. We will consider expectations and qualifications needed for different work environments and degree programs. Students will work towards matching NMSU's MA curriculum to their professional goals. You should make the curriculum and university resources work for you.

ANTH 506. Advanced Studies in Physical Anthropology
1-3 Credits
Lectures, seminars, or laboratory research in selected topics. May be repeated for a maximum of 12 credits.
Prerequisite(s): graduate standing in Anthropology or consent of instructor.

ANTH 507. Advanced Studies in Archaeology
1-3 Credits
Lectures, seminars, field or laboratory research in selected topics. May be repeated for a maximum of 12 credits.
Prerequisite(s): graduate standing in Anthropology or consent of instructor.

ANTH 508. Advanced Studies in Cultural Anthropology
1-3 Credits
Lectures, seminars, or field research in selected topics. May be repeated for a maximum of 12 credits.
Prerequisite(s): graduate standing in Anthropology or consent of instructor.

ANTH 512. Quantitative Analytical Methods in Anthropology
3 Credits (3)
This class is an introduction to statistical analysis of anthropological and social science data. Students will learn how quantitative and statistical techniques are used in the analysis of anthropological problems and how to evaluate statistical arguments in the literature. No previous background in statistics is required. We will consider data collection, sampling and statistical populations, exploratory summaries of data, and the importance of choosing appropriate statistical techniques. All course work will emphasize anthropological interpretation through applied statistical methods. The course has a four-field focus (archaeology, biological anthropology, cultural anthropology, and linguistics), and students will work with readings, examples, and problem assignments from each subfield.
Learning Outcomes
1. Articulate the difference between descriptive and inferential statistics.
2. Explain the difference between a population and a sample and learn how to draw random samples (various methods – simple random, stratified, systematic, etc.) in the field and using numerical data and statistical procedures within SAS or other STATPACKS (SPSS, R).
3. Use appropriate graphs, tables, and measures of central tendency and dispersion to display and summarize distributions of nominal, ordinal, interval and ratio level data.
4. Understand the Normal Distribution and the assumptions required for hypothesis testing.
5. Perform hypothesis testing and interpret the results for univariate, bivariate, and multivariate statistical procedures, including Chi Square, T-tests, Non-parametric Comparison tests, ANOVA, Correlation, Simple Linear Regression, Multiple Regression, Cluster and Discriminant Analysis (as time permits).
6. Develop an exploratory statistical analysis for original anthropological data and write a final paper interpreting the results.

ANTH 514. Advanced Archaeology of Magic, Witchcraft, and Religion
3 Credits (3)
The class offers an in-depth introduction to the Archaeology of Religion focusing on the theoretical framework of artifact agency. The course begins with a discussion of the role of material culture in society and religion (artifact agency theory) and then moves through a series of case studies that highlight important themes in the archaeology of religion. These themes include the Religion among the Earliest Paleolithic Cultures, Relationships between Houses and Temples, Sacrifice (Artifact, Animal and Human), New Religious Movements, and Witchcraft Persecution.
Learning Outcomes
1. Students will develop a stronger understanding of the role of religious material culture in anthropology and archaeology and be required to lead class discussions.
2. Students will develop strong research skills by applying that knowledge of material culture theory in a term paper that explores artifact agency in an ancient religion.
3. Students will develop strong communication skills through the preparation of a written term paper and class power point presentation of that research.

ANTH 515. Applied Anthropology
3 Credits (3)
Examines the intellectual roots of applied anthropology and early case studies of anthropologists working as administrators. Examines the ethical and methodological approaches that applied anthropologists employ. Examination of case studies that show the role of applied anthropologists in improving human service delivery, cultural preservation, planning and implementing programs of participatory change, advocacy, and economic development. Taught with ANTH 415.
Learning Outcomes
1. Students will explain the application of anthropological knowledge, methods and theoretical approaches to address social problems, issues, and structures.
2. Students will present an overview of the history of applied anthropology, identifying major events in the development of the discipline.
3. Students will explain the similarities and differences between applied anthropology, activist anthropology, and engaged anthropology.
4. Students will conduct research and identify internship opportunities in the applied are of their interests.
5. Students will conduct an interview with an applied anthropologist and document the experiences and training required to become an applied anthropologist.
6. Students will identify an applied professional area of their interests and write a reflective essay, delineating the education, training, and strategies required to attain this professional goal.

ANTH 516. Advanced Archaeology of the American Southwest
3 Credits (3)
Advanced topics in Southwestern archaeology including ritual architecture, environmental reconstruction, violence, site formation processes, and experiment and research.
Learning Outcomes
1. Students will have an advanced understanding of the changes in subsistence, social organization, and material culture in the American Southwest from the Ice Age through the Spanish Entrada.
2. Students will understand the history of archaeological method and theory as it played out in the archaeology of the American Southwest. They will recognize that theory determines they questions ask about the ancient peoples of the region.
3. Graduate students will write a term paper (professional technical and scientific writing) that contributes to their MA projects either directly as part of a specific thesis or as extension of their interest in a topic (e.g. , identity, domestication, ritual violence) or method (e.g., pottery sourcing, faunal analysis).

ANTH 517. Advanced Topics in Mesoamerican Archaeology
3 Credits (3)
Specific subjects in Mesoamerican archaeology to be announced in the Schedule of Classes. May be repeated for a maximum of 6 credits.

Prerequisite: graduate standing.

ANTH 518. Advanced Historical Archaeology
3 Credits (3)
This survey course explores the development of historical archaeology, its methods and theory, and popular research themes within the discipline. Students will be introduced to the ways that archaeologists identify and analyze historical-period documents, oral histories, features, and artifacts, and how they use these data to deepen our understanding of the recent past. Crosslisted with: ANTH 318.
Learning Outcomes
1. Critically evaluate historical sources.
2. Identify and analyze common historical-period artifacts and features.
3. Utilize historical and archaeological evidence in research.
4. Demonstrate how historical archaeology can be used to draw attention to and highlight the contributions of diverse populations in history.
5. Demonstrate improved oral and written communication skills.

ANTH 519. Advanced Topics in Prehistoric Archaeology
3 Credits (3)
Seminar on specialized research archaeology.
Prerequisite: graduate standing.

ANTH 520. Ethnographic Field Methods
3 Credits (3)
Basic methodologies used in conducting qualitative ethnographic research. Projects in participant observation, ethnographic interviews, life history interviews, folk taxonomy construction, and coding of field notes.
Learning Outcomes
1. Students will demonstrate knowledge of the different types of field methods used in ethnographic field work.
2. Students will complete a series of ethnographic field projects, including participant observation, ethnographic interviews, narrative interviews, and photo voice interviews.
3. Following the completion of each project, students will meet, discuss, and review their individual projects.
4. Students will present final project to class, outlining their specific methods and plans for their future research.

ANTH 522. Archaeological Field School
2-6 Credits (2-6P)
Graduate-level training in archaeological field methods, including excavation of archaeological sites, mapping, and data management and analysis. Consent of Instructor required.
Learning Outcomes
1. Map sites/site features using various methods.
2. Identify artifacts, ecofacts, and features in archaeological contexts.
3. Document sites, features, and/or excavation units using appropriate forms.
4. Conduct excavations using arbitrary or natural levels.
5. Process/analyze archaeological materials in field/laboratory settings.
6. Process archaeological materials safely so that they can be analyzed in a laboratory environment.
7. Record your daily field activities, observations, and preliminary interpretations in a field journal.

ANTH 523. Archaeological Mapping
3 Credits (3)
Techniques for mapping archaeological sites and recording spatial distributions of archaeological data using a variety of surveying equipment and computer mapping software. This course will take you through the process of creating a detailed archaeological site plan map and record the information on the NM Cultural Resource Information System (NMCRIS). You will learn how to set up and operate a theodolite and GPS devices (both optical and total station, GNSS receivers). You will record data sufficient to make 1. a feature map; 2. a topographic map; and 3. an artifact density map on our chosen site. You will learn how to calculate horizontal distances and elevations. You will learn about the capabilities and common sources of error in the use of the equipment. You will transform your raw data and draw several kinds of maps using Surfer software.
Learning Outcomes
1. Learn different methods and use of survey instrumentation to create maps of archaeological sites.
2. Learn how to record and process field data needed to create a. a feature map; b. a topographic map; and c. an artifact density map on our chosen site.
3. Learn to calculate horizontal distance and elevation.
4. Use common mapping software – ARCGIS and Surfer to draw your maps.
5. Learn about the capabilities and common sources of error in survey instrumentation.
6. Produce accurate information and site maps needed to complete NMCRIS LA forms.

ANTH 529. Advanced Evolutionary Medicine
3 Credits (3)
This course provides an overview of evolutionary medicine, a field that applies evolutionary theory to understanding variation in human biology and health and treating and preventing disease. Topics covered in the course include evolutionary perspectives on diet and nutrition, chronic disease, infectious disease, cancer, stress, mental health, reproductive health, women's health, and child growth and development.
Learning Outcomes
1. Understand the basic principles of evolutionary theory.
2. Understand how anthropologists and medical and public health professionals can apply evolutionary theory to understand human health and disease.
3. Understand both the promise and limits of evolution as an explanatory paradigm for variation in human health and disease.
4. Be able to apply principles of evolutionary medicine to development of a research proposal.
5. Develop collaborative and oral presentation skills through a group presentation.

ANTH 531. Issues in Nutritional Anthropology
3 Credits (3)
This course provides biological, ecological, and cross-cultural perspectives on human nutrition. Topics covered include human nutritional evolution, dietary adaptation, variation in human foodways and habits, relationships between diet and health, nutrition transitions, and methods for studying human diet and nutrition in field settings.
Learning Outcomes
1. Understand the ways in which biology, culture, and ecology shape human nutritional outcomes and dietary patterns.
2. Be able to identify methods best suited to answering questions about human diet and nutrition in field settings.
3. Be able to develop a research question and basic research strategy.

ANTH 533. Advanced Issues in Sex, Gender, and Culture
3 Credits (3)
Survey of the history of anthropological ideas about gender and women, and a comparison of gender roles, relations, and ideologies across a range of cultures. May be repeated up to 3 credits.
Learning Outcomes
1. Explain to others how you understand the concepts of sex, women, gender, and culture.
2. Critically analyze the uses of these concepts across a range of different contexts including media, politics, cultural performance, and everyday interactions.
3. Apply theoretical concepts introduced in this class to a current anthropological research problem/topic.

ANTH 535. Adv. Human Health and Biological Variation
3 Credits (3)
Overview of contemporary human biological variation and adaptability within a scientific evolutionary and biocultural framework. Special emphasis is placed on human adaptation to the environment and the sociocultural, epidemiological, and evolutionary factors that underlay contemporary issues in human health and disease. Crosslisted with: ANTH 435.
Learning Outcomes
1. Develop critical thinking skills and scientific literacy through discussion, reading, and writing exercises and evaluating scientific theories, data, and research methods.
2. Develop an understanding of evolutionary theory, and how human organic evolution shapes variation, adaptation, and health in contemporary human populations.
3. Learn how human evolutionary history has shaped the global distribution of contemporary human biological diversity.
4. Understand the scientific critique of the biological race concept, and how social inequality, particularly racism, can become embodied.
5. Understand the various ways that humans adapt to the environment on different timescales.
6. Study life course theory and how experiences during development impact health across the life course.
7. Develop specific transferable skills, including written communication, public speaking, and information gathering (research), and for graduate students, research questions development, hypothesis testing, basic data analysis/visualization in Excel.

ANTH 538. Plants, Culture, and Sustainable Development
3 Credits (3)
Study of role of indigenous cultures and indigenous knowledge systems in plant domestication, ethnoecology, and preservation of traditional crop diversity. Examination of issues related to conserving cultural diversity, food systems, food security and biodiversity.
Learning Outcomes
1. Students will explain the concepts of ecological anthropology, ethnoecology, and ethnobotany and their application to sustainable development.
2. Students will explain the contribution of conserving cultural and biological diversity to sustainable development in the modern world.
3. Students will demonstrate the role that indigenous food systems play in the management of ecological systems around the world.
4. Students will delineate and explain the role of emergent movements, including food sovereignty movements and international collaborative movements, in applying these concepts to solving worldwide sustainable development issues.

ANTH 539. Culture and Foodways
3 Credits (3)
Study of interaction between food and culture from anthropological perspective. Study of role of food in cultural history, social relations, ritual, and identity. Examination of impact of globalization of food systems on traditional cultures, local food systems, and food security.
Learning Outcomes
1. Students will demonstrate the role that food plays in constructing culture by delineating its role in specific cultural aspects.
2. Students will demonstrate the cultural significance of food within the context of "place" through food production, distribution, and consumption.
3. Students will identify and delineate the role of food in the diaspora, detailing how immigrant populations maintain cultural ties through food.
4. Students will explain the contradictions of culinary tourism, how the practice maintains local culinary traditions at the same time that it raises questions of authenticity.
5. Students will explain the role of cooking around the world and how cooking food maintains, reproduces, and transforms culture.
6. Students will explain the significance of commensality (food sharing and meals) in reproducing cultural ties, family bonds, and societal hierarchies.
7. Students will explain the recent history of international food activism and decolonizing food movements, identifying the role that these movements play in conserving indigenous, ethnic, and national identities.

ANTH 540. Cultural Resource Management
3 Credits (3)
Study of federal and state of New Mexico historic preservation laws and regulations and their application in current Cultural Resource Management and a review of relevant case studies.

ANTH 542. Cultural Resource Management II
3 Credits (3)
Continuation of ANTH 540. This course introduces students to the business and practice of doing contractual cultural resource management in the United States.
Learning Outcomes
1. Map an archaeological site (meeting New Mexico state standards for archaeological survey)
2. Document an archaeological site (using a Laboratory of Anthropology site form)
3. Prepare a written site description suitable for inclusion in a survey report
4. Analyze and present data using relevant software (e.g., Excel, Access)
5. Prepare a research proposal or report (meeting New Mexico state standards)

ANTH 543. Indigenous Ways of Knowing
3 Credits (3)
This course examines Indigenous knowledge and ways of knowing as a means to gain an appreciation of an epistemology and ontology that may be outside the boundaries of Eurocentric theory, concepts, and principles. Knowledge development through mythology and story telling is viewed from the nature of difference rather then comparative analysis.

Learning Outcomes

ANTH 545. Advanced Museology
3 Credits (3)
This course provides a broad introduction to the museum world. Through discussion of readings, examination of case-studies, and practical assignments, students will gain an understanding of the museum as an institution, as well as learn the challenges and responsibilities that museums and their staff encounter. Topics include the history of museums, contemporary debates surrounding the definition of museums, ethical and legal issues, and community connections. The course will cover various types of museums—including art, history, ethnographic, indigenous, and scientific—and discuss how these thematic orientations impact museum practice. Students will also explore common museum processes such as collecting, cataloguing, conservation, exhibition, research, and education through practical exercises using the collections of the University Museum in Kent Hall, as well as through case studies of museums around the world.
Learning Outcomes
1. Describe the major conceptual and practical influences on museums today—including issues of historical development, ethics, missions, and thematic orientations.
2. Critically engage with diverse types of museums as cultural institutions, their practices, and the communities with whom they engage.
3. Implement skills relevant to the museum profession, such as collections management, condition reporting, exhibition and programming planning, and research.

ANTH 546. Advanced Contemporary Medical Anthropology
3 Credits (3)
This advanced seminar in medical anthropology addresses contemporary issues in the field of medical anthropology through theoretical and ethnographic texts. Topics span a wide range of studies in medical anthropology and may include such issues as the social production of health and illness, medical pluralism, discourses of mental health, the practice of complementary and alternative medicine, health disparities, the political economy of infectious disease, race and biological variation in biomedicine, and implementing biocultural perspectives. Crosslisted with: ANTH 402.
Learning Outcomes
1. Discuss current issues relevant to the study of medical anthropology.
2. Apply medical anthropological concepts and ideas to theoretical and practical health issues.
3. Acquire skills in the critical appraisal of ethnographic literature.

ANTH 549. Advanced Museum Anthropology
3 Credits (3)
This course provides an introduction to the methodological and theoretical approaches of museum anthropology. Students will gain experience with all these aspects of museum anthropology in the course by engaging with critical scholarship, analyzing case studies, and practicing collections-based research methods utilizing the collections of the University Museum. Through assignments students will analyze objects in the museum's collections using techniques of close looking, drawing, photography, sequences of making, and external research using scholarly sources. Students will gain skills in primary and secondary research, the analysis of material culture, and the practicalities of navigating research in museums.
Learning Outcomes
1. Describe major theoretical approaches to museum anthropology, and how these have changed over time.
2. Critically engage with the intersections between museums as institutions and the practice of anthropology, including the politics of representation.
3. Implement methodological research skills as a student-scholar by conducting independent research based on museum collections.
4. Convert collections-based research into written and media works characteristic of scholar-facing and public-facing practice in museum anthropology, curatorship, and museum studies.

ANTH 550. Museum Field Methods
3 Credits (3)
This course introduces students to the fundamental concepts behind the creation of museum exhibitions. Drawing from the extensive collection of the University Museum, students will gain hands-on experience with exhibition development, resulting in the creation of a temporary public exhibition housed in the Museum's gallery space. By turning the museum inside out, this course will be a unique, behind-the-scenes, practical experience. Through readings and discussion, we will also examine historic and contemporary interpretations of exhibitions and collections from the origins of museums in cabinets of curiosity and Wunderkammer, to the surge in modern virtual exhibitions since 2020. Students will engage in practical applications that will prepare them for future academic work in museum studies and/or future employment or volunteer work in museums.
Learning Outcomes
1. Explain the basic concepts and terminology used in designing museum exhibits.
2. Differentiate the kinds of exhibitions and their intended audiences and purposes.
3. Describe the history of museum exhibitions and their evolution over time.
4. Discuss the challenges faced in designing and executing exhibitions, particularly regarding museum collections.
5. Apply the fundamental principles and practices of collections management.
6. Synthesize the fundamental principles and practices of museum exhibition planning and design including the role of the curator.

ANTH 556. Advanced Native American Intersections in Museums
3 Credits (3)
This course explores the changing relationships and complex intersections between Native people and museums. We will examine how museum practices of collection and exhibition influence ways in which knowledge is formed and presented, and interrogate the role of museums as crucial sites for discourse around issues of ownership, indigenous knowledge and representation. Case studies revealing shifting meanings of objects, curatorial challenges, the development of tribal museums and repatriation complexities will be used to critically engage with Native responses via art, criticism and legal action. Crosslisted with: ANTH 456.

ANTH 558. Advanced Gender and Reproduction
3 Credits (3)
This course examines biocultural variation in reproductive health and birth practices. Human reproductive events like childbirth, contraception, abortion, surrogacy, fertility treatment, and conception, are not only biological in nature, but are also shaped by cultural beliefs and social, medical, and political institutions. Through cross-cultural case studies, we will examine how reproductive experiences are impacted by health-related ideas and medical technologies, and by national and international population policies. We will explore how pregnancy, menstruation, birth, menopause, and fertility control provide sites for gender formation,

the reproduction of social inequalities, and state regulation of national populations.

Learning Outcomes

1. Identify the fundamental concepts, modes of analysis, and central questions of the anthropology of reproduction.
2. Learn how to use a cross-cultural approach to understand reproductive health.
3. Gain proficiency in the use of critical thinking skills in their assessment of ethnographic writing.
4. Summarize key historical and contemporary debates in the field of reproductive health.
5. Apply knowledge of peoples' reproductive practices, and gendered identities and sexual lifeways in a range of social contexts.
6. Articulate, in oral and written forms, the central issues in reproduction and culture.

ANTH 560. Advanced Forensic Anthropology
3 Credits (3)

Overview of the field of forensic anthropology. Topics covered include basic human osteology; skeletal examination and documentation; skeletal trauma; personal identification; forensic taphonomy and the process of decomposition; archaeology and scene processing; sex, age, stature, and ancestry estimation; and contemporary issues and limitations in the field of forensic anthropology.

Learning Outcomes

1. Understand how scientific findings from fields like biological anthropology are applied in forensic anthropology.
2. Understand the history and range of applications of forensic anthropology.
3. Gain a practical understanding of the methods, applications, and limitations of forensic anthropology as relates to police and other investigations.
4. Gain a practical understanding of how forensic anthropologists identify human bones and the process of building a biological profile of human remains.
5. Understand processes like decomposition and recovery of remains at crime scenes.

ANTH 564. Advanced Curation Crisis in Archaeology
3 Credits (3)

This collection management course will introduce students to collections curation, collections care, and collections-based research. Archaeological collections stewardship begins before an archaeologist steps foot into the field and continues well after the recovered collections reach the repository. This course provides students with an understanding of the curation#"crisis"#using archaeological collections curated at the University Museum as a case study and the responsibilities that archaeologists have to the collections they generate.

Learning Outcomes

1. Learn about the maintenance of archaeological and repository collections over time
2. Learn about the management of, access to, and use of archaeological collections
3. Learn about the curation crisis at a small museum (e.g., Kent Hall University Museum)
4. Learn about collections-based research
5. Learn about the development of a small as well as large archaeological database
6. Learn about various ways of disseminating archaeological collections to the public
7. Change the perception of the "just digging and we will deal with the collections later" approach.

ANTH 565. Paleoethnobotany
3 Credits (3)

Paleoethnobotany, the study of the human use of plants in antiquity, uses plant remains recovered from archaeological sites to address a broad range of topics. Paleoethnobotanical data can be used to investigate social, economic, and environmental issues including the shift from hunting and gathering to farming, adaptations to climate shift, the development of state-level societies, and social hierarchies to name a few topics. This course introduces the deposition, preservation, sampling, recovery, identification, description, and interpretation of paleoethnobotanical remains. This course is arranged around 1) exploring the major classes of plant remains likely to be encountered in archaeological sites; 2) identifying these remains and organizing the data to make interpretable results; and 3) addressing key issues within the sub-discipline including preservation, analytical methods, sampling, collection, and interpretation.

Prerequisite: ANTH 578 or ANTH 585.

Learning Outcomes

1. Learn about macro and micro botanical analysis of archaeological plant material.
2. Understand the problems and range of archaeological research using paleoethnobotanical data.
3. Gain knowledge of paleoethnobotanical analysis from sampling to interpretation.
4. Consider the broader applications of paleoethnobotanical interpretation, including economics, identity, foodways, politics, symbolism, and historical ecology.
5. Perform basic laboratory analysis.
6. Write a basic report for cultural resource management projects.

ANTH 567. Colonial New Mexico
3 Credits (3)

Between the 16th and 19th centuries, much of the region now known as New Mexico was colonized and government as New Mexico was colonized and governed as a Spanish colony and, later, as territories of the Republic of Mexico, United States, and Confederate States. These four centuries witnessed significant changes including the introduction of people, plants, animals, and diseases from Europe, Africa, and Asia; Indigenous responses to colonialism; epidemic diseases, revolutions, and wars; and the genesis of new cultural identities and practices. This class explores this turbulent period through the lens of historical archaeology.

Learning Outcomes

1. Identify and describe significant places, events, and people in New Mexico between AD 1500 and 1900 time line.
2. Explain the "Columbian exchange" in New Mexico, providing specific examples.
3. Differentiate and describe major material culture traditions pertaining to this place and time.
4. Investigate a topic, relating to this period and develop an original research paper.

ANTH 574. Advanced Human Osteology
3 Credits (3)

Advanced Human Osteology surveying the functional, developmental and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a

foundation for human evolutionary studies, bioarchaeology and forensic anthropology. May be repeated up to 3 credits. Crosslisted with: BIOL 574.

ANTH 575. Advanced Pottery Analysis in Archaeology
3 Credits (3)
This course introduces the basic concepts, methods, and approaches used in the analysis of archaeological pottery. The purpose of the course is first to provide hands-on experience with the full range of analytical techniques routinely applied to ceramic materials recovered from archaeological sites, but to also provide a contextual framework for the interpretation and evaluation of these data. Classes consist of brief introductory lectures, and seminar presentation and discussion of course readings. Lab meetings consist of exercises designed to provide you with practical experience working with the materials and measures covered in lectures and readings. Crosslisted with: ANTH 375.

Learning Outcomes

1. Students will learn the theory underlying pottery analysis as well as some of the methods used to identify and interpret pottery;
2. Students will learn to think about the organization of pottery technology from a behavioral rather than a purely typological framework;
3. Students will have the opportunity to develop and then evaluate a research question or problem statement within a chosen theoretical framework, as well as have the opportunity to evaluate that question or questions using both qualitative and quantitative analyses;
4. Students will gain the skills needed to assess pottery analysis reports and undertake pottery analyses for senior thesis, M.A. theses, and CRM contexts.

ANTH 576. Lithic Technology Organization
3 Credits (3)
Advanced seminars and laboratory exercises to learn and develop techniques and methods that will help us determine how to interpret behavioral and cultural information from lithic (stone tool) data. Consent of Instructor required.

ANTH 577. Advanced Zooarchaeology
3 Credits (3)
Detailed study and analysis of taphonomic processes affecting animal bone recovered from archaeological and paleontological contexts.

ANTH 578. Advanced Lab Methods in Archaeology
3 Credits (3)
In this course students learn how to process, analyze, and produce technical reports describing artifacts collected from archaeological sites.

Learning Outcomes

1. Identify different categories and types of archaeological materials.
2. Use relevant computer programs to inventory and analyze artifacts.
3. Explain how research design determines analytical methods and shapes interpretations.
4. Describe the methods and results of an artifact analysis in a technical report.
5. Discuss our ethical obligation to preserve collections for future researchers, while recognizing the challenges involved in this endeavor.

ANTH 579. Qualitative Data Analysis and Interpretation
3 Credits (3)
This course focuses on methods for qualitative data analysis, both computer-assisted and non-computer-assisted, and interpretation. It includes writing up data for academic articles or theses.

ANTH 585. Method and Theory in Archaeology
3 Credits (3)
Focus on major methodological and theoretical aspects of contemporary archeology.

ANTH 587. Field Work in Latin America
3-12 Credits
Covers anthropological field methods in Latin America that also incorporate in-field lab analysis. No S/U grading.
Prerequisite: consent of instructor.

ANTH 596. Readings
1-6 Credits
Individual study of selected readings and topics. May be repeated for a maximum of 6 credits. Consent of instructor required.

ANTH 597. Internship
1-9 Credits
Anthropological or archaeological internship in private, state, or federal agency. May be repeated for a maximum of 18 credits. Consent of instructor required. Restricted to ANTH majors.
Prerequisite(s): graduate standing.

ANTH 598. Special Research Problems
1-6 Credits (6)
Individual analytic or experimental investigations. May be repeated under different subtitles for a maximum of 6 credits. Consent of instructor required. Restricted to ANTH majors.
Prerequisite(s): graduate standing.

ANTH 599. Master's Thesis
1-15 Credits
Thesis. Consent of instructor required. Restricted to ANTH majors.
Prerequisite(s): graduate standing.

ARCH-ARCHITECTURE

ARCH 1115. Introduction to Architectural Graphics
4 Credits (2+4P)
Introduction to manual and digital drawing as well as modeling techniques for architectural and interior design. Students will learn how to represent composition, form and space by orthographic drawing, paraline and perspective views, and freehand sketching. Three-dimensional model building techniques will also be introduced. May be repeated up to 4 credits.

Learning Outcomes

1. Demonstrate an understanding of orthographic projection, multi-view drawings, plan, section, and elevation.
2. Demonstrate a knowledge of graphic standards such as line types, line weights, hatch/poche, symbols, dimensioning, annotation, key noting, cross-referencing, according to industry conventions.
3. Draw from observation and perform conceptual sketching and diagramming.

ARCH 1120. Introduction to Architecture
3 Credits (2+2P)
This course provides students the tools and vocabulary to analyze, interpret, and discuss the built environment from social, historical, perceptual, and technical determinants. Students are introduced to elements, principles, and theories of architecture through their social, historical, and technical determinants. The course seeks to lay a foundation in architectural studies, including introducing students to fundamental vocabulary and concepts.

Learning Outcomes

1. Identify and describe significant architects and iconic buildings.
2. Discuss social, cultural, and aesthetic contributions of specific architects and projects.
3. Explain architectural concepts via written and graphic communication.
4. Recall basic processes and vocabulary of architectural professional practice.
5. Understand our built environment and the language of design and architecture.
6. Understand how buildings are constructed and explain the process of development.
7. Describe and discuss design elements, principles, and theories.
8. Understand the relationships among owner, surveyors, designers, architects, engineers, and contractors.
9. Research design texts and analyze buildings, landscapes, interiors, sustainability, and products to increase knowledge of important elements of architecture and design. 1
10. Identify the various styles, periods, and movements and their social, historical, and technical impacts on architecture.

ARCH 1121. Computers in Architecture
3 Credits (2+2P)
Explore various software and photography techniques widely used in the architectural field. In addition to using industry standard CAD program as primary 2-d drafting tool, focus is to produce digital architectural models and renderings, presentation boards, and animations. Digital images will be produced and enhanced through basic techniques in photography and integration of various software. Both individual and group work will be required.

Learning Outcomes

1. Demonstrate the use of the computer and plotters/printers
2. Define and understand different terminologies
3. Demonstrate the understanding of different files using windows operating system
4. Understanding the appropriate use of the software in order to produce necessary drafting outcomes
5. Use proper plotting and printing procedures in order to increase efficiency and minimize paper waste
6. Demonstrating the use of different line types as the relate to drafting

ARCH 1122. Architectural Design Studio I
5 Credits (1+8P)
Enhancement of general graphic communication skills and introduction to fundamental design including exploration, development and defense of design concepts; structural order; 2D and 3D processes in manual and digital architectural graphic expression; model building; general communication and presentation techniques; and development of course portfolio. Course is Studio/critique-based with considerable amount of work/hours required. This course is designed to be taken during student's last year in the Pre-Architecture program at DACC. Consent of Instructor required. Restricted to Community Colleges only.
Prerequisite(s): Grade of B- or better in both ARCH 1120 and ARCH 1110.

Learning Outcomes

1. Write and speak effectively and use representational media appropriate for both within the profession and with the general public.
2. Raise clear and precise questions, use abstract ideas to interpret information, consider diverse points of view, reach well-reasoned conclusions, and test alternative outcomes against relevant criteria and standards
3. Gather, assess, record, and comparatively evaluate relevant information and performance in order to support conclusions related to a specific project or assignment.
4. Effectively use basic formal, organizational and environmental principles and the capacity of each to inform two-and three-dimensional design.
5. Apply the fundamentals of both natural and formal ordering systems and the capacity of each to inform two-and three-dimensional design.
6. Examine and comprehend the fundamental principles present in relevant precedents and to make informed choices about the incorporation of such principles into architecture and urban design projects.
7. Prepare a comprehensive program for an architectural project that includes an assessment of client and user needs; an inventory of spaces and their requirements; an analysis of site conditions (including existing buildings); a review of the relevant building codes and standards, including relevant sustainability requirements, and an assessment of their implications for the project; and a definition of site selection and design assessment criteria.
8. Respond to site characteristics, including its context and developmental patterning, the fabric, soil, topography, ecology, climate, and building orientation, in the development of a project design.
9. Design sites, facilities, and systems that are responsive to relevant codes and regulations, and include the principles of life-safety and accessibility standards. 1
10. Demonstrate the basic principles of structural systems and their ability to withstand gravitational, seismic, and lateral forces, as well as the selection and application of the appropriate structural system. 1
11. Understand the basic principles involved in the appropriate selection and application of building envelope systems relative to fundamental performance, aesthetics, moisture transfer, durability, and energy and material resources.

ARCH 1125. Design Fundamentals
3 Credits (2+2P)
Introduces fundamental principles and processes of two-, three-, and four-dimensional design. Design aesthetics, perception, technique, composition, evaluation of materials and methods, practicing design methodologies, exploring design principles and theories, and graphic authorship are explored through various types of assignments.
Prerequisite: ARCH 1120 and ARCH 1115.

Learning Outcomes

1. Demonstrate design solutions using the elements and principles of design and planning process to satisfy aesthetic and sustainable design criteria.
2. Furnish spaces by picture/sample of furniture, flooring, fabric, and finish samples.
3. Demonstrate the ability to use subtractive color theories and how color relates to space.
4. Demonstrate the ability to create basic lighting solutions.
5. Demonstrate the ability to perform space planning principles.

ARCH 1220. Architecture World History I
3 Credits (2+2P)
A survey of the development of world architecture from the ancient era to the advent of the enlightenment in Europe. Major emphasis is

on the visual, intellectual, cultural and technological aspects of the ancient and indigenous cultures of the classical and pre-modern world. Community Colleges only. Restricted to Alamogordo, Dona Ana and Grants campuses.

Learning Outcomes

1. Identify major architectural monuments from prehistory to the Renaissance (1400's) in the Western world
2. Demonstrate an understanding of major monuments, styles of architecture and building traditions of non-Western cultures
3. Recognize the relationship of movements and styles in Western architecture to their counterparts in painting and sculpture from the various historical periods
4. Describe the basic principles of urban design
5. Express an appreciation of architectural achievements and the ways in which the elements of art {line, form, color, texture, light, etc.) combine to produce objects of beauty in the built environment
6. Describe basic engineering concerns and achievements in architecture

ARCH 2112. Architectural Visualization I
3 Credits (2+2P)

Introduction to the history, theory, and emerging practices of architectural drawing. Students will learn technical workflows for 3-D digital modeling, 2-D digital drawing, and fabrication. This course will cover strategies for prescribing drawing conventions and modes of representation, including measured drawings, diagrams, orthographic views, perspectives, image-making, and rendering. May be repeated up to 3 credits.

Learning Outcomes

1. Architectural drawing conventions, such as line weights, line styles, composition, scale, notations, and orientation.
2. Graphic and compositional strategies for drawing and perspective making.
3. Conventional and unconventional approaches to modeling and drawing and the appropriate context for both.
4. Productive use and workflow of 2-D and 3-D digital software to construct architectural drawings and images.
5. Situate questions of representation within the historical and contemporary discourse on architectural environments.

ARCH 2114. Construction Documents
3 Credits (2+2P)

Basic use of CAD to produce residential, commercial, and industrial architectural working drawings, including floor plans, sections, foundation plans and details, exterior and interior elevations, framing plans, and site plans. Use and application of building and zoning codes, typical construction methods and materials, and accessibility requirements. Basic 3-D modeling, AIA layering standards, sheet layout, and construction document coordination. Restricted to: Community Colleges only.

Prerequisite(s)/Corequisite(s): DRFT 109.

Learning Outcomes

1. Create full 3D architectural project models, both via tutorials, and independently
2. Set models up as working drawings.
3. Have a working knowledge of the tools that the majority of users will use to work with Revit Architecture.
4. Project File management skills

ARCH 2115. Architecture Design Studio II
5 Credits (1+8P)

Advanced graphic communication, design, and 3D physical model representation. Focus on site analysis, programming and fundamental design issues of context, environment, program development and space planning, 2D and 3D design and presentation techniques. Course is 'Studio/critique-based' with considerable amount of outside work/hours required. This course is designed to be taken during student's last year in the Pre-Architecture program at DACC. Restricted to Alamogordo, Dona Ana and Grants campuses.

Prerequisite(s): Grade of C- or better in ARCH 1122.

Learning Outcomes

1. Write and speak effectively and use representational media appropriate for both within the profession and with the general public.
2. Raise clear and precise questions, use abstract ideas to interpret information, consider diverse points of view, reach well-reasoned conclusions, and test alternative outcomes against relevant criteria and standards
3. Gather, assess, record, and comparatively evaluate relevant information and performance in order to support conclusions related to a specific project or assignment.
4. Effectively use basic formal, organizational and environmental principles and the capacity of each to inform two-and three-dimensional design.
5. Apply the fundamentals of both natural and formal ordering systems and the capacity of each to inform two-and three-dimensional design.
6. Examine and comprehend the fundamental principles present in relevant precedents and to make informed choices about the incorporation of such principles into architecture and urban design projects.
7. Prepare a comprehensive program for an architectural project that includes an assessment of client and user needs; an inventory of spaces and their requirements; an analysis of site conditions (including existing buildings); a review of the relevant building codes and standards, including relevant sustainability requirements, and an assessment of their implications for the project; and a definition of site selection and design assessment criteria.
8. Respond to site characteristics, including its context and developmental patterning, the fabric, soil, topography, ecology, climate, and building orientation, in the development of a project design.
9. Design sites, facilities, and systems that are responsive to relevant codesand regulations, and include the principles of life-safety and accessibility standards. 1
10. Demonstrate the basic principles of structural systems and their ability to withstand gravitational, seismic, and lateral forces, as well as the selection and application of the appropriate structural system. 1
11. Understand the basic principles involved in the appropriate selection and application of building envelope systems relative to fundamental performance, aesthetics, moisture transfer, durability, and energy and material resources.

ARCH 2117. Architectural Visualization II
3 Credits (2+2P)

Students will advance on technical skills and workflows obtained in Architectural Visualization I to observe, document, transform and create multi-scalar ideas into irresistible visual expressions. This course will cover architectural drawing conventions of plan, section, elevation, axonometric projection, perspective construction, diagramming, mapping and imaging to effectively communicate design ideas through visual means. May be repeated up to 3 credits.

Prerequisite: ARCH 2111.

Learning Outcomes

1. Identify architectural conventions in orthographic projections.
2. Emphasize Architectural properties through the strategic use of drawing conventions.
3. Graphic and compositional strategies for drawing and perspective making.
4. Develop a process that transitions 2-dimensional drawings into 3-dimensional visual graphic forms.
5. Conventional and unconventional approaches to modeling and drawing and the appropriate context for both.

ARCH 2124. Professional Development and Leadership
3 Credits (2+2P)

To deepen their understanding of the architecture profession, students are encouraged to actively engage in leadership, collaboration, and community service. These experiences, along with a required internship in either Option A (Architectural Practice) or Option O (Other Qualifying Experience), provide essential real-world exposure and skill development directly aligned with architectural practice. While internships under Option A must be paid, students gaining experience under Option O may fulfill requirements through approved volunteer positions. This course is designed to support students in earning AXP hours and gaining meaningful experience in the Practice Management area, as defined by the National Council of Architectural Registration Boards (NCARB), ensuring a strong foundation in the professional standards and expectations of the field. May be repeated up to 6 credits.

Learning Outcomes

1. Develop and refine leadership skills including decision-making, delegation, conflict resolution, and team-building.
2. Adhere to ethical standards and professional codes of conduct in all aspects of practice.
3. Master professional communication techniques, including public speaking and visual presentation skills.
4. Develop strong, professional relationships with clients by understanding and addressing their goals.
5. Gain expertise in project management, including scheduling, scope management, and contract administration.
6. Understand foundational business principles essential to managing an architectural practice, including procurement processes, marketing strategies, proposal development, and operational efficiency.
7. Comply with legal and regulatory requirements governing architectural practice, including contract law and delivery methods.
8. Foster collaborative environments that support productivity, innovation, and positive interpersonal dynamics within design teams.
9. Demonstrate integrity, accountability, and transparency in decision-making, client interactions, and project execution. 1
10. Effectively engage with clients, stakeholders, and the public, managing expectations and building trust through clear, responsive dialogue. 1
11. Participate in community-based projects and design initiatives that serve the public interest and promote civic engagement. 1
12. Develop systems for responding to RFIs and design changes, ensuring that projects remain on track and within defined parameters. 1
13. Engage in lifelong learning and professional development to stay current with industry practices and expand leadership and technical competencies.

ARCH 2220. Architectural World History II
3 Credits (2+2P)

A survey of the development of world architecture from the enlightenment in Europe to the present. Community Colleges only. Restricted to Alamogordo, Dona Ana and Grants campuses.

Prerequisite(s): ARCH 1220 or consent of instructor.

Learning Outcomes

1. Identify major architectural monuments from 1400 to the present in the Western world
2. Identify major architectural monuments from 1400 to the present in the Western world
3. Recognize the relationship of movements and styles in Western architecture to their counterparts in design, painting, and sculpture from the various historical periods
4. Describe the basic principles of urban design
5. Express an appreciation of architectural achievements and the ways in which the elements of art (line, form, color, texture, light, etc.) combine to produce objects of beauty in the built environment
6. Analyze basic engineering concerns and achievements in architecture

ARCH 2994. Portfolio Design in Architecture
3 Credits (3)

This course is intended for Pre-Architecture students in their last semester of the program. Students develop a comprehensive portfolio that compiles, organizes, and showcases their most accomplished coursework produced in Architecture courses at DACC, in preparation for application to a 4 yr. Architecture program. Skills and techniques in architectural photography, scanning, and design layout using graphic software. Restricted to Community Colleges only.

Corequisite(s): ARCT 2115.

Learning Outcomes

1. Edit and enhance previous drawings, digital files, and models.
2. Research and learn about portfolio and layout styles.
3. Development/Presentation of Final Portfolio for application/transfer purposes, as well as presenting it to the class and other reviewers.
4. Document drawings, models, digital work and other productions accurately and effectively.
5. Organize their coursework and select the images that best showcase learned skills
6. Develop organizational habits to record and document their work and back up digital copies
7. Develop analytical skills to produce an effective layout to then produce a portfolio
8. Organize, layout and design their own portfolio.

ARCH 2995. Cooperative Experience
1-6 Credits

Supervised cooperative work program. Student employed in approved occupation; supervised and evaluated by employer and instructor. Student meets weekly with instructor. Graded S/U.

Prerequisite: consent of instructor.

Learning Outcomes

1. Varies

ARCH 2996. Special Topics
1-6 Credits

Topics subtitled in the Schedule of Classes. May be repeated for a maximum of 12 credits.
Prerequisite: consent of instructor.
Learning Outcomes
1. Varies

ARSC-ARTS & SCIENCES

ARSC 1110. Insights: University Experience for Future Careers
1 Credit (1)
Research and investigation of college majors and career opportunities.

ARSC 1115. Success Seminar
1 Credit (1)
Academic and personal strategies and campus resources to enhance scholastic achievement. May be repeated up to 1 credit.

ARSC 1120. Quantitative Foundations
3 Credits (3)
Course is designed to prepare students for College level mathematics. Initial assessments generate individualized paths to mastery of fundamental skills. Course also covers strategies and campus resources to enhance scholastic achievement. Traditional Grading with RR. May be repeated up to 6 credits.

ARSC 2511. Leadership and Mentorship Training for Arts and Sciences Student Leaders
1 Credit (1)
Leadership training for student volunteers serving in the Arts and Sciences Student Ambassador program or other student leadership roles. May be repeated up to 6 credits.
Learning Outcomes
1. Students will be able to identify leadership strengths and techniques to enhance leadership capabilities.
2. Students will be able to formulate strategies for goal setting and persistence.
3. Students will be able to identify different student support services available on NMSU main campus and their roles.
4. Students will be able to identify the different disciplines in the Arts and Sciences and their missions, and articulate their broader roles in training students.

ARSC 2996. Interdisciplinary Topics
1-4 Credits (1-4)
An interdisciplinary approach to subject matter cutting across departmental fields. Specific subjects to be announced in the Schedule of Classes. May be repeated up to 99 credits.

ARSC 3110. Prehealth Internship
1-3 Credits (30P)
Placement with an office of a health professional. May be repeated up to 3 credits.
Prerequisite: Minimum junior standing, 2.5 GPA.

ARSC 3130. Faculty Led International Travel
1-3 Credits (1-3)
This is an intensive Faculty Led International Program and earns an additional credit(s) for participation the FLiP. May be repeated up to 3 credits.

ARSC 3996. Interdisciplinary Topics
1-3 Credits (1-3)
An interdisciplinary approach to subject matter cutting across departmental fields. Specific subjects to be announced in the Schedule of Classes. May be repeated up to 99 credits.

ARSC 4110. Career Readiness for Majors in Arts and Sciences
1 Credit (1)
Career preparation for graduating students with majors in the College of Arts and Sciences. Students will evaluate their academic experiences as they relate to their career goals and formulate strategies to begin and build their careers.
Learning Outcomes
1. Students will evaluate their academic experiences as they relate to their career goals.
2. Students will demonstrate an understanding of how their educational experiences relate to post-graduation opportunities.
3. Students will learn to build and present a professional portfolio.

ARSC 4550. Topics in Pharmacy
12-18 Credits (12-18)
This course accepts the transfer of credits from the University of New Mexico College of Pharmacy to New Mexico State University for students who are participants in the UNM/NMSU Cooperative Pharmacy Program. May be repeated up to 18 credits.

ARSC 4555. Advanced Topics in Pharmacy
12-18 Credits (12-18)
This course accepts the transfer of credits from the University of New Mexico College of Pharmacy to New Mexico State University for students who are participants in the UNM/NMSU Cooperative Pharmacy Program. May be repeated up to 18 credits.

ARTH-ART HISTORY

ARTH 1115G. Orientation in Art
3 Credits (2+3P)
A multicultural examination of the principles and philosophies of the visual arts and the ideas expressed through them.
Learning Outcomes
1. Identify elements of art principles of design.
2. Articulate the relationship of art to the human experience.
3. Write and discuss critically using the vocabulary of art.
4. Interpret art within cultural, social, personal, and historical contexts.
5. Critically analyze an original work of art.

ARTH 2110G. History of Art I
3 Credits (3)
This survey course explores the art and architecture of ancient pre-historic cultures through the end of the fourteenth century. While focused primarily on the art of the Western civilizations, this course will also provide insights into the works of other major cultures in order to provide alternate views of art and history. Emphasis will be placed on the relationship of artworks to political, social, spiritual, intellectual, and cultural movements that affect and are affected by their creation and development.
Learning Outcomes
1. Identify major artworks from a variety of regions and time periods.
2. Investigate the methods of producing various works of art.
3. Articulate an understanding and appreciation for the political, social, spiritual, intellectual, and cultural contexts of art forms.
4. Comprehend and apply terms, methodologies and concepts common to studies of art history, developing a language to further understanding of art.
5. Compare works across a range of historical styles and periods.

ARTH 2120G. History of Art II
3 Credits (3)
This survey course will explore the architecture, sculpture, ceramics, paintings, drawings, and glass objects from the 14th century to the modern era. While focused primarily on the art of the Western civilizations, this course will also provide insights into the works of other major cultures in order to provide alternate views of art and history. Emphasis will be placed on the relationship of artworks to political, social, spiritual, intellectual, and cultural movements that affect and are affected by their creation and development.May be repeated up to 3 credits.
Learning Outcomes
1. Identify major artworks from a variety of regions and time periods.
2. Investigate the methods of producing various works of art.
3. Articulate an understanding and appreciation for the political, social, spiritual, intellectual, and cultural contexts of art forms.
4. Comprehend and apply terms, methodologies and concepts common to studies of art history, developing a language to further understanding of art.
5. Compare works across a range of historical styles and periods.

ARTH 2136. Writing in Art
3 Credits (3)
This class looks at the variety of writings associated with art history and studio art practice. It explores the discipline of art history itself, and introduces students to the specific ways in which art historians study art. Within a workshop setting, students will practice approaches to research, understanding art and writing about art. Students will also be introduced to professional writing practices, including digital formats, relating to studio art.
Learning Outcomes
1. Develop visual literacy in looking at art.
2. Analyze a complex art historical argument.
3. Apply art specific vocabulary to critically-based writings and discussions of art.
4. Develop writing skills to articulate the relationship of art to the human experience.

ARTH 2996. Special Topics in Art History
3 Credits (3)
Presents various topics. May be repeated up to 9 credits.

ARTH 300. Special Topics in Art History
3 Credits (3)
Specific subjects to be announced in the Schedule of Classes, individual topics may not be repeated . Restricted to Las Cruces campus only. May be repeated up to 12 credits.
Prerequisite: ARTH 2110G, ARTH 2120G, and ARTH 2136 or consent of instructor.
Learning Outcomes
1. Analysis of specific problems in art history
2. Evaluate approaches to specific problems in art history

ARTH 311. Art of China I: Neolithic to Song Dynasty
3 Credits (3)
Survey of the art of China from the neolithic period to the end of the Song dynasty. Non-majors welcome.
Prerequisite: ARTH 2110G, ARTH 2120G, and ARTH 2670 or HIST 2250G and HIST 2251G or consent of instructor.
Learning Outcomes
1. identify the principal periods and dynasties up to the Song dynasty and the major political, philosophical and religious ideas that emerged during those periods.
2. describe the principal stylistic characteristics of two-dimensional and three-dimensional artworks and architecture for each period
3. Analyze how the form, function and style of art corresponds to religious beliefs and funerary practices
4. identify some of the major monuments of Chinese painting and be able to discuss their specific historical contexts and meaning
5. Identify basic elements of Buddhist and Taoist iconography

ARTH 312. Art of China II: Song Dynasty to Today
3 Credits (3)
Survey of art, architecture and landscape design of China from the Song Dynasty to the present day Crosslisted with: ARTH 512.
Prerequisite(s): ARTS 2671 or ARTH 2110G or HIST 2250G and HIST 2251G or consent of instructor.

ARTH 336. Race and Art
3 Credits (3)
Traces race, representation and appropriation through a historical and cultural lens. Issues of identity up to and including contemporary visual expression are examined. Non-majors welcomed. Each topic may be taken one time.
Prerequisite: ARTH 2110G, ARTH 2120G, and ARTH 2136 or consent of instructor.
Learning Outcomes
1. Recognize how identity is perceived and constructed and the contemporary challenges to the creation of the "Other"
2. identify and place art objects within political, social, artistic and philosophical contexts.
3. Acquire the tools to determine how issues of race and identity are being explored and understood today.
4. Interpret and evaluate the relationship of art to the human experience

ARTH 342. Global Modernisms
3 Credits (3)
Examines themes and monuments from the late 19th century to 1968, emphasizing modern and avant-garde cultural practices.
Prerequisite: ARTH 2110G, ARTH 2120G, ARTH 2136, or consent of instructor.
Learning Outcomes
1. Identify and place art objects within political, social, artistic and philosophical contexts.
2. Summarize the major styles and practices that emerged in the Twentieth Century
3. Analyze the importance of context for these major styles
4. Explain different methodologies of Art History and their relevance for understanding Twentieth Century Art
5. Apply art specific vocabulary to critically based writings and discussions of the art objects studied
6. Develop analytical processes, writing skills and research methodology to interpret and articulate the relationship of art to the human experience.

ARTH 343. Contemporary Global Art Practices
3 Credits (3)
Examines the myriad of contemporary art practices, media, and forms from 1968 to the present.
Prerequisite: ARTH 2120G, ARTH 2136; or consent of instructor.

Learning Outcomes

1. Identify and place art objects within political, social, artistic and philosophical contexts.
2. Summarize the major styles and practices that emerge in the Contemporary period
3. Analyze the importance of context for these major styles and practices
4. Explain different methodologies of Art History and their relevance for understanding Contemporary Art
5. Apply art specific vocabulary to critically based writings and discussions of the art objects studied
6. Develop analytical processes, writing skills and research methodology to interpret and articulate the relationship of art to the contemporary human experience.

ARTH 344. Gender, Sexuality, and Art in the Americas
3 Credits (3)

This course examines woman power/trans/ queer discourses of both the global south and those of people of color in the United States in relation to art from Latin, Central, and North America.
Prerequisite: ARTH 2110G, ARTH 2120G, and ARTS 2136, or consent of instructor.

Learning Outcomes

1. Identify and analyze arguments and problems within gender and sexualities of the global south
2. Locate works of art in relation to the cultures from which they originate, historicizing and contextualizing them in socio-political histories
3. Identify and employ methodology(ies) and theoretical approaches salient to the specific forms of art practice which they are studying
4. Evaluate, comment upon, and formulate approaches to the artistic practices of people of the Americas based in feminist, decolonial methodologies

ARTH 345. Latin American Film
3 Credits (3)

Surveys films and their histories from Latin American and the LatinX diaspora.
Prerequisite: ARTH 2110G, ARTH 2120G, and ARTS 2136, or consent of instructor.

Learning Outcomes

1. Discuss, distinguish among, and analyze film techniques, genres, distribution systems, and movements, particularly as they relate to Latin America
2. Demonstrate an historical understanding of the political histories, movements, and changes in Latin America
3. Locate films in relation to the cultures from which they originate, historicizing and contextualizing them in socio-political histories
4. Identify and employ methodology(ies) and theoretical approaches salient to filmic

ARTH 346. Museum and Curatorial Studies
3 Credits (3)

This museum and curatorial studies course surveys practices, objects, and histories.
Prerequisite: ARTH 2110G, ARTH 2120G, and ARTS 2136, or consent of instructor.

Learning Outcomes

1. Historicize the development of museums, patronage, collecting, looting, and restitution; noting distinctions between cultures, geographic regions, and nation-state systems
2. Identify and analyze arguments and problems within museum studies
3. Distinguish between the professional positions, institutional functions, and governing missions within and among of distinct types of art institutions
4. Evaluate, comment upon, and formulate approaches to exhibition design in both their practical and ideological functions

ARTH 444. Art and Life in Renaissance Italy
3 Credits (3)

Examines how Italian Renaissance textual and visual culture offered Europe new ways of seeing and portraying itself. 1350-1550. Topics include: Florence, Venice, Rome, Leonardo, Michelangelo, titian, humanism, the Medici, and republican and courtly culture.
Prerequisite(s): ARTH 2110G, ARTH 2120G, ARTS 2671, or consent of instructor.

ARTH 477. Independent Research in Art History
1-9 Credits (1-9)

Advanced research on special problems to be conducted under supervision of art history faculty. May be taken up to 12 credits. Consent of instructor required.

Learning Outcomes

1. Student will analyze approaches to a problem in art history
2. Student will evaluate approaches to a problem in art history
3. Student will formulate approaches to address a problem in art history

ARTH 478. Seminar in Art History
3 Credits (3)

Reading, research, and discussion of advanced problems. Topics will be announced in the course schedule. Each topic may be only taken once. Non-art/art history majors, contact instructor for consent.
Prerequisite: ARTH 2110G, ARTH 2120G and ARTH 2136, and one 300 level ARTH course or consent of instructor.

Learning Outcomes

1. Analyze problems in art history
2. Propose a hypothesis relating to a problem in art history and support conclusions through research
3. Evaluate various approaches to problems in art history

ARTH 479. Methodologies and Theories of Art and Art History
3 Credits (3)

Theories and methodologies in art, art history and art criticism; taught with ARTH 579
Prerequisite: ARTH 2110G, ARTH 2120G, ARTH 2136 and one 300 level art history course or consent of instructor.

Learning Outcomes

1. understand the history of the discipline of art history, its origins, and its institutional developments
2. Assess the strengths and limitations of various approaches and methods to interpreting works of art
3. identify the methodology employed in an art historical argument
4. apply a variety of methodological and critical approaches to interpreting a work of art and assess the strengths and limitations of those applications
5. recognize strategies of art practice that correspond to different methodological and critical approaches

ARTH 500. Special Topics in Art History
3 Credits (3)
Specific subjects to be announced in the Schedule of Classes. Individual topics may only be taken one time. Students must be Graduate students to enroll.
Learning Outcomes
1. Analyze specific problems in Art History
2. Evaluate approaches to specific problems in Art History

ARTH 511. Art of China I: Neolithic to Song Dynasty
3 Credits (3)
Survey of the art of China from the neolithic period to the Song dynasty. Student must be a Graduate student to enroll.
Learning Outcomes
1. Identify the principal periods and dynasties up to the Song dynasty and the major political, philosophical and religious ideas that emerged during those periods.
2. Describe the principal stylistic characteristics of two-dimensional and three-dimensional artworks and architecture for each period
3. Analyze how the form, function and style of art corresponds to religious beliefs and funerary practices.
4. Identify some of the major monuments of Chinese painting and be able to discuss their specific historical contexts and meaning
5. Identify basic elements of Buddhist and Daoist iconography

ARTH 536. Race and Art
3 Credits (3)
This course explores the visual expression of race and identity in art and visual culture from a diverse geographical and historical range. Each topic may only be taken one time. Crosslisted with: ARTH 336. Students must be Graduate students to enroll.
Learning Outcomes
1. Recognize how identity is perceived and constructed and the contemporary challenges to the creation of the "Other"
2. Identify and place art objects within political, social, artistic and philosophical contexts.
3. Acquire the tools to determine how issues of race and identity are being explored and understood today.
4. Interpret and evaluate the relationship of art to the human experience.
5. Formulate a question concerning race and art and using analysis, evaluate the research on that question and create an original argument.

ARTH 542. Global Modernisms
3 Credits (3)
Examines themes and monuments of created from the end of the 19th century to 1968 emphasizing modern and avant-garde cultural practices. Crosslisted with: ARTH 342. Students must be Graduate students to enroll.
Learning Outcomes
1. Identify and place art objects within political, social, artistic and philosophical contexts.
2. Summarize the major styles that emerged in the early Twentieth Century to 1968
3. Analyze the importance of context for these major styles
4. Explain different methodologies of Art History and their relevance for understanding the art of this period
5. Apply art specific vocabulary to critically based writings and discussions of the art objects studied
6. Formulate a question in art history relating to the topic of the course, evaluate and assess research, and create an original argument concerning that problem

ARTH 543. Contemporary Global Art Practices
3 Credits (3)
Examines the myriad of contemporary art practices, media, and forms from 1968 to the present. Crosslisted with: ARTH 343. Students must be in Graduate standing to enroll.
Learning Outcomes
1. Identify and place art objects within political, social, artistic and philosophical contexts.
2. Summarize the major styles and practices that emerge in the Contemporary period
3. Analyze the importance of context for these major styles and practices
4. Explain different methodologies of Art History and their relevance for understanding Contemporary Art
5. Apply art specific vocabulary to critically based writings and discussions of the art objects studied
6. Formulate a question in contemporary art, evaluate and assess research, and create an original argument concerning that problem

ARTH 544. Gender, Sexuality, and Art in the Americas
3 Credits (3)
This course examines woman power/trans/ queer discourses of both the global south and people of color in the United States in relation to art from Latin, Central, and North America. Cross-listed with ARTH 344. Students must be in graduate standing to enroll.
Learning Outcomes
1. Identify and analyze arguments and problems within gender and sexualities of the global south
2. Locate works of art in relation to the cultures from which they originate, historicizing and contextualizing them in socio-political histories
3. Identify and employ methodology(ies) and theoretical approaches salient to the specific forms of art practice which they are studying
4. Evaluate, comment upon, and formulate approaches to the artistic practices of people of the Americas based in feminist, decolonial methodologies

ARTH 545. Latin American Film
3 Credits (3)
Surveys films and their histories from Latin American and the LatinX diaspora. Taught with ARTH 345. Students must be in graduate standing to enroll.
Learning Outcomes
1. Discuss, distinguish among, and analyze film techniques, genres, distribution systems, and movements, particularly as they relate to Latin America
2. Demonstrate an historical understanding of the political histories, movements, and changes in Latin America
3. Locate films in relation to the cultures from which they originate, historicizing and contextualizing them in socio-political histories
4. Identify and employ methodology(ies) and theoretical approaches salient to filmic works

ARTH 546. Museum and Curatorial Studies
3 Credits (3)

This museum and curatorial studies course surveys practices, objects, and histories. Taught with ARTH 346. Students must be in graduate standing to enroll.

Learning Outcomes

1. Historicize the development of museums, patronage, collecting, looting, and restitution; noting distinctions between cultures, geographic regions, and nation-state systems
2. Identify and analyze arguments and problems within museum studies
3. Distinguish between the professional positions, institutional functions, and governing missions within and among of distinct types of art institutions
4. Evaluate, comment upon, and formulate approaches to exhibition design in both their practical and ideological functions

ARTH 578. Seminar in Art History
3 Credits (3)

Reading, research, and discussion of advanced problems in art history; rotating topics will be announced in the course schedule. Individual topics may only be taken once. Student must be Graduate students to enroll.

Learning Outcomes

1. Analyze advanced problems in art history
2. Evaluate approaches to advanced problems in art history

ARTH 579. Graduate Seminar: Art Theory, Criticism, Historiography
3 Credits (3)

Theories and methodologies in art history and art criticism.
Prerequisite: graduate standing.

ARTH 597. Independent Study in Art History
3 Credits (3)

Supervised independent study in topics in art history. Students must be in graduate standing to enroll.

Learning Outcomes

1. Student will formulate a question in art history, evaluate and assess research, and create an original argument concerning that problem

ARTH 599. Art History Thesis
1-15 Credits (1-15)

Art history master's thesis research. Students must be in Graduate standing to enroll.

Learning Outcomes

1. Student will formulate a question in art history, evaluate and assess research, and create an original argument concerning that problem

ARTS-ART STUDIO

ARTS 1121. Studio Core I: Concept Development-Process and Play
3 Credits (2+4P)

This course is designed to introduce students to the process of making art from conception through research and execution without the expectation of technical proficiency in any one media area. This course focuses on a deceptively simple question. "What is Contemporary Art, and how can we make it?" Through the exploration of basic visual design concepts, collaborative learning, and interdisciplinary studio production, this course will help us to discover what it means to be an artist in the 21st century.

Learning Outcomes

1. Cultivate Creative Thinking by developing and enhancing the ability to think creatively and generate original ideas through the embracing of divergent thinking and exploration of the artistic process.
2. Apply Creative Problem Solving to address artistic challenges and demonstrate the capacity to find innovative solutions.
3. Demonstrate ability to integrate multidisciplinary strategies to enhance creative expression.
4. Use creative thinking to explore and express emotional experiences and cultural perspectives.
5. Engage in reflective practices to analyze and understand one's own creative process and critically assess its effectiveness.

ARTS 1122. Studio Core II: Formal Structure Tools & Techniques
3 Credits (3)

Introduce students to formal design concepts as well as to various technical skills and tools in order to explore and develop innovative forms of artistic expression.

Learning Outcomes

1. Analyze and interpret visual elements within artworks, recognizing the application of formal design concepts.
2. Demonstrate an understanding of how formal design concepts contribute to effective visual communication and apply an understanding of how aesthetics enhance the overall impact and quality of artistic creation.
3. Explore and apply technical skills across a range of artistic mediums, including traditional and digital formats.

ARTS 1145G. Visual Concepts
3 Credits (2+4P)

Visual Concepts is an introduction to the philosophies of art, visual thinking, and principles of visual organization. Designed to give students a broad view of aesthetic traditions, ideologies, and techniques basic to the creation and evaluation of art. Principles and concepts are taught in a common lecture and applied in parallel small studio sections. For non-art majors only.

Learning Outcomes

1. Develop understanding of history, major styles and contemporary issues in art.
2. Introduce students to the language of visual perception and aesthetic evaluation.
3. Introduce students to the fundamental processes of visual perception and artistic expression.
4. Develop students' confidence in using various art materials for artistic expression.
5. Develop students' ability to verbalize ideas and processes in art making.
6. Develop student's ability to communicate through writing about art and art experiences.

ARTS 1240. Design I
3 Credits (3)

This course introduces the fundamentals of two-dimensional design as it applies to fine art and commercial contexts. Emphasis will be on basic color theory, elements of dynamic composition, vocabulary of visual arts and design, and development of visual conceptual skills. Students will use a variety of materials and techniques. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Produce art works that apply and organize the elements of two-dimensional form (line, shape, value, texture, color and space).
2. Produce artworks that apply the principles of two-dimensional design (harmony, variety, repetition, balance, rhythm, proportion, dominance, movement, and economy).

3. Demonstrate effective use of materials and techniques with consideration for craftsmanship and presentation.
4. Use visual art vocabulary in the development and critique of work
5. Explore concepts and ideas: from conceptual, realistic/referential to non-representational

ARTS 1250. Design II
3 Credits (3)
This course introduces the basic formal (aesthetic), spatial, and physical aspects of 3-D form as they can be applied to sculptural and functional design. Techniques that explore structure, mass, volume, scale, surface, form, and function are covered, along with various media, which may include paper, wood, clay, and/or metal. Restricted to Community Colleges campuses only.
Learning Outcomes
1. Apply the artistic qualities of the elements of art and principles of design to three-dimensional form.
2. Create 3 dimensional form using varied sculptural methods, construction techniques and media.
3. Produce 3 D design projects safely with proper use of equipment and materials.
4. Apply realistic, referential, and abstract concepts and ideas to projects.
5. Demonstrate knowledge of 3-D related art vocabulary, origin and trends in sculpture, and 3-D design fundamentals.

ARTS 1310. Introduction to Ceramics
3 Credits (2+4P)
This course introduces the technical processes and conceptual concerns of working with ceramic material. Various methods of forming functional and expressive works out of clay are explored. Methods used include handbuilding and throwing, basic clay bodies, slip and glaze, and atmospheric firing.
Learning Outcomes
1. Explain the transformation of the ceramic material from raw clay form to glazed ceramic object
2. Demonstrate proficiency of technical ceramic skills
3. Explain larger concepts and design principles
4. Apply basic 3-D design principles in the formation of a work of art, as they apply to the ceramic media
5. Create ceramic works of art based on conceptual prompts
6. Critically evaluate a variety of artwork
7. Gain an understanding of the history of ceramic art from a multicultural perspective

ARTS 1320. Ceramics I
3 Credits (2+4P)
An introduction to the medium of clay incorporating hand building and wheel throwing to introduce the student to both the sculptural and utilitarian uses of clay. The student will also be introduced to a variety of glazing and firing techniques
Learning Outcomes
1. Demonstrate through critical discourse or writing an introductory knowledge of the history of ceramics, and ceramic language and terminology.
2. Demonstrate through mechanical application an introductory knowledge of the properties of clays, glazes, and a variety firing techniques.
3. Produce a body of work that exemplifies good ceramic design through the effective use of form, surface, and color.
4. Through the production a body of work demonstrate competency in hand building and throwing on the wheel.

ARTS 1410. Introduction to Photography
3 Credits (2+4P)
This course introduces the making of photographic images from a broad viewpoint to consider both as an art practice and as a cultural practice. The course covers technical information on camera use and functionality, composition and visual design, digital workflow and editing, professional functions of manipulating and enhancing images, and printing correctly and effectively. The historical aspects of photography are also covered.
Learning Outcomes
1. Gain fluency with basic camera function as well as a working knowledge of other photographic equipment and software to produce technically competent photographs.
2. Have a familiarity with current image-editing software to enhance images as well as developing a digital workflow for the management of digital images.
3. Be able to develop creative solutions to visual photographic problems.
4. Gain awareness of contemporary issues in contemporary art photographic practice that can be applied to the one's own individual practice.
5. Develop the ability to critically analyze and discuss photographic images.
6. Print and produce a final project that demonstrates synthesis of ideas presented in the course readings, critiques, and individual research.
7. Demonstrate photographic terminology, and the many ways photographs function in society, both currently and historically.

ARTS 1520. Digital Media I
3 Credits (2+4P)
This course provides an introduction to two of Adobe's major software applications, Illustrator and Photoshop, which are essential in creating artwork, designing promotional materials, websites and more. Part of the course deals with creating a variety of documents using the major tools of each program, and gaining an understanding of the contemporary graphic design industry and basic elements and principles of design. Community Colleges only.
Learning Outcomes
1. Demonstrate appropriate skills in configuring and navigating computer systems software applications as appropriate to digital image making needs including organization of files using keywords and running batch processes.
2. Exhibit an understanding of a layer based bitmap editing program, through photo retouching, precise use of selection tools, and color adjustment techniques.
3. Create imagery using a vector based illustration program which demonstrates an understanding of vector based drawing tools.
4. Integrate the use of bitmap and vector images using bitmap and vector based image making applications to demonstrate a basic understanding of composition, color, and appropriate image size and resolution.

ARTS 1543. Digital and Analog Drawing: Bridging Tradition and Technology
3 Credits (3)
An introduction to the historical foundations and contemporary potential of drawing that combines digital and traditional approaches. students will develop their ability to create and manipulate images by hand and with the aid of a computer, and learn to compare, translate, and integrate

visuals made by old and new technologies. Students will gain a better understanding of digital tools, their expressive capacities, and their application within the context of drawing.

Learning Outcomes

1. Demonstrate proficiency in traditional drawing fundamentals (including line, value, perspective, and proportion) as well as the formal principles of composition.
2. Develop a working knowledge of traditional drawing materials and supports; digital drawing and 3d-modeling software, such as Adobe Photoshop, Adobe Illustrator, and SketchUp and competency in hardware (including scanners, printers, vinyl/laser cutters, monitors, and projectors.
3. Apply observational drawing skills to digital drawing while demonstrating an understanding of digital drawing's unique materiality.
4. Demonstrate critical thinking and problem-solving skills through the analysis and critique of traditional and digital drawings.
5. Understand historical foundations of drawing and articulate how this intersects with contemporary technologies and approaches.

ARTS 1610. Drawing I
3 Credits (2+4P)

This course introduces the basic principles, materials, and skills of observational drawing. Emphasis is placed on rendering a 3-D subject on a 2-D surface with visual accuracy. Other topics include historical and contemporary references as well as an investigation of linear perspective, line, value, shape, space & composition.

Learning Outcomes

1. Produce drawings that demonstrate techniques and mechanics of observational drawing.
2. Demonstrate competency in the following practices: measuring and sighting, gesture, contour line, negative space, shape, value, space, volume, plane and texture.
3. Create drawings primarily from observation with black and white traditional drawing media.
4. Demonstrate effective verbal or written response to one's own art and the art of others.

ARTS 1630. Painting I
3 Credits (2+4P)

This course introduces the tradition of painting as a medium for artistic expression. Students will investigate materials, tools, techniques, history and concepts of painting. Emphasis is placed on developing descriptive and perceptual skills, color theory, and composition.

Prerequisite: ARTS 1610.

Learning Outcomes

1. Produce paintings that demonstrate the tradition of methods, techniques, materials, and tools of oil painting.
2. Construct a variety of support structures and grounds on which paintings are created
3. Examine the historical origins and practices of painting from the personal, social and cultural perspective.
4. Identify and apply environmentally safe painting practices, care of tools, equipment, and facilities, as well as disposal of mediums, solvents and paints.
5. Apply basic color theory to representational and non-representational painting.

ARTS 1710. Introduction to Printmaking
3 Credits (2+4P)

This course provides direct experience of exploring basic printmaking processes, including relief, intaglio, and monoprint processes, as well as the investigation of materials/media, tools, techniques, history, and concepts of printmaking. Emphasis is given to solving problems through thematic development while producing a portfolio of prints.

Learning Outcomes

1. Properly operate a printing press and safely handle materials and equipment.
2. Demonstrate an adequate ability to utilize basic historical printmaking techniques that are widely relevant to contemporary, artistic expressions.
3. Utilize formal elements of art and design (line, shape, value, texture, space, and color), to create prints that are formally sophisticated.
4. Create imagery that contains conceptual depth, which can be interpreted by viewers with regard to social, cultural, political, geographical, and/or psychological experiences and relevance.

ARTS 1711. Computer-Based Illustration
3 Credits (2+4P)

Introduction to the principles of computerized drawing and design. Using the basic concepts, drawing tools, and vocabulary of Adobe Illustrator.

Prerequisite: ARTS 1610, ARTS 1240, or consent of instructor.

Learning Outcomes

1. Demonstrate drawing with the pen tool.
2. Demonstrate the use of blending color and creating shapes.
3. Create spot colors and effectively use them in a page layout.
4. Demonstrate formatting and creating typography.
5. Demonstrate the use of layers, effects, graphic styles, symbols, and brushes
6. Demonstrate competency in creating digital graphics using of Adobe Illustrator software

ARTS 1712. Digital Graphics
3 Credits (2+4P)

Importing and exporting images and text into various desktop publishing formats. Exploring imaging, drawing, and page layout applications. Introduction to typography.

Prerequisite: ARTS 1520.

Learning Outcomes

1. Demonstrate competency in the use of InDesign software.
2. Create appropriate visual solutions based on target marketing information.
3. Demonstrate competency in the design and production of advertising and promotional materials.
4. Present ideas and concepts effectively and competently.
5. Visually demonstrate design solutions to be used in a portfolio

ARTS 1713. Web Page Design
3 Credits (2+4P)

Introduction to the creation of well-designed and organized Web sites. Emphasis on building creative but functional user-friendly sites. Introduction to HTML, Flash, Java Script, and Web-authoring software. Community Colleges only.

Prerequisite: ARTS 1520.

Learning Outcomes

1. Outline the structure and functionality of a typical website.
2. Demonstrate design and layout skills.
3. Demonstrate competency in the use of Dreamweaver software.
4. Demonstrate competency in the use of photo editing software.

5. Demonstrate skills learned for website functionality.
6. Create an Internet compatible website.

ARTS 1810. Jewelry and Small Metal Construction I
3 Credits (2+4P)
This course introduces the basic techniques, materials, and tools traditionally used in the creation of jewelry and/or small-scale sculptural objects.
Learning Outcomes
1. Apply basic jewelry fabrication techniques (such as: piercing, cold connections, soldering, metal forming, casting and stone setting) to complete projects.
2. Create design sketches of the objects prior to fabrication.
3. Demonstrate knowledge of materials and safe practices for making jewelry, as well as small functional and non-traditional objects.
4. Analyze projects through critiques, oral presentations, and discussions.

ARTS 2010. Portfolio Development
3 Credits (2+4P)
This course presents the practicalities of building an art career with emphasis on developing a professional portfolio through visual aids, resumes, statements, and presentations. It covers professional practices of the studio artist including self-promotion, contracts, research tools for exhibition venues and other art related opportunities.
Prerequisites: ARTS 1712, ARTS 2611, and ARTS 1520, or consent of instructor.
Learning Outcomes
1. Develop a portfolio package with visual aids, photographic documentation, resumes, bios and artist statements.
2. Analyze the qualifications, procedures and portfolio requirements necessary for professional art related opportunities.
3. Complete an oral presentation on a series of personal works.
4. Distinguish pathways for navigating the business side of being a professional artist.

ARTS 2430. Photographic Portraiture
3 Credits (2+2P)
This course covers the study of professional photography that involves people, including studio and environmental portraits. Topics include studio and exterior lighting techniques, and selecting lighting equipment and supplies. Restricted to: Community Colleges only.
Prerequisite(s): ARTS 1410 or FDMA 1545.
Learning Outcomes
1. Demonstrate successful operation of studio lighting equipment and accurately define lighting equipment terminology
2. Illustrate the principles of photographic lighting
3. Demonstrate and apply how to use and modify natural light effectively
4. Demonstrate understanding of different approaches such as formal, informal, candid, vernacular and their cultural implications
5. Distinguish historic and contemporary cultural notions informing different types of portraits

ARTS 2431. Introduction to Graphic Design
3 Credits (2+4P)
Introduction to the principles of visual communication and digital media, letterforms, typography and identity marks. Projects produced using conventional and digital tools.
Learning Outcomes
1. Demonstrate working knowledge of the graphic design software.
2. Identify and apply basic design concepts for the purpose of visual communication.
3. Conduct visual research and create presentations on design topics.
4. Solve graphic design problems through solving fundamental communication challenges by sketching, drawing, typographic composition, use of image and color.

ARTS 2440. Photo Finishing & Presentation
2 Credits (1+2P)
Use of visual language for personal expression. Freelance photography; care of original photos; preparation of portfolios, photographic markets, exhibitions and judging, galleries and copyrights. Students will prepare a photographic portfolio. Restricted to: Community Colleges only.
Prerequisite(s): FDMA 1545.
Learning Outcomes
1. Define your target market and create a complete “Personal Promotional Package”
2. Produce a professional Resume Cover Letter.
3. Produce a professional looking Business Card, Letterhead Mailing Labels
4. Produce a single page Promotional Piece, (and possible follow-up material)
5. Produce a PDF Formatted Portfolio (Create in Photoshop Export as PDF)
6. Produce a clean, professional looking traditional hard portfolio with 20-30 pieces
7. Present the Entire Promotional Portfolio and promo materials in a “Job Interview”

ARTS 2610. Drawing II
3 Credits (2+4P)
This course introduces color and colored media as an element of composition while emphasizing descriptive and perceptual drawing skills and conceptual approaches to contemporary drawing. Restricted to ART and ANVE/DFM majors.
Prerequisite(s): ARTS 1610.
Learning Outcomes
1. Create drawings in wet and dry color media.
2. Practice analyzing and visually translating observed subjects from realistic, referential, and/or objective form, to non-representational or abstract imagery in drawings.
3. Compose fully developed drawings that include a conceptual or historical basis.
4. Engage in effective written and oral critique in response to one’s own art and the art of others.

ARTS 2611. Advanced Computer-Base Illustration
3 Credits (2+4P)
Design custom graphics and create special effects with filtering, special effects on type, graphing, technical illustrations, and three-dimensional drawing using Adobe Illustrator.
Prerequisites: ARTS 1212, ARTS 1711, and ARTS 1520, or consent of instructor.
Learning Outcomes
1. Demonstrate competency in the use of Adobe Illustrator software.
2. Create appropriate visual solutions based on target marketing information.

3. Demonstrate competency in the design and production of advertising and promotional materials.
4. Present ideas and concepts effectively and competently.
5. Visually demonstrate design solutions to be used in a portfolio

ARTS 2616. Aspects of Drawing
2-3 Credits
Continued work in drawing with emphasis on personal creative endeavor. Community Colleges only.
Prerequisites: ARTS 1610 and ARTS 2610.
Learning Outcomes
1. Advanced skill level in the visual dynamics of line involved in the creation of drawing.
2. Advanced skill level in the visual dynamics of shape involved in the creation of drawing.
3. Advanced skill level in the visual dynamics of value involved in the creation of drawing.
4. Advanced skill level in the visual dynamics of color involved in the creation of drawing.
5. Advanced skill level in the visual dynamics in the combination of line, shape, value and color involved in the creation of drawing.

ARTS 2630. Painting II
3 Credits (2+4P)
This course focuses on the expressive and conceptual aspects of painting, building on the observational, compositional, technical, and critical skills gained previously. Students will investigate a variety of approaches to subject matter, materials, and creative processes through in-class projects, related out-of-class assignments, library research or museum/gallery attendance, written responses, and critiques. Prerequisite(s): ARTS 1610 and ARTS 1630
Learning Outcomes
1. Produce paintings building on the skills and techniques learned in Painting I
2. Solve unique format, support, ground, over and under texturing surface challenges
3. Practice analyzing and translating observed subjects from realistic, referential, and/or objective form, to non-representational imagery
4. Create paintings that explore personal content, stylization, symbolism, narrative, and/or iconography

ARTS 2635. Painting III
2-3 Credits
Continuation of ARTS 2630.
Prerequisites: ARTS 1610, ART 1240 (for art majors), ART 1630, or consent of instructor.
Learning Outcomes
1. Color mixing and color relationships
2. Create illusions of space and volume
3. The student will strengthen his or her own personal artistic style.
4. Knowledge of the proper use and maintenance of painting tools
5. Explore and learn the technique of a master painter of the past.
6. Awareness of nature, "eye hand response," and an imaginative or personal use of the medium.
7. Awareness of the creative process, exploring unforeseen possibilities
8. An ability to work independently.
9. Understanding of painting styles and arts vocabulary

ARTS 2839. Introduction to Sculpture
3 Credits (2+4P)
Beginning sculpture students "explore space" while learning new processes and skills, including mold making, welding and woodworking.
Learning Outcomes
1. Be able to utilize a variety of traditional materials and sculpture processes, including: mold making, metal fabrication/wood fabrication, and the creative integration of mixed media.
2. You will learn to differentiate between objects and installations, and be prepared to explore sculpture in upper division, topics based courses.

ARTS 2993. Art Workshop
0.5 Credits (.5)
Required for all freshman and sophomore Art majors for four semesters, this workshop is designed to build professional student cohorts within the Department of Art; incorporate visiting artist and scholar lectures into the curriculum; and actively involve students in exhibitions and gallery and departmental events. May be repeated up to 4 credits. Crosslisted with: ARTS 308. Restricted to: BA Studio Art, BA Art History BFA Studio Art, BFA Museum Conservation majors. Restricted to Las Cruces campus only.
Learning Outcomes
1. Varies

ARTS 2996. Special Topics in Studio
1-3 Credits
Specific subjects and credits to be announced in the Schedule of Classes. No more than 9 credits toward a degree.
Prerequisite: consent of instructor.
Learning Outcomes
1. Varies

ARTS 308. Art Workshop
0.5 Credits (.5)
Required for all junior and senior Art majors for four semesters, this workshop is designed to build professional student cohorts within the Department of Art; incorporate visiting artist and scholar lectures into the curriculum; and actively involve students in exhibitions and gallery and departmental events. May be repeated up to 4 credits. Crosslisted with: ARTS 208. Restricted to: BA studio art, BA Art History BFA studio art, BFA Museum Conservation majors.

ARTS 340. Internship in Art
1-9 Credits (3P)
This course provides students with the opportunity for workplace learning as an important component in their program of study. Students can identify an internship in graphic design, photography, conservation or other studio areas; or within broader arts institutions such as museums, galleries and visual arts centers which will provide them with professional experience that will support the successful achievement of their career goals in art. May be repeated up to 9 credits.
Prerequisite: ARTH 2110G, ARTH 2120G, ARTS 2136 and eighteen credits of ARTS/ARTH 2000 or ARTS/ARTH 300 studio courses.

ARTS 350. Special Topics in Intermediate Drawing and Painting
3 Credits (2+4P)
Intermediate drawing and painting course focusing on the following topics: Realism, Color, Narrative, and Abstraction. Other topics may be offered as well. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits.
Prerequisite: ARTS 1610 and ARTS 1630, or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an intermediate level drawing and painting course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in drawing and painting.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary drawing and painting.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to drawing and painting.

ARTS 355. Special Topics in Intermediate Graphic Design
3 Credits (2+4P)

Intermediate graphic design course focusing on the following topics: web design, typography, motion graphics, publication design. Other topics may be offered as well. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits.
Prerequisite: ARTS 2431 or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an intermediate level graphic design course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in graphic design.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary graphic design.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary graphic design.

ARTS 360. The Figure
3 Credits (2+4P)

Introduction to working from live models, anatomical skeletons, source images and the imagination in a variety of two-dimensional media, including painting and drawing. An emphasis is placed on anatomical accuracy and with a focus on the figure as an expressive subject. May be repeated up to 6 credits.
Prerequisite: ARTS 1610 or consent of instructor.

Learning Outcomes

1. Develop the ability to accurately observe and represent the human form from direct observation, focusing on proportions, anatomy, and spatial relationships.
2. Demonstrate a comprehensive understanding of human anatomy by accurately representing skeletal and muscular structures in proportionate and lifelike figure drawings.
3. Demonstrate proficiency in creating expressive and dynamic gesture drawings that convey movement, balance, and energy while maintaining anatomical plausibility.
4. Examine the figure as a subject for individual artistic expression, integrating personal interpretation and creative decision-making into assignments exploring how the human form can be used as a vehicle for storytelling, expressing emotion, and conveying conceptual content.

ARTS 365. Intermediate Sculpture Special Topics
3 Credits (2+4P)

Intermediate sculpture students will expand their fabrication skills in metal, wood and mixed media. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits. May be repeated up to 12 credits.
Prerequisite: ARTS 2839 or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an intermediate level sculpture course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in sculpture.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary sculpture.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary sculpture.

ARTS 370. Special Topics in Intermediate Digital Photography
3 Credits (2+4P)

Intermediate digital photography course addressing techniques and production of photo media within the context of contemporary art. Rotating topics include: Networks, Photo-book and Video art, among others. Each topic may only be taken one time. May be repeated up to 12 credits.
Prerequisite: ARTS 1410, or consent of instructor.

Learning Outcomes

1. Apply fundamental elements and principles of design to art production specific to an intermediate level photography course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in photography.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography.

ARTS 373. Intermediate Analog Photography
3 Credits (2+4P)

Introduction to skills and techniques of black and white film photography within the context of contemporary art. Emphasis on analog camera work and darkroom procedures. 35 mm SLR or rangefinder film camera required for course. May be repeated up to 6 credits.
Prerequisite(s): ARTS 1410, or consent of instructor.

ARTS 374. Intermediate Ceramics Multiples (Design and Production)
3 Credits (2+4P)

Intermediate ceramics course focusing on an introduction to the technical processes of throwing, prototyping, mold making, glaze calculation, and alternative firing.
Prerequisite: ARTS 1310 or consent of instructor.

Learning Outcomes

1. Develop the basic visual and tactile problem solving skills necessary to making one part and two part molds.
2. Demonstrate competency is using these techniques to translate basic cylindrical, spherical, and rectangular forms.
3. Develop ability to make successful clay casts from properly made molds.
4. Apply the principles of design to creating multiples: Balance, Emphasis, Rhythm, Contrast, Proportions, and Scale, Movement.
5. Develop basic skills in glazing and a variety of other surface design techniques.

6. Apply the visual element to glazing and surface design of ceramic forms: Line, Shape, Mass, Value, Color, Texture, Pattern, Space.
7. Through research, writing, and class critiques develop the ability to think, speak and write about the conceptual relevance to creating multiples in contemporary art.

ARTS 375. Intermediate Ceramics Sculptural Concerns
3 Credits (2+4P)
Intermediate ceramics course focusing on the refinement of technical skills with an emphasis on conceptual development related to materiality.
Prerequisite(s): ARTS 1310 or consent of instructor.
Learning Outcomes
1. Refine and master the basic skills in all the standard ceramic building techniques. This includes wheel throwing, coil building, and slab building.
2. Demonstrate competency is using these techniques to replicate complex geometric, organic, and figurative forms
3. Through the guidance of course assignments begin to develop original conceptual themes and natives to translate into sculptural forms.
4. Through the guidance of course assignments begin to develop original conceptual themes and natives to translate into sculptural form.
5. Refine and master glazing and surface design techniques. Begin to develop ability to mix glazes and slips.
6. Demonstrate clear understanding of the visual element to glazing and surface design: Line, Shape, Mass, Value, Color, Texture, Pattern, Space
7. Through research, writing, and class critique refine the ability to think, speak and write about contemporary ceramic sculpture in a competent and nuanced way.

ARTS 376. University Art Museum Research Internship
1-9 Credits
A competitive research internship in the NMSU University Art Museum. Requirements determined by instructor/supervising UAM professional. Students must contact the UAM in advance for instructions on how to apply. May be repeated up to 9 credits.
Prerequisite: ARTH 2110G, ARTH 2120G, ARTS 2136, ARTS 403 or consent of instructor.
Learning Outcomes
1. Students will demonstrate ability to execute variety of skills related to the running of an art museum (e.g. art handling, exhibitions, marketing, education, research, etc).

ARTS 385. Special Topics in Intermediate Metals/Jewelry
3 Credits (2+4P)
Intermediate Metals/Jewelry course focusing on the following topics: design and production, materiality and sculptural concern. Techniques may include casting, complex construction, forming, and mix media. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits.
Prerequisite(s): ARTS 1810 or consent of instructor.
Learning Outcomes
1. Apply fundamental elements and principles of design to art production specific to an intermediate level metals/jewelry course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in metals/jewelry.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary metals/jewelry.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary metals/jewelry.

ARTS 394. Special Topics in Studio
3 Credits (3)
Specific subjects and credits to be announced in the Schedule of Classes online. Topics cannot be repeated. May be repeated up to 9 credits.

ARTS 399. Conservation Principles: Methodology, Examination, Documentation
3 Credits (3)
This course offers an introduction to museum conservation and historic preservation, exploring essential techniques and contemporary challenges in the field. Students will gain an understanding of various approaches to conservation practices, treatment methods and related materials, as well as theoretical and ethical issues museum conservators must consider. The course focuses on fundamental skills in conservation examination (assessing the construction and condition of artworks/artefacts and preparing accurate reports), and documentation (recording condition utilizing digital photo documentation, stereomicroscopy, and specialized lighting techniques). Classes emphasize hands-on learning, equipping students with the fundamental skills needed to accurately assess and document condition, and methods used to analyze materials.
Learning Outcomes
1. Identify and apply various methods of digital documentation to cultural heritage objects.
2. Define and apply terminology specific to museum conservation, photo-documentation, and condition reporting.
3. Design condition reports for various types of media (e.g. paintings, archaeological objects, prints).
4. Apply critical thinking and problem-solving skills when presented with preparing written documentation and examining cultural heritage objects.
5. Describe major historical restorations and approaches to treatment.

ARTS 401. Museum Conservation Techniques I
3 Credits (2+3P)
Introduces the student to conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. This course also includes how to document the condition of an object during the conservation process.
Prerequisite: ARTS 399 or consent of instructor.
Learning Outcomes
1. Identify and explain strengths and weaknesses of the theory of conservation
2. Analyze a ceramic object through testing and observation; evaluate the results of an object to be conserved.
3. Create and defend a conservation treatment plan based on the conservation theory and the principles of conservation for cultural objects, tests results, observations, and personal experience in the lab.

4. Apply conservation and restoration techniques to the ceramic object in the lab, after analyzing, evaluating and creating a treatment plan for the object.
5. Create a Condition Report of the ceramic object by describing the condition and its treatment during the conservation process.

ARTS 402. Museum Conservation Techniques II
3 Credits (2+3P)
Continues conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation.
Prerequisite: ARTS 399 and ARTS 401 or consent of instructor.
Learning Outcomes
1. Analyze different types of materials by examining two objects, a painted canvas and a painted wood panel, through testing and observation and evaluate the results of the objects to be conserved.
2. Create and defend a conservation treatment plan based on the conservation theory and the principles of conservation for cultural objects, tests results, observations, and personal experience in the lab.
3. Apply conservation and restoration techniques to both objects in the lab, a painted canvas and a painted wood panel, after analyzing, evaluating and creating a treatment plan for the object.
4. Create a Condition Report for each object, describing the condition of the object, history, the problems the object presents, its treatment during the conservation process, and any remaining issues after treatment.

ARTS 403. Preventative Conservation/Collections Care
3 Credits (3)
Introduces the student on how to mitigate the deterioration and damage of cultural property in a museum setting through the formulation and implementation of policies and procedures. The course addresses most aspects of collections management and care for objects in storage, exhibitions and during transportation.
Learning Outcomes
1. Understand the principles of Preventive Conservation and Collections Care and develop conservation skills through recognizing, describing, explaining, locating, and reporting symptoms and causes of the agents of deterioration that affect all types of art objects
2. Apply methods of Preventive Conservation and collections care for causes of deterioration in museum collections
3. Analyze and Evaluate several museums and create a Museum Assessment that could serve a plan of action to remediate any problems encountered.
4. Create a plan for re-organizing a museum based on the Museum Assessment
5. Create a binder based on the readings from class that includes all the causes of deterioration of materials, how to prevent deterioration, and environmental control of collections.

ARTS 404. Applied Projects in Museum Conservation
3 Credits (3)
This course provides student with the practical application of techniques and policies learned in previous museum conservation coursework with the underpinnings of basic museum and conservation practices, particularly in collection care, preventive conservation, conservation, ethics, teamwork and security. Rotating special projects. May be repeated up to 6 credits.
Prerequisite: ARTS 399, ARTS 401, ARTS 402, ARTS 403 or consent of instructor.
Learning Outcomes
1. Analyze and examine the different types of materials that compose one or various objects through testing and observation and evaluate the results of the object/s to be conserved.
2. Create and defend the conservation treatment plan based on conservation theory and the principles of conservation for cultural objects, the tests results, and the observations.
3. Apply conservation and restoration techniques to the object/s in the lab after analyzing, evaluating and creating a treatment plan for the object/s.
4. Create Condition Reports, one for each object, by describing the condition of the object and its treatment during the conservation process.

ARTS 440. Internship in Art
1-9 Credits (3P)
This course provides students with the opportunity for workplace learning as an important component in their program of study. Students can identify an internship in graphic design, photography, conservation or other studio areas; or within broader arts institutions such as museums, galleries and visual arts centers which will provide them with professional experience that will support the successful achievement of their career goals in art. May be repeated up to 9 credits.
Prerequisite: ARTH 2110G, ARTH 2120G, ARTS 2136 and eighteen credits of ARTS/ARTH 2000 or ARTS/ARTH 300 studio courses.

ARTS 450. Special Topics In Advanced Drawing and Painting
3-6 Credits (2-4+4P)
Advanced drawing and painting course focusing on the following topics: Identity, Place, Spirituality, Body, and among others. Topics will be announced in the course schedule. May be repeated up to 12 credits.
Prerequisite: 3 credits of ARTS 350, or consent of instructor.
Learning Outcomes
1. Apply fundamental elements and principles of design to art production specific to an advanced level drawing and painting course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering advanced level tools and processes in drawing and painting.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary drawing and painting.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary drawing and painting

ARTS 455. Special Topics in Advanced Graphic Design
3-6 Credits (2-4+4P)
Advanced graphic design course focusing on the following special topics: special projects, identity design, storytelling, portfolio. Other topics may be offered as well. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 15 credits.
Prerequisite: 3 credits of ARTS 355, or consent of instructor.
Learning Outcomes
1. Apply fundamental elements and principles of design to art production specific to an advanced level graphic design course.

2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering advanced level tools and processes in graphic design.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary graphic design.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary graphic design.

ARTS 465. Advanced Sculpture Special Topics
3-6 Credits (2-4+4P)
Thematic classes deepen students' knowledge of contemporary sculpture and extended media through a series of interpretive assignments that culminates in a unified body of work. Special topics will be announced in the course schedule. May be repeated up to 12 credits.
Prerequisite: ARTS 365 or permission of the instructor.
Learning Outcomes
1. Apply fundamental elements and principles of design to art production specific to an intermediate level sculpture course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in sculpture.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary sculpture.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary sculpture.

ARTS 470. Advanced Digital Photography
3-6 Credits (2-4+4P)
Advanced digital photography course addressing technique and production of photo media within the context of contemporary art. Rotating topics may include: Temporality, Photo-installation and Video Art, among others. Each topic may only be taken once. May be repeated up to 12 credits.
Prerequisite: ARTS 370 or consent of instructor.
Learning Outcomes
1. Apply fundamental elements and principles of design to art production specific to an advanced digital photography course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering advanced level tools and processes in digital photography.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography.

ARTS 474. Advanced Ceramics Design and Production
3-6 Credits (3-6)
Advanced ceramics course focusing on the technical processes of throwing, prototyping, mold making, glaze calculation, and alternative firing. Discussions may also include issues of professional practice, marketing, and branding. May be repeated up to 6 credits.
Prerequisite(s): ARTS 374 and ARTS 375, or consent of instructor.
Learning Outcomes
1. Refine the basic visual and tactile problem solving skills necessary to making two part molds, and develop the ability to make complex multipart molds.
2. Demonstrate competency is using these techniques to translate complex geometric and organic forms
3. Develop pertinent conceptual reasoning for creating multiples of a form in ceramic material.
4. Demonstrate clear understanding of the principles of design in designing ceramic multiples: Balance, Emphasis, Rhythm, Contrast, Proportions, and Scale, Movement.
5. Develop basic skills in glazing and a variety of other surface design techniques.
6. Demonstrate clear understanding of the visual element of art to the glaze and surface design of ceramic multiples: Line, Shape, Mass, Value, Color, Texture, Pattern, Space,
7. Through research, writing, and class critiques refine the ability to think, speak and write about the conceptual relevance to creating multiples in contemporary art and articulate.

ARTS 475. Advanced Ceramics Sculptural Concerns
3-6 Credits (2-4+4P)
Advanced ceramics course focusing on conceptual development as it relates the creation of a unified body of work. Topics may include discussions of advanced techniques, professional practices, and contemporary issues in ceramics. May be repeated up to 15 credits.
Prerequisite(s): ARTS 374 and ARTS 375, or consent of instructor.
Learning Outcomes
1. Strive to innovate the standard ceramic building techniques in a way that contributes to, and is informed by, the field of ceramic sculpture.
2. Develop a cohesive body of work, which explores completely original concepts and themes.
3. Demonstrate clear understand of the principles of design by challenging them in an informed way.
4. Refine and master glazing and surface design techniques. Begin to develop ability to mix glazes and slips.
5. Demonstrate clear understanding of the visual element of art by challenging them in an informed way.
6. Through research, writing, and class critique refine the ability to think, speak and write about contemporary ceramic sculpture in a competent, nuanced, and critical way. Begin to measure one's work against the larger context of contemporary art.

ARTS 485. Special Topics in Advanced Metals/Jewelry
3-6 Credits (2-4+4P)
Advanced Metals/Jewelry course focusing on the following topics: conceptual development and personal aesthetic and style, professional practices, contemporary issues in Metals/Jewelry, and senior exhibition. Techniques may include enameling, coloring, historical processes, and digital technology. Topics will be announced in the course schedule. Each topic may only be taken once. May be repeated up to 12 credits.
Prerequisite: 6 credits of ARTS 385, or consent of instructor.
Learning Outcomes
1. Apply fundamental elements and principles of design to art production specific to an intermediate level metal/jewelry course.
2. Demonstrate the ability to express concepts in visual form through art making and process specific to a course covering intermediate level tools and processes in metal/jewelry.
3. Evaluate/appraise original works of art through the application of medium, tools, techniques and concepts specific to contemporary metal/jewelry.
4. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary metal/jewelry.

ARTS 490. Museum Conservation Internship
1-6 Credits (1-6)
The goal of this internship is to provide a student with a practical learning experience in preventative conservation techniques and policies so that they can relate what they have learned in the classroom from ART 403 Preventative Conservation/Collections Care to applied situations. It will provide the student an opportunity to learn skills and knowledge needing in working with museum collections. Tasks and projects will be assigned by the instructor. 3 credits required for BFA in Museum Conservation. May be repeated up to 6 credits.
Prerequisite(s): ARTS 403.

ARTS 493. Studio Core III: Professional Practices
3 Credits (3)
This course teaches how to engage as a professional practicing artist, including how to find opportunities and jobs, documenting and archiving artwork, installing art for display, shipping art, and how to apply for exhibitions and grants, among other topics.
Learning Outcomes
1. Demonstrate professionalism through understanding and application of professional standards.
2. Create a comprehensive portfolio of creative output, including written statements contextualizing this research.
3. Analyze and evaluate both one's own artwork as well as the work of others.
4. Develop an ethical framework for artistic practice and decision-making.
5. Demonstrate an awareness of the broader artistic landscape and the importance of community engagement.

ARTS 494. Special Topics in Studio
3 Credits (3)
Specific subjects and credits to be announced in the Schedule of Classes online. May be repeated up to 9 credits.

ARTS 495. Studio Core IV: Thesis Production & Display
3 Credits (3)
Special research and independent study leading to undergraduate BFA and graduate MFA thesis-exhibition. The course focuses on thesis development as well as practical training in exhibition and installation.
Learning Outcomes
1. Develop and demonstrate project management skills to plan, organize, and execute artistic projects efficiently.
2. Explore strategies for presenting artworks professionally, both in physical and digital formats.
3. Understand principles of exhibition design, including spatial considerations and audience engagement.
4. Showcase a range of artworks that demonstrate proficiency in synthesis, thesis development, and effective presentation.

ARTS 496. Fundamentals of Studio Management
1 Credit (1)
Advanced studio course designed to introduce students to the fundamentals of studio management. Includes training in proper tools use and maintenance; safety procedures; and practical experience with studio oversight. Concurrent registration in advanced level studio course of the same media area required. May be repeated for a maximum of 3 credits. Restricted to majors. Graded S/U.
Prerequisite: consent of instructor.

ARTS 499. Problems in Studio Art
1-6 Credits (1-6)
Individualized study in specialized studio areas not covered by other advanced courses. May be repeated up to 9 credits. Consent of Instructor required.

ARTS 501. Museum Conservation Techniques I
3 Credits (2+3P)
Introduces the student to conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. This course also includes how to document the condition of an object during the conservation process. May be repeated up to 3 credits. Crosslisted with: ARTS 401.

ARTS 502. Museum Conservation Techniques II
3 Credits (2+3P)
Continues conservation theory and the basic principles of conservation for cultural objects. The course integrates the history, philosophy and technologies of art conservation with knowledge of the properties of materials used in conservation. The student will learn and develop conservation skills including learning about the most frequent kinds of deterioration that can occur in various types of art objects, symptoms and causes as well as preventative and restoration techniques. Although this course provides practical experience, it also seeks to provide a broad understanding of the field of conservation. Crosslisted with: ARTS 402.
Prerequisite(s): ARTS 501.

ARTS 503. Preventive Conservation/Collections Care
3 Credits (3)
Introduces the student on how to mitigate the deterioration and damage of cultural property in a museum setting through the formulation and implementation of policies and procedures. The course addresses most aspects of collections management and care for objects in storage, exhibitions and during transportation. Crosslisted with: ARTS 403.

ARTS 504. Applied Projects in Museum Conservation
3 Credits (3)
This course provides students with the practical application of techniques and policies learned in previous conservation coursework with the underpinnings of basic museum and conservations practices, particularly in collection care, preventative conservation, conservation, ethics, teamwork and security. May be repeated up to 6 credits. Crosslisted with: ARTS 404.
Prerequisite(s): ARTS 401, ARTS 402, ARTS 403 OR ARTS 501, ARTS 502, ARTS 503.

ARTS 540. Internship in Art
1-9 Credits (3P)
This course provides students with the opportunity for workplace learning as an important component in their program of study. Students can identify an internship in graphic design, photography, conservation or other studio areas; or within broader arts institutions such as museums, galleries and visual arts centers which will provide them with professional experience that will support the successful achievement of their career goals in art. May be repeated up to 9 credits. Crosslisted with: ARTS 440 and ARTS 340.

ARTS 550. Drawing and Painting Workshop
3-6 Credits (2-4+4P)

Graduate level drawing and painting course focusing on the development of concepts, expression and visual form. May be repeated up to 27 credits.
Prerequisite(s): Graduate standing.

ARTS 555. Graphic Design
3 Credits (3)
May be repeated up to 27 credits.

ARTS 565. Sculpture Media
3-9 Credits
May be repeated up to 27 credits.

ARTS 570. Photography Seminar
3-9 Credits (3-9)
Graduate students develop and implement a research program using photographic media and processes. Outcomes and program developed in consultation with photography faculty.
Prerequisite: .
Learning Outcomes
1. Create original works of art through the application of medium, tools, techniques and concepts specific to contemporary photography at the graduate level.

ARTS 575. Ceramic Arts
3-9 Credits
May be repeated up to 27 credits.

ARTS 576. Museum/Gallery Research Internship
1-9 Credits
Research internship in museum or gallery. Requirements determined by instructor in cooperation with supervising museum/gallery professional. For art history credit. May be repeated for a maximum of 9 credits.
Prerequisite: graduate standing.

ARTS 585. Metals and Jewelry Design
3-9 Credits
May be repeated up to 27 credits.

ARTS 595. Problems in Studio
1-6 Credits
Individualized study in specialized studio areas not covered by other advanced courses. May be repeated up to 12 credits. Consent of Instructor required.

ARTS 596. Graduate Studio Seminar
3 Credits (3)
Explores issues in contemporary art making and their relationship to personal work. Presentation of research in oral, visual, and written form. May be repeated for a maximum of 18 credits. Restricted to majors.
Prerequisite(s): Graduate standing.

ARTS 598. Studio Thesis
1-15 Credits
Special research in studio, leading to an exhibition and written thesis statement.

ASTR-ASTRONOMY

ASTR 1115G. Introduction to Astronomy Lecture & Laboratory
4 Credits (3+2P)
This course surveys observations, theories, and methods of modern astronomy. The course is predominantly for non-science majors, aiming to provide a conceptual understanding of the universe and the basic physics that governs it. Due to the broad coverage of this course, the specific topics and concepts treated may vary. Commonly presented subjects include the general movements of the sky and history of astronomy, followed by an introduction to basic physics concepts like Newton's and Kepler's laws of motion. The course may also provide modern details and facts about celestial bodies in our solar system, as well as differentiation between them – Terrestrial and Jovian planets, exoplanets, the practical meaning of "dwarf planets", asteroids, comets, and Kuiper Belt and Trans-Neptunian Objects. Beyond this we may study stars and galaxies, star clusters, nebulae, black holes, and clusters of galaxies. Finally, we may study cosmology--the structure and history of the universe.The lab component of this course includes hands-on exercises that work to reinforce concepts covered in the lecture, and may include additional components that introduce students to the night sky. May be repeated up to 4 credits.
Learning Outcomes
1. Students will discuss the night sky as seen from Earth, including coordinate systems, the apparent daily and yearly motions of the sun, Moon, and stars, and their resulting astronomical phenomena.
2. Students will list and apply the steps of the scientific method.
3. Students will describe the scale of the Solar System, Galaxy, and the Universe.
4. Students will explain telescope design and how telescopes and spectra are used to extract information about Astronomical objects.
5. Students will describe the formation scenarios and properties of solar system objects.
6. Students will describe gravity, electromagnetism, and other physical processes that determine the appearance of the universe and its constituents.
7. Students will describe methods by which planets are discovered around other stars and current results.
8. Students will describe the structure, energy generation, and activity of the sun.
9. Students will compare our sun to other stars and outline the evolution of stars of different masses and its end products, including black holes. 1
10. Students will describe the structure of the Milky Way and other galaxies and galaxy clusters. 1
11. Students will describe the origin, evolution, and expansion of the universe based on the Big Bang Theory and recent Astronomical observations. 1
12. Students will describe conditions for life, its origins, and possible locations in the universe.

ASTR 1116. Introduction to Astronomy Lab, Special
1 Credit (1)
This lab-only listing exists only for students who may have transferred to NMSU having taken a lecture-only introductory astronomy class, to allow them to complete the lab requirement to fulfill the general education requirement. Consent of Instructor required. , at some other institution). Restricted to Las Cruces campus only.
Prerequisite(s): Must have passed Introduction to Astronomy lecture-only.
Learning Outcomes
1. Course is used to complete lab portion only of ASTR 1115G or ASTR 112
2. Learning outcomes are the same as those for the lab portion of the respective course.

ASTR 1120G. The Planets Lecture & Laboratory
4 Credits (3+2P)
Comparative study of the planets, moons, comets, and asteroids which comprise the solar system. Emphasis on geological and physical

processes which shape the surfaces and atmospheres of the planets. Laboratory exercises include analysis of images returned by spacecraft. Intended for non-science majors, but some basic math required. May be repeated up to 4 credits.

Learning Outcomes

1. Students will describe the sky as seen from Earth, the apparent daily and yearly motions of the Sun, Moon, planets and stars, and resulting astronomical phenomena.
2. Students will apply the process of the scientific method in an astrophysical setting.
3. Students will describe the structure of the solar system and explain the development of the currently accepted model of solar system formation.
4. Students will explain how telescopes and spectra are used to extract information about astronomical objects.
5. Students will describe properties of minor solar system objects, such as dwarf planets, moons, asteroids, meteoroids, and comets.
6. Students will compare and contrast bulk and unique properties of the Terrestrial and Jovian worlds.
7. Students will describe how gravity and other physical processes determine the appearance of the solar system and its constituents.

ASTR 301V. Revolutionary Ideas in Astronomy
3 Credits (3)

Examines recent fundamental scientific revolutions that have shaped our view of Earth and the universe. Topics in astronomy range from exoplanets to black holes to dark energy and raise questions about the very nature of how we use the scientific method to see the unseen, and how this shapes science research today.

Prerequisite(s): Any general education science course.

ASTR 305V. The Search for Life in the Universe
3 Credits (3)

Use of information from several of the sciences to explore the likelihood that life exists elsewhere in the universe. Subjects include an overview of historical ideas about the possibility of life elsewhere in the universe, the chemistry and biology of life on Earth, recent explorations for life within our solar system, and current search strategies for life in the universe and their scientific basis.

ASTR 308V. Into the Final Frontier
3 Credits (3)

Exploration of space: a brief review of the history of space flight, the Apollo program, joint U.S.-Soviet space missions, and unstaffed exploration of the planets. Emphasis on knowledge gained through these efforts. Includes new space initiatives. Same as HNRS 308V.

ASTR 330V. Planetary Exploration
3 Credits (3)

A current planetary exploration mission is studied within the context of the solar system. The data acquired and principles involved in executing the mission, as well as social, political, ethical and economic implications of planetary exploration, are examined. May be repeated up to 3 credits.

Learning Outcomes

1. Students will describe the various types of interplanetary missions used to explore solar system objects.
2. Students will explain the roles and responsibilities of the groups of scientists and engineers that comprise a mission team.
3. Students will describe the social, political, ethical, and financial challenges associated with planetary exploration.

ASTR 400. Undergraduate Research
1-3 Credits

Supervised individual study or research. May be repeated up to 9 credits.

Learning Outcomes

1. Students will learn basic astronomical research techniques in observation and theory.
2. Students will communicate their findings in venues such as department meetings.

ASTR 401. Topics in Modern Astrophysics
3 Credits (3)

This course is designed for students interested in astrophysics who have some background in math and physics and want to learn about basic astrophysics and interesting current topics. The course will cover basic astrophysical concepts such as orbital mechanics, light, and radiative processes and transfer. These concepts will be applied to the discussion of exciting modern topics involving planets, exoplanets, stars, galaxies, and/or cosmology, with topical emphasis determined by the instructor.

Prerequisite(s): MATH 1521G and (PHYS 2110 or PHYS 1310G).

ASTR 402. Astronomical Observations and Techniques
3 Credits (3)

Designed for students interested in astrophysics who have some background in math and astronomy and want to learn about techniques for obtaining and analyzing astronomical data. This course will review the properties of light and discuss the process of experimental design. The course will describe basic observational tools such as telescopes and detectors. It will discuss how data is obtained, and how features of the detector and the Earth's atmosphere can be corrected for. Some topics in basic astronomical data analysis will be discussed, with topical emphasis determined by the instructor. Some simple data analysis projects will be assigned. May be repeated up to 3 credits.

Prerequisite: MATH 1511G and (PHYS 2140 or PHYS 1320G) and (ASTR 1120G, ASTR 1115G, or ASTR 401).

Learning Outcomes

1. Review the properties of light and discuss the process of experimental design.
2. Describe basic observational tools such as telescopes and detectors.
3. Discuss how data is obtained, and how features of the detector and the Earth's atmosphere can be corrected for.
4. Discuss topics in basic astronomical data analysis.

ASTR 403. Fundamentals of Astronomy
3 Credits (3)

This course is designed to ensure a basic, quantitative knowledge of fundamental topics in astronomy and astrophysics. These topics include orbital mechanics, properties of radiation, principles of stellar radiation and spectra, structure and dynamics of the Milky Way, properties of galaxies, and basic cosmology. While this course is designed for first year graduate students, it is also cross-listed as a undergraduate course for students who have already had some exposure to astronomy and are prepared for a fast-paced review of fundamental topics and concepts in astronomy. Undergraduates will have a reduced homework load. Consent of Instructor required. Crosslisted with: ASTR 505.

Prerequisite(s): ASTR 401 or demonstrated background in astronomy and problem solving.

ASTR 499. Directed Study for Undergraduates
1-6 Credits

This course is for student who wish to minor in Astronomy but have already fulfilled all of the 6 credits of ASTR 400. This course will be administered by individual faculty who develop a meeting schedule with a student or students. It will count toward the minor requirements. May be repeated up to 6 credits.

Learning Outcomes

1. Students will learn basic astronomical research techniques in observation and theory.
2. Students will communicate their findings in venues such as department meetings.

ASTR 500. Seminar
1 Credit (1)
Organized group study treating selected topics.

ASTR 503. Fundamentals of Astrophysics
3 Credits (3)
This course is designed to ensure a basic, quantitative knowledge of fundamental topics in astronomy and astrophysics. These topics include orbital mechanics, properties of radiation, principles of stellar radiation and spectra, structure and dynamics of the Milky Way, properties of galaxies, and basic cosmology.

Learning Outcomes

1. Ensure a basic, quantitative knowledge of fundamental topics in astronomy and astrophysics.
2. Discuss orbital mechanics, properties of radiation, principles of stellar radiation and spectra, structure and dynamics of the Milky Way, properties of galaxies, and basic cosmology.

ASTR 506. Dynamics and Hydrodynamics
3 Credits (3)
Graduate level course on basic stellar dynamics and fundamentals of hydrodynamics. May be repeated up to 3 credits.

Learning Outcomes

1. Learn and be able to apply basics of stellar dynamics and hydrodynamics.

ASTR 530. Gas and Radiative Processes
3 Credits (3)
This course will introduce the basic physics of the the primary gaseous environments in the universe and their observational signatures. Astrophysical environment to be addressed will include the atmospheres of stars, the interstellar medium, the circumgalactic medium, and the intergalactic medium. Physical processes covered will include gas hydrodynamics, radiative and collisional excitation and ionization balance in astrophysics, atomic processes and detailed balancing, heating and cooling balance, and evolution. From the observational point of view, the course will discuss the spectral signatures of these processes, including stellar spectra, 21-cm spectra, emission line spectra from HII regions and planetary nebulae, and absorption lines from the interstellar medium, circumgalactic medium, and intergalactic medium.

Learning Outcomes

1. Introduce the basic physics of the the primary gaseous environments in the universe and their observational signatures.
2. Describe the atmospheres of stars, the interstellar medium, the circumgalactic medium, and the intergalactic medium.
3. Understand principles of gas hydrodynamics, radiative and collisional excitation and ionization balance in astrophysics, atomic processes and detailed balancing, heating and cooling balance, and evolution.
4. Discuss spectral signatures of these processes, including stellar spectra, 21-cm spectra, emission line spectra from HII regions and planetary nebulae, and absorption lines from the interstellar medium, circumgalactic medium, and intergalactic medium.

ASTR 535. Observational Techniques
3 Credits (3)
Up-to-date introduction to modern observational astronomy in a two-semester sequence. Topics include: introduction to computers, error analysis in data, the different types of optical telescopes, and optical and infrared photometry, image processing, and detectors. May be repeated up to 3 credits.

Learning Outcomes

1. Discuss an introduction to computers, error analysis in data, the different types of optical telescopes, and optical and infrared photometry, image processing, and detectors.

ASTR 545. Stellar Spectroscopy
3 Credits (3)
This course covers the physics of stellar atmospheres with emphasis on using spectra as a diagnostic tool for understanding the properties of stars. Topics include spectral classification, radiative transfer, gas equilibrium physics, line and continuum opacities, adiabatic and superadiabatic convection, and extraction of observed quantities from spectra for deducing physical conditions of the source.

ASTR 555. Galaxies I
3 Credits (3)
Fundamentals of the properties of galaxies and galaxy components, including stars and stellar populations, gas and dust, central black holes, and dark matter. Includes a detailed description of the properties of the Milky Way Galaxy.

ASTR 565. Stellar Interiors
3 Credits (3)
Internal constitutions of stars, computation of stellar models, and stellar evolution.

ASTR 598. Special Research Programs
1-6 Credits
Individual investigations, either analytical or experimental.

ASTR 599. Master's Thesis
1-15 Credits (1-15)
Master's level research in astrophysics or observational astronomy. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

ASTR 600. Pre-dissertation Research
1-15 Credits
Research.

ASTR 601. Thesis Proposal Preparation
1 Credit (1)
This is a one-credit course that introduces students to Departmental expectations regarding the Thesis Proposal and provides rigorous training in proposal-writing. Drawing heavily from the presentation in the course textbook, Writing Science by Joshua Schimel, students will practice devising, developing, and proposing three new ideas for astronomical research over the course of the academic term. Classroom activity will consist of a mixture of short lecture-discussions and focused peer-editing sessions; homework will consist of readings and writing assignments. While the course will assist students in developing their thesis proposals, its topics are general enough to be useful for any proposal. Students taking Pre-Dissertation Research in their fifth semester are required to register for this course, while students in their fourth and fifth years who have not yet defended their thesis proposals are strongly encouraged to join them. This course should not change the total number of credits for which students are expected to register in a semester

Learning Outcomes

1. Provide continuing programmatic/structural support to students as they transition from structured coursework/cumes to unstructured thesis work.
2. Suppress the temptation for students to distance physically starting in the third year.
3. Optimize balance between programmatic progress and ongoing research/outreach commitments.
4. Clarify thesis proposal expectations and improve consistency between experiences of different students.
5. Suppress thesis proposal inflation.
6. Train students in ideation and proposal writing.

ASTR 605. Interstellar Medium
3 Credits (3)
Basics of radiative transfer and processes in the interstellar medium. Properties of dust and infrared emission from grains. Applications to neutral atomic and molecular gas and ionized plasmas in galaxies. May be repeated up to 3 credits.

ASTR 616. Galaxies II
3 Credits (3)
Galaxy formation within a cosmological context. Topics include an introduction to cosmology, the growth of linear and nonlinear structures, the formation of dark matter halos, galaxy growth and feedback processes, and their observational signatures in the intergalactic and circumgalactic media.

ASTR 620. Planetary Processes
3 Credits (3)
Evaluation and analysis of observational data on solar system objects to determine their nature and physical conditions, with emphasis upon atmospheres (composition, structure, thermodynamics, evolution, etc.). Restricted to Astronomy Majors. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluation and analysis of observational data on solar system objects to determine their nature and physical conditions, with emphasis upon atmospheres (composition, structure, thermodynamics, evolution, etc.)

ASTR 621. Planetary System Formation
3 Credits (3)
The physical processes involved in planetary system formation are addressed. Specific foci include molecular cloud collapse, disk processes, and competing theories of planet formation within disks. Additional topics to be discussed may include: the solar wind, planetary magnetic fields, planetary ring processes, and mineralogy. May be repeated up to 3 credits. Restricted to: ASTR majors.

ASTR 630. Advanced Methods in Astrophysics
3 Credits (3)
Provides basic background in numerical and statistical methods relevant to astrophysical research. Topics include a review of probability and probability distribution functions, Bayesian and frequentist approaches, data simulation, parameter estimation, Markov Chain Monte Carlo, image processing, feature detection, inversions or other topics. May be repeated up to 3 credits.

Learning Outcomes

1. Perform basic background in numerical and statistical methods relevant to astrophysical research.
2. Review of probability and probability distribution functions, Bayesian and frequentist approaches, data simulation, parameter estimation, Markov Chain Monte Carlo, image processing, feature detection, inversions or other topics.

ASTR 670. Heliophysics, Space Plasmas, and Space Weather
3 Credits (3)
Explore the Sun and its processes. the heliopshere, and its interactions with the planets. Topics include: A introductory description of space weather and its physics; energy interaction with the space environment; the quiet Sun and its interactions with planetary atmospheres (with an emphasis on Earth); Magnetohydrodynamics; frozen-in flux; the solar wind; magnetized fluid dynamics; the active Sun(flares and coronal mass ejections); the effects of Space Weather. May be repeated up to 3 credits.

Learning Outcomes

1. Manipulate the equations of electromagnetism for any astrophysical plasma, and thereby predict the behavior of any plasma under specific conditions.
2. Use the equations of electromagnetism to explain temporal and spatial size scales throughout the heliosphere.
3. Interpret the role magnetism plays in both the storage and release of energy in plasmas.
4. Analyze the effect and impact of solar particles and radiation on Earth, and at other planets.

ASTR 671. Solar Astrophysics
3 Credits (3)
Solar astrophysics, including observational and theoretical aspects of the Sun's atmosphere. Although focused on the Sun, the course will be conducted so be of general interest to all astronomy graduate students

Learning Outcomes

1. Develop critical thinking skills in study the solar atmosphere.
2. Asses the validity of solar MHD and other approximations in uncovering the physics of the Sun.
3. Investigate the evolution of solar features at multiple size scales.
4. Determine the connections of the solar plasma oscillations and particle acceleration to energy release processes.

ASTR 698. Special Topics.
1-9 Credits
Special topics.

ASTR 700. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

AUTO-AUTOMOTIVE TECHNOLOGY

AUTO 111. Automotive Mechanics Basics
4 Credits (4)
Basic maintenance procedures of the major components of the automobile using service repair manuals, hand and power tools, precision measurement equipment, fasteners and chemicals. Restricted to: Community Colleges only.

AUTO 112. Basic Gasoline Engines
5 Credits (2+6P)
Principles of gasoline engine operation. Identification, design, function of engine components; engine disassembly and reassembly; trouble shooting, and rebuilding heads. May be repeated up to 5 credits.

Learning Outcomes

1. Recall vehicle service information, including fluid types, engine operation, service history, technical bulletins, and recalls for xEVs and ADAS-equipped vehicles.
2. Analyze and interpret on-board diagnostics (OBD) data, including DTCs, monitor status, and freeze frame data, and clear codes when necessary.
3. Inspect engine assembly for leaks and other issues, and determine required actions for maintenance or repair.
4. Verify the proper operation of engine components, including mechanical timing, covers, and warning indicators.
5. Apply appropriate service precautions for internal combustion engine repairs, particularly for xEVs.
6. Inspect and evaluate cylinder head and valve train components for wear, damage, and proper functionality, making necessary adjustments or replacements.
7. Analyze and assess engine block components, including vibration dampers and crankshaft assembly, for wear or damage.
8. Perform engine oil and filter changes and coolant system maintenance, ensuring correct fluid types and system integrity.
9. Test and troubleshoot cooling system components, including radiators, pumps, and thermostats, to identify and resolve overheating or leakage issues. 1
10. Examine and replace drive belts, tensioners, and pulleys, ensuring proper alignment and operation. 1
11. Inspect and replace oil temperature and pressure sensors, as well as auxiliary coolers, based on diagnostic results. 1
12. Evaluate and adjust engine cooling and lubrication system components for optimal performance and repair as needed.

AUTO 113. Automotive Electricity and Electronics PT I
4 Credits (2+4P)

Topics include mastery of DC electricity, use of digital multimeters, troubleshooting electrical problems in starting, charging and accessory systems. May be repeated up to 4 credits.

Learning Outcomes

1. Research and interpret vehicle service information, system architecture, wiring diagrams, and procedures for electrical/electronic systems, including xEV, ADAS, and high-voltage systems.
2. Identify and explain the function and configuration of key electrical/electronic system components (fuses, relays, resistors, sensors, modules, actuators, networks).
3. Use proper diagnostic tools (DMM, oscilloscope, graphing multimeter, scan tool) to measure voltage, current, resistance, and circuit operation; interpret results.
4. Diagnose and repair electrical faults, including shorts, opens, grounds, resistance issues, excessive parasitic draw, and voltage drops; verify proper circuit operation.
5. Inspect, test, and service wiring, terminals, connectors, and harnesses using appropriate procedures, tools, and soldering techniques.
6. Test and maintain low-voltage batteries, cables, and connections; perform state-of-charge/load tests and charging procedures; jump-start and maintain memory functions.
7. Diagnose and repair low-voltage starting systems including slow/no crank conditions, idle-stop/start systems, and electrical/mechanical faults.
8. Inspect, test, and service charging system components (alternator, drive belts, tensioners, pulleys) and identify causes of undercharge, overcharge, or no-charge conditions.
9. Inspect, aim and troubleshoot lighting systems, including interior/exterior lamps, sockets, switches, and wiring; correct intermittent, dim, or non-functioning lights. 1
10. Inspect and diagnose instrument clusters and driver information systems, including warning lights, gauges, sensors, and maintenance indicators. 1
11. Inspect, diagnose and repair body electronic systems (power locks/windows, wipers, security, infotainment, seat/airbag systems); verify module communication and function. 1
12. Demonstrate safety procedures for xEV high-voltage systems; locate, describe, and follow correct steps to de-energize/re-energize systems and protect components and personnel.

AUTO 114. Automotive Electricity and Electronics PT II
4 Credits (2+4P)

Advanced AC and DC automotive electronic circuits. Troubleshooting electronically controlled components including supplemental restraint systems and convenience accessories. Restricted to Community Colleges campuses only.

Prerequisite: AUTO 113.

Learning Outcomes

1. Understand and demonstrate safety rules related to electronically controlled automotive systems.
2. Diagnosis and demonstrate knowledge of series, parallel, and combination circuits, and their applications as applied to automotive repair.
3. Demonstrate use of wiring diagrams as a diagnostic aide.
4. Demonstrate use of meters, handheld labscopes, scan tools, and other diagnostic equipment.
5. Demonstrate use of repair manuals, both hard copy and electronic.
6. Demonstrate knowledge, diagnose and repair Air Bag Supplemental Inflatable Restraint systems
7. Demonstrate knowledge, diagnose and repair various convenience electronic systems.
8. Interpret customer concerns, create and complete a diagnostic routine and successfully repair an electrical problem.
9. Diagnose and repair starting and charging systems.

AUTO 115. Automotive Engine Repair
4 Credits (2+4P)

Principles of gasoline engine operation. Identification of engine parts, operation, and function. Disassembly and reassembly. Engine problem diagnoses (cooling system, lubrication system, engine noises). Restricted to Community Colleges only.

Learning Outcomes

1. Understand internal combustion engine theory.
2. Identify all components of an engine and their function.
3. Identify worn engine components and determine necessary repairs.
4. Effectively present engine issues and corrections using verbal and written communication.
5. Diagnose cooling system issues and the effect on various components.
6. Rebuild/ reassemble an engine to specifications.
7. Understand the operation and rationale of forced induction.
8. Identify methods of increasing engine efficiency.

AUTO 117. Electronic Analysis and Tune-Up of Gasoline Engines
5 Credits (2+6P)

Theory and operation of ignition and emission control systems and fuel system. Use of troubleshooting equipment and diagnostic equipment.
Prerequisite: AUTO 120 or consent of instructor.

AUTO 119. Manual Transmission/Clutch
5 Credits (2+6P)
Manual transmission, transfer cases, and clutch operating principles. Students will diagnose problems, remove and replace, disassemble, repair, and assemble units.

AUTO 120. Electrical Systems
4 Credits (2+4P)
Troubleshooting and repair of starters, alternators, and associated circuits. Reading electrical diagrams, diagnosis and repair of electrical accessories.
Prerequisite: consent of instructor.

AUTO 122. Automotive Brakes
4 Credits (2+4P)
Focus is on theory, diagnosis, and service of drum, disc, and anti-lock braking systems, brake component machining, hydraulic component reconditioning, friction and hardware replacement. May be repeated up to 4 credits.
Learning Outcomes
1. Research and interpret vehicle service information, brake system types (hydraulic, disc, drum, electric), service procedures, and manufacturer specifications for fluid and components, including xEV and ADAS-equipped vehicles.
2. Identify and explain brake system components and configurations, including power-assist units, electronic brake control systems (ABS, TCS, ESC), and regenerative braking systems.
3. Retrieve, record, and clear diagnostic trouble codes (DTCs) and perform service mode activation, calibration, initialization, and relearn procedures when required.
4. Diagnose hydraulic brake system concerns using pressure principles (Pascal's Law); inspect and test brake fluid, master cylinder, lines, hoses, and fittings; determine needed action.
5. Bleed, replace, or test brake fluids, fabricate lines, and ensure correct type and contamination-free hydraulic system operation.
6. Inspect, remove, replace, and/or service drum brake components including drums, shoes, wheel cylinders, springs, levers, adjusters, and support plates.
7. Inspect, measure, service, or refinish disc brake components including rotors, calipers, pads, pistons, hardware, and mounting surfaces; determine rotor serviceability.
8. Diagnose and correct brake system performance issues such as pulling, noise, dragging, pulsation, and poor stopping, in both hydraulic and mechanical systems.
9. Inspect and test power-assist units, including vacuum and hydraulic boosters; identify operational concerns, perform functional checks, and inspect related components. 1
10. Inspect, service, and replace related systems: wheel bearings (sealed and serviceable), parking brake systems (manual and electric), wheel studs, and brake light/indicator systems. 1
11. Diagnose and repair electronic brake systems (ABS, TCS, ESC); identify components, describe function, and evaluate system performance using appropriate tools. 1
12. Describe and test regenerative braking system functions and perform electronic brake system bleeding procedures safely and accurately.

AUTO 123. Job Shadowing
1 Credit (1)
Observing a professional in a real-world work setting, while gaining on-the-job training. Student will meet in a weekly class or online.
Learning Outcomes
1. Work with colleagues in the diagnosing and repair of automobiles.
2. Understand basic tool needs to meet industry requirements.
3. Prepare for various pay scales (straight time, flat-rate, hourly).
4. Understand daily operations in a live shop setting.
5. Understand the roles in the automotive field to include Technician, Service Writer, Shop Foreman, and Service Manager.

AUTO 124. Automotive Heating and Air Conditioning
4 Credits (2+4P)
R12 and R134A air conditioning systems maintenance diagnosis and repair. R12 to R134A conversion procedures. Troubleshooting automatic temperature controls and leak detection. May be repeated up to 4 credits.
Learning Outcomes
1. Research and interpret vehicle HVAC service information, including refrigerant/oil types, diagnostic procedures, and safety precautions related to xEVs and ADAS-equipped vehicles.
2. Identify HVAC system components and configurations, including compressors, condensers, evaporators, control panels, ducts, and sensors.
3. Use diagnostic tools and procedures to retrieve DTCs, interpret A/C performance test results, and analyze system pressures, temperatures, and operating noises.
4. Diagnose and repair refrigerant circuit faults, including leaks, pressure imbalances, abnormal compressor operation, and restricted flow components (expansion valves, orifice tubes, desiccants).
5. Inspect, service, or replace HVAC components, such as compressors, condensers, evaporators, receiver/driers, hoses, and system seals; select proper oil type and quantity per OEM specs.
6. Diagnose and service heating and engine cooling system interactions with HVAC, including hoses, heater cores, control valves, and electric heating systems.
7. Inspect and diagnose HVAC airflow and cabin control components, including blower motors, filters, ducts, switches, doors, resistors, relays, and protection devices.
8. Check operation of HVAC control systems, including manual, automatic, mechanical, electrical, and vacuum-based systems; service control panels and actuators.
9. Demonstrate proper handling and recovery of refrigerants, including system evacuation, recovery, recycling, recharging, oil management, and refrigerant identification. 1
10. Safely operate and maintain refrigerant service equipment and comply with environmental regulations for refrigerant labeling, storage, and handling.

AUTO 125. Brakes
5 Credits (2+6P)
Theory of operation, diagnosis, repair, and maintenance of disc and drum brakes; safety and use of special tools. May be repeated up to 5 credits.
Learning Outcomes
1. Research and interpret vehicle service information, brake system types (hydraulic, disc, drum, electric), service procedures, and manufacturer specifications for fluid and components, including xEV and ADAS-equipped vehicles.
2. Identify and explain brake system components and configurations, including power-assist units, electronic brake control systems (ABS, TCS, ESC), and regenerative braking systems.

3. Retrieve, record, and clear diagnostic trouble codes (DTCs) and perform service mode activation, calibration, initialization, and relearn procedures when required.
4. Diagnose hydraulic brake system concerns using pressure principles (Pascal's Law); inspect and test brake fluid, master cylinder, lines, hoses, and fittings; determine needed action.
5. Bleed, replace, or test brake fluids, fabricate lines, and ensure correct type and contamination-free hydraulic system operation.
6. Inspect, remove, replace, and/or service drum brake components including drums, shoes, wheel cylinders, springs, levers, adjusters, and support plates.
7. Inspect, measure, service, or refinish disc brake components including rotors, calipers, pads, pistons, hardware, and mounting surfaces; determine rotor serviceability.
8. Diagnose and correct brake system performance issues such as pulling, noise, dragging, pulsation, and poor stopping, in both hydraulic and mechanical systems.
9. Inspect and test power-assist units, including vacuum and hydraulic boosters; identify operational concerns, perform functional checks, and inspect related components. 1
10. Inspect, service, and replace related systems: wheel bearings (sealed and serviceable), parking brake systems (manual and electric), wheel studs, and brake light/indicator systems. 1
11. Diagnose and repair electronic brake systems (ABS, TCS, ESC); identify components, describe function, and evaluate system performance using appropriate tools. 1
12. Describe and test regenerative braking system functions and perform electronic brake system bleeding procedures safely and accurately.

AUTO 126. Suspension, Steering, and Alignment
5 Credits (2+6P)
Types of steering systems, suspension maintenance and repair, four-wheel alignment procedures. May be repeated up to 5 credits.
Learning Outcomes

1. Research and interpret vehicle service data including steering/suspension systems, fluid specifications, service procedures, and manufacturer recommendations for xEVs and ADAS-equipped vehicles.
2. Identify and explain suspension, steering, and wheel alignment components, including electronically controlled systems and their functions.
3. Retrieve, record, and clear diagnostic codes related to suspension and steering systems; disable and enable SRS/airbag systems according to safety procedures.
4. Diagnose and interpret suspension and steering system symptoms (uneven ride height, noises, binding, fluid leaks, tire wear, and abnormal steering behavior); determine corrective action.
5. Inspect and service power steering systems (hydraulic and electric), including pumps, belts, hoses, fluids, gears, racks, and related components.
6. Remove, inspect, adjust, and/or replace steering system parts including tie rods, linkages, steering shafts, columns, knuckles, and bushings.
7. Inspect, replace, and service suspension system parts including control arms, struts, shocks, ball joints, sway bars, torsion bars, bushings, and electronically controlled components.
8. Perform and evaluate wheel alignment procedures including camber, caster, toe, thrust angle, setback, and SAI; explain alignment angles and their impact on handling and tire wear.
9. Prepare a vehicle for alignment, perform pre-alignment inspections, and reset steering angle sensors; determine need for ADAS recalibration. 1
10. Inspect, service, and replace wheel bearings, hubs, and mountings; check for looseness, noise, and proper installation. 1
11. Inspect, rotate, mount, balance, and repair tires and wheels; verify tire pressure, inspect TPMS systems, and perform relearn/calibration procedures. 1
12. Diagnose wheel and tire concerns such as vibration, noise, shimmy, runout, and pull; determine needed action.

AUTO 127. Basic Automatic Transmission
4 Credits (2+4P)
Theory and operation of the automatic transmission; maintenance, troubleshooting, diagnosis, and repair of components. May be repeated up to 4 credits.
Learning Outcomes

1. Recall and interpret vehicle service information, including fluid types, service history, precautions, TSBs, and ADAS/xEV-related systems.
2. Identify and describe transmission and transaxle types, components, and operational principles of CVT, DCT, hybrid, and xEV drive systems.
3. Retrieve, interpret, and clear diagnostic trouble codes (DTCs), monitor status, and freeze frame data using diagnostic tools.
4. Inspect and evaluate fluid condition, levels, and possible leaks on transmissions/transaxles both with and without dipsticks.
5. Diagnose and analyze power flow, gear ratio issues, and hydraulic/pressure concerns using mechanical and hydraulic principles (Pascal's Law).
6. Differentiate and interpret between engine performance and transmission/transaxle issues; determine appropriate corrective actions.
7. Perform and evaluate stall, lock-up converter, and electronic pressure control tests; determine necessary service or repair actions.
8. Diagnose and repair electronic transmission/transaxle control systems using manufacturer data and diagnostic tools.
9. Inspect, adjust, and/or replace components such as valve shift linkage, range sensors, powertrain mounts, and park/neutral switches. 1
10. Drain, replace, and refill transmission fluids and filters using manufacturer specifications; perform system relearn procedures. 1
11. Inspect, test, and repair external seals, gaskets, bushings, and electrical/electronic circuits within the transmission system. 1
12. Remove, reinstall, and inspect off-vehicle components including the transmission/transaxle, torque converter, oil cooler, and converter flex plate; evaluate wear and mating surfaces.

AUTO 129. Automotive Steering and Suspension
4 Credits (2+4P)
Diagnosis/service of suspension components including shocks, springs, ball joints, manual and power steering systems and four wheel alignment are some areas covered. May be repeated up to 4 credits.
Learning Outcomes

1. Research and interpret vehicle service data including steering/suspension systems, fluid specifications, service procedures, and manufacturer recommendations for xEVs and ADAS-equipped vehicles.
2. Identify and explain suspension, steering, and wheel alignment components, including electronically controlled systems and their functions.

3. Retrieve, record, and clear diagnostic codes related to suspension and steering systems; disable and enable SRS/airbag systems according to safety procedures.
4. Diagnose and interpret suspension and steering system symptoms (uneven ride height, noises, binding, fluid leaks, tire wear, and abnormal steering behavior); determine corrective action.
5. Inspect and service power steering systems (hydraulic and electric), including pumps, belts, hoses, fluids, gears, racks, and related components.
6. Remove, inspect, adjust, and/or replace steering system parts including tie rods, linkages, steering shafts, columns, knuckles, and bushings.
7. Inspect, replace, and service suspension system parts including control arms, struts, shocks, ball joints, sway bars, torsion bars, bushings, and electronically controlled components.
8. Perform and evaluate wheel alignment procedures including camber, caster, toe, thrust angle, setback, and SAI; explain alignment angles and their impact on handling and tire wear.
9. Prepare a vehicle for alignment, perform pre-alignment inspections, and reset steering angle sensors; determine need for ADAS recalibration. 1
10. Inspect, service, and replace wheel bearings, hubs, and mountings; check for looseness, noise, and proper installation. 1
11. Inspect, rotate, mount, balance, and repair tires and wheels; verify tire pressure, inspect TPMS systems, and perform relearn/calibration procedures. 1
12. Diagnose wheel and tire concerns such as vibration, noise, shimmy, runout, and pull; determine needed action.

AUTO 130. Introduction to Transportation Industry
3 Credits (3)
State and national traffic statutes that relate to the trucking industry. A Commercial Driver's License Learner s Permit will be obtained through successful completion of the course.
Prerequisites: Must be 18 years of age, have a current driver's license and consent of instructor.

AUTO 131. Class A CDL
3 Credits (1+4P)
Instruction in how to perform proper pre-trip inspection; hands-on training with a tractor-trailer unit on the backing range and street driving to develop skills necessary to pass Class A DCL exam. Restricted to Community Colleges campuses only.
Prerequisite(s): Class A CDL restricted license (permit) and either restriction of D.O.T.

AUTO 132. Automotive Air-Conditioning and Heating Systems
4 Credits (2+4P)
Theory and operation, reading schematic diagrams, troubleshooting, repair, and replacement operations performed. May be repeated up to 4 credits.
Learning Outcomes
1. Research and interpret vehicle HVAC service information, including refrigerant/oil types, diagnostic procedures, and safety precautions related to xEVs and ADAS-equipped vehicles.
2. Identify HVAC system components and configurations, including compressors, condensers, evaporators, control panels, ducts, and sensors.
3. Use diagnostic tools and procedures to retrieve DTCs, interpret A/C performance test results, and analyze system pressures, temperatures, and operating noises.
4. Diagnose and repair refrigerant circuit faults, including leaks, pressure imbalances, abnormal compressor operation, and restricted flow components (expansion valves, orifice tubes, desiccants).
5. Inspect, service, or replace HVAC components, such as compressors, condensers, evaporators, receiver/driers, hoses, and system seals; select proper oil type and quantity per OEM specs.
6. Diagnose and service heating and engine cooling system interactions with HVAC, including hoses, heater cores, control valves, and electric heating systems.
7. Inspect and diagnose HVAC airflow and cabin control components, including blower motors, filters, ducts, switches, doors, resistors, relays, and protection devices.
8. Check operation of HVAC control systems, including manual, automatic, mechanical, electrical, and vacuum-based systems; service control panels and actuators.
9. Demonstrate proper handling and recovery of refrigerants, including system evacuation, recovery, recycling, recharging, oil management, and refrigerant identification. 1
10. Safely operate and maintain refrigerant service equipment and comply with environmental regulations for refrigerant labeling, storage, and handling.

AUTO 137. Fuel Systems and Emission Controls
4 Credits (2+4P)
Covers theory and operation of fuel system and emission control. Troubleshooting, vacuum diagrams, overhaul, repair and adjustment of carburetion and fuel injection.
Prerequisites: AUTO 117 or consent of instructor.

AUTO 160. Hybrid\Electric Vehicles
4 Credits (2+4P)
Theory and operation of Hybrid and Electric vehicles with emphasis on electrical motor subsystems and battery management systems.
Prerequisite: AUTO 113, AUTO 115.
Prerequisite/Corequisite: AUTO 205.
Learning Outcomes
1. Use automotive scanners and test equipment effectively.
2. Explain the difference between hybrid and electrical vehicles.
3. Identify faulty electrical components and determine necessary repairs.
4. Effectively present issues and corrections using verbal and written communication.
5. Demonstrate proper safety when working with hybrid/EV batteries.
6. Demonstrate knowledge of differences between hybrid and fully electric vehicles and their benefits.
7. Perform routine service on hybrid and electric vehicles.

AUTO 162. Advanced Non-Structural Repair I
4 Credits (2+4P)
This course will involve the students in all phases of minor non-structural collision damage repairs. It will encompass sheet metal repair, advanced panel replacement and alignment.
Prerequisite(s): AUTO 161.

AUTO 164. Automotive Industry Collision Repair I
4 Credits (2+4P)
This advanced course is a continuation of AUTO 161, 162, and 163. This course will incorporate all areas of major non-structural collision damage repair. Through practical application the student will learn how to effectively repair all heavy collision damage using current I-CAR repair standards and procedures.

Prerequisite(s): AUTO 163.

AUTO 165. Automotive Industry Collision Repair II
4 Credits (2+4P)
This advanced course is a continuation of AUTO 164 with emplasis on time efficiency. This course will involve the student in all areas of major collision damage repair. The student will be exposed to all applicable I-CAR industry procedures and standards involved in sheet metal and composite panel repair.
Prerequisite(s): AUTO 164.

AUTO 172. Introduction to Automotive Refinishing
4 Credits (2+4P)
This course is designed to incorporate all aspects of surface preparation, paint safety, refinishing materials, and refinishing fundamentals. Students will receive instructions for the application of acrylic enamel and base coat/clear coat refinishing systems.

AUTO 174. Intermediate Automotive Refinishing
4 Credits (2+4P)
This course encompasses all areas of surface preparation, damage repair and refinishing procedures that are necessary for achieving a proper spot repair. Students will also be exposed to safe work habits in the refinishing area and correct automotive detailing procedures.
Prerequisite(s): AUTO 172.

AUTO 176. Automotive Color Adjustment & Blending
4 Credits (2+4P)
This course will help develop the skills needed to match any type of paint. It will expose the student to color theory, color evaluation, color matching, and other color adjustment factors. The student will be instructed in multiple panel paint blending techniques as well.
Prerequisite(s): AUTO 174.

AUTO 178. Automotive Overall Refinishing
4 Credits (2+4P)
This course encompasses all areas of automotive refinishing. This advanced course is a continuation of AUTO 176 with emphasis in achieving industry refinishing times and standards consistent with that of I-CAR. The student will be exposed to surface preparation and refinishing techniques involved with overall coat/clear coat refinishing system.
Prerequisite(s): AUTO 176.

AUTO 181. Frame and Structural Repair
4 Credits (2+4P)
This course will involve the student in all areas of frame and structural damage repairs. Through theory and practical application, the student will learn how to diagnose and repair various types of damage include: mash, twist, sag, and side sway. This course will expose the students to safe work habits while using measuring and straightening equipment.
Prerequisite(s): AUTO 165.

AUTO 182. Structural Panel Replacement
4 Credits (2+4P)
This course is a continuation of AUTO 181 with infancies in structural panel replacement. The student will be exposed to frame and unibody measuring equipment and their proper use in sectioning procedures. Through theory and practical application the student will learn how to ID structural components, properly separate spot welds, position and weld new body panels in place.
Prerequisite(s): AUTO 181.

AUTO 200. Engine Performance
4 Credits (2+4P)
Theory and operation of ignition, emission control systems, fuel systems, and exhaust systems. Use of troubleshooting and diagnostic equipment. May be repeated up to 4 credits.
Prerequisite/Corequisite: AUTO 113, AUTO 115.
Learning Outcomes
1. Use automotive scanners and test equipment effectively
2. Identify all emission control components of an engine and their function
3. Identify faulty ignition components and determine necessary repairs
4. Effectively present engine issues and corrections using verbal and written communication
5. Diagnose fuel system issues and the effect on various components
6. Demonstrate knowledge of differences between different fuel delivery methods and their benefits
7. Understand the operation and rationale of forced induction
8. Identify methods of increasing engine efficiency

AUTO 201. Engine Performance I
4 Credits (2+4P)
Theory, function, service and analysis of engine related subsystems including ignition, fuel, starting, and charging systems. Emphasis is placed on diagnosis and operation of electronic engine control management systems. Restricted to Community Colleges only.

AUTO 203. Engine Performance II
4 Credits (2+4P)
Study of engine management systems and emission control systems, their function and relationship to vehicle performance and air pollution. Emphasis is placed on the analysis and repair of non-compliant vehicles. Restricted to Community Colleges only.
Prerequisite: AUTO 201.
Learning Outcomes
1. Be able to explain basic electrical theories.
2. Be able to explain basic and advanced engine designs and engine operating theory.
3. Be able to explain engine cooling and lubricating systems.
4. Be able to explain intake and exhaust systems
5. Test battery, starting and charging systems
6. Test ignition systems including point type, electronic trigger type, and distributor-less systems.
7. Test automotive fuel system including fuel tanks, lines, filters and pumps.
8. Test basic electronic fuel injection systems.
9. Test automotive computer input devices and controlled devices 1
10. Demonstrate ability to work with PC based automotive software including Alldata,

AUTO 205. Manual Drive Train and Axles
4 Credits (2+4P)
Operation, diagnosis, maintenance, repair or replacement of manual transmissions, clutch assemblies, differentials, drivelines, axles, and manual transaxles. May be repeated up to 4 credits.
Learning Outcomes
1. Research and interpret vehicle service information, including fluid types, service precautions, technical bulletins, and manufacturer specifications, especially for xEVs and ADAS-equipped vehicles.
2. Identify and describe components and configurations of manual drive trains, clutches, axles, CV/universal joints, and four-wheel/all-wheel drive systems.
3. Retrieve, record, and clear diagnostic trouble codes (DTCs), freeze frame data, and monitor status using diagnostic equipment.

4. Inspect and evaluate fluid conditions, seals, leaks, and perform necessary fluid changes for manual transmissions, differentials, and transfer cases using correct specifications.
5. Diagnose and troubleshoot drive train and clutch-related issues such as slippage, noise, vibration, pulsation, and fluid concerns; determine appropriate repairs.
6. Inspect, adjust, or replace clutch components including pedal linkage, cables, pressure plates, flywheels, and hydraulic systems.
7. Service and repair shift linkage systems by adjusting, lubricating, or replacing cables, pivots, brackets, and bushings.
8. Inspect, test, and replace drive shaft, half shaft, CV joints, and universal joint components; measure driveline angles, shaft runout, and check balance and phasing.
9. Inspect and maintain differential housings, fluid levels, companion flanges, seals, and gear assemblies; assess for leaks and proper function. 1
10. Demonstrate knowledge of ring and pinion gear setup, including adjustments for depth, preload, backlash, and gear contact patterns. 1
11. Inspect and service drive axles, including wheel studs, shaft seals, bearings, retainers, and measuring runout and endplay. 1
12. Identify and resolve four-wheel and all-wheel drive concerns, including shifting issues, tire size mismatches, locking mechanisms, and fluid leaks.

AUTO 206. Automatic Transmissions
5 Credits (2+6P)
Operation, diagnosis, maintenance, and repair of automatic transmissions including rear wheel drive, front wheel drive, and electronically controlled transmissions and transaxles. Restricted to Community Colleges only.

AUTO 208. Introduction to Alternative Fueled Vehicles
3 Credits (3)
Course will familiarize student with conditions that are resulting in the alternative fueled vehicle movement as well as the design and safety precautions unique to each alternative fuel. Propulsion systems covered include electric vehicles, bio-fueled vehicles, hybrid-electric vehicles and hydrogen powered vehicles, along with other emerging technologies as appropriate. Restricted to: Community Colleges only.
Prerequisite(s): AUTO 113 and AUTO 114.

AUTO 209. Hybrid Vehicle Service Techniques
3 Credits (3)
Designed for experienced automotive technicians, this course will cover safety procedures, design, operational overview and service techniques as well as minor diagnosis and repair of all classifications of hybrid-electric vehicles. Each student must possess legal Class '0' high voltage gloves and liners to attend this class. Restricted to: Community Colleges only.
Prerequisite(s): AUTO 113 and AUTO 114.

AUTO 210. Light Diesel
4 Credits (2+4P)
Theory and operation of light duty diesel engines with emphasis on highway diesel usage including major engine subsystems and fuel management systems.
Prerequisite/Corequisite: AUTO 113, AUTO 115.
Learning Outcomes
1. Use automotive scanners and test equipment effectively.
2. Identify all emission control components included on diesel engines and their function.
3. Identify faulty emission components and determine necessary repairs.
4. Effectively present engine issues and corrections using verbal and written communication
5. Diagnose fuel system issues and the effect on various components.
6. Demonstrate knowledge of differences between different fuel delivery methods and their benefits.
7. Understand the operation and rationale of forced induction.
8. Identify methods of increasing engine efficiency.

AUTO 221. Cooperative Experience I
1-6 Credits
Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. Student will meet in a weekly class. Graded S/U.
Prerequisite: consent of instructor.

AUTO 255. Special Problems in Automotive Technology
1-5 Credits
Individual studies in areas directly related to automotive technologies. May be repeated for a maximum of 12 credits.
Prerequisite: consent of instructor.

AUTO 290. ASE Certification Preparation
1 Credit (1)
This is the capstone course for the Automotive Technology Program and is a requirement for graduation. Consent of Instructor required. Restricted to: AUTO majors. Restricted to Community Colleges campuses
Learning Outcomes
1. write technical reports explaining customers complaint(s), specific component malfunction(s) and related problems to include repair procedures, specifications, parts and costs associated with each specific repair
2. determine, categorize and document component or systems malfunctions which will be discussed in class
3. adequately identify safety hazards associated with electrical, electronic, hydraulic, pneumatic and mechanical systems before participating in any lab project
4. use a systematic approach to identify, diagnose and repair new hydro, electrical and mechanical systems
5. identify all related parts and components before attempting to repair each system
6. clearly identify and understand the specific function of each component before these systems and subsystems are dismantled for repairs
7. demonstrate proficiency in locating, identifying and following procedures for repairs as outlined on the Mitchell and All-DATA computer information systems
8. retrieve all phases of automotive information needed to repair the following: Electrical and Electronics, Engine Repair, Engine Performance, Automatic transmissions, Heating And Air Conditioning Systems
9. demonstrate proficiency in the proper usage of on-board computer scanners used to identify and properly diagnose possible malfunction within a specific on-board computer system 1
10. demonstrate proficiency in the proper use of scanners, information and vehicle specifications to determine needed repairs 1
11. identify, evaluate, diagnosis and repair electrical, electronic and mechanical systems and subsystems

AUTO 295. Special Topics
1-6 Credits
Topics to be announced in the Schedule of Classes.

AXED-AGRICULTURAL EXTN EDUC

AXED 1110. Introduction to Agricultural, Extension, and Technology Education
3 Credits (3)
Orientation to programs, philosophies, competencies and leadership skills needed by professionals in agricultural and technology education, extension education, agricultural communications, and related career opportunities in industry, governmental agencies, and international organizations.
Learning Outcomes
1. Orient student to the AXED Department and their role as students.
2. Explore career opportunities (and the related skill sets needed for success) in public schools, career and technical institutions, the cooperative extension service, community, and international development, agricultural communications, agricultural industry associations and public service (e.g., NMDA and USDA).
3. Develop an understanding of the self-leadership skills needed to be effective in a variety of professional and personal environments.
4. Familiarize students with the aspects included within a total program in agricultural or technology education.
5. Strengthen skills in oral and written communications.

AXED 1130. Techniques in Agricultural Mechanization
3 Credits (2+2P)
Development of competencies in agricultural mechanics including safety, tool identification, operation and maintenance of hand and power tools, cold metal, drafting, and plumbing procedures. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry.
Learning Outcomes
1. To understand basic drafting language used in orthographic and isometric drawings.
2. To develop an understanding of the proper use and safety of basic hand and power tools.
3. To develop skills needed to operate basic hand and power tools correctly.
4. To develop an understanding of surveying methods and building layout for construction.
5. To develop an adequate level of competence in workshop techniques.
6. To prepare students to properly teach and demonstrate these techniques to others who may use them as a means of earning a living.

AXED 2110. Metal Fabrication
3 Credits (2+4P)
Instruction and skill development in process and procedures of metal fusion, including gas and electric welding techniques, safety, and oxy-acetylene cutting and welding. Designed to improve mechanical skills needed in agriculturally related occupations in education and industry.
Learning Outcomes
1. To develop students understanding and appreciation for metal fabrication, design and teaching.
2. To develop in the student an adequate level of competence in shop work techniques, so that the student may be able to properly teach and demonstrate multiple metal fabrication techniques to others who may use them as a mean of earning a living.
3. To develop the student's fundamental techniques in shielded metal arc welding, oxy-acetylene welding and cutting operations, metal inert gas welding (MIG), and gas tungsten-arc welding as needed in repair and construction of agricultural equipment.
4. Student will understand appropriate shop management techniques and have an appreciation for mechanized agriculture.
5. To assist the student in developing an understanding and comprehension of the fundamental principles that apply to the area of basic shop work included in this course; such as proper selection of electrodes, oxy-acetylene filler rods, welding processes best suited for given welding conditions, the proper tool for the job, etc.
6. To develop in the student comprehension of safety practices that apply to the areas of basic shop work, tools, and equipment required in the course.

AXED 2130. Early Field-Based Experience
2 Credits (2)
First Hand view of the roles of professional educators through field experiences with Cooperative Extension or other government agencies. Includes 4 weeks of classroom instruction and 30 hours of observation in a work setting. Consent of Instructor required. Restricted to Las Cruces campus only.
Learning Outcomes
1. Identify successful characteristics, tips and strategies that an agricultural education professional may use as part of their program.
2. Identify key components of an agricultural education program
3. Actively observe a local agricultural education program.
4. Identify ways that your agency program networks and interacts with clientele and community

AXED 2996. Special Topics
1-4 Credits (1-4)
Specific subjects and credits to be announced in the Schedule of Classes. Student can only take up to 6 credits per semester, and will not be able to have more than 12 credits count towards their degree. May be repeated up to 12 credits.
Learning Outcomes
1. Varies

AXED 3105. Introduction to Special Education in Career and Technical Education
3 Credits (3)
Characteristics, identification, and educational needs of exceptional learners. Attention is given to the various types of programs serving exceptional learners. Designed for all professional personnel who work with exceptional learners. Specific strategies for working with students with special needs in a shop or laboratory setting within the Career and Technical Education environment will be included.
Learning Outcomes
1. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
3. Explain the major components of an IEP and its processes, as well as the roles of learners, families and professionals on the team.

4. Discuss the different service delivery models and discuss the principles, practices, and pragmatics of inclusion co-teaching.
5. Analyze the disability categories under IDEA, 2004; characteristics, etiology, and diagnostic criteria.
6. Examine educational considerations for exceptional learners (educational approaches [Universal design and differentiated instruction], assistive technology, accommodations, modifications, and related supports and services).
7. Employ culturally responsive evidence-based practices to create family/school/community partnerships to promote academic achievement and prepare students for their post-school transitions.
8. Evaluate and synthesize research literature on a selected topic from current special education research.
9. Develop hands-on laboratory activities and educational strategies that are appropriate for a wide variety of learners.

AXED 3115. Small Engine Technology
3 Credits (2+2P)
Development of competencies in small gasoline engines; theory, operation, design, maintenance and safety. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry. May be repeated up to 3 credits.

AXED 3120. Agricultural Structures
3 Credits (2+3P)
Selection and use of agricultural building materials. Design, construction, and maintenance of agricultural structures. Development of competencies in carpentry, concrete, electricity, masonry, and safety. Designed for any major wishing to improve mechanical skills needed in agriculturally related occupations in education and industry. May be repeated up to 3 credits.

AXED 3130. Advanced Technology in the Agricultural Mechanization
3 Credits (2+3P)
Students will construct a project in the area of agricultural mechanization under the direction of instructor. Project must be completed within a semester and of sufficient complexity for 3 credits.
Prerequisite: AXED 1130 and AXED 2110 or consent of instructor.

AXED 3150. Philosophy and Methods of Contests
3 Credits (3)
Covers the roles that career development events (contests) play in agricultural and technology education and in extension programs. Topics include competition and cooperation, winning and losing, ethics, use of community resources, and academic and employability skills taught through contests. Coaching as a teaching method is introduced and expanded. Students will assist with the coordination of various career development events. May be repeated up to 3 credits.

AXED 3210V. John Muir: Lessons in Sustainability
3 Credits (3)
This course examines the life of John Muir in the context of sustainability. Muir was a farmer, inventor, explorer, botanist, glaciologist, conservationist, and noted nature author. He was influential in the National Parks movement and in starting the Sierra Club. Living in the natural world influenced his faith and philosophy. By examining his life and the themes that shaped it, students will develop an understanding of what it means to live sustainably and to contribute beyond their personal lives to a sustainable future. May be repeated up to 3 credits.

AXED 3996. Special Topics
1-4 Credits (1-4)
Course addresses specific subjects and issues as identified by department. Topics and credits to be announced in the Schedule of Classes. Students can only take up to 4 credits per semester and no more than 6 credits of the course may be applied to a degree. May be repeated up to 12 credits.
Learning Outcomes
1. Various

AXED 4110. Management of Change, Diffusion, and Adoption of Innovations
3 Credits (3)
Factors that influence the rates of diffusion and adoption of innovations. Consequences of adopting or rejecting innovations. Processes by which change agents influence introduction and adoption of innovations. Taught with AXED 5110. May be repeated up to 3 credits.
Learning Outcomes
1. Critically examine the adoption-diffusion model. Included are issues such as social class differentials in the dissemination of ideas and technology, non-adoption as a form of behavior, social and economic constraints on adoption behavior, and the consequences of adoption at both the individual and social levels.
2. Demonstrate understanding of how the rapid pace of change in technology and applied science may have good and bad outcomes.
3. Discuss the dissemination of new ideas and technology within various social units.
4. Discuss the applications of the adoption-diffusion model from the perspective of the change agent.
5. Enhance the development of leadership skills required to work with people in times of change.

AXED 4210. Curriculum Development and Assessment in Agricultural Education
3 Credits (3)
This course prepares students to develop curriculum, design lessons, and prepare appropriate assessments in an agricultural education setting. An emphasis will be placed on the developing curriculum using the currently established resources that are available to agriculture teachers.
Prerequisite: 2.5 GPA.

AXED 4215. Developing Excellent Programs in Career and Technical Education
3 Credits (3)
This course prepares students to effectively manage Supervised Agricultural Experiences (SAEs) as part of a comprehensive agricultural education program. Participants will learn strategies for guiding students in planning and conducting meaningful SAEs, utilizing the Agricultural Experience Tracker (AET) for recordkeeping and progress tracking, and developing high-quality award applications for proficiency awards, degrees, and other recognitions. Emphasis will be placed on integrating SAEs into classroom instruction and FFA activities to support the three-component model of agricultural education.
Learning Outcomes
1. Recognize the underlying philosophy of the SAE/FFA as an integral part of the total agricultural education program.
2. Describe ethical behavior as an FFA advisor and agricultural educator, including the proper management of finances.
3. Develop a personal philosophy for implementing SAE/FFA into the total agricultural education program.
4. Identify principles and practices for developing and conducting SAE programs.
5. Identify the importance of effectively supervising student SAEs, including safety considerations.
6. Apply record keeping skills in the use of the AET record book system.

7. Interpret the types of awards offered through the State and National FFA Organization.
8. Describe various opportunities, offered in the total agricultural education program at the local, state, and national level.

AXED 4220. Methods for Teaching Agricultural and Technology Education
3 Credits (3)
Methods of instruction and presentation, selection of teaching aids and support materials, classroom management, development of a complete educational program, and microteaching experiences. May be repeated up to 3 credits.
Prerequisite: GPA of 2.5 or above.

AXED 4230. Directed Teaching in Agricultural or Technology Education
15 Credits (15)
Semester-long off-campus professional experience in directed teaching and observation provided in selected centers under secondary agricultural or technology education supervising teachers. Consent of Instructor required.
Prerequisite: AXED 4215, AXED 4220 and consent of instructor.

AXED 4235. Directed Teaching in Extension Education
3-12 Credits (3-12)
Four-to-fourteen-week, professional experiences in directed teaching and observation provided in cooperative extension at the county, regional, or state level. Consent of instructor required. May be repeated up to 12 credits.

AXED 4330. Content Area Literacies
3 Credits (3)
Surveys integrated reading/writing/discursive practices in middle/secondary content areas.
Learning Outcomes
1. Analyze literacy processes, as they pertain to adolescent learners.
2. Discuss current trends and issues in content area literacy instruction with a specific focus on practices that promote achievement and equity.
3. Evaluate instructional practices that help students use reading, writing, speaking, listening, viewing and visually representing to learn the content areas.
4. Illustrate ethical reasoning and decision making in your approach to content area literacy education.
5. Integrate research, reflection, and best practices that positively impact students in a diverse society.

AXED 4510. Introduction to Research Methods
3 Credits (3)
Introduction to research design and methodology in education and behavioral sciences. Overview of common research designs and data collection strategies. Prepares students to critique published research and understand basic skills including hypothesis development and conducting a literature search. Students must be in junior standing to enroll. May be repeated up to 3 credits.

AXED 4520. Methods in Career and Technical Laboratory Instruction
2 Credits (2)
For students planning to teach agricultural or technology education at a secondary or postsecondary level. Focus on planning, delivering, and evaluating instruction in laboratories; and on CPR, first aid, and NCCER certifications. Laboratory safety and tool, equipment, and laboratory management systems are also emphasized. Restricted to AXED Majors. May be repeated up to 2 credits.

AXED 4610. Leadership On Agricultural and Natural Resource Issues
3 Credits (3)
Investigates leadership concepts and group dynamics as they relate to a changing world and complex agricultural and natural resource issues. Topics include emotional intelligence, leading change, political leadership, facilitating agreement, team building, and managing conflict in agricultural and natural resource settings. May be repeated up to 3 credits.

AXED 4620. Methods of Teaching Biological, Earth and Physical Sciences in Agriculture
3 Credits (3)
Students learn to set up and teach in a modular agriscience laboratory, utilizing a variety of technologies. Modules covered focus on incorporating biological, earth and physical sciences into agricultural instruction and may include: Tissue culture, animal anatomy, hydroponics microscopy, electrophoresis, microbiology, soils and plant nutrients, water quality, water systems, entomology, integrated pest management, and renewable energy applications. Students develop their own modules and/or experiments.

AXED 4710. 4-H Youth Development
1 Credit (1)
On-line course explores 4-H Youth Development as an integral part of the Cooperative Extension Service. Topics to be addressed include mission, philosophy, delivery modes, audiences and partnerships. Course is relevant for anyone interested in pursuing a career in Cooperative Extension. May be repeated up to 1 credit.

AXED 4715. The FFA Organization: An Overview
1 Credit (1)
Online course addressing the history, mission, philosophy and structure of the New Mexico and National FFA Organizations and their relationship to supervised agriculture experiences and the agricultural education curriculum. Course is relevant for anyone interested in pursuing a career in agricultural education. May be repeated up to 1 credit.

AXED 4991. Undergraduate Research
1-4 Credits (1-4)
Research experience in agricultural, extension, and technology education with applications to selected issues and problems. May be repeated up to 4 credits.

AXED 4997. Independent Study in Agricultural, Extension, or Technology Education
1-3 Credits (1-3)
Specific subjects are agreed upon by the student and instructor. Students must be juniors or seniors to enroll. May be repeated up to 6 credits.

AXED 5105. Introduction to Special Education in Career and Technical Education
3 Credits (3)
Characteristics, identification, and educational needs of exceptional learners. Attention is given to the various types of programs serving exceptional learners. Designed for all professional personnel who work with exceptional learners. Specific strategies for working with students with special needs in a shop or laboratory setting within the Career and Technical Education environment will be included.
Learning Outcomes
1. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.

3. Explain the major components of an IEP and its processes, as well as the roles of learners, families and professionals on the team.
4. Discuss the different service delivery models and discuss the principles, practices, and pragmatics of inclusion co-teaching.
5. Analyze the disability categories under IDEA, 2004: characteristics, etiology, and diagnostic criteria.
6. Examine educational considerations for exceptional learners (educational approaches [Universal design and differentiated instruction], assistive technology, accommodations/modifications, and related supports and services).
7. Employ culturally responsive evidence-based practices to create family/school/community partnerships to promote academic achievement and prepare students for their post-school transitions.
8. Evaluate and synthesize research literature on a selected topic from current special education research.
9. Develop hands-on laboratory activities and educational strategies that are appropriate for a wide variety of learners.

AXED 5110. Management of Change, Diffusion, and Adoption of Innovations
3 Credits (3)
Factors that influence rates of diffusion and adoption of innovations. Consequences of adopting or rejecting innovations. Processes by which change agents influence introduction and adoption of innovations. Taught with AXED 4110 with differential assignments for graduate students. May be repeated up to 3 credits.
Learning Outcomes
1. Critically examine the adoption-diffusion model. Included are issues such as social class differentials in the dissemination of ideas and technology, non-adoption as a form of behavior, social and economic constraints on adoption behavior, and the consequences of adoption at both the individual and social levels.
2. Demonstrate understanding of how the rapid pace of change in technology and applied science may have good and bad outcomes.
3. Discuss the dissemination of new ideas and technology within various social units.
4. Discuss the applications of the adoption-diffusion model from the perspective of the change agent.
5. Enhance the development of leadership skills required to work with people in times of change.

AXED 5130. Advanced Agricultural Mechanization
3 Credits (3)
This course provides an overview of advanced agriculture mechanization techniques and concepts. Precision farming tools and applications will be introduced, and hands-on activities will be utilized. A discussion about applications and benefits will frame the course lectures.
Learning Outcomes
1. Describe and classify various precision agriculture software/hardware technologies
2. Demonstrate usage of various precision agriculture technologies
3. Understand decision making processes associated with implementation of precision agriculture technologies
4. Analyze the costs, time, and application of precision agriculture technologies

AXED 5150. Strategic Communications Campaigns and Evaluation
3 Credits (3)
Client-based marketing and communication needs for stakeholders in agricultural and life sciences. Students will learn brand awareness for agricultural stakeholders by developing a campaign of communications and marketing materials using multiple channels (e.g., written, visual, social). Students will also evaluate the materials for their audience reach, visibility, and effectiveness. Strategic communications involve planning, prioritizing, and evaluating. Students will gain experience implementing these needs with a real-world client to keep materials relevant to industry demands. May be repeated up to 3 credits.
Learning Outcomes
1. Identify communications-related needs with a client or stakeholder in the food, agricultural, natural resources, and human (FANH) sciences.
2. Define priority communications areas to address client or stakeholder needs.
3. Direct a communications plan with channels, tactics, steps, and timelines.
4. Develop a campaign of communications materials (e.g., written, visual, social) around a client's needs.
5. Evaluate the reach, visibility, and effectiveness of the communications materials.
6. Manage a client's brand with desired audiences through establishing, promoting, and reinforcing messages.
7. Publish portfolio materials showcasing the client's brand.

AXED 5155. Youth Program Development and Management
3 Credits (3)
Designed for professionals involved in youth group activities. Basic concepts in planning, conducting, and managing educational youth programs in a variety of organizations. Taught with AXED 415 with differentiated assignments for graduate students. May be repeated up to 3 credits.

AXED 5160. Teaching Adults in Nonformal Settings
3 Credits (3)
The adult and postsecondary learner; adult learning styles and principles; use of community resources and problem-solving techniques; and learning strategies for adults in formal and nonformal education. Taught with AXED 430 with differentiated assignments for graduate students. May be repeated up to 3 credits.

AXED 5165. History and Philosophy of Agricultural and Extension Education
3 Credits (3)
History and Philosophy of Agricultural and Extension Education serves as a foundational core of graduate studies in Agricultural and Extension Education. The design of the course is to acquaint the student with a broad perspective of cultural and historical conditions that have shaped both education and agricultural education as we know it today. The primary purpose of this course is to explore the nature of selected philosophical concepts and philosophers and to evaluate their influence upon education and agricultural/extension education in the United States. In addition to philosophical influences, students will examine the historical events and governmental laws and policies that have evolved and developed our educational system of today.
Learning Outcomes
1. Understand the principles of philosophy in education and agricultural and extension education.
2. Recognize the influence of philosophers and philosophical documents upon education and agricultural and extension education.
3. Analyze the historical foundations that have established our modern educational system.
4. Develop a personal philosophy regarding education and agricultural education.

AXED 5170. Keys for Agricultural and Rural Development
3 Credits (3)
Introduction to concepts of development, the process of change, key factors that contribute to agricultural and rural development in a community, and strategies employed to effect change with implications for international students or domestic students planning to work internationally. May be repeated up to 3 credits.

AXED 5210. Curriculum Development and Assessment in Agricultural Education
3 Credits (3)
This course prepares students to develop curriculum, design lessons, and prepare appropriate assessments in an agricultural education setting. An emphasis will be placed on the developing curriculum using the currently established resources that are available to agriculture teachers.
Prerequisite: 2.5 GPA.

AXED 5215. Developing Excellent Programs in Career and Technical Education
3 Credits (3)
Students learn to develop excellence in the three components of a successful secondary school program in career and technical education: classroom and laboratory instruction, career and technical student organizations, and career development activities. Community-based program planning, utilizing partners, program marketing, and professional development are addressed as strategies for achieving excellence. Methods of obtaining financing and maintaining accountability of the program are discussed. Taught with AXED 445 with differentiated assignments for graduate students. May be repeated up to 3 credits.

AXED 5220. Methods for Teaching Agricultural and Technology Education
3 Credits (3)
Methods of instruction and presentation, selection of teaching aids and support materials, classroom management, development of a complete educational program, and microteaching experiences. Taught with AXED 446. May be repeated up to 3 credits.
Prerequisite: GPA of 3.0 or above.

AXED 5230. Directed Teaching in Agricultural or Technology Education
4-9 Credits (4-9)
Semester-long off-campus professional experience in directed teaching and observation provided in selected centers under secondary agricultural and technology supervising teachers. Students need to have completed a teaching methods class prior to enrolling in this course. Consent of Instructor required.

AXED 5235. Directed Teaching in Extension Education
4-9 Credits (4-9)
Four- to fourteen-week professional experiences in directed teaching and observation provided in cooperative extension at the county, regional, or state level. Taught with AXED 448 with reduced credit hours for graduate students. Restricted to AXED majors. May be repeated up to 9 credits.

AXED 5310. New Mexico Water Issues
3 Credits (3)
Designed for agricultural and natural resource professionals who must educate others or provide leadership on complex water issues in New Mexico. Students will travel to four distinct geographic and cultural regions of the state and study water policies, issues, and delivery technologies in each region. Specific areas covered will be determined by resource professionals who will present past, current and future issues involved in the distribution of water. Urban impacts on water use will also be investigated. May be repeated up to 3 credits.

AXED 5320. Risk and Crisis Communications in Agricultural, Consumer, and Environmental Sciences
3 Credits (3)
The purpose of this course is to introduce risk and crisis as interdisciplinary concepts, reviewing theoretical frameworks from a variety of fields and perspectives, such as communication, social psychology and public relations. Students will develop a theoretical understanding of all aspects of strategic communication pertaining risks. Using readings and reflective writings, you will understand how individuals cognitively process risks and how to leverage trust and knowledge to facilitate public understanding. In addition, you will learn crisis communication and management from an organizational perspective. Using case studies and discussions, students will be able to recommend strategies for managing crises occurred to agricultural and natural resource industries.
Learning Outcomes
1. Develop a critical understanding of theoretical and conceptual frameworks related to risk and crisis communications
2. Use an integrated framework to analyze the communication strategies used by the agricultural and natural resource industries
3. Recommend effective and ethical strategies for managing actual and potential crises

AXED 5330. Content Area Literacies
3 Credits (3)
Surveys integrated reading/writing/discursive practices in middle/secondary content areas.
Learning Outcomes
1. Analyze literacy processes, as they pertain to adolescent learners.
2. Discuss current trends and issues in content area literacy instruction with a specific focus on practices that promote achievement and equity.
3. Evaluate instructional practices that help students use reading, writing, speaking, listening, viewing and visually representing to learn the content areas.
4. Illustrate ethical reasoning and decision making in your approach to content area literacy education.
5. Integrate research, reflection, and best practices that positively impact students in a diverse society.

AXED 5510. Research Methods
3 Credits (3)
Students learn the research process as it is applied to solving problems in the behavioral sciences. Prepares students to conduct and critique research and to diffuse research findings. Implications, applications, and ethics of research also stressed. Students develop a research proposal for a problem of their choice. May be repeated up to 3 credits.

AXED 5515. Data Collection and Analysis
3 Credits (3)
Introduction to basic concepts of data collection and analysis. Interpretations from observational studies and controlled experiments. Roles of descriptive and inferential statistics in a complete data analysis. Mean, median, standard deviation, and graphical summaries of data. Correlation and simple regression. One- and two-sample tests and confidence intervals. Chi-square tests and basic analysis of variance. Competency in arithmetic and algebra required. An undergraduate statistics course recommended. May be repeated up to 3 credits.

AXED 5610. Leadership on Agricultural and Natural Resource Issues
3 Credits (3)

Investigates leadership concepts and group dynamics as they relate to a changing world and complex agricultural and natural resource issues. Topics include emotional intelligence, leading change, political leadership, facilitating agreement, team building, and managing conflict in agricultural and natural resource settings. Taught with AXED 475 with differential assignments for graduate students. May be repeated up to 3 credits.

AXED 5615. Effective Management of Volunteer Programs
3 Credits (3)
For individuals currently involved in, or interested in being involved in, the management and supervision of volunteer programs. Emphasis on practical application, utilizing a research and academic base. Explores the roles, functions, and tasks of volunteers and managers of volunteers including recruitment, orientation and training, supervision, evaluation, recognition and retention. May be repeated up to 3 credits.

AXED 5993. Workshops in Agricultural, Extension, and Technology Education
1-3 Credits (1-3)
Workshop procedures applied to current trends in agricultural, extension, and technology education. A maximum of seven credits will count towards a degree. May be repeated up to 7 credits.

AXED 5994. Creative Component
1-4 Credits (1-4)
For nonthesis program. Individual investigations or projects, either qualitative or quantitative studies. A maximum of six credits will count towards a degree. May be repeated up to 88 credits.

AXED 5996. Special Topics
1-4 Credits (1-4)
Specific subjects and credits to be announced in the Schedule of Classes. Students can take only a maximum of four credits per semester and no more than six credits will count towards a degree. May be repeated up to 6 credits.

AXED 5998. Internship/Cooperative Experience
1-6 Credits (1-6)
Supervised professional on-the-job learning experience. May be repeated up to 6 credits.

AXED 5999. Master's Thesis
1-6 Credits (1-6)
Thesis. May be repeated up to 88 credits.

AXED 7000. Doctoral Dissertation
1-9 Credits (1-9)
Independent research planned, conducted and reported in consultation with and the direction of a major professor. Open only to students pursuing graduate study beyond the master's degree level. Offered for variable credit, 1-18 credit hours, maximum of 18 credit hours. May be repeated up to 18 credits.
Prerequisite: Graduate Advisor Approval.
Learning Outcomes

1. Identify/define problems pertinent to the discipline.
2. Generate questions and/or a hypothesis to provide a solution to the problem.
3. Review and summarize the literature relative to the problem.
4. Apply appropriate research methods and collect data systematically.
5. Conduct research responsibly and ethically.
6. Evaluate, interpret, and analyze a body of empirical data and evidence.
7. Discuss findings in the broader context of the field.
8. Develop and sustain an evidence#based argument.
9. Write and speak critically and coherently. 1
10. Produce publishable results.

B A-BUSINESS ADMINISTRATION

B A 105. Special Topics
1-3 Credits
Current topics in business and economics.

B A 291. Business Administration and Economics Internship and Cooperative Education I
1-3 Credits
Introduction and applications of the principles of business administration and economics. Registration in one course allowed per co-op work phase; a minimum of 12 work weeks is required. Open only to students in the College of Business. Option of S/U or a grade. The amount of academic credit (1-3 cr.) will be determined by the academic experience, and not by the work experience.

B A 305. Leadership Training for COB Ambassadors
1 Credit (1)
Leadership development for volunteers serving as COB student ambassadors, focusing on COB undergraduate business degree programs, NMSU student services, public speaking and public relations.

B A 391. Business Administration and Economics Internship and Cooperative Education II
1-3 Credits
Applications of the principles of business administration and economics. Registration in one course allowed per co-op work phase; a minimum of 12 work weeks is required. Open only to students in the College of Business. Option of S/U or a grade. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not by the work experience.

B A 490. Selected Topics
3 Credits (3)
Prerequisites vary according to the seminar being offered.

B A 498. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.
Prerequisite: junior or above standing and consent of instructor.

B A 500. Macroeconomic Essentials
1 Credit (1)
Macroeconomic theory and public policy, national income concepts, unemployment, inflation, economic growth and international payment problems. Restricted to: MBA Major majors majors.

B A 501. Quantitative Tools for the MBA
1 Credit (1)
An overview of critical topics in math and statistics that will provide a quantitative foundation for students entering the Master of Business Administration program. Admission to the MBA program.

B A 545. Business Ethics
3 Credits (3)
Understanding of business ethics, social responsibilities of business organizations, and personal codes of conduct. Complexities of moral reasoning and principles of ethical behavior.

B A 550. Special Topics
3 Credits (3)
Interdisciplinary seminar in selected current business topics.

Prerequisite(s): Prerequisites vary according to the seminar being offered.

B A 590. Professional Paper/Presentation
3 Credits (3)
Paper written in close coordination with sponsoring professor and presented near the end of the student's final semester in the M.B.A. program. The paper will consist of a professional business report, a case study of a business or organization or a research report. Restricted to: MBA majors.
Prerequisite(s): Minimum of 3.0 average in: ACCT 503, BLAW 502, BFIN 503, and MKTG 503 or AEEC 551.

B A 598. Special Research Programs
1-3 Credits
Individual investigations either analytical or experimental. A maximum of 3 credits may be earned.
Prerequisite: consent of instructor.

B A 599. Master's Thesis
15 Credits
Thesis.

BCHE-BIOCHEMISTRY

BCHE 140. Explorations in Chemistry and Biochemistry
1 Credit (1)
In introduction to the experience of chemistry and biochemistry degrees. In this course, students will prepare a degree plan and personal statement. Career opportunities in chemistry and biochemistry will be presented and discussed. Graded S/U.
Learning Outcomes
1. Demonstrate knowledge and understanding of the sub-disciplines of Chemistry and Biochemistry.
2. Demonstrate knowledge and understanding of the requirements for the Chemistry and Biochemistry majors and career opportunities available to these majors.
3. Adopt strategies to prepare for future success in a job search or graduate school application.
4. Learn about undergraduate research opportunities in chemistry and biochemistry.

BCHE 241. Introduction to Research in Biochemistry
1-3 Credits
Techniques and procedures of biochemical research. May be repeated for a maximum of 3 credits.
Prerequisites: 8 credits of chemistry and 3.0 GPA in chemistry.

BCHE 395. Biochemistry I
3 Credits (3)
Principles governing chemistry and physics of life processes with emphasis on the relationships between molecular structure and cell function. Basic principles of biochemical processes, enzymology, and the structure/function of the major classes of biomolecules with introductions to metabolism. Introduction to catabolic metabolism. May be repeated up to 3 credits.
Prerequisite: C- or better in CHEM 314.
Learning Outcomes
1. Understand the structure, reactivity, and metabolic function of the presented biological molecules and apply that knowledge to biomolecules encountered in future experiences. Examples include the 20 common amino acids, carbohydrate molecules of glycolysis, carboxylic acids of the citric acid cycle, lipid components of biological membranes, and many catalytic enzymes.
2. Understand the theory and application of many of the experimental techniques of Biochemistry.
3. Understand biochemical regulation and the interconnectedness of metabolic processes. A large fraction of contemporary biochemical research is devoted to delineating biochemical regulation. Details of biochemical regulation will be interwoven with material presented throughout the semester, stressing the principles of regulation that are common in many organisms.
4. Understand enzyme kinetics and enzyme mechanism.

BCHE 395H. Biochemistry I Honors
3 Credits (3)
Principles governing chemistry and physics of life processes with emphasis on the relationships between molecular structure and cell function. Basic principles of biochemical processes, enzymology, and the structure/function of the major classes of biomolecules with introductions to metabolism. Introduction to catabolic metabolism. Taught with BCHE 395 with additional experiential-focused work required.
Prerequisite: C- or better in CHEM 314.
Learning Outcomes
1. Understand the structure, reactivity, and metabolic function of the presented biological molecules and apply that knowledge to biomolecules encountered in future experiences: Examples include the 20 common amino acids, carbohydrate molecules of glycolysis, carboxylic acids of the citric acid cycle, lipid components of biological membranes, and many catalytic enzymes.
2. Understand the theory and application of many of the experimental techniques of Biochemistry.
3. Understand biochemical regulation and the interconnectedness of metabolic processes. A large fraction of contemporary biochemical research is devoted to delineating biochemical regulation. Details of biochemical regulation will be interwoven with material presented throughout the semester, stressing the principles of regulation that are common in many organisms.
4. Understand enzyme kinetics and enzyme mechanism.
5. Demonstrate proficiency in problem-based learning and scientific communication.

BCHE 396. Biochemistry II, Lecture and Laboratory
4 Credits (2.5+3P)
Introduction to anabolic metabolism and hormonal regulation. Biochemical principles of the mechanism and regulation of replication, transcription, recombination and translation in prokaryotes and eukaryotes. Introduction to DNA-based information technology. Taught with BCHE 396 H. May be repeated up to 4 credits.
Prerequisite: C- or better in BCHE 395.
Learning Outcomes
1. Recognize the essential biochemical reactions and enzymatic mechanisms required for nucleic acid, amino acid, and fatty acid synthesis.
2. Learn the biochemical reaction mechanisms associated with key elements of the central dogma of molecular biology.
3. Identify the reactions and enzymes required for DNA maintenance and replication, transcription and RNA polymerization, and the translation of mRNA to primary amino acid sequence and protein synthesis.
4. Conduct experiments safely.
5. Select and manipulate plasmids to achieve desired recombinant DNA for experimentation.
6. Obtain relevant DNA sequence information from public databases.

7. Transform and isolate plasmid DNA to be used for cloning procedures.
8. Design DNA specific primers for PCR reactions.
9. Perform restriction digest and ligation reactions. 1
10. Analyze DNA sequence to validate the outcome of recombinant DNA experimentation. 1
11. Demonstrate scientific dissemination skills by attending scientific seminars or review primary literature and provide summary via written or oral presentation.

BCHE 396 H. Biochemistry II Honors, Lecture and Laboratory
4 Credits (2.5+3P)
Introduction to anabolic metabolism and hormonal regulation. Biochemical principles of the mechanism and regulation of replication, transcription, recombination and translation in prokaryotes and eukaryotes. Introduction to DNA-based information technology. Taught with BCHE 396 with additional work required. May be repeated up to 3 credits.
Prerequisite: C- or better in BCHE 395.
Learning Outcomes
1. Recognize the essential biochemical reactions and enzymatic mechanisms required for nucleic acid, amino acid, and fatty acid synthesis.
2. Learn the biochemical reaction mechanisms associated with key elements of the central dogma of molecular biology.
3. Identify the reactions and enzymes required for DNA maintenance and replication, transcription and RNA polymerization, and the translation of mRNA to primary amino acid sequence and protein synthesis.
4. Conduct experiments safely.
5. Select and manipulate plasmids to achieve desired recombinant DNA for experimentation.
6. Obtain relevant DNA sequence information from public databases.
7. Transform and isolate plasmid DNA to be used for cloning procedures.
8. Design DNA specific primers for PCR reactions.
9. Perform restriction digest and ligation reactions. 1
10. Analyze DNA sequence to validate the outcome of recombinant DNA experimentation. 1
11. Demonstrate scientific dissemination skills by attending scientific seminars or review primary literature and provide summary via written or oral presentation.

BCHE 432. Physical Biochemistry
3 Credits (3)
This course focuses on the theoretical principles of biophysical techniques and how they are applied to biological problems. Primary literature is used heavily to explain concepts and applications along with periodic demonstrations of biophysical techniques using department instruments. Students taking this course will be expected to present primary literature highlighting the applications of various techniques.
Prerequisite: CHEM 430 or CHEM 433.
Learning Outcomes
1. Understand the theoretical principles of spectroscopic and biophysical techniques.
2. Understand the appropriate applications for various instruments.
3. Be able to interpret spectroscopic and biophysical data.
4. Understand and describe biophysical literature.
5. Be able to describe biophysical studies to a diverse audience of scientists and non-scientists.

BCHE 440. Biochemistry Seminar
1 Credit (1)
Introduction to current literature in biochemistry and molecular biology. Selected topics in the field will be presented by the faculty. Students will present written and oral reports from literature searches. Restricted to: BCHE majors.
Prerequisite: BCHE 396.
Learning Outcomes
1. Students are proficient in reading scientific literature.
2. Students are proficient in the oral communication of scientific literature.

BCHE 441. Advanced Research in Biochemistry
1-3 Credits
Investigation of biochemical problems and the development of special techniques. May be repeated for a maximum of 3 credits.
Prerequisites: consent of instructor, 16 credits of chemistry and 3.0 GPA in chemistry for nonmajors.

BCHE 451. Special Topics
1-3 Credits
Selected topics of current interest designated by title and credit. May be repeated up to 12 credits.
Learning Outcomes
1. Increase depth of knowledge in a specific area of biochemistry.
2. Learn how to read and critically review primary research papers in a specific area of biochemistry.
3. Gain experience in presenting primary research papers in a specific area of biochemistry.

BCHE 452. Chemical Carcinogenesis
3 Credits (3)
Chemical-dependent DNA mutagenesis, cancer development, and progression, with an emphasis on current research.
Prerequisite: CHEM 314 or CHEM 2120.
Learning Outcomes
1. Students can describe the fundamental principles of multistage carcinogenesis, including initiation, promotion, and progression.
2. Students can explain the role of DNA mutagenesis and repair mechanisms in the development and prevention of cancer.
3. Students can summarize the basic principles of toxicokinetics and explain how carcinogens are metabolized and interact with biological systems.
4. Analyze and critically evaluate primary scientific literature related to chemical carcinogenesis.
5. Assess the significance and implications of recent advancements in carcinogenesis research.

BCHE 455. Independent Studies
1-3 Credits
Independent studies directed by consulting faculty.
Prerequisite: consent of instructor.

BCHE 542. Biochemistry I
3 Credits (3)
Principles governing chemistry and physics of life processes with emphasis on the relationships between molecular structure and cell function. In depth principles of biochemical processes, enzymology, and the structure/function of the major classes of biomolecules. Enzyme

reaction and regulatory mechanisms in central metabolism and principles of bioenergetics are covered.
Prerequisite: CHEM 314 and CHEM 430 or CHEM 433; or BCHE 395 or equivalent.

Learning Outcomes

1. Understand the structure, reactivity, and metabolic function of the presented biological molecules and apply that knowledge to biomolecules encountered in future experiences: examples include the 20 common amino acids, carbohydrate molecules of glycolysis, carboxylic acids of the citric acid cycle, lipid components of biological membranes, and many catalytic enzymes.
2. Understand the theory and application of many of the experimental techniques of Biochemistry.
3. Understand biochemical regulation and the interconnectedness of metabolic processes: a large fraction of contemporary biochemical research is devoted to delineating biochemical regulation.
4. Apply the principles of enzyme kinetics as a technique to determine enzyme mechanism and regulation.
5. Propose novel enzyme reaction mechanisms based on the understanding of various classes of enzyme mechanisms and the known function of cofactors.
6. Details of biochemical regulation will be interwoven with material presented throughout the semester, stressing the principles of regulation that are common in many organisms.

BCHE 545. Molecular and Biochemical Genetics
3 Credits (3)

An accelerated treatment of the molecular basis of gene expression. Discussion of chemical, enzymological, and genetic techniques of molecular biology.
Prerequisite/Corequisite: BCHE 542.

Learning Outcomes

1. Understand and explain fundamental concepts in biochemical genetics: describe the molecular structure and function of DNA, RNA, and proteins.
2. Analyze genetic mechanisms and their applications: Evaluate the processes of DNA repair, recombination, and site-specific recombination.
3. Develop and apply scientific inquiry and problem-solving skills: Formulate and articulate relevant research questions based on course material by demonstrate the ability to apply biochemical and genetic concepts to experimental design and interpretation and engaging in critical thinking through weekly question submissions and article discussions and communicating scientific concepts effectively and construct clear, well-reasoned written and verbal explanations of biochemical genetics concepts.
4. Demonstrate the ability to communicate complex genetic mechanisms to peers: Properly cite and reference academic sources, including AI-generated content when applicable: Understand and adhere to ethical guidelines regarding plagiarism, academic integrity, and responsible scientific conduct by completing a plagiarism tutorial and apply best practices in scientific writing and Engaging in respectful, collaborative discussions and maintain a professional attitude in all course interactions.
5. Apply knowledge to broader scientific and biomedical contexts: Relate biochemical genetic principles to real-world applications, including genetic engineering, biotechnology, and medical research.
6. Compare and contrast the mechanisms of DNA replication, transcription, and translation in prokaryotic and eukaryotic systems.
7. Explain the biochemical principles underlying gene expression and its regulation.
8. Recognize the importance of biochemical genetics in understanding diseases and developing therapeutic strategies.
9. Appreciate the evolutionary and functional implications of genetic mechanisms across biological systems. 1
10. Discuss epigenetic modifications and chromatin remodeling in gene regulation. 1
11. Analyze the role of non-coding RNAs and other regulatory elements in gene expression. 1
12. Interpret and critically assess primary scientific literature related to biochemical genetics and Synthesize experimental evidence to support or refute scientific hypotheses. 1
13. Identify key methodologies used in genetic and biochemical research.

BCHE 546. Biochemistry II: Central and Intermediary Metabolism
3 Credits (3)

Intermediary metabolism: catabolic and anabolic pathways of carbohydrates, lipids, amino acids, and nucleic acids, including their regulation.
Prerequisite: BCHE 542, or BCHE 395 with consent of instructor.

Learning Outcomes

1. Apply knowledge of the structure, reactivity, and metabolic function of scores of biological molecules: examples include the 20 amino acids, carbohydrate molecules of glycolysis, carboxylic acids of the citric acid cycle, lipid components of biological membranes, and many catalytic enzymes.
2. Apply the function of enzymes, enzymatic cofactors to the design and regulation of both catabolic and anabolic pathways.
3. Master an understanding of biochemical regulation and the interconnectedness of metabolic processes and a large fraction of contemporary biochemical research is devoted to delineating biochemical regulation.
4. Identify resources and communicate the connection between metabolism and disease or mutational analysis for basic research.
5. Develop an appreciation of the unity of life processes at the molecular level, the field of Biochemistry offers a unique perspective on human existence, you will begin to understand that we are not as different, nor as separate, from the animals, plants, and microbes of this world as is commonly assumed.

BCHE 598. Special Research Programs
1-3 Credits

May be repeated for a maximum of 6 credits. Same as CHEM 598. Graded S/U.

BCHE 599. Master's Thesis
15 Credits

May be repeated for a maximum of 6 credits. Same as CHEM 599.

BCHE 600. Research
1-15 Credits

May be repeated for a maximum of 20 credits. PR/U grading. Same as CHEM 600.

BCHE 647. Physical Biochemistry
3 Credits (3)

Fundamental applications of physical chemistry to the investigation of biological metabolites and biological macromolecules, including proteins, oligo-nucleotides, and molecular arrays with an emphasis on understanding biological functions based on chemical structures. Taught with BCHE 432. May be repeated up to 3 credits.

Prerequisite: C- or better in CHEM 430 or CHEM 433 or BCHE 542.

Learning Outcomes

1. Understand the theoretical principles of spectroscopic and biophysical techniques.
2. Understand the appropriate applications for various instruments.
3. Be able to interpret spectroscopic and biophysical data.
4. Understand and describe biophysical literature.
5. Be able to describe biophysical studies to a diverse audience of scientists and non-scientists.

BCHE 649. Topics in Biochemistry
1-3 Credits
Selected topics of current interest designated by title and credit. May be repeated for a maximum of 3 credits.

BCHE 652. Chemical Carcinogenesis
3 Credits (3)
Chemical-dependent DNA mutagenesis, cancer development, and progression, with an emphasis on current research.

Learning Outcomes

1. Students can describe the fundamental principles of multistage carcinogenesis, including initiation, promotion, and progression.
2. Students can explain the role of DNA mutagenesis and repair mechanisms in the development and prevention of cancer.
3. Students can summarize the basic principles of toxicokinetics and explain how carcinogens are metabolized and interact with biological systems.
4. Analyze and critically evaluate primary scientific literature related to chemical carcinogenesis.
5. Assess the significance and implications of recent advancements in carcinogenesis research.

BCHE 700. Doctoral Dissertation
20 Credits
May be repeated for a maximum of 20 credits. Graded PR/U. Same as CHEM 700.

BCIS-BUSINESS COMPUTER SYSTEMS

BCIS 1110. Introduction to Information Systems
3 Credits (3)
Examination of information systems and their impact on commerce, education, and personal activities. Utilization of productivity tools for communications, data analysis, information management and decision-making.

Learning Outcomes

1. Describe the social impact of information literacy and systems in relation to commerce, education, and personal activities.
2. Explain how to use the information resources legally, safely, and responsibly in relation to ethical, security, and privacy issues.
3. Evaluate bias, accuracy and relevance of information and its sources.
4. Use productivity tools for communications, data analysis, information management and decision-making.
5. Describe and use current information systems and technologies

BCIS 1160. Windows
1-3 Credits (1-3)
This course prepares students to develop the skills needed to deploy and manage Windows. Students will learn how to manage and troubleshoot Windows devices in a secure network environment. Students will also learn to run multiple operating systems using client Hyper-V. Microsoft Intune will be utilized to teach students to manage Windows mobile and desktop devices in a cloud-based environment. Out-of-class computer work is required. May be repeated up to 6 credits.

Learning Outcomes

1. Demonstrate how to install Windows.
2. Execute System Utilities.
3. Explain how to manage disks and file systems.
4. Recount the features of user management.
5. Describe Windows security features.
6. Identify the features of user productivity tools and application support.
7. Highlight the steps to complete performance tuning and system recovery.
8. Outline in detail how Microsoft Intune Device Management is utilized.
9. Summarize how to run multiple operating systems inside a virtual machine using Client Hyper-V. 1
10. Summarize Enterprise Computing. 1
11. Illustrate Remote Access and Client Support processes.

BCIS 1215. Introduction to MS Excel I
3 Credits
This course introduces Microsoft Excel spreadsheet software. Coverage includes creating, editing, manipulating, and printing workbooks, charts, features and commands, spreadsheet design, formulas, and functions.

Learning Outcomes

1. Identify the basic Excel (spreadsheet) concept.
2. Describe and apply basic skills of worksheet and cell formatting, charts, and tables.
3. Recognize and demonstrate the concepts of creating, editing, and formatting worksheets.
4. Apply and demonstrate the concepts of working with charts.
5. Apply formulas and functions.
6. Analyze data using formulas and compiling workbook data.

BCIS 1220. Introduction to MS Word
3 Credits (2+2P)
This course introduces MS Word software. Basic word processing techniques and applications will be covered. Students will create, revise, store, share and retrieve documents. Students will learn various formatting techniques, use of tables, use of references tools. May be repeated up to 6 credits.

Learning Outcomes

1. Manage documents: navigate within documents; format documents; save and share documents; and inspect documents for issues.
2. Insert and format text, paragraphs, and sections: Insert text and paragraphs; format text and paragraphs; create and configure document settings.
3. Manage tables and lists: create tables; modify tables; create and modify lists.
4. Create and manage references: create and manage reference elements; create and manage reference tabs.
5. Insert and format graphic elements: insert illustrations/text boxes; format illustrations and text boxes; add text to graphic elements; modify graphic elements.
6. Manage document collaboration: add and manage comments; manage change tracking.

BCIS 1230. Introduction to MS PowerPoint
3 Credits (3)
Introduction to the electronic presentation, specifically how to use, design and edit presentation graphics for use in a variety of personal and business applications. Students will learn how to create and work with design templates, auto layouts, and background slides. Also covered are how to add tables, charts, clip art, pictures, video, sound and animation effects.
Prerequisite: BCIS 1220 or ability to demonstrate keyboarding and Windows proficiency.
Learning Outcomes
1. Create, edit, format, and save PowerPoint presentations.
2. Create and change templates.
3. Create, apply, and customize Master slides.
4. Create, apply, and customize presentation themes.
5. Create, apply, and customize styles presentations.

BCIS 1750. Microsoft Outlook and Office Procedures
3 Credits (3)
This course provides information about office principles and procedures that are used in the fast-paced offices of today. Student will become proficient using Microsoft Outlook and other current technologies to develop the foundational skills necessary to manage email, appointments, contacts, and tasks.
Prerequisite: ENGL 1110G.
Learning Outcomes
1. Demonstrate office skills in office communications, record management, proofreading, research techniques, planning meetings and conferences, writing and dictating correspondence.
2. Describe the technologies of the modern office such as electronic mail, word processing, information processing, and telecommunications.
3. Perform a mastery of punctuation, grammar, writing skills and indexing skills.
4. Manage records, make travel arrangements, and execute general administrative duties.
5. Define ethics and ethical behavior.
6. Manage the Outlook environment efficiently within a professional business setting.
7. Manage messages in an organized way for productivity.
8. Manage schedules to clearly communicate among professionals.
9. Manage contacts and groups to effectively connect business individuals.

BCIS 2120. Desktop Publishing
3 Credits (3)
This course utilizes a variety of software packages to produce reports, brochures, advertisements, correspondence and newsletters. Various software packages are used such as Microsoft Office Publisher® and Adobe® InDesign CS Suite.
Prerequisite: BCIS 1110.
Learning Outcomes
1. Effectively utilize the features of Microsoft Publisher, such as create, open, edit, save, view and print a publication.
2. Design and create top quality publications using templates, color schemes, text and graphics suitable for academic professional, and personal use.
3. Merge publications while working with advanced formatting.
4. Produce publications using design techniques, font schemes, object manipulation, and layout guides.

BCIS 2130. Web Design
3 Credits (3)
Design and create a website using HTML, CSS, web development tools and industry-recognized software while applying best practices in site management and business web presence.
Learning Outcomes
1. Students will identify and apply best practices for web design in a business setting.
2. Students will create a basic web page utilizing WC3 principles.
3. Students will explain the importance and impact of web presence in today's business environment.
4. Students will determine and utilize web page features and techniques for a specific business.
5. Students will create a web design management plan for business.
6. Students will discuss web page tools for performance and web traffic analytics.
7. Students will identify web design components for a mobile society.

BCIS 2221. MS Word®II
3 Credits (2+2P)
This course provides an in-depth study of MS Word software. Students will learn how to create professional business documents, templates, customize themes, mail merge, and reports with citations and references.
Prerequisite: OTEC 1101 or keyboarding proficiency.
Learning Outcomes
1. Create, edit, format, and save Word documents.
2. Create reports using chosen reference style which includes citations and bibliography.
3. Create a multiple-page report with tables, footnotes, and endnotes.
4. Create a professional newsletter, which includes inserting section breaks, formatting columns, inserting symbols, and distinguishing between online and inline objects.
5. Create and change templates.
6. Create, apply, and customize document themes.
7. Create, apply, and customize styles.
8. Create and edit documents using mail merge with data sources and main documents.

BCIS 2310. Spreadsheets and Data Analysis
3 Credits (3)
Evaluation of and advanced applications of electronic spreadsheets. Basic concepts of business statistics, data analysis, and management science integrated in a contemporary spreadsheet environment. Emphasizes practical applications and business decision making.
Prerequisite: BCIS 1110.
Learning Outcomes
1. Develop and work with professional-looking worksheets.
2. Integrate Microsoft Excel®® with other Microsoft programs.
3. Work with multiple worksheets and workbooks.
4. Perform what-if analyses.
5. Enhance Microsoft Excel®® with Visual Basic®.
6. Use Microsoft Excel® to perform statistical analyses.

BCIS 321. Introduction to Software Development and Programming
3 Credits (3)

Computer algorithm development and programming logic in the context of business information systems using current programming environments. Includes program design, data types, data structures, control structures, arrays, and principles of object-oriented programming. May be repeated up to 3 credits.
Prerequisite: C- or better in BCIS 1110; and MATH 1215.
Learning Outcomes
1. Students are proficient in Python and knowledgeable on programming.
2. Students can use programming knowledge to work on business case studies involving data.

BCIS 338. Business Information Systems I
3 Credits (3)
This course covers the business and managerial applications/implications of management information systems (MIS) and an introduction to business analytics. In doing so, the course blends technical know-how with decision-making and systems integration. Additionally, this course provides you with working knowledge of productivity software (i.e., spreadsheet software).
Prerequisite: BCIS 1110 or consent of instructor.
Learning Outcomes
1. Students can explain how information systems and business analytics are used in business.
2. Students can construct intermediate and Advance levels of Excel spreadsheet application.
3. Students can construct intermediate-level O365 Cloud applications, Databases, and Collaborations.
4. Students can describe what business professionals need to know about computer hardware/Software/Security/Social Media and Business Intelligent.
5. Students can describe what business professionals need to know about and business processes and improvement.
6. Apply information systems viz. spreadsheet and analytics software, to solve business problems.

BCIS 350. Information Systems Analysis and Design
3 Credits (3)
An introduction to the analysis and design of secure information systems.
Prerequisite(s): Concurrently with BCIS 338 or consent of instructor.

BCIS 461. Business Analytics I
3 Credits (3)
This course provides an understanding of how organizations can utilize technology to successfully collect, organize, manipulate, use, and present data. The course blends the use of current technology with the managerial practices involving business analytics. The emphasis of the course will be on data management practices and the production of descriptive analytics. Crosslisted with: BCIS 561.
Prerequisite(s): BCIS 338 or consent of instructor.

BCIS 466. Business Analytics II
3 Credits (3)
This course provides an understanding of how organizations can build and test predictive models, utilizing business-related data to estimate model parameters. The emphasis of the course will be on utilizing data management systems to produce useful predictive analytics. Crosslisted with: BCIS 566.
Prerequisite(s): BCIS 461 or consent of the instructor.

BCIS 475. Database Management Systems
3 Credits (3)
Design, development, and use of database management systems in the business environment. Specifically, we will focus on both operational databases and analytical databases (Data Warehouse and Data Marts). Cross-listed with BCIS 575.
Prerequisite: BCIS 338 or consent of instructor.
Learning Outcomes
1. Describe fundamental database terminology and explain the primary features of database management systems.
2. Explain relational database concepts, such as primary key and referential integrity, normalization, and triggers.
3. Explain what a data model is.
4. Write SQL, the standard language of relational databases, at an advanced level.
5. Design a data model and code/implement it as a database solution using SQL.
6. Describe the fundamental concepts of Data Warehouses.
7. Design and build data warehouses.
8. Describe emergent database topics such as big data, data lakes, NoSQL.
9. Understand how a database can be used with Python programming language and MS Excel.

BCIS 480. Introduction to Cybersecurity: Exploring Computer, Network, and Data Security Principles
3 Credits (3)
This course introduces students to fundamental principles of cybersecurity and computer security. Through comprehensive exploration, students gain a deep understanding of diverse cybersecurity concepts spanning various domains. The curriculum covers essential aspects of computer security, including cryptography, authentication, access control, threat identification, counterattack strategies, and detection/prevention methods. These concepts are applied across application software, operating systems, networks, mobile apps, and databases. The course also covers securing network-based applications and network security fundamentals like TCP/IP, firewalls, intrusion detection, and vulnerability management. Ultimately, students develop a robust foundation in cybersecurity and computer security, preparing them for the digital landscape. Cross-listed with BCIS 580. May be repeated up to 3 credits.
Prerequisite: BCIS 338 or consent of instructor.
Learning Outcomes
1. Describe the key security requirement of confidentiality, integrity, and availability.
2. Discuss the types of security threats and attacks that must be dealt with and give examples of the types of threats and attacks that apply to different categories of computer and network assets.
3. Explain the fundamental security design principles.
4. Define e-commerce, understand how e-commerce differs from e-business, identify the primary technological building blocks underlying e-commerce, and recognize major current themes in e-commerce.
5. Identify and describe the unique features of e-commerce technology and discuss their business significance.
6. Understand the scope of e-commerce crime and security problems, the key dimensions of e-commerce security, and the tension between security and other values.
7. Identify the key security threats in the e-commerce environment.

8. Describe how technology helps secure Internet communications channels and protect networks, servers, and clients.

BCIS 482. Management of Information Security
3 Credits (3)
Provides management overview of information security and thorough examination of administration of information security. Surveys field of information security including planning, policy and programs, protection and people relative to information security.
Prerequisite: BCIS 338 or consent of instructor.
Learning Outcomes
1. Explain the fundamental concepts pertaining to the management of information security within the context of organizations.
2. Describe commonly used information systems (IS) security standards and guidelines.
3. Create IS security management and policy as well as risk management plans.
4. Explain the behavioral aspects of IS security and discuss the development of security culture within organizations.
5. Explain the technical aspects of IS security, including issues related to cryptography and network security.
6. Describe and evaluate the regulatory and ethical aspects of information system security (primarily within the United States and European Union context).

BCIS 485. Enterprise Resource Planning
3 Credits (3)
This course covers concepts in enterprise resource planning (ERP). Topics include how ERP integrates business processes across functional areas—such as the procurement process and the sales order process—and how businesses use ERP information systems in day-to-day operations as well as for performance monitoring.. SAP software will be utilized in multiple hand-on examples of ERP software, serving as a real-world illustration of an ERP system.
Prerequisite: C- or better in BCIS 338 or BCIS 350 or ACCT 351.
Learning Outcomes
1. Explain business processes common to most businesses--order processing, inventory management, and procurement.
2. Distinguish between master and transactional data common to most organizations.
3. Describe the cash-to-cash cycle in a production environment.
4. Explain how a business process often spans different functional areas of the business: accounting, marketing, and material management.
5. Describe how enterprise systems, such as SAP, integrate business functional areas into one enterprise-wide information system.
6. Use critical thinking to make decisions.

BCIS 490. Selected Topics
1-3 Credits
Current topics in business systems analysis. Consent of Instructor required.

BCIS 498. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with prior approval of the department head. May be repeated for a maximum of 3 credits.
Prerequisites: junior or above standing and consent of instructor.

BCIS 502. Business Information Systems
3 Credits (3)
Analysis of information systems as integral parts of business organizations, including the responsibility of management to understand their capabilities and uses in handling the organization s information flow and providing appropriate information for decision making.
Prerequisite: graduate students only.

BCIS 510. AI and Machine Learning for Supply Chain Decision-Making
3 Credits (3)
This course provides an understanding of the use of artificial intelligence (AI) and machine learning (ML) in supply chain operations, focusing on data-driven decision-making. Students will apply predictive and prescriptive models to address challenges in forecasting, inventory management, customer segmentation, and sourcing, among others.
Prerequisite: Programming Foundations (either CSCI 4525 or CSCI 4520), AI Foundations (CSCI 5405, CSCI 5420 or EE 565).
Learning Outcomes
1. Understand the most common supply chain management challenges and the potential for AI to address them.
2. Apply traditional AI and ML techniques such as regression and clustering to solve supply chain problems.
3. Assess model performance in the context of the supply chain.
4. Compare customer and supplier segmentation models.
5. Develop basic AI-driven supply chain decision support tools.
6. Reflect on the ethical implications of AI/ML applications in the supply chain.
7. Understand the implications of data management on developing AI decision support tools.

BCIS 550. Information Systems Analysis and Design
3 Credits (3)
Information systems development methodologies and the system life cycle. Justifying and managing systems development projects. Not open to students who have taken BCIS 350. Students must be Graduate Students to enroll. May be repeated up to 3 credits.
Learning Outcomes
1. Describe foundations of systems development.
2. Explain systems development life cycle and key methodologies.
3. Depict how to conduct planning in systems development.
4. Determine and structure system requirements.
5. Apply principles and guidelines to design interfaces, forms and databases.
6. Understand the major issues in the systems implementation and maintenance.

BCIS 561. Business Analytics I
3 Credits (3)
This course provides an understanding of how organizations can utilize technology to successfully collect, organize, manipulate, use, and present data. The course blends the use of current technology with the managerial practices involving business analytics. The emphasis of the course will be on data management practices and the production of descriptive analytics. Not open to students who have taken BCIS 461. No S/U or audit option.
Prerequisite: BCIS 338.
Learning Outcomes
1. Identify the reasons for and the evolution of computerized support in managerial decision making.
2. Describe the business intelligence (BI) methodology and concepts.
3. Identify and explain various types of analytics.
4. Explain the nature of data in the context of BI and Business Analytics.

5. Describe statistical modeling and its relationship to business analytics.
6. Apply descriptive and inferential statistics techniques.
7. Explain the importance of data/information visualization and apply different types of visualization techniques.
8. Explain the basic concepts of data warehousing.
9. Explain data integration and the extraction, transformation, and load (ETL) processes. 1
10. Describe the essence of business performance management (BPM). 1
11. Describe balanced scorecard and Six Sigma as performance measurement systems. 1
12. Explain the objectives and benefits of data mining. 1
13. Learn the standardized data mining process. 1
14. Enhance your communication (presentation and report writing), creative thinking, problem-solving, and analytical skills.

BCIS 566. Business Analytics II
3 Credits (3)
This course provides an understanding of how organizations can build and test predictive models, utilizing business-related data to estimate model parameters. The emphasis of the course will be on utilizing data management systems to produce useful predictive analytics. Not open to students who have taken BCIS 466. No S/U or audit option.
Prerequisite: BCIS 561.
Learning Outcomes
1. Identify and explain various types of analytics.
2. Define data mining as an enabling technology for business analytics.
3. Learn the standardized data mining processes and the different methods and algorithms of data mining.
4. Build working knowledge of the existing data mining software tools.
5. Describe text analytics and understand the need for text mining.
6. Learn the process of carrying out a text mining project and the common methods for sentiment analysis.

BCIS 575. Database Management Systems
3 Credits (3)
Design, development, and use of database management systems in the business environment. Not open to students who have taken BCIS 475.
Prerequisite: BCIS 350 or BCIS 550.
Learning Outcomes
1. Describe fundamental database terminology and explain the primary features of database management systems. (Cognitive Level: Understand)
2. Explain relational database concepts, such as primary key and referential integrity, normalization, and triggers. (Cognitive Level: Understand)
3. Explain what a data model is. (Cognitive Level: Understand)
4. Write SQL--the standard language of relational databases--at an advanced level. (Cognitive Level: Apply)
5. Design a data model and code/implement it as a database solution using SQL. (Cognitive Level: Create)
6. Describe the fundamental concepts of Data Warehouses. (Cognitive Level: Understand)
7. Design and build data warehouses. (Cognitive Level: Create)
8. Describe emergent database topics such as graph databases, big data, data lakes, NoSQL. (Cognitive Level: Understand)
9. Demonstrate how a database can be used with Python programming language and MSExcel. (Cognitive Level: Apply)

BCIS 580. Introduction to Cybersecurity: Exploring Computer, Network, and Data Security Principles
3 Credits (3)
This course introduces students to fundamental principles of cybersecurity and computer security. Through comprehensive exploration, students gain a deep understanding of diverse cybersecurity concepts spanning various domains. The curriculum covers essential aspects of computer security, including cryptography, authentication, access control, threat identification, counterattack strategies, and detection/prevention methods. These concepts are applied across application software, operating systems, networks, mobile apps, and databases. The course also covers securing network-based applications and network security fundamentals like TCP/IP, firewalls, intrusion detection, and vulnerability management. Ultimately, students develop a robust foundation in cybersecurity and computer security, preparing them for the digital landscape. Not open to students who have taken BCIS 480. No S/U or audit option. May be repeated up to 3 credits.
Prerequisite: BCIS 338 or equivalent or consent of instructor.
Learning Outcomes
1. Describe the key security requirement of confidentiality, integrity, and availability.
2. Discuss the types of security threats and attacks that must be dealt with and give examples of the types of threats and attacks that apply to different categories of computer and network assets.
3. Explain the fundamental security design principles.
4. Define e-commerce, understand how e-commerce differs from e-business, identify the primary technological building blocks underlying e-commerce, and recognize major current themes in e-commerce.
5. Identify and describe the unique features of e-commerce technology and discuss their business significance.
6. Understand the scope of e-commerce crime and security problems, the key dimensions of e-commerce security, and the tension between security and other values.
7. Identify the key security threats in the e-commerce environment.
8. Describe how technology helps secure Internet communications channels and protect networks, servers, and clients.

BCIS 582. Management of Information Security
3 Credits (3)
Provides management overview of information security and thorough examination of administration of information security. Surveys field of information security including planning, policy and programs, protection and people relative to information security. Not open to students who have taken BCIS 482.
Prerequisite: BCIS 338 or equivalent or consent of instructor.
Learning Outcomes
1. Explain the fundamental concepts of the management of information security within the context of organizations.
2. Describe commonly used information systems (IS) security standards and guidelines.
3. Create IS security management and policy as well as risk management plans.
4. Explain the behavioral aspects of IS security and discuss the development of security culture within organizations.
5. Explain the technical aspects of IS security, including issues related to cryptography and network security.

6. Describe and evaluate the regulatory aspects of information system security (primarily within the United States and European Union context).

BCIS 585. Enterprise Resource Planning & Business Processes
3 Credits (3)
Enterprise-wide information systems and their use in enterprise resource planning (ERP). This course will examine the many cross-functional business processes. Other topics include ERP implementation issues, change management, and business process re-engineering. Hands-on exercises use SAP Enterprise software. Not open to students who have taken BCIS 485. May be repeated up to 3 credits.
Prerequisite: C- or better in ACCT 351 or BCIS 502.
Learning Outcomes
1. Business processes common to most businesses, including order processing, procurement, inventory management, etc.
2. How a business process often spans different functional areas of the business: accounting, marketing, etc.
3. How enterprise systems, such as SAP, integrate business functional areas into one enterprise-wide information system.
4. Process modeling to depict the sequence of tasks completed in a business process.
5. Master data common to most businesses (e.g. customer, vendor, inventory, etc.).
6. The issues involved in implementing an ERP system.

BCIS 590. Special Topics
1-3 Credits (1-3)
Seminars in selected current topics in business computer systems. May be repeated up to 3 credits.
Prerequisite(s): Vary according to topic being offered.

BCIS 598. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with prior approval of department head. A maximum of 3 credits may be earned.
Prerequisite: consent of instructor.

BEST-BORDERLAND & ETHNIC STUDIES

BEST 1110G. Introduction to Borderlands and Ethnic Studies
3 Credits (3)
The field of Ethnic Studies is about 1) critical knowing and 2) unapologetic imagining and creation of a better, more just world. This course explores the roots, logics, and administrations of racism within the U.S. context, locally along the border, and framed within a larger global and historical context. The past few decades have borne witness to increasing global diversity and cross- border migrations, which has led many in the U.S. to imagine the nation as "post-racial." Simultaneously, increasing clashes that can only be described as "racist" have led people to wonder about the dark racist underpinnings of a society that believes it has achieved the goals put forth by the distinct and intersecting Civil Rights Movements of the 1960s.Perhaps now, more than any other time in history, there is earnest desire to talk about race and racism and unpack these constructs/activities/outcomes. This course is designed to inform us about how colonization, racism, and hegemony function. Secondly, it is designed for self and collective exploration of these somewhat broad and abstract concepts in an applied manner. Finally, it is designed for us to arrive at a shared understanding of the decolonial turn, or a re-humanization imperative. How do we understand, apply, and heal as these activities each relate to coloniality of power
Learning Outcomes
1. Learn and understand broad histories of social struggles, social movements, and ensuing human relationships.
2. Meaningfully engage classical and new materials from the Borderlands and Ethnic Studies "canon."
3. Articulate observations using key terms, theories, and concepts in Borderlands and Ethnic Studies.
4. Apply key concepts in "everyday life" via course activities.
5. Gain a better understanding of your own worldviews and opinions towards issues of race, class, gender, nationalism, migration, borders, social movements, and resistance.
6. Learn mindful and constructive ways to engage peers about sometimes "difficult" topics like race, power, and privilege.

BEST 2750G. Introduction to Palestine Studies: History, Land, Resistance, and Justice
3 Credits (3)
This course is an undergraduate general education "Palestine Studies" course that draws on "interdisciplinary and multidisciplinary". Palestine studies that engage with critical ethnic studies, settler-colonial studies, critical media literacy studies, gender, sexuality, and queer studies, and decolonial Arab feminisms as set of knowledges, methodologies, and practices. It also draws on an array of historical content published by Palestinian and Palestine Studies scholars and Palestinians' lived experiences represented in oral history studies, and cultural creations such as film, visual art, music, etc. and world media. The course is structured to connect the themes addressed throughout the semester by going back and forth from the critical historical moments in Palestinian history to the ongoing and contemporary Palestinian displacement, resistance, and struggles for freedom, justice, and the right of return to the land of their ancestors. The course aims to help participants understand how the Zionist form of settler-colonialism in Palestine is interlocked with settler-colonialism as an ongoing practice in the USA and other parts of the world. It also addresses the worldwide influence of settler-colonialism on the lives of colonized/gendered/racialized peoples, land theft and extraction, flow of capital, incarceration/detentions, mobility across borders, militarism and wars, mega sports events, and cultural and knowledge creation.
Learning Outcomes
1. Identify key major significant: (a) Events in the history of Palestine (historicize) and in the contemporary context inside Palestine and in the diaspora (contextualize); (b) Moments of solidarity with other global intersectional liberation struggles against settler colonialism (the indivisibility of justice).
2. Apply key concepts, theories, and approaches/methodologies in Palestinian Studies and Critical Ethnic Studies to critically assess: (a) Historical and contemporary consequences on Palestine as indigenous land and Palestinians as indigenous people. (b) Settler-colonialism, racism, and heteronormativity in the case of Palestine. (c) Implication of Zionist settler-colonialism and global settler-colonial powers' complicities/alliances and logics/tactics that maintain the occupation of Palestine and the displacement, dispossession, and incremental ethnic cleansing of Palestinians and their struggles in the diaspora. (d) Material presented by contemporary US media outlets.

BEST 300. History and Theories in Borderlands and Ethnic Studies
3 Credits (3)

This course provides a basic understanding of the history and theoretical foundations of Borderlands and Ethnic Studies. It engages in an in-depth analysis of the concepts and history that resulted in reshaping the way we understand race, national borders, immigration, education, and the law. It examines borderlands theorizing to critically engage the border not simply as a physical barrier meant to regulate migration, but the economic, cultural, spatial, and metaphorical borderlands that informs us on larger processes of membership, belonging, identity, politics, and dehumanization linked to social structures and institutions. It explores the history of social movements in the U.S. that sought to illuminate social inequalities and social justice issues and investigates the underlying causes and sources of these social movements as they relate to reconceptualizing race and the borderlands and their overall impact on society at large. Throughout the course we will ask the following questions: How does the idea of race permeate our everyday lives? How does education reinforce our understandings of race? How do historical struggles over economic resources and political power illuminate the formation and development of the borderlands? How does law relate to power relations and mechanisms of social control?

Learning Outcomes

1. Explain how race and ethnicity has been historically socially constructed in the U.S.
2. Understand how the social construction of race and ethnicity is related to issues of social control.
3. Understand how the idea of race helps to reinforce existing power arrangement.
4. Connect historical struggles for justice and equality in the U.S. to current social and political issues dealing with the Borderlands.
5. Explain hegemony and its link to shifting borders and nationalism.
6. Identify how racial beliefs are tied to laws, policies, and practices of social institutions and organizations.
7. Understand how race relates to the development of the border.
8. Analyze the ways race, class, and gender serve as interlocking systems of oppression.
9. Gain a better understanding of your own worldviews and opinions towards issues of race, class, , gender, nationalism, migration, borders, social movements, and resistance. 1
10. Critically engage and "think outside the box" when discussing the conceptualization and history of the idea of race.

BEST 3999. Capstone in Borderlands and Ethnic Studies
3 Credits (3)

This seminar is designed to culminate the undergraduate minor by summarizing knowledge and experience garnered in pre-courses: Intro to Borderlands & Ethnic Studies, History & Theories of Ethnic Studies, as well as the chosen gender course, the chosen race, history & education course, and the chosen elective course. Students will be asked to write a reflective essay at the start of the course that highlights 1) materials and ideas that have most impacted the student throughout the core courses, 2) discuss how the elective course complemented and expanded materials and ideas from BEST core classes, 3) what materials and ideas remain challenging to grasp, and 4) what kind of culminating project the student would like to complete. This essay will be the foundational document to carry the student through the semester, along with close guidance provided by the instructor as well as peer feedback.

Prerequisite/Corequisite: BEST 1110G, BEST 300, and either (AFST 2140G, CCST 3120V, or NATV 4110) and either (AFST 4110, CCST 3110, or NATV 4210).

Learning Outcomes

1. Design and develop a semester-long project that draws upon all previous BEST in collaboration with instruction and peers.
2. Re-explain vis-a-vis previous courses how race and ethnicity has been historically socially constructed in the U.S.
3. Critically engage and "think outside the box" when discussing the conceptualization and history of the idea of race.
4. Work with a community organization, agency, or other group to collaborate on the final project.
5. Present project to class as a final product.

BEST 4550. Borderlands Representations
3 Credits (3)

In this course, we will explore contemporary portrayals of border spaces and peoples in literature, film, visual art, and theory. We will engage an interdisciplinary and cross-genre exploration to examine the flexibility, tensions, and range of border-focused textual/artistic production. The Mexico-U.S. border will be the foundation and we will extend from this most familiar border to borders globally, with particular attention to the Canada-U.S. border, the Haitian-Dominican border, the Palestine/Israel nation states. Questions that will guide the course: How do representations of the Mexico-U.S. border reflect/converse with historical and contemporary political tensions? How do the perspectives and vantage points of Mexican, Chicano, and U.S. Anglo producers of cultural artifacts, including literature, diverge, collide, and coalesce? And, finally, how do perceptions and portrayals of geopolitical borders converse with understandings of the Mexico-U.S. border, what can we bring from our border-knowing to global borders, and what are specificities of particular border spaces?

Learning Outcomes

1. Express knowledge of major economic, political, social and cultural realities of multiple global borderlands.
2. Explain the multidisciplinary diversity and intellectual rigor that compose cultural productions of these borderlands.
3. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
4. Interpret, understand, and engage texts within cultural, social and historical contexts.
5. Gather, analyze, and evaluate information from a variety of sources.
6. Compose texts in a variety of media formats.

BEST 4660V. Social Movements: Borderlands and Beyond
3 Credits (3)

The field of ethnic studies is about critical knowing and unapologetic imagining and creation of a better, more just world. One way that is accomplished is through social movements. In this class we will study social movements in this class – and why some were more successful than others. We will explore the roots, logic, and ongoing practice of social movements around the world, and with a specific focus on the Borderlands. "A social movement is a complex set of different types of actions by different actors all oriented toward some general social change goal" (Oliver, 1995) After the murder of George Floyd, a social movement was sparked in which hundreds of thousands of people took to the street hoping to affect change in U.S. society. Did it work? This class will look at social movements – both successful and unsuccessful – throughout history.

Learning Outcomes

1. Learn and understand broad histories of social struggles, and social movements.

2. Meaningfully engage in traditional and new materials regarding social movements.
3. Articulate observations using key terms, theories, and concepts though the analysis of ethical issues related to social movements.
4. Apply key concepts in “everyday life” via course activities.
5. Develop an ability to engage peers in mindful and constructive ways about sometimes “difficult” topics like race, power, and privilege.

BEST 470. Literary Explorations of Race & Justice
3 Credits (3)
While this course is, as the title suggests, a survey of literary texts emphasizing race and justice, an exploration like this one posits an argument about which works of a literary tradition are most important, most fundamental, and, especially, how works that are deemed “political" feature in literary traditions. How have some authors and their texts become popularized, for whom, and what are some of the consequences (both positive and negative) of how the processes (both organic and inorganic) of popularization (canonicity, if you will) establish the parameters of ethnic literary traditions? We will work with these questions as you read and respond in discussion and in writing to some of what I, and others, consider a handful of the most prominent U.S. writers of color, their works, and their representations of race and justice. Other questions that will help us explore the multiplicity and richness of these literary texts: How do these texts converse with broader traditions of literatures? What are the conversations between and tensions within these texts and among its writers? How do aesthetics, politics, and community intersect? How do issues, including race and justice, ethnicity, gender, sexuality, and self-representation manifest within texts? What histories impact literary production and publication of these texts? How are these literary explorations of race and justice evolving and what does the future hold? The course will be writing-intensive, reading-intensive, and genre-inclusive, as we connect the "creative" realm of textual representation in fiction, poetry, and nonfiction to the "theoretical" realm of criticism and scholarship that provides ways for us to see and read textual representation critically, imaginatively, differently. The course promises to incite provocative discussions, as it engages the relevance of a rapidly changing U.S. population.
Learning Outcomes
1. Summarize the major economic, political, social and cultural forces influencing the composition, publication, and reception of literary texts focusing upon race and justice.
2. Explain the multidisciplinary diversity and intellectual rigor that compose these texts.
3. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
4. Interpret, understand, and engage texts within cultural, social and historical contexts.
5. Gather, analyze, and evaluate information from a variety of sources.
6. Compose texts in a variety of media formats.

BEST 480V. Narratives and Representations of Palestinians: Media, Music, Film, and Art
3 Credits (3)
This course is an undergraduate (that fulfills requirements for VWW) and graduate Palestine Studies course that draws on Palestine, settler-colonial studies, and decolonial Arab feminisms as an intersectional set of knowledges, methodologies, and practices. It also draws on various examples of contemporary Palestinian arts—paintings, fashion, land-based ceremonies/rituals, music, and film. The course is structured to connect the themes addressed throughout the semester with their iterations in world media, Palestinian art creation, and representation. The course aims to help the learners address 1) how Palestinian art creation is a resistance tool to the erasures imposed by the Zionist settler-colonial state of Israel on Palestinians and 2) how art creation in all its forms act to counter the Zionist’s narratives and propaganda about Palestinian history, heritage, identity and right to their land. It also introduces and engages liberatory and decolonial visions of art/knowledge creation, as well as, global resistance and solidarity with Palestinian artists.
Learning Outcomes
1. How Palestinian art creation is a resistance tool to the erasures imposed by the Zionist settler-colonial state of Israel on Palestinians.
2. How art creation in all its forms act to counter the Zionist’s narratives and propaganda about Palestinian history, heritage, identity and right to their land. It also introduces and engages liberatory and decolonial visions of art/knowledge creation, as well as, global resistance and solidarity with Palestinian artists.

BEST 4996. Special Topics in Borderlands and Ethnic Studies
3 Credits (3)
This course is a focused and intensive study of particular historical, aesthetic, cultural, political, or social issues and contexts within the discipline of Borderlands and Ethnic Studies. Repeatable under different subtitles.
Learning Outcomes
1. Define and articulate the fundamental characteristics and issues related to the topic of focus.
2. Contextualize the topic of focus within the broader field of Ethnic Studies, Chicanx Studies, Africana Studies, and/or Native American Studies.
3. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
4. Interpret, understand, and engage texts within cultural, social and historical contexts.
5. Gather, analyze, and evaluate information from a variety of sources.
6. Compose texts in a variety of media formats.

BEST 510. Foundations in Borderlands & Ethnic Studies
3 Credits (3)
This seminar explores the roots, logics, and administrations of racism within the U.S. context, locally along the border, and framed within a larger global and historical context. In addition to race, other social locations such as gender, class, and sexual orientation are explored as intersectional. The course uses traditional lecture format, multi-media, guest lecturers, and engaging activities inside and outside the classroom to apply materials in tangible and impactful ways. May be repeated up to 6 credits.
Learning Outcomes
1. Identify, compare and contrast broad histories of social struggles, social movements, and ensuing human relationships.
2. Meaningfully engage classical and new materials from the Borderlands and Ethnic Studies “canon.”
3. Articulate observations using key terms, theories, and concepts in Borderlands and Ethnic Studies.
4. Apply key concepts in “everyday life” via course activities.
5. Demonstrate mindful and constructive ways to engage peers about sometimes “difficult” topics like race, power, and privilege.

BEST 5110. Decolonial Research I: Overview
3 Credits (3)

This seminar introduces the practice of indigenizing research methods by looking beyond the canon of Eurocentric methodologies that have often trapped marginalized communities outside of normative time frames. Through the deconstruction of colonial apparatuses and their influence on research methods, the class explores key concepts in decolonizing research to move us to new understandings of communities according to indigenous traditions that privilege ancestral ways of knowing.

Learning Outcomes

1. Explain how producing research is connected to producing knowledge.
2. Identify and describe the impact of colonialism and imperialism on disrupting ways of knowing.
3. Recognize political and cultural implications of the world seen as a colonial, constructed narrative
4. Describe how a social reality can have set political and ideological conditions.
5. Distinguish how indigenous methodologies relate to decolonizing methods.
6. Describe how decolonizing methods are a different approach to research.
7. Identify decolonizing methods that have been used in research.
8. Critically engage with research lenses stemming from a decolonizing standpoint.

BEST 512. Theories in Borderlands and Ethnic Studies
3 Credits (3)

This seminar provides a basic understanding of theoretical foundations of Borderlands and Ethnic Studies. It also examines borderlands theorizing to critically engage the border not simply as a physical barrier meant to regulate migration, but the economic, cultural, spatial, and metaphorical borderlands that informs us on larger processes of membership, belonging, identity, politics, and dehumanization linked to social structures and institutions. Social movements in the U.S. that sought to illuminate social inequalities and social justice issues are explored. The course investigates the underlying causes and sources of these social movements as they relate to reconceptualizing race and the borderlands and their overall impact on society at large. May be repeated up to 6 credits.

Learning Outcomes

1. Explain how race and ethnicity has been socially constructed in the U.S.
2. Recognize how the social construction of race and ethnicity is related to issues of social control
3. Describe how the idea of race helps to reinforce existing power arrangements
4. Connect historical struggles for justice and equality in the U.S. to current social and political issues dealing with the borderlands
5. Explain hegemony and its link to shifting borders and nationalism
6. Identify how racial beliefs are tied to laws, policies, and practices of social institutions and organizations
7. Distinguish how biopolitics relates to the development of the border.
8. Analyze the ways race, class, and gender serve as interlocking systems of oppression.
9. Gain an understanding of and be able to evaluate your own worldviews and opinions towards issues of race, class, gender, nationalism, migration, borders, social movements, and resistance. 1
10. Critically engage and “think outside the box” when discussing the conceptualization and development of the idea of race.

BEST 5120. Theories in Borderlands and Ethnic Studies
3 Credits (3)

This seminar provides a basic understanding of theoretical foundations of Borderlands and Ethnic Studies. It also examines borderlands theorizing to critically engage the border not simply as a physical barrier meant to regulate migration, but the economic, cultural, spatial, and metaphorical borderlands that informs us on larger processes of membership, belonging, identity, politics, and dehumanization linked to social structures and institutions. Social movements in the U.S. that sought to illuminate social inequalities and social justice issues are explored. The course investigates the underlying causes and sources of these social movements as they relate to reconceptualizing race and the borderlands and their overall impact on society at large. May be repeated up to 6 credits.

Learning Outcomes

1. Explain how race and ethnicity has been socially constructed in the U.S.
2. Recognize how the social construction of race and ethnicity is related to issues of social control
3. Describe how the idea of race helps to reinforce existing power arrangements
4. Connect historical struggles for justice and equality in the U.S. to current social and political issues dealing with the borderlands
5. Explain hegemony and its link to shifting borders and nationalism
6. Identify how racial beliefs are tied to laws, policies, and practices of social institutions and organizations
7. Distinguish how biopolitics relates to the development of the border.
8. Analyze the ways race, class, and gender serve as interlocking systems of oppression.
9. Gain an understanding of and be able to evaluate your own worldviews and opinions towards issues of race, class, gender, nationalism, migration, borders, social movements, and resistance. 1
10. Critically engage and “think outside the box” when discussing the conceptualization and development of the idea of race.

BEST 5125. Decolonial Research II: Methodologies
3 Credits (3)

This course is a graduate Research Methodologies in Borderlands and Ethnic Studies course that draws on tenets of decolonizing academic research methodologies such as testimonios, pláticas, and art-based research. It is structured for participants to have hands-on practice to design a small pilot research project guided by one or two of the presented decolonial methodologies and collect data. The course builds on students' knowledge and practices they gained in previous best courses.

Learning Outcomes

1. Read a number of studies driven by decolonial methodologies such as testimonios, pláticas, and art-based research.
2. Design a small pilot study guided by one or more of the methodologies decolonial methodologies justifiable by decolonial theoretical frames.
3. Complete basic social and behavioral research training from the Collaborative Institutional Training Initiative (CITI Program) and obtaining the corresponding CITI certificate.
4. Apply for IRB on NMSU’s Streamline for approval.
5. Collect data using one or more methods guided by their selected methodology/ies while working with 1-3 collaborators/participants in a local community.
6. Organize and protect the data collected.

BEST 5135. Decolonial Research III: Data Analysis and Publication
3 Credits (3)
This course is a graduate Research Methodologies in Borderlands and Ethnic Studies course that draws on tenets of decolonizing academic research. It is structured for participants to have hands-on practice of qualitative data analysis as a decolonial praxis of co/creating knowledge while explicitly working with decolonial paradigms of inquiry. The course builds on students' knowledge and practices they gained in BEST 5110.
Learning Outcomes
1. Read examples of data analysis approaches in a number of exemplars of decolonizing, decolonial indigenous, anti-colonial, anti-racist, and critical race feminist academic research.
2. Select the components of a decolonial paradigm of inquiry that will guide their process of data analysis i.e., the epistemological framing.
3. Select the components of a decolonial paradigm of inquiry that will guide their process of data analysis i.e., the epistemological framing.
4. Practice the data analysis process by: a)"Plugging-in" data by thinking with the main disciplinary concepts, and the tenets of the epistemological framing and the methodologies that guided their original research study. b) Addressing their positionalities and relationality and answerability to the communities they collaborated with in their research project.
5. Complete several layers of analysis.
6. Theorize and assert a number of insights that contribute to their field of study.
7. Write an analysis section suitable for an academic publication such as a peer-reviewed article or book chapter.

BEST 550. Advanced Special Topics in Borderlands and Ethnic Studies
3 Credits (3)
This course is a focused and intensive study of particular historical, aesthetic, cultural, political, or social issues and contexts within the discipline of Borderlands and Ethnic Studies. Repeatable under different subtitles. May be repeated up to 9 credits.
Learning Outcomes
1. Define and articulate the fundamental characteristics and issues related to the topic of focus.
2. Contextualize the topic of focus within the broader field of Ethnic Studies, Chicanx Studies, Africana Studies, and/or Native American Studies.
3. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
4. Interpret, understand, and engage texts within cultural, social and historical contexts.
5. Gather, analyze, and evaluate information from a variety of sources.
6. Compose texts in a variety of media formats.

BEST 5750. Advanced Introduction to Palestine Studies: History, Land, Resistance, and Justice
3 Credits (3)
This course is graduate level course on "Palestine Studies" that draws on "interdisciplinary and multidisciplinary" Palestine studies that engage with critical ethnic studies, settler-colonial studies, critical media literacy studies, gender, sexuality, and queer studies, and decolonial Arab feminisms as set of knowledges, methodologies, and practices. It also draws on an array of historical content published by Palestinian and Palestine Studies scholars and Palestinians' lived experiences represented in oral history studies, and cultural creations such as film, visual art, music, etc. and world media. The course is structured to connect the themes addressed throughout the semester by going back and forth from the critical historical moments in Palestinian history to the ongoing and contemporary Palestinian displacement, resistance, and struggles for freedom, justice, and the right of return to the land of their ancestors. The course aims to help participants understand how the Zionist form of settler-colonialism in Palestine is interlocked with settler-colonialism as an ongoing practice in the USA and other parts of the world. It also addresses the worldwide influence of settler-colonialism on the lives of colonized/gendered/racialized peoples, land theft and extraction, flow of capital, incarceration/detentions, mobility across borders, militarism and wars, mega sports events, and cultural and knowledge creation.
Learning Outcomes
1. Apply key concepts, theories, and approaches/methodologies in Palestinian Studies and Critical Ethnic Studies to critically assess: (a) Historical and contemporary consequences on Palestine as indigenous land and Palestinians as indigenous people.
2. Apply key concepts, theories, and approaches/methodologies in Palestinian Studies and Critical Ethnic Studies to critically assess: (b) Settler-colonialism, racism, and heteronormativity in the case of Palestine.
3. Apply key concepts, theories, and approaches/methodologies in Palestinian Studies and Critical Ethnic Studies to critically assess: (c) Implication of Zionist settler-colonialism and global settler-colonial powers' complicities/alliances and logics/tactics that maintain the occupation of Palestine and the displacement, dispossession, and incremental ethnic cleansing of Palestinians and their struggles in the diaspora.
4. Apply key concepts, theories, and approaches/methodologies in Palestinian Studies and Critical Ethnic Studies to critically assess: (d) material presented by contemporary US media outlets.

BEST 5760. Advanced Narratives and Representations of Palestinians: Media, Music, Film, and Art
3 Credits (3)
This course is a graduate Palestine Studies course that draws on Palestine, settler-colonial studies, and decolonial Arab feminisms as an intersectional set of knowledges, methodologies, and practices. It also draws on various examples of contemporary Palestinian arts—paintings, fashion, land-based ceremonies/rituals, music, and film. The course is structured to connect the themes addressed throughout the semester with their iterations in world media, Palestinian art creation, and representation.
Learning Outcomes
1. Palestinian art creation is a resistance tool to the erasures imposed by the Zionist settler-colonial state of Israel on Palestinians.
2. Art creation in all its forms act to counter the Zionist's narratives and propaganda about Palestinian history, heritage, identity and right to their land. It also introduces and engages liberatory and decolonial visions of art/knowledge creation, as well as, global resistance and solidarity with Palestinian artists.

BEST 5999. Capstone in Borderlands and Ethnic Studies
3 Credits (3)
This seminar is designed to culminate the graduate certificate by summarizing knowledge and experience garnered in pre-courses: BEST 510, 511, 512. Students will be asked to write a reflective essay at the start of the course that highlights 1) materials and ideas that have most impacted the student throughout the core courses, 2) discuss how the elective course complemented and expanded materials and ideas from BEST core classes, 3) what materials and ideas remain challenging

to grasp, and 4) what kind of culminating project the student would like to complete. This essay will be the foundational document to carry the student through the semester, along with close guidance provided by the instructor as well as peer feedback. May be repeated up to 6 credits.
Prerequisite: BEST 5105, BEST 5110, and BEST 5120.
Learning Outcomes

1. Summarize, concisely, key concepts and frameworks learned in BEST seminars.
2. Express, reflectively, what these concepts and frameworks mean in the context of historical and contemporary social issues related to power dynamics created and exacerbated by hierarchies associated with racial, gender, class, sexual orientation and other positionalities.
3. Design a culminating project that encapsulates a nuanced understanding of Borderlands and Ethnic Studies, ensuring its impact on a broader audience.
4. Generously evaluate cohort mates' projects as they progress during semester.
5. Receive feedback about one's own project and apply those comments and critiques in useful ways and in collaboration with instructor.
6. Create/generate a culminating project that aligns with rubrics in the most effective manner possible.
7. Present work to cohort and instructor in an effective way.

BFIN-BUSINESS FINANCE

BFIN 2110. Introduction to Finance
3 Credits (3)
Introduces tools and techniques of financial management. Includes time value of money; financial planning, diversification and risk; debt and equity investment decisions; and financial statement analysis.
Prerequisite(s): OATS 106 or higher; OATS 120 or ACCT 2110; ECON 1110G or ECON 2110G.
Learning Outcomes

1. Explain the time value of money and its application in decision-making, including calculating present and future values of single payment and series of payments.
2. Identify the major sources of external long-term financing for corporations.
3. Explain risk-return tradeoff as it relates to diversification.
4. Differentiate the role of finance from other related disciplines such as accounting and economics.
5. Demonstrate knowledge of capital markets and securities (debt and equity).
6. Describe basic types of financial ratios and their uses.
7. Demonstrate the ability to prepare cash flows and make qualitative judgments on the relevance of the changes from one time frame to another.

BFIN 303V. Personal Financial Planning and Investing in a Global Economy
3 Credits (3)
Provides a framework for successful personal financial planning within an individual's career and income. Covers personal money management, federal and state taxation, the mathematics of finance and credit, housing, inflation, insurance, savings, and investments. Majors and minors may not use this course to satisfy their finance requirements.
Learning Outcomes

1. Students will develop an understanding of how globalization and international affairs impact their personal financial planning.
2. Students will develop an understanding of how knowledge from a variety of disciplines, including capital market history, the political environment, government, mathematics, behavioral economics, and statistics, are important to financial planning.
3. Students will develop an understanding of the core areas of a personal financial planning course which include: the financial planning process, time value of money, measuring financial health, tax planning, liquid asset management, the role of credit, consumer loans, home and auto financing, investment basics, domestic and international securities markets, bond investing, equity investing, mutual funds and retirement planning.
4. Students will integrate knowledge of international financial markets into the personal financial planning process by developing and writing their own personal financial plan.

BFIN 311. Financial Futures Markets
3 Credits (3)
Course taught with AEEC 3220.
Learning Outcomes

1. Understand and explain the concept of risk, list various sources of risks observed in businesses, and identify common methods used to manage risk.
2. Articulate the role that derivative markets play in reducing risk and illustrate how they can be used in practice to reduce risk.
3. Illustrate how derivative markets can be used to generate income and manage risk through hedging.
4. Demonstrate an understanding of the vocabulary associated with derivatives and derivative markets.

BFIN 322. Principles of Insurance
3 Credits (3)
Theory and practice of insurance and its economics and social significance; review of the major lines of insurance including life, health, and property liability insurance.
Learning Outcomes

1. Differentiate between traditional risk management and enterprise risk management.
2. Identify risks for business and in your personal life.
3. Evaluate and select risk treatment techniques based on the risks identified.
4. Differentiate between insurance, reinsurance, self-insurance, and a captive insurance program.
5. Distinguish between insurance and risk management concepts and operations.
6. Examining the needs for personal insurance policies for individuals and families.

BFIN 323. Life/Health/Employee Benefits
3 Credits (3)
Approaches to problems of employee security from the perspective of businesses. Topics including pensions, profit-sharing plans, 401(k) plans, group life and health plans, and flexible benefit programs. The course also addresses individual life, health, and annuity contracts within a financial planning context. May be repeated up to 3 credits.
Prerequisite/Corequisite: BFIN 322.
Learning Outcomes

1. Understand the various types of life insurance and annuity contracts and their uses.
2. Know how life and health insurers are regulated.
3. Analyze the insurance marketplace and health care reform.

4. Review contractual provisions of life insurance policies.
5. Understand how human life value is determined.
6. Calculate life contingencies and pricing of life and health insurance.

BFIN 324. Property and Liability Insurance
3 Credits (3)
Analysis of property and liability insurance with emphasis on handling of commercial exposures. Review of property and liability company operations including rate making and insurance accounting. May be repeated up to 3 credits.
Prerequisite/Corequisite: BFIN 322.
Learning Outcomes
1. Determine if an insurance policy covers an insurance claim.
2. Calculate the amount payable for an insurance claim.
3. Choose the insurance needed for a given situation.
4. Define frequently used insurance terms and acronyms.
5. Explain the responsibility of the various insurance functions.

BFIN 325. Real Estate Principles and Law I
3 Credits (3)
Real estate law and the fundamental aspects of the real estate purchase transaction and the real estate lease agreement. Topics include real estate brokerage, marketing of real estate, fundamental legal aspects of real estate, present and future interests, air and water rights, methods of transfer, basics of financing and liens, and real estate leases. Same as BLAW 325.

BFIN 341. Financial Analysis and Markets
3 Credits (3)
Financial analysis for business financing and investing decisions.
Prerequisite: ACCT 2110, ECON 2110G, ECON 2120G, MATH 1220G, A ST 311 or MATH 1350G.
Learning Outcomes
1. Solve time value of money problems.
2. Identify bond risk characteristics and calculate bond values.
3. Understand and apply dividend valuation models.
4. Compute returns and risks for single stocks and portfolio of stocks.
5. Solve capital budgeting problems.
6. Calculate component and weighted average costs of capital.

BFIN 350. Financial Statement Analysis
3 Credits (3)
This course will provide a structured approach to assessing a company's historical performance, forecasting its future performance, and determining its equity value. It introduces a mix of practical tools and theoretical concepts used in FSA. Throughout the course, you can make informed judgments about cash flow, earnings quality, hidden assets and liabilities, and overall business performance. Additionally, you will learn to integrate key principles from accounting, finance, economics, and business strategy to guide effective financial decision-making.
Prerequisite: BFIN 341 with a grade of C- or better.
Learning Outcomes
1. Develop a comprehensive framework for analyzing a business.
2. Understand the underlying business model and the story behind financial statements (Balance Sheet, Income Statement, Cash Flow Statement).
3. Gain familiarity with the disclosure of information in 10-K filings and accompanying financial statement notes.
4. Achieve proficiency in calculating and interpreting financial ratios.
5. Evaluate the quality, profitability, solvency, and liquidity of financial statements from the perspectives of various stakeholders.
6. Understand the implications of accounting errors, whether due to intentional manipulation or unintentional mistakes.
7. Learn about earnings announcements and their significance.
8. Apply various valuation methods and scenarios to calculate an organization's value effectively.

BFIN 355. Investments
3 Credits (3)
Analysis of investment risks and rewards and of the problems of portfolio selection and management. Operation of the securities market.
Prerequisite: BFIN 341 with a grade of C- or better.
Learning Outcomes
1. Understand the Investment Environment: Students will be able to describe the structure and function of financial markets and institutions, including the various asset classes and financial instruments available to investors.
2. Analyze Risk and Return: Students will learn to calculate and interpret key risk and return metrics and understand their historical trends, explore the relationship between risk and return in the context of portfolio management.
3. Apply Modern Portfolio Theory (MPT): Students will learn to apply the principles of Modern Portfolio Theory to construct and manage investment portfolios, including the concepts of efficient diversification and performance evaluation.
4. Evaluate Fixed Income and Derivative Securities: Students will develop the skills to analyze and value fixed-income securities and derivatives, including bonds, options, and other complex financial instruments.
5. Conduct Security Analysis and Equity Valuation: Students will be equipped to perform security analysis to determine the valuation of individual securities and assess their appropriateness for inclusion in an investment portfolio, understand the implications of market efficiency on investment strategies.
6. Develop Practical Investment Skills: Students will learn to open and manage a brokerage account, transfer funds, and execute trades, develop criteria for selecting stocks, making buy and sell decisions, and managing a portfolio through hands-on experience with a paper trading account.

BFIN 360. Financial Information Technology
3 Credits (3)
Integrated use of electronic financial information resources with spreadsheet and word processing applications in investigating financial issues and solving financial problems.
Prerequisite: A grade of C- or better in BFIN 341 or consent of instructor.
Learning Outcomes
1. Build and use spreadsheets to illustrate relationships among financial and economic variables: a) Accessing financial and economic information from various internet sources and placing b) Manipulating financial and economic data using spreadsheet formulas, tools, and functions c) Computing financial results using spreadsheet formulas, tools, and functions d) Diagramming and illustrating relationships between different financial and economic variables using charts and graphs.
2. Enhance student engagement with discussions on current events and topics in Finance.

BFIN 385. Analysis of Financial Markets and Institutions
3 Credits (3)

Analysis of the financial system, emphasizing its institutions and instruments.
Prerequisite: BFIN 341 with a grade of C- or better.
Learning Outcomes
1. Understand how financial markets function.
2. Learn the role in raising capital for the economy.
3. Analyze interest rates.
4. Analyze financial instruments.

BFIN 391. Finance Internship and Cooperative Education I
1-3 Credits
Introduction and application of finance principles in a work environment. Open only to students in the finance major or minor who will be working with an approved employer in a finance related position, over a period of 12 weeks or at least 300 work hours. Consent of instructor required.

BFIN 392. Insurance Internship and Cooperative Education I
1-3 Credits (1-3)
Introduction and application of insurance principles in a work environment. Open only to students in the finance major or insurance minor who will be working with an approved employer in an insurance related position, over a period of 12 weeks or at least 300 work hours. Consent of instructor required. Restricted to Finance majors.

BFIN 393. Banking Internship and Cooperative Education
1-3 Credits (1-3)
Professional banking experience with opportunities to engage in business analysis and to observe application of business principles in the management of a banking entity or a regulatory agency with banking oversight. Open only to students in the finance major or banking minor who will be working with an approved employer in a banking related position, over a period of 12 weeks or at least 300 work hours. May be repeated up to 3 credits. Consent of Instructor required.

BFIN 452. Personal Financial Planning for Professionals
3 Credits (3)
Introduction to personal financial planning, including goal setting and fact finding, cash management, credit, housing, retirement planning, taxation and estate planning. This course is intended for those planning careers in personal financial advising in one of the various financial services environments.
Prerequisite: BFIN 341, or consent of Instructor.
Learning Outcomes
1. Describe the financial planning process, assess the external environment, use goals to establish financial direction, and analyze a client's present financial position.
2. Estimate the impacts of income tax planning strategies, apply the basic process for retirement planning, and define the considerations for estate planning.
3. Evaluate the roles of various insurance products in managing risks, and recognize the professional and ethical aspects of financial planning.

BFIN 453. Investment Analysis
3 Credits (3)
Efficiency of capital markets, modern portfolio management, special topics of current interest to investment analysts.
Prerequisite: BFIN 355.
Learning Outcomes
1. Model forecasted financial statements using Excel.
2. Build equity asset valuation models using Excel.
3. Build financial models in Excel to estimate risk and return for individual stock.
4. Build financial models in Excel to construct an efficiently diversified portfolio.
5. Make decisions regarding investments for the Wetherbe Student-Managed Investment Fund.

BFIN 454. Fixed Income Markets, Instruments and Derivatives
3 Credits (3)
Course provides a broad introduction to treasury, corporate, municipal, mortgage backed and asset backed bond markets. The analytical techniques for valuing bonds, quantifying their exposure to changes in interest rate and credit risk exposures and investment decision-making are explored.
Prerequisite: BFIN 341.
Learning Outcomes
1. Basic understanding of the functions of the treasury bond market.
2. Be able to value credit products.
3. Conduct quantitative analysis of risk affecting bond instruments.
4. Understand Yield Curve.
5. Term Structure Estimation.
6. Work with Fixed-Income Derivatives.

BFIN 455. Derivative Markets and Securities
3 Credits (3)
Institutional aspects of derivative markets and the arbitrage based pricing of derivative instruments such as stock options, interest rate options, future contracts and swaps. The applied component of the course demonstrates use of these instruments as hedge and/or investment vehicles.
Prerequisite: BFIN 355.
Learning Outcomes
1. Analyze properties of stock options.
2. Be able to execute trading strategies using options and futures.
3. Be able to use the binomial pricing model to value options.
4. Be able to work with Option Greeks.
5. Be able to set up basic hedges using futures contracts.
6. Have a working knowledge of Interest Rate Futures.

BFIN 456. Business Risk Management
3 Credits (3)
The operational risks faced by firms and the study of various methods of handling these risks, including loss prevention, risk retention, self-insurance, corporate insurance programs, and capital markets.
Prerequisite: BFIN 322.
Learning Outcomes
1. Develop an understanding of risk management and its basic concepts.
2. Discuss alternative approaches to risk management and develop the knowledge to analyze the features and benefits of enterprise risk management.
3. Gain knowledge regarding risk assessments and the fundamental requirements for a successful risk management program through risk classification and risk analysis tools and techniques.
4. Apply risk control techniques to the identified risks and learn the importance of insurance and risk transfer.
5. Explore the importance of risk management strategy and risk management policy while understanding the techniques to implement a successful risk management program.
6. Develop knowledge about creating a risk-aware culture and understanding an organization's risk appetite.

7. Understand risk governance and how corporate governance requirements impact an organization's risks.
8. Learn risk assurance and risk reporting within an organization to expand their knowledge regarding internal control and corporate social responsibility.

BFIN 466. Financial Policy Decisions
3 Credits (3)
The course is designed to facilitate the practical application of the tools and concepts of basic corporate finance to actual business problems. By evaluating and solving actual problems involving financial management concepts, students will enhance their understanding of these tools and their ability to apply them in the business world. Cases will encompass a range of corporate financial problems. The application of artificial intelligence when analyzing the cases will be covered.
Prerequisite: BFIN 360.
Learning Outcomes
1. Provide students with cases that are not guided.
2. Use prompts to generate solutions to their own generated questions, use of prompts and critical thinking in asking/coming up with questions for AI and themselves to solve.
3. Use AI to change PDF data within the case into Excel spreadsheets.
4. Use AI to extract text data (for example, analyst report and social media).
5. Use AI to analyze data provided within the cases/perform interactive data analysis.

BFIN 470. Real Estate Appraisal
3 Credits (2+2P)
This course addresses issues influencing the value of real estate with some emphasis upon rural properties. Topics include courthouse records, property taxes, appraisal methodology, expert courtroom testimony, condemnation, and legal issues. Students will take field trips and write appraisals. Course material is relevant to students in Finance, Accounting, and Pre-Law, as well as Agriculture. Accredited for hours to apply to both pre-licensing and continuing education requirements of the New Mexico Real Estate Commission for both Appraisers and Real Estate Brokers. Cross-listed with AEEC 4550. May be repeated up to 3 credits.
Learning Outcomes
1. Distinguish between the Income Approach, Cost Approach, and Sales Comparison Approach.
2. Identify market abstracted influences on value.
3. Apply proper appraisal methodology.
4. Demonstrate appraisal knowledge by writing a residential appraisal and a farm appraisal.

BFIN 475. International Managerial Finance
3 Credits (3)
International aspects of financial transactions, decision-making, banking and financial markets. Taught with: I B 475 and BFIN 575.
Learning Outcomes
1. Explain and evaluate how the globalization process moves a business from a purely domestic focus in its financial relationships and composition to one truly global in scope.
2. Describe what three major corporate currency exposures arise from multinational business.
3. Define and explain the terms that are used in reference to exchange rates and currency regimes in addition to analyzing the characteristics of an ideal currency.
4. Explain how nations measure their level of international economic activity and how that is measured by the balance of payments.
5. Show how interest rates and inflation affect each country and currency.
6. Identify the forms of currency quotations used by currency dealers, financial institutions, and agents of all kinds when conducting foreign exchange transactions.
7. Distinguish between spot, forward, swaps, and other types of foreign exchange financial instruments as well as foreign currency futures and options contracts.

BFIN 480. Management of Financial Institutions
3 Credits (3)
Asset and liability management of financial institutions; emphasis on commercial bank management.
Prerequisite: BFIN 385 or consent of instructor.
Learning Outcomes
1. Learn bank management techniques.
2. Learn asset and liability management.
3. Learn capital adequacy.
4. Learn bank market structure.

BFIN 490. Selected Topics
1-3 Credits
Current topics in finance.
Prerequisites: vary according to the seminar being offered.

BFIN 498. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.
Prerequisites: junior or above standing and consent of instructor.

BFIN 500. Concepts in Finance
1 Credit (1)
An overview of fundamental principles of finance necessary for prospective MBA students who do not have an undergraduate background in finance. Includes: Time value of money concepts and calculations; risk and calculation of return given appropriate risk measures; bond risk characteristics and calculation of the value of a bond; calculation of the value of common stock (determination as to whether a stock is over-valued or under-valued); and calculation of the costs of capital and capital budgeting problems using the cost of capital.
Prerequisite(s): admitted to MBA Program or consent of course department.

BFIN 503. Financial Management
3 Credits (3)
Theory and application of financial analysis to asset management, project evaluation, capital structure, and dividend policy. Interrelationships among financial and other organizational decisions. May be repeated up to 3 credits.
Prerequisite: Graduate students only.
Learning Outcomes
1. Students will be able to compute the risk and return of portfolios and be able to process information to make prudent investment decisions.
2. Students will be able to conduct feasibility studies using capital budgeting techniques.
3. Students will be able to recognize and evaluate any real options present in capital budgeting situations.

4. Students will be able to compute bond values and analyze the impact of changes in interest rates and credit spreads.

BFIN 511. Financial Derivative Markets
3 Credits (3)
This course examines advanced futures and options strategies for income generation and risk management. Coverage includes a variety of markets, e.g., interest rates, stock indexes, metals, currencies, livestock, and grains. Both technical and fundamental trading strategies are identified and discussed. Same as AEEC 3220/BFIN 311 with additional coursework required at the graduate level. Cannot receive credit for both AEEC 3220/BFIN 311 and AEEC 5220/AEEC 5220. Taught with AEEC 5220.
Learning Outcomes
1. Define risk and identify methods of managing risk.
2. Demonstrate understanding of vocabulary associated with derivatives and derivative markets.
3. Identify the role that derivative markets play in reducing risk.
4. Demonstrate a basic understanding of derivative markets including their use in risk management and income generation.

BFIN 521. Personal Financial Planning for Professionals
3 Credits (3)
Introduction to personal financial planning, including goal setting and fact finding, cash management, credit, housing, retirement planning, taxation and estate planning. This course is intended for those planning careers in personal financial advising in one of the various financial services environments. For Graduate students only
Learning Outcomes
1. Describe the financial planning process, assess the external environment, use goals to establish financial direction, and analyze a client's present financial position.
2. Estimate the impacts of income tax planning strategies, apply the basic process for retirement planning, and define the considerations for estate planning.
3. Evaluate the roles of various insurances products in managing risks, and recognize the professional and ethical aspects of financial planning

BFIN 535. Investment Concepts
3 Credits (3)
Investments in common stocks and other securities. Risk and return, securities markets, portfolio theory and management. For Graduate students only
Learning Outcomes
1. Model forecasted financial statements using Microsoft Excel.
2. Build financial models in Excel to estimate risk and return for individual stock.
3. Build financial models in Excel to construct an efficiently diversified portfolio.
4. Make decisions regarding investments for the Wetherbe Student-Managed Investment Fund.

BFIN 545. Fixed Income Markets, Instruments and Derivatives
3 Credits (3)
Course provides a broad introduction to treasury, corporate, municipal, mortgage backed and asset backed bond markets. The analytical techniques for valuing bonds, quantifying their exposure to changes in interest rate and credit risk exposures and investment decision-making are explored. Assignments and exams will be differentiated from the undergraduate cross-listed course. In addition, graduate students are expected to complete a project. For Graduate students only.
Learning Outcomes
1. Describe basic features of a fixed-income security.
2. Describe mechanisms available for issuing bonds in primary markets.
3. Analyze repurchase agreements (repos) and the risks associated with them.
4. Compute invoice prices, yields, spot rates, and forward rates.
5. Compute PVBP, duration and convexity of a bond, duration of a portfolio of bonds.
6. Construct the term-structure of interest rates, Yield curve strategies.
7. Describe the process of calibrating a binomial interest rate tree to match a specific term structure.
8. Explain the principles underlying, and factors that influence, the market's pricing of CDS.
9. Explain and execute interest rate swaps.

BFIN 555. Derivative Markets and Securities
3 Credits (3)
Institutional aspects of derivative markets and the arbitrage based pricing of derivative instruments such as stock options, interest rate options, future contracts and swaps. The applied component of the course demonstrates use of these instruments as hedge and/or investment vehicles. Same as BFIN 455 with differentiated assignments for graduated students. For Graduate students only.
Learning Outcomes
1. Define forward contracts, futures contracts, options (call and puts), swaps, and credit derivatives and compare their basic characteristics.
2. Determine the value at expiration and profit from a long or a short position in a call or put option, or combinations such as straddles, covered calls, spreads, put-call parity etc.
3. Explain how the concepts of arbitrage, replication, and risk neutrality are used in pricing derivatives.
4. Explain how the value of an option is determined using a multiperiod-period binomial model.
5. Describe how the Black-Scholes-Merton model is used to value European options on equities.
6. Interpret each of the option Greeks.
7. Describe how a delta hedge is executed.
8. Define implied volatility and explain how it is used in options trading.
9. Describe a futures contract: long and short positions, hedging, basis risk, and hedge ratios

BFIN 566. Advanced Financial Management
3 Credits (3)
Application and integration of financial theory, concepts, and practice using the case method.
Prerequisite: BFIN 503.
Learning Outcomes
1. Provide students with cases that are not guided.
2. Use prompts to generate solutions to their own generated questions, use of prompts, and critical thinking in asking/coming up with questions for AI and themselves to solve.
3. Use AI to change PDF data within the case to Excel spreadsheets.
4. Use AI to extract text data (for example, analyst reports and social media).
5. Use AI to analyze data provided within the cases/perform interactive data analysis.

BFIN 575. International Managerial Finance
3 Credits (3)
International aspects of financial transactions, decision-making, banking and financial markets. Taught with: I B 475 and BFIN 475.
Learning Outcomes
1. Explain and evaluate how the globalization process moves a business from a purely domestic focus in its financial relationships and composition to one truly global in scope.
2. Describe what three major corporate currency exposures arise from multinational business.
3. Define and explain the terms that are used in reference to exchange rates and currency regimes in addition to analyzing the characteristics of an ideal currency.
4. Explain how nations measure their level of international economic activity and how that is measured by the balance of payments.
5. Show how interest rates and inflation affect each country and currency.
6. Identify the forms of currency quotations used by currency dealers, financial institutions, and agents of all kinds when conducting foreign exchange transactions.
7. Distinguish between spot, forward, swaps, and other types of foreign exchange financial instruments as well as foreign currency futures and options contracts.

BFIN 581. Management of Financial Institutions
3 Credits (3)
Asset and liability management of financial institutions; emphasis on commercial bank management. For Graduate students only.
Learning Outcomes
1. Describe the Financial System and Competing Financial Service Institutions.
2. Describe the impact of government policy and regulation on the banking industry.
3. Explain the array of organizational structures in Banking: Unit, Branch, Holding. Company and Electronic Services.
4. Analyze the Balance Sheets and Income Statements of Banks.
5. Measure and evaluate the performance of Banks and their principal competitors.
6. Apply different liquidity management strategies.

BFIN 590. Selected Topics
1-3 Credits (1-3)
Current topics in finance. Taught with BFIN 490 with differentiated assignments for graduate students. Consent of instructor required.

BFIN 598. Special Research Programs
1-3 Credits
Directed individual reading or research.
Prerequisite: consent of instructor.

BIOL-BIOLOGY

BIOL 1120G. Human Biology
3 Credits (3)
This course is an introduction to modern biological concepts with an emphasis on the relevance to humans and their relationships with the environment.
Learning Outcomes
1. Explain that biology is a scientific discipline based on observations and experimentations.
2. Explain the process of scientific inquiry and explain how scientific knowledge is discovered and validated.
3. Describe the chemical basis of living organisms and how biomolecules contribute to the structure and function of cells.
4. Develop a basic familiarity with cells and cell organelles.
5. Describe the structure and function of DNA as well as how DNA is used in the production of proteins
6. Describe the basic principles of genetics and heredity leading to human diversity.
7. Identify the major features of the systems in the human body, and understand the anatomy and physiology of them
8. Describe the roles of the organ systems in maintaining homeostasis
9. Explain the principles of evolution by means of natural selection explaining the diversity of life. 1
10. Describe how science and technology have impacted life in particular to society and the environment (e.g. medicine, forensic science, agriculture, ecology, sustainability).

BIOL 1120L. Human Biology Laboratory
1 Credit (3P)
This course introduces exercises, experiences, and activities exploring biological concepts and theories relevant to humans and their relationship to the environment in a laboratory setting.
Prerequisite(s)/Corequisite(s): BIOL 1120G.
Learning Outcomes
1. Understand general principles of cell structure and function.
2. Understand general principles of genetics.
3. Understand basic human anatomy and physiology.
4. Communicate scientific information effectively.
5. Demonstrate an understanding of the scientific method.
6. Knowledge of appropriate laboratory skills
7. Apply quantitative reasoning and scientific thinking to real world problems.

BIOL 1130G. Introductory Anatomy & Physiology (non-majors)
4 Credits (3+3P)
This course introduces the anatomy (structure) and physiology (function) of the human body, which includes the study of basic chemistry, molecules, cells, tissues, organs, organ systems, and terminology related to these concepts. May be repeated up to 4 credits. Restricted to Community Colleges campuses
Learning Outcomes
1. (Lecture) Define and explain anatomy and physiology.
2. (Lecture) Use anatomic directional, regional, and sectional terminology related to the human body.
3. (Lecture) Explain and describe the basic chemical principles of the human body including the structure and function of carbohydrates, lipids, proteins and nucleic acids.
4. (Lecture) Develop a basic familiarity with cells and cell organelles that include cell division, DNA replication, and protein synthesis.
5. (Lecture) Describe the structure and function of the major tissues in the human body.
6. (Lecture) Identify and describe the basic anatomical features of the integumentary, skeletal, muscle, nervous, endocrine, cardiovascular, lymphatic, digestive, respiratory, urinary and reproductive systems.
7. (Lecture) Describe the basic physiological roles of the integumentary, skeletal, muscle, nervous, endocrine, cardiovascular, lymphatic, digestive, respiratory, urinary and reproductive systems.

8. (Lecture) Apply and describe the principles of homeostasis in the human body.
9. (Laboratory) Use and apply proper anatomic terms 1
10. (Laboratory) Develop skills using the microscope correctly. 1
11. (Laboratory) Identify basic tissue types. 1
12. (Laboratory) Discuss and describe the basic anatomical features of the integumentary, skeletal, muscle, nervous, endocrine, cardiovascular, lymphatic, digestive, respiratory, urinary and reproductive systems. 1
13. (Laboratory) Demonstrate and describe physiological roles of the integumentary, skeletal, muscle, nervous, endocrine, cardiovascular, lymphatic, digestive, respiratory, urinary and reproductive systems.

BIOL 1190G. Contemporary Problems in Biology
4 Credits (3+3P)
Fundamental concepts of biology will be presented using examples from relevant problems in ecology, medicine and genetics. For nonscience majors only. Community Colleges only.
Learning Outcomes
1. Identify the unity and diversity of living things
2. Identify the structure and function of cells an biological molecules
3. Recognize and demonstrate patterns of inheritance
4. Describe mechanisms of evolution
5. Describe the human body systems including immune response
6. Discuss population dynamics and ecological systems
7. Describe the process of scientific inquiry, solve problems scientifically, and communicate on a scientific level
8. Apply quantitative analysis and scientific thinking to scientific and real world problems

BIOL 1996. Topics in Biology
1-3 Credits (1-3)
Introductory level coverage of biological topics. May be repeated up to 9 credits.
Learning Outcomes
1. Varies

BIOL 2110G. Principles of Biology: Cellular and Molecular Biology
3 Credits (3)
This course introduces students to major topics in general biology. This courses focuses on the principles of structure and function of living things at the molecular, cellular and organismic levels of organization. Major topics included are introduction to the scientific process, chemistry of cells, organization of cells, cellular respiration, photosynthesis, cell division, DNA replication, transcription, and translation. Must be taken with BIOL 2110L to meet general education requirements. May be repeated up to 3 credits.
Prerequisite/Corequisite: a C- or better in MATH 1215 or higher and a C- or better in (CHEM 1120G or CHEM 1215G or CHEM 1216).
Learning Outcomes
1. Apply the scientific method to develop and evaluate hypotheses and propose an experiment to test a scientific hypothesis related to cell biology and molecular biology.
2. Describe the distinguishing characteristics of various biological molecules (water, carbohydrates, lipids, proteins, and nucleic acids).
3. Compare and contrast the basic features of cells and how prokaryotic cells differ from eukaryotic cells.
4. Understand how organisms maintain homeostasis in a dynamic environment.
5. Describe how biological molecules are acquired and how they are subsequently used to meet the metabolic needs of organisms.
6. Describe membrane structure and function.
7. Describe and analyze the nature of bioenergetic transformations and metabolism within the cell.
8. Describe the processes of cellular respiration and photosynthesis.
9. Analyze with specific detail the processes of DNA replication, transcription, and translation. 1
10. Analyze with specific detail the types, mechanisms, and regulation of cellular division. 1
11. Assess important applications of cell and molecular biology to energy use, medicine, and other day-to-day processes.

BIOL 2110L. Principles of Biology: Cellular and Molecular Biology Laboratory
1 Credit (3P)
This course introduces students to major topics in general biology. This courses focuses on the principles of structure and function of living things at the molecular, cellular and organismic levels of organization. Major topics included are introduction to the scientific process, chemistry of cells, organization of cells, cellular respiration, photosynthesis, cell division, genetics, DNA replication, transcription, and translation. May be repeated up to 1 credit.
Prerequisite: MATH 1215 or higher, and a C- or better in (CHEM 1120G or CHEM 1215G or CHEM 1216).
Prerequisite/Corequisite: BIOL 2110G.
Learning Outcomes
1. Describe and apply the scientific method to solve problems in biological context
2. Demonstrate knowledge of laboratory safety skills and procedures.
3. Practice principles of scientific method while conducting laboratory activities and experiments.
4. Perform laboratory activities using relevant laboratory equipment, chemical reagents, and supplies to observe biological specimens, to measure variables, and to design and conduct experiments.
5. Operate light microscopes, prepare wet mount slides, and use stains.
6. Exhibit ability to use pipettes and other volumetric measuring devices, chemical glassware, balances, pH meters or test papers, spectrophotometers, and separation techniques, such as chromatography and/or electrophoresis to perform activities relevant to other course competencies.
7. Analyze and report data generated during laboratory activities and experiments.

BIOL 2210. Human Anatomy and Physiology I for the Health Sciences
4 Credits (3+3P)
This course is the first of two that serve as an introduction to human anatomy and physiology for biology majors and allied health students. The course entails describing, explaining, and analyzing structure and function from the submicroscopic to the organismal level with emphasis on anatomic, directional, and sectional terminology, basic cellular structure and metabolism, tissue differentiation and characteristics, and organ system structure and function; Specifically the integumentary, skeletal, muscular, and nervous systems. Restricted to: Community Colleges only.
Learning Outcomes
1. Describe and apply anatomical terminology.
2. Describe multi cellular organization.
3. Distinguish and describe major tissue types.

4. Describe the structure and function of the integumentary system.
5. Describe the structure and function of the skeletal system.
6. Describe the structure and function of the muscular system.
7. Describe the structure and function of the nervous system.
8. Describe the structure and function of the special senses.
9. Define homeostasis and describe specific examples for the integumentary, skeletal, muscular, and nervous systems.

BIOL 2225. Human Anatomy and Physiology II
4 Credits (3+3P)
This course is the second of two that serve as an introduction to human anatomy and physiology for biology majors and allied health students. The course entails describing, explaining, and analyzing structure and function from the submicroscopic to the organismal level with emphasis on specific cellular, tissue, and organ structure and physiology, and organ system structure and function; specifically the endocrine, cardiovascular, respiratory, urinary, and reproductive systems. Additionally, an analysis of these concepts is included: fluid and electrolyte balance, pregnancy, growth and development from zygote to newborn, and heredity. Restricted to: Community Colleges only. May be repeated up to 4 credits.
Prerequisite: BIOL 2210.
Learning Outcomes
1. Identify and describe the major anatomical features of the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems.
2. Analyze the physiological roles of the endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems in maintaining homeostasis in the human body.
3. Explain how fluid and electrolyte balance is maintained in the human body.
4. Compare and contrast the anatomy and physiology of male and female reproductive systems.
5. Describe pregnancy from conception to parturition including human growth and development from zygote to newborn.
6. Explain heredity and genetic control.

BIOL 2310. Microbiology
3 Credits (3P)
Introduction to the basic principles of microbiology, microbial pathogenesis, host defenses and infectious diseases. The course will emphasize concepts related to the structure and function of microorganisms, including their mechanisms of metabolism and growth. Host parasite interactions will also be emphasized, including mechanisms of microbial pathogenesis and mechanisms of host defenses against infectious diseases. Restricted to Community Colleges campuses only.
Prerequisite(s): CHEM 1120G or CHEM 1215G or CHEM 1225G.
Corequisite(s): BIOL 2310L.
Learning Outcomes
1. Describe and compare the structure and function of prokaryotic and eukaryotic cells.
2. Describe and compare the techniques used for staining of and microscopic observation of bacteria including morphology.
3. Describe the nutritional requirements for bacterial growth and the impact of environmental factors on bacterial growth (temperature, pH, oxygen, etc.).
4. Describe and compare the mechanisms of aerobic respiration, anaerobic respiration, and fermentative metabolism.
5. Describe the mechanism of bacterial growth by binary fission, and laboratory methods used for observing and measuring bacterial growth.
6. Describe the mechanisms of bacterial DNA replication, RNA transcription, and translation, and compare and contrast witheukaryotic cells.
7. Describe the structure and replication strategies of viruses.
8. Describe and contrast mechanisms of innate nonspecific immunity and adaptive specific immunity.
9. Describe immune hypersensitivity reactions, autoimmune diseases, and immunodeficiency diseases. 1
10. Differentiate between host microberelationships, mechanisms of microbial pathogenesis, differentiate between communicable and noncommunicable diseases and describe mechanisms of direct and indirect transmission of communicable diseases.

BIOL 2310L. Microbiology Lab
1 Credit (3P)
This course will emphasize both the theory and hands-on application of techniques used in a microbiology laboratory for the growth and identification of bacterial species. Students will learn microscopy skills and staining techniques for the observation of bacteria. Students will also learn aseptic techniques used for isolation of bacteria, inoculation of cultures, and interpretation of selective and differential growth media for the identification of bacterial species.
Prerequisite: BIOL 2310 or BIOL 2320 or concurrent enrollment.
Learning Outcomes
1. Demonstrate skills of microscopy.
2. Demonstrate skills of bacterial staining.
3. Demonstrate aseptic technique for inoculation of bacterial growth media.
4. Interpret results from selective and differential media.
5. Demonstrate appropriate use of diagnostic reagents.
6. Interpret results of diagnostic assays.
7. Identify unknown bacterial species through the use of a dichotomous key, inoculation and interpretation of laboratory assays, and application of the scientific method.

BIOL 2320. Public Health Microbiology
3 Credits (3)
This course introduces microbiology on the health profession level. It incorporates cell structure, metabolism, growth, controls of growth, infectious epidemiology, etiology, pathogenicity, and relative virulence of pathogens. It will lead to students assessing a clinical infection scenario from the microbiological perspective that includes making diagnoses based on data from appropriate diagnostic tests, investigating appropriate treatment options, and making recommendations for prevention.
Prerequisite: BIOL 2110G and BIOL 2110L.
Learning Outcomes
1. Identify key physical features of various infectious agents and describe their structure and function in the pathogen
2. Describe the microbiological, serological, biochemical and genetic tests that are used to identify infectious agents in a laboratory setting and be able to interpret test results in order to identify the pathogen
3. Explain how structural and metabolic differences between infectious agents and human host can be exploited for chemotherapy

4. Explain the observed effect of a particular environmental change on the growth of a given microorganism, and the relationship between bacterial growth patterns and selected foodborne illnesses
5. Describe several mechanisms by which pathogens generate genetic diversity and the role genetic diversity plays in resistance to therapy and treatment failure
6. Explain the role of innate, and adaptive immunity in host defense
7. Describe general virulence strategies used by variety of pathogens, and different types of vaccines along with recommendations for vaccinations of specific populations
8. Demonstrate understanding of signs and symptoms of selected diseases, and be able to relate disease agents with environmental reservoirs and transmission

BIOL 2505. Pathophysiology
3 Credits (3)
This course is designed to provide the conscientious student with a solid foundation for understanding the pathophysiological processes of the human organism. Successful completion of this course will promote the general student learning outcomes listed below. Corequisite/Prerequisites(s): AHS 154 or BIOL 2225. Restricted to: Community Colleges only.
Prerequisite(s): AHS 153 or BIOL 2210.
Learning Outcomes
1. To describe the general concepts of disease processes and factors associated with disease causation.
2. To identify the function of basic cellular structures, determining the process of cellular malfunctions.
3. To describe the response of the body to injury and immunologic challenge.
4. To discuss the etiology, pathogenesis, and treatment modalities of frequently occurring diseases.

BIOL 2511. Human Pathophysiology
3 Credits (3)
The first in a two-course sequence that covers changes in body physiology that result from disease or injury. Includes a general introduction to pathophysiology as well as an overview of altered cellular and tissue biology, injury, inflammation, and neoplasia. Students will also explore deviation from fluid, hemodynamic, and endocrinologic balance. Topics related to the science of pathophysiology, including pathology, pathogenesis, etiology, epidemiology, and clinical manifestations, are also discussed throughout the course where relevant. Grade of C- or higher in microbiology is recommended. Restricted to Community Colleges campuses only.
Prerequisite(s): Grade of C- or higher in BIOL 2210 and BIOL 2225.
Learning Outcomes
1. The cellular adaptations occurring in atrophy, hypertrophy, hyperplasia, dysplasia, and metaplasia; the types and causes of cellular injury; and the types of necrosis.
2. The different compartments for body fluids; the factors that affect water movement; the processes that drive and affect capillary exchange; the mechanisms causing edema; the electrolytes in body compartments; the various electrolyte imbalances; the body mechanisms that maintain acid-base balance; and the various acid-base imbalances and how they are compensated for .
3. The interrelationships of DNA, RNA, and proteins; the various types of mutations; the various types of mutagens, the various types of numerical and structural chromosomal aberrations; the various genetic terms; the single-gene disorders discussed in class; the multifactorial disorders discussed in class.
4. The relationships between genes, environment, and multifactorial diseases; the criteria used to define multifactorial disease; the characteristics of multifactorial traits; and the various features of the threshold model.
5. The terms related to tumor/cancer biology, classification, and nomenclature; the various features of cancer biology, including the characteristics of cancer and the genetic basis of cancer; features related to cancer invasion and metastasis; and the clinical manifestations and treatments of cancer.
6. Features related to Innate and adaptive immunity; features related to the first, second, and third lines of defense; the mechanisms and manifestations of inflammation; components/mechanisms related to the complement, clotting, and kinin systems; mechanisms of wound healing; and features of dysfunctional wound healing.
7. Aspects/mechanisms of specific (adaptive) immunity, features related to the structure, function, and classification of immunoglobulins; features related to haptens, antigens, immunogens, and epitopes; the different types of antigens; features related to immunological memory; and features related to the different types of active and passive immunity.
8. Aspects related to allergy, autoimmunity, and alloimmunity; aspects/mechanisms/examples related to the four basic types of hypersensitivity reactions; mechanisms and examples related to autoimmunity; and aspects/mechanisms related to immunodeficiency.
9. The risk factors for infection; the six components of the chain of infection; general concepts, terms, and processes/mechanisms related to basic microbiology; and the mechanisms of microbial pathogenicity. 1
10. General concepts, terms, and processes/mechanisms related to normal hormonal action; mechanisms of hormonal alterations; processes/mechanisms related to the pathophysiology of the various disorders discussed in class; and the clinical manifestations and treatment of the hormonal alterations discussed in class.

BIOL 2512. Human Pathophysiology II
3 Credits (3)
The second in a two-course sequence that covers changes in body physiology that result from disease or injury. This course focuses on the pathophysiology of the nervous, cardiovascular, lymphatic, respiratory, digestive, urinary, and reproductive systems. Topics related to the science of pathophysiology, including pathology, pathogenesis, etiology, epidemiology, and clinical manifestations, are also discussed throughout the course where relevant. Grade of C- or higher in microbiology is recommended. Restricted to Community Colleges campuses only. May be repeated up to 3 credits.
Prerequisite: Grade of C- or higher in BIOL 2210, BIOL 2225, and BIOL 2511.
Learning Outcomes
1. The different types of sensory modalities; the different dysfunctions of the general and special senses; the different pain theories discussed in class; the various aspects of the neuroanatomy and neuromodulation of pain; the various clinical descriptions of pain; the various aspects of temperature regulation; components of the pathogenesis of fever; the various disorders of temperature regulation; the various aspects of sleep disorders; the various components of visual dysfunction; and the various aspects of auditory, gustatory, and olfactory dysfunction.

2. The various alterations in cognitive systems; the various alterations in arousal; the outcomes of alterations in arousal; the various alterations in awareness; the various seizure disorders; the various data processing deficits; various alterations in cerebral hemodynamics; and alterations in neuromotor function.
3. The various disorders of the central and peripheral nervous systems; and the various disorders of the neuromuscular junction.
4. The components of normal blood; the process/stages of hematopoiesis; the various normal RBC laboratory values; the components and functions of the lymphatic system; the various types of imbalances of erythropoiesis; the various types of anemias and their causes; the various types of polycythemia and their causes; the processes related to hemostasis; the various alterations of white blood cells and their causes; and the various alterations of lymphoid and hemostatic function.
5. The various diseases of the veins; the various diseases of the arteries; the various aspects of atherosclerosis; features related to the pathogenesis and consequences of coronary artery disease; the disorders of the heart wall and their consequences; the various aspects of valvular dysfunction; aspects of the pathogenesis and manifestations of rheumatic disease; the causes, pathogenesis, and manifestations of infective endocarditis; the causes, manifestations, and pathophysiology of heart failure; and the various types of shock.
6. The various signs and symptoms of pulmonary disease; the various conditions caused by pulmonary disease/injury; the various disorders of the chest wall and pleura; and the causes, manifestations, and pathophysiology of selected pulmonary disorders.
7. The features and consequences of upper and lower urinary tract obstruction; the various types of urinary tract infection; the causes, pathogenesis, and clinical manifestations of glomerulonephritis; the various features of nephrotic and nephritic syndrome; and the various features (etiology, pathophysiology, and clinical manifestations) of both acute kidney injury and chronic kidney disease.
8. The various clinical manifestations of gastrointestinal dysfunction; the various aspects (etiology, pathophysiology, and clinical manifestations) of disorders of motility; the causes, manifestations, and pathophysiology of gastritis; features related to the causes, manifestations, and pathophysiology of peptic ulcer disease; features related to the etiology, pathogenesis and pathophysiology of selected malabsorption syndromes, inflammatory bowel diseases, diverticular disease of the colon, appendicitis, and irritable bowel syndrome; the various types of vascular insufficiency; the various disorders of nutrition and their causes and clinical manifestations; and the various disorders of the accessory organs of digestion.
9. The various features associated with alterations of sexual maturity (delayed puberty and precocious puberty); features related to the etiology, pathogenesis, and pathophysiology of the various disorders of the male reproductive system, including disorders of the urethra, disorders of the penis, disorders of the scrotum, disorders of the testes, disorders of the epididymis, disorders of the prostate gland, and disorders of the male breast; features related to the etiology, pathogenesis, and pathophysiology of male sexual dysfunction; features associated with abnormalities of reproductive tract development; the various hormonal and menstrual alterations and their causes and clinical manifestations; the various conditions related to infection, inflammation, and pelvic organ prolapse (uterine prolapse, cystocele, rectocele, and enterocele); conditions involving benign growths and cancer (endometriosis, cervical cancer, vaginal cancer, vulvar cancer, endometrial cancer, uterine sarcoma, and ovarian cancer); features related to the etiology, pathogenesis, and pathophysiology of female sexual dysfunction (disorders of desire, vaginismus, anorgasmia, and dyspareunia); features related to infertility; and features related to the etiology, pathogenesis, and pathophysiology of breast cancer.

BIOL 2610G. Principles of Biology: Biodiversity, Ecology, and Evolution
3 Credits (3)
This course is an introduction to the dynamic processes of living things. Major topics include the mechanisms of evolution, biological diversity, Mendelian genetics, and ecology.
Prerequisite/Corequisite: grade of C- or better in MATH 1215 or higher, or a Math Placement Exam score adequate to enroll in mathematics courses beyond MATH 1215.
Learning Outcomes
1. Understand the scientific method and apply it to biological topics of genetics, evolution, ecology, and biodiversity.
2. Apply quantitative reasoning and scientific thinking to real world problems.
3. Identify and describe the basic principles of evolution.
4. Analyze the relationships between the genetics of populations and evolution.
5. Analyze the processes of speciation.
6. Describe how the hierarchical classification scheme is used to categorize organisms.
7. Describe how DNA research has modernized bio systematics.
8. Compare and contrast the general characteristics of each of the living domains and kingdoms.
9. Relate the structure of organisms to the way they function. 1
10. Explain how the life histories of organisms are adapted for different environments. 1
11. Relate the complexity of behavior to the overall complexity of an organism. 1
12. Describe the ecological roles played by organisms in each kingdom. 1
13. Compare basic ecological principles at the population and community levels of organization. 1
14. Describe and compare energy relationships and the cycling of materials in ecosystems. 1
15. Identify and describe the basic principles of Mendelian genetics.

BIOL 2610L. Principles of Biology: Biodiversity, Ecology, and Evolution Laboratory
1 Credit (3P)
This laboratory course is an introduction to the dynamic processes of living things. This course introduces students to the methods used in the study of Mendelian genetics, evolution, ecology, and biological diversity. Designed for students continuing in life sciences.
Prerequisite/Corequisite: BIOL 2610G; grade of C- or better in MATH 1215 or higher, or a Math Placement Exam score adequate to enroll in mathematics courses beyond MATH 1215.
Learning Outcomes
1. Describe and apply the scientific method to generate testable hypotheses in evolution and ecology.
2. Design and conduct laboratory experiments using relevant laboratory equipment and methods.
3. Analyze and report data generated during laboratory activities and experiments.
4. Communicate scientific results from experiments in Mendelian genetics, evolution, ecology, and biodiversity.

BIOL 2996. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 6 credits. Community Colleges only.
Learning Outcomes
1. Varies

BIOL 301. Principles of Ecology
3 Credits (3)
A survey of ecology including general theory, the adaptations of organisms, population dynamics, species interactions, and the structure and function of natural communities and ecosystems. MATH 1511G and A ST 311 recommended. Same as ENVS 301. Crosslisted with: ENVS 301.
Prerequisite(s): BIOL 2610G, MATH 1220G.

BIOL 302. Molecular Biology Techniques Laboratory
3 Credits (6P)
This combined lecture and laboratory course emphasizes molecular biology laboratory practices through the hands-on application of commonly applied techniques, protocols, and equipment. The topics covered include both the fundamental development of empirical data as well as data analysis using stand-alone and web-based resources. Consent of instructor required.
Prerequisite(s): BIOL 2110G or equivalent, and MATH 1220G.

BIOL 305. Principles of Genetics
3 Credits (3)
Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.
Prerequisite: (BIOL 2610G and BIOL 2110G, or BIOL 2110G and BCHE 140, and either CHEM 1215G or CHEM 1216).
Learning Outcomes
1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

BIOL 309. Guided Biological Research Lab
3 Credits (3)
This laboratory course provides a guided experience to hands-on research in biology. It is intended for early-career undergraduates who have finished the introductory sequence of Biology courses. Topics will vary with instructor.
Prerequisite(s): BIOL 2610G, BIOL 2110G, and MATH 1220G.

BIOL 311. General Microbiology
3 Credits (3)
Principles of physiology, molecular biology, ecology, and taxonomy of microorganisms.
Prerequisite(s): BIOL 2110G and MATH 1220G.

BIOL 311 L. General Microbiology Laboratory
2 Credits (4P)
Microbiology techniques and procedures, including isolation and identification of microorganisms and biotechnology procedures that employ microorganisms.
Prerequisite(s)/Corequisite(s): BIOL 2320 or BIOL 311. Prerequisite(s): BIOL 2110G and MATH 1220G.

BIOL 312. Plant Taxonomy
3 Credits (2+3P)
Classification and identification of representative plant families and local plants. Emphasis on ability to use technical sources. Saturday field trips may be recommended.
Prerequisite(s): BIOL 2610G and MATH 1220G.

BIOL 313. Structure and Function of Plants
3 Credits (2+3P)
Structure, function, and survey of plants. BIOL 2110G recommended.
Prerequisite(s): BIOL 2610G, MATH 1220G, and sophomore-level standing.

BIOL 314. Plant Physiology
3 Credits (3)
Photosynthesis, respiration, water relation of plants, minerals and organic nutrition, growth and development.
Prerequisite(s): BIOL 2110G and CHEM 1225G.

BIOL 322. Zoology
3 Credits (2+3P)
Structure, function, and survey of animals. BIOL 2110G recommended.
Prerequisite(s): BIOL 2610G, MATH 1220G, and at least sophomore-level standing.

BIOL 350. Special Topics
1-4 Credits
Specific subjects announced in Schedule of Classes and offered as scheduled courses. May be repeated for unlimited credit.

BIOL 351. Biology Internship
1-6 Credits
Substantial off-campus experience in biology selected by student in consultation with regular biology faculty member. Internship must be approved by faculty member. Student will supply mutually agreed upon documentation of internship activities after the internship is completed. May be repeated up to 6 credits. Restricted to: BIOL, MBIO, CEC, GEBT majors. Graded: S/U Grading (S/U, Audit).
Prerequisite(s): 45 college credits, 2.5 or better GPA, consent of instructor.

BIOL 353. Pre-Professional Human Anatomy
4 Credits (4)
Pre-professional clinincally-oriented survey of human anatomy. Designed primarily for pre-nursing majors. Provides comprehensive anatomical training for students planning careers in health and allied health sciences, such as medicine, dentistry, nursing, physical therapy, physicians aid, human nutrition, and food science. Suitable as a biology elective. Concurrent enrollment in BIOL 353 L is recommended but not required. May be repeated up to 4 credits.
Prerequisite(s): BIOL 2110G and either CHEM 1120G, CHEM 1215G, or CHEM 1216.

BIOL 353 L. Pre-Professional Human Anatomy Laboratory
1 Credit (3P)
Laboratory experience in human anatomy using anatomical models and cat dissections. Designed as a learning aid to support and augment BIOL 353 pre-professional Human Anatomy. For students planning careers in health and allied health sciences such as medicine, dentistry, nursing, physical therapy, physicians aid, human nutrition, and food science. May be repeated up to 1 credits.
Prerequisite(s)/Corequisite(s): BIOL 353. Prerequisite(s): BIOL 2110G and either CHEM 1120G, CHEM 1215G, or CHEM 1216.

BIOL 354. Physiology of Humans
3 Credits (3)

Principles of integrative functions in humans. A systems approach emphasizing tissues, organs, and their regulation.
Prerequisite(s): BIOL 2110G and MATH 1220G.

BIOL 354 L. Laboratory of Human Physiology
1 Credit (3P)
Laboratory to accompany BIOL 354.
Prerequisite(s): MATH 1220G and either BIOL 2221, BIOL 381, BIOL 354, or concurrent enrollment in BIOL 354.

BIOL 377. Cell Biology
3 Credits (3)
Fundamentals of eukaryotic cell structure, organization, and function. Emphasis on membranes, subcellular organelle systems, cytoskeleton, and cell cycle. Includes basic aspects of molecular biology. May be repeated up to 3 credits. BIOL 2610G recommended.
Prerequisite(s): (BIOL 2110G, BIOL 305 or GENE 315) and MATH 1220G.

BIOL 381. Animal Physiology
3 Credits (3)
Principles of integrative function in animals, emphasizing tissues, organs, organ systems, and regulation. Includes adaptations of animals to their environments. BIOL 2610G and BIOL 377 recommended.
Prerequisite(s): BIOL 2110G and junior-level standing, MATH 1220G.

BIOL 382. Plant Signalling and Development
3 Credits (3)
This is a course that introduces plant signalling pathways and their role in development to students. The lectures are structured to facilitate in-class discussions on the current state and future directions in this field. Topics will cover a wide range of biological questions and the methods used to study them. May be repeated up to 3 credits.
Prerequisite(s): BIOL 305 or GENE 315, and MATH 1220G.

BIOL 385. An Introduction to Cancer
3 Credits (3)
This course will cover 3 areas of cancer research and their interdisciplinary connections: clinical cancer research, epidemiology and public health, and basic cancer research. May be repeated up to 3 credits.
Prerequisite(s): BIOL 305 or GENE 315 or equivalent and MATH 1220G.

BIOL 398. Biology Research Programs
1-3 Credits
Directed studies and research experiences, by arrangement with instructor. May be repeated for a maximum of 6 credits.

BIOL 402. Biology Honors Thesis
1-3 Credits (1-3)
Provides guidance in how to write a scientific paper in the sciences. Students will produce an honors thesis based on previous independent research. Consent of instructor required.
Prerequisite(s): MATH 1220G and consent of instructor.

BIOL 412. Seminar in Microbiology
1 Credit (1)
Seminar to aid students in assessment and presentation of current topics in microbiology.
Prerequisite(s): BIOL 311, BIOL 311 L, and MATH 1220G.

BIOL 417. Topics in Environmental Microbiology
3 Credits (3)
This is an advanced undergraduate course based on current literature in Environmental Microbiology, and is a seminar-style, discussion-based class. Topics typically include marine microbiology, ancient DNA, and the human microbiome. Crosslisted with: BIOL 577.
Prerequisite(s): MATH 1220G, BIOL 477 or consent of instructor.

BIOL 424. Human Osteology
3 Credits (3)
A survey of the functional, developmental, and evolutionary biology of the human skeleton. Identifying bones and teeth from hands-on experience with skeletal and dental material. Provides a foundation for human evolutionary studies, bioarchaeology and forensic anthropology. Students are recommended to take ANTH 355 or an equivalent before enrolling in this course. BIOL 424L should be taken concurrently when it is offered. Crosslisted with: ANTH 474.

BIOL 427. Symbiosis
3 Credits (3)
In-depth treatment of the ecology, evolution, and mechanisms that are found in symbiotic systems. May be repeated up to 3 credits. Crosslisted with: BIOL 527.
Prerequisite(s): BIOL 2610G, BIOL 2110G, and MATH 1220G.

BIOL 436. Disease Vector Biology
3 Credits (3)
Fundamentals of disease vector biology with emphasis on molecular biology. Explores an overview of vector borne diseases, insect endocrinology, insect immunity, olfaction, vector genome projects and transgenic insect techniques. Includes student presentations and literature discussions. Crosslisted with: BIOL 536
Prerequisite(s): BIOL 2110G, BIOL 305, and MATH 1220G.

BIOL 442. Genomics Technology
3 Credits (3)
The course introduces current genomic techniques in genome sequencing, transcriptome analysis, detection of genetic variation, and metagenomics. May be repeated up to 3 credits. Crosslisted with: BIOL 562.
Prerequisite(s): BIOL 2110G, BIOL 305 or BIOL 478 or GENE 315, and MATH 1220G.

BIOL 446. Bioinformatics and NCBI Database
3 Credits (3)
The course discusses how to use NCBI database and bioinformatic tools for research with genomics approaches. The topics include nucleotide and protein sequence analysis, similarity search with blast algorithms, gene/genome annotation, protein structure analysis, gene expression analysis, and metagenomic study.
Prerequisite(s): BIOL 2110G, BIOL 305 or BIOL 478 or GENE 315, and MATH 1220G.

BIOL 450. Special Topics
1-3 Credits
Specific subjects announced in the Schedule of Classes and offered as scheduled courses. May be repeated for unlimited credit.

BIOL 451. Physiology of Microorganisms
3 Credits (3)
Aspects of cellular physiology unique to prokaryotes. BCHE 395 recommended.
Prerequisite(s): C- or better in BIOL 311, MATH 1220G.

BIOL 455. Biometry
3 Credits (3)
Biometry is the analysis of biological data using mathematical and statistical models. The course will cover basic theories of probability and statistics and will introduce principles of sampling, estimation, experimental design, and hypothesis testing. Students will analyze biological data using computer programs and will perform tests for goodness-of-fit, independence, analysis of variance, correlation, and regression.
Prerequisite: BIOL 2610G or BIOL 2110G, and MATH 1220G.

Learning Outcomes

1. Cover basic theories of probability and statistics.
2. Understand principles of sampling, estimation, experimental design, and hypothesis testing.
3. Analyze biological data.
4. Perform tests for goodness-of-fit, independence, analysis of variance, correlation, and regression.

BIOL 459. Darwinism Versus Creationism
3 Credits (3)
This course examines the debate regarding Creationism versus Darwinism as explanations for the origin and diversification of life on Earth. Topics covered include the nature and philosophy of science, new-world creationism, old-world creationism, intelligent design, history of evolutionary thought, modern evolutionary theory, and the Creationism-Darwinism debate at the societal, political, and educational interfaces. The course structure will include formal lectures and in-class discussion of assigned readings.
Prerequisite(s): BIOL 2610G or BIOL 2110G, and MATH 1220G.

BIOL 459 H. Darwinism versus Creationism Honors
3 Credits (3)
This course will examine the history and philosophy surrounding the debate between Darwinism and Creationism. The course will also examine the consequences of the debate at the interface of sociology, economics, politics, and education. The Honors version of the course (BIOL 459H) will require a term paper in addition to the requirements of BIOL 459. Crosslisted with: BIOL 459.
Prerequisite(s): BIOL 2610G or BIOL 2110G, and MATH 1220G.

BIOL 462. Conservation Biology
3 Credits (3)
Examination of the value of biological diversity, the natural processes that control biological diversity, and the ways in which human activities have resulted in the loss of biological diversity, both regionally and globally.
Prerequisite(s): BIOL 301 and either MATH 1430G or MATH 1511G.

BIOL 467. Evolution
3 Credits (3)
Covers theory, historical background, population variation, natural selection, adaptation, speciation.
Prerequisite(s): BIOL 2610G, BIOL 305 or GENE 320, and MATH 1220G.

BIOL 469. Biology of Emerging Infectious Diseases
3 Credits (3)
This class will investigate the evolutionary and ecological drivers of disease emergence. The effect of emerging diseases on human health will be addressed throughout the class, but the class will also consider the consequences of disease emergence for the health of wildlife and plant populations. Additionally, the class will consider the mechanisms used to control disease emergence and why they succeed or fail.
Prerequisite(s): MATH 1220G, Introductory Genetics (BIOL 305 or equivalent) or consent of the instructor.

BIOL 470. Developmental Biology
3 Credits (3)
The purpose of this course is to introduces students to the principles that govern the development of a single fertilized egg cell into a complex multicellular organism. These principles, and often the molecular mechanisms by which they are accomplished, appear to be universal for all multicellular organisms including both plants and animals. We will explore issues such as: how cells become committed to particular cell fates and how this commitment is maintained; how organs acquire particular shapes, sizes and positions; the developmental causes of some human diseases; how the environment affects development; and, how changes in development provide the material basis for evolutionary change.
Prerequisite(s): BIOL 2110G, BIOL 305, and MATH 1220G.

BIOL 473. Ecology of Microorganisms
3 Credits (2+3P)
The metabolic interactions of microorganisms in the environment, with emphasis on their roles in ecological processes.
Prerequisite(s): MATH 1220G, BIOL 311 or consent of instructor.

BIOL 474. Immunology
3 Credits (3)
Basic concepts of the immune response.
Prerequisite(s): MATH 1220G, BIOL 305, and CHEM 2115 or CHEM 313.

BIOL 475. Virology
3 Credits (3)
Mechanisms of viral infections of animals and man. BCHE 395 or BIOL 305 are recommended.
Prerequisite(s): BIOL 311 and MATH 1220G.

BIOL 476. Soil Microbiology
3 Credits (3)
Nature and physiology of soil microorganisms, how they affect plant growth and recycle nutrients. Land framing, bioremediation, and other environmental problems as influenced by soil microorganisms. SOIL 2110 and BIOL 311 recommended. Same as SOIL 476.

BIOL 476 L. Soil Microbiology Laboratory
1 Credit (3P)
Enumeration of soil microorganisms, their activities, and transformations they mediate. Same as SOIL 476L.
Prerequisite(s)/Corequisite(s): BIOL 476.

BIOL 477. Applied and Environmental Microbiology
4 Credits (4)
A lecture-laboratory course on the microorganisms and the reactions they mediate which either impact the environment or have industrial applications. Reading of current literature will be emphasized. Topics include bioremediation, water quality, and aspects of industrial and food microbiology.
Prerequisite(s): MATH 1220G, BIOL 311, and 311 L, or consent of instructor.

BIOL 478. Molecular Biology of Microorganisms
3 Credits (3)
The biochemical basis for gene mutation, recombination, and expression with emphasis on prokaryotes. Includes fundamentals of recombinant DNA technology. BIOL 305 and BCHE 395 recommended.
Prerequisite(s): BIOL 311 and MATH 1220G.

BIOL 479. Medical Microbiology
3 Credits (3)
An in-depth overview of microbial pathogens associated with human infectious disease. Etiological agents, pathogenesis, and processes leading to the disease state and the therapies of infectious disease.
Prerequisite(s): MATH 1220G and BIOL 311 required, BIOL 474 recommended.

BIOL 479 L. Medical Microbiology Laboratory
1 Credit (1)
Overview of common procedures used by medical microbiologists to identify agents of disease or microbial pathogen traits. May be repeated up to 1 credits.
Prerequisite(s)/Corequisite(s): BIOL 479. Prerequisite(s): MATH 1220G, BIOL 311, BIOL 311 L.

BIOL 480. Animal Behavior
3 Credits (3)
A survey of the field of animal behavior. BIOL 322 recommended. May be repeated up to 3 credits.
Prerequisite: MATH 1220G or higher, BIOL 2610G, and junior-level standing.
Learning Outcomes
1. Distinguish between proximate mechanisms and ultimate causation.
2. Engage in the scientific process as applied to animal behavior.
3. Interpret and produce graphical representations of data.
4. Describe general patterns of animal behavior across a wide range of contexts.

BIOL 484. Animal Communication
3 Credits (3+3P)
An examination of how animals produce and perceive signals, what factors influence the form of signals in different sensory modalities, and how conflicts between senders and receivers affect signaling strategies. Weekly discussion from the primary literature and group research products. May be repeated up to 3 credits.
Prerequisite: BIOL 2610G or consent of instructor, and MATH 1220G or higher.
Learning Outcomes
1. Describe how animal signals are produced, transmitted, and received in various taxa,
2. Understand how evolutionary, ecological and economic principles help predict how animals will communicate,
3. Describe general patterns of animal communication across a range of social contexts.

BIOL 488. Principles of Conservation Genetics
3 Credits (3)
Fundamentals of the genetics of small populations. Genetic technologies used in studying small populations. Application of genetics and evolution to the conservation of biological populations.
Prerequisite(s): MATH 1220G and BIOL 305.

BIOL 490. Neurobiology
3 Credits (3)
Fundamentals of neurobiology with an emphasis on properties of neurons and glia, principles of synaptic transmission, development of nervous system and organization of motor and sensory systems.
Prerequisite(s): BIOL 2110G, MATH 1430G or equivalent.

BIOL 498. Biology Research Programs
1-3 Credits
Directed studies and research experiences, by arrangement with instructor. May be repeated for a maximum of 6 credits.

BIOL 509. Guided Biological Research Lab
3 Credits (3P)
This laboratory course provides a guided experience to hands-on research in biology. It is intended for early-career graduate students wishing an introduction to research practices. Topics will vary with instructor. Crosslisted with: BIOL 309.

BIOL 510. Current Topics in Biology
3 Credits (3)
Introduction to diverse topics in modern biology, including dynamic areas of current research.

BIOL 514. Plant Physiology
3 Credits (3)
Overview of photosynthesis, respiration, water relations of plants, minerals and organic nutrition, growth and development. May be repeated up to 2 credits.
Prerequisite: BIOL 2110G and CHEM 1225G.
Learning Outcomes
1. Describe how individual plants survive in variable environments. This means that students will be able to: a. Summarize the chemical and physical bases for major plant processes. b.Explain how major plant processes interact to support plant growth and development. c. Describe the adaptive forms of physiological processes and their underlying anatomical modifications.
2. Predict consequences of environmental change on physiological processes within individual plants.
3. Apply course concepts to real-world scenarios that involve plant function and plant development.
4. Describe experimental approaches used to understand physiological processes within individual plants.

BIOL 520. Molecular Cell Biology
3 Credits (3)
An in-depth look at cellular processes and structures at the molecular level. Emphasis is placed on formal student presentations and discussions of current literature.
Prerequisite: BIOL 377 or equivalent.

BIOL 527. Symbiosis
3 Credits (3)
In-depth treatment of the ecology, evolution, and mechanisms that are found in symbiotic systems. May be repeated up to 3 credits. Crosslisted with: BIOL 427.
Prerequisite(s): Graduate status.

BIOL 536. Advanced Disease Vector Biology
3 Credits (3)
Fundamentals of disease vector biology with emphasis on molecular biology. Explores an overview of vector borne diseases, insect endocrinology, insect immunity, olfaction, vector genome projects and transgenic insect techniques. Includes student presentations and literature discussions. Taught with: BIOL 436.
Prerequisite(s): BIOL 2110G and BIOL 305.

BIOL 540. Science and Ethics
1-3 Credits (1-3)
Ethical concerns facing researchers in the basic and applied biological sciences. Coverage of responsible conduct in research including scientific integrity and research misconduct, mentor/trainee responsibilities, data management, authorship, publication practices, human subjects, animal welfare, intellectual property, conflicts of interest and effort and collaborative science. Emphasis on ethical reasoning skills. Discussion of ethical and societal implications of issues selected from a broad range of contemporary research areas (genetics, reproductive biology, environmental sciences, nanoscience, drug discovery, bioengineering, neuroscience). Subtitled. May be repeated up to 4 credits. Crosslisted with: PHIL 540.

BIOL 541. Professional Development Seminar
1-3 Credits
Practical aspects of career enhancement including job seeking, professional presentations, grant proposals, etc.
Prerequisite: consent of instructor.

BIOL 550. Special Topics
1-3 Credits
Readings, discussions, and/or field and laboratory investigation of selected problems. Possible topics: human genetics, systematic

entomology, or parasitism in animals. May be repeated for unlimited credit.
Prerequisite: consent of instructor, and designation of a specific topic before registration.

BIOL 562. Advanced Genomics Technology
3 Credits (3)
This course covers current genomics techniques in genome sequencing, transcriptome analysis, detection of genetic variation, and metagenomics. May be repeated up to 3 credits. Consent of Instructor required. Crosslisted with: BIOL 442.

BIOL 565. Biology In The K-6 Curriculum
3 Credits (3)
Linking important biological concepts to the K-6 curriculum and standards. Addressing known content area challenges with effective pedagogical approaches. Aligning content, standards, classroom activities and assessment. Does not fulfill requirements for degrees in biology. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.
Learning Outcomes
1. Explain that biology is a scientific discipline based on observations and experimentations.
2. Explain the process of scientific inquiry and explain how scientific knowledge is discovered and validated.
3. Describe the chemical basis of living organisms and how biomolecules contribute to the structure and function of cells.
4. Develop a basic familiarity with cells and cell organelles.
5. Describe the structure and function of DNA as well as how DNA is used in the production of proteins
6. Describe the basic principles of genetics and heredity leading to human diversity.
7. Identify the major features of the systems in the human body, and understand the anatomy and physiology of them
8. Describe the roles of the organ systems in maintaining homeostasis
9. Explain the principles of evolution by means of natural selection explaining the diversity of life. 1
10. Describe how science and technology have impacted life in particular to society and the environment (e.g. medicine, forensic science, agriculture, ecology, sustainability) 1
11. Describe the benefits of a case study approach to teaching 1
12. Align biology content with specific K-6 (e.g. NGSS) science standards 1
13. Design an instructional case study (complete with teaching notes and assessment) to address specific K-6 science standards

BIOL 566. Advanced Bioinformatics and NCBI Database
3 Credits (3)
The course discusses how to use NCBI database and bioinformatic tools for research with genomics approaches. The topics include nucleotide and protein sequence analysis, similarity search with blast algorithms, gene/genome annotation, protein structure analysis, gene expression analysis, and metagenomic study. Consent of Instructor required.

BIOL 568. Communities and Ecosystems
3 Credits (3)
Community ecology is an interdisciplinary field that integrates numerous theories, concepts, and methods to study the patterns and dynamics of biotic assemblages. Because biotic groups affect the biogeophysical and biogeochemical processes that govern Earth system functioning, community ecology also plays an increasingly large role in the study of ecosystem ecology, a discipline which seeks to understand the processes governing nutrient and energy flow across the Earth system. This course will explore the theories and methods for study of biodiversity, biogeography, and community assembly, as well as the pathways through which communities exert influence on ecosystem functioning. Topics will also include evolutionary influences on communities, the integration of community ecology into conservation and land management, and community ecology in an era of rapid environmental change.

BIOL 577. Advanced Topics in Environmental Microbiology
3 Credits (3)
This course is based on current literature in Environmental Microbiology, and is a seminar-style, discussion-based class. Topics typically include marine microbiology, ancient DNA and the human microbiome.
Prerequisite(s): Consent of instructor.

BIOL 581. Physiology of Animals
3 Credits (3)
Comprehensive treatment of integrative physiology of animals, emphasizing tissues, organ systems, and regulatory control, including neuroendocrine function, circulation, respiration, and excretion. Term paper required. BIOL 2610G, BIOL 377 recommended.
Prerequisite: BIOL 2110G.

BIOL 582. Advanced Plant Signalling and Development
3 Credits (3)
This is a course that introduces plant signalling pathways and their role in development to students. The lectures are structured to facilitate in-class discussions on the current state and future directions in this field. Topics will cover a wide range of biological questions and the methods used to study them. May be repeated up to 3 credits.
Prerequisite(s): BIOL 305 or GENE 315, and MATH 1220G.

BIOL 587. Behavioral and Evolutionary Ecology
3 Credits (3)
This course will investigate the causes and consequences of phenotypic variation and the adaptive value of phenotypic traits.

BIOL 589. Speciation and Adaptation
1-3 Credits (1-3)
Examination of the two great themes of evolutionary biology. Begins with an historical overview of perspectives on these evolutionary processes, and then moves through the foundations of modern research to focus on recent advances driven by improvements in theory and technology. Emphasis on synthesis of the primary literature through lectures, discussion, and written assignments.
Learning Outcomes
1. Students will actively participate in discussions focused on both classic foundational texts as well as recent research in this field.
2. Students are expected to lead class discussions on relevant evolution topics.
3. Students will learn to write a literature review paper on a specific topic in the field of evolutionary biology.

BIOL 590. Neuroscience
1-3 Credits
Detailed examination of the principles underlying nervous system organization and function. Emphasis on recent advances in multidisciplinary, integrated approaches to study the nervous system. May be repeated up to 9 credits.

BIOL 598. Special Research Programs
1-9 Credits
Individual investigations either analytical or experimental.

BIOL 599. Master's Thesis
15 Credits

Thesis.

BIOL 600. Doctoral Research
1-15 Credits
Research.

BIOL 610. Seminar
1-3 Credits (1-3)
Oral presentation and discussion of journal articles and ongoing research projects. May be repeated up to 6 credits. Graded: S/U Grading (S/U, Audit).

BIOL 612. Microbiology Seminar
1 Credit (1)
Seminar to aid graduate students in assessment and presentation of classical and current topics in microbiology.

BIOL 697. University Teaching Experience
1-3 Credits
Certain graduate students will be permitted to teach up to one-third of one of the biology courses. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. May be repeated up to 3 credits.
Learning Outcomes
1. Varies.

BIOL 698. Selected Topics
1-3 Credits
Selected topics for doctoral students.

BIOL 700. Doctoral Dissertation
15 Credits
Dissertation.

BLAW-BUSINESS LAW

BLAW 2110. Business Law I
3 Credits (3)
Survey of the legal environment of business and common legal principles including: the sources of law, dispute resolution and the U.S. court systems, administrative law, tort law, contract law, agency and employment law, business structure and governance, ethics and corporate social responsibility. Explores sources of liability and presents strategies to minimize legal risk. Offered at all NMSU Community Colleges except Dona Ana Community College. Credit may not be earned in both BLAW 2110 and BLAW 317.
Learning Outcomes
1. Describe the sources of law.
2. Describe and explain dispute resolution and the court systems in the United States.
3. Describe the concepts of negligence, intentional torts and strict liability.
4. Describe and apply the essential aspects of contracts from creation, performance, breach and remedies, including basic contract law from Article 2 of the Uniform Commercial Code.
5. Explain the concept of ethics.

BLAW 313. Sports and the Law
3 Credits (3)
Introduction to legal concepts related to sports and business including an introduction to U. S. law and the civil practice, agency, sports contracts, sport torts, sport crimes, pertinent federal legislation such as Title IX, drugs and sports, international sports issues, pertinent antitrust issues, intellectual property, ethics and alternative dispute resolution.
Prerequisite(s)/Corequisite(s): BLAW 316.

BLAW 316. Legal Environment of Business
3 Credits (3)
Survey of business law including: the legal system (court systems, sources and types of law, litigation and dispute resolution), ethics and corporate social responsibility, administrative law, tort law, contract law, agency and employment law, business structure and governance, securities regulations, and international law. Students may not receive credit for both BLAW 316 and BLAW 317.

BLAW 325. Real Estate Principles and Law I
3 Credits (3)
Real estate law and the fundamental aspects of the real estate purchase transaction and the real estate lease agreement. Topics include real estate brokerage, marketing of real estate, fundamental legal aspects of real estate, present and future interests, air and water rights, methods of transfer, basics of financing and liens, and real estate leases. Same as BFIN 325.

BLAW 330. Entrepreneurial Law
3 Credits (3)
This course will explore the legal issues faced in the process of launching, financing, and growing a new venture. We will pay special attention to ventures making use of innovative technologies and business models. Intellectual property (trade secrets and confidential information, patents, copyrights, and trademarks) are of special importance to innovation-driven ventures, so we will consider in- depth how intellectual property is developed, protected, and put to use.

BLAW 385V. Employment and Consumer Law
3 Credits (3)
Study of the interrelationships between business, legal, and ethical aspects of employment and consumer issues and their attendant civil liability and remedies in domestic and international markets.
Learning Outcomes
1. Almost every aspect of today's businesses is subject to a myriad of legal requirements imposed by law (whether that law be civil or criminal, common or statutory, or regulatory). Legal issues lurk everywhere! To succeed in business, one must be aware of the major aspects of the substantive law and the nature of the legal system, and be able to communicate with the lawyers that he or she will likely come in contact with.
2. Successful completion of this course will not qualify you to be a lawyer or to solve your own legal problems (or those of your business). Rather, this course will provide you with a broad overview of certain aspects of the law that you may encounter in your day-to-day business (or personal) affairs (some of the subjects covered in a chapter in this course are semester-long courses in law school, so this course necessarily is somewhat of a "survey" of the topics covered).
3. Successful completion of the course should provide you with sufficient knowledge to recognize when "legal" issues in consumer protection are looming, and provide you some tools to assist you in seeking the right help to address the issues. Students taking this course will better understand the American legal system, with an emphasis on administrative law, since most consumer protection regulations are a creature of administrative law.
4. Secondly, students will master the scope of several consumer protection agencies, their respective roles and responsibilities, and the associated obligations of businesses and consumers to comply with the various agency rules and regulations.
5. Third and finally, interspersed throughout the semester student will learn about select topics they choose that have some relationship

to consumer protection. This is student guided, and can be anything of interest to you. In the past, I have covered landlord-tenant law, intellectual property, state lemon laws, election law, and employment law.

BLAW 490. Selected Topics
1-3 Credits
Prerequisites vary according to the seminar being offered.

BLAW 498. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with the prior approval of the department head.
Prerequisites: junior or above standing and consent of instructor and department head.

BLAW 502. Legal Environment of Business
3 Credits (3)
Legal procedures and the judicial system as applied to business situations and a general coverage of the bodies of substantive law most commonly associated with business.
Prerequisite: graduate students only.

BLAW 518. Uniform Commerical Code and Advanced Business Law Topics
3 Credits (3)
Property, advanced contract law, debtor-creditor relations, bankruptcy and Uniform Commercial Code topics, including sales, negotiable instruments, secured transactions. Students who have taken either BLAW 318 or BLAW 418 may not receive credit for BLAW 518. Same as BLAW 418 with differentiated assignments for graduate students.
Prerequisite(s): BLAW 316 or BLAW 502.

BLAW 550. Selected Topics
3 Credits (3)
Seminars in selected topics related to business law or the legal environment of business.
Prerequisite(s): Varies according to seminar being offered.

BLAW 598. Special Research Programs
1-3 Credits
Individual investigations either analytical or experimental with the prior consent of the instructor and department head.
Prerequisite: consent of instructor and department head.

BLED-BILINGUAL EDUCATION

BLED 1110. Introduction in Bilingual Education/ESL
3 Credits
An overview of the American Education system with emphasis on organization, governance, law, demographics, and professional practice. Will include supervised experience in bilingual education/ESL elementary settings for prospective bilingual education/ESL teachers.
Learning Outcomes
1. Complete 24 hours field observations in a classroom.
2. Articulate the attributes of an education professional entering the field.
3. Construct an individualized map to teacher licensure in the State of New Mexico.
4. Differentiate and summarize the major educational philosophies and historical events that have influenced the progression of educational practice.

BLED 2110. Bilingual Methods
3 Credits (3)
This course provides a historical overview of bilingual and ESL education including an emphasis on present trends and practices. Discussions of the aspects of bilingualism at both an individual and a societal level are included. May be repeated up to 3 credits.
Learning Outcomes
1. (Culture) Develops awareness in the learner of the value of cultural diversity.
2. (Culture) Prepares and assists students to interact successfully in cross cultural settings.
3. (Culture) Recognizes and accepts different patterns of child development within and between cultures in order to formulate realistic instructional strategies.
4. (Culture) Recognizes the similarities and differences between mainstream American and other cultures and the potential conflicts and opportunities they may create for students.
5. (Culture) Demonstrates knowledge of the effects of culture and socio-economic variables in learning styles.
6. (English Language Development) Demonstrates knowledge of the basic nature of language, language acquisition, language variation, language change, and the relation of language to society and culture.
7. (English Language Development) Demonstrates knowledge of the nature of bilingualism and the process of becoming bilingual.
8. (Instructional Methodology) Demonstrates knowledge of the historical, legal, theoretical, and sociological foundations of programs of instruction for second language learners.
9. (Instructional Methodology) Demonstrates knowledge of theories of first and second language acquisition. 1
10. (Instructional Methodology) Utilizes teaching methods appropriate to various age and language groups.

BLED 3110. Secondary Bilingual/ESL Field Experience
3 Credits (2+2P)
Develop professional skills, dispositions, and understanding of secondary bilingual youth, content, and pedagogy through discussion seminar and interactions with public education mentor teachers. Focused observations, study of classroom language and culture, introduction to lesson planning and student assessment. Requires 32 hours of practicum field experience. Taught with EDUC 3997. May be repeated up to 3 credits.
Learning Outcomes
1. Complete thirty-two hours of secondary classroom and professional development practicum with a satisfactory rating from middle/high school cooperating teacher.
2. Apply Costa's Level of Thinking, WICOR strategies, Cornell Notes, and other high-yield strategies of the AVID College Readiness System.
3. Interact with youth through a tutoring model.
4. Demonstrate ability to effectively utilize specific observation techniques in secondary classrooms following specific guidelines.
5. Describe classroom language and culture of middle/high school.
6. Develop an understanding of resources available at the secondary level.
7. Identify authentic assessment and instructional methods that can be used to deliver engaging lessons in specific content areas.
8. Participate in a weekly discussion seminar.
9. Assemble a culminating reflective portfolio that demonstrates the ability to self-assess strength and need areas based on NM Teach InTASC standards and experiences in the classroom/professional development.

BLED 3120. Sheltered English Instruction for the ESL Classroom
3 Credits (3)
Addresses the acquisition of English proficiency by speakers of other languages.
Learning Outcomes
1. Discuss sheltered instruction for teaching English learners (ELs).
2. Compare and contrast SIOP model lesson components and features.
3. Co-Design a grade-level and subject-specific SIOP lesson with a peer.
4. Correlate components of your prepared lesson plan to ensure alignment.
5. Co-Implement your SIOP lesson in class.
6. Evaluate two lessons (yours and another lesson developed by two other peers).

BLED 3130. Language, Literacy, and Culture in the ESL Classrooms
3 Credits (3)
Framework and strategies for developing the written abilities of second language learners.
Learning Outcomes
1. Build an online learning community.
2. Demonstrate an understanding of various perspective and theories on language, culture, and literacy.
3. Demonstrate an understanding of the impact that federal and state language/literacy policies have had on schools.
4. Evaluate the major arguments articulated and varying positions taken about language, literacy, and culture by scholars from different disciplines, such as Sociolinguistic, Linguistics, Sociology, Cultural studies.
5. Analyze social, political, and ideological aspects/components of these concepts, perspectives, and theories.
6. Explain the interaction between literacy, language, culture, and its implication for student learning.
7. Apply the theories of language, culture, and literacy they are learning in classroom practices.
8. Demonstrate critical thinking skill.

BLED 3140. Issues in Schooling for Bilingual Learners
3 Credits (3)
Current thought and direction regarding bilingual education in the United States and New Mexico. May be repeated up to 3 credits.
Learning Outcomes
1. To create a framework for understanding issues facing bilingual learners with scrutiny toward socialjustice.
2. To review and study the various theories that informs bilingual education.
3. To explore the classroom practice of these theories with bilingual learners.
4. To co-construct practical teaching strategies to use with bilingual learners.
5. To reflect on the socio/politico-cultural constructs and contexts of bilingual learners

BLED 4110. Second Language Acquisition
3 Credits (3)
Exploring affective, cultural, linguistic, cognitive factors that influence the second language acquisition process with application to classroom practice. Restricted to: TEP. EED, ECED,SED and SPED majors.
Learning Outcomes
1. Explore different language perspectives as they relate to first and second language acquisition.
2. Explore the role of language across different social contexts and academic contexts.
3. Explore the cognitive factors influencing language development in second language learning and acquisition.
4. Examine culturally linguistically diverse styles of second language learners and how these factors influence the second language acquisition process.
5. Explore, select and implement second language teaching methods.

BLED 4996. Special Topics
3 Credits (3)
Course subtitled in the Schedule of Classes. May be repeated up to 9 credits.
Learning Outcomes
1. Examine specific topics selected by the instructor in the field of bilingual education.

BLED 5110. Adult and Family Literacy in TESOL
3 Credits (3)
An exploration of the theoretical, programmatic, and curricular frameworks for English language learners and their families. Focus on the development of culturally responsive and pedagogically sound literacy programs. May be repeated up to 3 credits.
Learning Outcomes
1. Examine the assumptions underlying the common practices of family and adult education that predominate in schools and in public discourse.
2. Plan and conduct an adult and family literacy project by expanding the range of family literacies to include those practiced in non-mainstream cultural groups, as well as to include those literacies that are necessary in order to be able to participate fully in building a democratic society.
3. Develop research questions, collect data from the adult and family literacy sessions, and write a Family Literacy Research Project.
4. Develop an advocacy plan for policy makers and administrators based on your work with adults and families.

BLED 5120. The Bilingual Preschool Child
3 Credits (3)
Principles of multicultural education applied to preschool and primary levels. Focus on issues, methods, and materials. May be repeated up to 3 credits.
Learning Outcomes
1. Compare and contrast bilingual -bicultural early childhood curriculum models.
2. Address early literacy and language development in children's first and second languages.
3. Demonstrate strategies for cross-cultural competence when working with families and communities.
4. Respond to the linguistic and cultural backgrounds of children.
5. Use the cultural arts in curriculum planning and language development.
6. Apply theory and research in bilingual studies.

BLED 5130. Issues in Schooling for Bilingual Learners
3 Credits (3)

Identification and consideration of current thought and directions in bilingual education, nationally and internationally. May be repeated up to 3 credits.

Learning Outcomes

1. To create a framework for understanding issues facing bilingual learners with scrutiny toward social justice.
2. To review and study the various theories that informs bilingual education
3. To explore the classroom practice of these theories with bilingual learners
4. To co-construct practical teaching strategies to use with bilingual learners
5. To reflect on the socio/politico-cultural constructs and contexts of bilingual learners

BLED 5210. Literacy-Language Instruction for Bilingual Students
3 Credits (3)

Framework and strategies for developing the written language abilities of bilingual learners, with attention to the interrelationships among reading, writing, and oral language. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate knowledge about diverse theories on literacy, language, and culture and fully grasp the intersection between language, culture, and literacy and its implication for student learning.
2. Articulate an understanding of children's literacy and biliteracy development by examining the relationship between oral and written language.
3. Apply pedagogical knowledge about teaching and learning of reading/writing across different social contexts.
4. Develop an understanding of theoretical frameworks governing proficient reading and writing of all children, particularly bilingual learners.
5. Refine understanding of how children "come to know" literacy, bi-literacy, and critical literacy.
6. Implement best practices that organize, facilitate, mediate, and develop children's language, literacy, and content knowledge across the curriculum.
7. Demonstrate an understanding of how to organize teaching/learning for success in literacy and biliteracy across curricular content.

BLED 5220. Sheltered English Instruction for the ESL Classroom
3 Credits (3)

Addresses the acquisition of English proficiency vie the SIOP (Sheltered Instruction Observational Protocol)a research validated model for lesson planning and implementation that provides English learners with access to grade-level standards.

Learning Outcomes

1. Discuss sheltered instruction for teaching English learners (ELs).
2. Compare and contrast SIOP model lesson components and features.
3. Co-Design a grade-level and subject-specific SIOP lesson with a peer.
4. Correlate components of your prepared lesson plan to ensure alignment.
5. Co-Implement your SIOP lesson in class.
6. Evaluate two lessons (yours and another lesson developed by two other peers).

BLED 5230. Language, Literacy and Culture in the ESL Classrooms
3 Credits (3)

Framework and strategies for developing the written abilities of second language learners. Explore different theories of language, culture and literacy by analyzing the interconnections between language, culture and literacy.

BLED 5310. Bilingual/Multicultural Schooling and Community Relations
3 Credits (3)

Rationale, information pertinent to the school and the community in a setting involving economic, cultural, and linguistics diversity. May be repeated up to 3 credits.

Learning Outcomes

1. This course is designed as a space to enhance educators' understanding of bilingual/multicultural schooling and community relations in the borderland region as it relates to the rest of the US, with a view to rethinking their own role in order to become agents of change.
2. The main objective of this course is the development of a framework to understand, critique and contribute to the strengthening and critical transformation of school and community relations in the borderlands

BLED 5320. Second Language Acquisition
3 Credits (3)

Exploring affective, cultural, linguistic, cognitive factors that influence the second-language-acquisition process with application to classroom practice. May be repeated up to 3 credits.

Learning Outcomes

1. Explore different language perspectives as they relate to first second language acquisition
2. Explore the role of language across different social contexts and academic contexts
3. Explore the cognitive factors influencing language development in second language learning and acquisition
4. Examine culturally linguistically diverse styles of second language learners and how these factors influence the second language acquisition process
5. Explore, select and implement second language teaching methods.

BLED 5330. Assessment in Culturally & Linguistically Responsive Teaching
1-3 Credits (1-3)

An overview of approaches to assessment with a special focus on cultural and linguistic responsiveness needed for teaching learners of English as an additional language.

Learning Outcomes

1. Explore different approaches to assessment in cultural and linguistically diverse (CLD) settings
2. Explore authentic assessment by content areas for assessing CLD students
3. Explore assessment of English language development in CLD students
4. Examine culturally linguistically diverse styles of CLD students
5. Select Culturally and Linguistically responsive assessments for assessing content and language in CLD students

BLED 5410. Sociolinguistics in Education
3 Credits (3)

Course provides an overview of sociolinguistics, with emphasis on the study of the relationship between language and society. Explores both foundational and current issues as they relate to educational practice.

Learning Outcomes

1. The nature of reading and writing as socio-psycholinguistic processes including: Language, culture and politics and their

relationships; The structure, forms and purposes of written language; What makes a text a text; Readers and writers as users of language. What that means; Written language in education and curriculum; Oral and written language development and their relationships; Alphabetic and non-alphabetic writing systems; Defining oneself as a literate person

BLED 5420. Pedagogy of TESOL
3 Credits (3)
Overview of approaches that provide for interactive, culturally responsive pedagogy for students acquiring English. Emphasis on content and language integration through sheltered instruction. May be repeated up to 3 credits.
Learning Outcomes
1. Understand and explore the foundations of TESOL instruction.
2. Analyze the sociocultural theory of teaching English as a second/ foreign language.
3. Demonstrate an understanding of culturally responsive pedagogy in language teaching and academic achievement.
4. Evaluate principles of best practices instruction and applications of TESOL methods.
5. Explore assessment issues and concepts related to English Language Learners.
6. Examine the impact of polices, national laws, school and community partnerships, and personal professional development on TESOL instruction.
7. Develop, select, and implement second language teaching methods.

BLED 5990. TESOL Practicum
3 Credits (3)
Classroom applications of ESL literacy development through supervised teaching experiences accompanied by a seminar. May be repeated up to 3 credits.
Learning Outcomes
1. Apply philosophies of education related to curriculum issues in content and language ESL classroom settings
2. Apply knowledge of second language acquisition theory and methods in teaching ESL
3. Collaborate with peers in the design of age appropriate culturally and linguistically responsive lessons for English language learners
4. Reflect on teaching experiences making connections to theories, methods, assigned readings, and prior knowledge and experience
5. Authenticate a culturally and linguistically responsive pedagogy in practice

BLED 5992. Directed Study in Bilingual Education
1-6 Credits (1-6)
Independent research topics in bilingual education based on particular individual interest or needs. May be repeated up to 88 credits.
Learning Outcomes
1. Analyze selected topics of interest in bilingual education selected by the student.

BLED 5996. Selected Topics in Bilingual Education
1-6 Credits (1-6)
Various topics on current requests and needs in bilingual education. May be repeated up to 6 credits.
Learning Outcomes
1. Examine specific topics selected by the instructor in the field of bilingual education.

BLED 5998. Internship in Bilingual Education
1-6 Credits (1-6)
Advanced experience in educational bilingual settings for prospective bilingual education teachers. May be repeated up to 6 credits.
Learning Outcomes
1. The Internship has traditionally meant that you will be involved in practicing what you have learned in a series of studies you have taken or are taking. In this course, we will cover topics and themes related to bilingual education

BLED 6110. Acquiring Emancipatory Discourses: TESOL/BIL
3 Credits (3)
An elaboration of understandings of bi- and multilingualism and related models of education based on current research and practice. May be repeated up to 3 credits.
Learning Outcomes
1. This course is designed for participants to -deepen their critical understanding of the relationship between language and power and its relevance to educational studies -analyze critical discourses from different contexts, institutional settings, and social agents: major discourse theorists, educational researchers, teachers, and students -become familiar with Critical Discourse Analysis as a framework and a methodology to study the role of discourse in the construction of the social world and its relevance to teachers, students, and researchers in education

BLED 6120. Multiple Critical Literacies
3 Credits (3)
An exploration of the multiple literacies that operate on the individual, classroom, community, cultural and societal levels. Taught with READ 6120. May be repeated up to 3 credits.
Learning Outcomes
1. This doctoral level course explores in depth various theories about literacy.
2. Placed in the bilingual and multicultural context, this course critically reviews and brings to the forefront key linguistic, educational, socio-economic, political, cultural, and racial issues related to literacy.
3. It goes on to unveil and carefully analyze various ideological forces informing multiple forms of literacy and the effects of these forces on student learning, teachers' teaching practices, and people's lives in general.

BLED 6130. Literacy / Biliteracy Assessment and Evaluation
3 Credits (3)
Developing students ability to understand and critique both traditional and alternative forms of assessment.
Learning Outcomes
1. Literacy assessment and evaluation
2. Documenting student language and literacy development
3. Interpreting and analyzing your documentation/data
4. Generating and implementing appropriate, engaging and effective literacy instructions in order to meet children's interests and needs
5. Linguistics, psycholinguistics, sociolinguistics and their relationships
6. Readers and writers as users of language.
7. Relationships between reading, writing and text
8. Reading strategies and instructional implications
9. Kidwatching: documenting and analyzing literacy processes and events 1

10. Miscue Analysis: Understanding and analyzing children's oral reading 1
11. Defining oneself as a literate person

BLED 6210. Curriculum and Instructional Leadership
3 Credits (3)
The purpose of this course is to examine the concepts of leadership and curriculum. This examination will focus on the dynamic relationships of these concepts in our society and their differentiated effects on diverse community groups. Our examination will lead us on a development and contributions. Taught with: EDUC 6210.
Learning Outcomes
1. To become well versed in those issues surrounding leadership and curriculum and their impact on various groups in society.
2. To develop an understanding of how the interactions of leadership, curriculum, and multiculturalism impacts distribution of knowledge in our society.
3. To develop an appreciation for the diverse representations of the concepts curriculum and leadership.
4. To evolve an understanding of the interconnectedness of leadership, curriculum, multiculturalism, and people.
5. For you to determine: A good leader-

BLED 6220. Praxis and Reflexivity
3 Credits (3)
The cyclical research processes of continuous self and systemic (re)evaluation vis-a-vis classroom, community, and society with an eye toward reflection, growth, change, and larger forms of social agency. May be repeated up to 3 credits.
Learning Outcomes
1. Thematic and theoretical explorations aimed at setting the path for your dissertation research
2. Theorization and the actualization of your own educational praxis and reflexivity as educators within this 'new world order', Therefore we will read, discuss and enact some theoretical and practical ideas by well-known and not so well-known thinkers and researchers who have been working on these issues for several years.

BLED 6310. Critical Theory and Pedagogy
3 Credits (3)
The course will explore critical theory and pedagogy and its applications to everyday life, teaching and learning. Taught with: EDUC 6310.
Learning Outcomes
1. Review, study and write about the history of critical theory and pedagogy.
2. Become familiar with current research regarding critical theory and pedagogy and to gain knowledge and understanding of its application to teaching and learning.
3. Create the opportunity to interact with peers and instructor regarding course topics.
4. Begin to understand the why and not only the how and what of critical theory and its pedagogies.

BLED 6320. Social Justice Issues in Education
3 Credits (3)
Students are introduced to social justice issues as they relate to education. In particular, we will seek to understand the interconnectedness and relationship between the social construction of inequity within education and the ways in which teachers, students, researchers and administrators grapple with such inequities. There will be an examination of historical and social injustices, social movements that seek to overcome these injustices, and contemporary work done by activists around the globe to cause transformation with such issues. Crosslisted with: EDUC 637.
Learning Outcomes
1. Define and describe key social justice concepts and principles in education,
2. Compose documents and reports while correctly utilizing American Psychological Association (APA) format,
3. Develop online resources for use in their work,
4. Critique and reflect upon diverse theoretical frameworks,
5. Utilize conceptual frameworks to analyze divergent theories in education, and
6. Apply information provided in this course to real-life situations.

BLED 6992. Directed Study in Bilingual Education
1-6 Credits (1-6)
Independent research topics in bilingual education based on particular individual interest or needs. May be repeated up to 6 credits.
Learning Outcomes
1. Analyze selected topics of interest in bilingual education selected by the student.

BLED 6998. Internship in Bilingual Education
3 Credits (3)
In this course you will apply your knowledge developed in prior coursework about the research, history, theories, policies, pedagogies, and practices in bilingual education. You will apply this knowledge in a bilingual internship setting where you will conduct your own research.
Learning Outcomes
1. The Internship has traditionally meant that you will be involved in practicing what you have learned in a series of studies you have taken or are taking.
2. In this course, we will cover research topics and themes related to bilingual education.

BMGT-BUSINESS MANAGEMENT

BMGT 112. Banks and Your Money
3 Credits (3)
Banking in today's economy: language and documents of banking, check processing, teller functions, deposit function, trust services, bank bookkeeping, loans, and investments.
Learning Outcomes
1. Define and explain the importance of full-service commercial banking.
2. Explain the impacts of the banking industry on the economy, the community, and individuals.
3. Describe the major functions of commercial banks and their interrelationships.
4. List and describe the major products and services provided by commercial banks.
5. Contrast the differences and similarities between time and demand deposits.
6. Describe the process and rationale behind issuing credit and loans.
7. Discuss the importance, necessity and process of bank investments.
8. Explain the concept of liquidity and its importance to the banking industry.
9. Identify and describe the duties of the various bank regulating agencies and the major regulations they enforce. 1

10. Describe the history and growth of the banking industry in the United States. 1
11. Explain the functions and importance of the Federal Reserve System.

BMGT 126. Retail Management
3 Credits (3)
Phases of retailing, including types of retail outlets and basic problems of organizing and operating a retail store. Restricted to: Community Colleges only.
Learning Outcomes
1. Define retailing in its various perspectives and note its special characteristics.
2. Explain the steps in strategic planning for retailers.
3. Describe consumer demographics, lifestyle factors, needs and desires.
4. Examine consumer attitudes toward shopping and consumer shopping behavior, including the consumer decision process and its stages.
5. Explore the methods used by manufacturers, wholesalers, and retailers to exert influence in the distribution channel.
6. Describe the wheel of retailing, scrambled merchandising and the retail life cycle and retail strategy mixes.
7. Examine consumer attitudes toward shopping and consumer shopping behavior, including the consumer decision process and its stages.
8. Create a merchandise plan, which uses forecasting, assortments, brands, timing and allocation.

BMGT 132. Principles of Selling
3 Credits (3)
Analysis of customer behavior, persuasive communication, process of the sales interview. Restricted to: Community Colleges only. May be repeated up to 3 credits.
Learning Outcomes
1. Define selling, consider it from various perspectives; demonstrate its impact, and its special characteristics.
2. Explain the steps within the selling process.
3. Demonstrate how the steps in the selling process interact within one another in a logical, seamless flow.
4. Examine ethics in personal selling.
5. Demonstrate the creativity and innovation that any successful salesperson uses to overcome challenges by employing new ideas to sell their products.
6. Students will identify and understand their core personality style to enhance their communication skills.
7. Incorporate sales communication and techniques into a job interview.

BMGT 136. Forecasting Business Activity
3 Credits (3)
Course covers the important elements of forecasting all types of business activities including inventory control, revenue forecasts, staffing, and other industry specific activities using metrics and data analysis processes. Restricted to Community Colleges campuses only.
Prerequisite: BUSA 1110.
Learning Outcomes
1. Define integrity and understand its importance to small business and explain how it applies to various stakeholders.
2. Distinguish among the different types and sources of startup ideas.
3. Understand the pros and cons of franchising.
4. Describe the purpose and content of an income statement and balance sheet.
5. Designate the purpose of financial forecasting.
6. Diagnose a pro forma income statement to forecast a new ventures profitability.
7. Realize the concepts of forecasting a firm's cash flows.
8. Identify various scenarios for effective financial forecasting.
9. Evaluate the choice between debt and equity financing. 1
10. Comprehend how technology can be used to improve customer relationships. 1
11. Explain how the internet and social media are changing promotional and communication practices. 1
12. Discuss the key financial issues in managing a firm's inventory.

BMGT 138. Advertising
3 Credits (3)
Psychological approach to non-personal consumer persuasion; applied techniques in media selection, layout mechanics, production methods, and campaign structures. Restricted to: Community Colleges only. May be repeated up to 3 credits.
Learning Outcomes
1. Define advertising and the relevant application of psychology in delivering the message.
2. Explain the importance of various advertising media in the marketing mix.
3. Identify and explain the social, ethical and legal issues advertisers must consider.
4. Describe the significance of the marketing function in business.
5. Explain the importance of advertising and other marketing communication tools.
6. Demonstrate application of the planning process as it applies to marketing and advertising.
7. Describe the factors that are weighed when considering the use of radio and television in the creative advertising mix.
8. Describe the relationship between market segment, consumer behavior and selection of advertising campaign types.
9. List the alternative means of reaching a target market and the technical challenges of each.

BMGT 140. Principles of Supervision I
3 Credits (3)
Principles of supervision emphasizing planning, organization, rating of employees and procedures to develop good morale. Introduction to interpretation of case studies. Restricted to: Community Colleges only.
Learning Outcomes
1. Identify the elements that are necessary to be a successful supervisor in today's workforce.
2. Discuss how globalization affects supervisors in today's diverse labor force.
3. Explain the concepts of the learning organization and Continuous Quality Improvement and how their concepts influence organizational design and the management of employees.
4. Examine employee benefits and the applicable federal laws which affect the individual and the organization, and discuss their impact on both.
5. Identify and explain the decision-making process for a supervisory position.

6. Describe the value and impact of employee motivation for both the organization and the supervisor.
7. Recognize and define effective leadership styles and skills.
8. Review the importance of communication in the workplace, give examples of communication techniques and describe techniques for overcoming communication barriers.
9. Define and analyze essential supervisory skills including: team cohesiveness, human relations, decision making skills, planning and goal setting. 1
10. Summarize the importance of high ethical standards within the organization and for the employee.

BMGT 150. Income Taxation
3 Credits (3)
Federal income taxation of individuals, sole proprietorships, partnerships, corporations, trusts, and estates with particular reference to CLU, life insurance and annuities. Restricted to: Community Colleges only.

BMGT 155. Special Topics I
1-3 Credits (1-3)
Introductory special topics of lower division level work that provides a variety of timely subjects and content material. May be repeated up to 9 credits. Restricted to Community Colleges campuses only.

BMGT 160. Self-Presentation and Etiquette
3 Credits (3)
Introduction to business etiquette based on tradition, social expectations, and professional behavior standards. Restricted to: Community Colleges only.

BMGT 201. Work Readiness and Preparation
3 Credits (3)
Instruction in methods of selection, seeking, acquiring and retaining employment. Addresses work success skills, business etiquette, employer expectation and workplace norms. Restricted to Community Colleges campuses only.
Learning Outcomes
1. Catalog personal and professional information that will aid in career planning and job search processes.
2. Develop methods of establishing short- and long-term career goals.
3. Recognize the strengths of various kinds of resumes and how they are used based on one's career status and type of job being sought.
4. Explain the importance of good communication and work etiquette in job success.
5. Demonstrate how to create a professional image to increase job search success.
6. Explore career management opportunities and practices.
7. Demonstrate successful interview techniques.
8. Compare and contrast employee and employer expectations.
9. Discuss ethical and appropriate work practices. 1
10. Prepare a job specific resume, cover letter, and follow up/thank you letter which are professional and appropriate.

BMGT 205. Customer Service in Business
3 Credits (3)
Establishes concepts of service quality in relationship to business success and maximization of returns to the organization. Explores techniques for delivering quality and service in a variety of business settings. Restricted to: Community Colleges only.
Learning Outcomes
1. Identify customer service and aspects of exceptional customer service.
2. Describe the elements of communication in customer service.
3. Explain professionalism in customer service.
4. Evaluate methods of resolving complaints from customers.
5. Describe the differences and influences of customers with disabilities, generational groups, and culturally diverse backgrounds.
6. Describe the purpose and use of voice and virtual technologies.
7. Explain the role of customer service management in providing quality service.

BMGT 208. Business Ethics
3 Credits (3)
The course examines the underlying dimensions of ethics in business, investigating ethics in relationship to the organization, the stakeholders, and society. Exploration of ethical issues from a historical context, analyzing actual events through the lens of business decision making, including legal/political, sociocultural, economic, and environmental considerations will be undertaken. Restricted to Community Colleges campuses only.
Learning Outcomes
1. Identify and reflect on the foundation of personal morals.
2. Compare and contrast the various ethical philosophies that impact personal and business decisions.
3. Describe the concepts of justice and economic distribution and apply to a real-world scenario.
4. Explain capitalism and how ethics relate to that economic system.
5. Illustrate ethical responsibilities through the lens of the corporation and apply to a real-world scenario.
6. Define and appraise the impact of ethical decisions on the consumer.
7. Explain environmental ethics through a business perspective and apply to a real-world scenario.
8. Analyze ethical and moral issues and decisions facing employers and employees through real world scenarios.

BMGT 216. Business Math
3 Credits (3)
Application of basic mathematical procedures to business situations, including percentage formula applications, markup, statement analysis, simple and compound interest, and annuities. Restricted to: Community Colleges only.
Prerequisite(s): CCDM 103 N or satisfactory math score on ACT.

BMGT 221. Internship I
1,3 Credits (1,3)
Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships may be paid or unpaid. Students are supervised/evaluated by both the employer and instructor. May be repeated up to 3 credits.
Learning Outcomes
1. Define and explain the purpose, expectations, and professional standards associated with the internship experience.
2. Demonstrate the ability to apply theoretical knowledge and practical skills acquired in the classroom to real-world situations within the internship setting.
3. Assess personal strengths, weaknesses, and areas for improvement based on feedback received from internship supervisors, self-reflection, and peer evaluations.

4. Collaborate effectively with colleagues, supervisors, and clients in the internship setting, demonstrating strong communication, teamwork, and problem-solving skills.
5. Evaluate the overall internship experience and its impact on personal and professional development, and identify areas for future growth and learning in the chosen field of study.

BMGT 232. Personal Finance
3 Credits (3)
Budgeting, saving, credit, installment buying, insurance, buying vs. renting a home, income tax statement preparation, investment, and estate disposal through will and trust. Restricted to: Community Colleges only.
Learning Outcomes
1. Explain the time value of money.
2. Explain the importance and relevance of financial planning.
3. Demonstrate development of a financial plan.
4. Explain the concepts of cash flow and use of capital.
5. Describe credit and the use of credit to attain wealth.
6. Demonstrate a variety of investment techniques and vehicles.
7. Explain the importance of estate planning.
8. List the functions and uses of insurance.

BMGT 236. Small Business Start-Up
3 Credits (3)
Starting a small business is a complex endeavor that requires specialized knowledge. This course prepares students to take the first step in business ownership and operations. Restricted to Community Colleges campuses
Learning Outcomes
1. Identify the unique challenges of starting a small business.
2. Identify opportunities to start up a business and conduct a needs analysis.
3. Develop value proposition/market fit for proposed products and services.
4. Develop an appropriate business model.
5. Identify the availability of necessary resources.

BMGT 237. Managing Small Businesses
3 Credits (3)
Managing a small business requires the owner/operator to be proficient in a number of skills and technical areas. This course provides small business owners/operators with the training and essential knowledge to manage a small business. Restricted to Community Colleges campuses.
Learning Outcomes
1. Identify the strengths and weaknesses of small businesses.
2. Define entrepreneurship and identifying its traits.
3. Demonstrate a capability to explore and research business opportunities.
4. Explain how to plan to start a new business, identifying legal structures, financing options, and organizing a management team.
5. Identify and analyze financial statements.
6. Review the importance of management information systems.
7. Identify their own managerial leadership style.
8. Review purchasing and inventories, taxation and insurance.
9. Describe the process of writing a business plan.

BMGT 250. Diversity in the Workplace
3 Credits (3)
Concepts of culture, diversity, prejudice, and discrimination within the domestic workforce/society. Restricted to Community Colleges campuses only.
Prerequisite: BUSA 1110.
Learning Outcomes
1. Students will identify and evaluate tools useful for exploring their own identity.
2. Students will analyze and evaluate the connections they have with individuals from different backgrounds.
3. Students will analyze and evaluate concepts of culture, prejudice, and discrimination.
4. Students will demonstrate the ability to analyze, evaluate, and apply inclusive strategies to work effectively within a diverse workforce.

BMGT 272. E-Commerce Operations
3 Credits (3)
Includes the many forms of e-commerce and emerging technologies that will impact the business of tomorrow. Restricted to Community Colleges campuses only.
Prerequisite(s): OECS 105 or BCIS 1110.

BMGT 280. Introduction to Human Resources
3 Credits (3)
Personnel functions encompassing job analysis, recruitment, selection, training, appraisals, discipline, and terminations. Prerequisite(S): BUSA 1110 or B A 104. Restricted to Community Colleges campuses only.

BMGT 282. Introduction to International Business Management
3 Credits (3)
Overview of the social, economic and cultural environment of international business transactions. Restricted to Community Colleges only.
Prerequisite(s): BUSA 1110.

BMGT 286. Introduction to Logistics
3 Credits (3)
Overview on the planning, organizing, and controlling of transportation, inventory maintenance, order processing, purchasing, warehousing, materials, handling, packaging, customer service standards, and product scheduling. Restricted to: Community Colleges only.

BMGT 287. Introduction to Export/Import
3 Credits (3)
Procedures and documentation for exporting and importing products. Emphasis on NAFTA regulations and other U.S. border operations crossings. Restricted to Community Colleges only.
Prerequisite(s): BUSA 1110.

BMGT 290. Applied Business Capstone
3 Credits (3)
Refines skills and validates courses taken in BMGT program. Business simulations, case studies and projects used to test and improve business practices. Student must be within 25 credits of graduation. Restricted to: BMGT majors. Restricted to Community Colleges campuses only.
Prerequisite: BUSA 1110, and (BMGT 140 or MGMT 2110), and (BUSA 2230G or SOCI 1110G or PSYC 1110G).
Learning Outcomes
1. Plan, design, and create a real world project related to their field of study.
2. Participate in job shadowing in positions related to their field of study.
3. Create a portfolio in preparation for career applications.
4. Collaborate as a member of a team in their field of study.

5. Identify and use ethical decision-making in working on individual projects, job shadowing, and a team.

BMGT 298. Independent Study
3 Credits (3)
Individual studies directed by consenting faculty with prior approval of department chair. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): Sophomore standing with 3.0 GPA.

BUSA-BUSINESS ADMINISTRATION

BUSA 1110. Intro to Business
3 Credits (3)
Fundamental concepts and terminology of business including areas such as management, marketing, accounting, economics, personnel, and finance; and the global environment in which they operate.
Learning Outcomes
1. Explain how business and entrepreneurship affect the quality of life and the world around us.
2. Explain the characteristics of the different forms of business ownership.
3. Perform basic stakeholder analysis concerning accountability, ethics and social responsibility of business.
4. Demonstrate knowledge of the various dimensions of the business environment including political and legal, socio-cultural, environmental, diversity, economic, technological, and global.
5. Describe the purpose and functions of finance, operations, marketing, management, accounting, and information systems.
6. Demonstrate basic skills such as use of common business terminology, information search skills, presentation and writing skills, and team skills.
7. Describe the purpose and content of a business plan.

BUSA 1115. Business English I
3 Credits (3)
This course focuses on the skill development with an emphasis on correct grammar, punctuation, sentence structure, vocabulary, preparation of business letters and reports, and on presenting information in a logical, forceful and acceptable form.
Learning Outcomes
1. Identify basic parts of speech.
2. Use nouns, pronouns, verbs, prepositions, and conjunctions correctly.
3. Use subject/verb agreement principles correctly.
4. Demonstrate proper use of phrases and clauses and compose simple, compound, complex, and compound/complex sentence structures.
5. Demonstrate proper use of commas, semicolons and colons correctly in sentences and paragraphs.
6. Demonstrate proper grammatical usage for effective spoken and written English, in the business environment.
7. Develop coherent sentences and paragraphs using transitions, pronouns, and repetition of key words.
8. Utilize English skills in proofreading, editing, and writing business documents and various forms of communication such as emails, text messages, letters, reports, etc.

BUSA 1180. Business Mathematics
3 Credits (2+2P)
Applies basic mathematical operations to business and accounting applications.
Prerequisite: CCDM 103 N or adequate score on math placement exam.
Learning Outcomes
1. Select and interpret relevant information in narrative problems to solve a given business situation.
2. Choose appropriate formulas to solve quantitative business-related problems.
3. Use formulas accurately to solve quantitative business-related problems.

BUSA 1210. Records Management
3 Credits (3)
Principles, methods and procedures for the selection, operation and control of manual and automated records systems.
Learning Outcomes
1. Recognize Records Control and Management systems.
2. Utilize vocabulary pertaining to records management.
3. Recognize the importance of using organized, efficient records management systems.
4. Recognize various kinds of filing equipment and supplies (paper and electronic).
5. Apply ARMA (Association for Records Managers and Administrators) rules in alphabetic card and correspondence filing exercises.
6. Apply procedures for maintaining and controlling records including: requisitioning, charging-out, returning, and reserving files.
7. Discuss records retention cycle including: control procedures for transferring, storing, and destruction of files.
8. Recognize the use of color as a method for improving efficiency in filing systems.

BUSA 2175. Personal Development
3 Credits (3)
Development of a marketable, employable office systems person, to include interview, voice, manners, and apparel.
Learning Outcomes
1. Plan, compose and create a resume, list of references, letter of application and other job search documents.
2. Research job leads.
3. Prepare for job interviews.
4. Perform self-assessment and self-examination in order to improve soft skills.
5. Develop soft skills to improve employability and job success.

BUSA 2230G. Human Relations in Business
3 Credits (3)
This course is an examination and application of personal and interpersonal competencies and skills needed in a business setting to understand oneself, one's co-workers, employers, and customers.Students will investigate and examine attitudes, behavior, ethical behavior and cultural influences that affect the business environment. It offers structured situations in which interpersonal relationships and communication skills are explored May be repeated up to 3 credits.
Learning Outcomes
1. Identify and describe the relevance and development of human relations theories as they apply to management, interpersonal interactions, leadership, conflict resolution, and other behaviors in the workplace.
2. Critically examine how individual beliefs, values, attitudes, and perceptions of the world are formed and discuss how they affect self-

esteem and human interactions in the workplace individually and in formal and informal groups.
3. Recognize differing communication styles and apply effective communication skills to various workplace situations.
4. Examine the interrelationships between self, culture, ethnicity, gender, and personal environment and analyze their effects on the development of individual work behaviors.
5. Articulate the factors that influence the development of communication, self-esteem, motivation, trust, leadership, and conflict resolution skills.
6. Apply knowledge of human behavior and its origins to the analysis of workplace case studies and the development of solutions to workplace dilemmas.
7. Apply ethical decision-making in business situations.

C E-CIVIL ENGINEERING

C E 109. Computer Drafting Fundamentals
3 Credits (2+2P)
Introduction to principles and fundamentals of drafting using both manual drawing techniques and computer-aided drafting (CAD) applications. Crosslisted with: DRFT 109 and E T 109. May be repeated up to 3 credits.
Learning Outcomes
1. Describe related career options/pathways.
2. Explain and apply common drafting terms, concepts, and conventions.
3. Utilize various AutoCAD commands and Coordinate Entry methods to produce accurate and precise Two-Dimensional drawings.
4. Setup AutoCAD working environment, drawings, styles, and applicable settings.
5. Navigate the AutoCAD user interface efficiently.
6. Apply different drafting methods, strategies, and processes.
7. Utilize AutoCAD to produce basic 2D CAD working drawings.
8. Measure utilizing scales accurately.
9. Create drawings with different scales and units. 1
10. Plot drawings produced in AutoCAD at various scales and on various sheet sizes. 1
11. Utilize the two Drawing Environments: Paper Space and Model Space. 1
12. Manage AutoCAD drawing files.

C E 151. Introduction to Civil Engineering
3 Credits (3)
Problem solving and use of computer software for civil engineering applications. May be repeated up to 3 credits.
Prerequisite/Corequisite: MATH 1220G.
Learning Outcomes
1. Understand the Civil Engineering profession and curriculum.
2. Develop software skills for use in Civil Engineering education and professional practice.
3. Understand and apply the basics of professional and academic ethics.

C E 198. Special Topics
1-3 Credits
Special topics in civil engineering. May be repeated up to 6 credits.
Prerequisite: consent of department head.
Learning Outcomes
1. Students will develop knowledge related to the specific civil engineering special topic selected for study.

C E 233. Mechanics-Statics
3 Credits (3)
Engineering mechanics using vector methods. May be repeated up to 3 credits.
Prerequisite: C- or better grade in MATH 1521G or MATH 1521H, C- or better grade in PHYS 1310G and cumulative GPA of 2.0.
Learning Outcomes
1. Student will be able to apply concepts of equilibrium.

C E 234. Mechanics-Dynamics
3 Credits (3)
Kinematics and dynamic behavior of solid bodies utilizing vector methods. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better grade in the following: C E 233 and PHYS 1310G and MATH 1521G or MATH 1521H.
Learning Outcomes
1. Student will be able to apply concepts of kinematics and accelerated motion.

C E 256. Environmental Engineering and Science
3 Credits (3)
Principles in environmental engineering and science: physical chemical systems and biological processes as applied to pollution control. Crosslisted with: ENVS 2111.
Prerequisite: (C- or better grade in CHEM 1215G) and (C- or better grade in MATH 1511G or ENGR 190).

C E 256 L. Environmental Science Laboratory
1 Credit (1P)
Laboratory experiments associated with the material presented in C E 256. May be repeated up to 1 credit. Same as ENVS 2111L.
Corequisite: C E 256.
Learning Outcomes
1. An understanding of experimental analyses related to environmental science

C E 298. Special Topics
1-3 Credits
Special topics in civil engineering. May be repeated up to 6 credits.
Prerequisite: consent of department head.
Learning Outcomes
1. Students will develop knowledge related to the specific civil engineering special topic selected for study.

C E 301. Mechanics of Materials
3 Credits (3)
Stress, strain, and elasticity of materials. May be repeated up to 3 credits.
Prerequisite: C- or better grade in ENGR 233.
Learning Outcomes
1. Calculate deformations, stresses, and strains of various types of members under loading.
2. Calculate principal stresses and strains.
3. Perform two-dimensional stress and strain transformation.
4. Analyze statically indeterminate structures using the method of consistent deformations.
5. Construct shear and moment diagrams for beam type structures.

6. Calculate beam deflections and rotations using various methods.
7. Determine buckling loads for elastic columns.

C E 311. Civil Engineering Materials
3 Credits (2+3P)
Introduction to the structure, physical properties, testing and mechanical behavior of civil engineering materials and components made from these materials. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 301.
Learning Outcomes
1. Students will understand the structure, properties, and roles of steel, aggregates, concrete, masonry, wood, and asphalt in civil engineering.

C E 315. Structural Analysis
4 Credits (3+3P)
Classical analysis of determinate and indeterminate structures; introduction to modern methods of structural analysis using computer programs. May be repeated up to 4 credits.
Prerequisite: C- or better grade in C E 301.
Learning Outcomes
1. Students will be able to compute internal resultants and deflections for trusses, beams, and frames.
2. Students will be able to analyze statically determinate and statically indeterminate structures.

C E 331. Fluid Mechanics and Hydraulics
3 Credits (3)
Fluid Mechanics and Hydraulics. Fundamentals and theory of fluid mechanics, compressible fluids, flow of incompressible fluids in open and closed conduits.
Prerequisite: C- or better grade in PHYS 1310G, C- or better grade in ENGR 233 or C E 233.
Learning Outcomes
1. Students learn how to read and interpret problem statements related to fluid mechanics and hydraulics, how to work in teams as well as apply critical thinking skills to solve problems.
2. Students develop an understanding of the theories and principles of hydraulics to understand hydraulic engineering components and subsystems.

C E 331 L. Fluid Mechanics and Hydraulics Laboratory
1 Credit (1P)
Fundamentals and Theory of Fluid Mechanic, compressible and incompressible flow of fluids in open and closed conduits.
Prerequisite/Corequisite: C E 331. Restricted to: C E majors.
Learning Outcomes
1. An understanding of fluid statics and dynamics as demonstrated by a series of hydraulic experiments.

C E 355V. Technology and the Global Environment
3 Credits (3)
A scientific basis for understanding changes in the global environment that result through the complex interactions of natural phenomena and the impacts of the activities of man. May be repeated up to 3 credits.
Prerequisite: junior or senior standing, and the general education requirements for math and natural sciences.
Learning Outcomes
1. An understanding of the natural and man-made factors that influence changes in the global environment.

C E 356. Fundamentals of Environmental Engineering
3 Credits (3)
Introduction to water treatment and water pollution and the analysis and design of selected treatment processes. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 256.
Learning Outcomes
1. Students will understand water treatment processes.
2. Students will understand wastewater treatment processes.

C E 357. Soil Mechanics
3 Credits (2+3P)
Engineering properties of soils, consolidation settlement, compaction, water flow through soils, geostatic stresses, soil shear strength, lateral earth pressure, and soil laboratory testing.
Prerequisite: GEOL 1110G and C E 301.
Learning Outcomes
1. The course covers the basic principles governing the mechanical behavior of soils.
2. Students will develop an understanding of soil mechanics, flow through porous media, and mass-volume relationships, as well as the laboratory methods for measuring the mechanical and index properties of soils.
3. Students will be able to interpret and use the laboratory test results for soil classification and for solving simple geotechnical engineering problems.

C E 382. Hydraulic and Hydrologic Engineering
3 Credits (3)
Analysis and design of hydraulic systems, including pipe networks, open channels, regulating structures, and pumping systems. Surface water and groundwater hydrology, analysis and design. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 331, C E 331 L.
Learning Outcomes
1. Student will be able to analyze hydraulic systems such as pipes, pumps, and open channels.

C E 398. Special Topics
1-3 Credits
Special topics in civil engineering. May be repeated up to 6 credits.
Prerequisite: consent of department head.
Learning Outcomes
1. Students will develop knowledge related to the specific civil engineering special topic selected for study.

C E 435. Technical Communication for Engineers
3 Credits (3)
The course addresses the fundamentals of communicating technical information that is clear, concise, and concrete to a wide variety of stakeholder types.
Learning Outcomes
1. Ability to write in a way that is clear.
2. Ability to write in a way that is concise.
3. Ability to write in a way that is concrete.

C E 444. Elements of Steel Design
3 Credits (3)
Analysis and design of tension members, beams, columns, and bolted and welded connections. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 315.
Prerequisite/Corequisite: C E 311.

Learning Outcomes

1. Students will be able to design structural steel elements (compression, tension, and flexural members) and connections.

C E 445. Reinforced Concrete Design
3 Credits (3)
Design and mechanics of structural reinforced concrete members. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 315.
Prerequisite/Corequisite: C E 311.
Learning Outcomes

1. Students will be able to analyze and design reinforced concrete structural elements subjected to loads.
2. Students will be able compute development lengths of reinforcing steel.
3. Students will understand the importance of meeting code requirements in their designs.

C E 452. Geohydrology
3-4 Credits (3+1P)
Origin, occurrence, and movement of fluids in porous media and assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. Crosslisted with: ENVS 452 and GEOL 452.
Prerequisite(s): Junior or Senior.
Learning Outcomes

1. An understanding of the movement of water in porous media and its effects on aquifers.
2. An understanding of the development and conservation of ground water resources.

C E 454. Wood Design
3 Credits (3)
Theory and design of wood structural members and systems subjected to gravity and lateral loads. Taught every other year, alternates with C E 455, Masonry Design. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 315.
Prerequisite/Corequisite: C E 311.
Learning Outcomes

1. Students will have a working knowledge of wood materials commonly used in structural applications.
2. Students will be able to design wood structural members and components.
3. Students will be able design basic connections between wood structural members.

C E 455. Masonry Design
3 Credits (3)
Theory and design of masonry structural members and systems subjected to gravity and lateral loads. Taught every other year, alternates with C E 454.
Prerequisite: C- or better grade in C E 315.
Prerequisite/Corequisite: C E 311.
Learning Outcomes

1. Introduce students to topics in masonry design that are commonly encountered in structural engineering.
2. Provide the background needed to understand the code requirements applicable to problems in masonry design.

C E 457. Foundation Design
3 Credits (2+3P)
Application of principles of classical soil mechanics to the design of shallow and deep foundations, and the fundamentals of geotechnical site investigation. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 357.
Learning Outcomes

1. Students will be able to apply geotechnical engineering principles to the analysis and design of shallow and deep foundations.
2. Students will be able to compute foundation settlement.

C E 460. Site Investigation
3 Credits (2+2P)
Investigation and characterization of surficial and subsurface geologic materials and ground water for civil engineering projects. Includes exploration program, drilling and sampling, rock and soil classification and logging, groundwater monitoring, profiles, and preparation of geotechnical reports.
Prerequisite: C- or better grade in C E 357.
Prerequisite/Corequisite: C E 457.
Learning Outcomes

1. Develop approach to scoping and conducting a subsurface investigation.
2. Develop an understanding of geotechnical complexity and how to use the graded approach.
3. Use soil mechanics and foundation design skills to perform geotechnical analyses and develop recommendations needed by the project team to provide client(s) with needed facilities.
4. Understand field and laboratory tools and techniques used to develop suitable data for subsurface analyses and geotechnical report recommendations.
5. Understand the observational approach, how to use it, and how to avoid its misuse.
6. Develop skills needed to prepare geotechnical letter reports and complete geotechnical investigation reports.

C E 469. Structural Systems
3 Credits (3)
Design of structural systems for buildings and bridges. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 444 or C E 445.
Learning Outcomes

1. Students will understand the scope of structural design projects.
2. Students will understand how a structural design project, representative of entry-level work in practice, is performed.

C E 470. Design of Municipal and Hazardous Waste Landfills
3 Credits (3)
Solid waste and application of geotechnical engineering principles and methods to the site selection and design of municipal and hazardous waste landfills. May be repeated up to 3 credits.
Prerequisite: C- or better grade in C E 357 and C E 452, or consent of instructor.
Learning Outcomes

1. Students will understand the importance of site selection for municipal and hazardous waste landfills.
2. Students will understand the elements of design for municipal and hazardous waste landfills.

C E 471. Transportation Engineering
3 Credits (3)
Highway and traffic design and systems. Students must be in junior or senior standing to enroll. May be repeated up to 3 credits.

Prerequisite: C- or better in MATH 1521G.

Learning Outcomes

1. Provide understanding of the principles of transportation engineering with a focus on highway engineering and traffic analysis.
2. Provide basic skill set that will allow a student to address most of the transportation problems that are likely to appear in professional practice and on the Fundamentals of Engineering exam (FE) and the Principles and Practice of Engineering exam (PE).
3. Provide foundation for future coursework in transportation should a student wish to pursue further coursework in the fields.

C E 477. Engineering Economics and Construction Management
3 Credits (3)

Engineering economics, construction and project management. May be repeated up to 3 credits.

Prerequisite/Corequisite: C- or better grade in C E 357.

Learning Outcomes

1. Understand time value of money and be able to perform economic analyses on engineering problems to determine whether a given project is worthwhile or to prioritize multiple alternatives based on present worth.
2. Understand the mathematical and ethical implications of benefit/cost and internal rate of return analyses
3. Estimate durations and requirements of individual construction tasks.
4. Develop construction schedules using Critical Path Method (CPM) Analysis.
5. Understand the legal and ethical concerns involved in economic analysis and construction engineering.

C E 479. Pavement Analysis and Design
3 Credits (3)

Covers stresses and deflections in pavement layers, material characterization, flexible and rigid pavement design by AASHTO, and rehabilitation concepts. May be repeated up to 3 credits.

Prerequisite: C- or better grade in C E 357.

Learning Outcomes

1. Students will be able to analyze and design flexible and rigid pavements.

C E 481. Civil Engineering Capstone Design
3 Credits (3)

Culminating multidisciplinary project-oriented capstone design. Ethics, professional development, global issues. May be repeated up to 3 credits.

Prerequisite: C- or better grade in C E 356, C- or better grade in C E 382, and a C- or better grade in either C E 444 or C E 445.

Prerequisite/Corequisite: C E 457, C E 471, C E 477.

Learning Outcomes

1. Students will understand the scope of civil engineering design projects.
2. Students will understand how a civil engineering project, representative of entry-level work in practice, is performed.

C E 482. Hydraulic Structures
3 Credits (3)

Engineering design of water-regulating structures. Capstone design course. May be repeated up to 3 credits.

Prerequisite: C- or better grade in C E 382.

Prerequisite/Corequisite: C E 477.

Learning Outcomes

1. Students will understand the scope of interdisciplinary civil engineering design projects.
2. Students will understand how a hydraulic design project, representative of entry-level work in practice, is performed.

C E 483. Surface Water Hydrology
3 Credits (3)

Hydrologic cycle and relationships between rainfall and surface water runoff. May be repeated up to 3 credits.

Prerequisite: C- or better grade in C E 331 or consent of instructor.

Learning Outcomes

1. Students will understand the hydrologic cycle and basic principles of hydrology.

C E 485. Design of Earth Dams
3 Credits (3)

Engineering design applied to site selection, foundation inspection and treatment, hydrology and hydraulics, stability, and seepage analysis. Economic and environmental factors.

Prerequisite: C E 357, C E 382.

Learning Outcomes

1. Course introduces the students to small earthen dam siting, design and construction based on the knowledge and skills acquired in earlier coursework.
2. Course incorporates engineering standards and realistic constraints and prepares students for entry-level work.
3. Students work in teams to design a small earthen dam.

C E 490. Introduction to Artificial Intelligence for Civil Engineers
3 Credits (3)

Introduces various machine learning methods for solving various civil engineering problems. Topics include: supervised & unsupervised machine learning; classification and linear regressions; K-nearest neighbor; decision tree, bagging, & boosting; random forest; and support-vector machines.

Prerequisite: C- or better grade in STAT 371.

Learning Outcomes

1. Identify appropriate data analysis methods for various civil engineering problems.
2. Perform various Machine Learning (ML) analyses to solve civil engineering problems.
3. Evaluate various forms of Machine Learning (ML) analysis results.

C E 497. Senior Seminar
1 Credit (1)

Selected topics on the civil engineering profession and orientation for professional practice. Preparation for the FE exam. Students must be able to submit their application for degree while enrolled in this course.

Learning Outcomes

1. Prepare students for professional and ethical aspects of employment or graduate studies.

C E 498. Special Topics
1-3 Credits

Special topics in civil engineering. May be repeated up to 9 credits.

Prerequisite: consent of department head.

Learning Outcomes

1. Students will develop knowledge related to the specific civil engineering special topic selected for study.

C E 501. Advanced Mechanics of Materials
3 Credits (3)

Study of stress and strain in two and three dimensions, theories of failure, stress concentrations, unsymmetrical bending, curved beams, beams on

elastic foundations, column theories, torsion, thick-wall cylinders. May be repeated up to 3 credits. Same as M E 501.
Prerequisite: C E 301, MATH 392.
Learning Outcomes
1. Students will understand the three-dimensional stress and strain, constitutive relationships, and yield criteria in the field of theoretical mechanics.
2. Students will understand the mechanics of torsion, non-symmetric bending, curved beams, and column buckling.
3. Students will have a basic understanding of stress concentrations, fracture mechanics, and plate behavior.

C E 502. Advanced Mechanics of Steel Structures
3 Credits (3)
Advanced structural mechanics applicable to steel structures. Includes inelastic behavior, plastic analysis, column and frame stability and torsion.
Prerequisite: C E 444.
Learning Outcomes
1. Introduce students to advanced topics in structural mechanics of steel structures that are commonly encountered in structural engineering
2. Provide the background needed to understand the code requirements applicable to problems in plastic design of steel structures

C E 503. Special Design and Analysis Program
3-6 Credits
Design and analysis covering subject matter of an approved 450 undergraduate departmental course plus an additional report or project. Course may be subtitled in the Schedule of Classes. May be repeated up to 6 credits.
Prerequisite: consent of instructor/committee.
Learning Outcomes
1. Students will develop knowledge related to the specific civil engineering design or analysis topic selected for study.

C E 504. Advanced Engineering Design
3 Credits (3)
Advanced engineering design covering subject matter of a selected capstone undergraduate design course plus an additional report or project. May be subtitled. May be repeated up to 3 credits.
Prerequisite: consent of instructor/committee.
Learning Outcomes
1. Students will develop knowledge related to the specific civil engineering design topic selected for study.

C E 507. Design of Earth Retaining Structures
3 Credits (3)
Lateral earth pressure theory, soil-reinforcement interaction, and analysis and design of rigid and flexible earth retaining structures for support of fills and excavations, including retaining walls, mechanically stabilized earth (MSE) walls, sheet pile walls, anchored walls, tiebacks and soil nailing. May be repeated up to 3 credits.
Prerequisite: C E 357.
Prerequisite/Corequisite: C E 457.
Learning Outcomes
1. Students will be able to design retaining walls and other earth retaining structures.

C E 508. Advanced Soil Behavior
3 Credits (3)
The course covers particle-scale phenomena that govern the macro-scale behavior of soils. Topics covered in the class include classical concepts as well as contemporary advances in soil mechanics. The students will develop a fundamental understanding of soil-water interaction, theories of contact level deformation, and mass and energy transport through granular media. Consent of Instructor required. May be repeated up to 3 credits.
Prerequisite: C E 357 or Instructor Consent.
Learning Outcomes
1. Students will develop an in-depth understanding of advanced soil mechanics topics.

C E 509. Deep Foundations
3 Credits (3)
Behavior, analysis and design of pile and pier foundations subjected to axial and lateral loads. May be repeated up to 3 credits.
Prerequisite: C E 457 or consent of instructor.
Learning Outcomes
1. Students will be able to analyze and design pile and pier foundations.

C E 510. Introduction to Nondestructive Testing
3 Credits (3)
This course explores the application of different Nondestructive Testing (NDT) methods in material characterization and product qualification.
Prerequisite: C E 311 or CHME 361 or Consent of Instructor.
Learning Outcomes
1. Students will develop a working knowledge of non-destructive test methods that utilize acoustic, electrical, and/or imaging principles.

C E 514. Numerical Methods in Civil Engineering
3 Credits (3)
Mathematical, numerical, and programming foundations of applied numerical methods with a focus on Civil and Environmental Engineering applications using MATLAB.
Learning Outcomes
1. To provide necessary background and skills to use MATLAB as a programing language for engineering problem solving.
2. To introduce classical and some modern methods for civil engineering numerical problem solving.
3. Develop numerical algorithms and programs for solving civil engineering problems involving: (1) multi-dimensional integration, (2) multivariate differentiation, (3) ordinary differential equations, (4) partial differential equations, (5) optimization (6) parameter estimation methods such as linear and nonlinear least square methods.

C E 515. Finite Element Methods
3 Credits (3)
Introduces the finite element method. Topics may include beam, frame, plane stress, plane strain, axisymmetric, and 3-D stress elements. Includes static and dynamic analysis. Uses readily available finite-element software. May be repeated up to 3 credits.
Prerequisite: graduate standing or consent of instructor.
Learning Outcomes
1. Students will be able to formulate and use the finite element method to solve problems in solid mechanics.

C E 531. Open Channel Hydraulics
3 Credits (3)
Theoretical and applied hydraulics of open channels, with emphasis on nonuniform flow, rapidly varied flow, and wave formation. May be repeated up to 3 credits.

Prerequisite: C E 382 or consent of instructor.

Learning Outcomes

1. Students will have in-depth knowledge of advanced topics related to open channel hydraulics.

C E 535. Technical Communication for Engineers

3 Credits (3)

The course addresses the fundamentals of communicating technical information that is clear, concise, and concrete to a wide variety of stakeholder types. Same as C E 435 with differentiated assignments for graduate students.

Learning Outcomes

1. Ability to write in a way that is clear
2. Ability to write in a way that is concise
3. Ability to write in a way that is concrete

C E 544. Advanced Design of Steel Structures

3 Credits (3)

Connection design; beam-column analysis and design; composite construction; and plate girder design.

Prerequisite: C E 444.

Learning Outcomes

1. Introduce students to advanced topics in steel design that are commonly encountered in structural engineering
2. Provide the background needed to practice structural steel design
3. Provide the background needed to understand the code requirements applicable to difficult problems in structural steel design

C E 545. Advanced Concrete Design

3 Credits (3)

Advanced topics in ultimate strength design of reinforced concrete that include: concrete footings, retaining structures, short and long columns, torsion members, deep beams and shear walls, two-way slabs, and shear and moment transfer at slab-column connections.

Prerequisites: C E 445.

Learning Outcomes

1. Introduce students to advanced topics in reinforced concrete design that are commonly encountered in structural engineering
2. Provide the background needed to practice structural concrete design
3. Provide the background needed to understand the code requirements applicable to difficult problems in structural concrete design

C E 547. Bridge Engineering

3 Credits (3)

Topics related to prestressed concrete, reinforced concrete and steel bridge design according to the AASHTO specifications; bridge analysis and evaluation.

Prerequisite: C E 444 or C E 445.

Learning Outcomes

1. Introduce students to topics in bridge design that are commonly encountered in structural engineering
2. Provide the background needed to understand the code requirements applicable to problems in bridge design

C E 554. Wood Design

3 Credits (3)

Theory and design of wood structural members and systems subjected to gravity and lateral loads. Design project required. Taught every other year, alternates with C E 555 - Masonry Design. May be repeated up to 3 credits.

Learning Outcomes

1. Students will have a working knowledge of be able to design wood materials commonly used in structural applications members and components.
2. Students will be able to design wood structural members and components.
3. Students will be able design basic connections between wood structural members.

C E 555. Masonry Design

3 Credits (3)

Theory and design of masonry structural members and systems subject to gravity and lateral loads. Design project required. Taught every other year, alternates with C E 554.

Learning Outcomes

1. Introduce students to advanced topics in masonry design that are commonly encountered in structural engineering.
2. Provide the background needed to practice masonry design.
3. Provide the background needed to understand the code requirements applicable to difficult problems in masonry design.

C E 557. Water Resources Development

3 Credits (3)

Students function as members of a consulting panel and prepare reports on major water resources development problems. Political, financial, and social aspects of water resources development are considered as well as scientific and technical details. May be repeated up to 3 credits.

Learning Outcomes

1. Students will have a working knowledge of important topics related to development of water resources.

C E 571. Structural Dynamics

3 Credits (3)

Response of elastic structure to dynamic loading. Moving load, earthquake and blast loading.

Prerequisite: ENGR 234 and C E 315.

Learning Outcomes

1. Introduce students to topics in structural dynamics that are commonly encountered in structural engineering
2. Provide the background needed to understand the code requirements applicable to problems in seismic and blast-resistant design

C E 579. Ground Improvement

3 Credits (3)

The objective of this course is to introduce common ground improvement techniques, including mechanical (compaction, soil reinforcement, preloading and accelerated consolidation) and chemical (cementing, ion-replacement, polymer bonding) stabilization methods, as well as seepage and dewatering. Emphasis will be placed on developing an understanding of the underlying physical and chemical processes involved in each case. May be repeated up to 3 credits.

Prerequisite: C E 357.

Learning Outcomes

1. Students will understand a wide variety of ground improvement techniques and the physical and chemical principles involved with each technique.

C E 581. Ground Water Hydrology

3 Credits (3)

Mathematical treatment of water flow in porous media. Emphasis on hydraulics of water movement, including pumping and recharge wells, drainage, and water quality. May be repeated up to 3 credits.

Prerequisite: MATH 392, G EN 452, and C E 382, or consent of instructor.
Learning Outcomes
1. Students will understand advanced topics related to flow in porous media and other issues related to ground water hydrology.

C E 582. Statistical Hydrology
3 Credits (3)
Application of statistical techniques to hydrologic data, including distributions, hypothesis testing, linear models, non-parametrics, and time-series and stochastic models. May be repeated up to 3 credits.
Learning Outcomes
1. Students will understand applications of statistical methods within the field of hydrology.

C E 585. Slope Stability Analysis and Design
3 Credits (3)
Design of earth slopes, causes of instability, limit equilibrium methods, slope reinforcement (geosynthetics soil nailing, tiebacks), seismic analysis, rock slope stability. Consent of instructor required.
Learning Outcomes
1. Be familiar with the implications of drainage conditions and pore water pressure in the soil as they relate to soil shear strength and slope stability.
2. Be able to recognize the differences between short-term and long-term analyses (total versus effective stress analyses) applied to slope stability.
3. Be able to perform hand calculations of slope stability for very simple cases.
4. Be familiar with the set of input data usually required to perform stability analyses using software.
5. Be able to design soil slopes with various soil profiles and geometry and reinforcement using slope stability software.
6. Recognize and understand the effects of geologic and groundwater conditions on the stability of soil slopes.
7. Understand the mechanisms by which the most common methods of slope stabilization work (tie-backs, soil nailing, geosynthetics).

C E 590. Advanced Artificial Intelligence for Civil Engineers
3 Credits (3)
Deep learning methods for solving civil engineering problems. Topics include: introduction, backpropagation, training, regulations, and techniques of Neural Networks (NN); image processing using Convolutional Neural Networks (CNN); time-series data analysis using Recurrent Neural Networks (RNN); Gated Recurrent Units; and introduction to Transfer Learning.
Prerequisite: STAT 371 and MATH 392.
Learning Outcomes
1. Identify appropriate data analysis methods and utilize mathematical formulations of Deep Learning (DL) for various civil engineering problems.
2. Perform various Deep Learning (DL) analyses to solve civil engineering problems.
3. Evaluate various forms of Deep Learning (DL) analysis results.

C E 596. Special Topics
1-3 Credits
Graduate level special topics in civil engineering. May be repeated up to 6 credits.
Prerequisite: consent of department head.
Learning Outcomes
1. Students will develop knowledge related to the specific civil engineering special topic selected for study.

C E 598. Special Research Programs
1-3 Credits
Individual investigations either analytical or experimental. May be subtitled. Maximum of 3 credits per semester. May be repeated up to 99 credits.
Learning Outcomes
1. Students will develop knowledge related to the specific civil engineering research topic selected for investigation.

C E 599. Master's Thesis
1-15 Credits
Thesis. May be repeated up to 88 credits.
Learning Outcomes
1. Students will progress toward completion of a research thesis.

C E 600. Doctoral Research
1-15 Credits
Research. May be repeated up to 88 credits.
Learning Outcomes
1. Students will progress toward completion of their doctoral research.

C E 604. Advanced Engineering Topics
3 Credits (3)
In depth study of a topic at the forefront of civil or environmental engineering. Journal papers will be critically reviewed and students will be asked to write an analysis of the topic and present their thoughts orally. May be repeated up to 3 credits.
Learning Outcomes
1. Students will develop knowledge related to the specific civil engineering special topic selected for study.

C E 614. Advanced Numerical Methods in Civil Engineering
3 Credits (3)
Advanced mathematical, numerical, and programming for applied numerical methods with a focus on Civil and Environmental Engineering applications using MATLAB. Same as C E 514 with differentiated material and assignments for C E 614 students.
Learning Outcomes
1. To provide necessary background and skills to use MATLAB as a programing language for engineering problem solving.
2. To introduce classical and some modern methods for civil engineering numerical problem solving.
3. Develop numerical algorithms and programs for solving civil engineering problems involving: (1) multi-dimensional integration, (2) multivariate differentiation, (3) ordinary differential equations, (4) partial differential equations, (5) optimization (6) parameter estimation methods such as linear and nonlinear least square methods, and (7) time series analysis such as Fourier transform, wavelet, and basic filtering.

C E 682. Topics in Hydrodynamics II
3 Credits (3)
Selected topics in hydrometeorology, including the transfer of water and energy between the land surface and the lower atmosphere.
Learning Outcomes
1. This course helps lay the foundation for theoretical concepts useful in measurement, analysis and estimation of evaporation/evapotranspiration. Students learn some of the theoretical concepts and relationships useful in the phenomenon of evaporation as well

as gain some field experience on measurement of evapotranspiration and open water evaporation.

C E 698. Special Research Programs
1-3 Credits
May be subtitled. May be repeated up to 9 credits.
Learning Outcomes
1. Students will gain knowledge related to the research topic selected for study.

C E 700. Doctoral Dissertation
1-15 Credits
Dissertation. May be repeated up to 88 credits.
Learning Outcomes
1. Students will progress toward completion of a research dissertation.

CCDE-DEVELOPMENTAL ENGLISH

CCDE 105 N. Effective Communication Skills
4 Credits (3+2P)
Instruction and practice in basic communication, to include written and oral presentations. Develops thinking, writing, speaking, reading, and listening skills necessary for successful entry to college and university classes. Provides laboratory. RR applicable.

CCDE 110 N. General Composition
4 Credits (3+2P)
Instruction and practice in preparation for college-level writing. Students will develop and write short essays. Provides laboratory.
Learning Outcomes
1. Recognize and employ reading and writing processes.
2. Employ rhetorical awareness in reading and writing.
3. Compose a variety of texts that demonstrate reading comprehension, clear focus, and logical development of ideas that advance the writer's purpose.
4. Recognize and apply organizational strategies.
5. Locate, evaluate, and integrate appropriate sources including appropriate style guide.
6. Recognize and use conventions of standard American English including usage and mechanics of sentence structure.

CCDM-DEVELOPMENTAL MATHEMATICS

CCDM 100 N. Mathematics Preparation for College Success
1-4 Credits
Mathematics skills course designed for college students with math skills insufficient for success in CCDM 103N. May be repeated for a maximum of 4 credits. RR applicable.

CCDM 103 N. Pre-Algebra
4 Credits (3+2P)
Fundamental mathematics operations and arithmetic computations. Introduction to algebra and applied geometry. Provides laboratory and individualized instruction. RR applicable.

CCDM 105 N. Mathematics Preparation and Pre-Algebra
5 Credits (4+2P)
A total immersion course that combines CCDM 100N and CCDM 103N using tutorials, manipulatives, and classroom instruction. Completion of this class is equivalent to the completion of CCDM 100N and CCDM 103N. Restricted to: Community Colleges only.

CCDM 114 N. Algebra Skills
4 Credits (3+2P)
Fundamental algebra operations: algebraic expressions, solving linear and quadratic equations, factoring, radicals, exponents. Provides laboratory and individualized instruction. Completion of CCDM 114N meets basic skills requirement. Graded: Traditional with RR. Traditional Grading with RR. Restricted to Community Colleges campuses only.
Prerequisite(s): C or better in CCDM 103N or CCDM 105N or adequate placement score.

CCDR-DEVELOPMENTAL READING

CCDR 105 N. Fundamentals of Academic Reading.
3 Credits (2+2P)
Fundamentals of academic reading skills. Emphasis on vocabulary development and text comprehension through literature based instruction. Course earns institutional credit but will not count towards degree requirements. Graded: Traditional with RR. May be repeated up to 3 credits. Traditional Grading with RR. Restricted to Community Colleges campuses only.
Prerequisite(s): Appropriate placement score.

CCDR 110 N. Effective College Reading
3 Credits (2+2P)
Provides a variety of strategies for effective reading and studying at the college level. Emphasis on reading across disciplines. Course earns institutional credit but will not count towards degree requirements. Graded: Traditional with RR. May be repeated up to 3 credits. Traditional Grading with RR. Restricted to Community Colleges campuses only.
Prerequisite(s): Appropriate placement score.

CCDS-DEVELOPMENTAL SKILLS

CCDS 109 N. Study Skills for Reading
1-3 Credits
Individualized reading skill strategies necessary for success in college classroom. May be repeated for a maximum of 3 credits. Graded traditional or S/U.

CCDS 111 N. Study Skills for Math
1-3 Credits
Individualized study skill strategies necessary for success in the math classroom. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

CCDS 113 N. Study Skills for English
1-3 Credits
Individualized study skill strategies necessary for success in the composition classroom. May be repeated for a maximum of 3 credits.

CCDS 119 N. College Reading and Writing
4 Credits (4)
Instruction and practice in preparation for college-level reading and writing. Students will develop and write essays, work on the writing process, and learn to read and analyze college-level texts. Traditional Grading with RR.
Prerequisite(s): Appropriate placement test score.
Learning Outcomes
1. Practice the reading and writing process through activities such as pre- reading/writing, annotating, drafting, summarizing, peer reviewing, discussing, revising, proofreading, journaling, researching, and citing.

2. Infer and interpret meanings in various texts through activities such as summarizing, annotating, journaling, reflecting, and textual analysis.

CCST-CHICANA/O STUDIES

CCST 2110G. Introduction to Chicana and Chicano Studies
3 Credits (3)
An introductory survey of the Mexican American experience in the United States, with special reference to New Mexico. The course includes exploration of historical, political, social and cultural dimensions. NMSU Specific It seeks to review the historical causes and consequences of the formation of the Chicano identity and to understand its relation to the development of the Chicano experience as a distinct culture. The course explores the social and political impact that Chicana/o thought and theory has had on the United States over time, specifically developing concepts related to identity, community, social movements, and social justice. Ultimately, the course will facilitate understanding the historical ways in which Chicana/os have negotiated the pressures of their surroundings and in the process shaped or redefined American conceptions of identity, race, gender, sexuality, ethnicity, education, protest, and resistance.
Learning Outcomes
1. Apply various transdisciplinary perspectives and processes to understand humanist expressions through a variety of creative productions.
2. Assess and apply social, historical, economic and cultural perspectives as they impact diverse populations over a period of time.
3. Explain the ways in which narratives help people understand one another more clearly and profoundly across ethnic and cultural groups.
4. Design projects that foster and increase a full understanding of a subject in order to promote change in their own and listeners' attitudes, values, beliefs, or behaviors.
5. Apply qualitative and numerical data to explain diverse human actions in an everyday context of life.

CCST 3110. Chicana/o History
3 Credits (3)
This course is an exploration and discuss the history of Mexican Americans in the U.S., with emphasis on their contributions to society and the political, economic and cultural forces that exemplify their experiences as a population. Beginning in 1492, at the onset of European "contact" with indigenous people living in what is now called Mexico, students will study the early beginnings of Mexicans as a mestizo (mixed) race and follow this group on a rough timeline through the present. Films, music, images and poetry are included to supplement lecture material. With special attention to New Mexico and the borderlands specifically, students will endeavor to make relevant, contemporary connections to the material. Additionally, the course will contextualize this history of a population and experiences within the establishment of Chicana/o Studies as an evolving discipline.
Learning Outcomes
1. Summarize the major economic, political, social and cultural histories defining and effected by the Mexican American population.
2. Gain understanding of how these histories evolved in political solidarity with other minority populations in the United States.
3. Understand the multidisciplinary diversity and intellectual rigor that effected and currently compose Chicana/o Studies as an academic discipline.
4. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
5. Interpret, understand, and engage texts within cultural, social and historical contexts.
6. Gather, analyze, and evaluate information from a variety of sources.
7. Compose texts in a variety of media formats.

CCST 3120V. Chicana/o Genders and Sexualities
3 Credits (3)
This survey course introduces students to Chicanx genders and sexual identities and representations as socially and culturally constructed in transnational Latinx communities and contexts. Through a lens of Chicana feminist and queer theories, students will gain familiarity with gender- and sexuality-related stereotypes and cultural expectations, as well as the histories of individual and group resistance to these norms. Course materials will highlight the revolutionary challenges to limitations and contributions to social, political, and cultural change made by queer Chicanx individuals and groups, women, and men resisting confining constructions of masculinity. This course will be both reading and writing intensive.
Learning Outcomes
1. Explain the multidisciplinary diversity and intellectual rigor that compose Chicanx feminist and queer theoretical traditions
2. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions
3. Interpret, understand, and engage texts within cultural, social and historical contexts
4. Gather, analyze, and evaluate information from a variety of sources
5. Compose texts in a variety of media formats.

CCST 3130. Chicana/o Education
3 Credits (3)
This course deconstructs the history of education through the lens of culture and race. Using a framework of intersectionality, the creation of public education, and the impact of historical shifts within the law concerning education will be examined. Special emphasis is placed on the role of ethnicity in the development of the United States and its education system. Includes an overview of multicultural/ multilingual curricula with a special focus on culturally / linguistically responsive instruction and assessment practices. This course provides a critical examination of race and culture using multicultural theoretical frameworks to analyze the conditions of education today. Additionally, this course will particularly foreground Latinx and Chicanx resistance and revolution in the realm of education and what this history and activism teaches us about our own identity, worldviews, environment, and ways of understanding in the contexts of both informal and formal processes and experiences of education.
Learning Outcomes
1. Analyze and interpret the historical, philosophical, economic, and sociocultural elements of education as it relates to race and culture.
2. Evaluate and interpret the ways in which education policies influence and are influenced by equity issues.
3. Describe multicultural education initiatives and assumptions about teaching, learning, and knowing.
4. Understand how cultural groups and students' cultural identities affect language learning and education overall, especially for Latinx and Chicanx students.

5. Explain and provide examples of anti-bias teaching strategies and education practices.

CCST 5110. Introduction to Chicana/o Studies
3 Credits (3)
An graduate survey of the Mexican American experience in the United States, with special reference to New Mexico. The course includes exploration of historical, political, social and cultural dimensions. Seeks to review the historical causes and consequences of the formation of the Chicano identity and to understand its relation to the development of the Chicano experience as a distinct culture. The course explores the social and political impact that Chicana/o thought and theory has had on the United States over time, specifically developing concepts related to identity, community, social movements, and social justice. Ultimately, the course will facilitate understanding the historical ways in which Chicana/os have negotiated the pressures of their surroundings and in the process shaped or redefined American conceptions of identity, race, gender, sexuality, ethnicity, education, protest, and resistance.
Learning Outcomes
1. Apply various transdisciplinary perspectives and processes to understand humanist expressions through a variety of creative productions.
2. Assess and apply social, historical, economic and cultural perspectives as they impact diverse populations over a period of time.
3. Explain the ways in which narratives help people understand one another more clearly and profoundly across ethnic and cultural groups.
4. Design projects that foster and increase a full understanding of a subject in order to promote change in their own and listeners' attitudes, values, beliefs, or behaviors.
5. Apply qualitative and numerical data to explain diverse human actions in an everyday context of life.

CCST 5120. Advanced Chicana/o Genders and Sexualities
3 Credits (3)
This survey course introduces students to Chicanx genders and sexual identities and representations as socially and culturally constructed in transnational Latinx communities and contexts. Through a lens of Chicana feminist and queer theories, students will gain familiarity with gender- and sexuality-related stereotypes and cultural expectations, as well as the histories of individual and group resistance to these norms. Course materials will highlight the revolutionary challenges to limitations and contributions to social, political, and cultural change made by queer Chicanx individuals and groups, women, and men resisting confining constructions of masculinity. This course will be both reading and writing intensive.
Learning Outcomes
1. Explain the multidisciplinary diversity and intellectual rigor that compose Chicanx feminist and queer theoretical traditions.
2. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
3. Interpret, understand, and engage texts within cultural, social and historical contexts.
4. Gather, analyze, and evaluate information from a variety of sources.
5. Compose texts in a variety of media formats.

CCST 5130. Advanced Chicana/o Education
3 Credits (3)
This course deconstructs the history of education through the lens of culture and race. Using a framework of intersectionality, the creation of public education, and the impact of historical shifts within the law concerning education will be examined. Special emphasis is placed on the role of ethnicity in the development of the United States and its education system. Includes an overview of multicultural/multilingual curricula with a special focus on culturally / linguistically responsive instruction and assessment practices. This course provides a critical examination of race and culture using multicultural theoretical frameworks to analyze the conditions of education today. Additionally, this course will particularly foreground Latinx and Chicanx resistance and revolution in the realm of education and what this history and activism teaches us about our own identity, worldviews, environment, and ways of understanding in the contexts of both informal and formal processes and experiences of education.
Learning Outcomes
1. Analyze and interpret the historical, philosophical, economic, and sociocultural elements of education as it relates to race and culture.
2. Evaluate and interpret the ways in which education policies influence and are influenced by equity issues.
3. Describe multicultural education initiatives and assumptions about teaching, learning, and knowing.
4. Understand how cultural groups and students' cultural identities affect language learning and education overall, especially for Latinx and Chicanx students.
5. Explain and provide examples of anti-bias teaching strategies and education practices.

CCST 5140. Advanced Chicana/o History
3 Credits (3)
This course is an exploration and discuss the history of Mexican Americans in the U.S., with emphasis on their contributions to society and the political, economic and cultural forces that exemplify their experiences as a population. Beginning in 1492, at the onset of European “contact” with indigenous people living in what is now called Mexico, students will study the early beginnings of Mexicans as a mestizo (mixed) race and follow this group on a rough timeline through the present. Films, music, images and poetry are included to supplement lecture material. With special attention to New Mexico and the borderlands specifically, students will endeavor to make relevant, contemporary connections to the material. Additionally, the course will contextualize this history of a population and experiences within the establishment of Chicana/o Studies as an evolving discipline.
Learning Outcomes
1. Summarize the major economic, political, social and cultural histories defining and effected by the Mexican American population.
2. Gain understanding of how these histories evolved in political solidarity with other minority populations in the United States.
3. Understand the multidisciplinary diversity and intellectual rigor that effected and currently compose Chicana/o Studies as an academic discipline.
4. Develop compelling and logical arguments for class discussion, individual and group presentations and writing assignments, based on course readings and discussions.
5. Interpret, understand, and engage texts within cultural, social and historical contexts.
6. Gather, analyze, and evaluate information from a variety of sources.
7. Compose texts in a variety of media formats.

CEPY-COUNSELING & EDUCATIONAL PSYCHOLOGY

CEPY 1120G. Human Growth and Behavior
3 Credits (3)
Introduction to the principles of human growth and development throughout the life span. May be repeated up to 3 credits.
Learning Outcomes
1. Students will demonstrate an understanding of the scientific study of processes of change and stability throughout the human lifespan (i.e. Human Development).
2. Students will demonstrate a familiarity with the generally recognized stages of human development from conception to death.
3. Students will be able to demonstrate understanding of the normal and exceptional patterns of human development.
4. Students will be able to demonstrate understanding of recent research development regarding the identified stages of human development as they relate to gender and multicultural issues

CEPY 1150. Career Excellence
1 Credit (1)
Professional career curriculum to assist students in developing an understanding and ability to articulate who they are as emerging professionals through personal assessment activities. The focus will be on providing students with tools and strategies for reflection, planning, and goal-setting.Course does not count toward CEP minor. Spring only course offering. Restricted to College of HEST Majors only.
Learning Outcomes
1. Demonstrate an understanding of the relationship between academic and professional career success.
2. Express a familiarity with professionalism and career culture and communicate a comprehension of various professional career skills.
3. Apply material learned to other aspects to professional excellence.
4. Develop a career life plan that will highlight goals, taking into account life circumstances.
5. Become competent in appropriate professional communication.

CEPY 1160. Academic Excellence
1 Credit (1)
The course is designed to provide you students with a foundation in their personal academic process. The course will assist students in developing an understanding and ability to articulate who they are as beginning college students through personal assessment activities. The focus will be on providing students with tools and strategies for reflection, planning, and goal-setting. Topics discussed will include time management, study skills, test taking skills, stress management, motivational and academic discipline skills, interpersonal skills and college survival skills. We intend for this to be a supportive, respectful and collaborative environment where everyone can learn and grow. Fall only course offering. Restricted to College of HEST majors.
Learning Outcomes
1. Students will be able to demonstrate an understanding of the relationship between time management and academic success.
2. Students will be able to express a familiarity with college culture.
3. Students will be able to communicate a comprehension of study skills and test taking strategies.
4. Students will be able to apply material learned to other aspects to enhance academic excellence.
5. Students will be able to develop an academic life plan that will highlight goals, taking into account life circumstances.
6. Become competent in appropriate academic communication.

CEPY 2110. Learning in the Classroom
3 Credits (3)
This class introduces you to the basic principles of learning, including cognition, motivation, and assessment. You will examine the relationships between theory, research, and practice in learning, memory, child development, motivation, and educational assessment for the school setting. This course will provide the student with concepts and principles of educational psychology that will form a framework for thinking about learning and instruction and how theories of learning are connected to classroom situations May be repeated up to 3 credits.
Learning Outcomes
1. Define learning and compare and contrast the factors that cognitive, behavioral, and humanistic theories believed to influence the learning process, giving specific examples of how these principles could be used in the classroom.
2. Observe and reflect upon the teaching learning processes in economically, socially, culturally and educationally diverse classroom populations in order to develop a current understanding of students and families in public and private school.
3. Discuss how theories of information processing and cognitive theories of learning can impact memory, study strategies, and how certain teaching techniques can help students learn.
4. Compare teacher-centered and student-centered approaches to learning, and to identify a positive learning environment.
5. Identify various methods to motivate students and create effective learning environments.
6. Use major concepts of child and adolescent development, human learning, and social and cultural influences in planning and implementing classroom instruction, strategies, and management.
7. Evaluate the best means of accommodating instruction to meet individual needs and differences.
8. Students will examine how learning style, cultural and social issues and learning disabilities impact the learner's effectiveness in the classroom setting.
9. Explain different types of assessment used to assess learning and provide examples of effective assessment practices. 1
10. Discuss the relationship between motivation and classroom management

CEPY 2120. The Preschool Child
3 Credits (3)
Survey of psychological development from conception to age five. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate an understanding of major theories of early childhood development
2. Demonstrate an understanding of recognized stages of human development from prenatal to preschool years
3. Explore cultural influences that may create variability in human development
4. Apply major theories to themselves and reflect on their early childhood development.

CEPY 2130. Adolescence - School Setting
3 Credits (3)

This course is designed to present the student with an introduction to the area of adolescent development with an emphasis on the positive aspects of this life stage. Students will be encouraged to be reflective on the topics presented in class that will include issues on diversity, culture, health, and well-being, emerging adulthood and suggestions for improving the lives of adolescents. May be repeated up to 3 credits.

Learning Outcomes

1. Students will become knowledgeable about the historical background of adolescent development.
2. Students will become knowledgeable about the major theories related to adolescence.
3. Students will evaluate different developmental theories and their fit across cultures as you reflect on your personal experiences through discussions and videos you will watch.
4. Students will identify key developmental milestones, conflicts, and concepts of each chapter presented by utilizing critical thinking skills as you complete summary questions.
5. Students will define relevant terms, ideas, and concepts in the study of adolescent development through quizzes and homework assignments.

CEPY 2140. Explorations of Counseling & Community Psychology
3 Credits (3)

An introduction and exploration of various career options and functions within the mental health disciplines to aid in professional development. Emphasis will be placed on depth and scope of the choices available including research, teaching, community work, public policy, and clinical work and prevention (e.g. counseling, psychotherapy, assessment, consultation). May be repeated up to 6 credits.

Learning Outcomes

1. Acquire knowledge of historical and contemporary issues which affect the provision of mental health services by members of diverse mental health disciplines including clinical, counseling, school, and community psychologists, clinical mental health counselors, and others.
2. Acquire knowledge pertaining to education and training requirements for various disciplines.
3. Acquire survey-level knowledge of psychological assessment, measurement, and treatment.
4. Acquire survey-level knowledge of various inquiry approaches applicable to research pertaining to mental health and well-being—both at the individual and community level.
5. Understand the mental health recovery model and explore the lived experiences of individuals with mental health problems in contemporary society.
6. Understand the principles of sensitivity and respect for diverse populations as integral to professional practice in diverse mental health disciplines and settings, including practice in educational and community settings.

CEPY 2140H. Exploration of CCP
3 Credits (3)

An exploration of careers, activities, & techniques in counseling, school, and community psychology. Taught with CEPY 2140 with differentiated instruction and/or independent project to be determined. Restricted to Las Cruces campus only.

Learning Outcomes

1. Demonstrating knowledge of the basic functions of careers in counseling, community and school psychology.
2. Establishing a familiarity with the educational requirements necessary for a career in counseling, community, and school psychology.
3. Acknowledging and enhancing sensitivity and respect for diverse populations in various counseling areas; including educational and community settings.
4. Beginning to develop the interpersonal skills needed to succeed in the counseling, community and school psychology professions.

CEPY 3110. Gender Roles in Education
3 Credits (3)

Physiological, psychological, and political aspects of sex role socialization and the effects of these factors on personal development.

Learning Outcomes

1. Increase awareness of gender issues insect with other identities.
2. Increase knowledge about feminism and masculinity from a multicultural and systems perspective.
3. Increase knowledge about gender issues among people of color, geographic regions, and differing socioeconomic status.
4. Gain an understanding of intentional and unintentional sexist behavior and the consequences of such behavior.
5. Prepare students to work with diverse populations by emphasizing differences in values based on gender roles.
6. Practice interpersonal and team-building skills.
7. Practice critical thinking skills in evaluating research evidence.
8. Increase knowledge of how gender influences education.
9. Understanding systemic influences on gender issues and learning how to take action for social justice.

CEPY 3210V. Human Relations Training
3 Credits (3)

Gain skills, knowledge, and sensitivity for living and working with others. May be repeated up to 3 credits.

Learning Outcomes

1. Critically evaluate academic literature regarding human relations.
2. Be familiar with theories of human relations.
3. Integrate and apply these theories toward understanding the dynamics of interpersonal and organizational relationships.
4. Demonstrate an increased understanding of human relations as they apply to one's family systems.
5. Demonstrate an increased understanding of the impact of culture on human relations.
6. Translate knowledge of human relations into attitudes, skills, and techniques that will result in favorable learning experiences for students.

CEPY 4110V. Introduction to Counseling
3 Credits (3)

Principles of counseling for nonmajors. May be repeated up to 3 credits.

CEPY 4120. Introduction of Mindfulness Practice
3 Credits (3)

Students will learn about contemplative practices through learning and participation in various mindfulness practices. Engages students in a practice or experience that leads to reflection and, thus, acquired knowledge about themselves, others, and group functioning. May be repeated up to 3 credits.

Learning Outcomes

1. To learn about mindfulness practices for self-care.
2. To incorporate mindfulness practices into daily life.

3. To learn how mindfulness practices may increase well-being.
4. To increase students' knowledge of mindfulness theory and research.
5. To learn about the philosophical underpinnings of mindfulness.

CEPY 4130. Addictions Prevention and Recovery
3 Credits (3)
Understanding addictions process, prevention, and recovery, including biological, interpersonal and sociological influences, and intervention strategies. May be repeated up to 3 credits.
Learning Outcomes
1. To introduce students to the basic categories and processes of different addictions.
2. To introduce students to psychopharmacology and assist them to obtain an understanding of drug classification, specific drugs, and the etiology of drug addiction.
3. To foster students' awareness of the most prominent approaches to prevention in the development of addictions.
4. To foster students' awareness of the most prominent theories and approaches for conceptualizing clients presenting with addictions (i.e., transtheoretical, motivational interviewing, cognitive behavioral).
5. To assist students to better understand how different cultural groups (i.e., gender, race/ethnicity, sexual orientation, etc.) use and abuse drugs and recover from various addictions.
6. To assist students to gain awareness of ethical issues of particular importance to addictions treatment.

CEPY 4140. Family Guidance
3 Credits (3)
Systems based guidance procedures for enhancing family strengths and development, and application of family guidance procedures for prevention and remediation of problems.
Prerequisite: CEPY 1120G.
Learning Outcomes
1. Identify, describe, and explain human behaviors and how they are influenced by social structures, institutions, and processes within the contexts of complex and diverse communities.
2. Articulate how beliefs, assumptions, and values are influenced by factor s such as politics, geography, economics, culture, biology, history, and social#institutions.
3. Describe ongoing reciprocal interactions among self, society, and the environment.
4. Apply the knowledge base of the social and behavioral sciences to identify, describe, explain, and critically evaluate relevant issues, ethical dilemmas, and arguments.

CEPY 4150. Psychology, Multiculturalism and Counseling
3 Credits (3)
Understanding social identities such as race, ethnicity, sexual orientation, age, social class and spirituality as it relates to psychosocial development, academic achievement and counseling.
Learning Outcomes
1. Demonstrate a multicultural, global, and multiple perspectives approach to cultural differences.
2. Demonstrate increased cultural awareness, sensitivity, and empathy toward marginalized groups.
3. Identify subjective perceptions, biases, and the role culture plays in social interactions.
4. Examine societal institutions for privileges and barriers encountered by various groups.
5. Demonstrate increased flexibility, knowledge, and skills related to becoming multicultural.
6. Recognize that intersecting identities affect appropriate treatment and education.

CEPY 4150H. Psych., Multiculturalism & Counseling
3 Credits (3)
Understanding social identities such as race, ethnicity, sexual orientation, age, social class and spirituality as it relates to psychosocial development, academic achievement and counseling. Taught with CEPY 4150. Differentiated instruction/independent project to be determined.

CEPY 4997. Independent Study
1-6 Credits (1-6)
Individual study directed by consenting faculty. May be repeated up to 6 credits.

CEPY 4998. Internship in Counseling & Community Psychology: Clinical
3 Credits (3)
Students will deepen their understanding of the fields of counseling, community psychology, and school psychology by completing a department-approved, supervised clinical internship. Internship placements may occur in schools, community agencies, or counseling centers, providing students with hands-on exposure to the helping professions. Through direct experience in these settings, students will develop practical skills in client interaction, enhance their understanding of ethical and culturally responsive practice, and strengthen their interpersonal competence. This course supports the development of professional identity and sensitivity when working with diverse populations, preparing students for future graduate study or entry-level roles in human services and mental health fields. May be repeated up to 6 credits.
Learning Outcomes
1. Analyze in-depth the fields of counseling, community, and school psychology professions.
2. Examine their interests, strengths, and abilities to develop a better sense of their career goals.
3. Evaluate counseling, community, and school psychology professions through their interaction with faculty and supervisors.
4. Connect with on-site supervisors and gain hands-on work experience.
5. Practice sensitivity and respect for diverse populations in various counseling arenas to include educational and community settings.
6. Apply interpersonal skills needed to succeed in the counseling, community, and school psychology professions and graduate school.

CEPY 4999. Internship in Counseling & Community Psychology: Research
3 Credits (3)
This course offers students the opportunity to deepen their understanding of research in the fields of counseling, community, and school psychology through a structured research internship. Students will engage in supervised research activities such as literature reviews, data collection and analysis, and dissemination of findings. The internship fosters critical thinking, ethical research practices, and collaboration with diverse populations. Through this experience, students will gain insight into how research informs practice, contribute to ongoing scholarly projects, and build foundational skills for future graduate study or professional roles in the behavioral sciences and helping professions.
Learning Outcomes
1. Analyze in-depth the research processes, methods, and ethics in the fields of counseling, community, and school psychology professions.

2. Examine their interests, strengths and abilities to develop a greater sense of their career goals.
3. Construct an original literature review to transform their clinical or personal interests into a research inquiry consistent with the scientist-practitioner model of training.
4. Evaluate counseling, community, and school psychology professions through their interaction with faculty and supervisors.
5. Conduct research by establishing a connection with a faculty member and research team leader.
6. Practice sensitivity and respect for diverse populations in various counseling arenas to include educational and community settings.
7. Apply interpersonal skills needed to succeed in the counseling, community, and school psychology professions and graduate school.

CEPY 5110. Introduction to Counseling
3 Credits (3)
Overview of counseling theory, techniques, ethics, and professional issues. Same as CEPY 4110V. This course is open to all majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean.
Learning Outcomes
1. Fostering intelligent inquiry into the field of counseling which may include abstract and logical thinking, critical analysis and the integration and synthesis of general knowledge in counseling and psychological principles (applying counseling to everyday task of life).
2. Promoting literacy in writing, reading, speaking, and listening as per topics relating to counseling (for example, completing assigned readings in preparation for class, completing the required assignments).
3. Promoting the application of information and digital literacy.
4. Encouraging an understanding of scientific inquiry within the field of counseling.
5. Providing a historical consciousness including an understanding of one's own heritage as well as a sensitivity and respect for other peoples and cultures that are represented in the community at large.
6. Examining one's value system and enhancing awareness to issues of diversity including multiculturalism (for example, exploring personal qualities of effective counselors and multicultural issues in counseling).
7. Being accountable for assuming personal and social responsibility.
8. Promoting an appreciation of the application of creative arts, such as art and music, movement, and mindfulness to the counseling process.

CEPY 5120. Human Development
3 Credits (3)
Theory and research regarding cognitive, social, and emotional development across the lifespan with emphasis on enhancing human development. Non majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Students will understand and be able to apply the major theories and research that attempt to explain chronological constancy and change in human beings, with emphasis on practical applications and implications.
2. Students will build a foundational knowledge of human development for adaptation to the professional fields of education, counseling, and psychology.
3. Students will explore the universality and cultural variations in human development from conception to death.
4. Students will learn about the factors which facilitate and impede healthy physical, cognitive, social, and affective/emotional development.

CEPY 5130. Multicultural Counseling
3 Credits (3)
Understanding age, gender, ethnicity, socioeconomic status and culture in relation to human development, education, and counseling. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Awareness will be accomplished by assisting students in the exploration and identification of students' individual cultural assumptions(i.e. WORLDVIEW) in relation to people diverse from themselves. This will be accomplished via modeling, observations, readings, group processing and other experiential exercises.
2. Knowledge will be accomplished by exploring the question, "What is Multiculturalism" in its many forms, roles, and relationships. It will begin with the examination of the psychology of multiculturalism and the requirements of cultural competency in intercultural communications. In addition, a review of various theories of diversity (i.e. identity development, acculturation, worldview, bilingualism, and disability, to name a few) will be embedded in readings, assignments, and class discussion. Exploration of various diverse populations will also be integrated into this course.
3. Skills will focus on "How to" of multicultural competency and its practical applications to everyday interactions. Students will learn about basic issues related to assumptions that are used in communication intra-cultural and intercultural interactions.

CEPY 5150. The Art & Science of Mindfulness for Helping Professionals
1-3 Credits (1-3)
In this course students will learn about contemplative practices by learning about and participating in various mindfulness practices for self-care and to increase well-being. Students will learn about psychological theories and research that support the use of mindfulness in helping others increase their well-being. Students will learn how to teach mindfulness to others. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. To learn about mindfulness practices for self-care.
2. To incorporate mindfulness practices into daily life.
3. To learn how mindfulness practices may increase well-being.
4. To increase students' knowledge of mindfulness theory and research.
5. To develop skills to teach mindfulness to others.

CEPY 5160. Organization and Administration of School Counseling Services
3 Credits (3)
Procedures for establishing and maintaining counseling programs in the schools. Professional and ethical issues in school counseling and group laboratory experience to enhance self-awareness and interpersonal skills for effective professional relationships. Restricted to CEP graduate

majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will learn about the history of school guidance/counseling and apply that knowledge to assess current trends and the quality of services provided in counseling programs with respect to the changing needs of today's diverse systems.
2. Students will learn to develop and administer a school guidance/counseling program according to professional and ethical standards developed by The American School Counseling Association's (ASCA) National Model of School Counseling.
3. Students will be introduced to a variety of technology-based career development applications, educational resources and research to promote academic advancement and social-emotional well-being. Additionally, students will explore the use of technology designed to implement, monitor, and evaluate a comprehensive school counseling program.
4. Students will gain an understanding of effective teamwork within a school setting including theories, models, and processes of consultation and change with teachers, administrators, and other school personnel. Students will explore strategies and methods of advocacy with families and communities designed to empower them to address issues of social justice within an educational system.
5. Students will build a framework for facilitating school-level individual and group counseling services. They will analyze and interpret trends in academic achievement by understanding the cultural context of the school environment as it relates to groups of students and to institutional functioning.

CEPY 5170. Professional Issues in Mental Health Counseling
3 Credits (3)

History, roles, organizational structures, settings, ethics, standards, laws, and credentialing related to mental health counseling. Group laboratory experience to enhance self-awareness and interpersonal skills for effective professional relationships. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students should understand and demonstrate ethical decision-making processes and resources.
2. Students should demonstrate understanding of the expectations and requirements of their new professional identity.
3. Students should demonstrate knowledge of history and philosophy of the counseling profession and its specialty areas.
4. Students should demonstrate understanding of the multiple professional roles and functions of counselors across specialty areas, and their relationships with human service and integrated behavioral health care systems, including inter-agency and inter-organizational collaboration and consultation.
5. Students should demonstrate knowledge and understanding of counselors' roles and responsibilities as members of interdisciplinary community outreach and emergency management response teams.
6. Students should demonstrate knowledge and understanding of the the role and process of the professional counselor advocating on behalf of the profession; advocacy processes needed to address institutional and social barriers that impede access, equity, and success for clients.

CEPY 5180. Addictions Counseling
3 Credits (3)

Emphasis on alcohol and other psychoactive substance abuse. Also includes eating disorders, gambling, and other addictive behaviors. Covers review of psychopharmacology, assessment, and diagnosis with the major focus on treatment and professional issues. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize the potential for substance use disorders to mimic and coexist with a variety of medical and psychological disorders.
2. Know the disease concept and etiology of addiction and co-occurring disorders.
3. Identify standard screening and assessment instruments for substance use disorders and process addictions.

CEPY 5210. Research Methods
3 Credits (3)

Develop research and program evaluation including critical literature review, generating questions, quantitative and qualitative methodology, analysis, and writing proposals. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will understand how to critically evaluate research relevant to the practice of clinical mental health counseling.
2. Become knowledgeable of models of program evaluation for clinical mental health programs.
3. Demonstrate knowledge of evidence-based treatments and basic strategies for evaluating counseling outcomes in clinical mental health counseling.
4. Apply relevant research findings to inform the practice of clinical mental health counseling.
5. Develop measurable outcomes for clinical mental health counseling programs, interventions, and treatments.
6. Analyze and use data to increase the effectiveness of clinical mental health counseling interventions and programs.

CEPY 5220. Testing, Assessment, and Psychometric Theory
3 Credits (3)

Selection, administration, and interpretation of tests and other assessment methods. Topics include reliability, validity, norms, cultural factors, and ethics related to appraisal. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Basic concepts of standardized and non-standardized testing and other assessment techniques, including norm-referenced and criterion-referenced assessment, environmental assessment, performance assessment, individual and group test and inventory methods, psychological testing, and behavioral observations (II-G-seven-b)

2. Statistical concepts, including scales of measurement, measures of central tendency, indices of variability, shapes and types of distributions, and correlations (II-G-seven-c)c.Reliability (i.e., theory of measurement error, models of reliability, and the use of reliability information) (II-G-seven-d)
3. Validity (i.e., evidence of validity, types of validity, and the relationship between reliability and validity) (II-G-seven-e)
4. Social and cultural factors related to the assessment and evaluation of individuals, groups, and specific populations (II-G-seven-f)
5. Ethical strategies for selecting, administering, and interpreting assessment and evaluation instruments and techniques in counseling (II-G-seven-g)

CEPY 5230. Counseling Theory and Technique
3 Credits (3)
Major theories of counseling with an emphasis on development of the ability to offer theory-based counseling and consultation. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Students will demonstrate the ability to foster counseling and helping relationships that are based on studies of the counseling process in a multicultural society and include an orientation to wellness and prevention as desired counseling goals.
2. Students will be able to apply theories and models of counseling, including a systems approach, to conceptualize clients, help select appropriate counseling interventions, and so the student begins to develop a personal model of counseling based on current professional research and practice with the aid of processes provided in this course.
3. Students will demonstrate the ability to foster counseling and helping relationships that include essential interviewing, counseling, and case conceptualization skills as well as developing the ability to provide professional feedback in consultation with other trainees.
4. Students will demonstrate the ability to foster counseling and helping relationships that include developmentally relevant counseling treatment or intervention plans, the development of measurable outcomes for clients, and evidence-based counseling strategies and techniques for prevention and intervention
5. Students will be able to demonstrate counselor characteristics and behaviors that influence helping processes.
6. Students will demonstrate knowledge and ability to provide suicide prevention, crisis intervention, trauma-informed, and community-based strategies, such as Psychological First Aid.

CEPY 5235. Counseling Theory and Techniques for School Psychologists
3 Credits (3)
Major theories of counseling with an emphasis on development of the ability to offer theory-based counseling and consultation. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. The student will demonstrate an understanding of their psychosocial and cultural context and how such phenomena influence their values, beliefs and, therefore, theoretical orientation.
2. The student will demonstrate the ability to examine and apply critical perspectives related to counseling theory and techniques.
3. The student will be able to compare and contrast various theoretical perspectives in the area of counseling children and adolescents in school settings.
4. The student will demonstrate the development of skills leading toward becoming a culturally responsive practitioner in the area of counseling with individuals from a variety of diverse backgrounds.
5. The student will be able to identify, describe, and apply legal and ethical issues relevant to practice in the area of counseling children and adolescents in the schools.
6. The student will be able to collaborate with others in the process of becoming a competent school psychologist in providing counseling services in the schools.

CEPY 5240. Child and Adolescent Counseling Theory and Technique
3 Credits (3)
Counseling theory and technique applied to children and adolescents from a developmental perspective in school and mental health settings. Restricted to CEP graduate students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Students will demonstrate understanding of their psychosocial and cultural context and how such phenomena influence their values, beliefs and, therefore, theoretical orientation to counsel children and adolescents.
2. Students will examine and apply critical perspectives related to counseling children and adolescents.
3. Students will compare and contrast various theoretical perspectives in the area of counseling children and adolescents.
4. Students will develop a knowledge base leading toward becoming a culturally responsive practitioner in the area of counseling with individuals from a variety of diversebackgrounds.
5. Students will identify, describe, and apply legal and ethical issues relevant to practice in the area of counseling children and adolescents in various settings.
6. Students will collaborate with others in the process of developing relevant treatment plans and providing counseling services to children and adolescents in diverse settings.

CEPY 5250. Family Therapy Theory and Technique
3 Credits (3)
Major theories of family therapy and associated assessment, intervention and evaluation techniques. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Students will be able to explain a systems perspective and differentiate family and other systems theories and major models of family and related interventions.
2. Students will be able to demonstrate and apply an understanding of the family life cycle and impact on family and individual functioning.
3. Students will be able to prepare and utilize various forms of assessment for families and couples, including observation, collection of collateral information, and interviewing.

4. Students will be able to illustrate awareness of and skill in the use of formal and informal assessment measures used in family and couple counseling.
5. Students will be able to summarize evidence-based interventions and treatments for family and couple counseling.
6. Students will be able to analyze multicultural counseling theories and techniques for diverse family types and apply multicultural and family theories to one's own experience.
7. Students will be able to demonstrate an ability to communicate and relate effectively with families and couples.
8. Students will be able to describe ethical issues related#to counseling families and couples and be able to identify a process to make sound judgments.

CEPY 5260. Group Work Theory and Technique
3 Credits (3)
Didactic and experiential learning in group theory and practice, which involves experiences in group participation and leadership. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Provide students with an intellectual understanding of group work theory and technique.
2. Provide students with an experiential understanding of group work.
3. To help students develop specific group facilitation competencies

CEPY 5270. Diagnosis and Treatment Planning
3 Credits (3)
Appraisal and conceptualization of mental disorders and other problems through diagnostic interviewing using the DSM. Treatment planning for counseling with children, adolescents, and adults. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will know the etiology, the diagnostic process and nomenclature, treatment, referral, and prevention of mental and emotional disorders.
2. Students will know the principles, models, and documentation formats of biopsychosocial case conceptualization and treatment planning.
3. Students will understand current literature that outlines theories, approaches, strategies, and techniques shown to be effective when working with specific populations of clients with mental and emotional disorders.
4. Students will understand the basic classifications, indications, and contraindications of commonly prescribed psychopharmacological medications so that appropriate referrals can be made for medication evaluations and so that the side effects of such medications can be identified.
5. Students will know the principles of the diagnostic process, including differential diagnosis, and the use of current diagnostic tools, such as the current edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM).
6. Students will understand the established diagnostic criteria for mental and emotional disorders, and describes treatment modalities and placement criteria within the continuum of care.
7. Students will know the impact of co-occurring substance use disorders on medical and psychological disorders.
8. Students will understand the relevance and potential biases of commonly used diagnostic tools with multicultural populations.
9. Students will understand appropriate use of diagnosis during a crisis, disaster, or other trauma- causing event. 1
10. Students will be able to differentiate between diagnosis and developmentally appropriate reactions during crises, disasters, and other trauma-causing events.

CEPY 5280. Primary Care Psychology
3 Credits (3)
Didactic and experiential learning in primary care psychology issues. Through this course students will learn about the cultural necessity of the integration of mental and physical health issues and multidisciplinary collaboration. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: Biologic bases of behavior as related to health/illness and coping
2. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: Psychological bases of behavior as related to health/illness and coping
3. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: Sociocultural bases of behavior as related to health/illness and coping
4. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: Understanding and application of inter-professional collaboration
5. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: A knowledge of substance use disorders, particularly opioid use disorder and treatment in a primary care setting
6. Students will demonstrate the following primary care psychology competency within the context of addressing integrated behavioral health care: How to utilize telemedicine effectively

CEPY 5310. Academic Assessment And Intervention
3 Credits (3)
Advanced theory and use of norm and criterion referenced instruments in the classroom: planning of prescriptive and educational programs. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to CEP graduate majors.

Learning Outcomes

1. Practitioner: Define assessment and describe the steps in the assessment process.
2. Research, Pedagogy: Describe a flowchart for the screening/referral/evaluation process according to New Mexico regulations.
3. Practitioner, Effectiveness: Describe the uses of criterion and norm-referenced instruments as well as alternative forms of

assessment (observation, curriculum based assessment and informal techniques).

4. Effectiveness: Identify and discuss instruments/assessment procedures appropriate for use in identifying academic achievement, learning aptitude, vocational aptitude, performance in specific areas, and social emotional functioning.
5. Effectiveness: Identify appropriate instruments/assessment procedures required for the exceptionality recognized under New Mexico regulations.
6. Effectiveness: Administer and score twenty-four instruments in reading, math, written language and processing and to utilize these results in completing test interpretations and psycho-educational reports.
7. Reflection, Pedagogy: Interpret, report, and utilize assessment date in special education programming.
8. Diversity: Determine the assessment needs of students who are speakers of languages other than English.
9. Practitioners: Evaluate a test, write a review, and demonstrate and explain it in class. 1
10. Assessment, Evaluation: Synthesize information gathered through comprehensive assessment procedures into a practical whole.

CEPY 5320. Career/Life Planning and Vocational Assessment
3 Credits (3)
Vocational choice theories, relationship between career choice and life style, sources of occupational and educational information, and approaches to decision making and values clarification. Laboratory involves supervised interpretation of vocational assessment. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean.

Learning Outcomes

1. Career development theories and decision-making models.
2. Career, vocational, educational, occupational and labor market information resources, and career information systems.
3. Career development program planning, organization, implementation, administration, and evaluation.
4. Interrelationships among and between work, family, and other life roles and factors, including the role of multicultural issues in career development.
5. Career and educational planning, placement, follow-up, and evaluation.
6. Assessment instruments and techniques relevant to career planning and decision making.
7. Career counseling processes, techniques, and resources, including those applicable to specific populations in a global economy.

CEPY 5985. Counseling Practicum
3 Credits (3P)
Supervised experience of counseling and consultation. Weekly individual and group supervision involves review of audio, video, and/or live sessions and case presentations. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 6 credits.

Prerequisite: CEPY 5230.

Learning Outcomes

1. Understands ethical and legal considerations specifically related to the practice of clinical mental health counseling.
2. Understands a variety of models and theories related to clinical mental health counseling, including the methods, models, and principles of clinical supervision.
3. Understands the management of mental health services and programs, including areas such as administration, finance, and accountability.
4. Demonstrates the ability to apply and adhere to ethical and legal standards in clinical mental health counseling.
5. Recognizes the importance of family, social networks, and community systems in the treatment of mental and emotional disorders.
6. Uses the principles and practices of diagnosis, treatment, referral, and prevention of mental and emotional disorders to initiate, maintain, and terminate counseling.
7. Applies multicultural competencies to clinical mental health counseling involving case conceptualization, diagnosis, treatment, referral, and prevention of mental and emotional disorders.
8. Applies effective strategies to promote client understanding of and access to a variety of community resources.
9. Demonstrates appropriate use of culturally responsive individual, couple, family, group, and systems modalities for initiating, maintaining, and terminating counseling. 1
10. Demonstrates the ability to use procedures for assessing and managing suicide risk. 1
11. Applies current record-keeping standards related to clinical mental health counseling. 1
12. Provides appropriate counseling strategies when working with clients with addiction and co-occurring disorders. 1
13. Demonstrates the ability to recognize his or her own limitations as a clinical mental health counselor and to seek supervision or refer clients when appropriate. 1
14. Maintains information regarding community resources to make appropriate referrals. 1
15. Advocates for policies, programs, and services that are equitable and responsive to the unique needs of clients. 1
16. Demonstrates the ability to modify counseling systems, theories, techniques, and interventions to make them culturally appropriate for diverse populations. 1
17. Knows the principles and models of assessment, case conceptualization, theories of human development, and concepts of normalcy and psychopathology leading to diagnoses and appropriate counseling treatment plans. 1
18. Understands various models and approaches to clinical evaluation and their appropriate uses, including diagnostic interviews, mental status examinations, symptom inventories, and psychoeducational and personality assessments. 1
19. Demonstrates skill in conducting an intake interview, a mental status evaluation, a biopsychosocial history, a mental health history, and a psychological assessment for treatment planning and caseload management. 2
20. Demonstrates appropriate use of diagnostic tools, including the current edition of the DSM, to describe the symptoms and clinical presentation of clients with mental and emotional impairments. 2
21. Demonstrates the ability to conceptualize an accurate multi-axial diagnosis of disorders presented by a client and discuss the differential diagnosis with collaborating professionals.

CEPY 5990. Advanced Counseling Practicum
3-6 Credits (3-6P)
Supervised experience of appraisal and individual, family, and/or group counseling and consultation serving child, adolescent, and/or adult clients. Weekly individual and group supervision involves review of counseling sessions and case presentations. This course will carry a subtitle to reflect the practicum setting. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to CEP graduate majors. May be repeated up to 6 credits.
Prerequisite: CEPY 5985 or consent of instructor.
Learning Outcomes
1. Obtain a minimum of one-hundred and fifty clinical hours including sixty hours of direct service (face-to-face) with clients appropriate to the program. For students enrolled in only six credits, this translates to three-hundred clinical hours, including one-hundred and twenty hours of direct service.
2. Obtain one hour a week of individual supervision with the on-site supervisor and a minimum of one and a half hours per week of group supervision with a program faculty member.
3. Students will have the opportunity to become familiar with a variety of professional activities in addition to direct service such as record keeping, information and referral, in-service, and staff meeting.
4. Students will have an opportunity to gain supervised experience in the use of a variety of professional resources such as assessment instruments, technologies, professional literature, and research.
5. Students receive a formal evaluation by site supervisor and program faculty member.
6. Students will have opportunity to work with clients who represent the ethnic and demographic diversity of their community.
7. Students will formally evaluate their supervisors and learning experience at the end of their internship experiences.
8. Students will be covered by professional liability insurance while enrolled in this course.
9. Students will adhere to ethical standards of ACA and related entities, and applications of ethical and legal considerations in professional counseling. 1
10. Students will have an opportunity to apply concepts of mental health education, consultation, collaboration, outreach and prevention strategies, and community mental health advocacy.

CEPY 5997. Special Research Programs
1-6 Credits (1-6)
Individual investigations either analytical or experimental. Maximum of 6 credits per semester and total of 9 credits overall. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 9 credits.
Learning Outcomes
1. Learning outcomes will vary depending on course content.

CEPY 5998. Counseling Internship
3-12 Credits (3-12)
Supervised experience in a professional counselor role in a school or agency. Students perform all counselor functions including appraisal, individual/family/group counseling, consultation, administration, program development, research, and/or evaluation. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 12 credits.
Prerequisite: CEPY 5990.
Learning Outcomes
1. Obtain a minimum of six-hundred clinical hours including two-hundred and forty hours of direct service (face-to-face) with clients appropriate to the program. For students enrolled in only six credits, this translates to three-hundred clinical hours, including one-hundred and twenty hours of direct service.
2. Obtain one hour a week of individual supervision with the on-site supervisor and a minimum of one and a half hours per week of group supervision with a program faculty member.
3. The student has the opportunity to become familiar with a variety of professional activities in addition to direct service such as record keeping, information and referral, in-service, and staff meeting.
4. The student has an opportunity to gain supervised experience in the use of a variety of professional resources such as assessment instruments, technologies, professional literature, and research.
5. Students receive a formal evaluation by site supervisor and program faculty member.
6. Students will have opportunity to counsel clients who represent the ethnic and demographic diversity of their community.
7. Students will formally evaluate their supervisors and learning experience at the end of their internship experiences.
8. Students will be covered by professional liability insurance while enrolled in internship.
9. Students will adhere to ethical standards of ACA and related entities, and applications of ethical and legal considerations in professional counseling. 1
10. Students will have an opportunity to apply concepts of mental health education, consultation, collaboration, outreach and prevention strategies, and community mental health advocacy.

CEPY 5999. Master's Thesis
1-15 Credits (1-15)
Thesis. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 88 credits.
Learning Outcomes
1. To develop and complete master's research thesis.

CEPY 6120. Human Development
3 Credits (3)
Same as CEPY 5120 with differentiated assignments for Ed.S and Ph.D. students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Students will understand and be able to apply the major theories and research that attempt to explain chronological constancy and change in human beings, with emphasis on practical applications and implications.
2. Students will build a foundational knowledge of human development for adaptation to the professional fields of education, counseling, and psychology.
3. Students will explore the universality and cultural variations in human development from conception to death.

4. Students will learn about the factors which facilitate and impede healthy physical, cognitive, social, and affective/emotional development.

CEPY 6130. Psychology of Multiculturalism
3 Credits (3)
In this advanced course for post-master's graduate students in applied fields of psychology, students will apply psychological concepts related to multiculturalism as well as critical race theories, feminist theories, queer theories, and liberation theories to understand intersecting social identities. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: SPSY, C EP, CEP majors.
Learning Outcomes
1. Students will understand and apply multicultural and pluralistic characteristics within and among diverse groups nationally and internationally.
2. Students will understand and apply theories and models of multicultural counseling, cultural identity development, and social justice and advocacy.
3. Students will understand and apply multicultural counseling competencies.
4. Students will understand and apply the impact of heritage, attitudes, beliefs, understandings, and acculturative experiences on an individual's views of others
5. Students will understand and apply the effects of power and privilege for counselors and clients.
6. Students will understand and apply help-seeking behaviors of diverse clients.
7. Students will understand the impact of spiritual beliefs on clients' and counselors' worldviews.
8. Students will understand and apply strategies for identifying and eliminating barriers, prejudices, and processes of intentional and unintentional oppression and discrimination.

CEPY 6140. Cognitive & Affective Basis of Behavior
3 Credits (3)
This course provides an overview of cognitive and affective bases of behavior as well as the integration of cognition and affect in psychological processes. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, program director, department head, and graduate school dean. Restricted to CEP graduate majors. May be repeated up to 3 credits.
Learning Outcomes
1. Students will be able to identify key concepts of cognition such as memory, attention and learning.
2. Students will identify the functions and roles of affect and emotional expression.
3. Students will understand the connection between cognition and affect and how these two areas of human function influence each other.
4. Students will be able to integrate and apply research findings and implications in the study of cognition and affect to practical experiences.
5. Students will apply models and theories of cognition and affect to understanding and predicting behavior.

CEPY 6150. Social Psychology
3 Credits (3)
Theory, research and practice from feminist and multicultural perspectives will examine the integration of social identities such as gender, sexual orientation, race, ethnicity, age, social class, spirituality, and ability in relation to counseling psychology. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to: CEP graduate majors. May be repeated up to 3 credits.
Learning Outcomes
1. Heighten the student's awareness of multiple social identities, worldview beliefs, and other within-group variables.
2. Aid the student in developing a knowledge base in the realms of social psychology and multicultural research, culturally-responsive interventions and professional practice.
3. provide experiences for the application of this awareness and knowledge as a means of Develop the skills necessary for being a reflective decision-maker, creative problem solver, and responsive service provider for diverse individuals in a variety practice settings and intervention modalities.

CEPY 6160. History and Systems of Psychology
3 Credits (3)
History and systems of psychology related to contemporary applied psychology. This course will focus largely on the history of modern psychology and on the major systems (or schools) of psychology. Restricted to CEP graduate majors.
Learning Outcomes
1. Effectively discuss historical and philosophical antecedents and contexts of psychology and compare and contrast multiple perspectives on important issues in this field.
2. Apply global awareness to this topic (e.g., intersecting identities; how interlocking oppressions vary by epoch, continent, nation, cultural group, region, organizational system; etc.)
3. Develop professional arguments; support opinions with reason and personal experience; and demonstrate higher order thinking and creative engagement (for definitions of terms like analyze, synthesize, evaluate, and create.
4. Develop thoughtful inquiries that inspire scholarly discourse and further investigation; consider which types of evidence are needed to find answers; and effectively facilitate respectful, thought-provoking discussions of controversies and debatable topics.

CEPY 6170. Psychology of Poverty
3 Credits (3)
This course is designed to examine the nature, extent and impact of poverty on Southwestern populations and across the United States in relation to assessment and interventions and its impact on the education and psychological well-being of children and families. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: CEP graduate majors.
Learning Outcomes
1. Students will learn how views of poverty have evolved in history.
2. Students will be aware and demonstrate the skills of the different methods used to measure and understand poverty.
3. Students will identify and apply relevant issues from education, health disparities, and criminal justice related to the psychology of poverty.

4. Students will evaluate and present their own self-awareness and understanding of their worldview of poverty, along with its impact of how they view others in poverty.
5. Students will conduct self-assessments regarding their range of liberalism/conservatism; implicit bias and how it impacts their interpretation of information of poverty.
6. Students will understand and lead discussions as to why poverty remains so prevalent in U.S. society.
7. Students will be able to articulate the within group differences and similarities of racial and ethnic backgrounds or family types that are susceptible to poverty.
8. Students will learn successful interventions in working with children, adolescents and families impacted by the psychology of poverty.

CEPY 6175. School Intervention and Organization in a Diverse Society
3 Credits (3)
Introduces public school organization and laws and the psycho-sociological perspective of education. Curriculum and theory, teaching methods and materials will be presented and operationalized through a psycho-educational point of view.

Learning Outcomes

1. Show knowledge of public school organizations and their functions.
2. Demonstrate knowledge of public school and special education law.
3. Express knowledge of sociological and psychological constructs in education.
4. Convey knowledge of and be able to utilize research-based multi-contextual teaching, curriculum, theory, and intervention methods for students in special education settings.
5. Communicate knowledge of and be able to utilize appropriate materials for students in special education settings.

CEPY 6180. Physiology of Behavior
3 Credits (3)
Basic biological aspects of psychopharmacology with applications to clinical populations and treatment implications. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, and department head. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to understand and apply concepts related basic neuroanatomy, neurochemistry, and neurophysiology.
2. Students will be able to understand and apply basic knowledge related basic biological basis of the interdependence between behavior, cognition, and emotion.
3. Students will understand the pharmacology and pharmacodynamics of major drug groups used in the treatment of CNS diagnoses; including, but no limited to, antidepressants, antipsychotics, anxiolytics, anticonvulsants, and natural remedies or herbal supplementation.
4. Students will recognize the strengths and weaknesses of a wide range of research methodologies to screen compounds and test the mechanisms of action of drugs.
5. Students will understand the drug development process from target identification to FDA approval and ongoing safety surveillance.
6. Students will appreciate how pharmacological investigation informs the understanding of the underlying pathology of the illness.
7. Students will access, critique, and assimilate evidence from scientific studies as it relates to translational neuroscience and the search for promising targets for psychotropic drugs.
8. Students will become familiar with to the indication, contraindication, therapeutic drug monitoring, and effectiveness of medications across DSM-V classifications. As well as psychotropic drug tapering or switching. The implications of patient characteristic and medical co-morbidities are addressed.
9. Students will share informed opinions about advances and challenges in experimental (off-label) psychopharmacology; and of their opinions of integrated psychotherapy or combined medicine. 1
10. Students will work effectively with peers and Instructor; as part of multidisciplinary learning environment.

CEPY 6185. Ethics, Law & Professional Issues in School Psychology
3 Credits (3)
This course provides an introduction and overview of the profession of school psychology with emphasis on the roles, functions, and competencies of the school psychologist within the context of legal and ethical practice. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean.

Learning Outcomes

1. Students will demonstrate an understanding of various professional issues, role functions, and historical contexts related to the field of school psychology.
2. Students will demonstrate the ability to examine and apply critical perspectives related to various professional issues, role functions, and the historical contexts associated with the field of school psychology.
3. Students will explore best practices issues associated with school psychology role functions and practices.
4. Students will demonstrate the development of skills leading her or him toward becoming a culturally responsive practitioner in the field of school psychology.
5. Students will obtain knowledge of the National Association of School Psychologists (NASP) Principles of Professional Ethics (2020) and the American Psychological Association's Ethical Principles of Psychologists and Code of Conduct (2010; 2016 amendments) and learn to apply these principles to specific areas of practice such as assessment, direct and indirect intervention, consultation, and research.
6. Students will understand complexities of ethical and legal issues occurring in school settings and will develop ethical decision-making skills.
7. Students will demonstrate knowledge of the provisions of state and federal statutes such as the Individuals with Disabilities Education Improvement Act (2004), Every Student Succeeds Act (2017) and Section 504of the Rehabilitation Act of 1973 as well as other case laws related to the practice of school psychology and learn how to apply these mandates to the practice of school psychology.
8. Students will understand the importance of developing awareness of the legal and ethical issues affecting their professional identity and the need to remain current on these issues throughout their careers as school psychologists.
9. Students will continue to emerge as critical thinkers, reflective decision-makers, and creative problem-solvers, in general.

CEPY 6190. Ethical/Professional Issues in Counseling Psychology
3 Credits (3)
History of counseling psychology, scientist-practitioner model, American Psychological Associations Ethical Principles of Psychologists and Code

of Conduct. Focus on current ethical, professional, and scientific issues. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to: CEP majors. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be knowledgeable of and act in accordance with the current version of the APA Ethical Principles of Psychologists and Code of Conduct, relevant laws, regulations, rules, and policies governing health service psychology at the organizational, local, state, regional, and federal levels, and relevant professional standards and guidelines; Recognize ethical dilemmas as they arise, and apply ethical decision-making processes in order to resolve the dilemmas; Conduct self in an ethical manner in all professional activities.
2. Students will develop an understanding of how their own personal/cultural history, attitudes, and biases may affect how they understand and interact with people different from themselves; Apply knowledge of the current theoretical and empirical knowledge base as it relates to addressing diversity in all professional activities including research, training, supervision/consultation,and service.
3. Students will be expected to behave in ways that reflect the values and attitudes of psychology, including integrity, deportment, professional identity, accountability, lifelong learning, and concern for the welfare of others; Engage in self-reflection regarding one's personal and professional functioning and engage in activities to maintain and improve performance, well-being, and professional effectiveness
4. Students will be expected to produce and comprehend oral, nonverbal, and written communications that are informative and well-integrated; demonstrate a thorough grasp of professional language and concepts; Demonstrate effective interpersonal skills and the ability to manage difficult communication well.

CEPY 6210. School Psychology Research and Program Evaluation
3 Credits (3)

Survey and analysis of research and program evaluation procedures in school psychology. Critical review of literature, formulating questions, quantitative and qualitative methodology, and data analysis as foundations for reading research literature and generating research, program evaluation, and/or grant proposals. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will advance their foundational knowledge of research methodology and research design.
2. Students will develop skills and knowledge to conduct comprehensive literature reviews.
3. Students will critique scientific research studies by applying attained knowledge in research methodology and design.
4. Students will produce a research proposal they will conduct in their areas of interest within the field of school psychology.
5. Students will present a research proposal that will conduct within the field of school psychology.
6. Students will demonstrate skills and knowledge for program evaluation by developing a program evaluation plan.
7. Students will demonstrate knowledge and skills necessary to conduct single-subject design studies.

CEPY 6220. Spanish for Mental Health Professionals
3 Credits (3)

This course emphasizes the vocabulary for Mental Health Professionals to include academic, psychological and medical terminology. Students will incorporate Spanish terms in assessment and treatment plans through role plays. Further, the course will include an overview of the use of interpreters and translators in working with culturally and linguistically diverse clientele. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: CEP graduate majors. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to demonstrate brief, basic conversation in Spanish using mental health and health-care related expressions and terminology.
2. Students will be able to understand and respond to relevant cultural and linguistic client concerns related to presenting issues.
3. Students will be able to increase their Spanish speaking capabilities when engaged in their professional roles (e.g. conducting clinical interviews, gathering mental health histories, conducting assessments and delivering interventions using various theoretical frameworks).
4. Students will understand cultural and social factors that influence the practitioner-client relationship and communication with Latinx clients.
5. Students will be able to engage effectively in role play situations involving application of concepts learned.

CEPY 6240. Child and Adolescent Counseling Theory and Technique
3 Credits (3)

Taught with CEPY 5240 with differentiated assignments for Ed.S. and Ph.D. students. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to demonstrate an understanding of their psychosocial and cultural context and how such phenomena influence their values, beliefs and, therefore, theoretical orientation to counsel children and adolescents.
2. Students will be able to demonstrate the ability to examine and apply critical perspectives related to counseling children and adolescents.
3. Students will be able to compare and contrast various theoretical perspectives in the area of counseling children and adolescents.
4. Students will be able to demonstrate the development of a knowledge base leading toward becoming a culturally responsive practitioner in the area of counseling with individuals from a variety of diverse backgrounds
5. Students will be able to identify, describe, and apply legal and ethical issues relevant to practice in the area of counseling children and adolescents in various settings.
6. Students will be able to collaborate with others in the process of developing relevant treatment plans and providing counseling services to children and adolescents in diverse settings.

CEPY 6250. Family Therapy Theory and Technique
3 Credits (3)

Taught with CEPY 5250 with differentiated assignments for Ed.S and Ph.D students. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the

permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate their comprehension of a systems perspective that provides an understanding of family and other systems theories and major models of family and related interventions.
2. Students will demonstrate an understanding of the family life cycle and impact on family and individual functioning.
3. Students will demonstrate an awareness of and develop skills with various forms of assessment for families and couples, including observation, collection of collateral information, and interviewing.
4. Students will demonstrate an awareness of and develop skills in using formal and informal assessment measures used in family and couple counseling.
5. Students will develop conceptual skills that demonstrate an understanding of theory and implementation of interventions.
6. Students will demonstrate knowledge about evidenced-based interventions and treatments for family and couple counseling.
7. Students will demonstrate their understanding of multicultural counseling theories and techniques for family and marital counseling.
8. Students will be able to apply multicultural and family theories to their own experience in an effort to improve your counseling work.
9. Students will demonstrate will demonstrate an ability to communicate and relate effectively to families and couples. 1
10. Students will be able to design and implement outreach and psychoeducational interventions to families and couples. 1
11. Students will demonstrate their knowledge related to ethical issues surrounding counseling families and couples and be able to make sound judgments.

CEPY 6260. Consultation

3 Credits (3)

Didactic and experimental trainings in theory-based consultation. Supervision provided by faculty involves audio, video, and/or live observation consultation activities and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean.

Learning Outcomes

1. You will develop knowledge and skills in the practice of problem-solving model in school settings.
2. You will develop knowledge of various consultation and supervision theories.
3. You will develop their theoretical orientation to consultation in school settings.
4. You will develop knowledge and skills to devise and conduct a single-subject design intervention in the context of the consultation.
5. You will demonstrate an understanding of current issues in relation to consultation practices in school settings.
6. You will demonstrate skills for conducting consultation with teachers and parents with diverse backgrounds.
7. You will understand and adhere to ethical practices in conducting a consultation case.

CEPY 6265. Diagnostic Class

3 Credits (3)

Emphasis on developing the knowledge, skills, and necessary application abilities related to diagnosis and associated interventions related to mental health and psychopathology issues that impact a student's ability to navigate the education setting. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be expected to demonstrate the knowledge of the etiology, the diagnostic process and nomenclature, treatment, referral, and prevention of mental and emotional disorders.
2. Students will be expected to demonstrate knowledge of the principles, models, and documentation formats of biopsychosocial case conceptualization and treatment planning.
3. Students will be expected to demonstrate understanding of current literature that outlines theories, approaches, strategies, and techniques shown to be effective when working with specific populations of clients with mental and emotional disorders.
4. Students will be expected to demonstrate understanding of basic classifications, indications, and contraindications of commonly prescribed psychopharmacological medications so that appropriate referrals can be made for medication evaluations and so that the side effects of such medications can be identified
5. Students will be expected to demonstrate knowledge of the principles of the diagnostic process, including differential diagnosis, and the use of current diagnostic tools, such as the current edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM)
6. Students will be expected to demonstrate understanding of the established diagnostic criteria for mental and emotional disorders, and describes treatment modalities and placement criteria within the continuum of care.
7. Students will be expected to demonstrate knowledge of the the impact of co-occurring substance use disorders on medical and psychological disorders.
8. Students will be expected to demonstrate understanding of the relevance and potential biases of commonly used diagnostic tools with multicultural populations.
9. Students will be expected to demonstrate understanding of the appropriate use of diagnosis during a crisis, disaster, or other trauma-causing events. 1
10. Students will be expected to differentiate between diagnosis and developmentally appropriate reactions during crises, disasters, and other trauma-causing events.

CEPY 6270. Diagnosis and Treatment Planning

3 Credits (3)

Taught with CEPY 5270 with differentiated assignments for Ph.D. students. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be expected to demonstrate knowledge of the etiology, the diagnostic process and nomenclature, treatment, referral, and prevention of mental and emotional disorders.
2. Students will be expected to demonstrate knowledge of the principles, models, and documentation formats of biopsychosocial case conceptualization and treatment planning.
3. Students will be expected to demonstrate practice of using the DSM 5 to create differential diagnoses.

4. Students will be expected to construct an initial treatment plan based upon a systemic and differential diagnosis.
5. Students will be expected to formulate a culturally relevant diagnosis and treatment plan.
6. Students will be expected to discuss the barriers to assessment and treatment, as it relates to mental illness stigma.

CEPY 6275. Professional Preparation Seminar
3 Credits (3)
This seminar course provides academic support for students enrolled in the Specialist in Education (Ed.S.) School Psychology Program in preparation for capstone experiences (i.e., internship and culminating exams) in addition to continued development of students' professional identity as School Psychologists.
Learning Outcomes
1. Students will reflect on the growth of their knowledge, experiences, and skills gained in the School Psychology Program (SPP).
2. Students will reflect on how to expand their knowledge and skills during their internship.
3. Students will prepare for securing an internship position.
4. Students will develop and articulate a professional philosophy of counseling within school psychology.
5. Students will demonstrate skill in oral and written presentations.
6. Students will understand the role of mentoring and supervision in personal and professional.

CEPY 6320. Career/Life Planning and Vocational Assessment
3 Credits (3)
Taught with CEPY 5320 with differentiated assignments for Ed.S and Ph.D. students. Restricted to CEP graduate students. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Knowledge and understanding of career development theories and decision-making models.
2. Knowledge and understanding of career, vocational, educational, occupational and labor market information resources, and career information systems.
3. Knowledge and understanding of career development program planning, organization, implementation, administration, and evaluation.
4. Knowledge and understanding of interrelationships among and between work, family, and other life roles and factors, including the role of multicultural issues in career development.
5. Knowledge and understanding of career and educational planning, placement, follow-up, and evaluation.
6. Knowledge and understanding of assessment instruments and techniques relevant to career planning and decision making.
7. Knowledge and understanding of career counseling processes, techniques, and resources, including those applicable to specific populations in a global economy.

CEPY 6330. Behavior Assessment and Intervention
3 Credits (3)
This course introduces basic concepts, methods, and applications of academic and behavior assessment and intervention. Students will learn how to conduct functional/informal assessments of academic and behavior and how to write behavior and academic plans. Methods appropriate for assessment and intervention of school-age children will be emphasized. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to: CEP graduate majors.
Learning Outcomes
1. Students will gain and demonstrate knowledge on how behavior assessment fits within psychological/psycho-educational assessment.
2. Students will demonstrate the ability to examine and apply critical perspectives related to educational assessment.
3. Students will learn the rational, defining features and theoretical underpinnings of behavioral assessment.
4. Students will learn how to conduct and complete functional assessments of behavior.
5. Students will learn how to develop and evaluate a satisfactory positive behavior intervention plan.
6. Students will develop and/or learn techniques of behavioral observation.
7. Students will learn how to integrate behavioral observation findings with other assessment methods.

CEPY 6340. Appraisal of Cognitive Functioning
3 Credits (3)
Selection, administration, scoring, interpretation, and report writing using individual tests of intelligence. Moderator variables, such as acculturation, ethnic identity development, and world view are also incorporated. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Students will become knowledgeable about the historical background of intelligence testing.
2. Students will become knowledgeable about the major theories of intelligence.
3. Students will be able to discuss orally and in writing the pros and cons of intelligence testing and will be able to support the discussion with specific facts and research.
4. Students will be able to select "appropriate" intellectual assessment instruments for children, adolescents, and adults.
5. Students will be able to state pertinent information relative to these major intelligence tests such as age range, standardization, reliability, and validity.
6. Students will demonstrate mastery of administration, scoring, and interpretation of various norm-referenced cognitive assessment instruments while taking into consideration the cultural context of the individual.
7. The student will be able to demonstrate the ability to integrate information into meaningful written reports.

CEPY 6350. Appraisal of Personality
3 Credits (3)
Selection, administration, scoring, interpretation, and report writing using major objective and projective tests of personality. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Knowledge of the current theoretical and empirical knowledge base as it relates to addressing diversity in all professional activities including research, training, supervision/consultation, and service.
2. Produce and comprehend oral, nonverbal, and written communications that are informative and well-integrated; demonstrate a thorough grasp of professional language and concepts.
3. Demonstrate current knowledge of diagnostic classification systems, functional and dysfunctional behaviors, including consideration of client strengths and psychopathology.
4. Demonstrate understanding of human behavior within its context (e.g., family, social, societal and cultural).
5. Demonstrate the ability to apply the knowledge of functional and dysfunctional behaviors including context to the assessment and/or diagnostic process.
6. Select and apply assessment methods that draw from the best available empirical literature and that reflect the science of measurement and psychometrics; collect relevant data using multiple sources and methods appropriate to the identified goals and questions of the assessment as well as relevant diversity characteristics of the service recipient.
7. Interpret assessment results, following current research and professional standards and guidelines, to inform case conceptualization, classification, and recommendations, while guarding against decision-making biases, distinguishing the aspects of assessment that are subjective from those that are objective.
8. Communicate orally and in written documents the findings and implications of the assessment in an accurate and effective manner sensitive to a range of audiences.

CEPY 6360. School Safety and Crisis Response
3 Credits (3)

This course emphasizes a comprehensive and systematic approach for school safety, emergency readiness, and crisis response skill development for school-based mental health professionals. Developing prevention and post-crisis intervention skills through teaming, planning, and data-based decision making is highlighted. Course content fits within a multi-tiered system of support assessment and intervention model.

Learning Outcomes

1. Demonstrate knowledge of school crisis prevention and intervention within a multi-tiered system of support.
2. Demonstrate knowledge of school physical safety and psychological safety as crisis prevention concepts.
3. Demonstrate knowledge of legal requirements and best practices surrounding school safety teams/plans and school crisis teams/plans.
4. Demonstrate knowledge of how to evaluate school and individual needs after a school crisis.
5. Demonstrate knowledge of important school crisis data for making decisions about crisis prevention, preparedness, and intervention.
6. Demonstrate knowledge and skills related to school crisis intervention (e.g., psychoeducational strategies, group crisis intervention, individual crisis intervention, and long-term psychotherapy).
7. Demonstrate emerging crisis intervention skills (through role playing in the classroom).

CEPY 6410. Introduction to Qualitative Research
3 Credits (3)

This course is intended to be an introduction to qualitative research methods for persons wishing to understand, apply, and conduct qualitative studies with human subjects in the fields of counseling and psychology. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students will understand the importance of applying and conducting culture-centered and ethical psychological research among persons from ethnic, linguistic, and racial minority backgrounds.
2. Students will understand the shift that has taken place in the past century from ignoring cultural variables to that of valuing the vast amounts of uncharted knowledge that is contained therein.
3. Students will gain a deeper understanding of the qualitative paradigm that informs research and the way we conduct and consume it.
4. Students will understand the components that make up good qualitative research considering carefully the variables that inform the proposed outcome of the study.
5. Students will assess the benefit of research to the entities, individuals and communities being studied.
6. Students will learn to be grounded in the empirical and conceptual literature on the ways that culture influences the variables under investigation, as well as psychological and social science research traditions and skills.
7. Students will be aware of their cultural assumptions on which their research questions are based (Egharevba, 2001).
8. Students will learn to be aware of, and if appropriate, to apply indigenous theories when conceptualizing research studies. They are encouraged to include members of cultural communities when conceptualizing research, with particular concern for the benefits of the research to the community (Fontes, 1998; LaFromboise, 1988).
9. Students will learn to consider the psychological (rather than demographic) contextual factors of race, ethnicity, language, gender, sexual orientation, socio-economic status, and other social dimensions of personal experience in conceptualizing their research design (Fouad Brown, 2000; Quintana et al., 2001). 1
10. Students will strive to recognize and incorporate research methods that most effectively complement the worldview and lifestyles of persons who come from a specific cultural and linguistic population; e.g., quantitative and qualitative research strategies (Hoshmand, 1989; Marin Marin, 1991; Ponterotto Casas, 1991). 1
11. Students will learn to consider culturally sensitive assessment techniques and data-generating procedures. 1
12. In analyzing and interpreting data from research studies and in proposed research, students will learn to consider cultural influences as possible explanations for their findings. 1
13. Students will learn the importance of considering the benefit to participants, and to include participants in the interpretation of results. They are encouraged to find ways for the results to be of benefit to the community, and to represent the participants' perspectives accurately and authentically.

CEPY 6420. Psychometrics
3 Credits (3)

An introduction to psychometrics, including topics such as theory and techniques of psychological measurement, scale and inventory construction, reliability, validity, evaluation of measurement quality, classical and contemporary measurement theory, and standardization. Restricted to CEP graduate majors. Non-majors may be permitted to

enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean.

Learning Outcomes

1. Students will acquire knowledge and skills in psychometrics.
2. Students will understand and apply psychometric theory through the completion of instrument evaluation, instrument development,and factor analysis projects.

CEPY 6425. Counseling Psychology Research
3 Credits (3)

Survey and analysis of research and program evaluation procedures in counseling psychology. Critical review of literature, formulating questions, quantitative and qualitative methodology, and data analysis are covered as a foundation for reading research literature and generating research, program evaluation, and/or grant proposals. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Students refine their foundational knowledge of research methods.
2. Students learn how to conduct comprehensive literature reviews in counseling psychology.
3. Students learn about sampling procedures and their limitations.
4. Students refine their knowledge about measurement applied to research (including the reliability, validity, norms and cultural relevance of measurement procedures).
5. Students refine their knowledge of statistics and the application of statistics to deriving conclusions from research data.
6. Students learn about ethical issues related to conducting research.
7. Students apply knowledge and skills in the areas described above to the critique of counseling psychology research.
8. Students apply knowledge and skills in the areas described above to the development of a draft proposal for research they can conduct in their area of interest within counseling psychology.
9. Students present and defend a proposal for research in counseling psychology.

CEPY 6430. Advanced Statistics
3 Credits (3)

An intermediate course focusing on more advanced theories and techniques of inferential statistics as applied to education and psychology. Includes ANOVA, planned contrasts, ANCOVA, simple regression, and non-parametrics. Both hand calculation and computer packages will be employed. Open to all College of HEST majors. May be repeated up to 3 credits.

Learning Outcomes

1. Students will understand how to describe procedural steps to submit proposals to the IRB at NMSU.
2. Students will be able to create data files and use SPSS to clean and examine datasets to assess data quality.
3. Students will be understand how to plan to address a research question, identify appropriate statistical tests and variables.
4. Students will be able to use SPSS to run statistical analyses to examine differences in means or relationships between two variables.
5. Students will understand how to assess assumptions and interpret findings of these analyses.
6. Students will understand key concepts, such as statistical significance, error, effect size, sample size, and statistical power.of analytic approaches, findings, and interpretations of the data
7. Students will be able to effectively communicate using scientific writing and accurate portrayal of the data in terms.

CEPY 6440. Multivariate Statistics
3 Credits (3)

Theories and techniques of multivariate statistics as applied to education and psychology. Includes multiple regression, logistic regression, MANOVA, factor analysis, and structural equation modeling. Computer packages will be the primary tool for data analysis. Open to all majors of the College of HEST. May be repeated up to 3 credits.

Learning Outcomes

1. To be able to construct statistical models, both non-multivariate (e.g., multiple regression) and multivariate (e.g., MANOVA, MANCOVA), and carry out the analysis using statistical software (e.g., SPSS, R).
2. To be able to interpret results of both non-multivariate and multivariate analyses, in the context of the data.
3. To be able to generate original research questions that can be answered with quantitative methods discussed in this course.
4. To be able to carry out a quantitative method discussed in this course to answer a research question(s), and to be able to appropriately interpret the results.
5. To be able to read published research in your field of study that makes use of multivariate methods, and critically interpret the results based on the claims and evidence provided.

CEPY 6450. Educational Experimentation
3 Credits (3)

Same as ELAD 6910. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 3 credits.

Learning Outcomes

1. Reflect on abilities to identify and effectively manage strengths and potential barriers that may impact progress on dissertation by thoroughly analyzing strengths and barriers and developing an action plan.
2. Conceptualize a dissertation topic that is germane to the field of Counseling Psychology and provide a convincing argument supporting the need for such research.
3. Conduct extensive and systematic literature searches for previous research and theory relevant to dissertation topic.
4. Write a comprehensive outline and annotated bibliography of the literature that incorporates the most relevant research and theoretical work associated with dissertation topic to inform literature review.
5. Clearly state research questions and hypotheses that will be examined in dissertation.
6. Create a detailed and comprehensive action plan that adheres to APA ethical guidelines for research that a reader can use to replicate dissertation study (i.e., method section).
7. Demonstrate understanding of the importance of having a diverse sample.
8. Present dissertation research to the class in a simulated proposal meeting.
9. Become more adept at providing support and challenge to student peers during weekly seminars and simulated proposal meetings. 1

10. Identify strategies for choosing and working with your dissertation committee effectively. 1
11. Demonstrate your knowledge of APA writing style.

CEPY 6510. Practicum in School Psychology: Psychoeducational
1-6 Credits (1-6)
Supervised practicum in psychological and educational evaluation. Skill development in ecological assessment, including interviewing, observations micro-counseling, acculturation, world view, and ethnic identity formation. Graded: S/U Grading (S/U, Audit). Restricted to CEP graduate majors. May be repeated up to 6 credits.
Prerequisite: CEPY 6340, CEPY 5310.
Learning Outcomes
1. Students will demonstrate sound diagnostic reasoning and data based decision-making through the formulation of possible preliminary hypotheses and testing of hypotheses via use of appropriate assessment methods.
2. Students will demonstrate skills in planning appropriate assessments, taking into consideration contextual factors, referral concerns, and background information; and will select appropriate evaluation methods.
3. Students will demonstrate skills related to devising and implementing evidence-based academic interventions for students in need.
4. Students will demonstrate sensitivity in regards to cultural diversity and diversity of values, as well as begin the process of being culturally responsive in their professional practices.
5. Students will become familiar with and practice in accordance with best practices and relevant standards of the profession.
6. Students will become familiar with the application of state special education rules and regulations.
7. Students will identify and apply relevant legal and ethical responsibilities and requirements.
8. Students will demonstrate effective interpersonal skills with clients and colleagues, appropriate to the functioning as a professional school psychologist.

CEPY 6520. Field Experience in Educational Diagnostics
1-6 Credits (1-6)
CEPY 6520 is designed to provide students with supervised school-based experiences and practices. The goal of the course is for students to master the competencies required for the delivery of academic services in the educational diagnostician role. The specific emphases in this course are placed on a data-based decision-making skills, psychoeducational assessment activities, and academic interventions.Under faculty and school-system staff supervisions, students will assume service delivery responsibilities and with increasing independence will respond to the diagnostic and intervention needs of students. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 6 credits.
Prerequisite: CEPY 6340 and CEPY 5310.
Learning Outcomes
1. Students will demonstrate sound diagnostic reasoning and data-based decision-making through the formulation of possible preliminary hypotheses and testing of hypotheses via use of appropriate assessment methods.
2. Students will demonstrate skills in planning appropriate assessments, taking into consideration contextual factors, referral concerns, and background information; and will select appropriate evaluation method.
3. Students will demonstrate skills related to devising and implementing evidence-based academic interventions and provide recommendations for students in need.
4. Students will demonstrate sensitivity in regards to cultural diversity and diversity of values, as well as begin the process of being culturally competent in their professional practices.
5. Students will become familiar with and practice in accordance with best practices and relevant standards of the profession.
6. Students will become familiar with the application of state special education rules and regulations.
7. Students will identify and apply relevant legal and ethical responsibilities and requirements.
8. Students will demonstrate effective interpersonal skills with clients and colleagues.

CEPY 6530. Practicum in School Psychology: Psychological
1-6 Credits (1-6)
School-based supervised experience for the advanced student. Provides experiences in various roles and models of service delivery (group, multifactored, integrative, family assessments) expected of school psychologists. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to: CEP graduate majors. May be repeated up to 6 credits.
Prerequisite: CEPY 6350 and CEPY 5235.
Learning Outcomes
1. Enhance the knowledge and skill students already possess and aid in the development of new knowledge and skills (related to psychological, behavioral needs of students).
2. Provide students with the opportunity to respond to supervision and use supervision in a constructive manner.
3. Provide students with the opportunity to share experiences as school psychologists in training in a supportive environment.
4. Provide the students with the opportunity to engage in learning activities that will assist them in functioning independently as school psychologists (i.e., data-based decision-making and accountability).
5. Provide the instructor with the opportunity to observe the student's ability to plan and execute successful interventions and demonstrate diagnostic skills.
6. Students will be able to establish a counseling relationship with students' clients through the provision of individual and/or group counseling as stated on their IEP's.
7. Students will be exposed to current issues, theories, and practices in the field of school psychology.
8. Students will be able to integrate theory/research and practice via case presentations.
9. Students will be able to demonstrate knowledge and integration of technology in their practice as school psychologist. 1
10. Students will refine their skills in working with culturally and linguistically diverse students, families, educators, and other professionals.

CEPY 6540. Advanced Multicultural School Psychology Field Experience
3 Credits (3)
Supervised school psychology field experience including appraisal diagnosis, case conceptualization, treatment planning, theory-based counseling and evaluation from a multicultural perspective with diverse

populations. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of sessions and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to CEP graduate majors.
Prerequisite: CEPY 6510, CEPY 6530.
Learning Outcomes

1. Students will enhance the knowledge and skill they already possess and aid in the development of new knowledge and skills (related to psychological, behavioral needs of students).
2. Students will respond to supervision and use supervision in a constructive manner.
3. Students will share experiences as school psychologists in training in a supportive environment.
4. Students will engage in learning activities that will assist them in functioning independently as doctoral-level school psychologists (i.e., data-based decision-making and accountability).

CEPY 6550. Counseling Psychology Theory/Practicum
1-6 Credits (1-6)
Theories of counseling and psychotherapy and their application during supervised counseling with clients. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 6 credits.
Learning Outcomes

1. Students will refine their understanding of counseling theory and hone counseling skills through readings, lecture, demonstration, case presentation, and supervised counseling experiences.
2. Students will learn about and employ a variety of evidence-based approaches to counseling and psychotherapy that have historically been used by counseling psychologists.
3. Students will reflect on their development of an approach to counseling that is effective, theoretically sensible, and personally congruent.

CEPY 6560. Group Work Theory/Practicum
1-6 Credits (1-6)
Application of theory in group work with clients and in supervising group leaders in training. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. Restricted to: CEP majors. May be repeated up to 6 credits.
Prerequisite: CEPY 6550.
Learning Outcomes

1. Apply the basic elements of group theory to small groups, including principles of group dynamics, group process components, developmental stage theories, group member roles and behaviors, and therapeutic factors.
2. Demonstrate effective leadership skills and intervention strategies in simulated class discussions to actual group sessions in the community.
3. Possess knowledge of ethical and professional issues encountered by group leaders.
4. Develop awareness of the relative advantages of group work for clients and counselors, as well as other practical advantages; discern when group may not be the preferred modality for clients.
5. Distinguish characteristics of various group theoriesand approaches.
6. Identify relevant socio-cultural factors and multicultural considerations in group work and its impact on theory, process, and group leadership skills.
7. Communicate how they have improved their skill development relative to self-awareness and group leadership.
8. Have knowledge of professional group organizations, certifications (Certified Group Psychotherapist), and be able to effectively market group skills in preparation for the pre-doctoral internship year.

CEPY 6570. Advanced Counseling Psychology Practicum
1-6 Credits (1-6P)
Supervised counseling psychology experience including appraisal, diagnosis, case conceptualization, treatment planning, theory-based counseling and evaluation. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of counseling sessions and case presentations. Restricted to CEP graduate majors. Graded: S/U Grading (S/U, Audit). May be repeated up to 12 credits.
Prerequisite: CEPY 6560.
Learning Outcomes

1. To increase skill level in clinical work with individual/group/couple therapy and initial intakes through practice, formal supervision, and group case discussion.
2. To integrate one's theoretical orientation into a brief practice therapy model and to improve treatment planning ability.
3. To improve treatment planning ability by increasing knowledge and integration of empirically supported interventions.
4. To increase exposure and use of assessment procedures and tools in clinical work.
5. To be cognizant of cultural/diversity issues with clients and develop enough self-awareness to respond effectively to a wide range of clients.
6. To examine professional identity concerns as they arise and increase one's knowledge base about specific areas of clinical interest.
7. To adhere to APA's Ethical Principles of Psychologists and Code of Conduct and Specialty Guidelines for the Delivery of Service by Counseling Psychologists and Guidelines for Providers of Psychological Services to Ethnic, Linguistic, and Culturally Diverse Populations, and to develop a more applied understanding of them.
8. To increase one's knowledge of relevant Mental Health Statutes and the Board of Psychologist Examiners Rules and Regulations for the state in which you are practicing (NM or TX).
9. To demonstrate self-awareness and self-reflection through ongoing self-evaluation of counseling skills. 1
10. To learn how to design and implement outreach presentations and to gain experience in consulting with interdisciplinary staff. 1
11. To become familiar with and acquire practice with career counseling and the use of career inventories.

CEPY 6580. Supervision Theory and Practicum
1-6 Credits (1-6)
Didactic and experimental training in theory-based supervision. Supervision provided by doctoral psychologist faculty involves audio, video, and/or live observation of supervision sessions and case presentations. Restricted to CEP graduate majors. May be repeated up to 6 credits.

Prerequisite: CEPY 6530 or CEPY 6570.

Learning Outcomes

1. Students will be able to conceptualize the counseling supervision process.
2. Students will be able to understand the differences between various models of counseling supervision in order to develop a clearly conceptualized supervision theory/style.
3. Students will be able to establish an effective supervisory relationship.
4. Students will be able to demonstrate a variety of appropriately used supervision interventions.
5. Students will be able to demonstrate self-awareness through ongoing self-assessment of supervisory skills and self- reflection of your experience.
6. Students will be able to accurately assess your supervisee's abilities and developmental level.
7. Students will be able to be cognizant of cultural/diversity issues with supervisees and develop enough self-awareness to respond effectively to such issues in both supervision and counseling.
8. Students will be able to provide clear and timely feedback to your supervisee based on your on-going assessment.
9. Students will be able to demonstrate the ability to write accurate and timely supervision process and progress notes. 1
10. Students will be able to understand the differences between various models of consultation. 1
11. Students will be able to understand the major issues in consulting and its place within the counseling profession, including orienting students to their professional identities.1
12. Students will be able to understand how to orient students to their professional identities (school psychology, counseling psychology, or counseling. In addition, this course also provides supervisors an orientation to the counseling profession, including its history, counseling professional associations (e.g., the American Counseling Association), counseling licensure, roles counselors full fill in the community, and the difference between counseling and other related professions.

CEPY 6590. Behavioral Health Practicum
1-6 Credits (1-6)

An intensive supervised experience in providing behavioral health services at an on or off campus interdisciplinary health setting. Supervision provided by doctoral level psychologist faculty in collaboration with other team disciplines' supervising faculty involves audio, video, and/or live observation of counseling sessions and team interventions and case presentations. Restricted to CEP graduate majors. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean. May be repeated up to 6 credits.

Learning Outcomes

1. Students will be able to apply a Biopsychosocial model of health and illness to case conceptualizations, treatment plans, and interventions at individual, group, and systemic levels.
2. Students will learn and use motivational interviewing to support patient behavior change
3. Students will learn strategies to employ telehealth services
4. Students will learn behavioral strategies for Opiate Use Disorder
5. Students will learn and perform a functional assessment of patient problems
6. Students will learn and apply evidence-based brief behavior change interventions (e.g. goal setting, self-monitoring, stimulus control, positive reinforcement, guided imagery, progressive muscle relaxation, mindfulness social support)
7. Students will describe and demonstrate behavioral health consultation skills
8. Students will demonstrate understanding of health disparities and social justice issues relevant to health care setting, patient population, and service delivery models.
9. Students will learn about ethical considerations for psychologists in health care settings

CEPY 6610. Internship in School Psychology
1-12 Credits (1-12)

Supervised experience in school psychology. Restricted to CEP graduate majors. May be repeated up to 12 credits.

Prerequisite: CEPY 6510 , CEPY 6530.

Learning Outcomes

1. Student will complete 1200 clock hour internship experience an approved site.

CEPY 6620. Internship in Counseling Psychology I
1-18 Credits (1-18)

Full-time equivalent of one-half calendar year of internship preferably in an APA-approved or APA-equivalent site. Available to Ph.D. students who have successfully completed their comprehensive exams. Restricted to CEP graduate majors. May be repeated up to 18 credits.

Learning Outcomes

1. Students will complete the full-time equivalent of one calendar year internship at a site accredited by the American Psychological Association (APA) that has been matched with the student through the APPIC process.

CEPY 6630. Internship in Counseling Psychology II
1-18 Credits (1-18)

Full-time equivalent of one-half calendar year of internship preferably in an APA-approved or APA-equivalent site. Available to Ph.D. students who have successfully complete their comprehensive exams. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, program director, department head, and graduate school dean May be repeated up to 18 credits.

Learning Outcomes

1. Varies by site.

CEPY 6640. Doctoral Internship in School Psychology
1-18 Credits (1-18)

Supervised doctoral internship experience in school psychology. 1800 to 2000 clock hours are completed on a full-time basis. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to CEP graduate majors. May be repeated up to 12 credits.

Prerequisite: CEPY 6510, CEPY 6530, CEPY 6540.

Learning Outcomes

1. Varies by site.

CEPY 6996. Selected Topics
1-6 Credits (1-6)

Offered under various subtitles which indicate the subject matter covered. A maximum of 6 credits in any one semester and a total of 18 credits overall. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor,

department head, and graduate school dean. May be repeated up to 18 credits.

Learning Outcomes

1. Varies

CEPY 6999. Ed.S. Thesis
1-15 Credits (1-15)
Study and research at the Specialist in Education level. Each problem to be designated by a qualifying subtitle. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

CEPY 7000. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

CHEF-CULINARY ARTS

CHEF 101. Culinary Arts Kitchen Orientation
3 Credits (3)
Provides students with basic information and skills necessary for success in the Culinary Arts program. Students learn basic kitchen routines, safety and sanitation, professional conduct and deportment, standard kitchen calculations, knife handling, and are introduced to the laboratories for initial cooking experiences. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Be able to discuss the appropriate wearing of the chef uniform and the safety reasons for it.
2. Demonstrate appropriate sanitation in the professional kitchen.
3. Demonstrate proper hand-washing techniques.
4. Demonstrate proper kitchen equipment use and layout.
5. Explain professional kitchen safety practices.
6. Demonstrate basic kitchen math skills.
7. Explain the purchasing cycle in a professional kitchen.
8. Discuss appropriate behavior in the kitchen.
9. Demonstrate basic knife skills. 1
10. Discuss basic sauce preparation and uses. 1
11. Understand real life issues in professional kitchens and variety of opportunities. 1
12. Explain the importance of culinary history.

CHEF 125. Introductory Cake Decorating
1 Credit (2P)
Introduction to the professional cake decorating techniques used by pastry chefs. Basic skills of piping a variety of icings into different patterns are taught. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Demonstrate understanding of basic cake decorating principles and techniques.
2. Identify and describe basic methods for cake decoration.
3. Understand methods of production for borders, flowers, colorflow methods, and basic figure piping.
4. Demonstrate understanding of frosting types and the advantages of each.
5. List the need for and uses of various types of specialty decorating equipment.
6. Identify types of labor-saving products that specifically relate to cake decorating.

CHEF 126. Intermediate Cake Decorating
1 Credit (2P)
Introduction to more advanced professional cake decorating techniques used by pastry chefs. Fondant work and more complex decorating schemes are taught.

Prerequisite: Grade of C- or better in CHEF 125.

Learning Outcomes

1. Demonstrate understanding of advanced cake decorating principles and techniques.
2. Identify and describe advanced methods for cake decoration.
3. Understand methods of production for borders, flowers, ribbons, bows, and various 3-dimensional techniques with fondant.
4. Demonstrate understanding of creating and working with fondant.
5. List the need for and uses of various types of specialty decorating equipment.
6. Identify types of labor-saving products that specifically relate to cake decorating.

CHEF 127. Chocolate Work
1 Credit (2P)
Introduction to working with chocolate utilizing a variety of methods. Tempering, forming, molding, and other professional techniques will be taught. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Name the physical properties of chocolate and the ingredients used in its preparation.
2. List the common equipment used in chocolate and confectionary preparation.
3. Explain the production of chocolate from the cacao pod to the finished product.
4. Identify a variety of chocolate products.
5. Explain the various procedures for tempering chocolate.
6. Prepare simple chocolate decorations and candies.

CHEF 128. Advanced Chocolate Work
1 Credit (2P)
More advanced treatments of chocolate are explored and professional techniques for the chocolatier are developed.

Prerequisite: Grade of C- or better in CHEF 127.

Learning Outcomes

1. Apply the various procedures for tempering chocolate.
2. Demonstrate understanding of physical properties of chocolate and the ingredients used in its preparation.
3. Construct elaborate chocolate sculptures and candies.
4. Inventory the common equipment used in chocolate and confectionary preparation.
5. Design and outline a sculpture incorporating a variety of chocolate and confectionary techniques.

CHEF 129. Wedding Cake Design and Construction
1 Credit (2P)
Basic skills in designing wedding (or other specialty event) cakes. Includes shaping, icing selection, decorating scheme, presentation, transportation, and remote set up. Restricted to Community Colleges campuses only.
Prerequisite: Grade of C- or better in CHEF 125 and CHEF 126.
Learning Outcomes
1. Apply the techniques of wedding cake decorating philosophies.
2. Combine the methods from Basic and Advanced Cake and incorporate it into creating a wedding cake.
3. Use previously learned methods of production of flowers, ribbons, bows and various other techniques to complete a wedding cake.
4. Identify types of labor-saving products that specifically relate to wedding cakes.
5. Formulate the proper techniques in delivering cakes to clients.

CHEF 155. Special Topics
1-3 Credits (1-3)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 6 credits.
Learning Outcomes
1. Competencies are based on the subject matter of the Special Topic.

CHEF 156. Sugar Work
1 Credit (1)
This course provides students with a comprehensive exploration of the principles, techniques, and artistic applications of sugar-based confectionery. The course begins with thread, then moves on to soft ball, firm ball, hard ball, then soft crack, hard crack and finally caramel. While students are learning these different stages, they are creating recipes that require using the different stages. This is a pre-requisite for Advanced Sugar Work. May be repeated up to 3 credits.
Learning Outcomes
1. Name the physical properties of sugar and the ingredients used in its preparation.
2. List the common equipment used in sugar and confectionary preparation.
3. Explain the production of sugar from the farm to the finished product.
4. Identify a variety of sugar stages and products.
5. Explain the various procedures for sugar preparations and their applications.
6. Prepare simple sugar decorations and candies.

CHEF 157. Advanced Sugar Work
1 Credit (1)
This advanced-level course delves into the intricacies of advanced sugar manipulation, focusing on techniques such as blown sugar, pulled sugar, and intricate sugar sculptures. Through a rigorous exploration of the chemical and physical properties of sugar, students will gain a profound comprehension of temperature control, crystallization, and the nuanced interplay of ingredients. The course places a strong emphasis on honing precision and innovation in sugar craftsmanship, ensuring that students not only develop technical expertise but also cultivate a discerning eye for design and presentation. May be repeated up to 3 credits.
Prerequisite: Grade of C- or better in CHEF 156.
Learning Outcomes
1. Apply the various procedures for sugar confectionery.
2. Demonstrate understanding of the physical properties of sugar and the ingredients used in its preparation.
3. Construct elaborate sugar sculptures and candies.
4. Inventory the common equipment used in sugar and confectionery preparation.
5. Design and outline a sculpture incorporating a variety of sugar and confectionery techniques.

CHEF 158. Gum Paste
1 Credit (1)
This course offers a comprehensive exploration of the specialized artistry and techniques associated with the use of gum paste in pastry and confectionery. Tailored for students seeking an in-depth understanding of advanced sugar crafting, the curriculum focuses on the fabrication and manipulation of gum paste to create intricate and lifelike decorative elements. Students will delve into the scientific properties of gum paste, examining its pliability, drying characteristics, and color absorption, while gaining proficiency in crafting flowers, figurines, and ornate embellishments. The course places a strong emphasis on precision, attention to detail, and artistic expression in gum paste work. Through practical exercises, students will learn to design and construct elaborate cake decorations, showpieces, and other edible works of art. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate understanding of gum paste flower-making principles and techniques.
2. Identify and describe advanced methods for gum paste flower making.
3. Understand methods of production for peonies, roses, and sunflower techniques with gum paste.
4. Demonstrate understanding of creating and working with gum paste.
5. List the need for and uses of various types of specialty decorating equipment.
6. Identify types of labor-saving products that specifically relate to gum paste flowers.

CHEF 159. Sculpted Cakes
1 Credit (1)
This course is designed to provide students with a comprehensive understanding and mastery of the intricate artistry involved in crafting three-dimensional and visually stunning cake sculptures. Participants will delve into the principles of structural engineering, cake carving, and fondant application to create edible masterpieces that push the boundaries of traditional cake design. The curriculum focuses on both the theoretical and practical aspects of sculpted cake creation, covering topics such as conceptualization, planning, and execution of complex designs. Students will develop proficiency in utilizing a variety of tools and techniques, including internal support structures, modeling chocolate, and edible paints. Through hands-on projects and collaborative exercises, students will refine their sculpting skills and gain the expertise required to transform cakes into visually captivating works of art. May be repeated up to 3 credits.
Learning Outcomes
1. Discuss the physical properties of cakes and the ingredients used in their preparation.
2. Describe the common equipment used in cake sculpting and confectionary preparation.
3. Identify a variety of ways to sculpt cakes into realistic shapes.
4. Explain the various procedures for working with cake and decorating tools.

5. Identify types of labor-saving products that specifically relate to sculpting cake.

CHEF 160. Asian Cookery
1 Credit (1)
This course offers an immersive exploration of the diverse and rich culinary traditions of Asia. The curriculum covers essential techniques, ingredients, and flavor profiles unique to each region, fostering an appreciation for the artistry and balance inherent in Asian cooking. Through hands-on experiences in the kitchen, students will develop the ability to execute traditional dishes while also exploring innovative and contemporary interpretations. Special attention is given to ingredient sourcing, flavor layering, and mastering the diverse cooking methods characteristic of Asian cuisine. May be repeated up to 6 credits.
Learning Outcomes
1. Identify the basic ingredients and palette of flavors of China, Korea, Japan, Vietnam, Thailand, Indonesia, and India.
2. Identify the cooking techniques of the major regions of Asia.
3. Describe unique cooking equipment or vessels used in these regions.
4. Apply basic cooking fundamentals to a variety of dishes from these regions.
5. Demonstrate previously learned principles of food safety and sanitation through professional work habits.
6. Accurately apply previously learned principles of culinary mathematics to a written project.

CHEF 161. Experimental Cookery
1 Credit (1)
This course in Experimental Cookery offers an innovative and intellectually stimulating exploration into the avant-garde realms of culinary creation. The curriculum transcends conventional boundaries to foster a deep understanding of experimental techniques, molecular gastronomy, and cutting-edge culinary trends. Students will engage in theoretical discussions on the principles of flavor pairing, texture manipulation, and creative plating, while also gaining hands-on experience in the kitchen to apply these concepts. The course encourages students to push the boundaries of traditional culinary practices, experiment with novel ingredients, and leverage modern technology to transform familiar dishes into gastronomic marvels. Emphasis is placed on developing a discerning palate, critical thinking skills, and the ability to adapt and innovate in response to evolving culinary landscapes. May be repeated up to 3 credits.
Learning Outcomes
1. Implement various cooking techniques such as sous-vide, molecular gastronomy, and infusion, to create innovative and experimental dishes.
2. Show food science principles and how they impact the cooking process to experiment with texture, taste, and presentation.
3. Analyze and adapt recipes to critically evaluate traditional experimenting with ingredient substitutions, flavor.
4. Collaborate on experimental menus in teams to showcase their collective skills and creativity.
5. Create fusion cuisine to explore the art of fusion cooking.

CHEF 162. Not So Traditional Holiday Cookery
1 Credit (1)
This course is tailored for students seeking a unique exploration of festive cuisines that break away from conventional holiday traditions. Delving into the global spectrum of celebratory dishes, this course aims to broaden students' culinary perspectives by introducing innovative and culturally diverse approaches to holiday cooking. The curriculum encompasses theoretical discussions on the historical, social, and cultural influences shaping non-traditional holiday cuisines, providing a context for the exploration of ingredients and techniques. Through hands-on experiences in the kitchen, students will learn to craft unconventional yet delectable holiday menus that reflect a fusion of flavors and culinary traditions. Emphasis will be placed on creativity, adaptability, and the development of well-balanced and aesthetically pleasing dishes. May be repeated up to 3 credits.
Learning Outcomes
1. Explore global culinary traditions by discussing diverse cultures and cuisines from around the world to discover non-traditional holiday dishes.
2. Create holiday-inspired dishes by adapting traditional holiday ingredients and concepts into modern and innovative dishes.
3. Incorporate seasonal and locally available ingredients to create non-traditional holiday dishes.
4. Develop a deeper knowledge and appreciation for cultural diversity by exploring the historical and social significance of non-traditional holiday dishes.
5. Design a non-traditional holiday menu collaborating to design a cohesive non-traditional holiday menu that showcases their culinary skills and creativity.

CHEF 165. Math for Kitchen Operations
3 Credits (3)
Fundamental mathematical concepts and computations, including measurement, recipe scaling and conversions, metric unit conversion, ingredient yield calculations, ratios and cost extensions are covered. Examples of basic mathematical calculations use kitchen and food service functions, as well as situations to demonstrate principles.
Learning Outcomes
1. Demonstrate mastery of basic math functions.
2. Calculate percentages when given data by which they may be derived.
3. Demonstrate accurate measurement calculations both in English and Metric systems.
4. Convert English to Metric measurements and vice versa with accuracy.
5. Demonstrate the ability to scale a recipe – expanding and reducing portions prepared.
6. Calculate recipe cost accurately.
7. Using standard yield factors for ingredients determine the required purchase amounts of the ingredients for a given recipe.
8. Using published baking recipe ratios, determine the quantities of ingredients required for baked goods.
9. Calculate inventory value and order quantities based on par stock and other systems.

CHEF 211. Food Production Management I
3 Credits (2+2P)
Introduction to kitchen design, workflow, and commercial equipment. Techniques, methods, and application of basic food production principles. Practical experience in cooking processes from a managerial viewpoint. Taught with: HOST 211. Restricted to Community Colleges only.
Learning Outcomes
1. Demonstrate understanding of workflow concept.
2. Understand basic principles of kitchen design/layout.
3. Identify and discuss use of commercial kitchen equipment.

4. Demonstrate safe working techniques in kitchen settings.
5. Observe and demonstrate comprehension of basic preparation techniques.
6. Apply knowledge of varied and appropriate methods of cooking.
7. Identify and describe physical and chemical change occurring during the cooking process.
8. Describe the flow of products through the operation from order to use.
9. Prepares a production order for meal service. 1
10. Explains the basic organization of typical restaurant kitchens. 1
11. Prepares a staffing chart for a hypothetical kitchen. 1
12. Discuss and identify trends in cooking and food preparation. 1
13. Show understanding concerning infusion of ideas and ingredients into cooking styles and technologies. 1
14. Demonstrate understanding of the link between customers and creativity by developing regional recipes.

CHEF 212. Food Production Management II
3 Credits (2+2P)
Selection and use of ingredients. Demonstration and application of classical and modern cooking and preparation techniques. Management techniques for kitchen personnel. Recipe design and analysis. Taught with: HOST 212. Restricted to Community Colleges only. May be repeated up to 3 credits.
Prerequisite: Grade of C- or above in CHEF 211 or consent of instructor.
Learning Outcomes
1. Demonstrate understanding of ingredient variety and availability.
2. Describe base sauces, mother sauces and derivations – both classical and modern.
3. Understand methods of preparation for protein products and application of varied cooking techniques.
4. Identify methods of preparation for side dishes, starches and vegetables.
5. Understand garde-manger functions and demonstrate knowledge of cold food preparation techniques.
6. Demonstrate understanding of buffet layout and design.
7. Understand the importance of appearance and demonstrate the ability to prepare appropriate garnish.
8. Apply elements of design, color, texture and structure as they relate to the presentation of food items.
9. Demonstrates understanding of recipe layout, structure and design. 1
10. Analyze recipes for functionality. 1
11. Understand rationale for standardized recipes and demonstrate ability to develop the same.

CHEF 213. Bakery Management I
3 Credits (2+2P)
Fundamentals of baking from a supervisory/management perspective. Exposure to commercial equipment and processes. Introduction to commercial alternatives to scratch-preparation methods. Crosslisted with: HOST 213. Restricted to Community Colleges only. May be repeated up to 3 credits.
Learning Outcomes
1. Identify and explain at least five common baking ingredients and demonstrate their use.
2. Describe and analyze the biological and chemical reactions that occur during baking.
3. Identify and describe Danish pastry production methods and individual sweet roll construction.
4. Recognize methods of bread production for both yeast and quick bread varieties.
5. Demonstrate various production techniques for pies, pastries, and cookies.
6. Identify different types of ovens and evaluate the advantages of each.
7. Identify and evaluate the necessity and functionality of various specialty baking equipment.
8. Identify types of labor-saving products that specifically relate to baking operations.
9. Demonstrate knowledge of value in using proof and bake products. 1
10. Demonstrate the application and proper utilization of convenience production items. 1
11. Explain need and rationale for use of mixes and pre-made products. 1
12. Demonstrate development of a baking formula. 1
13. Explain the importance of planning production times and products. 1
14. Discuss the challenges of staffing in baking operations.

CHEF 214. Bakery Management II
3 Credits (2+2P)
Advanced techniques and management of bakery operations are explored. Students learn classical forms and techniques. Modern methods of preparing traditional pastry and baked goods are introduced. Taught with: HOST218. Restricted to Community Colleges only. May be repeated up to 3 credits.
Prerequisite: Grade of C- or above in CHEF 213 or consent of instructor.
Learning Outcomes
1. Accurately calculates labor cost for hypothetical bakery operation.
2. Explains the importance and challenges of equipment scheduling in a bakery.
3. Uses appropriate baking ingredients for advanced baking processes.
4. Connects the biological and chemical reactions occurring during the baking process with the anticipated outcomes and products.
5. Demonstrates the production methods used in advanced baking processes.
6. Demonstrates artisan bread production for yeast bread varieties.
7. Produces torts, pastries and cakes.
8. Familiar with the specialty equipment used in advanced baking techniques.
9. Rationalizes the value of producing high-end bakery items. 1
10. Identify types of labor-saving products that specifically relate to production of high-end products. 1
11. Utilize the specialty convenience production items that support up-scale bakery products.

CHEF 233. Culinary Arts Fundamentals I
4 Credits (1+9P)
Introduction to the basics of culinary arts, including ingredients recognition, cooking methods and techniques, knife usage, preparation of basic stocks, mother sauces, starches and vegetables. Students will participate in laboratory work designed to create an understanding of the professional role of the culinarian. Preparation and production of food products integral to service to guests is incorporated in the course. Restricted to: CHEF, HOST majors. Restricted to Community Colleges Campuses only. May be repeated up to 4 credits.

Learning Outcomes

1. Describe the meaning and function of the mise en place concept.
2. Demonstrate knowledge of how kitchen equipment operates and ability to utilize equipment in safe and sanitary manner.
3. Identify ingredients for use in differing recipes and processes.
4. Discuss basic stocks and sauce preparation and their uses.
5. Apply principles of starch, vegetable and various egg cookery methods.
6. Utilize techniques for proper preparation of fruits, salads and dressings.
7. Demonstrate basic meat cookery methods and techniques.

CHEF 234. Culinary Arts Fundamentals II
4 Credits (1+9P)
Continuation of introductory course focusing on meat cookery, daughter sauces, cold food preparation, poultry and seafood. Safe use of equipment is emphasized while experiencing differing methods of preparation and cooking. Preparation and production of food products integral to service of guests is incorporated in this course. Restricted to: HOST,HSMG,CHEF majors. Restricted to Community Colleges campuses only.
Prerequisite: Grade of C- or better in CHEF 233.
Learning Outcomes

1. Demonstrate the ability to properly, and safely, operate all kitchen equipment.
2. Identify and explain the five major cooking techniques and their application to different foods.
3. Prepare basic dishes using one or more of the major cooking techniques.
4. Demonstrate the ability to accurately and safely perform basic knife cuts.
5. Evaluate the flavor and quality of cooked meat, poultry, fish, vegetables, starches, and legumes, as well as specialty soups.

CHEF 235. Advanced Culinary Arts I
4 Credits (1+9P)
Exploration and experience in preparation techniques beyond the basic level. Nutritional components of food are discussed, as in the application of good nutrition practices in recipe design. Students are encouraged to use creative methods to expand the individual's culinary expressions. Prepares food products for service to guests in both bulk feeding and individual service settings. Plans, prepares, serves and critiques meals provided for students, faculty and staff. May be repeated up to 4 credits.
Prerequisite/Corequisite: Grade of C- or better in CHEF 234 if course has been previously taken. Restricted to: CHEF majors. Restricted to Community Colleges campuses only.
Learning Outcomes

1. Create and compose menus for small meals and menu service.
2. Practice and prepare advanced dishes using the five major cooking techniques.
3. Demonstrate the ability to Perform basic and advanced knife cuts with accuracy, safety, and speed.
4. Manage and organize peers to produce a full menu for service.
5. Prepare and asses the flavor and quality of produce, meat, poultry and seafoods, and legumes.

CHEF 236. Advanced Culinary Arts II
4 Credits (1+9P)
Advanced techniques and experimental use of food combinations to enhance the student's repertoire of skills and abilities. Utilizes knowledge to develop recipes for unique products. Plans, prepares, serves and critiques meals provided for students, faculty and staff. May be repeated up to 4 credits.
Prerequisite: Grade of C- or better in CHEF 235.
Learning Outcomes

1. Create a diverse à la carte menu that features a wide variety of dishes, including appetizers, main courses, side dishes, and desserts.
2. Produce staffing plans for back of house and front of house.
3. Implement advanced culinary techniques to refine their culinary skills by mastering advanced cooking techniques of dishes to meet the standards of à la carte dining.
4. Develop expertise in food plating and presentation focused on the art of food plating and presentation to create visually stunning dishes.
5. Practice effective table service and hospitality.
6. Manage a simulated restaurant service experiencing the challenges and responsibilities of running a restaurant kitchen and dining area.
7. Evaluates meal service and critiques positive and negative aspects.

CHEF 237. Banquet/Catering Production
3 Credits (1+6P)
Planning and implementation of the culinary aspects of catered functions. Development of time schedules, work assignments and service plans for catered events and banquet functions. Production of food items in appropriate quantities for catered events. Costing and control functions are covered. May be repeated up to 6 credits.
Prerequisite: Grade of C- or better in CHEF 233.
Learning Outcomes

1. Evaluates event contract for requirements and restrictions.
2. Coordinates efforts of sales and production staffs to meet customer needs.
3. Develops menus for events within price / quality constraints of contract.
4. Plans event staffing, food production, and service organization.
5. Prepares food, stages and serves food products.
6. Evaluates production, service, and cost efficacy.

CHEF 240. Baking Fundamentals I
4 Credits (1+9P)
Introduction to baking techniques, measurement and use of ingredients; equipment use and chemical reactions inherent in the baking process. Production of simple desserts and baked goods. Introduction to working with bread doughs. May be repeated up to 4 credits.
Corequisite: Grade of C- or better in CHEF 233.
Learning Outcomes

1. Identify quality characteristics of a wide range of ingredients and baked products.
2. Describe the five major ingredients and their functions in baked products.
3. Demonstrate proficiency in scaling and measuring of ingredients.
4. Explain and demonstrate the basic fundamental techniques of baking and pastry.
5. Demonstrate the ability to properly, and safely, operate all bakeshop equipment.
6. Identify and describe basic formula of, custards, creams and batters.
7. Demonstrate principles of food safety and sanitation through professional work habits.

CHEF 241. Baking Fundamentals II
4 Credits (1+9P)

More advanced baking and bread making techniques are covered in this course with emphasis on the more advanced elements of quantity production. Students work with a variety of products and ingredients. May be repeated up to 4 credits.
Prerequisite: Grade of C- or better in CHEF 240.
Learning Outcomes
1. Construct complex desserts, pastries and cakes.
2. Apply the basic formulas of custards creams and batters.
3. Identify the function of yeast and other leaveners in breads.
4. Demonstrate the ability to produce enriched and specialty bread products.
5. Experiment with the differences in fundamental techniques of baking and pastry.

CHEF 242. Intermediate Baking I
4 Credits (1+9P)
More advanced baking and pastry techniques are covered in this course with emphasis on the basic elements of patisserie production. Focus is on preparing students to work in a pastry kitchen. May be repeated up to 4 credits.
Prerequisite: Grade of C- or better in CHEF 241.
Learning Outcomes
1. Produces acceptable quality cake items using standardized recipes.
2. Prepares tarts and pies as assigned, meeting quality standards.
3. Demonstrates use of puff pastry in a variety of advanced dessert items.
4. Prepares and utilizes frostings and icings appropriate to the item being produced.
5. Designs and decorates dessert items creatively.
6. Prepares baked custards and chilled mousse items that meet quality standards.
7. Produces high quality yeast bread products.

CHEF 243. Intermediate Baking II
4 Credits (1+9P)
Continuation of work with basic elements of patisserie products including laminated doughs and filled products. Students prepare creams, custards, fillings and are introduced to cake assembly procedures.
Prerequisite: Grade of C- or better in CHEF 242.
Learning Outcomes
1. Demonstrates ability to weigh/measure ingredients based on formula.
2. Explains the differences between recipes and formulas.
3. Discusses the different ingredients used in commercial baking and their uses.
4. Demonstrates the processes for making yeast doughs.
5. Demonstrates the making of sweet doughs.
6. Explains the use of the commercial equipment found in bakeries.
7. Explains how the chemical reactions in baked products effects the product.
8. Calculates the effect of heat of friction on the product.
9. Demonstrates scaling of large batch production into useable units.

CHEF 255. Special Topics
3 Credits (3)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 6 credits. Restricted to: CULI, HOST, HSMG majors. Restricted to Community Colleges campuses only.

CHEF 256. International Cuisine
3 Credits (1+6P)
Exploration into a variety of international cuisines is undertaken, including the cultural and historical backgrounds of the foods being prepared. Students work on developing themed menus and production plans for meals utilizing a single international cuisine. May be repeated up to 6 credits.
Prerequisite: Grade of C- or better in CHEF 233.
Learning Outcomes
1. Develops menus as appropriate for assignment.
2. Writes recipes for items following standard procedures.
3. Prepares order lists for assignment.
4. Develops budget for assignment.
5. Cost National Dish recipes.
6. Designs a production list / station workload plan for assignment.
7. Under guidance, explores advanced cooking techniques.
8. Develop a palate of various ingredients.
9. Serves meals to guests following appropriate protocols. 1
10. Evaluates meal service and critiques positive and negative aspects.

CHEF 257. Garde Manger
3 Credits (1+6P)
Traditional garde manger skills are taught, including plated salads, cold foods, entrements, pates, forcemeat, terrines, charcuterie and chaud froid work. The art and craft of food design, preparation and service are emphasized. May be repeated up to 3 credits. Restricted to: CHEF, HOST majors. Restricted to Community Colleges campuses only.
Prerequisite: Grade of "C" or above in CHEF 233.
Learning Outcomes
1. Demonstrates preparation and presentation of plated salads.
2. Prepares sandwiches and other cold items as assigned that meet standards.
3. Develops, designs and prepares entremets and palate refreshers.
4. Prepares classical and modern patés and forcemeats as assigned.
5. Designs and prepares terrines and galatines following recipes and directions.
6. Prepares charcuterie products as assigned following recipes and directions.
7. Designs, prepares, and decorates products with chaud froid as appropriate.

CHEF 260. Nutrition for Chefs
3 Credits (3)
Aspects of basic human nutritional requirements are covered as are the applications of the standards to the cooking and baking. Meeting the USDA nutrient guidelines while preparing good tasting food is discussed, calorie, fat and sodium reduction techniques are explored. May be repeated up to 3 credits.
Learning Outcomes
1. Describes the functions of the various nutrients and their importance in human nutrition.
2. Explains how hydration impacts health.
3. Discusses the concept of balance and moderation in eating choices.
4. Explains how lifestyle choices impacts nutrition.
5. Discusses food fads and their challenge to the culinarian.
6. Catalogs the nutritional guidelines promoted by the USDA.

7. From the restaurant's perspective discusses the importance of being aware of customers' allergies and dietary restrictions.

CHEM-CHEMISTRY

CHEM 1111. Basic Chemistry
3 Credits (3)
For students whose preparatory science or math training has been deficient. Does not meet the chemistry requirement in any curriculum.
Prerequisite: Enhanced ACT composite score of at least 18 or a grade of C- or better in CCDM 114 N.
Learning Outcomes
1. The goals and objectives for CHEM 1111 are to equip students with the necessary problem solving skills to be successful in CHEM 1215G/1225G

CHEM 1120G. Introduction to Chemistry Lecture and Laboratory (non majors)
4 Credits (3+3P)
This course covers qualitative and quantitative areas of non-organic general chemistry for non-science majors and some health professions. Students will learn and apply principles pertaining, but not limited to, atomic and molecular structure, the periodic table, acids and bases, mass relationships, and solutions. The laboratory component introduces students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment.
Prerequisite: CCDM 114N or A S 103 or MATH 1215 or higher.
Learning Outcomes
1. (Lecture) Use the different systems of measurements and perform conversions within the same system of measurement and between different systems of measurements
2. (Lecture) Identify elements from their name or symbol, use the periodic table to describe reactivity patterns of elements and to predict compound formation.
3. (Lecture) Describe the basic structure of an atom using subatomic particles, and apply these concepts to nuclear reactions.
4. (Lecture) Describe ion formation and the difference between covalent and ionic compounds. Name and write formulas for ionic and simple molecular compounds.
5. (Lecture) Write and balance chemical reactions. Use balanced reactions in stoichiometric calculations.
6. (Lecture) Describe the differences between the solid, liquid and gas phases. Use the gas laws in calculations, and apply these laws to everyday situations.
7. (Lecture) Explain different types of energy, and how energy is released or absorbed in a reaction
8. (Lecture) Describe acid and base behavior.
9. (Lecture) Explain the intermolecular attractive forces that determine physical properties; apply this knowledge to qualitatively evaluate these forces and predict the physical properties that result. 1
10. (Lecture) Explain the intermolecular attractive forces that determine physical properties; apply this knowledge to qualitatively evaluate these forces and predict the physical properties that result 1
11. (Laboratory) Practice concepts associated with laboratory safety, including the possible consequences of not adhering to appropriate safety guidelines. 1
12. (Laboratory) Demonstrate the computational skills needed to perform appropriate laboratory-related calculations to include, but not be limited to determining the number of significant figures in numerical value, solving problems using values represented in exponential notation, solving dimensional analysis problems, and manipulating mathematical formulas as needed to determine the value of a variable. 1
13. (Laboratory) Perform laboratory observations (both qualitative and quantitative) using sensory experience and appropriate measurement instrumentation (both analog and digital). 1
14. (Laboratory) Record quantitatively measured values to the correct number of significant figures and assign the correct units. 1
15. (Laboratory) Master basic laboratory techniques including, but not limited to weighing samples (liquid and solid), determining sample volumes, measuring the temperature of samples, heating and cooling a sample or reaction mixture, decantation, filtration, and titration. 1
16. (Laboratory) Draw appropriate conclusions based on data and analyses. 1
17. Present experimental results in laboratory reports of appropriate length, style and depth, or through other modes as required. 1
18. Determine chemical formulas and classify different types of reactions. 1
19. Relate laboratory experimental observations, operations, calculations, and findings to theoretical concepts presented in the complementary lecture course.

CHEM 1215G. General Chemistry I Lecture and Laboratory for STEM Majors
4 Credits (3+3P)
This course covers descriptive and theoretical chemistry.
Prerequisite: (1) grade of C- or better in MATH 1215 or higher, or a Mathematics Placement Exam Score adequate to enroll in mathematics courses beyond MATH 1215, or grade of C- or better in CHEM 1111.

CHEM 1216. General Chemistry I Lecture and Laboratory for CHEM Majors
4 Credits (3+3P)
As the first of a two-semester sequence, this course teaches fundamental concepts in chemistry, including the electronic structure of atoms, chemical periodicity, nature of chemical bonds, molecular structure, the three phases of matter, etc. Designed for majors in chemical and other physical sciences, including engineering. May be appropriate for the life science major. It is assumed that the students are familiar with college algebra, chemical nomenclature, stoichiometry, and scientific measurements. The laboratory component is designed to complement the theory and concepts presented in lecture, and will introduce students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment.
Prerequisite(s): Eligible to take MATH 1250G and an ACT composite score of 22 or higher.
Learning Outcomes
1. Apply the mole concept to amounts at a microscopic level and use this to perform stoichiometric calculations for reactions in solution, gases and thermochemistry.
2. Calculate solution concentrations in various units.
3. Apply the gas laws and kinetic molecular theory to relate atomic level behavior to macroscopic properties.
4. Explain the electronic structure of atoms, isotopes and ions in terms of its subatomic particles.
5. Analyze how periodic properties (e.g. electronegativity, atomic and ionic radii, ionization energy, electron affinity, metallic character) and reactivity of elements results from electronic configurations of atoms.

6. Understand the nature of chemical bonds (ionic and covalent). Apply knowledge of electronic structure to determine molecular structure and polarity.
7. Understand the formation of different phases of matter and the underlying fundamental intermolecular interactions.
8. Describe physical states and changes, and distinguish these from chemical changes.
9. Describe the energy conversions that occur in chemical reactions and state changes, relating heat of reaction to thermodynamic properties such as enthalpy and internal energy; apply these principles to measure and calculate energy changes in reaction. 1
10. Apply principles of general chemistry to specific real-world problems in environment, engineering and health-related fields.

CHEM 1225G. General Chemistry II Lecture and Laboratory for STEM Majors
4 Credits (3+3P)
This course is intended to serve as a continuation of general chemistry principles for students enrolled in science, engineering, and certain preprofessional programs. The course includes, but is not limited to a theoretical and quantitative coverage of solutions and their properties, kinetics, chemical equilibrium, acids and bases, entropy and free energy, electrochemistry, and nuclear chemistry. Additional topics may include (as time permits) organic, polymer, atmospheric, and biochemistry.
The laboratory component is designed to complement the theory and concepts presented in lecture, and will introduce students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment.
Prerequisite(s): C- or better in CHEM 1215G and C- or better in MATH 1215 or higher.
Learning Outcomes
1. Explain the intermolecular attractive forces that determine physical properties and phase transitions, and apply this knowledge to qualitatively evaluate these forces from structure and to predict the physical properties that result.
2. Calculate solution concentrations in various units, explain the effects of temperature, pressure and structure on solubility, and describe the colligative properties of solutions, and determine solution concentrations using colligative property values and vice versa.
3. Describe the dynamic nature of chemical equilibrium, and apply LeChatelier's Principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures as well as describe the equilibrium constant and use it to determine whether equilibrium has been established, and calculate equilibrium constants from equilibrium concentrations and vice versa.
4. Describe the different models of acids and base behavior and the molecular basis for acid strength, as well as apply equilibrium principles to aqueous solutions, including acid/base and solubility reactions, and calculate pH and species concentrations in buffered and unbuffered solutions.
5. Explain titration curves as well as calculate concentrations of reactants.
6. Explain and calculate the thermodynamic functions, enthalpy, entropy and Gibbs free energy, for a chemical system, and relate these functions to equilibrium constants Student Learning Outcomes – Laboratory
7. Demonstrate and apply concepts associated with laboratory safety, including the possible consequences of not adhering to appropriate safety guidelines.
8. Demonstrate the computational skills needed to perform appropriate laboratory related calculations to include, but not be limited to determining the number of significant figures in numerical value with the correct units, solving problems using values represented in exponential notation, solving dimensional analysis problems, and manipulating mathematical formulas as needed to determine the value of a variable.
9. Perform laboratory observations (both qualitative and quantitative) using sensory experience and appropriate measurement instrumentation (both analog and digital).
10. Prepare solutions with an acceptable accuracy to a known concentration using appropriate glassware.
11. Perform basic laboratory operations related to, but not limited to, colligative properties of solutions, chemical equilibria, acid/base titrations, electrochemistry.
12. Draw conclusions based on data and analyses from laboratory experiments.
13. Relate laboratory experimental observations, operations, calculations, and findings to theoretical concepts presented in the complementary lecture course.

CHEM 1226. General Chemistry II Lecture and Laboratory for CHEM Majors
4 Credits (3+3P)
As the second of a two-semester sequence, this course teaches fundamental concepts in chemistry, including solutions, equilibria, electrochemistry, thermodynamics and kinetics. Designed for majors in chemical and other physical sciences, including engineering. May be appropriate for the life science major. It is assumed that the students are familiar with college algebra, chemical nomenclature, stoichiometry, and scientific measurements. The laboratory component is designed to complement the theory and concepts presented in lecture, and will introduce students to techniques for obtaining and analyzing experimental observations pertaining to chemistry using diverse methods and equipment.
Prerequisite(s): C- or better in CHEM 1216.
Learning Outcomes
1. Describe the colligative properties of solutions and explain them using intermolecular forces. Determine solution concentrations using colligative property values and vice versa.
2. Explain rates of reactions, rate laws, and half-life; determine the rate, rate law and rate constant of a reaction and calculate concentration as a function of time and vice versa. Understand the principle of catalysis.
3. Explain the collision model of reaction dynamics, including activation energy, catalysts and temperature; Derive a rate law from a reaction mechanism and evaluate the consistency of a mechanism with a given rate law.
4. Describe the dynamic nature of chemical equilibrium and its relation to reaction rates; apply Le Chatelier's Principle to predict the effect of concentration, pressure and temperature changes on equilibrium mixtures.
5. Describe the equilibrium constant and use it to determine whether equilibrium has been established; calculate equilibrium constants from equilibrium concentrations (including pressures) and vice versa.
6. Describe the different models of acids and base behavior, and the molecular basis for acid strength.

CHEM 2111. Explorations in Chemistry and Biochemistry
1 Credit (1)

In introduction to the experience of chemistry and biochemistry degrees. In this course, students will prepare a degree plan and personal statement. Career opportunities in chemistry and biochemistry will be presented and discussed.

Learning Outcomes

1. Demonstrate knowledge and understanding of the subdisciplines of Chemistry and Biochemistry.
2. Demonstrate knowledge and understanding of the requirements for the Chemistry and Biochemistry majors and career opportunities available to these majors.
3. Adopt strategies to prepare for future success in a job search or graduate school application.
4. Learn about undergraduate research opportunities in chemistry and biochemistry.

CHEM 2115. Survey of Organic Chemistry and Laboratory
4 Credits (3+3P)

This course is a one -semester survey of organic and biological chemicals. Students will be introduced to nomenclature, molecular structure, properties, and reactions of hydrocarbons, alcohols, carbonyls, organic acids and bases, carbohydrates, lipids, and proteins. The handling of organic chemicals, simple organic reactions, tests for functional groups, and synthesis will be learned in the laboratory component of this course.

Prerequisite: C- or better in CHEM 1225G or CHEM 1226.

Learning Outcomes

1. Identify common organic functional groups.
2. Translate between the IUPAC names and structures of simple organic molecules.
3. Predict the products of certain organic chemical reactions from reagents and conditions presented.
4. Predict physical and chemical behavior of organic molecules based on structure.
5. Synthesize several classes of organic compounds in the laboratory that were previously studied in the lecture component of this course.
6. Recognize and name the four basic bioorganic units and certain of their derivatives and macromolecules.
7. Construct 3 dimensional models of organic compounds.
8. Understand and apply safety principles associated with Organic Chemistry laboratory operations and activities.
9. Present experimental results in laboratory reports of appropriate length, style and depth, or through other modes as required. 1
10. Draw/recognize stereochemistry and explain its relevance to bioorganic molecules.

CHEM 2120. Integrated Organic Chemistry and Biochemistry
3 Credits (3)

This course is a one- semester introduction to Organic Chemistry and Biochemistry designed for students in health and environmental occupations. The course surveys organic compounds in terms of structure, physical, and chemical properties, followed by coverage of the chemistry of specific classes of organic compounds in the biological environment. Students will apply course concepts to everyday organic and biological chemistry problems in preparation for careers in health and environmental fields. May be repeated up to 3 credits.

Prerequisite: CHEM 1120G or CHEM 1215G.

Corequisite: CHEM 2120L.

Learning Outcomes

1. Identify and name basic organic compounds.
2. Construct/draw organic compounds from the names.
3. Predict the products of certain organic chemical reactions from reagents and conditions presented.
4. Recognize and name the four basic bioorganic units and certain of their derivatives and macromolecules.
5. Compare and contrast the function and location of the four bioorganic units and their macromolecules and cofactors.
6. Draw/recognize stereochemistry and explain its relevance to bioorganic molecules.
7. Discuss the pathways and functions of some of the cellular metabolic processes.
8. Recognize and describe metabolic cellular processes and macromolecular structure with respect to health and/or disease state.

CHEM 2120L. Integrated Organic Chemistry and Biochemistry Lab
1 Credit (1,3P)

This course provides experiences with the physical properties and laboratory synthesis of organic compounds.

Corequisite: CHEM 2120.

Learning Outcomes

1. Discuss the chemical, structural, and physical differences among the different functional groups.
2. Prepare, label, and use solutions of appropriate and known concentrations.
3. Recognize chiral organic molecules, and explain their biological significance.
4. Understand and be able to identify the process of organic reactions: nucleophilic and electrophilic, redox reactions, and enzyme catalyzed reactions.
5. Predict the products of substitution, elimination, condensation, and redox reactions.
6. Explain why certain lipids and amino acids are essential while others are not.

CHEM 2130. Organic Chemistry I
3 Credits (3)

This course is the first of a two semester sequence of Organic Chemistry, the chemistry of carbon containing compounds, as required for chemistry, medical science, and engineering majors. The course includes theoretical, qualitative, and quantitative discussion of Organic Chemistry concepts, including but not limited to a review of electronic structure and bonding, acids and bases, stereochemistry, an introduction to organic compounds, isomers, substitution and elimination reactions of alkyl halides, reactions of alkenes, alkynes, alcohols, ethers, epoxides, amines, and thiols, mass and infrared spectrometry, ultraviolet/visible spectroscopy, and nuclear magnetic resonance.

Prerequisite: CHEM 1225G or CHEM 1226.

Learning Outcomes

1. Review properties of elements and molecules discussed in general chemistry (electronegativity, bonding, formal charge, octet rule).
2. Review chemical reactions discussed in general chemistry (products, reactants, balanced equations, byproducts).
3. Classify organic compounds and their properties by functional group, including substitution and elimination reactions of alkyl halides, reactions of alkenes, alkynes, alcohols, ethers, epoxides, amines, and thiols.
4. Use common and IUPAC rules of nomenclature to name organic compounds.
5. Review the structure and stability of compounds.

6. Comprehend the relationship between structure and reactivity.
7. Comprehend configurations of organic compounds (resonance structures, stereochemistry, isomers).
8. Interpret spectral properties and use in structure determination.
9. Correctly describe the four-five step synthesis of a simple organic molecule using reactions learned in the class.

CHEM 2135. Organic Chemistry II
3 Credits (3)
This course is the second of a two semester sequence of Organic Chemistry, the chemistry of carbon containing compounds, as required for chemistry, medical science, and engineering majors. The course will emphasize structure, main physical properties, chemical reactivity, and reaction mechanisms relating to alcohols, arenes and carbonyl compounds, as well as continued integration of mass and infrared spectrometry, ultraviolet/visible spectroscopy, and nuclear magnetic resonance technique and analysis.
Prerequisite: CHEM 2130 or CHEM 313.
Learning Outcomes
1. Identify functional groups and other key features of different organic compounds.
2. Correctly name organic compounds using the proper nomenclature (IUPAC and common names).
3. Analyze relationships among molecular structure, chemical reactivity, physical and spectral properties.
4. Understand chemical reactivity and reaction mechanisms relating, but not limited to dienes, arenes, alcohols, ethers, amines, phenols, and carbonyl compounds, i.e. aldehydes, ketones, carboxylic acids and derivatives.
5. Write out correctly the mechanisms of electrophilic aromatic substitution, formation and hydrolysis of acetals and ketals, formation and hydrolysis of imines and enamines, conjugate addition of nucleophiles to α,β-unsaturated carbonyl compounds, Fischer esterification and hydrolysis of esters under both acidic and basic conditions, transesterification under acidic and basic conditions, amide hydrolysis under acidic and basic conditions, the aldol reaction and condensation, and the Claisen condensation/Dieckmann cyclization for examples that are different than those studied in class.
6. Relate structures to spectral properties, interpreting IR, thirteenC and oneH NMR.
7. Describe the six-seven step synthesis of a simple organic molecule using reactions learned in this class.
8. Convert the Fischer projection of a carbohydrate to its corresponding Haworth projection, or convert the Haworth projection of a carbohydrate to its Fischer projection.
9. Recognize derivatives of carbonic and phosphoric acids, alkaloids, carbohydrates, peptides, steroids, prostaglandins, aglycones, carbohydrate anomers, reducing sugars, waxes, fats, and oils.

CHEM 2991. Introduction to Research
1-3 Credits (3+9P)
Techniques and procedures of chemical research. May be repeated for a maximum of 3 credits.
Prerequisites: 8 credits of chemistry and a 3.0 GPA in chemistry.
Learning Outcomes
1. Varies

CHEM 2996. Special Topics in Chemistry
1-6 Credits (1-6)
Specific subjects in Chemistry. These subjects will be announced in the 'Schedule of Classes'. It may be repeated under different topics for a maximum of 12 credits.
Learning Outcomes
1. Varies

CHEM 313. Organic Chemistry I
3 Credits (3)
An introduction to the structure, properties, nomenclature, and reactivity of organic molecules. Topics include functional groups, stereochemistry, reaction mechanisms, and multi-step synthesis. Emphasis is placed on substitution and elimination reactions, reactions of alkenes, alkynes, alcohols, phenols, and radicals. Builds on general chemistry concepts such as bonding, acid-base reactions, and molecular stability to develop a foundational understanding of organic reactivity.
Prerequisite: C- or better in CHEM 1225G or CHEM 1226.
Learning Outcomes
1. Demonstrate knowledge of the properties of elements and molecules discussed in general chemistry (electronegativity, bonding, formal charge, octet rule).
2. Demonstrate knowledge of the chemical reactions discussed in general chemistry, specifically Acid / Base Reactions (products, reactants, balanced equations).
3. Classify organic compounds and their properties by functional group, including substitution and elimination reactions of alkyl halides, reactions of alkenes, alkynes, radicals, alcohols, and phenols.
4. Use common and IUPAC rules of nomenclature to name organic compounds.
5. Demonstrate knowledge of the structure and stability of organic compounds.
6. Demonstrate comprehension of the relationship between organic structure and reactivity.
7. Demonstrate comprehension of the configurations of organic compounds (resonance structures, stereochemistry, isomers).
8. Correctly describe the four-five step synthesis of a simple organic molecule using various reactions.
9. Critically interpret molecular structures, predict chemical behavior based on structure, and articulate the relationship between form and function in organic compounds.

CHEM 314. Organic Chemistry II
3 Credits (3)
An in-depth focus on reactions and mechanisms as they relate to organometallic compounds, alcohols, ethers, ketones, aldehydes, carboxylic acid derivatives, an amines. May be repeated up to 3 credits.
Prerequisite(s): C- or better in CHEM 313.
Learning Outcomes
1. Identify several new functional groups and other key features of organic compounds
2. Interpret 1H / 13C NMR, IR, UV-Vis, and Mass spectrometry data and have the ability to correlate structural elements with spectral features
3. Understand the chemical reactivity and reaction mechanisms relating, but not limited, to organometallic compounds, alcohols, ethers, ketones, aldehydes, carboxylic acids, and amines. Mechanistic highlights include: etherification, acetal formation / removal, alcohol oxidation, carbonyl addition reactions, enolate (and related) reactions, formation of carboxylic acid derivatives, and nucleophilic acyl substitution processes. Apply these mechanistic and reactivity considerations to these same groups when they appear

as substructures in larger biologically-important molecules (e.g. carbohydrates, amino acids, and lipids).
4. Design concise, three to five step syntheses of simple organic molecules using reactions learned in both CHEM 313 and 314
5. Qualitatively assess stability, solubility properties, chemical reactivity, spectral properties, and potential reactions that would lead to preparation, simply via visual inspection of structure.

CHEM 315. Organic Chemistry Laboratory
2 Credits (6P)
Techniques, preparative and analytical methods in organic chemistry.
Prerequisite: C- or better in CHEM 313 or consent of instructor.
Prerequisite/Corequisite: CHEM 314.
Learning Outcomes
1. Students engage in safe laboratory practices and understand the importance of personal protective equipment (PPE) for the handling of laboratory glassware, chemical reagents, and the operation of analytical instrumentation.
2. Students demonstrate the ability to record scientific observations and critically evaluate data to determine the identity, purity, and yield of products.
3. Through laboratory reports, students summarize and discuss their findings in a clear and concise manner.
4. Students identify and characterize organic molecules by utilizing physical / spectroscopic means, including melting / boiling point determination, Infra-red (IR) Nuclear Magnetic Resonance (NMR) spectroscopies.
5. Students demonstrate proficiency in performing common laboratory techniques, including reflux, distillation, recrystallization, vacuum filtration, aqueous extraction, and thin layer chromatography.
6. Related to pre- / co-requisite coursework in CHEM 313 / 314, students demonstrate an ability to determine the outcome of simple organic reactions, utilizing a basic understanding of mechanisms and the relative reactivity of functional groups.

CHEM 351. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.
Prerequisite: consent of instructor.

CHEM 371. Analytical Chemistry
4 Credits (2+6P)
The fundamental principles of quantitative chemical measurements including concepts in statistics, chemical equilibrium, and physical properties and phenomena that underlie modern analytical instrumentation.
Prerequisite: C- or better in CHEM 1225G or CHEM 1226.
Learning Outcomes
1. Evaluate and interpret the sources and effects of error and uncertainty in measurements.
2. Apply statistical tools to evaluate and interpret data from chemical analyses.
3. Apply knowledge of acid/base equilibria for the preparation of buffers and the execution of titration-based analyses.
4. Understand the design and application of standards and calibration in chemical analysis.
5. Quantify chemical concentrations via spectroscopy.
6. Understand the fundamental equilibria governing chemical separations.

CHEM 422. Environmental Chemistry
3 Credits (3)
Chemistry of organic and metal ion pollutants in the environment and principles important to their remediation including bioremediation. Restricted to: Main campus only. Crosslisted with: ENVS 422
Prerequisite(s): CHEM 1225G and either CHEM 2120 or CHEM 313.
Learning Outcomes
1. Describe and explain the solid, liquid, and gas phases of the environment and how they interact.
2. Understand the chemical reactions and processes that occur between various phases of the environment.
3. Learn how the chemical processes can be managed to promote environmental remediation, including the techniques and calculations used.

CHEM 424. Soil Chemistry
3 Credits (3)
Same as SOIL/GEOL 424.

CHEM 430. Physical Chemistry: Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy
3 Credits (3)
Lecture course covering the basic four areas of Physical Chemistry at the advanced undergraduate level. Topics include: Statistical Mechanics, Thermodynamics, Kinetics, Quantum Chemistry, Group Theory, and Spectroscopy at the advanced undergraduate level.
Prerequisite: CHEM 1225G or 1226; MATH 1521G or higher; PHYS 1240G, 2140, 2240 or PHYS 1320G.
Learning Outcomes
1. Students will master the theoretical basis and underlying laws governing Physical Chemistry (Thermodynamics, Kinetics, Quantum Chemistry, and Spectroscopy) at the advanced undergraduate level of expertise. In particular, students will develop critical thinking and problem solving skills in the above four areas of Physical Chemistry.

CHEM 433. Physical Chemistry I
3 Credits (3)
This course will cover topics relevant to the quantum description of the Chemical world at the undergraduate level, with an emphasis on acquiring sufficient background knowledge necessary for subsequent graduate level courses. May be repeated up to 3 credits.
Prerequisite: CHEM 1225G or CHEM 1226; MATH 1521G; PHYS 2140 or PHYS 1320G, or consent of instructor.
Learning Outcomes
1. Students will develop critical thinking and problem-solving skills with direct application to basic Quantum Chemistry and Spectroscopy. Topics the students will master include (but are not limited to): The Schrodinger Equation, One-Electron Atoms, (i.e. the hydrogen atom), Many-Electron Atoms, Molecular Symmetry (Group Theory), Working with and generating Character Tables, Electric Dipole Spectroscopy, Vibrational Spectroscopy, Rotational Spectroscopy.

CHEM 433 H. Physical Chemistry I Honors
3 Credits (3)
Same as CHEM 433. Additional work to be arranged. May be repeated up to 3 credits.
Prerequisite: CHEM 1225G or CHEM 1226; MATH 1521G or MATH 1521H; PHYS 2140 or PHYS 1320G, or consent of instructor.
Learning Outcomes
1. Students will develop critical thinking and problem-solving skills with direct application to basic Quantum Chemistry and Spectroscopy. Topics the students will master include (but are not limited to): The Schrodinger Equation, One-Electron Atoms, (i.e. the hydrogen atom),

Many-Electron Atoms, Molecular Symmetry (Group Theory), Working with and generating Character Tables, Electric Dipole Spectroscopy, Vibrational Spectroscopy, Rotational Spectroscopy.

CHEM 441. Advanced Research
1-3 Credits (3+9P)
Investigation of chemical problems and the development of special techniques. May be repeated for a maximum of 3 credits.
Prerequisites: consent of instructor, 16 credits of chemistry and 3.0 GPA in chemistry for nonmajors.

CHEM 443. Senior Seminar
1 Credit (1)
Discussions of current chemical research, impact of chemistry on society and/or ethics as applied to chemists.
Prerequisite: CHEM 430.
Learning Outcomes
1. Students are proficient in reading and analyzing scientific literature.
2. Students are proficient in the oral communication of scientific literature.

CHEM 451. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.
Prerequisite: consent of instructor.

CHEM 455. Independent Studies
1-3 Credits
Independent studies directed by consulting faculty.
Prerequisite: consent of instructor.

CHEM 456. Inorganic Structure and Bonding
3 Credits (3)
Study of structure and bonding of inorganic elements with a focus on transition metals. An introduction to symmetry, group theory, and spectroscopy will be included. May be repeated up to 3 credits.
Prerequisite: (MATH 1521G or MATH 1521H) and C- or better in CHEM 314.
Learning Outcomes
1. Students will learn about inorganic coordination complexes with a focus on transition metals, and may include the main group and f-elements. Students will learn about inorganic nomenclature and to analyze complexes using Lewis acid-base concepts.
2. Students will learn bonding theories, including group theory and symmetry point groups. Students will learn introductory concepts in organometallic chemistry and electronic spectroscopy.

CHEM 471. Advanced Integrated Inorganic and Physical Chemistry Laboratory
3 Credits (9P)
Laboratory course covering Inorganic and Physical Chemistry techniques at the advanced undergraduate level. Topics may include: Transition metal/Main group synthesis in air and air free environments, Period f-element synthesis, UV-Vis spectroscopy, FT-IR spectroscopy, NMR spectroscopy, Isothermal Titration Calorimetry.
Prerequisite/Corequisite: CHEM 430 and CHEM 315.
Learning Outcomes
1. Students will engage in experiential learning to become proficient in the listed techniques at the advanced undergraduate level of expertise. Students will develop critical thinking and problem solving skills. Students will learn essential laboratory data documentation, record keeping, and communication skills.

CHEM 472. Advanced Integrated Instrumental Analysis and Protein Biochemistry Laboratory
3 Credits (9P)
Laboratory course covering Protein Biochemistry and Instrumental Analysis techniques at the advanced undergraduate level. Topics may include: Affinity-based protein purification, basic protein quantification, protein activity assay, multi-variant analysis, diode array UV/VIS spectroscopy, ICP-MS, absorption and emission spectroscopy, raman spectroscopy, fluorescence, and separation science (HPLC, GCMS). Includes data analysis lab.
Prerequisite: CHEM 371.
Prerequisite/Corequisite: BCHE 395.
Learning Outcomes
1. Students will engage in experiential learning to become proficient in the listed techniques at the advanced undergraduate level of expertise. Students will develop critical thinking and problem solving skills. Students will learn essential laboratory data documentation, record keeping, and communication skills.

CHEM 474. Radiochemistry
3 Credits (1+6P)
The course contains a lecture and a laboratory component. The lecture component will introduce students to the fundamentals of radiation, radiation detection, and radiation safety. The applications of radiation in industry, medicine, and energy production will also be discussed. A primary focus will include actinide chemistry. The laboratory section will introduce students to practical concepts covered in the lecture portion of class, the handling of radioactive material and the spectroscopic identification of radioactive materials.
Prerequisite: C- or better in CHEM 1225G and C- or better in MATH 1511G.
Learning Outcomes
1. From the lecture portion of the course students will gain familiarity with identifying different types of radiation, be able to describe radioactivity, radiation detection, how radiation interacts with matter, explain historic and modern uses of radiation.
2. In the laboratory section of the course students will be able to follow and perform radiation safety protocols, understand and apply basic radiochemical spectroscopic and counting techniques, and the safe handling of radioactive materials.

CHEM 475. Central Concepts in Chemistry - Safety
1 Credit (1)
Students will obtain university safety training plus departmental-specific safety guidelines for the research laboratory
Learning Outcomes
1. Students completing this course will be knowledgeable of all safety guidelines delineated by the University, College, and Department.
2. When possible accident case-studies will be incorporated within the curriculum.

CHEM 476. Central Concepts in Chemistry - Research Ethics
1 Credit (1)
Students will complete Federal Agency (NSF, NIH, etc.) on-line training modules in responsible conduct in research and discuss relevant case-studies of research misconduct.
Learning Outcomes
1. Completion of this class will yield researchers fully aware of federal and professional guidelines regarding the ethical conduction and dissemination of data and conclusions.

CHEM 477. Central Concepts in Chemistry - ProfessionalDevelopment
1 Credit (1)

Students will receive basic instruction in research dissemination strategies (presentations) and career planning.

Learning Outcomes

1. Completion of this class will yield researchers fully aware of research dissemination strategies, be able to set career goals, and create a plan to attain those goals.

CHEM 501. Central Concepts in Chemistry - Energy
3 Credits (3)

This course will provide the students with a detailed examination of several topics in chemical energetics. These topics include: (1) basic thermodynamics concepts, (2) statistical thermodynamics (3) chemical equilibria, and (4) intermolecular interactions.

Learning Outcomes

1. Students completing this course will gain an understanding of chemical thermodynamics and equilibria as they relate to all areas of chemistry.

CHEM 502. Central Concepts in Chemistry - Structure
3 Credits (3)

This course will provide the students with a detailed examination of several topics in chemical reactivity. These topics include: (1) principles of chemical bonding and (2) organic and inorganic structure determination.

Learning Outcomes

1. Students completing this course will understand the fundamental components of molecular interactions and their impact on molecular structure and function in all areas of chemistry.
2. In addition, they will learn the theory and practice of physical techniques used to determine molecular structure.

CHEM 503. Central Concepts in Chemistry - Dynamics
3 Credits (3)

This course will provide the students with a detailed examination of several topics in chemical reactivity. These topics include: (1) basic kinetic concepts, (2) fundamental gas phase kinetics (3) organic and inorganic reaction mechanisms.

Learning Outcomes

1. Students who successfully complete this course will understand the fundamentals of chemical dynamics: from simple gas or solution phase reaction mechanisms to biomolecular interactions.

CHEM 504. Central Concepts in Chemistry - Measurements
3 Credits (3)

This course will provide the students with a detailed examination of several topics in chemical measurements. These topics include: (1) spectroscopic, electrochemical and chromatographic techniques, (2) statistical methods of measurement and validation relevant to biomolecules, synthetic polymers and mixtures.

Learning Outcomes

1. The collection of quantitative data is central to all subdisciplines of chemistry.
2. Students completing this course will understand the basic principles of chemical measurements and the uncertainties inherently associated with those measurements.
3. They will also gain knowledge of tools available to minimize those uncertainties in data interpretation.

CHEM 507. Chemistry of the Elements
1-3 Credits (1-3)

Discussion of the reactions and structures of inorganic compounds. This course is made up of three independent modules of 1 credit each. It may be taught in one, two or three modules. Module 1: Synthesis and preparation of inorganic or organometallic compounds. Module 2: Analysis of inorganic or organometallic compounds. Module 3: Applications of inorganic or organometallic compounds. May be repeated up to 3 credits.

Learning Outcomes

1. By the end of module one, students will have a general understanding of synthetic techniques or strategies used for the preparation of inorganic or organometallic molecular or extended structure systems.
2. Model One may include a focus on solution, hydrothermal, pyrochemical, solid-state or other synthetic techniques.
3. By the end of module two, students will understand the basics of different analysis methods used for inorganic or organometallic molecular or extended structure systems.
4. Model Two, the analysis methods may cover solution, solid, or gas phase methods.
5. Model Two, the module will cover aspects of spectroscopic methods such as paramagnetic NMR, EPR, UV-vis-NIR, IR, and analysis methods covered may include single or powder X-ray diffraction, magnetometry, and more.
6. By the end of module three, students will understand the industrial applications relevant to inorganic or organometallic molecular or extended structure systems: some of these may include the generation of energy, industrial catalysis, materials science, and more.

CHEM 510. Graduate Student Seminar
1 Credit (1)

Research seminar for graduate students in Chemistry. Enrollment required each semester for all graduate students. Masters or Doctoral candidates presenting a research seminar enroll for a letter grade. All other participating students enroll using the S/U grading option.

Learning Outcomes

1. Graduate students will gain experience organizing a research presentation.
2. Graduate students will develop oral presentation skills.

CHEM 514. Organic Structure Determination
1-3 Credits (1-3)

This course is made up of three independent modules of 1 credit each. May be taught in one, two or three modules. Module 1: Infrared Spectroscopy and Other Spectroscopic Methods, Applications of infrared spectroscopy to the structure determination of organic compounds. Module 2: Mass Spectrometry, Application of mass spectrometry to the structure determination of organic compounds. Module 3: NMR spectroscopy, Applications of NMR spectroscopy to the structure determination of organic compounds. May be repeated up to 3 credits.

Learning Outcomes

1. By the end of module one, students will have a general understanding of the physical basis of infrared spectroscopy and molecular vibrations, be able to describe and use the frequency, shape and intensity of diagnostic absorptions in the IR spectra to correlate with common organic functional groups, recognize the utility of the fingerprint region of an IR spectrum to establish identity of small organic compounds, and integrate IR knowledge with other spectroscopic methods for the structure determination of small organic compounds.
2. By the end of module two, students will understand the basis of mass spectrometry as a tool for structure determination, have a general understanding of the different techniques commonly used for sample ionization, describe fragmentation patterns for common

classes of organic compounds: alkanes, alkenes, alkynes, aromatic hydrocarbons, alcohols, ethers, amines and carbonyl compounds, use molecular ion and fragmentation pattern information to propose structures of small organic molecules, integrate mass spectrometry knowledge with other spectroscopic methods for the structure determination of small organic compounds.

3. By the end of module three, students will understand the physical basis of the nuclear magnetic resonance experiment and the relationship between nuclear and magnetic properties of atoms, describe and use the concepts of chemical and magnetic equivalence, chemical shift, and anisotropic effects in oneH NMR spectra, use information from homonuclear (oneH-oneH) and heteronuclear (oneH-thirteenC) coupling experiments to propose structures of small organic molecules, use information from twoD-NMR experiments (COSY, HMQC, HMBC, NOESY) to propose structures of small organic molecules including stereochemistry, integrate NMR knowledge with other spectroscopic methods for the structure determination of small organic compounds.

CHEM 515. Modern Organic Chemistry
1-3 Credits (1-3)
Recent developments in synthesis and theoretical principles of organic chemistry. This course is made up of three independent modules of 1 credit each. May be taught in one, two, or three modules. Module 1: Structure and Reactivity. Module 2: Reactions. Module 3: Synthesis. May be repeated up to 3 credits.

Learning Outcomes

1. By the end of module one, students will have a general understanding of the fundamental basis of structure and reactivity of organic compounds.
2. Module one, topics can include but are not limited to: structure and bonding, reactivity and stability, aromaticity, stereochemistry, conformational, steric and stereoelectronic effects.
3. By the end of module two, students will have a general understanding of current synthetically useful reactions for organic compounds.
4. Module two, topics can include but are not limited to: additions and eliminations, substitutions, pericyclic, radical and photochemical reactions, functional group interconversions, oxidations and reductions, protecting groups.
5. By the end of module three, students will have a general understanding of the basis for organic synthesis.
6. Module three, topics can cover but are not limited to retrosynthesis and planning, comparative analysis, strategies and tactics for the synthesis of medium to complex targets.
7. Module three, emphasis is placed in showcasing the utility of catalytic, asymmetric, chemo-, regio- and stereo-selective transformations.

CHEM 520. Comprehensive Literature Review Seminar for Graduate Students
1 Credit (1)
Graduate student presents a literature review on an approved topic. The seminar presentation will include cover new developments of primary significance to the topic based on current research papers and culminate in a testable hypothesis. A passing grade allows the student to take the comprehensive exam.

Learning Outcomes

1. Student will prepare an abstract of their presentation understandable to a broad chemistry/biochemistry audience
2. Student will demonstrate a reasonable understanding of every concept introduced
3. Student will present a well-organized topic leading to a logical hypothesis
4. Student will demonstrate the ability to develop a data-supported hypothesis

CHEM 526. Advanced Analytical Chemistry
3 Credits (3)
Equilibria, and the theories of gravimetric, volumetric, and instrumental analysis.

CHEM 527. Separations
3 Credits (3)
Covers the fundamentals of separation methods and relationships to modern analytical techniques such as gas chromatography and liquid chromatography.

CHEM 598. Special Research Programs
1-3 Credits
Individual investigations, either analytical or experimental. Graded S/U.

CHEM 599. Master's Thesis
15 Credits
Thesis preparation.

CHEM 600. Research
1-15 Credits
Course used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.

CHEM 619. Topics in Organic Chemistry
1-3 Credits
Selected topics of current interest designated by subtitle.

CHEM 629. Advanced Topics in Analytical Chemistry
3 Credits (3)
Discussion of advanced topics in the field of analytical chemistry. May be repeated with different subtitles. Consent of instructor required.

CHEM 639. Topics in Physical Chemistry
1-3 Credits
Selected topics of current interest designated by subtitle.

CHEM 700. Doctoral Dissertation
17 Credits
Dissertation preparation.

CHIN-CHINESE

CHIN 311. Advanced Chinese Language I
3 Credits (3)
This course emphasizes the development of advanced oral, aural, reading and writing skills in Mandarin Chinese. Expanding of vocabulary and development of reading comprehension will be through different genres of authentic texts. Students will be trained to write short essays on a variety of topics.

CHIN 312. Advanced Chinese Language II
3 Credits (3)
This course emphasizes the development of advanced oral, aural, reading and writing skills in Mandarin Chinese. Expanding of vocabulary and development of reading comprehension will be through different genres of authentic texts. Students will be trained to write short essays on a variety of topics.
Prerequisite(s): Grade of C or better in CHIN 311.

CHME-CHEMICAL & MATERIALS ENGR

CHME 101. Introduction to Chemical Engineering Calculations
2 Credits (2)
Introduction to the discipline of chemical engineering, including: an overview of the curriculum; career opportunities; units and conversions; process variables; basic data treatments; and computing techniques including use of spreadsheets.
Prerequisite/Corequisite: MATH 1220G, or MATH 1250G, or MATH 1511G, or MATH1511H.
Learning Outcomes
1. Describe career opportunities available to holders of a BSCHE degree.
2. Find and use learning and advising resources within CHME and Engineering.
3. Create a course registration plan for future semesters that meets the degree and prerequisite requirements for the BSCHE in the timeliest manner.
4. Diagram a process with unit operations and material and energy flows.
5. Perform unit analysis and unit conversions accurately and efficiently.
6. Validate calculated results using estimation techniques.
7. Apply the concept of significant figures to numerical answers.
8. Identify and describe process variable measurements using engineering vocabulary.
9. Express and convert concentrations using mass, mole, and volume bases. 1
10. Convert between absolute and relative pressure and temperature scales. 1
11. Perform calculations in Excel using built-in and custom functions. 1
12. Generate 2-D plots of data and functions in Excel. 1
13. Perform a regression of data to a mathematical model.

CHME 102. Material Balances
2 Credits (2)
Perform material balances in single- and multi-phase, reacting and non-reacting systems under isothermal conditions.
Prerequisite: MATH 1220G, or MATH 1250G, or MATH 1511G, or MATH 1511H.
Learning Outcomes
1. Analyze data using trendlines, linearize when necessary.
2. Use unit conversions when solving problems.
3. Turn a verbal or written problem statement into a diagram and a mathematical form.
4. Write and solve material balances on single and multi-unit processes, for both nonreactive and reactive processes.
5. Identify what phase a substance is in and then be able to use the correct equations to relate volume to mass and moles.
6. Use Raoult's and Henry's law when solving mass balances.

CHME 201. Energy Balances & Basic Thermodynamics
3 Credits (3)
Chemical Engineering energy balances; combined energy and material balances including those with chemical reaction, purge and recycle; thermochemistry; application to unit operations. Introduction to the first and second laws of thermodynamics and their applications. May be repeated up to 3 credits.
Prerequisite: CHME 102 and MATH 1250G or MATH 1511G or MATH 1511H.
Prerequisite/Corequisite: CHEM 1216 or CHEM 1215G.
Learning Outcomes
1. Correctly implement unit conversions (outcome (a) an ability to apply knowledge of mathematics, science, and engineering).
2. Analyze and solve elementary material balances on single and multi-unit process, for both nonreactive and reactive processes.
3. Apply the first law of thermodynamics to batch and flow processes.
4. Locate thermophysical property data in the literature and estimate properties when data are not available.
5. Conduct combined material and energy balances around continuous multi-unit processes with and without chemical reaction.
6. Perform process calculations using psychrometric charts, enthalpy concentration diagrams and steam tables.
7. Derive and solve differential equations for transient heat and material balances on dynamic systems.
8. Determine individual learning style and describe how learners of that style can help themselves.
9. Use modern engineering tools (example, Excel) to solve material and energy balance problems.

CHME 303. Chemical Engineering Thermodynamics
4 Credits (4)
Applications of the First Law and Second Law to chemical process systems, especially phase and chemical equilibria and the behavior of real fluids. Development of fundamental thermodynamic property relations and complete energy and entropy balances. Modeling of physical properties for use in energy and entropy balances, heat and mass transfer, separations, reactor design, and process control.
Prerequisite: CHME 201.
Prerequisite/Corequisite: MATH 1511G or MATH 1511H.
Learning Outcomes
1. Use an engineering approach to solve a problem (identify scope, create diagram, determine knowns and unknowns, apply appropriate equations, calculate solutions and evaluate reasonableness of the solution).
2. Solve engineering problems using material, energy and entropy balances.
3. Compile appropriate property data for chemical compounds and mixtures.
4. Choose and solve appropriate equations of state.
5. Use equilibrium relationships to solve chemical engineering problems.
6. Acquire and apply new knowledge as needed, using appropriate learning strategies (maps to ABET Student Outcome seven) by analyzing a current environmental issue in chemical engineering.

CHME 305. Transport Operations I: Fluid Flow
3 Credits (3)
Theory of momentum transport. Unified treatment via equations of change. Shell balance solution to 1-D problems in viscous flow. Analysis of chemical engineering unit operations involving fluid flow. General design and operation of fluid flow equipment and piping networks.
Prerequisite: CHME 201.
Prerequisite/Corequisite: MATH 1521G or MATH 1521H.
Learning Outcomes
1. Mathematical Solutions: solve applied math problems involving linear ordinary differential equations with boundary conditions; solve partial differential equations that can be analytically solved with boundary

conditions; identify how coordinate systems are used with ODEs and PDEs; simplify second order PDEs with assumptions; identify when an analytical solution to a PDE is possible and when numerical methods are required.
2. Basic Fluid Concepts and Calculations: identify the properties of fluids, calculate problems that involve pressure measurements, fluid statics, and fluid kinematics; describe physical phenomena of fluid flow; define and explain viscosity, density, specific gravity, surface forces, velocity fields, Newtonian vs. Non-Newtonian, laminar flow, turbulent flow, Reynold's number, and other fluid motion topics.
3. Bernoulli and Energy Equations: apply the Bernoulli equation to sets of fluid problems; solve energy balances in the context of fluids and fluid motion, distinguish between approximations of and appropriate models for Bernoulli's Equation (i.e friction losses, x, pumps, compressors, turbines, surface forces, gas-liquid flow, non-Newtonian fluids, and the Moody diagram).
4. Momentum Analysis: apply momentum balances using the governing equations of momentum to solve one dimensional velocity profile problems of external or internal viscous fluid flow; interpret the different approximations of the momentum balance; classify differential vs. integral forms of momentum analysis; and calculate problems using the Navier Stoke's Equations.
5. Special topics: identify different turbo- and fluid-machinery; explain why computational fluid dynamics is important; solve problems using external flow with applications: boundary layers, lift, drag; and calculate problems with dimensional analysis methods.

CHME 306. Transport Operations II: Heat and Mass Transfer
4 Credits (4)
Theory of heat and mass transport. Unified treatment via equations of change. Analogies between heat and mass transfer. Shell balance solution to 1-D problems in heat and mass transfer. Analysis of chemical engineering unit operations involving heat transfer. Design principles for mass transfer equipment.
Prerequisite: CHME 305.
Prerequisite/Corequisite: MATH 3160.
Learning Outcomes
1. Adopt a systematic problem solving approach, consistently and effectively.
2. Diagram heat flows for conductive, convective, and radiative processes.
3. Find and use material property values.
4. Convert and use appropriate units of energy, power, flux, etc.
5. Write conservation equations for planar, cylindrical, and spherical systems.
6. Apply assumptions such as steady state, number of dimensions, order of magnitude, and/or constant properties to simplify conservation equations.
7. Solve the energy conservation equation for the temperature distribution using appropriate boundary and/or temporal conditions.
8. Calculate heat fluxes into and out of a control volume.
9. Draw resistance circuits and calculate the overall heat transfer coefficient, U, for compound systems. 1
10. Calculate the temperature distribution, heat flux, efficiency, and effectiveness of extended surfaces such as fins. 1
11. Use lumped capacitance and exact solution models to solve transient heat transfer problems. 1
12. Calculate transport dimensionless numbers and explain what they represent. 1
13. Use fluid velocity profiles to calculate boundary layer shapes and thicknesses. 1
14. Calculate convection heat transfer coefficient, h, for external and internal flows using formulas and graphs of experimental results. 1
15. Explain the causes and relative magnitudes of free convection. 1
16. Calculate free convection coefficients using equations and experimental results. 1
17. Label key regimes and heat transfer features of boiling and condensation curves. 1
18. Compare and contrast parallel, cross, and countercurrent flow in heat exchangers. 1
19. Determine the needed surface areas and/or fluid flow rates for heat exchangers given unit operation or process energy needs. 2
20. Calculate and explain heat exchanger efficiency. 2
21. Predict likelihood and account for consequences of fouling. 2
22. Define radiation terminology such as blackbody, grey surface, emissivity, etc. 2
23. Relate surface temperature to radiation wavelength and energy. 2
24. Calculate the view factor between two surfaces and use it to calculate heat transfer. 2
25. Write and solve the mass and molar forms of the one-D mass conservation equations. 2
26. Calculate absolute and relative species velocities and fluxes. 2
27. Use heat transfer relationships and analogous equations to solve diffusion and advection mass transfer problems. 2
28. Predict which kind(s) of heat transfer will be relevant for a given situation. 2
29. Describe implications of problem solutions and perform additional "what if" calculations to understand patterns in the bigger picture.

CHME 307. Transport Operations III: Staged Operations
3 Credits (3)
Theory of mass transport. Mass transfer coefficients. Analysis of chemical engineering unit operations involving mass transfer and separations. Equilibrium stage concept. General design and operation of mass-transfer equipment and separation sequences. Restricted to Chemical Engineering Majors. May be repeated up to 3 credits.
Prerequisite: CHME 303, CHME 306.
Prerequisite/Corequisite: CHEM 313.
Learning Outcomes
1. Determine which kind of separation (e.g., distillation, adsorption, membrane, etc.) is best suited to separate a particular mixture.
2. Design various kinds of separation units to achieve a target flow rate and purity.
3. Evaluate the cost effectiveness and energy requirements of a separation.
4. Perform McCabe-Theile analysis.
5. Include efficiencies and mass transfer effects in the design of separation units.

CHME 323 L. Transport Operations and Instrumentation Laboratory
2 Credits (6P)
Laboratory experiments demonstrate the principles of process measurement and instrumentation through the determination of thermodynamic properties, transport phenomena properties, heat transfer, and material physical properties. Treatment of data includes regression techniques, analysis of error, and statistical analysis.

Restricted to: Chemical Engineering majors. May be repeated up to 2 credits.
Prerequisite: I E 311.
Prerequisite/Corequisite: CHME 306.
Learning Outcomes
1. Introduce students to practical skills needed to be able to apply the scientific and engineering concepts acquired in earlier coursework and to achieve the following.
2. Organize and carry out experimental design and actual hands-on experiments.
3. Understand safety regulations and safe operation procedures in the Chemical Engineering laboratory.
4. Be able to analyze and interpret experimental data with theories learned in previous courses.
5. Write organized and cohesive technical and reports.
6. Organize and prepare standard operating procedures.
7. Work effectively in a team environment.
8. Prepare and present technical works and answer questions.

CHME 341. Chemical Kinetics and Reactor Engineering
3 Credits (3)
Analysis and interpretation of kinetic data and catalytic phenomena. Applied reaction kinetics; ideal reactor modeling; non-ideal flow models. Mass transfer accompanied by chemical reaction. Application of basic engineering principles to design, operation, and analysis of industrial reactors. Restricted to:CHME,CMEG,CH E majors. May be repeated up to 3 credits.
Prerequisite: CHME 303, CHME 306.
Learning Outcomes
1. Perform mole balances in systems involving reactions.
2. Calculate conversion in batch and flow systems.
3. Size single and staged continuous-stirred tank, and plug flow reactors.
4. Develop rate laws from mechanisms and experimental data.
5. Calculate pressure drops and the effect on kinetics in packed-bed PFRs.
6. Apply the differential and integral methods of kinetic data analysis.
7. Maximize product selectivity for systems involving multiple reactions.
8. Understand effects of non-isothermal operation and unsteady-state behavior.
9. Apply rate limiting step and quantify performance in catalytic systems. 1
10. Quantify mass transfer limitations on heterogeneous systems. 1
11. Understand the idea of a residence time distribution,and the effect on reactor ideality.

CHME 352 L. Simulation of Unit Operations
2 Credits (2P)
Definition, specification, and convergence of basic unit operations in a process simulator. Course will cover how to access variables, define and converge design specifications and converge tear/recycle streams. Restricted to:CHME majors. May be repeated up to 2 credits.
Prerequisite/Corequisite: CHME 307, CHME 341.
Learning Outcomes
1. Apply Aspen Plus programming solutions to specify and converge unit operations involving: non-rigorous balance units (RSTOIC, SEP, MIX, FSPLIT, SSPLIT DUPL); pressure changers (PUMP , COMPR, VALVE); pipe networks (PIPE, PIPELINE); heat exchangers (HEATER, HEATX); reactors and kinetic models (RPLUG, RCSTR, BATCH, REQUIL, RGIBBS);flash drums and decanters (FLASHII, DECANTER); distillation columns (DSTWU, intro to RADFRAC)

CHME 361. Engineering Materials
3 Credits (3)
Bonding and crystal structure of simple materials. Electrical and mechanical properties of materials. Phase diagrams and heat treatment. Corrosion and environmental effects. Application of concepts to metal alloys, ceramics, polymers, and composites. Selection of materials for engineering design. May be repeated up to 3 credits.
Prerequisite: CHEM 1215G or CHEM 1216.
Learning Outcomes
1. Explain the effects of composition, bonding, structure, and defects on material properties.
2. Compute the response of materials to external influences.
3. Predict rates of materials failures.
4. Select materials for applications.

CHME 370V. Discovery and Use of Radioactive Materials
3 Credits (3)
History, properties and uses of common radionuclides, including applications in fire safety, energy production, medicine, science, industry, and warfare. Impacts of radioactive materials extraction, processing, research, testing, and disposal in the Southwest. Perspectives about radioactive materials within different cultures. Management of radioactive materials by different countries.
Learning Outcomes
1. Give examples of common radionuclides and their uses.
2. Compare radioactive decay processes.
3. Describe the social, economic, and environmental impacts of radioactive materials in state, national, and global history.
4. Complete a written or creative art project that represents the attributes of a common radionuclide.
5. Present the contexts that influence the treatment and perspectives of radioactive materials within different cultures.

CHME 391. Industrial Employment
1-3 Credits (1-3)
Employment in chemical, petroleum, food, biotechnology, materials, environmental, pharmaceutical, or other industry relevant to the discipline, with opportunity for professional experience and training in chemical engineering. Requires written report covering work period approved by employer. Consent of Instructor required. Students must complete the NMSU Cooperative Education and Internship Learning Agreement. May be repeated up to 6 credits.
Learning Outcomes
1. Gain educational and work experiences that are directly related to the BSCHE curriculum and the student's career goals.
2. Develop an understanding of the demands, responsibilities, and opportunities of professional employment.
3. Be provided an opportunity to apply principles and techniques learned in the CHME curriculum to real life problem-solving situations.
4. Gain a better understanding of decision-making and implementation processes.
5. Criterion three Student Outcomes specifically addressed by this course are found in a mapping of outcomes against all CHME courses in the curriculum.

CHME 392. Numerical Methods in Engineering
3 Credits (3)

Study and application of numerical methods in solving problems commonly encountered in engineering. MATLAB will be used as the working environment for implementing and performing the numerical methods in computers.
Prerequisite/Corequisite: MATH 1521G or MATH 1521H.
Learning Outcomes

1. Use MATLAB as a tool to solve chemical engineering problems.
2. Import and graph data using MATLAB.
3. Write and use script M-files and function M-files.
4. Understand the differences between script M-files and function M-files and why they are used in different situations.
5. Be able to translate algebraic equations into matrices, and use MATLAB to solve systems of linear algebraic equations.
6. Fit equations to data, obtain parameters, and determine the goodness of fit.
7. Linearize non-linear equations and obtain parameters for the nonlinear equations.
8. Use MATLAB to symbolically and numerically integrate one-dimensional integrals.
9. Solve systems of ordinary differential equations analytically (by hand). 1
10. Solve systems of ordinary differential equations numerically and analytically using MATLAB. 1
11. Criterion three Student Outcomes specifically addressed by this course are found in a mapping of outcomes against all CHME courses in the curriculum.

CHME 395V. Brewing Science and Society
3 Credits (3)
An overview of the science of brewing and the interrelationships between society, technology, business, and the evolution of the current beer market. Topics covered are history of brewing and the interrelationships between societal attitudes, technology, and cultural preferences; beer styles and evaluation techniques; production and characteristics of ingredients used in brewing; brewing unit operations; biochemistry of malting, mashing, and fermentation; engineering in the brewery; homebrewing; and societal and health issues related to beer and alcohol. Students must be at least 21 years of age by the first day of instruction of the semester to enroll in this course. May be repeated up to 3 credits.
Learning Outcomes

1. Provide the undergraduate student with a broad perspective of beer and the brewing industry as well as technical knowledge about the brewing process.

CHME 412. Process Dynamics and Control
3 Credits (3)
Process modeling, dynamics, and feedback control. Linear control theory and simulation languages. Application of Laplace transforms and frequency response to the analysis of open-loop and closed-loop process dynamics. Dynamic response characteristics of processes. Stability analysis and gain/phase margins. Design and tuning of systems for control of level, flow, and temperature. May be repeated up to 3 credits.
Prerequisite: CHME 341.
Learning Outcomes

1. Mathematical Solutions: solve applied math problems involving linear ordinary differential equations, integration by parts, perform partial fraction expansion; use the Laplace Transform to solve differential equations; Laplace Transform look-up tables, solve inverse Laplace Transform problems.
2. Model-based Control: use MATLAB, Simulink, and/or visual basic simulator to computationally model process control, to make simple mathematic calculations, to solve differential equations, to take the Laplace Transform of a function, to plot curves representing response of a control loop, and to implement other simulation-based actions covered in class.
3. Basic Process Control Concepts and Calculations: draw and use block diagrams of open and closed-loop transfer functions for control problems; identify control system instrumentation (sensors, transmitters, transducer, final control elements); use process control techniques to address safety concerns; use process control vocabulary appropriately; choose a control strategy for a process; formulate control objectives; identify, formulate and solve linear chemical process dynamics problems; formulate and solve an approximate linear model to a nonlinear process; analyze the stability of a dynamic system.
4. PID Control Concepts: tune a P, PI, or PID controller using control theory; choose the appropriate control action (P, PI, PID) for a particular process,
5. Other topics: develop process models of non-steady-state process dynamics; Identify appropriate loop pairings for multivariable control; identify and implement feedforward and feedback control strategies; implement single-variable controllers (temperature, pressure, concentration, flow, level); and identify advanced control strategies and apply them in appropriate situations (cascade, ratio, pH).

CHME 423 L. Unit Operations Laboratory
2 Credits (6P)
Experiments with chemical engineering unit operations including the use of computer data acquisition. Covers control systems with closed-loop process control, instrumentation and development of empirical models from process data. Includes written and oral reports. May be repeated up to 2 credits.
Prerequisite: CHME 307, CHME 341.
Prerequisite/Corequisite: CHME 412.
Learning Outcomes

1. Understand and apply engineering experimentation techniques and safety procedures common to the chemical industry.
2. Apply principles developed in chemical engineering courses to the analysis of chemical engineering processes and unit operations.
3. Know the materials characterization methods.
4. Improve skills necessary for group work—interpersonal skills, coordination of the efforts of several persons, leader and subordinate roles, etc. Introduce students to practical skills needed to be able to apply the scientific and engineering concepts acquired in earlier coursework.

CHME 448. Industrial Safety
3 Credits (3)
An introduction to the fundamentals of chemical process safety, including toxicology, industrial hygiene, source models, fires and explosions, relief systems, hazard identification, risk assessment, environmental fate and transport, hazardous waste generation, pollution prevention, and regulatory requirements.
Prerequisite(s)/Corequisite(s): CHME 323 L.
Learning Outcomes

1. Demonstrate a knowledge and understanding of the elements of process safety management.
2. Be able to pro-actively identify and analyze safety hazards.

3. Demonstrate knowledge and understanding of risk management tools, programs and processes associated with process safety.
4. Understand the OSHA PSM requirements.
5. Understand and appreciate the need for professional integrity and ethical decision making in the professional practice of engineering.
6. Demonstrate an understanding of issues encountered including business, environmental, health, safety and public interest issues.

CHME 451. Intellectual Property for Engineers and Scientists
3 Credits (3)
An overview of intellectual property with an emphasis on patents. Terminology, patentability requirements, invention disclosures, inventorship, scope of claims, patent application content and the patent prosecution process, and post-allowance matters including infringement and enforcement. May be repeated up to 3 credits.
Learning Outcomes
1. Assess what kind of protection – patent, trade secret, copyright, trademark – is appropriate for particular intellectual property.
2. Describe relevant subject matter and standards for protection under patent, trade secret, copyright, and trademark.
3. Differentiate inventorship, authorship and ownership in an intellectual property context.
4. Devise search strategies to assess 'prior art' and public information that may affect availability of intellectual property protection.
5. Generate sample content for a patent application (including claims) and a trademark application.
6. Analyze office actions and propose solutions for issues raised during patent prosecution and trademark prosecution.
7. Compare and contrast the procedures for obtaining a patent, securing a trademark, registering a copyright and establishing trade secret protection.
8. Describe basic considerations relating to enforcement and infringement of intellectual property.

CHME 452. Chemical Process Design & Economic Evaluation
3 Credits (3)
Concepts in chemical engineering process design, including: capital and manufacture cost estimation; discounted cash flows; interest; taxes; depreciation; profitability analysis; project specifications. May be repeated up to 3 credits.
Prerequisite: CHME 307, CHME 341.
Learning Outcomes
1. Write and explain the meanings of the basic equations related to engineering economic analysis.
2. Formulate mathematical models and solve problems involving process design and economic analysis.
3. Discuss the environmental, social, and economic implications of process design.
4. Criterion three Student Outcomes specifically addressed by this course are found in a mapping of outcomes against all CHME courses in the curriculum.

CHME 455. Chemical Plant Design
3 Credits (3)
Design and analysis of integrated process plants. Consideration given to optimizing performance, operability, reliability, safety, control, energy integration, and cost effectiveness. Requires written report covering solution of a capstone design problem. Restricted to: CHME majors.
Prerequisite: CHME 452.
Corequisite: CHME 455 L.
Learning Outcomes
1. Understand government regulation of chemical processes.
2. Be knowledgeable of process safety analysis procedures.
3. Understand "normal" process conditions vs. those of concern.
4. Be able to perform a process optimization (topological vs. parametric).
5. Be able to perform a heat integration analysis through pinch technology.
6. Use heuristics to confirm the suitability of a process design.
7. Understand how to perform a base case analysis.
8. Be able to complete an analysis of a chemical plant design that includes: base case development and justification; process simulation; topological and parametric optimizations; societal impact assessment; and economic evaluation; including making recommendations based on their findings.

CHME 455 L. Chemical Plant Simulation
1 Credit (1P)
Construction, convergence, and optimization of chemical processes in a process simulator. Dynamic process simulation and control. Taken concurrently with CHME 455. May be repeated up to 1 credit.
Prerequisite: CHME 412, CHME 352 L.
Learning Outcomes
1. Understand how to input from the Aspen Plus Graphical User Interface (GUI).
2. How to specify unit operations in Aspen Plus.
3. Be able to perform a sensitivity analysis and an optimization.
4. Understand how to apply a design specification in Aspen Plus.
5. Understand how to use Calculator Blocks such as Fortran or Excel.
6. Be able to specify a catalytic reactor with LH kinetics.
7. Be able to optimize a RADFRAC distillation column on an economic basis.
8. Be able to converge complex multicomponent RADFRAC distillations.
9. Be able to use the economics analyzer package in conjunction with a simulation.

CHME 461. Calculation of Material and Molecular Properties
3 Credits (3)
The aim is to describe and apply techniques for computing common properties of materials and molecules: optimized geometries, transition states, vibrational spectra, energies (electronic, internal energy, enthalpy, and Gibbs free energy), heat capacities, net atomic charges, atomic spin moments, and effective bond orders. These techniques allow one to estimate the thermodynamic properties of a chemical, as well as to compute the mechanisms and energy barriers for chemical reactions and catalytic processes, and to quantify the electronic, magnetic, and chemical ordering in materials. The theory behind these techniques will be described and students will perform hands-on computer exercises using common computational chemistry programs. Taught with CHME 561. May be repeated up to 3 credits.
Prerequisite: CHEM 1216 or CHEM 1226, MATH 1521G or MATH 1521H, (PHYS 2140 or PHYS 1320G).
Learning Outcomes
1. Basic concepts of computational chemistry.
2. Calculating the energies and geometries of reactants and products for chemical reactions.
3. Finding the transition state of a chemical reaction: determining the reaction pathway, transition state geometry, and the energy barrier. Meaning of the energetic span for a catalytic cycle.

4. Quantifying whether the transition state is closer to the reactant (early transition state) or closer to the product (late transition state). Postulates related to transition state lateness.
5. Computing vibrational spectra.
6. Using the harmonic approximation to estimate thermodynamics properties: internal energy, enthalpy, Gibbs free energy, and heat capacities.
7. Computing net atomic charges, atomic spin moments, and effective bond orders to determine the electronic, magnetic, and chemical ordering of materials.

CHME 464. Polymer Science & Engineering
3 Credits (3)
This course covers concepts in science and engineering of macromolecules, such as synthesis and chemistry, characterization of molecular weight, morphology, rheology, and mechanical behavior, structure and property relationships, and polymer processing. Taught with CHME 564. May be repeated up to 3 credits.
Prerequisite: CHEM 313 or CHEM 2115.
Learning Outcomes
1. Describe the fundamental concepts in polymer science and engineering;
2. Analyze the microstructure and molecular weight of polymers;
3. Discuss the chemistry, importance and applications of natural polymers;
4. Interpret different synthesis methods of polymers;
5. Analyze the kinetics of polymerization;
6. Discuss the polymer rheology and viscoelastic behavior of polymers;
7. Explain the characterization and processing of polymers; and
8. Argue the selection of polymer and/or design a specific polymer for specific applications (through final project).
9. Criterion three Student Outcomes specifically addressed by this course are found in a mapping of outcomes against all CHME courses in the curriculum.

CHME 467. Nanoscience and Nanotechnology
3 Credits (3)
This is a lecture/laboratory course designed to present the basic concepts, the techniques and the tools to synthesize and characterize nanometer scale materials, and the latest achievements in current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics and energy. It is intended for a multidisciplinary audience with a variety of backgrounds. This course should be suitable for graduate students as well as advanced undergraduates. Topics covered will include: nanoscience and nanotechnology, nanofabrication, self-assembly, colloidal chemistry, sol-gel, carbon nanotubes, graphene, thin film, lithography, physical vapor deposition, chemical vapor deposition, quantum dots, lithium batteries, X-ray diffraction, scanning electron microscopy, transmission electron microscopy, nanoelectronics, nanophotonics and nanomagnetics, etc. Students must also have completed (EH&S Safety training to include the courses: (1) Employee & Hazard Communication Safety (HazCom); (2) Hazardous Waste Management; and (3) Laboratory Standard) trainings to enroll. Crosslisted with: PHYS 520 . May be repeated up to 3 credits.
Prerequisite: (CHEM 1216 or CHEM 1226), (PHYS 1230G or PHYS 1310G).
Learning Outcomes
1. Understand the basic and state-of-art synthesis methods and applications in nanoscience and nanotechnology (Student outcome (a) an ability to apply knowledge of mathematics, science, and engineering).
2. Do lab work to use tools and analyze data (Student outcome (b) an ability to design and conduct experiments, as well as to analyze and interpret data).
3. Form a team for lab work and lab report (Student outcome (d) an ability to function on multidisciplinary teams).
4. Present literature review and ask questions (Student outcome (g) an ability to communicate effectively).

CHME 470. Introduction to Nuclear Energy
3 Credits (3)
Atomic and nuclear structure, nuclear stability and radioactivity, nuclear reactions, detection and measurement of radiation, interaction of radiation with matter, radiation doses and hazard assessment, principles of nuclear reactors, and applications of nuclear technology. Taught with CHME 570. May be repeated up to 3 credits.
Prerequisite: CHEM 1215G or CHEM 1225G, MATH 1521G or MATH 1521H.
Learning Outcomes
1. Basic Concepts. Write and explain the meanings of the basic balances and equations of nuclear science and engineering.
2. Problem Solving. Solve problems involving radioactive decay rates, radiation interactions, rates of nuclear reactions, energies of nuclear transformations, and applications.
3. Model Building. Given a verbal or pictorial description, create useful mathematical models of nuclear engineering systems, such as radiation shields, radiation detectors, nuclear reactors, and energy converters.
4. Social and Economic Effects. Discuss the global environmental, social, and economic effects of nuclear technology.

CHME 471. Health Physics
3 Credits (3)
Introduction to radiation protection, radiation/radioactivity, radioactive decay/fission, interactions of radiation and matter, biological effects of radiation, radiation measurement and statistics, sampling for radiation protection, radiation dosimetry, environmental transport, radiation protection guidance, external and internal radiation protection, and hazards analysis. Taught with CHME 571.
Prerequisite(s): MATH 1521G or MATH 1521H, CHME 470.
Learning Outcomes
1. Develop the ability to solve problems using the equations to calculate: a. Atomic Structure and Atomic Radiation: binding and ionization energies, atomic densities, characteristic X-rays and Auger electrons. b. The Nucleus and Nuclear Radiation: nuclear binding energies, alpha particle energy and recoil nucleus energy in an interaction, calculate Q of beta particle, antineutrino, recoil nucleus, orbital electron, internal conversion electron, and internal conversion coefficient. c. Interaction of heavy charged particles, beta and gamma radiation with matter: maximum energy transfer, stopping power, mean excitation energies, range and slowing down time. collisional stopping power, radiative stopping power, radiation yield, range, slowing-down time. Photon threshold energy, energy of the scattered photon and the Compton shift in wavelength, momentum of the scattered photon, average kinetic energy of Compton Recoil electrons, linear and mass attenuation coefficients, threshold energy and atomic cross section for the photodisintegration of a radionuclide, rate of energy absorption per unit mass. d. Statistics Know the concepts of Statistics of radioactive disintegration, the Binomial Poisson Normal distributions, error and error propagation, counting rates, Criteria for Radiobioassay. Calculate Minimum Significant Measured Activity, Type-I Errors, Minimum Detectable True

Activity, Type-II Errors. e. Radiation Dosimetry: Know and calculate the units of exposure, absorbed dose, dose equivalent, kerma, specific energy, lineal energy; alpha and low-energy beta emitters distributed in tissue, charged-particle beams, point source of gamma rays, neutrons; measurement of exposure, absorbed dose, X- and Gamma-Ray, neutron dose.

2. Know the concepts of: a. Radiation Detection and measurements methods: Ionization in gases, Ionization current, W values, Ionization pulses, Gas-filled detectors, Ionization in semiconductors, Band theory of solids, semiconductors, Radiation measuring devices; Scintillators, Organic and Inorganic scintillation detectors; Photographic Film; Thermoluminescence, Optically stimulated luminescence, Radiophotoluminescence, Chemical dosimeters, Calorimetry, Cerenkov detectors, Neutron Detection: Slow, Intermediate and Fast Neutrons. b. Chemical and Biological Effects of Radiation: Radiation effects time frame, physical and prechemical chances in irradiated water, chemical yields in water; Sources of Human Data biological effects: The life span study, medical radiation, radium-dial painters, uranium miners, accidents, acute radiation syndrome; Delayed somatic effects: Cancer, life shortening cataracts; Dose–response relationships, factors affecting dose response, relative biological effectiveness, dose rate, oxygen enhancement ratio, chemical modifiers. c. Radiation-Protection Criteria and Exposure Limits: Become knowledgeable about objectives of radiation protection, elements of radiation-protection programs, The NCRP and ICRP; NCRP/ICRP Dosimetric Quantities: Equivalent dose, Effective dose, Committed equivalent dose, Committed effective dose ,Limits on intake; Risk estimates for radiation protection; Current exposure limits of the NCRP and ICRP. Occupational limits, Non-occupational limits Exposure of individuals under 18 Years of age; Occupational limits in the Dose-Equivalent System -The "2007 ICRP Recommendations". d. Internal Dosimetry and Radiation Protection: ICRP-30 Dosimetric Model for the Respiratory System and Gastrointestinal Tract, ICRP-66 Human Respiratory Tract Model, ICRP-30 Dosimetric Model for the Organ Activities as Functions of Time, for Submersion in a Radioactive Gas Cloud , Metabolic Data for Reference Man, ICRP Publication 89, Specific Absorbed Fraction, Specific Effective Energy, and Committed Quantities; Number of Transformations in Source Organs over 50 Y. e. External Radiation Protection: Design concepts of distance, time, and shielding for radiation protection, primary and secondary protective barriers; shielding of Gamma-Ray, X-rays, beta and neutron radiation, ICRP Report.
3. Hands on experience with background radiation and contamination measurement, concepts of statistical variation of radiation measurement.
4. Term Paper group interaction, writing manuscript, and personal presentation.

CHME 474. Power Plant Design
3 Credits (3)
Principles of electric power generation. Review of DC and AC systems, energy sources, and prime movers. Analysis of hydroelectric, fossil fuel, nuclear, and alternative power systems. Environmental and economic considerations. Taught with CHME 574.
Prerequisite: MATH 1511G or MATH 1511H, CHEM 1215G or CHEM 1216G.
Learning Outcomes
1. Write and explain the meanings of the basic concepts and equations related to electric power generation.
2. Formulate mathematical models and solve problems involving electric power generation.
3. Summarize the economic, environmental, and regulatory issues involving electric power generation.

CHME 476. Nuclear Fuel Cycles
3 Credits (3)
Physical and chemical processes in the conventional nuclear fuel cycle: uranium mining and milling, conversion, enrichment, fuel fabrication, reactor operations, interim storage, reprocessing and recycling, waste treatment and disposal. Alternative fuel cycles and future prospects. Taught with CHME 576. May be repeated up to 3 credits.
Prerequisite: CHME 470.
Learning Outcomes
1. Write and explain the basic principles and equations related to the conventional nuclear fuel cycle.
2. Solve problems involving chemical and nuclear processes in the conventional nuclear fuel cycle.
3. Given a verbal or pictorial description, create useful mathematical models of chemical engineering systems in the nuclear fuel cycle.
4. Discuss the global environmental, social, and economic implications of nuclear fuel cycles.

CHME 478. Electrochemistry: Basics & Applications
3 Credits (3)
Theory and application of electrochemical devices. Topical information related to electrochemistry are concepts, principles, and examples of energy storage, mechanisms responsible for electrochemical devices, and current progress and problems. Relevant devices covered include the lithium ion battery, supercapacitor, fuel cell, solar cell and electrolyzer.
Learning Outcomes
1. Understand the mechanisms responsible for electrochemical device.
2. Realize the current progress in electrochemistry.
3. Identify the problems and hurdles for electrochemical device practical applications.

CHME 479. Corrosion and Degradation of Materials
3 Credits (3)
Failure of engineering materials in aggressive environments. Chemical and electrochemical mechanisms of corrosion. Influence of chemical composition and microstucture on corrosion behavior. Types of corrosion and chemical attack, including uniform corrosion, galvanic corrosion, pitting and other forms of localized corrosion, stress corrosion cracking, and corrosion fatigue. Methods of corrosion mitigation including cathodic protection, coatings, passivation, and corrosion inhibitors. Corrosion in nuclear reactors and nuclear waste repositories. May be repeated up to 3 credits.
Prerequisite: CHME 361.
Learning Outcomes
1. Basic Concepts: Explain the basic principles related to the corrosion and degradation of materials.
2. Problem Solving: Solve problems involving mechanical, chemical and electrochemical processes in materials exposed to harsh environments.
3. Mitigation: Discuss methods for preventing the degradation and failure of materials.

CHME 481. Biomedical Engineering and Engineering Healthcare
3 Credits (3)
Orientation to solving human and world health issues with biological engineering systems, tools, and analysis methods. Introduces general

concepts including applied biology for engineers, biophotonics, biosensing, bioinstrumentation, tissue and biomaterials engineering, biomedical engineering research practices, and physical bioanalytical methods. May be repeated up to 3 credits.
Prerequisite: CHEM 1215 or CHEM 1225.
Learning Outcomes
1. Solve problems related to the design of biomedical instruments.
2. Apply basic mathematics, biology concepts, and laws of physics and chemistry to solve biomedical engineering type problems.
3. Explain differences in biomedical research and industries.
4. Identify the current challenges in the field of biomedical engineering and predict what investigators and industries are doing to tackle such problems.
5. Critique biomedical engineering research through interpretation of peer-reviewed literature, formal presentations and formal reports.
6. Design a solution to a current biomedical engineering problem by computational modeling, experimental design, and/or researching a specific subject in biomedical engineering (i.e. reading peer-reviewed research articles/manuscripts/textbooks).
7. Engage in hands-on learning of biomedical devices such as the building of a simple flow-cytometer.

CHME 486. Biofuels
3 Credits (3)
Introduction to the fundamentals and applications of biofuels and bioenergy production; biomass resources and their composition; types of biofuels; conversion technologies (thermochemical and biochemical conversion processes); biodiesel production, algae to biofuels; economic and environmental assessments; term paper of selected topics relevant to biofuels. May be repeated up to 3 credits.
Prerequisite: CHEM 313 or consent of instructor.
Learning Outcomes
1. Understand basic concepts about biomass derived energy;
2. Identify potential biomass feedstocks including energy crops;
3. Understand the concept of 1st generation, 2nd generation and advance biofuels;
4. Understand terminologies related to biomass conversion and biofuel production;
5. Have an understanding of the existing and emerging biomass to energy technologies;
6. Understand and apply mass and energy balances in biomass conversion;
7. Apply engineering thermodynamics, organic chemistry, chemistry of plant materials;
8. Familiarize with characterization of biomass feedstocks;
9. Understand the unit processes/ unit operations involved in biofuel/ bioenergy production; 1
10. Be able to do the basic engineering calculations related to biofuel production; 1
11. Understand the concept of a biorefinery system and be able to develop major unit operations of an integrated biorefinery; 1
12. Describe techno-economic analyses of biofuel conversion technologies; 1
13. Have an understanding of environmental implications; and 1
14. Apply biomass-derived energy in different applications.

CHME 490. Senior Seminar
1 Credit (1)
Research seminar attended by graduate students is open to CHME undergraduates who are research active May be repeated up to 2 credits. Students must be in Senior Standing to enroll in this course.
Prerequisite(s)/Corequisite(s): CHME 498.
Learning Outcomes
1. Expose students to the breadth and depth of research in chemical engineering and related fields.

CHME 491. Undergraduate Special Topics
3 Credits (3)
Lecture and/or laboratory instruction on special topics in chemical engineering. May be repeated up to 6 credits.
Learning Outcomes
1. Gain exposure to, knowledge of, and practice solving problems in a variety of CHME topics that are directly related to broadening the BSCHE curriculum and the student's career goals.
2. Topics will vary by years and section depending on current topics of interest in CHME and availability of instructors.
3. be provided an opportunity to apply principles and techniques learned in the CHME curriculum to real life problem-solving situations in specialized topics.

CHME 495. Brewing Science & Engineering
3 Credits (3)
Details of beer production, fermentation science, brewery operation, and process design & economics. Engineering considerations including process safety, fermentation kinetics, unit operations, and economies of scale. Beer styles, recipe formulation, product quantification for tax purposes, and brew analytical methods will also be discussed. Students must be 21 years old to enroll. Crosslisted with: FSTE 430.
Learning Outcomes
1. To provide the undergraduate student with a broad perspective of beer and the brewing industry as well as technical knowledge about the brewing process.

CHME 495 L. Brewing Science & Technology Lab
1 Credit (3P)
Brewing and brewing operations in a one-barrel brewery. Topics addressed will include brewery safety, characteristics and handling of brewing ingredients, recipe formulation, water treatment, wort preparation, fermentation, waste disposal, and packaging.
Prerequisite/Corequisite: CHME 495.
Learning Outcomes
1. Demonstrate a working 1-barrel brewery and its unit operations, from recipe formulation to brewing and fermentation to cleaning and sanitizing.

CHME 497. Undergraduate Special Projects
1-3 Credits (1-3)
Provides an opportunity for undergraduate students to work on special projects under the direction of a faculty member. Written report covering work is required. May be repeated up to 6 credits.
Learning Outcomes
1. Prepare a written project report conforming to the format of the CHME writing standard.
2. Articulate a clear project question or problem.
3. Define, articulate, and use appropriate terminology and concepts.
4. Use library and other tools to search for existing body of information relevant to their project.
5. Identify and practice appropriate engineering ethics.

6. Know and apply problem solving skills to constructively address setbacks.
7. Work collaboratively with others, using listening and communication skills.
8. Work autonomously in an effective manner, setting and meeting deadlines.
9. Reflect on own project outcomes, identifying lessons learned, strengths, and ways to improve. 1
10. Communicate confidently and constructively with students, faculty, and project sponsor (as required). 1
11. Explain project to others in the field and to broader audiences through presentations. 1
12. Articulate the relevance of their project to their coursework and professional future, synthesizing their project, academic, and professional interests and goals.

CHME 498. Undergraduate Research
1-3 Credits (1-3P)
Provides an opportunity for undergraduate students to work in research studies under the direction of a faculty member. Consent of Instructor required. May be repeated up to 6 credits.
Learning Outcomes
1. Prepare a written research report conforming to the format of the CHME writing standard.
2. Articulate a clear research question or problem and formulate a hypothesis.
3. Identify and demonstrate appropriate research methodologies.
4. Define, articulate, and use appropriate terminology, concepts, and theory.
5. Use library and other tools to search for existing body of research relevant to their topic.
6. Know existing body of research relevant to their topic and explain how their project fits.
7. Identify and practice research ethics and responsible conduct in research.
8. Know and apply problem solving skills to constructively address research setbacks.
9. Work collaboratively with other researchers, using listening and communication skills. 1
10. Work autonomously in an effective manner, setting and meeting deadlines. 1
11. Reflect on own research, identifying lessons learned, strengths, and ways to improve. 1
12. Communicate confidently and constructively with graduate students, other researchers, and faculty. 1
13. Explain research to others in the field and to broader audiences through presentations. 1
14. Articulate the relevance of their research to their coursework and professional future, synthesizing their research, academic, and professional interests and goals. 1
15. Criterion Three Student Outcomes specifically addressed by this course are NOT found in a mapping of outcomes against all CHME courses in the curriculum as this is a technical elective, not a required core course.

CHME 501. Graduate Thermodynamics for Chemical Engineers
3 Credits (3)
Advanced applications of the first and second law to chemical process systems. The calculus of thermodynamics, equilibrium and stability criteria. Properties relationships for real fluids, both pure materials and mixtures. An introduction to molecular thermodynamics and statistical mechanics.
Learning Outcomes
1. Solve problems using the energy balance appropriate for a system (the First Law of Thermodynamics).
2. Solve problems using the entropy balance appropriate for a system (the Second Law of Thermodynamics).
3. Evaluate, manipulate, and use thermodynamic partial derivatives.
4. Correctly use thermodynamic property charts, steam tables, and other relations to determine the thermodynamic properties of real substances and mixtures.
5. Determine whether a system is at equilibrium and whether it is stable.
6. Use the thermodynamic relationships governing phase changes.
7. Apply the basic relations of statistical thermodynamics and how to apply them.

CHME 506. Graduate Transport Phenomena(s)
3 Credits (3)
Covers the analysis of simultaneous momentum, energy, and mass transport. Development of integral and local balance equations in vector-tensor form. Application of vector-tensor analysis to transport equations. Boundary layer theory and turbulence. May be repeated up to 3 credits.
Learning Outcomes
1. Perform vector and tensor analysis.
2. Formulate momentum, heat, and mass transport equations.
3. Analyze and solve macroscopic momentum, heat, and mass balances for steady and quasi-steady-state problems.
4. Formulate the transport phenomena in boundary layer.
5. Compare the difference in between laminar and turbulent flows.
6. Differentiate polymeric and non-Newtonian fluids.
7. Demonstrate the analogies between momentum, heat and mass transfer problems.

CHME 516. Graduate Numerical Methods in Chemical Engineering
3 Credits (3)
Survey of numerical methods for solving problems commonly encountered in heat and mass transfer, fluid mechanics, and chemical reaction engineering. May be repeated up to 3 credits.
Learning Outcomes
1. Understand criteria to evaluate and compare the performance of different numeric methods.
2. Solve linear and nonlinear systems of equations for several unknown variables.
3. Numerically solve ordinary and partial differential equations to solve both initial and boundary value problems.
4. Numerically optimize functions to find zeros, minima, and maxima.
5. Use and understand the key differences between different numerical methods.
6. Solve basic problems in statistics and data regression for model parameter estimation.
7. Prepare Matlab programs using user-defined functions and scripting files.
8. Use Matlab to manipulate data plots.
9. Use Matlab to perform both symbolic and numeric integration of mathematical functions. 1

10. Apply these numerical methods to the solution of Chemical Engineering problems, including batch reaction kinetics, heat transfer, mass transfer, and vapor-liquid equilibria calculations. 1
11. Understand and use Matlab control structures, including iterative loops and " IF … THEN" blocks.

CHME 542. Graduate Reactor Analysis and Design (s)
3 Credits (3)
Application and analysis of equations of continuity to multicomponent reaction systems. Introduction to homogeneous and heterogeneous catalysis, single-phase combustion, and shock reaction systems. May be repeated up to 3 credits.
Learning Outcomes
1. Perform mole balances in systems involving chemical reaction.
2. Calculate conversion in batch and flow systems.
3. Size single and staged continuous-stirred tank, and plug flow reactors.
4. Develop rate laws from mechanisms and experimental data.
5. Calculate pressure drops and the effect on kinetics in packed-bed PFRs.
6. Apply the differential and integral methods of kinetic data analysis.
7. Maximize product selectivity for systems involving multiple reactions.
8. Understand effects of non-isothermal operation and unsteady-state behavior.
9. Apply rate limiting step and quantify performance in catalytic systems. 1
10. Quantify mass transfer limitations on heterogeneous systems. 1
11. Understand the idea of a residence time distribution, and the effect on reactor ideality.

CHME 548. Industrial Safety
3 Credits (3)
Same as CHME 448 with graduate-level projects.
Prerequisite: CHEM 1216 or CHEM 1215G.
Learning Outcomes
1. Demonstrate a knowledge and understanding of the elements of process safety management.
2. Pro-actively identify and analyze safety hazards.
3. Demonstrate knowledge and understanding of risk management tools, programs and processes associated with process safety.
4. Understand the OSHA PSM requirements.
5. Understand and appreciate the need for professional integrity and ethical decision making in the professional practice of engineering.
6. Demonstrate an understanding of issues encountered including business, environmental, health, safety and public interest issues.
7. Analyze scenarios for a mock chemical plants and prepare risk analysis presentations both individually and as a group project.
8. Apply the above to a research environment.

CHME 564. Polymer Science & Engineering
3 Credits (3)
Synthesis, structure, property relationships of synthetic polymers. Taught with CHME 464. May be repeated up to 3 credits.
Prerequisite: CHME 201, CHEM 314.
Learning Outcomes
1. Describe the fundamental concepts in polymer science and engineering.
2. Analyze the microstructure and molecular weight of polymers.
3. Discuss the chemistry, importance and applications of natural polymers.
4. Interpret different synthesis methods of polymers.
5. Analyze the kinetics of polymerization.
6. Discuss the polymer rheology and viscoelastic behavior of polymers.
7. Explain the characterization and processing of polymers.
8. Argue the selection of polymer and/or design a specific polymer for specific applications (through final project).

CHME 565. Rheology and Viscoelasticity
3 Credits (3)
This course is an introduction to rheology and viscoelasticity. In particular, the flow behavior of Non-Newtonian Fluids and Viscoelastic Fluids will be covered. Rheometry, the technique for characterization of fluids, will be discussed. Most of the course is quantitative and uses mathematical modeling. Taught with CHME 465.
Prerequisite: CHME 306.
Learning Outcomes
1. Apply linear viscoelastic models to characterize fluids.
2. Evaluate the viscoelastic behavior of fluids with respect to their chemical structure and molecular weight.
3. Apply nonlinear viscoelastic methods to characterize complex fluids.
4. Design a rheological toolbox to characterize the behavior of complex fluids.

CHME 567. Nanoscience and Nanotechnology
3 Credits (3)
This is a lecture/laboratory course designed to present the basic concepts, the techniques and the tools to synthesize and characterize nanometer scale materials, and the latest achievements in current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics and energy. It is intended for a multidisciplinary audience with a variety of backgrounds. This course should be suitable for graduate students as well as advanced undergraduates. Topics covered will include: nanoscience and nanotechnology, nanofabrication, self-assembly, colloidal chemistry, sol-gel, carbon nanotubes, graphene, thin film, lithography, physical vapor deposition, chemical vapor deposition, quantum dots, lithium batteries, X-ray diffraction, scanning electron microscopy, transmission electron microscopy, nanoelectronics, nanophotonics and nanomagnetics, etc. Taught with CHME 467. May be repeated up to 3 credits.
Prerequisite: (CHEM 1225G or CHEM 1226) and (PHYS 1230G or PHYS 1310G).
Learning Outcomes
1. Understand the basic and state-of-art synthesis methods and applications in nanoscience and nanotechnology (student outcome (a) an ability to apply knowledge of mathematics, science, and engineering).
2. Do lab work to use tools and analyze data (Student outcome (b) an ability to design and conduct experiments, as well as to analyze and interpret data).
3. Form a team for lab work and lab report (Student outcome (d) an ability to function on multidisciplinary teams).
4. Present literature review and ask questions (Student outcome (g) an ability to communicate effectively).

CHME 570. Introduction to Nuclear Energy
3 Credits (3)
Atomic and nuclear structure, nuclear stability and radioactivity, nuclear reactions, detection and measurement of radiation, interaction of

radiation with matter, radiation doses and hazard assessment, principles of nuclear reactors, and applications of nuclear technology. Taught with CHME 470. May be repeated up to 3 credits.

Learning Outcomes

1. Basic Concepts. Write and explain the meanings of the basic balances and equations of nuclear science and engineering.
2. Problem Solving. Solve problems involving radioactive decay rates, radiation interactions, rates of nuclear reactions, energies of nuclear transformations, and applications.
3. Model Building. Given a verbal or pictorial description, create useful mathematical models of nuclear engineering systems, such as radiation shields, radiation detectors, nuclear reactors, and energy converters.
4. Social and Economic Effects. Discuss the global environmental, social, and economic effects of nuclear technology.

CHME 571. Health Physics
3 Credits (3)

Introduction to radiation protection, radiation/radioactivity, radioactive decay/fission, interactions of radiation and matter, biological effects of radiation, radiation measurement and statistics, sampling for radiation protection, radiation dosimetry, environmental transport, radiation protection guidance, external and internal radiation protection, and hazards analysis. Taught with CHME 471.

Prerequisite: MATH 1521G or MATH 1521H, CHME 470 or CHME 570.

Learning Outcomes

1. Develop the ability to solve problems using the equations to calculate: a. Atomic Structure and Atomic Radiation: binding and ionization energies, atomic densities, characteristic X-rays and Auger electrons. b. The Nucleus and Nuclear Radiation: nuclear binding energies, alpha particle energy and recoil nucleus energy in an interaction, calculate Q of beta particle, antineutrino, recoil nucleus, orbital electron, internal conversion electron, and internal conversion coefficient. c. Interaction of heavy charged particles, beta and gamma radiation with matter: maximum energy transfer, stopping power, mean excitation energies, range and slowing down time. collisional stopping power, radiative stopping power, radiation yield, range, slowing-down time. Photon threshold energy, energy of the scattered photon and the Compton shift in wavelength, momentum of the scattered photon, average kinetic energy of Compton Recoil electrons, linear and mass attenuation coefficients, threshold energy and atomic cross section for the photodisintegration of a radionuclide, rate of energy absorption per unit mass. d. Statistics Know the concepts of Statistics of radioactive disintegration, the Binomial Poisson Normal distributions, error and error propagation, counting rates, Criteria for Radiobioassay. Calculate Minimum Significant Measured Activity, Type-I Errors, Minimum Detectable True Activity, Type-II Errors. e. Radiation Dosimetry: Know and calculate the units of exposure, absorbed dose, dose equivalent, kerma, specific energy, lineal energy; alpha and low-energy beta emitters distributed in tissue, charged-particle beams, point source of gamma rays, neutrons; measurement of exposure, absorbed dose, X- and Gamma-Ray, neutron dose.
2. Know the concepts of: a. Radiation Detection and measurements methods: Ionization in gases, Ionization current, W values, Ionization pulses, Gas-filled detectors, Ionization in semiconductors, Band theory of solids, semiconductors, Radiation measuring devices; Scintillators, Organic and Inorganic scintillation detectors; Photographic Film; Thermoluminescence, Optically stimulated luminescence, Radiophotoluminescence, Chemical dosimeters, Calorimetry, Cerenkov detectors, Neutron Detection: Slow, Intermediate and Fast Neutrons. b. Chemical and Biological Effects of Radiation: Radiation effects time frame, physical and prechemical chances in irradiated water, chemical yields in water; Sources of Human Data biological effects: The life span study, medical radiation, radium-dial painters, uranium miners, accidents, acute radiation syndrome; Delayed somatic effects: Cancer, life shortening cataracts; Dose-response relationships, factors affecting dose response, relative biological effectiveness, dose rate, oxygen enhancement ratio, chemical modifiers. c. Radiation-Protection Criteria and Exposure Limits: Become knowledgeable about objectives of radiation protection, elements of radiation-protection programs, The NCRP and ICRP; NCRP/ICRP Dosimetric Quantities: Equivalent dose, Effective dose, Committed equivalent dose, Committed effective dose ,Limits on intake; Risk estimates for radiation protection; Current exposure limits of the NCRP and ICRP. Occupational limits, Non-occupational limits Exposure of individuals under 18 Years of age; Occupational limits in the Dose-Equivalent System -The 2007 ICRP Recommendations. d. Internal Dosimetry and Radiation Protection: ICRP-30 Dosimetric Model for the Respiratory System and Gastrointestinal Tract, ICRP-66 Human Respiratory Tract Model, ICRP-30 Dosimetric Model for the Organ Activities as Functions of Time, for Submersion in a Radioactive Gas Cloud , Metabolic Data for Reference Man, ICRP Publication 89, Specific Absorbed Fraction, Specific Effective Energy, and Committed Quantities; Number of Transformations in Source Organs over 50 Y. e. External Radiation Protection: Design concepts of distance, time, and shielding for radiation protection, primary and secondary protective barriers; shielding of Gamma-Ray, X-rays, beta and neutron radiation, ICRP Report.
3. Hands on experience with background radiation and contamination measurement, concepts of statistical variation of radiation measurement.
4. Term Paper group interaction, writing manuscript, and personal presentation.

CHME 574. Power Plant Design
3 Credits (3)

Principles of electric power generation. Review of DC and AC systems, energy sources, and prime movers. Analysis of hydroelectric, fossil fuel, nuclear, and alternative power systems. Environmental and economic considerations. Taught with CHME 474. May be repeated up to 3 credits.

Learning Outcomes

1. Write and explain the meanings of the basic concepts and equations related to electric power generation.
2. Formulate mathematical models and solve problems involving electric power generation.
3. Summarize the economic, environmental, and regulatory issues involving electric power generation.

CHME 576. Nuclear Fuel Cycles
3 Credits (3)

Physical and chemical processes in the conventional nuclear fuel cycle: uranium mining and milling, conversion, enrichment, fuel fabrication, reactor operations, interim storage, reprocessing and recycling, waste treatment and disposal. Alternative fuel cycles and future prospects. Taught with CHME 476. May be repeated up to 3 credits.

Learning Outcomes

1. Write and explain the basic principles and equations related to the conventional nuclear fuel cycle.
2. Solve problems involving chemical and nuclear processes in the conventional nuclear fuel cycle.

3. Given a verbal or pictorial description, create useful mathematical models of chemical engineering systems in the nuclear fuel cycle.
4. Discuss the global environmental, social, and economic implications of nuclear fuel cycles.

CHME 578. Electrochemistry: Basics & Applications
3 Credits (3)
Theory and application of electrochemical devices. Topical information related to electrochemistry are concepts, principles, and examples of energy storage, mechanisms responsible for electrochemical devices, and current progress and problems. Relevant devices covered include the lithium ion battery, supercapacitor, fuel cell, solar cell and electrolyzer.
Prerequisite: CHEM 1215G or CHEM 1216.
Learning Outcomes
1. Understand the mechanisms responsible for electrochemical devices, realize the current progress and identify the problems that challenge the practical applications.

CHME 590. Graduate Seminar
1 Credit (1)
Presentations on topics of professional interest in chemical engineering. Includes seminars by faculty, graduate students, and invited speakers from academia, government, and industry. May be repeated up to 6 credits.
Learning Outcomes
1. Expose students to the breadth and depth of research in chemical engineering and related fields.

CHME 591. Graduate Special Topics
1-3 Credits (1-3)
Lecture and/or laboratory instruction on special topics in chemical engineering. May be repeated up to 12 credits.
Learning Outcomes
1. Gain exposure to, knowledge of, and practice solving problems in a variety of CHME topics that are directly related to broadening the MSCHE, MECPI, and PHDCHE curriculum and the student's career goals.
2. Topics will vary by years and section depending on current topics of interest in CHME and availability of instructors.
3. Be provided an opportunity to apply principles and techniques learned in the CHME curriculum to real life problem-solving situations in specialized topics.

CHME 593. Graduate Special Projects
1-3 Credits (1-3)
Provides an opportunity for graduate students to work on special projects under the direction of a faculty member. Written report covering work is required. May be repeated up to 6 credits.
Learning Outcomes
1. Prepare a written project report conforming to the format of the CHME writing standard.
2. Articulate a clear project question or problem.
3. Define, articulate, and use appropriate terminology and concepts.
4. Use library and other tools to search for existing body of information relevant to their project.
5. Identify and practice appropriate engineering ethics.
6. Know and apply problem solving skills to constructively address setbacks.
7. Work collaboratively with others, using listening and communication skills.
8. Work autonomously in an effective manner, setting and meeting deadlines.
9. Reflect on own project outcomes, identifying lessons learned, strengths, and ways to improve. 1
10. Communicate confidently and constructively with students, faculty, and project sponsor (as required). 1
11. Explain project to others in the field and to broader audiences through presentations. 1
12. Articulate the relevance of their project to their coursework and professional future, synthesizing their project, academic, and professional interests and goals.

CHME 594. Professional Communication in Chemical Engineering
2 Credits (2)
Connections between interpersonal relationships and the effective communication of information. Strategies for formal and informal written and verbal communication in the context of presentations, interviews, reports and publications. Factors affecting non-verbal communication. Special focus will be given to understanding and adapting to the audience's perspective. 2 credits. Open to chemical engineering graduate students or by permission of instructor. This class will prepare you to communicate technical information effectively within a variety of contexts and to a variety of audiences. Class assignments will be partially based on current student needs such as preparing presentations for professional conferences, giving research progress reports, and writing research manuscripts.
Learning Outcomes
1. Describe why and how interpersonal relationships affect communication of information, even within technical contexts.
2. Describe and implement methods for improving interpersonal relationships; introduce themselves to others, implement strategies for dealing with conflicts.
3. Assess the rhetorical situation for a given communication.
4. Display evidence and reasoning as well as convey credibility.
5. Understand different stakeholder audiences, and how to communicate with them differently.
6. Analyze the consequences of actions and ethical principles.
7. Design documents for users, including dividing content into manageable units.
8. Write a manuscript for the research community, including appropriate citations; manage time to allow for revisions and peer evaluation, provide useful feedback to peers during the revision process, find, understand and follow directions for manuscript and proposal preparation, locate relevant peer-reviewed journal articles using library and web resources.
9. Choose precise, accurate and concise language, and eliminate jargon, prepare effective graphs, illustrations, tables and equations. 1
10. Prepare, rehearse and deliver a research presentation.

CHME 595. Chemical Process Design and Business Analysis
3 Credits (3)
Graduate chemical process design principles, emphasizing literature review, patent search, heuristics application, process simulation assistance to process creation, synthesis of reactor and separator trains, second-law analysis, heat and power integration, process equipment mechanical design specifications, process design optimization, cost accounting and capital estimation, annual costs, earnings, and profitability analysis.
Prerequisite: CHME 452, CHME 455 L or equivalent.
Prerequisite/Corequisite: CHME 506, CHME 516, CHME 542.

Learning Outcomes

1. Make a definitive estimate or project control.
2. Perform research on the process.
3. Identify the equipment, instrumentation needed.
4. Summarize the safety aspects.
5. Identify the environmental impact.
6. List local/state/federal regulations.
7. Provide a cost estimate from vendor costs.
8. Provide sketches and drawings for the plant or system (e.g. PIDs, plot plans, evaluation diagrams, energy balances, and final PFDs with stream tables/mass balances).
9. Provide final cohesive report.

CHME 596. Chemical Process Industries Research
1 Credit (1)
Independent graduate-level chemical process design project development, literature search, and proposal/defense.
Prerequisite: CHME 595.
Learning Outcomes

1. Information about the entire process, the equipment, the instrumentation (background).
2. Information about safety aspects (even if this is existing and not new).
3. Environmental control, local/state/federal regulations, etc.
4. Prepare and defend a comprehensive report.

CHME 597. Advanced Chemical Process Industry Analysis
2 Credits (2)
In-depth analysis and defense of a timely commercially-relevant chemical process design.
Prerequisite: CHME 596.
Learning Outcomes

1. Prepare a final report that is comprehensive.
2. Data collected, an analysis related to yield, or anything else that would be appropriate as a final discussion/conclusions/recommendations about the process.
3. Add figures/graphs/tables as well as sketches and drawings for the plant PIDs, plot plans, elevation diagrams, energy balances, final PFDs with stream tables/mass balances.

CHME 599. Master's Thesis
1-15 Credits (1-15)
Thesis. May be repeated up to 88 credits.
Learning Outcomes

1. Varies, to make progress toward a Master of Science degree.

CHME 690. Graduate Seminar
1 Credit (1)
Presentations on topics of professional interest in chemical engineering. Includes seminars by faculty, graduate students, and invited speakers from academia, government, and industry. Required each semester for every Ph.D. student. All candidates for graduate degrees required to give seminar. May be repeated up to 8 credits.
Learning Outcomes

1. Expose students to the breadth and depth of research in chemical engineering and related fields.

CHME 698. Ph.D. Research
1-9 Credits (1-9P)
Advanced topics for current research. Course subtitled in the Schedule of Classes. May be repeated up to 99 credits.
Learning Outcomes

1. To make progress toward a PhD degree.

CHME 700. Doctoral Dissertation
1-9 Credits (1-9)
Individual research in selected topics of current interest in chemical engineering. May be repeated up to 88 credits.
Learning Outcomes

1. Demonstrate skills in the (a) design of experiments or simulations, (b) collection of experimental/simulated data, (c) development of appropriate models, and (d) make appropriate use of those models;
2. Complete an independent research project, resulting in at least a thesis/dissertation and peer-reviewed journal article(s);
3. Defend original research in front of a panel of peers and experts;
4. Be knowledgeable of the contemporary issues that are relevant to their chosen area of research.

CHSS - COMM HEALTH/SOC SRVCS

CHSS 1110. Intro to Health & Community Services
3 Credits (3)
This course offers a holistic and multidisciplinary approach towards health promotion, wellness and a healthy lifestyle. Emphasis is placed on the major problems/issues that have the greatest significance to personal and community health. Topics to be discussed include:nutrition, fitness, stress management, sexuality, drug education and others. May be repeated up to 3 credits.
Learning Outcomes

1. Understand basic foundations of community health –history, framework and present progress: Identify key historical advances, people and events in public health; Understand Healthy People 2020 goals and objectives; Understand the levels of prevention (primary, secondary, tertiary) of public health
2. Identify organizations that help shape community health and their role in promoting health: Governmental; Quasi-Governmental; Nongovernmental; Identify local resources/agencies focused on health and human services
3. Conduct research in public health: Identify major sources for public health research; Governmental websites; Journals; Interpret and evaluate public health resources for academic use; Write a basic journal article critique
4. Understand the history and function of the school health program: Identify components of a coordinated school health program; Identify and overcome barriers common to CSHP; Apply the CSHP to contemporary issues in child/adolescent health

CHSS 2510. Service Learning
4 Credits (4)
Service Learning Experience in Human and Community Service: Exploration of contemporary social, civil, economic and ethical problems that require student participation in collaborative efforts within the community. Restricted to Community Colleges campuses only.
Prerequisite: PHLS 2110.
Prerequisite/Corequisite: PHLS 1110G, CHSS 1110, and PHLS 2120.
Learning Outcomes

1. Understand the importance of service learning in community building and civic participation.
2. Students will complete 120 hours of service learning experience with a collaborating community agency.

3. Compile and submit a list of detailed daily service learning activities including contact individuals, meetings attended, presentations, specific tasks accomplished or contributions to agency or community, new skills learned, trainings, and number of hours spent on each activity.
4. Design a service learning project incorporating the key elements of Public Health, and addressing a need in the community.
5. Provide an oral presentation and write a personal reflection of the service learning experience in class.
6. Practice critical thinking, decision making skills, and civic responsibility in promoting better health and general well-being.

CHSS 2511. Service Learning - Community Health Worker
1 Credit (1)
Service Learning Experience in Community Health Work: Exploration of contemporary social, civil, economic and ethical problems that require student participation in collaborative efforts within the community. May be repeated up to 1 credit.
Prerequisite: PHLS 2110, consent of instructor.
Prerequisite/Corequisite: PHLS 1110G, CHSS 1110, and PHLS 2120.
Learning Outcomes
1. Understand the importance of service learning in community building and civic participation.
2. Students will complete 30 hours of service learning experience with a collaborating community agency focusing on Community Health Work.
3. Compile and submit a list of detailed daily service learning activities including contact individuals, meetings attended, presentations, specific tasks accomplished or contributions to agency or community, new skills learned, trainings, and number of hours spent on each activity.
4. Attend CHW trainings focused on community health including (but not limited to) chronic disease, environmental and mental health.
5. Provide an oral presentation and write a personal reflection of the service learning experience in class.
6. Practice critical thinking, decision making skills, and civic responsibility in promoting better health and general well-being

CJUS-CRIMINAL JUSTICE

CJUS 1110G. Introduction to Criminal Justice
3 Credits (3)
This course provides an overall exploration of the historical development and structure of the United States criminal justice system, with emphasis on how the varied components of the justice system intertwine to protect and preserve individual rights. The course covers critical analysis of criminal justice processes and the ethical, legal, and political factors affecting the exercise of discretion by criminal justice professionals.
Learning Outcomes
1. Describe the history, structure and function of the criminal justice system in the United States.
2. Discuss the role of law enforcement, court systems, corrections, and security in maintaining social order.
3. Identify and describe crime causation theories, various measures of crime and their reliability and victimization theories.
4. Relate fundamental principles, concepts and terminology used in criminal justice to current events.
5. Apply basic analytical and critical thinking skills in evaluating criminal justice issues, policies, trends and disparities.

CJUS 1120. Criminal Law
3 Credits (3)
This course covers basic principles of substantive criminal law including elements of crimes against persons, property, public order,public morality, defenses to crimes, and parties to crime. May be repeated up to 3 credits.
Learning Outcomes
1. Explain the concepts of substantive criminal liability in the United States, including actus reas, mens rea, causation, concurrence, and parties to crime.
2. Define the differences between criminal law and civil law in the United States.
3. Demonstrate basic knowledge of legal terminology as it relates to criminal law.
4. Identify the elements of crimes against persons, property, public order and the administration of justice, public morality, and the inchoate crimes.
5. Describe the various defenses to crimes.

CJUS 1996. Special Topics in Criminal Justice
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. May be repeated under different topics for a maximum of 6 credits.
Learning Outcomes
1. Varies

CJUS 2120. Criminal Courts and Procedure
3 Credits (3)
This course covers the structures and functions of American trial and appellate courts, including the roles of attorneys, judges, and other court personnel, the formal and informal process of applying constitutional law, rules of evidence, case law and an understanding of the logic used by the courts.
Learning Outcomes
1. Explain the application of the Constitutional Amendments that apply to criminal justice.
2. Explain and describe the dual court system in the U.S. and how courts enforce the rule of law.
3. Identify and list the duties and requirements of the courtroom workgroup.
4. Describe courtroom procedures, rules of the court, and due process of law.
5. Articulate basic knowledge of the U.S. criminal court system.
6. Define legal terms.
7. Explain the use of discretion in criminal procedure.
8. Differentiate the role of courts of limited jurisdiction, courts of general jurisdiction, and the appellate courts in the processing of criminal cases.

CJUS 2140. Criminal Investigations
3 Credits (3)
This course introduces criminal investigations with in the various local, state, and federal law enforcement agencies. Emphasis is given to the theory, techniques, aids, technology, collection, and preservation procedures which insure the evidentiary integrity. Courtroom evidentiary procedures and techniques will be introduced. Community Colleges only. (Note: students completing CJUS 2140 may not take CJUS 321.)
Learning Outcomes
1. Identify developments in investigation technology.
2. Identify common types of criminal investigations and their key components.

3. Apply proper crime scene investigative protocols.
4. Explain proper evidentiary gathering and handing procedures, and utilize various interviewing techniques.
5. Identify and compare different law enforcement agencies and the role they play in criminal investigations.
6. Describe proper collection, evidence preservation, documentation, and court presentation.
7. Develop effective search authorization.

CJUS 2150. Corrections System
3 Credits (3)
This course introduces the corrections system in the United States, including the processing of an offender in the system and the responsibilities and duties of correctional professionals. The course covers the historical development, theory, and practice, as well as the institutional and community-based alternatives available in the corrections process.

Learning Outcomes

1. Describe the purposes of the corrections system and the issues facing the corrections system.
2. Explain the components of the corrections system and describe their functions.
3. Compare and contrast the different forms of correction practices.
4. Explain the goals of corrections, the different factors affecting the sentencing process, the legal rights of prisoners, and the issues concerning prison violence.
5. Explain the impact of reentry into society.
6. Identify the issues concerning capital punishment.
7. Describe the effectiveness of various correction programs on offenders.

CJUS 2160. Field Experience in Criminal Justice
3-6 Credits
This course is designed to provide actual experience working for a criminal justice agency and the opportunity to apply criminal justice concepts and theory to a field situation. Students already working in an agency will complete an approved learning project while on the job.
Prerequisites: CJUS 1110G, prior arrangement and consent of instructor and a GPA of 2.0 or better in major.

Learning Outcomes

1. Obtain practical experience by observing, researching, and working in a criminal justice agency.
2. Apply the knowledge of principles, theories, and methods that were learned in the classroom to situation in which field experience will be devoted
3. Instill an understanding for general and specific problems that criminal justice agencies encounter on a daily basis.
4. Develop a professional work ethic and attitudes, including reliability, professional responsibility, and the ability to work cooperatively with others.

CJUS 2220. The American Law Enforcement System
3 Credits (3)
This course covers the historical and philosophical foundations of law and order, with an in-depth examination of the various local, state, ad federal law enforcement agencies and how they interact within the criminal justice system.

Learning Outcomes

1. Discuss, evaluate, and analyze the role of police in the democratic society today, and the historical development of modern day law enforcement
2. Define and explain the different types of community policing and the valid reasons behind their application within a community
3. List and discuss the ways to overcome the barriers to change within a police organization, good recruitment, screening, and retention of employees
4. Analyze and discuss the history of and the different types of police patrol, as well as the use of force and deadly force, and methods used for controlling police behavior
5. Describe and discuss the different types of police behavior, potential oversight, and remedy and their limitations
6. List and discuss the benefits of higher and continued education, along with the minimum educational requirements for police officers
7. Evaluate and discuss the reasons for police stress and the methods of dealing with stressors
8. Interpret current court cases, both state and federal, that affect police procedures

CJUS 300. Introduction to Criminal Justice Research
3 Credits (3)
Overview and evaluation of criminal justice research. Selection of research topics, methods of data selection and collection, analysis techniques, and presentation of findings.
Prerequisite: restricted to majors or consent of instructor.

CJUS 301. Advanced Research Methods
3 Credits (3)
Study of selected quantitative and qualitative skills and their application to criminal justice research.
Prerequisite: Restricted to majors or consent of instructor.

CJUS 302. Crime, Justice and Society
3 Credits (3)
Through critical analysis students build a rich understanding of the role of crime in our contemporary landscape and explore ideas and practices associated with justice, victimization, criminality, morality and righteousness. The course cultivates knowledge & awareness of the interactions between socially constructed phenomena (race, class, power, ethnicity, economic structures) and popular beliefs, policies, and practices associated with crime, punishment, and formal social control. It is recommended that you complete three of the following English courses before enrolling in this class: ENGL 1110G, ENGL 2210G, ENGL 2221G & ENGL 2130G. Restricted to: Criminal Justice majors.

CJUS 303. Introduction to Criminological Theory
3 Credits (3)
Defining and measuring crime, crime causation, and the criminal behavior system, and their linkage to criminal justice policies, procedures, and practices. Students must be enrolled or have completed third English writing class and completed two of the following: ENGL 1110G, ENGL 2210G, ENGL 2221G or ENGL 2130G. Restricted to: C J majors.
Prerequisite(s): CJUS 300.

CJUS 304. Historical Perspectives of Criminal Justice Systems
3 Credits (3)
Examines the precursors to and development of three distinct systems associated with crime and punishment in the United States: the Courts, the Police, & Corrections. By studying the historical context and socio-political backdrop in which theses institutions emerged and expanded students will come to a richer understanding of them and their attendant

polices, practices, conventions, and assumptions.It is recommended that you complete three of the following English courses before enrolling in this class: ENGL 1110G, ENGL 2210G, ENGL 2221G or ENGL 2130G. Restricted to: Criminal Justice majors.
Prerequisite(s): CJUS 300.

CJUS 306. Criminal Procedural Law
3 Credits (3)
Legal analyses of the rights of criminal defendants; legal duties and responsibilities of criminal justice personnel in the processing of criminal defendants. May be repeated up to 3 credits. Restricted to: C J majors.
Prerequisite(s): Restricted to majors, Forensic Science minors, or consent of instructor.

CJUS 307. Law of Evidence
3 Credits (3)
Evidentiary rules and concepts and their application in a criminal trial. May be repeated up to 3 credits. Restricted to: C J majors.
Prerequisite(s): Restricted to majors, Forensic Science minors, or consent of instructor.

CJUS 321. Criminal Investigation and Intelligence
3 Credits (3)
Principles of criminal investigation and intelligence production; processing cases from complaint through crime scene search, identification and collection of evidence, interviewing and interrogation, and case preparation for courts. May be repeated up to 3 credits. Restricted to: C J majors.
Prerequisite(s): Restricted to majors, Forensic Science minors, or consent of instructor.

CJUS 331. American Correctional Institutions
3 Credits (3)
Structure, organization, and operations of United States jails and prisons. Overview of correctional standards and classification systems, emphasizing current theory and practice.
Prerequisite: restricted to majors or consent of instructor.

CJUS 332. Correctional Law
3 Credits (3)
Federal and state laws and rules of post-conviction procedures; rights of the convicted related to sentencing, appeals, clemency, and restoration of rights.
Prerequisite: restricted to majors or consent of instructor.

CJUS 333. Juvenile Corrections
3 Credits (3)
Development and implementation of juvenile facilities and community programs. Effectiveness of current corrections practices. Restricted to majors.

CJUS 345. Victimology
3 Credits (3)
Study of risk factors in crime victimization, the impact of crimes upon victims, and the role of the victim in the criminal justice system.
Prerequisite: restricted to majors or consent of instructor.

CJUS 347. Sex Crimes
3 Credits (3)
Dynamics of sex crimes for victims and offenders, plus consideration of the legal and correction systems' response to sex crimes. Restricted to majors.

CJUS 348. Serial Killers
3 Credits (3)
Overview and critical assessment of serial homicide and its relevance for contemporary U.S. society. Focus on factors influencing definitions and cultural understanding of serial homicide.
Prerequisite(s): 60 credit hours.

CJUS 360. The Juvenile Justice System
3 Credits (3)
History, development, and philosophy behind a separate juvenile justice system. Role of the juvenile court, evaluation of juvenile law and procedure, and the processing of juvenile offenders.
Prerequisite: restricted to majors or consent of instructor.

CJUS 380. Introduction to Terrorism
3 Credits (3)
Overview of the phenomenon of terrorism, psychological and sociological theories of terrorism, and various contemporary governmental policies.

CJUS 391. Special Readings in Criminal Justice
1-3 Credits
Individually chosen subject areas not readily available in other courses. May be repeated for a maximum of 6 credits under different subtitles. Restricted to majors.
Prerequisites: at least a 2.5 GPA and consent of instructor.

CJUS 393. Internship in Criminal Justice
1-12 Credits
Field experience in a local, state, or federal criminal justice or private security agency. Includes orientation, observation, conferences, and work experience. Credits limited to six if student has taken CJUS 2160. May be repeated for a maximum of 12 credits. Restricted to majors. Graded S/U.
Prerequisites: consent of instructor and GPA of 2.5 or better.

CJUS 399. New Mexico Law
3 Credits (3)
Examination of the history, development and implementation of law in New Mexico with an emphasis on legal issues unique to New Mexico. Crosslisted with: POLS 399. May be repeated up to 3 credits.

Learning Outcomes

1. To understant the unique legal issues of New Mexico through critical examination of the history, development and implementation of law in the state.
2. To develop skills to critically analze debates over legal issues in New Mexico.
3. To develop skills to effectively communicate analysis of legal issues in New Mexico in oral and written forms.

CJUS 405. Juvenile Courts and Law
3 Credits (3)
History, development, and current status of juvenile courts. Legal status of juveniles in court and constitutional protections afforded them. Restricted to majors.

CJUS 410. Criminal Justice Administrative Systems
3 Credits (3)
Administrative structures in criminal justice agencies and institutions; relationship of administrative structures to practical police, courts, and corrections problems.
Prerequisite: restricted to majors or consent of instructor.

CJUS 412. Introduction to Security Technology and Loss Prevention
3 Credits (3)
Private and public responses to security problems, including employee theft, perimeter security, and domestic or foreign terrorism; reviews related law and management practices.

CJUS 414. Race, Crime and Justice
3 Credits (3)

Historical and contemporary analysis of the relationship between race and crime in the United States with emphasis upon human equality and fairness. Overview of racial and ethnic social categorizations and how they impact law and order.

CJUS 416. Global Perspectives on Youth and Drug Use
3 Credits (3)
Overview of global drug use among young people, comparative legal structures, formal and informal responses. Restricted to C J, C EP, ANTH, GOVT, SOC, GNDR, S WK majors.

Learning Outcomes

1. Identify and analyze the history of drugs.
2. Compare different legal and illegal drugs of abuse in cultures around the world, with particular reference to children and youth.
3. Critique the different strategies in addressing illegal drugs and the use of medical marijuana.
4. Identify the various categories of drugs.
5. Collaborate with classmates in a group project to investigate designer drugs.
6. Examine how the local program focuses on substance use prevention and/or drug treatment operates and summarize recommendations for drug prevention programs and education.

CJUS 417. Drugs In Our World
3 Credits (3)
Comparative analysis of patterns and theories of drug use, terminology concerning drugs, associated behaviors, dangers, criminal relationships, class stratification, and the impact of drugs.

Learning Outcomes

1. Identify and analyze types of drugs their effects on society.
2. Compare major contributing factors responsible for addiction regulations of drugs in the criminal justice system.
3. Clearly communicate (orally or in writing) arguments regarding the adverse effects of drugs on social and economic costs in the U.S.
4. Examine the patterns of abuse among various groups of people.
5. Critique the current prevention programs for drug use and abuse offer suggestions for effective drug treatments.

CJUS 424. Forensic Law
3 Credits (3)
Overview of the rules and issues related to the use of scientific information in the legal process. May be repeated up to 3 credits. Restricted to: C J majors.
Prerequisite(s): C J major, Forensic Science minors, or consent of instructor.

CJUS 425. Issues in Ethics, Law, and Criminal Justice
3 Credits (3)
Examination of the key ethical and decision-making dilemmas facing professionals working in the field of law and criminal justice.
Prerequisite: restricted to majors or consent of instructor.

CJUS 427. Race and Crime in Film
3 Credits (3)
Critical analysis of film where messages relating race and crime are present, with emphasis on how this imagery informs problem definition, policies, and practice within the criminal justice system.
Prerequisite(s): 60 credit hours.

CJUS 428. Mexican-Americans and Issues of Social Justice
3 Credits (3)
In this course we will explore and discuss social issues related to the Mexican American community in the U.S., with special emphasis on their collective historical struggles and contributions to society. We will discuss the political, economic and cultural forces that exemplify their experience as a "whole."
Prerequisite(s): Students must have completed CJUS 300 or research methods equivalent or consent from the instructor.

CJUS 429. Immigration & Justice
3 Credits (3)
This course is designed to introduce undergraduate students to the complexities of immigration in the United States through a social justice lens. Students will explore the intersections of race, ethnicity, gender, and class in immigration through different groups' historical and contemporary experiences, including immigrants' experience with the criminal justice system.
Prerequisite(s): Student must have completed CJUS 300 or Research Methods equivalent or consent of the instructor.

CJUS 432. Documentary Production
3 Credits (3)
Survey of theory and history of documentary film making including viewings and discussions of notable films and directors. Class works with actual documentary project. May be repeated up to 6 credits. Restricted to: ANVE, DFM majors.
Prerequisite: FDMA 1220, FDMA 2520.

Learning Outcomes

1. Analyze documentary forms, storytelling strategies, and ethical considerations to inform the development of original nonfiction projects.
2. Produce short documentary films—individually and collaboratively—that demonstrate technical proficiency in shooting, sound, and editing.
3. Develop research-driven proposals and pitch presentations that effectively communicate concept, story, and social relevance to an intended audience.

CJUS 434. Probation, Parole, and Community Corrections
3 Credits (3)
Structure, organization, and operation of probation, parole, and other community-based correctional programs in the U.S. Overview of historical and recent trends in the supervision of offenders in the community and in the development of alternatives to incarceration. Analysis of issues related to community correctional policies and practices. Restricted to majors.

CJUS 435. Political Penology
3 Credits (3)
Comparative analysis of incarceration and sanctions as punishment for crimes of conscience, religious intolerance, and dissidence.

CJUS 436. Courts and Sentencing
3 Credits (3)
This course will focus on the structure, organization, and operation of the state and federal court systems in the United States. It examines courtroom decision making and dynamics of courthouse justice—prosecutorial discretion, plea bargaining practices, jury and judicial decision making and sentencing. Additional topics will include racial, gender and class disparities in sentencing outcomes and the impact of recent reforms directed at the criminal court system. Restricted to: Criminal Justice majors.

CJUS 437. Wrongful Convictions
3 Credits (3)
This course will address causes (e.g. problems in witness identification, forensics, police and attorney conduct) as well as results of erroneous dispositions (e.g. compensation, media dynamics, possible reforms) in

a critical analysis. Appropriate for prospective police, legal, and policy professionals. Restricted to: Criminal Justice majors.

CJUS 440V. Comparative Criminal Justice Systems
3 Credits (3)
Cross-national study of selected Western and non-Western legal systems. Comparison of structures and functions of police, court systems, and corrections in different systems.

CJUS 453. Women and Justice
3 Credits (3)
Critical analysis of the impact of the criminal justice system, race and class upon the lives of women. Restricted to majors.

CJUS 454. Human Trafficking
3 Credits (3)
Study of global human trafficking, its causes and costs, and mitigation strategies. Restricted to C J, GOVT, SOC, GNDR, S WK majors.

CJUS 456. Police and the Community
3 Credits (3)
This course is an advanced introduction to policing in the United States. The course will also cover current issues in policing, such as new technologies and the role of police in terrorism prevention.

Learning Outcomes

1. Describe the evolution of police community relations and community policing.
2. Compare and contrast traditional policing with community policing.
3. Examine discretion in police work and relate it to legal, operational, and ethical issues and problems.
4. Examine police misconduct and corruption.
5. Examine the importance of professionalism and ethics in police work.
6. Identify strategies for interacting with the physically and mentally disabled, the elderly, and crime victims.

CJUS 4750V. International Criminal Law, War Crimes, Genocide, & Crimes Against Humanity
3 Credits (3)
The course provides a basic introduction to international criminal law and current events and issues involving international criminal justice. It examines how the international criminal justice system addresses the gravest crimes and mass human rights violations. The course is broken up into three parts. First it explores the evolution and historical development of prosecution of international crimes and mass atrocities by international criminal courts and tribunals. Second, the course examines the main elements of international crimes including war crimes, genocide, crimes against humanity, and crimes of aggression. This section also explores the sources of international criminal law and jurisdiction over the investigation and prosecution of international crimes. The last section examines the growth of the International Criminal Court (ICC) and recent developments in international criminal justice including sentencing, reparations and victim participation. The course provides an understanding of the codification and application of international criminal law and international humanitarian law and challenges to addressing mass human rights violations during or after conflict.

Learning Outcomes

1. Explain the historical evolution of international criminal law.
2. Define the core crimes of war crimes, crimes against humanity and genocide.
3. Identify foundational texts of international criminal law.
4. Understand domestic and international judicial enforcement.
5. Describe the forms and modes of criminal responsibility.
6. Identify issues related to the prosecution and punishment of international crimes at the national and international level.
7. Explain the history of the International Criminal Court.
8. Understand the international criminal court structure, function and proceedings.
9. Critically examine efficacy of international criminal law and criminal courts. 1
10. Gain a better understanding of your own worldviews and opinions towards international criminal law and justice.

CJUS 484. Hate Crimes & Groups
3 Credits (3)
Explores the phenomenon of hate-motivated violence. Examines the hate crime laws, organized hate groups, and social theories attempting to explain violent hate.

CJUS 501. Research Methods in Criminal Justice
3 Credits (3)
Research design, methods of data collection and analysis, and preparation of research reports. Restricted to majors.
Prerequisite: C J major or consent of instructor.

CJUS 502. Statistics in Criminal Justice
3 Credits (3)
Intermediate level statistical techniques applied to criminal justice data.

Learning Outcomes

1. Understand the basic statistical procedures for criminal justice research.
2. Use statistical software to enter and edit data, and conduct basic analysis.
3. Allow students the opportunity to recognize the critical role of empirical research in informing, influencing, and evaluating criminal justice practices and policies.
4. Developing a basic understanding of the role of statistics in criminal justice research.
5. Interpret and evaluate research evidence and statistical operations.

CJUS 511. Nature of Crime
3 Credits (3)
Defining and measuring crime, crime causation, and criminal behavior systems. Restricted to majors.
Prerequisite: C J major or consent of instructor.

CJUS 514. Advanced Race, Crime, and Justice
3 Credits (3)
Advanced analysis of the historical and contemporary relationship between race and crime in the United States with emphasis upon human equality and fairness. Overview of racial and ethnic social categorizations and how they impact law and order.

CJUS 515. A Course on Punishment
3 Credits (3)
Exploration and analysis of the idea and practice of punishment through a variety of philosophical perspectives, seeking to understand its moral and practical viability as employed in contemporary society, including its application within the criminal justice system.

CJUS 520. Advanced Girls, Women & Crime
3 Credits (3)
Advanced critical social science analysis of concepts of violence and justice as experienced by women impacted by the criminal justice system. Restricted to C J, GNDR majors. Crosslisted with: GNDR 520

CJUS 525. Issues in Ethics, Law, and Criminal Justice
3 Credits (3)
Examination of the key ethical and decision-making dilemmas facing professionals working in the fields of law and criminal justice. Restricted to majors.

CJUS 527. Advanced Race & Crime in Film
3 Credits (3)
Advanced critical analysis of film where messages relating race and crime are present, with emphasis on how this imagery informs problem definition, policies, and practice within the criminal justice system.

CJUS 528. Advanced Mexican-Americans and Issues of Social Justice
3 Credits (3)
Advanced analysis of social issues related to the Mexican American community in the U.S., with special emphasis on their collective historical struggles and contributions to society. We will discuss the political, economic and cultural forces that exemplify their experience as a "whole."
Learning Outcomes
1. Explore and discuss social issues related to the Mexican American community in the U.S.
2. Gain a better understanding of the history of the Mexican American experience in the U.S.
3. Understand current social justice issues impacting the Mexican American community.
4. Explore the Mexican American community experience particularly in the southwest.
5. Critically engage the challenges faced by the Mexican American community on issues such racial discrimination, racial profiling, immigration, and crime.

CJUS 529. Advanced Immigration & Justice
3 Credits (3)
Advanced analysis of the complexities of immigration in the United States through a social justice lens. Students will explore the intersections of race, ethnicity, gender, and class in immigration through different groups' historical and contemporary experiences, including immigrants' experience with the criminal justice system.

CJUS 531. Advanced Family Violence and the Law
3 Credits (3)
This course will examine how practitioners are involved in the criminal justice system in areas of family violence including: child physical abuse; child sexual abuse; child neglect; child ritualistic abuse; child exploitation; sibling abuse; intimate partner abuse; stalking; sexual abuse and elder abuse. This course will be helpful for those who wish to go into law enforcement or victim's advocacy work. Restricted to: Criminal Justice majors.

CJUS 532. Advanced Issues in Criminal Justice (f, s, sum)
3 Credits (3)
Seminar on problems and conflicts encountered in major criminal justice issues. Topics announced in the Schedule of Classes. May be repeated under different subtitles for unlimited credit.

CJUS 537. Advanced Wrongful Convictions
3 Credits (3)
This course will address causes (e.g. problems in witness identification, forensics, police and attorney conduct) as well as results of erroneous dispositions (e.g. compensation, media dynamics, possible reforms) in a critical analysis. Appropriate for prospective police, legal, and policy professionals. Restricted to: Criminal Justice majors.

CJUS 541. Seminar in Criminal Justice Policy Analysis and Planning
3 Credits (3)
Seminar on policy development, planning and implementation processes in criminal justice. Links formal policy goals as they relate to theory and outcomes. Topics announced in the Schedule of Classes. Restricted to majors.
Prerequisite: C J major or consent of instructor.

CJUS 545. Advanced Victimology
3 Credits (3)
Study of risk factors in crime victimization, the impact of crimes upon victims, and the role of the victim in the criminal justice system. Consideration of the impact of criminal justice policy on victim outcomes.

CJUS 560. Juvenile Justice Systems
3 Credits
Policy development and operations in police, court, and correctional agencies in response to juveniles. Analysis of programs designed to identify, prevent and treat juvenile offenders. CJUS 570. Probation and Parole 3 cr. Advanced analysis of goals, theories and practices of all forms of correction in the community, including probation, parole, plus other intermediate sanctions. Restricted to majors.

CJUS 581. Community Policing
3 Credits (3)
Overview and analysis of community policing issues from various perspectives. Analysis of strategies that facilitate police and community collaboration. Restricted to majors.

CJUS 591. Directed Readings in Criminal Justice
3 Credits (3)
Supervised review of literature in specialized areas of the nature of crime, law and social control, and criminal justice administration. Consent of instructor required.

CJUS 592. Independent Research
1-3 Credits
Design and execution of a criminal justice research project. Requires a written paper in standard format, including literature review, hypotheses, methodology, findings, and conclusions.

CJUS 593. Internship
3-6 Credits
Supervised placement in an applied or research setting in criminal justice. An in-depth written report of the project is required. Restricted to C J majors. May be repeated for a maximum of 6 credits. Graded S/U.
Prerequisites: introductory graduate course in the area of the internship and consent of the internship supervisor.

CJUS 599. Master's Thesis
1-15 Credits
Thesis.

CNST-CONSTRUCTION

CNST 1110. General Carpentry or Building Trades I
8 Credits (2+12P)
This course will have two components: a classroom segment, where carpentry concepts will be explored, and a hands-on segment where students will be able to participate in the actual construction of a structure. Habitat for Humanity has generously offered one of their projects as a "hands-on" site. May be repeated up to 8 credits.
Learning Outcomes
1. Identify and define various elements of a Structural Wood Wall.
2. Build Structural and non-load bearing Walls and Partitions using OSHA compliant safety practices.
3. Size floor joists and roof rafters according to local building codes.

4. Hang and “Trim Out” Doors and Windows for Residential Construction Projects.
5. Choose construction project foundations.

CNST 1114. Basic Carpentry
3 Credits (1+4P)
Covers orientation to the trade; wood building materials, fasteners, and adhesives; detailed description and explanations of hand-operated and power tools, including safety; framing basics including laying out and constructing of wood floors, walls and ceilings and includes roughing in of door and window openings.
Corequisite: CNST 1115, CNST 1116.
Learning Outcomes
1. Students will be able to operate hand and power tools safely.
2. Demonstrate the ability to read construction drawings.
3. Work effectively as a team.
4. Identify various types of building materials and their uses.
5. Calculate the quantities of lumber and wood products using industry standard methods.
6. Describe the fasteners, anchors and adhesives used in construction.
7. Describe the responsibilities of safety related to the construction industry.
8. Select proper tools for the job.
9. Identify the different grades and markings of wood building materials. 1
10. List and recognize different types of flooring materials. 1
11. Knowledge of the materials and methods used to construct floor systems using the platform method of floor framing. 1
12. Describe the procedure for laying out a wood frame wall. 1
13. Describe the correct procedure for laying out floor joist. 1
14. Estimate the materials required to frame a floor system.

CNST 1115. Carpentry Level I
3 Credits (1+4P)
Describes the various kinds of roofs and provides instructions for lay out of the different roofing systems. Describes the various types of windows, skylights, and exterior doors and provides instruction for installation.
Corequisite: CNST 1114; CNST 1116.
Learning Outcomes
1. Students will be able to operate hand and power tools safely.
2. Demonstrate the ability to read construction drawings.
3. Work effectively as a team.
4. Identify various types of building materials and their uses.
5. Calculate the quantities of lumber and wood products using industry standard methods.
6. Describe the fasteners, anchors and adhesives used in construction.
7. Describe the responsibilities of safety related to the construction industry.
8. Select proper tools for the job.
9. Identify the different grades and markings of wood building materials. 1
10. List and recognize different types of flooring materials. 1
11. Knowledge of the materials and methods used to construct floor systems using the platform method of floor framing. 1
12. Describe the procedure for laying out a wood frame wall. 1
13. Describe the correct procedure for laying out floor joist. 1
14. Estimate the materials required to frame a Floor System.

CNST 1116. Basic Carpentry Lab
2 Credits (2)
Provides students the opportunity to practice skills they have acquired in CNST 1114 and CNST 1115. It includes task-oriented projects in which students can apply many of the skills and knowledge that have been presented throughout the National Center for Construction and Education Research (NCCER) Carpentry Program.
Corequisite: CNST 1114; CNST 1115.
Learning Outcomes
1. Demonstrate the correct selection, use, and care of various hand tools.
2. Demonstrate the correct selection, use, and care of various power tools.
3. Recognize and Read basic blueprint terms, components, and symbols.
4. Recognize and identify different classifications of drawings.
5. Lay out and frame a complete roof structure.
6. Be able to layout and set up concrete forms.
7. Build a Staircase.
8. Install windows and exterior doors properly.

CNST 1118. Math for Building Trades
3 Credits (3)
Geometry, algebra, arithmetic, and basic trigonometry pertaining to mathematical applications in the building trades field. Same as OEET 118, DRFT 118, OEPB 118.
Prerequisite: CCDM 103 N.

CNST 1120. Construction Drawings
4 Credits (2+4P)
An introduction to the various construction documents with symbols. Emphasizing extraction of information and specifications from drawings.
Learning Outcomes
1. Interpret construction documents.
2. Identify and navigate the basic views commonly displayed in a technical drawings.
3. Identify and describe common components on construction documents.
4. Demonstrate the use of measuring devices.
5. Use appropriate construction terminology.

CNST 1121. Introduction to Construction I
2 Credits (2+1P)
Basic safety, including personal protective equipment, how to perform basic construction tasks safely, and what to do if an accident occurs. Includes basic construction methods.
Corequisite: CNST 1122 and CNST 1133.
Learning Outcomes
1. Students will be able to operate hand and power tools safely.
2. Demonstrate the ability to read construction drawings.
3. Students will demonstrate the ability to effectively work in a team.
4. Demonstrate how related industry theories apply to real world settings.
5. Investigate mechanical processes found in building trades.
6. Identify and resolve ethical workplace issues.

7. Describe the responsibilities of safety related to the construction industry.
8. Students will be able to selected the proper tools for the job.

CNST 1122. Introduction to Construction II
2 Credits (2+1P)
Introduction to power and hand tools, blueprints, and basic rigging hardware and techniques.
Corequisite: CNST 1121 and CNST 1133.
Learning Outcomes
1. Students will be able to operate hand and power tools safely.
2. Demonstrate the ability to read construction drawings.
3. Students will demonstrate being able to work effectively in a team.
4. Demonstrate how related industry theories apply to real world settings.
5. Investigate mechanical processes found in building trades.
6. Identify and resolve ethical workplace issues.
7. Describe the responsibilities of safety related to the construction industry.
8. Students will be able to selected the proper tools for the job.

CNST 1133. Introduction to Construction Laboratory
3 Credits (3)
Provides students the opportunity to practice skills they have acquired in CNST 1121 and CNST 1122 It includes task-oriented projects in which students can apply many of the skills and knowledge that have been presented throughout the National Center for Construction and Education Research (NCCER) Carpentry Program.
Corequisite: CNST 1121, CNST 1122.
Learning Outcomes
1. Demonstrate effectively leadership skills.
2. Work effectively as a team.
3. Demonstrate the ability to read construction drawings.
4. Demonstrate how related industry theories apply to real world settings.
5. Identify and resolve ethical workplace issues.
6. Describe the responsibilities of safety related to the construction industry.
7. Work effectively as a team.
8. Demonstrate an awareness of the environmental problems arising from conventional practices.
9. Students will be able to operate hand and power tools safely. 1
10. Students will be able to selected the proper tools for the job. 1
11. Investigate mechanical processes found in building trades.

CNST 1144. Woodworking Skills I
3 Credits (1+4P)
Use and care of hand tools and elementary power tools, safety procedures, and supervised project construction. May be repeated up to 3 credits.
Learning Outcomes
1. Students will gain the skills necessary to use hand tools, and power tools, perform basic calculations accurately, and complete projects.
2. Students will purchase materials, draft, and construct one project without a door or drawer.
3. Students will develop creative thinking skills and problem-solving skills in working with the various hand tools.

CNST 1155. Woodworking Skills II
3 Credits (1+4P)
Advanced woodworking skills to include use of advanced power tools, power tool safety, and supervised construction.
Learning Outcomes
1. Students will gain the skills necessary to use hand tools, and power tools, perform basic calculations accurately, and complete projects.
2. Students will purchase materials, draft, and construct one project without a door or drawer.
3. Students will develop creative thinking skills and problem-solving skills in working with the various hand tools.

CNST 1160. Plumbing Theory I
3 Credits (2+3P)
Covers occupational introductions, human relations, safety, tools and equipment used in plumbers trade, plumbing components, sizes of various residential and commercial plumbing systems, pipe fittings, pipe joining and cost estimation.
Learning Outcomes
1. Demonstrate the ability to use equipment safely and to demonstrate these practices in the classroom.
2. Demonstrate diagramming and explain the drain, waste, and vent system.
3. Demonstrate the ability to diagram and explain the potable water system.
4. Demonstrate the ability to draw and explain storm water systems.
5. Demonstrate an awareness of the various materials and fittings used in plumbing.
6. Demonstrate an awareness of the various materials and fittings used in plumbing.
7. Demonstrate soldering of copper pipe. Demonstrate gluing of PVC pipe.

CNST 1166. Woodworking Theory and Practice
3 Credits (2+2P)
History of wood manufacturing, industrial techniques, wood characteristics, stains and finishes. Design and construction of minor wood projects. May be repeated up to 3 credits.
Learning Outcomes
1. Students will learn about the history of woodworking, learn about the different types of wood and best use for projects; learn about wood stain, and construct one project without a drawer working with various hand tools.

CNST 1215. Weatherization in Construction
3 Credits (2+2P)
Introduction to industry weatherization standards and practices utilized in the construction of buildings for the purpose of energy conservation. Economic and environmental impacts of the use of energy in heating and cooling building will be examined.
Prerequisite(s): CNST 1110, CNST 1122 and CNST 1133.
Learning Outcomes
1. Knowledge of the construction industry.
2. Knowledge of related career pathways.
3. Applicable knowledge and skills related to specific industry fields.
4. Knowledge and ability to follow industry safety practices and procedures.
5. Understand applicable codes, rules, and regulations.

CNST 1240. Cabinet Making
3 Credits (1+3P)
Covers advanced design and construction of cabinets including safety and use of hand and power tools, and materials.
Prerequisites: CNST 1155, CNST 1166, or consent of instructor.
Learning Outcomes
1. Demonstrate the safe use of various hand and power tools used in cabinet making.
2. Demonstrate the proper selection of tools for required tasks.
3. Design cabinet projects and prepare accurate materials lists.
4. Perform planning, joining, cutting, routing and other procedures used for cabinet making.
5. Demonstrate how to select and apply various finishes.
6. Properly assemble, install, assess and adjust cabinet project components.

CNST 1311. Small Equipment Maintenance and Repair
4 Credits (2+4P)
Covers small engine theory, troubleshooting and repair, auto maintenance, hydraulic theory and repair lubricants, batteries and scheduled tool maintenance. May be repeated up to 4 credits.

CNST 1330. Professional Development and Leadership
1 Credit (1)
As members and/or officers of various student professional organizations, students gain experience in leadership, team building, and community service. Students competing or participating in Skills USA are required to register for the course.
Learning Outcomes
1. Apply knowledge of conduit types and sizes to select appropriate bending methods.
2. Describe the purpose and function of raceways and fittings.
3. Restate the properties, ratings, and applications of different conductors and cables.
4. Identify the layout and organization of electrical drawings, including plans, elevations, and details.
5. Determine residential service sizing, grounding, and bonding requirements.
6. Apply knowledge of test equipment usage and safety practices to perform accurate electrical measurements and diagnostics.

CNST 1510. Forklift Operation
1 Credit (1)
Classroom instruction and hands-on practice to prepare students to operate a forklift safely in the workplace. Students will have the opportunity to earn a forklift operator's permit. Consent of Instructor required.
Learning Outcomes
1. Recall the rules and regulations for operating a forklift.
2. Apply knowledge of the correct methods for handling loads with a forklift.
3. Evaluate the factors affecting the stability of a forklift.
4. Utilize a forklift safety checklist to ensure compliance with safety protocols and procedures.
5. Indicate the process and safety guidelines for battery charging in forklifts.
6. Define the procedures for servicing and handling LP gas in forklifts.

CNST 2217. Building and the Environment
3 Credits (3)
Introduction to LEED's, and Green Building Fundamentals, sustainability, sustainable design and green building evaluating cost implication of green building. Describes site development; managing site water runoff, improving a project's water use efficiency. Discusses renewable energy sources, and introduces student to generating power on-site using renewable energy sources, improving a building's indoor environment quality, improving the building industries' environmental performance and environmental aspects of building maintenance, re-use and conservation.
Learning Outcomes
1. Employ effective oral and written communication skills.
2. Interpret information and instructions accurately.
3. Explain knowledge of sustainable and alternative building practices, such as LEED/Green initiatives.
4. Evaluate mechanical processes commonly used in building trades.
5. Describe and utilize methods to measure personnel and individual improvement.
6. Demonstrate effective leadership skills by utilizing available resources efficiently.

CNST 2290. Plumbing II
3 Credits (2+3P)
Provides students the opportunity to gain more practice in the skills and knowledge learned in Plumbing I. Students will install fixtures and run the various plumbing supply lines from Plumbing Level I. The course included hands on projects in which the students apply many of the competencies that have been presented through the National Center for Construction and Education Research (NCCER) Plumbing Program.
Prerequisite/Corequisite: CNST 1160.
Learning Outcomes
1. Work with copper tubing and fittings.
2. Practice safety related to the plumbing trade.
3. Work with cast iron pipe and fittings.
4. Work with steel pipe and fittings.
5. Perform calculations related to the plumbing trades.
6. Read plumbing blueprints and drawings.
7. Install plumbing fixtures.
8. Install and design drain, waste and vent systems.
9. Identify the major components of water distribution systems and describe their functions.

CNST 2994. Special Problems in Building Technology
1-4 Credits
Individual studies in areas directly related to building technologies. May be repeated up to 4 credits.
Learning Outcomes
1. Varies.

CNST 2995. Cooperative Co-Op
1-4 Credits (1-4)
Supervised cooperative work program. Student is employed in an approved occupation and is supervised and rated by the employer and instructor. Student will meet in a weekly class.
Learning Outcomes
1. Varies.

CNST 2996. Topics in Construction
1-6 Credits (1-6)
Topics to be announced in the Schedule of Classes.

Learning Outcomes
1. Varies.

COMM-COMMUNICATION

COMM 1115G. Introduction to Communication
3 Credits (1+2P)
This survey course introduces the principles of communication in the areas of interpersonal, intercultural, small group, organizational, public speaking, mass, and social media. May be repeated up to 3 credits.
Learning Outcomes
1. Describe basic communication terms, forms and concepts.
2. Identify basic communication research methods and theories.
3. Explain the significance of ethics and diversity in communication processes.
4. Apply various concepts and skills in multiple communication contexts.

COMM 1130G. Public Speaking
3 Credits (3)
This course introduces the theory and fundamental principles of public speaking, emphasizing audience analysis, reasoning, the use of evidence, and effective delivery. Students will study principles of communication theory and rhetoric and apply them in the analysis, preparation and presentation of speeches, including informative, persuasive, and impromptu speeches. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate effective speech preparation.
2. Demonstrate effective speech delivery through use of language, nonverbal elements and the creation of presentation aids.
3. Analyze a potential audience and tailor a speech to that audience.
4. Evaluate presentations according to specific criteria.
5. Explain common propaganda techniques and logical fallacies, and identify them in the speeches of others.
6. Recognize diversity and ethical considerations in public speaking.

COMM 2110. Communication Theory
3 Credits (3)
This course provides an exploration of major theories, concepts and methods of research in the study of human communication. May be repeated up to 3 credits.
Learning Outcomes
1. Identify, explain, and illustrate key concepts and principles of the major traditions of communication theory.
2. Analyze practical problems and situations using theories.
3. Integrate research correctly and ethically from credible sources to support the primary purpose of communication.

COMM 2996. Special Topics
1-3 Credits (1-3)
Specific subjects and credits to be announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes
1. Define and describe key concepts and principles related to the group study or selected topic as identified by the course subtitle.
2. Apply key concepts and principles related to the group study or selected topic as identified by the course subtitle.

COMM 2997. Independent Study
1-3 Credits (1-3)
Individualized, self-paced projects for students with a special interest in communication topics. Students must be sophomore standing to enroll. May be repeated up to 6 credits.
Prerequisite: COMM 1115G.
Learning Outcomes
1. The student will study a selected topic and conduct a literature review or comparable research assignment.
2. The student will apply knowledge and understanding of the topic in a final paper or project.

COMM 3110. Communication Theory and Discovery
3 Credits (3)
The course explores the nature of communication science, major communication theories, and how communication research is conducted and interpreted.
Learning Outcomes
1. Understand philosophical underpinnings of communication theories and methods
2. Understand the relationship between theory and research methods in the field of communication
3. Apply concepts, theories, and research findings to various contexts outside of the classroom
4. Become an intelligent consumer of research: have the ability to read, comprehend, demonstrate understanding and critically evaluate communication and other research reported in scholarly journals and published documents as well as in the popular press.

COMM 3120. Persuasion Theory and Practice
3 Credits (3)
Students will be introduced to the field of persuasion and social influence. We will review current and classical theories as well as research on attitudes and attitude change. We will explore, construct, and analyze persuasive messages using persuasive theories, and we will focus on subtopics within persuasion like interpersonal and mass communication.
Learning Outcomes
1. Differentiate the major theories in the field of persuasive communication.
2. Design persuasive messages using principles from the theories covered in class.
3. Analyze and understand the workings of a persuasive message.
4. Become a (more) critical consumer of persuasive messages.
5. Apply and recognize persuasive communication theories in your own life.

COMM 3510. Organizational Communication
3 Credits (3)
Communication strategies and patterns of private and governmental organizations, including research on the communication process. May be repeated up to 3 credits.
Learning Outcomes
1. Evaluate the organizational theory, concepts, and research discussed in class and their implications for the field of organizational communication.
2. Explain the role communication plays in each of the organizational communication processes discussed in class.
3. Critically assess communication practices within all types of organizations.

4. Evaluate the ethical issues brought forth in organizational communication.

COMM 3530. Conflict Management
3 Credits (3)
Communication strategies to manage and negotiate conflict in intrapersonal, interpersonal, group, and organizational settings. May be repeated up to 3 credits.
Learning Outcomes
1. Analyze the role of communication in conflict and conflict management processes.
2. Analyze the components of conflict that lead to constructive or destructive communication patterns.
3. Evaluate the effectiveness and appropriateness of strategies, methods, and responses that are appropriate to a given conflict situation.

COMM 3610. Interpersonal Communication
3 Credits (3)
Theories of interpersonal communication and relational communication including study of relevant models, contexts and constructs. May be repeated up to 3 credits.
Learning Outcomes
1. To define and describe communication and interpersonal communication.
2. To identify and describe concepts and behaviors related to nonverbal, verbal, relational, interpretive, role, self, and goal competence in the context of interpersonal communication.
3. To compare and apply concepts of interpersonal communication competence by reflecting on examples from communication in personal and everyday relationships.
4. To define, apply, and analyze concepts of family communication competence in media portrayals of, and in one's own experience of, family communication.
5. To define, apply, and analyze concepts of romantic communication competence in either a personal romantic relationship or in the example of a couple observed/interviewed.

COMM 3710. Communication and Culture
3 Credits (3)
Cultural and intercultural communication theory and behavior, with a concentration on the development of specific communication skills which should facilitate effective intercultural communication. May be repeated up to 3 credits.
Learning Outcomes
1. Define culture and other related concepts.
2. Explain processes of enculturation and acculturation.
3. Apply the concepts to one's own experience.
4. Create new ways of presenting material about culture and communication.

COMM 4210. Political Communication
3 Credits (3)
Presidential and congressional campaigns, political persuasion techniques, political advertising, power in language, and media aspects of political information. Ideology, resistance to political manipulation, and dependence of democracies on communication. May be repeated up to 3 credits.
Learning Outcomes
1. Identify and explain key concepts in political communication, and apply that knowledge to your own life experiences and views on the world.
2. Read and critically analyze current research in political communication.
3. Become informed and critical consumers of political messages and the news media.

COMM 4220. Communication Technologies
3 Credits (3)
Development and evolution of human communication technologies from prehistory through the future of computer-mediated communication networks. Examines behavioral, cognitive, social, cultural, and political issues of new communication technologies and their use and management. May be repeated up to 3 credits.
Learning Outcomes
1. Understand the key concepts, theories, and research findings regarding scholarly investigations of new media technologies.
2. Apply concepts, theories, and research findings related to social media to a variety of social issues and one's own lived experiences.
3. Develop the ability to think about social media critically and analytically.
4. Learn how to effectively communicate ideas, information, and messages through new media technologies (particularly, social media platforms) in order to achieve a specific goal.
5. Articulate the benefits and drawbacks of living in a digital world.

COMM 4230. Strategic Communication
3 Credits (3)
This course covers history, theory, and research related to the use of strategic organizational communication to change attitudes. The course is a survey course designed to help you understand how organizations create targeted, creative, research-based communication to accomplish their objectives. Students will examine the role of communication in organizational planning and execution of advertising, marketing, public relations, and social change. Strategic Communication provides insight into how communicators use critical and creative thinking to gather, organize, evaluate and deliver information in a culturally diverse world.
Learning Outcomes
1. Understand the definition of strategic communication and its analysis levels.
2. Understand the career options you might have with strategic communication.
3. Get familiar with ethical strategic communication practices.
4. Learn how to conduct strategic communication planning.
5. Analyze an organization's diverse stakeholder groups.
6. Derive effective message tactics and campaign designs with different media.
7. Develop a campaign plans book for your selected client.

COMM 4310. Sports Communication
3 Credits (3)
This course provides a senior-level exploration of the role sports and sports communication plays in contemporary culture. Readings will examine the interrelationship between sports and media in society, the identities that fans assume when engaging in fanship and sports viewership, the pervasiveness of sports communication practices in the sports industry, the role of media in story telling, and the way cultural

identifiers of class, ethnicity, and gender play out in the media. This is taught with COMM 5310. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate the historical impact of sports on society.
2. Understand the evolution of sports media and ESPN and its impact on American culture.
3. Assess existing and future sports communication research and media theory.
4. Assess the current trends in sports media and the culture of sports.
5. Transfer knowledge of sports communication to a critical appreciation of sports media; including the study of image repair and framing theory.

COMM 4520. Small Group Communication
3 Credits (3)

Principles and methods of modern group discussion with emphasis on the role of the group in problem solving. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize and develop a complex understanding of the theories and principles of group communication.
2. Become an intelligent consumer of group research literature.
3. Adopt and articulate a clearly developed communication perspective toward group research.
4. Gain an understanding of the within-group phenomena.

COMM 4530. Leadership Communication
3 Credits (3)

Examination of traditional theories and concepts of leader-follower dynamics; presentation of cognitive, systems, and symbolic interpretative views of leadership with an emphasis on persuasion and motivation in leader-follower interactions. May be repeated up to 3 credits.

Learning Outcomes

1. Apply leadership concepts and theories.
2. Analyze leadership philosophies.
3. Identify the fundamental ways leadership is practiced in organizations.
4. Assess your own leadership traits and behaviors.
5. Develop your own personal leadership philosophy.

COMM 4550. Case Studies in Leadership Communication
3 Credits (3)

Students will assess, synthesize, integrate and evaluate research in the area of leadership and organizational communication. Students will interact with modern topics related to communication and organizations through the analysis and discussion of various cases pulled from current events in organizational research.

Learning Outcomes

1. Practice case analysis related to organizational theories and skills.
2. Apply leadership communication concepts and theories to real life scenarios.
3. Develop critical thinking skills for inclusive leaders.
4. Examine the role of the inclusive model of leadership within organizations.
5. Develop your own case studies related to current organizational topics.
6. Examine emerging organizational ethics issues such as gender, ethics, and morality within leadership.
7. Develop an understanding of the personal and organizational factors related to leading teams and organizations.

COMM 4560. Ethics & Diversity in Leadership Communication
3 Credits (3)

To provide students with an opportunity to explore the issues related to ethical decision-making and personal ethical development as they apply to interpersonal communication, followership, organizations, diversity, and organizational citizenship.

Learning Outcomes

1. Practice personal ethical decision-making in organizations.
2. Apply ethical leadership concepts and theories to real-life scenarios.
3. Develop critical thinking skills for inclusive leaders.
4. Examine the role of individual morals and philosophies in organizational ethics.
5. Develop your own personal philosophy of organizational ethics.
6. Examine emerging organizational ethics issues.
7. Develop an understanding of the personal and organizational factors related to ethics and diversity.

COMM 4620. Deception and Communication
3 Credits (3)

Deceptive communication including nonverbal indicators of lies, types of lies, and influence of relationships on lying behavior and interpretation. May be repeated up to 3 credits.

Learning Outcomes

1. Students will acquire basic knowledge of research on Deception.
2. Students will be able to identify reasons for why people lie.
3. Students will be able to apply the course concepts to real world situations.
4. Students will be able to tell the difference between what is "true" and what is "false" about how we deceive in the popular press and movies/TV.
5. Students will learn about THE two theories in the area of Deception and be able to differentiate between them.

COMM 4630. Family Communication
3 Credits (3)

This course examines cutting edge research on family communication, as well as classic theories and research findings that have influenced and revolutionized the way scholars conceptualize family interaction. May be repeated up to 3 credits.

Learning Outcomes

1. To develop a communication perspective on the family as a system.
2. To identify and distinguish between theories of family interaction.
3. To recognize and explain how family communication patterns and processes affect communication between family members.
4. To analyze communication processes that are unique to family subsystems such as romantic, parent-child, sibling, and extended family relationships.
5. To analyze the role of family interaction in the development and course of mental and physical health problems.
6. To analyze theories of family stress and the impact of specific family stressors on family interaction and well-being.
7. To apply theories and concepts to real-life scenarios.

COMM 4640. Nonverbal Communication
3 Credits (3)

Study of and experimentation with nonverbal aspects of human communication as vital components of the total communication process. May be repeated up to 3 credits.

Learning Outcomes

1. To analyze nonverbal channels of communication between persons, including channels such as the voice, face, eyes, posture, gestures, space, territory, clothing, paralanguage, and touch.
2. To analyze how nonverbal behaviors collectively communicate functions such as dominance, deception, intimacy, and turn-taking.
3. To analyze individual and social factors affecting the production of nonverbal behaviors, and the effects of such behaviors on others' attitudes, perceptions, cognitions, and relationships.
4. To analyze the origins of nonverbal communication, by examining developmental trends, continuities with other animal species, cultural similarities and differences, and physiological bases.
5. To examine applications of nonverbal research and theory to infant development, personality, gender, relational satisfaction, relationship development, culture, aging, and social media.

COMM 4720. International Communication
3 Credits (3)

Exploration of the forms and channels of communication is substantially influenced by international cultural and political factors. Covers: global communication technology; news, information, and entertainment flows; and international diplomacy and negotiation. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate an understanding of the history of international communications, and the issues and controversies that have appeared.
2. Demonstrate an understanding of the international agencies responsible for the regulation of media, including content, and technologies.

COMM 4730. Environmental Communication
3 Credits (3)

Examines the link between communication and environment within the context of communication scholarship. Topics include sense of place, cultural approaches to interacting with environment as well as exploring current themes surrounding environment. May be repeated up to 3 credits.

Learning Outcomes

1. Identify ways in which public discourses socially construct relationships between nature and humans.
2. Demonstrate an understanding of critical and cultural approaches to environmental communication.
3. Identify key issues in environmental conflicts, risk communication, and democratic participation in policy-making.
4. Demonstrate an ability to critically evaluate environmental advocacy, deliberation, and public relations.

COMM 4750. Health Communication
3 Credits (3)

Examination of central issues in communication theory and practice as applied to health care. Includes communication in health care organizations, media dissemination of health information, role of communication in disease prevention and health promotion, and symbolic meaning of illness within cultures. May be repeated up to 3 credits.

Learning Outcomes

1. Students will gain an understanding of health communication theories and concepts.
2. Students will be able to apply theories and concepts to a real-world health issue.
3. Students will be able to differentiate among health communication theories and concepts.

COMM 4996. Selected Topics
1-6 Credits (1-6)

Individual and/or group study of selected topics. To be identified by subtitle. May be repeated up to 12 credits.

Learning Outcomes

1. Gain basic knowledge regarding the group study or selected topic as identified by the course subtitle.
2. Gain expert insight into the selected topic identified by the course subtitle.

COMM 4997. Independent Study
1-3 Credits (1-3)

Individualized, self-paced projects for advanced students. Students must be in junior standing to enroll. May be repeated up to 6 credits.

Prerequisite: COMM 1115G.

Learning Outcomes

1. The student will study a selected topic and conduct a literature review or comparable research assignment.
2. The student must demonstrate both quantity and quality of knowledge and understanding of the topic in a final written paper.

COMM 4998. Communication Internship
3 Credits (3)

Internship opportunity to apply what has been learned to a real-world situation. Students must be in junior standing to enroll. Students must be in Junior or Senior Standing. May be repeated up to 6 credits.

Prerequisite: COMM 3510.

Learning Outcomes

1. Apply course concepts and discussion topics to the internship experience.
2. Differentiate between good and poor communication skills.
3. Evaluate the complex communication phenomena within the workplace.
4. Apply a valuable experiential education outside of the classroom.

COMM 5110. Theories of Communication
3 Credits (3)

The theories covered in this course are intended to provide you with a foundational background for future graduate courses that will explore theoretical and topical areas of study in more depth. May be repeated up to 3 credits.

Learning Outcomes

1. Learn how theories are developed, analyzed, evaluated, and applied.
2. Be able to assess, synthesize, and evaluate communication theories.
3. Gain a broad overview of the field of human communication theory.
4. Appreciate the diversity of theoretical ideas within communication literature.
5. Develop a deeper understanding through the exploration of selected topics.
6. Begin to solidify a theoretical stance of your own that will motivate and guide further studies.

COMM 5120. Persuasion Theory
3 Credits (3)
Work with an actual persuasion campaign, such as public information, political, or commercial marketing campaigns. Includes case studies of large-scale persuasion efforts, current theoretical models of persuasion processes, and methods for studying, evaluating, and refining messages for optimal effects. May be repeated up to 3 credits.
Learning Outcomes
1. Become a critical consumer of persuasive messages and persuasive campaigns.
2. Create persuasive messages utilizing principles from one or more of the theories covered in class.
3. Apply concepts, theories, and research findings to various contexts outside of the classroom.

COMM 5130. Quantitative Research Methods
3 Credits (3)
Seminar in the quantitative study of human communication phenomena, research desgin, and statistical analysis. May be repeated up to 3 credits.
Learning Outcomes
1. Understand the logic of social science research.
2. Compare different research methods (experiment, survey, content analysis, and so on).
3. Develop and write clear hypotheses.
4. Understand how to assess the validity and reliability of measures.
5. Design a survey to test your hypotheses.
6. Use statistical analyses to answer questions in the field of communication.
7. Discuss the limitations of your study and the implications for your conclusions.
8. Become a better consumer of statistics and social science research.

COMM 5140. Qualitative Research Methods in Communication
3 Credits (3)
Survey of qualitative research methods in the study of human communication, including historical and critical approaches, interviewing, participant-observation, and communication ethnography. Students apply methods to their own research. May be repeated up to 3 credits.
Learning Outcomes
1. Learn about the nature and application of qualitative research in social and organizational research.
2. Learn to conceptualize qualitative research and to formulate problem statements and research questions.
3. Learn how to design a qualitative research study.
4. Learn about qualitative data collection procedures--observation, interviews, focus group interviews, and collection and use of documents and archival data.
5. Apply research design and data collection skills by undertaking a pilot research study.

COMM 5210. Political Communication
3 Credits (3)
Political communication theory, research, and issues. Empirical studies of campaigns, movements, news media, voter decision-making, political participation, socialization, and knowledge. Political theory, field research, communication science findings and research methods. May be repeated up to 3 credits.
Learning Outcomes
1. Identify and explain key concepts in political communication, and apply that knowledge to your own life experiences and views on the world.
2. Read and critically analyze current research in political communication.
3. Become informed and critical consumers of political messages and the news media.

COMM 5220. Communication Technologies
3 Credits (3)
Seminar on design, usage, and social impact of electronic mail, communication through computer networks, and new technologies of organizational communication such as group decision support systems (GDSS). Each student will study an actual application of a major communication technology in an organization. May be repeated up to 3 credits.
Learning Outcomes
1. Understand the key concepts, theories, and research findings regarding scholarly investigations of new media technologies.
2. Apply concepts, theories, and research findings related to social media to a variety of social issues and one's own lived experiences.
3. Develop the ability to think about social media critically and analytically.
4. Learn how to effectively communicate ideas, information, and messages through new media technologies (particularly, social media platforms) in order to achieve a specific goal.
5. Articulate the benefits and drawbacks of living in a digital world.

COMM 5230. Strategic Communication
3 Credits (3)
This course covers history, theory, and research related to the use of strategic organizational communication to change attitudes. The course is a survey course designed to help you understand how organizations create targeted, creative, research-based communication to accomplish their objectives. Students will examine the role of communication in organizational planning and execution of advertising, marketing, public relations, and social change. Strategic Communication provides insight into how communicators use critical and creative thinking to gather, organize, evaluate and deliver information in a culturally diverse world. Graduate students will be required to fulfill advanced research and presentation requirements.
Learning Outcomes
1. Understand the definition of strategic communication and its analysis levels.
2. Understand the career options you might have with strategic communication.
3. Get familiar with ethical strategic communication practices.
4. Learn how to conduct strategic communication planning.
5. Analyze an organization's diverse stakeholder groups.
6. Derive effective message tactics and campaign designs with different media.
7. Develop a campaign plans book for your selected client.

COMM 5310. Sports Communication
3 Credits (3)
This seminar provides a graduate-level exploration of the role sports and sports communication plays in contemporary culture. Readings will examine the interrelationship between sports and media in society, the identities that fans assume when engaging in fanship and sports

viewership, the pervasiveness of sports communication practices in the sports industry, the role of media in story telling, and the way cultural identifiers of class, ethnicity, and gender play out in the media. This is taught with COMM 4310. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate the historical impact of sports on society.
2. Understand the evolution of sports media and ESPN and its impact on American culture.
3. Assess existing and future sports communication research and media theory.
4. Assess the current trends in sports media and the culture of sports.
5. Transfer knowledge of sports communication to a critical appreciation of sports media; including the study of image repair and framing theory.

COMM 5510. Organizational Communication
3 Credits (3)

Communication strategies and patterns of private and governmental organizations, including research on communication systems. May be repeated up to 3 credits.

Learning Outcomes

1. Recognize and develop a complex understanding of the theories and principles of organizational culture and communication.
2. Become an intelligent consumer of organizational culture.
3. Plan, design, execute, interpret, and/or critically evaluate the conclusions of an original organizational communication research project.
4. Adopt and articulate a clearly developed communication perspective toward organizational research.

COMM 5530. Leadership Communication
3 Credits (3)

This course examines traditional theories and concepts of leadership and also highlights popular and historic leaders. May be repeated up to 3 credits.

Learning Outcomes

1. Equip students with effective leadership skills.
2. Apply leadership concepts and theories to real-life scenarios.
3. Develop critical thinking skills for inclusive leaders.
4. Analyze leadership philosophies.
5. Identify the fundamental ways leadership is practiced in organizations.
6. Develop your own personal philosophy of organizational ethics.
7. Develop skills to be able to identify modern trends in organizations and emerging organizational leaders.

COMM 5550. Case Studies in Leadership Communication
3 Credits (3)

Students will assess, synthesize, integrate and evaluate research in the area of leadership and organizational communication. Students will interact with modern topics related to communication and organizations through the analysis and discussion of various cases pulled from current events in organizational research. COMM 5550 is the graduate version of COMM 4550. Additional work will be required for Graduate Students.

Learning Outcomes

1. Practice case analysis related to organizational theories and skills.
2. Apply leadership communication concepts and theories to real life scenarios.
3. Develop critical thinking skills for inclusive leaders.
4. Examine the role of the inclusive model of leadership within organizations.
5. Develop your own case studies related to current organizational topics.
6. Examine emerging organizational ethics issues such as gender, ethics, and morality within leadership.
7. Develop an understanding of the personal and organizational factors related to leading teams and organizations.

COMM 5560. Ethics & Diversity in Leadership Communication
3 Credits (3)

To provide students with an opportunity to explore the issues related to ethical decision-making and personal ethical development as they apply to interpersonal communication, followership, organizations, diversity, and organizational citizenship. Additional work will be required for Graduate Students.

Learning Outcomes

1. Practice personal ethical decision-making in organizations.
2. Apply ethical leadership concepts and theories to real-life scenarios.
3. Develop critical thinking skills for inclusive leaders.
4. Examine the role of individual morals and philosophies in organizational ethics.
5. Develop your own personal philosophy of organizational ethics.
6. Examine emerging organizational ethics issues.
7. Develop an understanding of the personal and organizational factors related to ethics and diversity.

COMM 5610. Interpersonal Communication
3 Credits (3)

Theories of interpersonal communication and communication within a relationship, including study of relevant models, contexts, and constructs. May be repeated up to 3 credits.

Learning Outcomes

1. To define interpersonal communication, explore relationship types, and analyze demographic trends in personal relationships.
2. To examine the human need for interpersonal relationships, as well as social networks, the development of social skills, and the role of social support.
3. To analyze how people develop and communicate their identity within relationships.
4. To examine the role of communication in developing and maintaining relationships, with a focus on relational stages, turning points, dialectics, uncertainty, expectations, self-disclosure, affection, intimacy, influence, conflict, power, as well as cultural influences to close relationships.
5. To analyze relational hurt, relational transgressions, relational deterioration, and termination from a communication perspective.
6. To analyze and review current theory and peer-reviewed research in interpersonal communication.
7. To examine practical applications of interpersonal communication that have the potential to help or harm people, and to explore the gaps and links between theory and practice.

COMM 5630. Family Communication
3 Credits (3)

This course examines cutting edge research on family communication, as well as classic theories and research findings that have influenced and revolutionized the way scholars conceptualize family interaction. Topics include basic family communication processes, communication in family

subsystems, communication during family stress, and the role of family interaction in health and well-being. Students will explore how family relationships are built, maintained, and destroyed by communication as well as the potentially important and long lasting effects of family relationships on individuals. May be repeated up to 3 credits.

Learning Outcomes

1. To develop a communication perspective on the family as a system.
2. To identify and distinguish between theories of family interaction.
3. To recognize and explain how family communication patterns and processes affect communication between family members.
4. To analyze communication processes that are unique to family subsystems such as romantic, parent-child, sibling, and extended family relationships.
5. To analyze theories of family stress and the impact of specific family stressors on family interaction and well-being.
6. To analyze the role of family interaction in the development and course of mental and physical health problems.
7. To analyze and review current theory and peer-reviewed research in family communication.
8. To examine practical applications of family communication that have the potential to help or harm people, and to explore the gaps and links between theory and practice.

COMM 5640. Nonverbal Communication
3 Credits (3)

This course focuses on human physical behaviors as the basis of communication between persons. This physical behavior includes such variables as the voice, face, eyes, posture, gesture, space, territory, clothing, and touch. The content of the course considers the individual and social factors affecting the production of such behaviors, and the effects of such behaviors on others' attitudes, perceptions, cognitions, and relationships. Applications of research and theory in nonverbal communication to infant development, personality, sex differences, marital satisfaction, relationship development, culture, aging, and brain functioning are also studied throughout the course. May be repeated up to 3 credits.

Learning Outcomes

1. To analyze nonverbal channels of communication between persons, including channels such as the voice, face, eyes, posture, gestures, space, territory, clothing, paralanguage, and touch.
2. To analyze how nonverbal behaviors collectively communicate functions such as dominance, deception, intimacy, and turn-taking.
3. To analyze individual and social factors affecting the production of nonverbal behaviors, and the effects of such behaviors on others' attitudes, perceptions, cognitions, and relationships.
4. To analyze the origins of nonverbal communication, by examining developmental trends, continuities with other animal species, cultural similarities and differences, and physiological bases.
5. To examine applications of nonverbal research and theory to infant development, personality, gender, relational satisfaction, relationship development, culture, aging, and social media.
6. To analyze and review current theory and peer-reviewed research in nonverbal communication.

COMM 5710. Communication and Culture
3 Credits (3)

Cultural and intercultural communication theory and research. Focuses on discovering and describing distinctive ways of speaking within and between cultures.

Learning Outcomes

1. Analyze the complex intersections between communication and culture.
2. Understanding the definition of culture.
3. Analyze how culture is expressed.
4. Learn how culture is studied.
5. Understand what happens when we engage in intercultural communication.

COMM 5994. MA Project
1-6 Credits (1-6)

Project credits are used for the master's degree project option. May be repeated up to 6 credits.

Learning Outcomes

1. Propose and defend the project during the first semester.
2. Complete and defend the project during the second semester.

COMM 5996. Special Topics
1-9 Credits (1-9)

Individual and/or group study of special topics. To be identified by subtitle. May be repeated up to 99 credits.

Learning Outcomes

1. Gain basic knowledge regarding the group study or selected topic as identified by the course subtitle.
2. Gain expert insight into the selected topic identified by the course subtitle.

COMM 5997. Independent Study
1-6 Credits (1-6)

Individualized, self-paced projects. May be repeated up to 99 credits.

Learning Outcomes

1. The student will study a selected topic and conduct a literature review or comparable research assignment.
2. The student must demonstrate both quantity and quality of knowledge and understanding of the topic in a final written paper.

COMM 5998. Communication Internship for Graduate Students
3 Credits (3)

Internship opportunity to apply what students have learned to the real world. May be repeated up to 3 credits.

Learning Outcomes

1. Apply course concepts and discussion topics to the internship experience.
2. Differentiate between good and poor communication skills.
3. Evaluate the complex communication phenomena within the workplace.
4. Apply a valuable experiential education outside of the classroom.

COMM 5999. Master's Thesis
1-15 Credits (1-15)

Thesis. May be repeated up to 88 credits.

Learning Outcomes

1. Submit Thesis Proposal and defend the first semester of enrollment.
2. Complete Thesis and defend during the second semester of enrollment.

CSCI-COMPUTER SCIENCE

CSCI 1110. Computer Science Principles
4 Credits (3+2P)

This course provides a broad and exciting introduction to the field of computer science and the impact that computation has today on every aspect of life. It focuses on exploring computing as a creative activity and investigates the key foundations of computing: abstraction, data, algorithms, and programming. It looks into how connectivity and the Internet have revolutionized computing and demonstrates the global impact that computing has achieved, and it reveals how a new student in computer science might become part of the computing future.
Prerequisite: MATH 1215 or higher.

Learning Outcomes

1. Identify and differentiate programming constructs like IF, FOR, and WHILE.
2. Convert numbers between Hexadecimal, Binary and Decimal.
3. Write pseudo code to manipulate a robot.
4. Use an ASCII table to translate HEX strings into characters.
5. Encrypt and Decrypt simple messages with a Caeser Cypher.

CSCI 1115G. Modern Computing in Practice
4 Credits (3+2P)

This course provides a survey of practical and theoretical foundations for how computers work and how they support fundamental organizational needs. The course covers broad aspects of the hardware, software, and mathematical basis of computers. Lab assignments provide hands-on applications to use simple basic software tools to write simple programs, build and edit websites, analyze data with spreadsheets, choose an office productivity suite, and demonstrate computer literacy to potential employers. May be repeated up to 4 credits.
Prerequisite: MATH 1130G or MATH 1215 or higher.

Learning Outcomes

1. Students will create simple python programs using conditional statements and loops.
2. Students will analyze data with spreadsheet formulas, charts, and tools.
3. Students will create and publish a personal website using website building tools.
4. Students will edit HTML and CSS to format a website manually.
5. Students will practice the skill of performing software QA and providing actionable feedback to developers.
6. Students will become aware of common cybersecurity risks.
7. Students will learn basic vocabulary and context for broad aspects of hardware, software, and computer science theory such as Security, Privacy, Cloud Computing, the Internet, the Web, Operating Systems, Discrete Math, and Information Systems.
8. Students will be exposed to various sub-fields of CS including artificial intelligence, security, data analytics, UX, web development, and QA testing.
9. Students will reason about the societal impacts of technology. 1
10. Students will incorporate their new knowledge and skills into their resume.

CSCI 1120. Introduction to Computer Animation
3 Credits (3)

Introductory course for learning to program with computer animation as well as learning basic concepts in computer science. Students create interactive animation projects such as computer games and learn to use software packages for creating animations in small virtual worlds using 3D models. Recommended for students considering a minor/major in computer science or simply interested in beginning computer animation or programming.

CSCI 1210. Computer Programming Fundamentals
3 Credits (2+2P)

This course is an introduction to problem-solving methods and algorithm development. Students will learn how to design, code, debug, and document programs. Students will explore basic programming concepts including variables, data types, operators and expressions. Students will learn about input/output mechanisms, including command prompt interaction, and reading and writing data to files. Students will be introduced to control structures such as branching, conditionals, iteration, and loops and arrays. They will also learn how to define and use functions/methods to structure code and improve code reuse. May be repeated up to 3 credits.
Prerequisite(s): MATH 1215 or higher.

Learning Outcomes

1. Demonstrate an understanding of procedural programming techniques by implementing programs which employ structured programming techniques.
2. Implement control flow structures in programs to execute statements in a specified order, repeat sequences of statements, and execute different statements based on conditions.
3. Apply modularization principles by defining and using functions/methods to structure code and improve code reuse and maintainability.
4. Write code utilizing data structures such as arrays, simple classes and objects, to provide useful access to, and operations on, data.
5. Input/output mechanisms to collect user input and display data, including implementing error handling mechanisms to handle invalid input and output operations. the concept of recursion and identify base case and inductive step.

CSCI 1220. Computer Programming Fundamentals: Python
3 Credits (3)

This course is an introduction to fundamental programming concepts, with a focus on problem-solving techniques and algorithm development using the Python programming language. Students will learn how to create basic scripts, work with data types and variables, use control structures, and build functions. The course is designed for students with little or no prior experience in programming and is intended to provide a foundation in programming that can be applied in a variety of fields.
Prerequisite: MATH 1215 or higher.

Learning Outcomes

1. Apply programming concepts to design and develop solutions for computational problems.
2. Utilize optimal flow-control strategy for solving a given problem.
3. Design and implement functions to support organization, decomposition and reusability of code.
4. Evaluate and select data structures to efficiently organize and store information for a given problem.
5. Demonstrate the concept of scope to control access to global, local, and class variables.
6. Create and use a simple class to demonstrate object-oriented programming principles.
7. Utilize basic file input/output with text-based files.

CSCI 1225. Python Programming II
3 Credits (3)

This course covers advanced Python programming, including classes, objects, and inheritance, embedded programming in domain applications, database interaction, and advanced data and text processing. The focus will be on preparing students to use Python in their own areas.

Prerequisite(s): CSCI 1220 or CSCI 4520.

CSCI 1235. R Programming I
3 Credits (3)
This course is an introduction to data processing in the R language, covering fundamental script configuration, data types and data collections, R control structures, and basic creation of graphs and data visualizations. This course will not focus on the statistical capabilities of R, though some basic statistical computations will be used.
Prerequisite(s): MATH 1220G.
Learning Outcomes
1. Show proficiency in installing R, navigating the RStudio interface, setting work directories, executing scripts, and using built-in R functions for data analysis.
2. Create and implement custom R functions to streamline and automate data processing.
3. Demonstrate the ability to create, manipulate, and use various R data structures including vectors, matrices, arrays, data frames, lists, and factors for effective data operations.
4. Acquire skills to import and export data in various formats including CSV and RData, and install and use essential R packages for data analysis.
5. Utilize R's control flow constructs like conditional statements and loops to write robust R scripts for data analysis.
6. Use apply family functions, such as apply(), sapply(), lapply(), and tapply(), to enhance data manipulation and analysis, particularly when dealing with missing values.
7. Generate, customize, and save various types of plots including scatter plots, bar charts, pie charts, histograms, and box plots for data visualization.
8. Apply exploratory data analysis techniques, including measuring central tendency, dispersion, and constructing five-number summaries, to analyze data distributions.
9. Manipulate string data using R functions and regular expressions to prepare text for analysis.

CSCI 1240. C++ Programming I
3 Credits (2+2P)
This course is an introduction to problem-solving methods and algorithm development using C++. Students will learn how to design, code, debug, and document programs. Students will explore basic programming concepts including variables, data types, operators and expressions. They will also learn how to work with the C++ preprocessor directives and libraries. Students will learn about input/output mechanisms, including command prompt interaction, reading and writing data to files. Students will be introduced to control structures such as branching, conditionals, iteration, and loops and arrays. They will also learn how to define and use functions to structure code and improve code reuse.
Prerequisite: MATH 1215 or higher.
Learning Outcomes
1. Implement programs which employ structured programming techniques.
2. Implement control flow structures.
3. Apply modularization principles by defining and using functions/methods to structure code and improve code reuse and maintainability.
4. Write code utilizing data structures such as arrays, using pointers, and simple classes to provide useful access to, and operations on, data.
5. Use input/output mechanisms to collect user input and display data, including implementing error handling mechanisms to handle invalid input and output operations.

CSCI 1720. Computer Science I
4 Credits (3+2P)
Computational problem solving; problem analysis; implementation of algorithms using Java. Object-oriented concepts, arrays, searching, sorting, and recursion.
Prerequisite: (A C- or better in either MATH 1220 or higher) OR (Math placement into MATH 1250 or higher) OR (A C- or better in CSCI 1110).
Learning Outcomes
1. Develop algorithms to solve problems.
2. Implement algorithms using the fundamental programming features of sequence, selection, iteration, and recursion.
3. Apply an understanding of primitive and object data types.
4. Design and implement classes based on given attributes and behaviors.
5. Explain the fundamental concepts of object-oriented programming.

CSCI 2210. Object-Oriented Programming
4 Credits (3+2P)
This course is an introduction to object-oriented programming. Including: Classes and objects, and associated topics such as constructors, properties, and methods, inheritance, polymorphism, encapsulation, abstraction, exception handling and best practices. May be repeated up to 4 credits.
Prerequisite: At least a C- in CSCI 1720 or ENGR 140.
Learning Outcomes
1. Implement object-oriented designs based on project requirements.
2. Use encapsulation to write programs that are loosely coupled and easy to debug, maintain and modify.
3. Use inheritance to define simple class hierarchies that allow code to be reused by distinct subclasses.
4. Implement and reason about control flow in a program using polymorphism to solve common programming problems.

CSCI 2220. Introduction to Data Structures and Algorithms
4 Credits (3+2P)
Design, implement, and use fundamental abstract data types including linked lists, stacks, queues, and trees. Analyze the time and space complexity of algorithms, such as sorting.
Prerequisite: At least a C- in CSCI 1720, or placement.
Learning Outcomes
1. Implement basic data structures such as linked lists, stacks, queues, and trees in a high-level programming language.
2. Compare alternative implementations of data structures with respect to time and space complexity.
3. Explain the advantages and disadvantages of a variety of sorting algorithms.

CSCI 2230. Assembly Language and Machine Organization
4 Credits (3+2P)
Computer structure and system organization, instruction execution, memory addressing modes, hardware/software interface. Programming in assembly language.
Prerequisite: At least a C- in CSCI 1720 or ENGR 140.
Learning Outcomes
1. Describe the architecture of a microcontroller, the interconnections between the components, and the major units inside the CPU.

2. Use signed and unsigned numbers, bitwise operations, branching instructions, and the corresponding flags in the status register.
3. Use immediate, direct, indirect addressing modes in assembly instructions.
4. Map high-level programming language features to assembly instructions, such as loops, conditionals, procedure calls, value and reference parameter passing, return values, and recursion.
5. Interface with input/output devices via instructions, memory addressing, or interrupts.
6. Design and implement an assembly language program.

CSCI 2310. Discrete Mathematics for Computer Science
4 Credits (3+2P)
Discrete mathematics required for Computer Science, including the basics of logic, number theory, methods of proof, sequences, mathematical induction, set theory, counting, and functions. Taught with CSCI 4560.
Prerequisite: At least C- in CSCI 1720.
Learning Outcomes
1. Use logic to specify precise meaning of statements, demonstrate the equivalence of statements, and test the validity of arguments.
2. Construct and recognize valid proofs using different techniques including the principle of mathematical induction.
3. Use summations, formulas for the sum of arithmetic and geometric sequences.
4. Explain and apply the concepts of sets and functions.
5. Apply counting principles to determine the number of various combinatorial configurations.

CSCI 2410. Practical Programming
2 Credits (1+1P)
A hands-on dive into practical programming skills development. Students will practice skills such as implementing algorithms that manipulate data in arrays and other data structures, implementing and using hashing-based data collections, using I/O in programs to access and create data, and object-oriented programming. Students will also focus on honing their use of tools such as command line, integrated development environments, debuggers, and profilers for software development. May be repeated up to 2 credits.
Learning Outcomes
1. Perform simple manipulation of arrays and other basic data structures.
2. Better utilize objects and object oriented programming.
3. Utilize different tools for building, debugging, and improving their programs.
4. Will be able to learn and use a new programming language quickly.
5. Use basic I/O capabilities in a variety of languages.
6. Use documentation to learn important features of a programming languages.
7. Write programs that solve interview-like problems.

CSCI 2996. Special Topics
1-3 Credits (1-3)
Varies.
Learning Outcomes
1. Varies.

CSCI 3410. Introduction to Intelligent Agents Using Science Fiction
3 Credits (3)
This course uses science-fiction movies to introduce fundamental principles and techniques in agents and multi-agent systems. It is a gentle introduction to decision theory, machine learning, multi-agent systems, and ethics in agent-based systems.
Learning Outcomes
1. Use decision-theoretic models and algorithms to represent and solve simple planning and reasoning problems under uncertainty.
2. Use Markov Decision Processes to model and solve planning and reinforcement learning problems.
3. Use game-theoretic models and algorithms to represent and solve simple game- theoretic problems.
4. Understand the tradeoffs between the different agent models.
5. Understand the challenges for ensuring that AI agents are safe as they play an increasingly large role in modern society.

CSCI 3710. Software Development
4 Credits (3+2P)
Software specification, design, testing, maintenance, documentation; informal proof methods; team implementation of a large project. Taught with CSCI 4575.
Prerequisite: At least a C- in CSCI 2210 and CSCI 2220.
Learning Outcomes
1. Understand and explain the activities and structure of different styles of software development processes, including waterfall, (spiral,) iterative, and agile methodologies.
2. Apply requirements knowledge and techniques to create functional and non-functional requirements for a software system.
3. Apply high and low level design ideas to create an object-oriented design of a software system.
4. Use good design and programming ideas to implement individual and team software systems in compiled OOP languages.
5. Apply white and black box testing techniques and tools to individual and team software development.
6. Use UML class diagrams (and sequence diagrams) to capture aspects of system design and/or requirements (domain).
7. Use practical software development tools, including version control systems, automated build tools, and testing tools.

CSCI 3720. Data Structures and Algorithms
4 Credits (3+2P)
Introduction to efficient data structure and algorithm design. Order notation and asymptotic run-time of algorithms. Recurrence relations and solutions. Abstract data type dynamic set and data structures based on trees. Classic algorithm design paradigms: divide-and-conquer, dynamic programming, greedy algorithms. Taught with CSCI 5110.
Prerequisite: At least a C- in CSCI 2220 and CSCI 2310.
Learning Outcomes
1. Analyze the growth of functions via asymptotic notation.
2. Evaluate the asymptotic running time of a given algorithm.
3. Solve recurrence relations of the kinds encountered in algorithm analysis.
4. Design algorithms using the divide-and-conquer technique.
5. Design algorithms using the greedy technique.
6. Design algorithms using the dynamic-programming technique.
7. Use and analyze data structures based on trees.
8. Analyze the design, correctness, and time complexity of basic graph algorithms.

CSCI 3730. Compilers and Automata Theory
4 Credits (3+2P)
Methods, principles, and tools for programming language processor design; basics of formal language theory (finite automata, regular expressions, context-free grammars); development of compiler components. Taught with CSCI 4580.
Prerequisite: At least a C- in CSCI 2210, CSCI 2220, and CSCI 2230.
Learning Outcomes
1. Understand the language theory concepts of regular languages, context free languages, regular expressions, context free grammars, and formal language hierarchy.
2. Use Thompson's construction to convert from regular expression to NFA, and subset construction to convert from NFA to DFA.
3. Apply recursive descent parsing in programming a parser of a small grammar.
4. Understand the ideas in LL and LR parsing of context-free language classes.
5. Understand and use table-driven top-down (LL(1)) and bottom up (SLR) parsing to parse a sentence.

CSCI 3790. Algorithm Design & Implementation
3 Credits (3)
Introduction to efficient data structure and algorithm design. Basic graph algorithms. Balanced search trees. Classic algorithm design paradigms: divide-and-conquer, greedy scheme, and dynamic programming. Taught with CSCI 4590.
Prerequisite: At least a C- in CSCI 2220, or consent of instructor.

CSCI 3997. Independent Study
1-6 Credits (1-6)
Faculty supervised investigation, to culminate in a written report. May be repeated up to 6 credits.
Learning Outcomes
1. Varies.

CSCI 4105. Programming Language Structure I
3 Credits (3)
Syntax, semantics, implementation, and application of programming languages; abstract data types; concurrency. Not for Computer Science graduate students.
Prerequisite: At least a C- in CSCI 3730 and CSCI 3710.
Learning Outcomes
1. Analyze the strengths and weaknesses of various programming languages for solving specific classes of problems.
2. Develop strategies to efficiently learn and adapt to new programming languages.
3. Evaluate and justify the choice of programming paradigms and languages for new and unfamiliar problems.
4. Identify and explain the primary components of a running program.
5. Implement programs using the principles of functional programming.
6. Implement programs using the principles of logic programming.
7. Design and implement simple parallel programs using threads.
8. Write programs in at least five different programming languages, demonstrating proficiency in syntax and idiomatic usage.
9. Write and analyze C programs to demonstrate an understanding of low-level architecture details.

CSCI 4110. Computing Ethics and Social Implications of Computing
1 Credit (1)
An overview of ethics for computing majors includes: history of computing, intellectual property, privacy, ethical frameworks, professional ethical responsibilities, and risks of computer-based systems.
Prerequisite: At least a C- in CSCI 3710.
Learning Outcomes
1. Understand the fundamental technologies and operation of the web.
2. Design and develop responsive interactive web sites.
3. Deploy web applications on Cloud Computing Platforms.
4. Leverage modern tools and packages to develop full stack web applications.
5. Be fluent in the application of emerging web technologies like browser extensions, WebSockets, and WebRTC.
6. Use existing materials and references on the web to learn new skills.

CSCI 4120. Operating Systems I
3 Credits (3)
Operating system principles and structures, and interactions with architectures. Not for Computer Science graduate students.
Prerequisite: At least a C- in CSCI 2230 and CSCI 3710.
Learning Outcomes
1. Explain OS control and management of hardware resources.
2. Explain OS management and execution of processes.
3. Explain OS control and management of real and virtual memory.
4. Explain classical concurrency issues and their solutions.
5. Analyze and implement threads.
6. Analyze OS interaction with networks and architecture.

CSCI 4130. Linux System Administration
3 Credits (3)
Basic system administration for Linux environments. Topics include user managements, file systems, security, backups, system monitoring, kernel configuration and other relevant aspects of system administration. Not for Computer Science graduate students.
Learning Outcomes
1. Understand the history and basic concepts of Linux and explain the differences between Linux distributions.
2. Demonstrate the installation of a Linux VM, use of basic Linux commands, and navigate the Linux file system.
3. Understand the basics of shell environments and types and write basic shell scripts to automate tasks.
4. Understand Linux file system security, user and group management, file system hierarchy and disk management.
5. Install, update, remove, and configure software, firewalls, and network settings, in Linux.
6. Monitor system performance and, analyze and troubleshoot system logs.
7. Understand device and configuration management automation.

CSCI 4140. Database Management Systems I
3 Credits (3)
Database design and implementation; models of database management systems; privacy, security, protection, recovery. Not for Computer Science graduate students. Taught with CSCI 5140.
Prerequisite: At least a C- in CSCI 2220 and CSCI 2310.
Learning Outcomes
1. Utilize the basic concepts of relational database model.
2. Utilize database query languages (e.g. SQL).
3. Identify data integrity and security requirements.

4. Analyze, capture, and model user requirements for building database systems using conceptual models.
5. Design and normalize relational schemas.
6. Apply application development methods to implement a database system.

CSCI 4205. Computer Security
3 Credits (3)
Introduction to the art and science of computer security. Fundamentals of computer security including elementary cryptography, authentication and access control, security threats, attacks, detection and prevention in application software, operating systems, networks and databases. Not for Computer Science graduate students. Taught with CSCI 5205.
Prerequisite: At least a C- in CSCI 2220, CSCI 2230 or consent of instructor.
Learning Outcomes
1. Describe fundamental concepts in security and privacy.
2. Understand requirements of security in different contexts.
3. Describe practical implementation challenges in security/privacy system design.
4. Explain at a high-level symmetric and public key cryptography.
5. Explain various access control mechanisms such as authentication, authorization.
6. Understand aspects of secure system design that a computer programmer/engineer needs to account for.

CSCI 4206. Hardware Security
3 Credits (3)
Hardware security covers the intersection of hardware and security attacks/defenses. Students will study a variety of approaches to hardware security in this course, e.g., micro-architectural side channels, cache side-channel attacks, memory attacks, speculative-based attacks, etc. Students will also learn about the various computer architectural components that can be exploited for launching security attacks. Taught with CSCI 5206. Preferable to have knowledge of CSCI 4230 (Architectural Concepts I).
Prerequisite: At least a C- in CSCI 2230.
Learning Outcomes
1. Understand how computer architectural components can be exploited for launching security attacks.
2. Build an insight of developing defense mechanism again hardware-based security attacks.
3. Explain micro-architectural side channels.
4. Understand cache side channel attacks.
5. Demonstrate knowledge of memory attacks.
6. Explain Speculative execution based attacks.
7. Understand Rowhammer.
8. Explain trusted execution environment as a security mechanism.

CSCI 4210. Introduction to Smart Grids
3 Credits (3)
This course is an introduction to the technologies and design strategies associated with the Smart Grid. The emphasis will be on the development of communications, energy delivery, coordination mechanisms, and management tools to monitor transmission and distribution networks. Topics include: Smart grid introduction and evolution; Power systems; Networking and transport control; Artificial intelligence & agent coordination; Data mining for smart grids. Taught with CSCI 5210.
Prerequisite: At least a C- in CSCI 2220 and a C- in ENGR 230; or Consent of instructor.
Learning Outcomes
1. Get basic understanding of how conventional power system is operated and protected.
2. Understand and use basic knowledge of communication techniques in smart grids.
3. Understand and use basic knowledge for the coordination of the different units in smart grids.
4. Understand and apply data mining techniques for protecting smart grids.

CSCI 4215. Parallel Programming
3 Credits (3)
Programming of shared memory and distributed memory machines; tools and languages for parallel programming; techniques for parallel programming; parallel programming environments. Not for Computer Science graduate students. Taught with CSCI 5215.
Prerequisite: At least a C- in CSCI 3730 or consent of instructor.
Learning Outcomes
1. Describe existing parallel architectures including shared memory versus distributed memory platforms.
2. Apply basic techniques for organizing parallel computations.
3. Apply basic techniques for performance measurement and theoretical limitations of parallelism.
4. Explain alternative parallel techniques and hardware.
5. Perform performance Analysis of different parallel programming techniques.
6. Program shared memory machines using threads, processes, and the OpenMP library.
7. Program using a message passing paradigm and obtain working knowledge of the Message Passing Interface (MPI).

CSCI 4220. Cloud and Edge Computing
3 Credits (3)
The course presents a top-down view of cloud computing, from applications and administration to programming and infrastructure. Its main focus is on the concepts of networking and parallel programming for cloud computing and large scale distributed systems which form the cloud infrastructure. The topics include: overview of cloud computing, cloud systems, parallel processing in the cloud, distributed storage systems, virtualization, security in the cloud, and multicore operating systems. Students will study state-of-the-art approaches to cloud computing followed by large cloud corporations, namely Google, Amazon, Microsoft, and Yahoo. Students will also apply what they learn through project developments using Amazon Web Services. Not for graduate Computer Science majors. Taught with: CSCI 5220.
Prerequisite: Background in CSCI 4245/CSCI 5245 is preferred or consent of instructor.
Learning Outcomes
1. Explain the role of cloud computing and IoT.
2. Explain security techniques in cloud and IoT networks.
3. Summarize the features and associated risks of different service models.
4. Design a model or prototype as a solution of the identified problem.
5. Understand the differences between various infrastructure deployment models such as on-prem, hybrid, public, and private.

CSCI 4225. Introduction to Cryptography
3 Credits (3)
The course covers basic cryptographic primitives, such as symmetric, public-key ciphers, digital signature schemes, and hash functions, and

their mathematical underpinnings. Course helps students understand basic notions of security in a cryptographic sense: chosen plaintext and chosen ciphertext attacks, games, and reductions. Course also covers computational number theory relevant to cryptography. Consent of Instructor required. Taught with: CSCI 5225.
Prerequisite: CSCI 2310 (or equivalent) with a C or better.
Learning Outcomes

1. Describe basic cryptographic primitives, including symmetric ciphers, asymmetric ciphers, digital signatures, message authentication codes, and hash functions.
2. Understand the mathematical, fundamental underpinnings of cryptography, and how to reason about the security of crypto primitives: indistinguishability (IND) properties of ciphertexts, CPA/CCA games, and reductions to fundamental math assumptions.
3. Be able to discuss number theory/algebra underpinning the design of cryptographic primitives, in some depth.

CSCI 4230. Architectural Concepts I
3 Credits (3)
Comparison of architectures to illustrate concepts of computer organization; relationships between architectural and software features. Not for Computer Science graduate students.
Prerequisite: At least a C- in CSCI 2230 and CSCI 3730.
Learning Outcomes

1. Explain the concepts in instruction set architecture.
2. Analyze the behavior of pipelined CPU data path and control.
3. Analyze behavior and performance of memory hierarchies with different cache designs.
4. Describe the implementation of binary integer and floating point representation and arithmetic.
5. Identify and analyze performance of instruction level parallelism and multi-core parallelism.
6. Describe virtual memory and architectural support for operating systems.
7. Understand the organization of various kinds of secondary storage devices, and their performance and tradeoffs.
8. Create software that demonstrates performance of architectural features and evaluate the effects of software change.

CSCI 4235. Cellular Networks and Mobile Computing
3 Credits (3)
This course will offer a solid introduction to major global wireless standards and comparisons of the different wireless technologies and their applications and examine each technology and how to utilize several different systems for the best results. A basic understanding of Computer Networks is preferable as a course prerequisite.
Learning Outcomes

1. Understand user associations and routing in a cellular/mobile network.
2. Develop insight into interaction of elements within the cellular/mobile core.
3. Understand the concept of end-to-end delivery of a packet and/or signal.
4. Develop an understanding of what happens with the hand-off at each step along the communications path.
5. Be able to explain differences in core architecture between different generations of cellular and mobile network technologies.

CSCI 4240. Software Reverse Engineering
3 Credits (3)
This class provides students with fundamental experience in software reverse engineering with a focus on malware reverse engineering. Students will learn operational security for safely analyzing untrusted code in a sandbox environment. Students will learn control flow integrity attacks, binary control flow analysis, and how to analyze live program behavior. Taught together with CSCI 5240.
Learning Outcomes

1. Students will learn how malware behaves, spreads, and is controlled.
2. Students will learn how to safely analyze malware in controlled environments.
3. Students will learn how malware seeks to hide in systems.
4. Students will learn to perform static analysis of binaries using simple tools.
5. Students will learn how malware obfuscates itself to avoid analysis, including using crypto packers, polymorphism, and sandbox detection.
6. Students will learn to perform decompilation and control-flow analysis of binaries using Ghidra.
7. Students will learn to dynamically analyze malware in a sandbox environment while observing network traffic, resource consumption, and system calls.
8. Students will learn to detect malware running with operating-system level permissions (rootkits).
9. Students will learn memory forensics techniques to detect malware hidden within benign processes.

CSCI 4245. Computer Networks I
3 Credits (3)
Fundamental concepts of computer communication networks: layered network architecture, network components, protocol stack and service. Example of application, transport, network and data link layers, protocols primarily drawn from the Internet (TCP, UDP, and IP) protocol multimedia networks; network management and security. Not for Computer Science graduate students. Taught with CSCI 5245.
Prerequisite: At least a C- in CSCI 2220 and CSCI 2230.
Learning Outcomes

1. Explain the layered model of networking using the OSI and TCP/IP models.
2. Explain TCP and UDP as particular transport layer protocols.
3. Explain and analyze routing and forwarding mechanisms.
4. Implement application layer protocols.
5. Explain other network issues such as multicasting, audio/video data streaming, and Domain Name System.

CSCI 4250. Human-Centered Computing
3 Credits (3)
Covers iterative, human-centered interface design, including prototyping and evaluation. Basics of graphic design and visualization. Not for Computer Science graduate students. Taught with CSCI 5250.
Prerequisite: At least C- in CSCI 3710.
Learning Outcomes

1. Describe, analyze, and/or critique a device interface using a design vocabulary.
2. Enact a human-centered process of interaction design: gather data; develop a data-driven design; iterate design through testing; and evaluate results.
3. Conduct human-computer interaction research by proposing, developing, and conducting experiments; analyzing data; and developing synthesized results.

4. Communicate design and evaluation with presentations, demos, and reports.
5. Implement a variety of interaction techniques.

CSCI 4255. Digital Game Design
3 Credits (3)
An introduction to digital game design. Topics include design, development, and playtesting of games. The course is structured to use team-based learning. Not for Computer Science graduate students. Taught with CSCI 5255.
Prerequisite/Corequisite: CSCI 3710.
Learning Outcomes
1. Describe, analyze, and/or critique games with a consistent vocabulary.
2. Design, develop, and playtest games.
3. Understand the formal systems of games.
4. Communicate game designs through demonstrations and presentations.

CSCI 4260. Visual Programming
3 Credits (3)
Design and implementation of programs using visual (i.e. dataflow or diagrammatic) programming techniques, with an emphasis on real-time data processing. Students will learn how to design visual programs, including how to handle cycles and state maintenance, and will learn to process audio, video, and other data using visual programs. Not for Computer Science graduate students. Taught with CSCI 5260.
Prerequisite: At least a C- in CSCI 2220 and CSCI 2310.
Learning Outcomes
1. Develop software in graph-based visual environments.
2. Understand flows of control in visual programming environments.
3. Use signals, digital and analog, to drive software.
4. Communicate software design and evaluation with presentations, demos, and reports.

CSCI 4265. Modern Web Technologies
3 Credits (3)
In this course, we will take a full-stack approach to modern web application design. We will start with the fundamentals including HTML5, CSS3, Javascript, JSON, and the underlying networking concepts and protocols driving the modern web. We will then move on to more advanced topics including javascript backend development with Node.js, NoSQL database design with MongoDB, cloud computing, and re-sponsive web design. Finally, we cover advanced topics including the design and im- plementation of browser extensions and real-time web technologies like WebRTC and WebSockets. Consent of Instructor required. Taught with: CSCI 5265.
Learning Outcomes
1. Understand the fundamental technologies and operation of the web.
2. Design and develop responsive interactive web sites.
3. Deploy web applications on Cloud Computing Platforms.
4. Leverage modern tools and packages to develop full stack web applications.
5. Be fluent in the application of emerging web technologies like browser extensions, WebSockets, and WebRTC.
6. Use existing materials and references on the web to learn new skills.

CSCI 4270. Principles of Virtual Reality
3 Credits (3)
This course is an introduction to building systems and doing research in / on virtual reality. We cover system design, development, and evaluation, with an emphasis on recent research in the space. We cover a range of methods, qualitative and quantitative, in order to develop insights into effective VR designs. Students in this class will develop a foundation in VR development; learn about current topics in VR; and design, develop, evaluate, and report on a VR system.
Prerequisite: CSCI 4250.
Learning Outcomes
1. Design and develop systems in virtual reality.
2. Understand the variety of development techniques in VR.
3. Understand the state-of-the-art in VR systems.
4. Communicate understanding of people, designs, and evaluations through presentations, demos, and/or reports.

CSCI 4305. Bioinformatics
3 Credits (3)
Introduction to bioinformatics and computational biology. Computational approaches to sequences analysis, protein structure prediction and analysis, and selected topics from current advances in bioinformatics. Not for Computer Science graduate students. Taught with CSCS 5305.
Prerequisite: At least a C- in CSCI 2220 and CSCI 2310.
Learning Outcomes
1. Explain the biology motivation of a bioinformatics question.
2. Formulate a computational problem and its solution to address a molecular biology question.
3. Implement basic bioinformatics algorithms such as sequence alignment, pattern matching, and genome assembly.
4. Evaluate the performance of a bioinformatics algorithm on real data sets.
5. Argue the correctness of a bioinformatics algorithm.
6. Analyze the complexity of a bioinformatics algorithm.

CSCI 4310. Bioinformatics Programming
3 Credits (3)
Computer programming to analyze high-throughput molecular biology data including genomic sequences, bulk and single-cell transcriptome, epigenome, and other omics data. Quality control, library size normalization, confounding effect removal, clustering, statistical modeling, trajectory inference, and visualization. Taught with CSCI 5310.
Learning Outcomes
1. Write R scripts and functions to manipulate biological sequences, genome annotation, and gene expression data.
2. Perform high-throughput data analysis with established R packages.
3. Detect differential gene expression on RNA sequencing data.
4. Perform single-cell RNA sequencing data analysis (quality control, library size normalization, confounding effect removal, modeling).
5. Assess statistical significance of analytical results.
6. Create automatic data analysis pipeline to link multiple software packages.

CSCI 4405. Artificial Intelligence I
3 Credits (3)
Fundamental principles and techniques in artificial intelligence systems. Intelligent Agents; solving problems by searching; local search techniques; game-playing agents; constraint satisfaction problems; knowledge representation and reasoning. Further selected topics may also be covered. Not for Computer Science graduate students. Taught with CSCI 5405.
Prerequisites: At least a C- in CSCI 2220 and CSCI 2310.

Learning Outcomes

1. Use various search algorithms commonly used in problem-solving.
2. Use various methods for solving constraint satisfaction problems.
3. Use propositional and first-order logic to represent knowledge.
4. Use logical inference methods to derive conclusions from a knowledge base.
5. Use adversarial search for game-playing agents.
6. Analyze the different search strategies.
7. Design and Implement heuristic search for problem-solving.
8. Understand how adversarial attacks can affect decision-making and problem-solving in classical AI.

CSCI 4410. Computer Graphics I
3 Credits (3)
Languages, programming, devices, and data structures for representation and interactive display of complex objects. Not for Computer Science graduate students. Taught with CSCI 5405.
Prerequisite: At least C- in CSCI 3730 or CSCI 3710.
Learning Outcomes

1. Demonstrate understanding of techniques used in three-dimensional graphics.
2. Apply Computer Graphics lightning and shading to model a scene.
3. Understand client-server graphics using WebGL.
4. Apply Geometric and Solid modeling techniques.
5. Develop and implement Computer Graphics algorithms.

CSCI 4415. Introduction to Data Mining
3 Credits (3)
Techniques for exploring large data sets and discovering patterns in them. Data mining concepts, metrics to measure its effectiveness. Methods in classification, clustering, frequent pattern analysis. Selected topics from current advances in data mining. Taught with CSCI 5415.
Prerequisite: At least a C- in CSCI 2220 and CSCI 2310.
Learning Outcomes

1. Explain and recognize different data mining tasks such as data pre-processing, visualization, classification, regression, clustering, association rules, and anomaly detection.
2. Apply classical data mining / machine learning algorithms for classification, clustering, association rules, and anomaly detection.
3. Evaluate and compare the performance of different data mining / machine learning algorithms.
4. Utilize data mining algorithms to analyze data in real applications using a data mining tool.

CSCI 4420. Applied Machine Learning I
3 Credits (3)
An introductory course on practical machine learning. An overview of concepts for both unsupervised and supervised learning. Topics include classification, regression, clustering, and dimension reduction. Classical methods and algorithms such as linear regression, neural networks, support vector machines, and ensemble approaches. Recent techniques such as deep learning. Focused on applying of machine learning techniques in application domains. Not for Graduate Majors. Taught with: CSCI 5420.
Prerequisite: At least a C- in CSCI 2220, MATH 1511G; or consent of instructor.
Learning Outcomes

1. Implement and utilize different data processing techniques.
2. Differentiate and assess several dimension reduction techniques.
3. Utilize several classifiers (SVM, Decision tree, k-Nearest Neighbor, and logistic regression) and differentiate their advantages and disadvantages.
4. Explain and demonstrate regression analysis.
5. Describe and illustrate clustering approaches.
6. Apply ensemble learning approaches.
7. Implement several neural network classifiers, including deep learning models.

CSCI 4425. Introduction to Deep Learning
3 Credits (3)
The course covers basic concepts of neural networks which include transition of classical machine learning to hierarchical feature learning, feedforward networks, regularization, optimization, hyperparameter tuning, deep convolutional networks and their applications in computer vision, deep sequence models, and deep generative models. Taught together with CSCI 5425.
Prerequisite: At least a C- in CSCI 2220 or CSCI 1220, and CSCI 2310, or consent of instructor.
Learning Outcomes

1. Have significant familiarity with different state-of-the-art theories and practices of deep learning.
2. Be able to apply deep learning to a variety of tasks suitable for data science-based projects of academia and industry.
3. Understand much of the current literature on the topic, review papers, and extend their knowledge through further study.
4. Design and evaluate novel deep learning models.
5. Train and test deep learning models on real-life and benchmark datasets using Python libraries such as TensorFlow and PyTorch.

CSCI 4430. Graph Data Mining
3 Credits (3)
The course covers graph terminology, representation, and techniques to extract patterns from large graph data. The topics include random and scale-free graph generation, link analysis (PageRank), graph representation learning, graph neural networks, deep graph generation, community detection, frequent subgraph mining, graph classification, influence maximization, and knowledge graph mining.
Prerequisite: At least a C- in CSCI 2220 or CSCI 1220, and CSCI 2310, or consent of instructor.
Learning Outcomes

1. Have significant familiarity with different state-of-the-art theories and practices of graph data mining.
2. Graph representation and graph querying using graph manipulating toolbox/library.
3. Use random and scale-free graph models to generate graphs and visualize complex network properties.
4. Apply algorithms such as PageRank, spectral clustering, and non-negative matrix factorization.
5. Implement graph representation learning algorithms and graph neural networks.
6. Understand much of the current literature on the topic, review papers, extend their knowledge through further study, and present findings of the papers.

CSCI 4435. Text Mining and Natural Language Processing
3 Credits (3)
This course is an introduction to text mining and natural language processing (NLP). It covers NLP techniques for extracting insights from unstructured text data. Topics include text classification, semantic

textual similarity, topic modeling, sentiment analysis, text summarization, text generation, and machine translation.
Prerequisite: At least a C- in CSCI 2220 and CSCI 2310.
Learning Outcomes
1. Describe and apply techniques for text processing, text representation, and text modeling.
2. Describe and apply machine learning algorithms for text mining and NLP tasks such as text classification, semantic textual similarity, topic modeling, sentiment analysis, text summarization, text generation, and machine translation.
3. Utilize Python and popular libraries for implementing NLP-based applications.
4. Evaluate the performance of text mining and NLP algorithms.

CSCI 4440. Generative Artificial Intelligence
3 Credits (3)
Covers the theory and applications of generative artificial intelligence. Concentration will be on specific topics such as large language models, adversarial neural networks, neural symbolic computing, and inductive logic programming. May be repeated up to 3 credits.
Learning Outcomes
1. Understand the theoretical foundation of generative AI tools.
2. Understand the strengths and weaknesses of generative AI tools and identify appropriate tools for a given application.
3. Utilize advanced generative AI tools such as multi-modal LLMs for problem-solving and developing practical applications.
4. Understand the ethical consequence of using generative AI tools.

CSCI 4505. Java Programming
3 Credits (2+2P)
Programming in the Java language. More advanced than CSCI 1210. Recommended for nonmajors only. Not for Computer Science undergraduate standing students.

CSCI 4510. C++ Programming
3 Credits (3)
Programming in the C++ language. Taught with CSCI 1240. More advanced than CSCI 1240. Recommended for nonmajors only. Not for Computer Science undergraduate students.
Learning Outcomes
1. Use various data types and the corresponding operations.
2. Write C++ programs that contain expressions, program control, functions, arrays, and input/output.
3. Explain basic object-oriented programming concepts.
4. Demonstrate proficiency in using classes, inheritance, pointers, streams, and recursion.

CSCI 4520. Python Programming I
3 Credits (3)
This course is an introduction to programming in the Python language, covering fundamental scripts, data types and variables, functions, and simple object creation and usage. The focus will be on preparing students to use Python in their own areas. No prior programming experience is required. Taught with CSCI 1220. More advanced than CSCI 1220.
Learning Outcomes
1. Develop an algorithm to solve a problem.
2. Demonstrate the ability to use Python data types: int, float, strings, and lists; and the built-in functions associated with those data types.
3. Edit and debug programs using the Spyder IDE for Python.
4. Implement algorithms using the Python features of assignment, input, output, branches, loops, and functions.
5. Explain the fundamental concepts of object-oriented programming with Python.
6. Design and implement Python classes based on given attributes and behaviors.
7. Work with existing Python modules such as math, random, and os.
8. Write Python programs that input data from files and store results in files.

CSCI 4525. Python Programming II
3 Credits (3)
This course covers advanced Python programming, including classes, objects, and inheritance, embedded programming in domain applications, database interaction, and advanced data and text processing. The focus will be on preparing students to use Python in their own areas. For graduate students only. Has more advanced work than CSCI 1225, and does not count towards Computer Science major requirements. Computer Science students are excluded from taking this course.
Prerequisite(s): CSCI 1220 or CSCI 4520.
Learning Outcomes
1. Write Python applications for solving data-analysis problems.
2. Represent and interpret data using Python libraries NumPy, pandas, and the re (regular expression) package.
3. Apply exception handling in Python applications for error handling.
4. Perform data loading, cleansing, and processing using Python.
5. Connect to a relational database using Python, to create, load, and process data.
6. Retrieve data from websites using Python and web APIs.
7. Create data visualizations with Python libraries to improve the problem-solving process.
8. Write object-oriented programs with Python classes.

CSCI 4530. R Programming I
3 Credits (3)
This course is an introduction to data processing in the R language, covering fundamental script configuration, data types and data collections, R control structures, and basic creation of graphs and data visualizations. This course will not focus on the statistical capabilities of R, though some basic statistical computations will be used. For graduate students only. Has more advanced work than CSCI 1235. Does not count towards Computer Science major requirements. Student should have a good understanding of college algebra or higher, before enrolling.
Learning Outcomes
1. Show proficiency in installing R, navigating the RStudio interface, setting work directories, executing scripts, and using built-in R functions for data analysis.
2. Create and implement custom R functions to streamline and automate data processing.
3. Demonstrate the ability to create, manipulate, and use various R data structures including vectors, matrices, arrays, data frames, lists, and factors for effective data operations.
4. Acquire skills to import and export data in various formats including CSV and RData, and install and use essential R packages for data analysis.
5. Utilize R's control flow constructs like conditional statements and loops to write robust R scripts for data analysis.
6. Use apply family functions, such as apply(), sapply(), lapply(), and tapply(), to enhance data manipulation and analysis, particularly when dealing with missing values.

7. Generate, customize, and save various types of plots including scatter plots, bar charts, pie charts, histograms, and box plots for data visualization.
8. Apply exploratory data analysis techniques, including measuring central tendency, dispersion, and constructing five-number summaries, to analyze data distributions.
9. Manipulate string data using R functions and regular expressions to prepare text for analysis.

CSCI 4540. Computer Science I Transition
3 Credits (3)
Computational problem solving; problem analysis; implementation of algorithms. Recursive structures and algorithms. For Computer Science graduate students only; cannot be used to meet a Computer Science student's program of study. Taught with CSCI 1720.
Learning Outcomes
1. Develop algorithms to solve problems.
2. Implement algorithms using the fundamental programming features of sequence, selection, iteration, and recursion.
3. Apply an understanding of primitive and object data types.
4. Design and implement classes based on given attributes and behaviors.
5. Explain the fundamental concepts of object-oriented programming.

CSCI 4545. Object Oriented Programming Transition
3 Credits (3)
Introduction to problem analysis and problem solving in the object-oriented paradigm. Practical introduction to implementing solutions in the C++ language. Hands-on experience with useful development tools. Cannot be used in a Computer Science student's program of study. Taught with CSCI 2210.
Prerequisite: At least a C- in CSCI 1720 or CSCI 4540 or consent of instructor.
Learning Outcomes
1. Develop an algorithm to solve a problem.
2. Implement algorithms using the C and C++ languages including imperative and object-oriented language features.
3. Demonstrate a noticeable increase in understanding of problem analysis and program design.
4. Demonstrate proficiency in using control structures including if statements (single selection), switch (multiple selection), and loops (repetition).
5. Demonstrate proficiency in using arrays and functions.
6. Create UML class and relationship diagrams.
7. Design a class to model a real-world person, place, thing, or event.
8. Use editing and debugging software to create, debug, and test C and C++ programs.
9. Understand the basic terminology used in object-oriented programming. 1
10. Create a make file to build an executable from a set of C or C++ source files.

CSCI 4550. Introduction to Data Structures Transition
3 Credits (3)
Design, implementation, use of fundamental abstract data types and their algorithms: lists, stacks, queues, deques, trees; imperative and declarative programming. Internal sorting; time and space efficiency of algorithms. Cannot be used in a C S student's program of study. Consent of Instructor required. Taught with CSCI 2220.
Prerequisite: At least a C- in CSCI 1720 or CSCI 4540 or consent of instructor.
Learning Outcomes
1. Be able to implement and use lists.
2. Be able to implement and use stacks.
3. Be able to implement and use queues.
4. Be able to implement and use trees.
5. Be able to perform the run time analysis of basic algorithms using Big O notation.
6. Be able to implement, use, and analyze searching algorithms.
7. Be able to solve a problem recursively.
8. Take a problem statement from a user and convert it into a Java program that fulfills the user's needs.
9. Create object oriented Java classes that effectively separate and hide implementation details from client applications.

CSCI 4555. Machine Programming and Organization Transition
3 Credits (3)
Computer structure, instruction execution, addressing techniques; programming in machine and assembly languages. Cannot be used in a Computer Science student's program of study. Taught with CSCI 2230.
Prerequisite: At least a C- in CSCI 1720 or CSCI 4540 or consent of instructor.
Learning Outcomes
1. Describe the architecture of a microcontroller, the interconnections between the components, and the basic units inside the CPU.
2. Use signed and unsigned numbers, the associated branching instructions, and the corresponding flags in the status register.
3. Explain immediate, direct, indirect addressing modes, their opcode and operands, and their utilities.
4. Map high-level programming language features to assembly instructions, including loops, conditionals, procedure calls, value and reference parameter passing, return values, and recursion.
5. Interface with I/O devices including LED and sensors via digital input and output, and analog-to-digital conversion.
6. Program timers/counters and interrupts to control real-time applications.
7. Design an assembly program.

CSCI 4560. Discrete Math for Computer Science Transition
3 Credits (3)
Logical connectives, sets, functions, relations, graphics, trees, proofs, induction, and application to computer science. For Computer Science graduate students only. Cannot be used in a Computer Science student's program of study. Taught with CSCI 2310.
Prerequisite: At least a C- in CSCI 1720 or CSCI 4540 or consent of instructor.
Learning Outcomes
1. Use logic to specify precise meaning of statements, demonstrate the equivalence of statements, and test the validity of arguments.
2. Construct and recognize valid proofs using different techniques including the principle of mathematical induction.
3. Use summations, formulas for the sum of arithmetic and geometric sequences.
4. Explain and apply the concepts of sets and functions.
5. Apply counting principles to determine the number of various combinatorial configurations.

CSCI 4575. Software Development Transition
3 Credits (3)
Software specification, design, testing, maintenance, documentation; informal proof methods; team implementation of a large project. For Computer Science graduate students only. Cannot be used in a Computer Science student's program of study. Taught with CSCI 3710.
Prerequisite(s): At least a C- in CSCI 2210 or CSCI 4545, in CSCI 2220 or CSCI 4550, or consent of instructor.
Learning Outcomes
1. Understand and explain the activites and structure of different styles of software development processes, including waterfall, (spiral,) iterative, and agile methodologies.
2. Apply requirements knowledge and techniques to create functional and non-functional requirements for a software system.
3. Apply high and low level design ideas to create an object-oriented design of a software system.
4. Use good design and programming ideas to implement individual and team software systems in compiled OOP languages.
5. Apply white and black box testing techniques and tools to individual and team software development.
6. Use UML class diagrams (and sequence diagrams) to capture aspects of system design and/or requirements (domain).
7. Use practical software development tools, including version control systems, automated build tools, and testing tools.

CSCI 4580. Compilers and Automata Transition
3 Credits (3)
Methods, principles, and tools for programming language processor design; basics of formal language theory (finite automata, regular expressions, context-free grammars); development of compiler components. For Computer Science graduate students only; cannot be used in a students program of study. Taught with CSCI 3730.
Prerequisite: At least a C in (CSCI 2210 or CSCI 4545), in (CSCI 2220 or CSCI 4550), in (CSCI 2230 or CSCI 4555), or consent of instructor.
Learning Outcomes
1. Understand the language theory concepts of regular languages, context free languages, regular expressions, context free grammars, and formal language hierarchy.
2. Use Thompson's construction to convert from regular expression to NFA, and subset construction to convert from NFA to DFA.
3. Apply recursive descent parsing in programming a parser of a small grammar.
4. Understand the ideas in LL and LR parsing of context-free language classes.
5. Understand and use table-driven top-down (LL(1)) and bottom up (SLR) parsing to parse a sentence.

CSCI 4590. Algorithm Design and Implementation
3 Credits (3)
This course introduces the basic knowledge of designing classical algorithms and implementing these algorithms using a programming language. In particular, the course teaches various data structures, including graphs and balanced binary search trees, and efficient schemes to implement these data structures. This course also teaches basic algorithm design techniques including divide-and-conquer, greedy scheme, and dynamic programming. This course covers graph algorithms, including graph traversals (depth-first search and breadth-first search), connectivity, shortest paths, and minimum spanning trees. Graduate standing. Not for Computer Science students. Taught with CSCI 3430.
Prerequisite: At least a C- in CSCI 2220, or Consent of Instructor.
Learning Outcomes
1. Use and implement sorting algorithms.
2. Design and implement graph algorithms.
3. Design and implement algorithms using the divide-and-conquer technique.
4. Design and implement algorithms using the greedy technique.
5. Design and implement algorithms using the dynamic programming technique.
6. Apply and implement balanced search trees.
7. Use and implement hashing techniques.
8. Perform the run time analysis of basic algorithms using Big O notation.

CSCI 4980. Senior Project
4 Credits (4)
Capstone course in which Computer Science majors work in teams and apply computer science skills to complete a large project. Restricted to: Computer Science majors or Cybersecurity majors.
Prerequisite: At least a C- in CSCI 3730 and CSCI 3710.
Learning Outcomes
1. Apply design and development principles in the construction of software systems of varying complexity.
2. Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
3. Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
4. Use current techniques, skills, and tools necessary for computing practice.
5. Analyze a problem, and identify and define the computing requirements appropriate to its solution.
6. Function effectively as teams to accomplish a common goal.
7. Communicate effectively with a range of audiences.

CSCI 4996. Special Topics
1-12 Credits
Topics announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes
1. Varies.

CSCI 4999. Senior Thesis
4 Credits (4)
Capstone course in which Computer Science majors apply computer science skills to complete a research project, culminating in a written thesis report. Restricted to: Computer Science majors or Bachelor of Science in Cybersecurity degree.
Prerequisite: At least a C- in CSCI 3730 and CSCI 3710.
Learning Outcomes
1. Apply design and development principles in the construction of software systems of varying complexity.
2. Apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
3. Design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.

4. Use current techniques, skills, and tools necessary for computing practice.
5. Analyze a problem, identify, and define the computing requirements appropriate to its solution.
6. Communicate effectively with a range of audiences via presentations and technical reports.

CSCI 5110. Data Structure and Algorithms Transition
3 Credits (3)
Introduction to efficient data structure and algorithm design. Order notation and asymptotic run-time of algorithms. Recurrence relations and solutions. Abstract data type dynamic set and data structures based on trees. Classic algorithm design paradigms: divide-and-conquer, dynamic programming, greedy algorithms. For Computer Science graduate students only. Taught with CSCI 3720.
Prerequisite: At least a C- in (CSCI 2220 or CSCI 4550) and a C- in (CSCI 2310 or CSCI 4560), or consent of instructor.
Learning Outcomes
1. Analyze the growth of functions via asymptotic notation.
2. Evaluate the asymptotic running time of a given algorithm.
3. Solve recurrence relations of the kinds encountered in algorithm analysis.
4. Design algorithms using the divide-and-conquer technique.
5. Design algorithms using the greedy technique.
6. Design algorithms using the dynamic-programming technique.
7. Use and analyze data structures based on trees.
8. Analyze the design, correctness, and time complexity of basic graph algorithms.

CSCI 5140. Database Management Systems I
3 Credits (3)
Database design and implementation; models of database management systems; privacy, security, protection, recovery; taught with CSCI 4140; requires more advanced graduate work than taught with CSCI 4140. Students are expected to have solid knowledge of data structures and discrete mathematics.
Learning Outcomes
1. Utilize the basic concepts of relational database model.
2. Utilize database query languages (e.g. SQL).
3. Identify data integrity and security requirements.
4. Analyze, capture, and model user requirements for building database systems using conceptual models.
5. Design and normalize relational schemas.
6. Apply application development methods to implement a database system.

CSCI 5205. Computer Security
3 Credits (3)
Introduction to the art and science of computer security. Fundamentals of computer security including elementary cryptography, authentication and access control, security threats, attacks, detection and prevention in application software, operating systems, networks and databases. Taught with CSCI 4205. Requires more advanced graduate work than CSCI 4205. Recommended knowledge of materials in CSCI 2220.
Prerequisite: At least a C- in CSCI 2230 or consent of instructor.
Learning Outcomes
1. Describe fundamental concepts in security and privacy.
2. Understand requirements of security in different contexts.
3. Describe practical implementation challenges in security/privacy system design.
4. Explain at a high-level symmetric and public key cryptography.
5. Explain various access control mechanisms such as authentication, authorization.
6. Understand aspects of secure system design that a computer programmer/engineer needs to account for.

CSCI 5206. Hardware Security
3 Credits (3)
Hardware security covers the intersection of hardware and security attacks/defenses. Students will study a variety of approaches to hardware security in this course, e.g., micro-architectural side channels, cache side-channel attacks, memory attacks, speculative-based attacks, etc. Students will also learn about the various computer architectural components that can be exploited for launching security attacks. Taught with CSCI 4206. Preferable to have knowledge of CSCI 4230.
Prerequisite: At least a C- in CSCI 2230.
Learning Outcomes
1. Understand how computer architectural components can be exploited for launching security attacks.
2. Build an insight into developing defense mechanisms against hardware-based security attacks.
3. Explain micro-architectural side channels.
4. Understand cache side-channel attacks.
5. Demonstrate knowledge of memory attacks.
6. Explain Speculative execution based attacks.
7. Understand Rowhammer.
8. Explain trusted execution environment as a security mechanism.

CSCI 5210. Introduction to Smart Grids
3 Credits (3)
This course is an introduction to the technologies and design strategies associated with the Smart Grid. The emphasis will be on the development of communications, energy delivery, coordination mechanisms, and management tools to monitor transmission and distribution networks. Topics include: Smart grid introduction and evolution; Power systems; Networking and transport control; Artificial intelligence & agent coordination; Data mining for smart grids. Taught with CSCI 4210. Requires more advanced work than CSCI 4210.
Prerequisite: At least a C- in CSCI 2220 and a C- in ENGR 230 or Consent of Instructor.
Learning Outcomes
1. Get basic understanding of how conventional power system is operated and protected.
2. Understand and use basic knowledge of communication techniques in smart grids.
3. Understand and use basic knowledge for the coordination of the different units in smart grids.
4. Understand and apply data mining techniques for protecting smart grids.

CSCI 5215. Parallel Programming
3 Credits (3)
Programming of shared memory and distributed memory machines; tools and languages for parallel programming; parallelizing compilers; parallel programming environments; taught with CSCI 4215; requires more advanced graduate work than CSCI 4215. Students are expected to have knowledge of programming and machine organization equivalent to CSCI 2210 and CSCI 2230.

Learning Outcomes

1. Describe existing parallel architectures including shared memory versus distributed memory platforms.
2. Apply basic techniques for organizing parallel computations.
3. Apply basic techniques for performance measurement and theoretical limitations of parallelism.
4. Explain alternative parallel techniques and hardware.
5. Perform performance Analysis of different parallel programming techniques.
6. Program shared memory machines using threads, processes, and the OpenMP library.
7. Program using a message passing paradigm and obtain working knowledge of the Message Passing Interface (MPI).

CSCI 5220. Cloud and Edge Computing
3 Credits (3)

The course presents a top-down view of cloud computing, from applications and administration to programming and infrastructure. Its main focus is on the concepts of networking and parallel programming for cloud computing and large scale distributed systems which form the cloud infrastructure. The topics include: overview of cloud computing, cloud systems, parallel processing in the cloud, distributed storage systems, virtualization, security in the cloud, and multicore operating systems. Students will study state-of-the-art approaches to cloud computing followed by large cloud corporations, namely Google, Amazon, Microsoft, and Yahoo. Students will also apply what they learn through project developments using Amazon Web Services. Might have additional requirements for graduate students. To enroll in this course a background in CSCI 4245/CSCI 5245 is preferred or have consent from the instructor. Taught with: CSCI 4220. Requires more advanced graduate work than CSCI 4220.

Learning Outcomes

1. Explain the role of cloud computing and IoT.
2. Explain security techniques in cloud and IoT networks.
3. Summarize the features and associated risks of different service models.
4. Design a model or prototype as a solution to the identified problem.
5. Understand the differences between various infrastructure deployment models such as on-prem, hybrid, public, and private.

CSCI 5225. Introduction to Cryptography
3 Credits (3)

The course covers basic cryptographic primitives, such as symmetric, public-key ciphers, digital signature schemes, and hash functions, and their mathematical underpinnings. Course helps students understand basic notions of security in a cryptographic sense: chosen plaintext and chosen ciphertext attacks, games, and reductions. Course also covers computational number theory relevant to cryptography. Taught with: CSCI 4225. Requires more advanced graduate work than CSCI 4225.
Prerequisite: CSCI 2310 (or equivalent) with a C or better.

Learning Outcomes

1. Describe basic cryptographic primitives, including symmetric ciphers, asymmetric ciphers, digital signatures, message authentication codes, and hash functions.
2. Understand the mathematical, fundamental underpinnings of cryptography, and how to reason about the security of crypto primitives: indistinguishability (IND) properties of ciphertexts, CPA/CCA games, and reductions to fundamental math assumptions.
3. Be able to discuss number theory/algebra underpinning the design of cryptographic primitives, in some depth.

CSCI 5235. Cellular Networks and Mobile Computing
3 Credits (3)

This course will offer a solid introduction to major global wireless standards and comparisons of the different wireless technologies and their applications and examine each technology and how to utilize several different systems for the best results. Taught together with CSCI 4235. A basic understanding of Computer Networks is preferable as a course prerequisite.

Learning Outcomes

1. Understand user associations and routing in a cellular/mobile network.
2. Develop insight into interaction of elements within the cellular/mobile core.
3. Understand the concept of end-to-end delivery of a packet and/or signal.
4. Develop an understanding of what happens with the hand-off at each step along the communications path.
5. Be able to explain differences in core architecture between different generations of cellular and mobile network technologies.

CSCI 5240. Software Reverse Engineering
3 Credits (3)

This class provides students with fundamental experience in software reverse engineering with a focus on malware reverse engineering. Students will learn operational security for safely analyzing untrusted code in a sandbox environment. Students will learn control flow integrity attacks, binary control flow analysis, and how to analyze live program behavior. Taught together with CSCI 4240.

Learning Outcomes

1. Students will learn how malware behaves, spreads, and is controlled.
2. Students will learn how to safely analyze malware in controlled environments.
3. Students will learn how malware seeks to hide in systems.
4. Students will learn to perform static analysis of binaries using simple tools.
5. Students will learn how malware obfuscates itself to avoid analysis, including using crypto packers, polymorphism, and sandbox detection.
6. Students will learn to perform decompilation and control-flow analysis of binaries using Ghidra.
7. Students will learn to dynamically analyze malware in a sandbox environment while observing network traffic, resource consumption, and system calls.
8. Students will learn to detect malware running with operating-system level permissions (rootkits).
9. Students will learn memory forensics techniques to detect malware hidden within benign processes.

CSCI 5245. Computer Networks I
3 Credits (3)

Fundamental concepts of computer communication networks: layered network architecture, network components, protocol stack and service. Example of application, transport, network and data link layers, protocols primarily drawn from the Internet (TCP, UDP, and IP) protocol suite; local and wide area networks, wireless and mobile networks, multimedia networks; network management and security; taught with CSCI 4245; requires more advanced graduate work than CSCI 4245. Students are

expected to have solid knowledge of data structures, machine-level programming. Knowledge of statistics (at the level of MATH 371 or MATH 470) is recommended.

Learning Outcomes

1. Explain the layered model of networking using the OSI and TCP/IP models.
2. Explain TCP and UDP as particular transport layer protocols.
3. Explain and analyze routing and forwarding mechanisms.
4. Implement application layer protocols.
5. Explain other network issues such as multicasting, audio/video data streaming, and Domain Name System.

CSCI 5250. Human-Centered Computing
3 Credits (3)

Covers iterative, human-centered interface design, including prototyping and evaluation. Basics of graphic design and visualization. Taught with SCI 4250. Requires more advanced graduate work than CSCI 4250 with an emphasis on studying recent research in human-computer interaction. Students are expected to have knowledge of software engineering equivalent to CSCI 3710.

Learning Outcomes

1. Describe, analyze, and/or critique a device interface using a design vocabulary.
2. Enact a human-centered process of interaction design: gather data; develop a data-driven design; iterate design through testing; and evaluate results.
3. Conduct human-computer interaction research by proposing, developing, and conducting experiments; analyzing data; and developing synthesized results.
4. Communicate design and evaluation with presentations, demos, and reports.
5. Implement a variety of interaction techniques.

CSCI 5255. Digital Game Design
3 Credits (3)

An introduction to digital game design. Topics include design, development, and playtesting of games. The course is structured to use team-based learning. Taught with CSCI 4255. Requires more advanced graduate work than CSCI 4255 with deeper attention to a team game project.

Learning Outcomes

1. Describe, analyze, and/or critique games with a consistent vocabulary.
2. Design, develop, and playtest games.
3. Understand the formal systems of games.
4. Communicate game designs through demonstrations and presentations.

CSCI 5260. Visual Programming
3 Credits (3)

Design and implementation of programs using visual (i.e. dataflow or diagrammatic) programming techniques, with an emphasis on real-time data processing. Students will learn how to design visual programs, including how to handle cycles and state maintenance, and will learn to process audio, video, and other data using visual programs. Students must be in graduate standing to enroll. Taught with CSCI 4260. Requires more advanced graduate work than CSCI 4260.

Learning Outcomes

1. Develop software in graph-based visual environments.
2. Understand flows of control in visual programming environments.
3. Use signals, digital and analog, to drive software.
4. Communicate software design and evaluation with presentations, demos, and reports.

CSCI 5265. Modern Web Technologies
3 Credits (3)

In this course, we will take a full-stack approach to modern web application design. We will start with the fundamentals including HTML5, CSS3, Javascript, JSON, and the underlying networking concepts and protocols driving the modern web. We will then move on to more advanced topics including javascript backend development with Node.js, NoSQL database design with MongoDB, cloud computing, and re-sponsive web design. Finally, we cover advanced topics including the design and im- plementation of browser extensions and real-time web technologies like WebRTC and WebSockets. Taught with: CSCI 4265. Requires more advanced graduate work than CSCI 4265.

Learning Outcomes

1. Understand the fundamental technologies and operation of the web.
2. Design and develop responsive interactive web sites.
3. Deploy web applications on Cloud Computing Platforms.
4. Leverage modern tools and packages to develop full stack web applications.
5. Be fluent in the application of emerging web technologies like browser extensions, WebSockets, and WebRTC.
6. Use existing materials and references on the web to learn new skills.

CSCI 5305. Bioinformatics
3 Credits (3)

Introduction to bioinformatics and computational biology. Computational approaches to sequences analysis, protein structure prediction and analysis, and selected topics from current advances in bioinformatics; taught with CSCI 4305; requires more advanced graduate work than CSCI 4305. Students are expected to have a knowledge of algorithms and data structures equivalent to CSCI 3720 or exposure to Biology (equivalent to BIOL 2310 or BIOL 311).

Learning Outcomes

1. Explain the biology motivation of a bioinformatics question.
2. Formulate a computational problem and its solution to address a molecular biology question.
3. Implement basic bioinformatics algorithms such as sequence alignment, pattern matching, and genome assembly.
4. Evaluate the performance of a bioinformatics algorithm on real data sets.
5. Argue the correctness of a bioinformatics algorithm.
6. Analyze the complexity of a bioinformatics algorithm.

CSCI 5310. Bioinformatics Programming
3 Credits (3)

Computer programming to analyze high-throughput molecular biology data including genomic sequences, bulk and single-cell transcriptome, epigenome, and other omics data. Quality control, library size normalization, confounding effect removal, clustering, statistical modeling, trajectory inference, and visualization. Taught with CSCI 4310. Requires more advanced graduate work than CSCI 4310.

Learning Outcomes

1. Write R scripts and functions to manipulate biological sequences, genome annotation, and gene expression data.
2. Perform high-throughput data analysis with established R packages.
3. Detect differential gene expression on RNA sequencing data.

4. Perform single-cell RNA sequencing data analysis (quality control, library size normalization, confounding effect removal, modeling).
5. Assess statistical significance of analytical results.
6. Create automatic data analysis pipeline to link multiple software packages.

CSCI 5405. Artificial Intelligence I
3 Credits (3)
Fundamental principles and techniques in artificial intelligence systems. Knowledge representation formalisms; heuristic problem solving techniques; automated logical deduction; robot planning methods; algorithmic techniques for natural language understanding, vision and learning; taught with CSCI 4405; requires more advanced graduate work than CSCI 4405. Students are expected to have strong knowledge of algorithms and data structures (at the level of CSCI 3720).
Learning Outcomes
1. Use various search algorithms commonly used in problem-solving.
2. Use various methods for solving constraint satisfaction problems.
3. Use propositional and first-order logic to represent knowledge.
4. Use adversarial search for game-playing agents.
5. Analyze the different search strategies.
6. Design and Implement heuristic search for problem-solving.
7. Use logical inference methods to derive conclusions from a knowledge base.
8. Understand how adversarial attacks can affect decision-making and problem-solving in classical AI.

CSCI 5410. Computer Graphics I
3 Credits (3)
Languages, programming, devices, and data structures for representation and interactive display of complex objects. Taught with C S 476. Requires more advanced graduate work than CSCI 4410. Students are expected to have knowledge of compilers design and software engineering equivalent to CSCI 3730 and CSCI 3710.
Learning Outcomes
1. Demonstrate understanding of techniques used in three-dimensional graphics.
2. Apply Computer Graphics lightning and shading to model a scene.
3. Understand client-server graphics using WebGL.
4. Apply Geometric and Solid modeling techniques.
5. Develop and implement Computer Graphics algorithms.

CSCI 5415. Introduction to Data Mining
3 Credits (3)
Techniques for exploring large data sets and discovering patterns in them. Data mining concepts, metrics to measure its effectiveness. Methods in classification, clustering, frequent pattern analysis. Selected topics from current advances in data mining. Students are expected to have a preparation in Discrete Mathematics and Data Structures equivalent to C S 272 and CSCI 2310. Requires more advanced graduate work than CSCI 4415. Taught with: CSCI 4415.
Learning Outcomes
1. Explain and recognize different data mining tasks such as data pre-processing, visualization, classification, regression, clustering, association rules, and anomaly detection.
2. Apply classical data mining / machine learning algorithms for classification, clustering, association rules, and anomaly detection.
3. Evaluate and compare the performance of different data mining / machine learning algorithms.
4. Utilize data mining algorithms to analyze data in real applications using a data mining tool.

CSCI 5420. Applied Machine Learning I
3 Credits (3)
An introductory course on practical machine learning. An overview of concepts for both unsupervised and supervised learning. Topics include classification, regression, clustering, and dimension reduction. Classical methods and algorithms such as linear regression, neural networks, support vector machines, and ensemble approaches. Recent techniques such as deep learning. Focused on applying of machine learning techniques in application domains. Taught with: CSCI 4420. Requires more advanced graduate work than CSCI 4420.
Learning Outcomes
1. Implement and utilize different data processing techniques.
2. Differentiate and assess several dimension reduction techniques.
3. Utilize several classifiers (SVM, Decision tree, k-Nearest Neighbor, and logistic regression) and differentiate their advantages and disadvantages.
4. Explain and demonstrate regression analysis.
5. Describe and illustrate clustering approaches.
6. Apply ensemble learning approaches.
7. Implement several neural network classifiers, including deep learning models.

CSCI 5425. Introduction to Deep Learning
3 Credits (3)
The course covers basic concepts of neural networks which include transition of classical machine learning to hierarchical feature learning, feedforward networks, regularization, optimization, hyperparameter tuning, deep convolutional networks and their applications in computer vision, deep sequence models, and deep generative models. Taught with CSCI 4425. Requires more advanced graduate work than CSCI 4425.
Prerequisite: At least a C- in CSCI 2220 or CSCI 1220, and CSCI 2310, or consent of instructor.
Learning Outcomes
1. Have significant familiarity with different state-of-the-art theories and practices of deep learning.
2. Be able to apply deep learning to a variety of tasks suitable for data science-based projects of academia and industry.
3. Understand much of the current literature on the topic, review papers, and extend their knowledge through further study.
4. Design and evaluate novel deep learning models.
5. Train and test deep learning models on real-life and benchmark datasets using Python libraries such as TensorFlow and PyTorch.

CSCI 5430. Graph Data Mining
3 Credits (3)
The course covers graph terminology, representation, and techniques to extract patterns from large graph data. The topics include random and scale-free graph generation, link analysis (PageRank), graph representation learning, graph neural networks, deep graph generation, community detection, frequent subgraph mining, graph classification, influence maximization, and knowledge graph mining. Taught with CSCI 4430. Requires more advanced graduate work than CSCI 4430.
Prerequisite: At least a C- in C S 272 or CSCI 1220, and CSCI 2310, or consent of instructor.
Learning Outcomes
1. Have significant familiarity with different state-of-the-art theories and practices of graph data mining.

2. Graph representation and graph querying using graph manipulating toolbox/library.
3. Use random and scale-free graph models to generate graphs and visualize complex network properties.
4. Apply algorithms such as PageRank, spectral clustering, and non-negative matrix factorization.
5. Implement graph representation learning algorithms and graph neural network.
6. Understand much of the current literature on the topic, review papers, extend their knowledge through further study, and present findings of the papers.

CSCI 5435. Text Mining and Natural Language Processing
3 Credits (3)
This course is an introduction to text mining and natural language processing (NLP). It covers NLP techniques for extracting insights from unstructured text data. Topics include text classification, semantic textual similarity, topic modeling, sentiment analysis, text summarization, text generation, and machine translation.
Prerequisite: At least a C- in CSCI 2220/C S 272 or C S 463/CSCI 4550 and C S 278/CSCI2310 (or C S 465/CSCI 4560).
Learning Outcomes
1. Describe and apply techniques for text processing, text representation, and text modeling.
2. Describe and apply machine learning algorithms for text mining and NLP tasks such as text classification, semantic textual similarity, topic modeling, sentiment analysis, text summarization, text generation, and machine translation.
3. Utilize Python and popular libraries for implementing NLP-based applications.
4. Evaluate the performance of text mining and NLP algorithms.

CSCI 5440. Generative Artificial Intelligence
3 Credits (3)
Covers the theory and applications of generative artificial intelligence. Concentration will be on specific topics such as large language models, adversarial neural networks, neural symbolic computing, and inductive logic programming. Taught together with CSCI 4440.
Prerequisite: At least a C- in CSCI 4405 or CSCI 5405.
Learning Outcomes
1. Understand the theoretical foundation of generative AI tools.
2. Understand the strengths and weaknesses of generative AI tools and identify appropriate tools for a given application.
3. Utilize advanced generative AI tools such as multi-modal LLMs for problem-solving and developing practical applications.
4. Understand the ethical consequence of using generative AI tools.

CSCI 5505. Analysis of Algorithms
3 Credits (3)
Techniques for design and analysis of algorithms; time and space complexity; proving correctness of programs. Particular algorithms such as sorting, searching, dynamic programming. NP complete problems. Students are expected to have knowledge of algorithms and data structures equivalent to CSCI 3720.
Learning Outcomes
1. Prove algorithm correctness by loop-invariant.
2. Prove an algorithm to be incorrect by counterexamples.
3. Develop efficient divide-and-conquer algorithms.
4. Design and analyze binary search tree algorithms.
5. Construct dynamic programming solutions.
6. Prove the correctness of dynamic programming solutions by contraposition.
7. Traverse graphs efficiently.
8. Find paths in graphs efficiently.
9. Determine if a problem is NP-Complete or NP-Hard. 1
10. Basic concepts of quantum computing.

CSCI 5510. Automata, Languages, Computability
3 Credits (3)
Regular and context-free languages, pushdown and finite-state automata, Turing machines, models of computation, halting problems. Students are expected to have knowledge of algorithms equivalent to CSCI 3720.
Learning Outcomes
1. Describe the language accepted by an automaton or generated by a regular expression or a context-free grammar.
2. Design automata, regular expressions and context-free grammars accepting or generating a certain language.
3. Prove properties of languages, grammars, and automata with formal mathematical methods.
4. Convert between equivalent deterministic and non-deterministic finite automata, and regular expressions.
5. Convert between equivalent context-free grammars and pushdown automata.
6. Define Turing machines performing simple tasks.

CSCI 5605. Operating Systems II
3 Credits (3)
Advanced topics related to operating system principles, guided by the current literature. Students are expected to have knowledge of computer architectures and operating systems equivalent to CSCI 4230 and CSCI 4120.
Learning Outcomes
1. Further an understanding of the principles of operating systems.
2. Develop insight into process management and scheduling issues.
3. Understand memory management operation.
4. Develop an understanding of file system implementation and of multiple levels of hardware support and management.
5. Develop a deep understanding of the concepts of cooperating processes, including communication, synchronization, and deadlock (detection and avoidance).
6. Be able to evaluate operating system features.
7. Develop an understanding of the distributed operating system environment.

CSCI 5750. Artificial Intelligence II
3 Credits (3)
Covers advanced theory and application of artificial intelligence. Concentration on several specific research areas, such as knowledge representation, problem solving, common-sense reasoning, natural language understanding, automated tutoring systems, learning systems. Students are expected to have knowledge of artificial intelligence equivalent to CSCI 4405.
Learning Outcomes
1. Apply selected planning algorithms in solving problems.
2. Identify problems where knowledge representation and reasoning techniques are applicable.
3. Be able to apply answer set programming in problem solving.

4. Be aware of various advanced research topics in Artificial Intelligence.

CSCI 5810. Advanced Software Engineering
3 Credits (3)
Advanced tools and methods for developing large software systems. Topics include object-oriented modeling and design, component architectures, templates and generic programming, software configuration and revision control, static and dynamic analysis tools, model, checking, advanced testing, and verification. Students are expected to have knowledge of software engineering equivalent to CSCI 3710.
Learning Outcomes
1. Be able to explain modern software development process ideas.
2. Be able to apply agile software development techniques in a project.
3. Be able to specify, design, and develop a complex software system in a team.
4. Be able to properly utilize both black box and white box testing techniques.
5. Be able to explain how unsound and incomplete formal methods can aid in system verification and validation.
6. Be able to utilize sound and complete formal methods to prove properties of a system.

CSCI 5820. Database Management Systems II
3 Credits (3)
Advanced data models and abstractions, dependencies, implementations, languages, database machines, and other advanced topics. Students are expected to have knowledge of data base management systems equivalent to CSCI 4140.
Learning Outcomes
1. Analyze storage and file structures of an RDBMS.
2. Analyze and apply indexing techniques of an RDBMS.
3. Analyze query evaluation approaches of an RDBMS.
4. Analyze the mechanisms of transaction management in an RDBMS.

CSCI 5840. Computer Networks II
3 Credits (3)
Advanced topics in computer networks. Covers advanced topics in networking, with emphasis on wireless, and IP networks. Students are expected to have knowledge of computer networks equivalent to CSCI 4245 and statistics equivalent.
Learning Outcomes
1. Understand design of link layer protocols.
2. Understand challenges and implementations for multimedia streaming.
3. Be able to use basic security constructs in the networking context.
4. Understand the concepts of edge and cloud computing.
5. Understand the concepts and challenges of Internet of Things.
6. Learn concepts of distributed networking.
7. Learn and evaluate future internet architectures.

CSCI 5860. Algorithms in Systems Biology
3 Credits (3)
The course will introduce important algorithms and computational models used in systems biology to study molecular mechanisms for cellular dynamics, processes, and systems. Cellular processes, such as metabolism and signal transduction, are studied as systems and networks quantitatively from high throughput molecular measurements. The topics include molecular biological systems, network alignment, model simulation, network inference, model optimization, and hybrid models. Students will be able to construct models and analyze their properties in the context of molecular biological systems. Students are expected to have knowledge of algorithms and data structures equivalent to CSCI 3720.
Learning Outcomes
1. Create mathematical representation of biological systems.
2. Infer biological network topology from observed omics data set.
3. Simulate the behavior of a biological system using a mathematical model.
4. Characterize behaviors of biological systems.
5. Estimate parameters in a biological system model.
6. Validate a model's statistical relevance given observed data.

CSCI 5991. Special Research Problems
1-6 Credits (1-6)
Faculty-supervised investigation, to culminate in a written report. Maximally 6 credits can be applied to the student program of study. Written agreement with faculty supervisor is the required consent. May be repeated up to 18 credits.
Learning Outcomes
1. Research experience for graduate student.

CSCI 5994. Master's Project
1-6 Credits
Project-oriented capstone course to be completed by Master of Science students under supervision of their advisor. Maximum of 6 credits may be applied toward Master of Science degree. Restricted to Computer Science majors. May be repeated up to 6 credits.

CSCI 5996. Special Topics
1-6 Credits
Topic announced in the Schedule of Classes. May be repeated up to 6 credits.

CSCI 5999. Master's Thesis
1-6 Credits (1-6)
Thesis to be developed by Master of Science Students under supervision of their advisor. May be repeated up to 6 credits.
Learning Outcomes
1. Varies.

CSCI 6991. Pre-dissertation Research
1-15 Credits
Pre-dissertation research. May be repeated up to 88 credits.

CSCI 7000. Doctoral Dissertation
1-15 Credits
Dissertation. May be repeated up to 88 credits.

CTEC-CYBER TECHNOLOGY

CTEC 152. JAVA Programming
1-3 Credits (1-3)
Introduction to concepts of programming in the Java language. Topics include data types, control structures, functions, arrays, files, and the mechanics of running, testing, and debugging code. This is a hands-on course that does not require students to have prior programming experience. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

CTEC 158. Visual Basic Programming
1-3 Credits (1-3)

Introduction to concepts of programming in the Visual Basic language. Topics include data types, control structures, functions, arrays, files, and the mechanics of running, testing, and debugging code. This is a hands-on course that does not require students to have prior programming experience. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

CTEC 245. Fundamentals of Cloud Based Data Systems
1-3 Credits (1-3)
Introduction to the techniques and tools required to develop database driven web applications. The course teaches students how to design, develop, and deploy efficient and responsive, database-driven web applications using Oracle Application Express. Restricted to Community Colleges campuses only. May be repeated up to 6 credits.
Prerequisite/Corequisite: CTEC 240.

CTFM-CLTHNG/TXTLS/FSHN MRCHDSG

CTFM 1110. Fundamentals of Fashion
3 Credits (3)
Survey of the fashion business from fiber to end product.
Learning Outcomes
1. Describe the roles and functions of industry jobs and sectors involved in the designing, production, marketing, and distribution of fashion brands within the global context.
2. Describe the business strategies of industry sectors involved in the designing, production, marketing, and distribution of fashion brands within the global context.
3. Describe the interrelationships among line planning, line development, and line presentation at manufacturing and retail levels.
4. Provide examples of the fashion industry's environmental and social impact.
5. Learn about all career tracks involved in the fashion industry and the global fashion supply chain.
6. Synthesize industry-relevant information on current issues in the fashion industry.

CTFM 2120. Fashion Illustration
3 Credits (1+4P)
This course explores aspects of fashion illustration, from drawing basic fashion figures to producing finished professional illustrations in color. This course provides the opportunity for students to integrate their fashion design development with computer-aided systems. The emphasis is on fashion innovation and concept design exploration enhanced by computer applications. May be repeated up to 3 credits.. Prerequisites: ARTS 1145G and CTFM 1110
Learning Outcomes
1. To learn Adobe Illustrator and Adobe Photoshop as drawing and design tools for electronic design and rendering.
2. To understand and utilize the computer as a tool for fashion design.
3. To understand methods of design input, including scanning, digitizing and resizing.
4. To develop customer profiles
5. To Understand Concept Style

CTFM 2130. Concepts in Apparel Construction
3 Credits (1+4P)
Students are introduced to professional standard sewing techniques and apparel construction. The techniques learned are applied to produce finished garments. Restricted to: FCSE,CTFM majors. Restricted to Las Cruces campus only.
Learning Outcomes
1. Define sewing construction terminology, equipment and sewing machine parts.
2. Learn to select suitable patterns and fabrics for garments.
3. Learn to alter commercial patterns for different body types.
4. Identify fabric types, finishes, and labeling.
5. Perform standard operating procedures on sewing machines.
6. Perform clothing construction techniques for various garments.
7. Apply knowledge of industry sewing methods to recognition of garment workmanship.

CTFM 2990. Fashion Practicum
1-3 Credits (1-3)
Applied field experience in the related areas of apparel design, fashion merchandising, and textile science. May be repeated up to 3 credits. Restricted to: CTFM majors. Restricted to Las Cruces campus only.
Learning Outcomes
1. Gain hands-on knowledge of the fashion industry.
2. Demonstrate the ability to analyze the practices of management, as observed in the industry.
3. Demonstrate an attitude that is appropriate for a prospective manager in the industry.
4. Demonstrate the understanding of, and the ability to use research and problem solving methods to develop, analyze, and present a critical incident analysis.

CTFM 300. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. Restricted to Las Cruces campus only.
Prerequisite(s): CTFM 1110; CTFM 2120.

CTFM 365. Apparel Analysis
3 Credits (3)
An in-depth investigation of the development, production and comparison of wearing apparel. Focus on the structural, functional and decorative aspects of apparel. Emphasis on sourcing of companies and materials, costing of the product line, comparing design and manufacturing techniques that affect price, quality, and size of apparel. Restricted to: CTFM majors.
Prerequisite(s): CTFM 1110 and CTFM 2130.

CTFM 366V. Historic Fashion and Society
3 Credits (3)
This course will introduce you to the clothing history, sociocultural aspects of clothing, the use of historic clothing as inspiration for fashion design, clothing as an aspect of material culture, or adaptation of styles to amplify character or aesthetic expression in theater or dance. Additionally, we look at the history of clothing as a way to understand how this medium of expression in our lives has been used to elevate, suppress, unite and separate society.
Learning Outcomes
1. Compare and contrast the functions and uses of Euro American dress in historic periods.
2. Explain international issues in specific timelines in regards to dress and society.
3. Compare and contrast multicultural and economic issues.

4. Compare and Contrast specific political, cultural, economic, or technological developments in relationship to clothing through themes.
5. Illustrate and Summarize of the evolution of Western clothing in chronological time periods.
6. Define period and clothing terminology.
7. Identify themes in the study of clothing history.

CTFM 371. Textile Science
3 Credits (1+4P)
The study of fiber characteristics, fabric properties and the manufacturing processes that affect the selection, use, and care of textile goods. Restricted to: CTFM majors.
Prerequisite(s): CTFM 1110.

CTFM 372. Fashion Merchandising
3 Credits (3)
A study of the processes required to bring consumer goods to the marketplace.
Prerequisite(s): CTFM 1110 and CTFM 2130.

CTFM 373. Advanced Apparel Construction II
3 Credits (1+4P)
This course builds on Basics of Apparel Construction and explores the application of advanced sewing technology across a range of fashion products. Restricted to: CTFM majors.
Prerequisite(s): CTFM 2130.

CTFM 375. Fashion Buying
3 Credits (3)
The application of planning, purchasing and controlling inventories using industry data and analytics. Includes merchandising math with an emphasis on product selection and pricing.
Prerequisite(s): ACCT 2110, CTFM 1110, and CTFM 2130.

CTFM 377. Fashion Study Tour
1-3 Credits (1-3)
Study of international/domestic fashion, designers, manufacturers, merchandisers and/or retailers. May be repeated up to 6 credits. Consent of Instructor required.

CTFM 401. Professional Development
1 Credit (1)
Introduction to the field experience including resume writing, interviewing skills, understanding business ethics and etiquette. Also includes a discussion of career paths and advice from industry guest speakers. Restricted to: CTFM majors.
Prerequisite(s): CTFM 372 and CTFM 375.

CTFM 402. Field Experience
1-3 Credits (1-3)
Practical experience in fashion, clothing design, manufacturing, merchandising, or retailing. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: CTFM majors.
Prerequisite(s): CTFM 401.

CTFM 403. Post-Field Experience
1 Credit (1)
A case based approach to analyzing internship experiences. Students will share their experiences and prepare case studies about specific business issues they encountered during CTFM 402. Restricted to: CTFM majors.
Prerequisite(s): CTFM 402.

CTFM 460. Cultural Perspectives in Dress
3 Credits (3)
Explores the social, psychological and cultural aspects of dress and appearance. Consent of Instructor required.

CTFM 473. Flat Pattern for Apparel Design
3 Credits (1+4P)
Applied design principles to flat patterns techniques including bodies, skirts, sleeves, neckline, and bodies-sleeve combinations. Projects will require three-dimensional approaches in apparel design. Restricted to: CTFM majors.
Prerequisite(s): CTFM 2120 and CTFM 373.

CTFM 474. Fashion Promotion
3 Credits (3)
A comprehensive examination of promotion in the merchandising environment of fashion related goods. Restricted to: CTFM majors.
Prerequisite(s): CTFM 372.

CTFM 476. Draping for Apparel Design
3 Credits (1+4P)
Development of garment shapes using draping techniques. Emphasis placed on torso development, contouring principles and desgin development on the form. This course exposes the student to the design process, from initial concept and muslin sample development to final execution of the finished garments. Restricted to: CTFM majors.
Prerequisite(s): CTFM 2120 and CTFM 373.

CTFM 477. Capstone in Fashion Mechandising
3 Credits (3)
Synthesizes previous coursework. Students apply multi-disciplinary principles to the analysis of fashion merchandising case studies and industry related challenges.
Prerequisite(s): CTFM 372, CTFM 375 and CTFM 402.

CTFM 492. Special Problems
1-4 Credits
Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 6 credits toward a degree.

CTFM 571. Textile Science
3 Credits (1+4P)
The study of fiber characteristics, fabric properties and the manufacturing processes that affect the selection, use and care of textile goods. Students will be required to complete additional assignments beyond what is required for CTFM 371.

CTFM 598. Special Research Programs
1-4 Credits
Individual investigations, either analytical or experimental. May be repeated for a maximum of 4 credits per semester and no more than 6 credits toward a degree.

DANC-DANCE

DANC 1110G. Dance Appreciation
3 Credits (3)
This course introduces the student to the diverse elements that make up the world of dance, including a broad historic overview,roles of the dancer, choreographer and audience, and the evolution of the major genres. Students will learn the fundamentals of dance technique, dance history, and a variety of dance aesthetics. Restricted to: Main campus only. May be repeated up to 3 credits.
Learning Outcomes
1. Explain a range of ideas about the place of dance in our society.
2. Identify and apply critical analysis while looking at significant dance works in a range of styles.

3. Identify dance as an aesthetic and social practice and compare/contrast dances across a range of historical periods and locations.
4. Recognize dance as an embodied historical and cultural artifact, as well as a mode of nonverbal expression, within the human experience across historical periods and cultures.
5. Use dance to consider contemporary issues and modes of thought.

DANC 1130. Ballet I
1 Credit (1)
This course is the beginning level of ballet technique. Students learn the basic fundamentally and performance skills of ballet techniques, which may include flexibility, strength, body alignment, coordination, range of motion, vocabulary, and musicality. May be repeated up to 2 credits.
Learning Outcomes
1. Apply fundamental movements of ballet techniques.
2. Enhance flexibility, strength, body alignment, coordination, balance, kinesthetic awareness, range of motion, and musicality.
3. Employ basic theories of classical ballet placement and proper alignment.
4. Develop basic ballet terminology, variations in timing and changes of facing, and barre and center combinations.

DANC 1131. Introduction to Ballroom Dance
1 Credit (1)
An introduction to ballroom dance at the beginning level. Students will learn the fundamentals of technique including carriage, common movement vocabulary, and partnering, and will be introduced to steps and dances from the Bronze Syllabus of American Smooth and International Standard dances. Offered every Fall. May be repeated up to 2 credits.
Learning Outcomes
1. Execute the basic figures of various Ballroom dances in American and International styles
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow
3. Develop the skills of style and performance quality within the dance
4. Demonstrate improved overall physical capability, musicality, and movement memory
5. Appreciate Ballroom dancing as an artform and a discipline

DANC 1135. Introduction to Argentine Tango
1 Credit (1)
An introduction to Argentine Tango at the beginning level. Students will learn the fundamentals of technique including carriage, common movement vocabulary, and partnering, as well as the history and culture of the form. Offered Spring of even years. May be repeated up to 2 credits.
Learning Outcomes
1. Execute the basic figures of Tango and Argentine Tango
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow
3. Develop the skills of style and performance quality within the dance
4. Articulate the cultural and historical underpinnings of these forms as World dances
5. Demonstrate improved overall physical capability, musicality, and movement memory
6. Appreciate Tango as an artform and a discipline

DANC 1140. Flamenco I
1 Credit (1)
This course introduces the student to the art of flamenco and its cultural features and significance. Students will learn the fundamentals of this art form and introductory techniques and skills, which may include handwork, footwork, postures, and specific dances. May be repeated up to 2 credits.
Learning Outcomes
1. Demonstrate a basic level of competency in the principles of alignment, anatomy, coordination, mobility, stability, and stamina.
2. Demonstrate fundamental flamenco techniques relative to spatial awareness, rhythm, phrasing, and sequencing.
3. Demonstrate competency with basic flamenco movement vocabulary.
4. Perform a variety of flamenco dances, poses, steps, hand movements, and combinations.

DANC 1150. Modern Dance I
1 Credit (1)
Modern Dance techniques and styles. Students are introduced to proper warm-up techniques, body alignment, control and flexibility. Students work with various rhythms and combinations of movements. The course emphasizes dance technique and creative experience. The history, terminology and philosophy of Modern Dance are also discussed. May be repeated up to 2 credits.
Learning Outcomes
1. Use a more developed sense of muscle control and strength, stretch and balance, coordination.
2. Demonstrate and verbalize an increased awareness of Modern Dance techniques
3. Execute dance phrases,combining several movements and in more than one rhythm.
4. Demonstrate an increased awareness of musicality while dancing and use Modern Dance Techniques creatively.

DANC 1155. Introduction to Hip Hop Dance
1 Credit (1)
This course provides an engaging and energetic introduction to the foundational elements and cultural history of hip-hop dance. Students will learn basic techniques, rhythms, and movements inspired by various hip-hop styles, including breaking, popping, locking, and social dances. The course emphasizes musicality, body awareness, self-expression, and an understanding of hip-hop as a global cultural phenomenon. No prior dance experience is required.
Learning Outcomes
1. Identify and execute fundamental hip-hop dance movements and techniques.
2. Understand the historical context and cultural significance of hip-hop dance.
3. Develop a basic sense of rhythm, musicality, and timing in relation to hip-hop music.
4. Explore personal style and self-expression through freestyle and choreography.
5. Demonstrate improved body awareness, coordination, and spatial understanding.
6. Engage respectfully with the diverse origins and evolution of hip-hop culture.

DANC 1161. Tap Dance
1 Credit (1)
The theory and practice of tap dance technique at the beginning level. No previous dance experience is expected. Coursework includes vocabulary and movement exercises in both Buck & Wing and Rhythm styles. May

be repeated once for a maximum of 2 credits. May be repeated up to 2 credits.

Learning Outcomes

1. Recognize and articulate the fundamentals of tap technique, vocabulary, and history.
2. Exhibit improved timing, dexterity, and style through the experience of various schools of tap dance technique, including Buck and Wing and Rhythm.
3. Define proper body alignment and control and understand basic mechanical concepts essential to efficient movement.
4. Demonstrate improved overall physical capability, musicality, and movement memory.
5. Appreciate tap dance as an artform and a discipline.

DANC 1185. Introduction to Country Western Dance
1 Credit (1)

An introduction to Country Western Dance at the beginning level. Students will learn the fundamentals of technique and several dances, including Country Western Two-Step, Nightclub Two-Step, Polka, and Line Dance. Offered Fall of odd years. May be repeated up to 2 credits.

Learning Outcomes

1. Execute the basic figures of various Country Western social dances.
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow.
3. Develop the skills of style and performance quality within the dance.
4. Demonstrate improved overall physical capability, musicality, and movement memory.
5. Appreciate Country Western dancing as an artform and a discipline.

DANC 1220. Introduction to Latin Social Dance
1 Credit (1)

An introduction to Latin social dance at the beginning level. Students will learn the fundamentals of technique including carriage, common movement vocabulary, and partnering, and will be introduced to steps and dances from the Bronze Syllabus of American Rhythm and International Latin dances. Offered every Spring. May be repeated up to 2 credits.

Learning Outcomes

1. Execute the basic figures of various Latin dances in American and International styles.
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow.
3. Develop the skills of style and performance quality within the dance.
4. Demonstrate improved overall physical capability, musicality, and movement memory.
5. Appreciate Latin dancing as an artform and a discipline.

DANC 1235. Introduction to West Coast Swing Dance
1 Credit (1)

An introduction to West Coast Swing dancing at the beginning level. Students will learn the fundamentals of technique of several Swing forms and the Hustle, including basic steps, partnering, and musical forms. Offered Fall of even years. May be repeated up to 2 credits.

Learning Outcomes

1. Execute the basic figures of both West Coast Swing and the Hustle.
2. Demonstrate an understanding of the elements of technique of these forms, including posture, use of the hips and legs, and lead and follow.
3. Develop the skills of style and performance quality within the dance.
4. Demonstrate improved overall physical capability, musicality, and movement memory.
5. Appreciate Swing dancing as an artform and a discipline.

DANC 2130. Ballet II
2 Credits (2)

Intermediate level of ballet technique; Introduction of more advanced Ballet vocabulary at barre/center work; increase flexibility, strength, body alignment, and coordination for practice of steps/combinations with variations in timing and changes of facing. Restricted to Las Cruces campus only. May be repeated up to 8 credits.

Learning Outcomes

1. A successful student will be able to understand and execute with accuracy all the steps presented on the take home quizzes and are encouraged and expected to attend at least two semesters of each level in order to advance to the next level of ballet technique

DANC 2150. Modern Dance II
2 Credits (2)

Modern II is designed to further the student's abilities in modern dance technique, to enhance efficient use of weight and momentum, to release held patterns in the body's mechanics, to enrich spatial awareness, and to begin work on performance techniques. May be repeated up to 8 credits.

Learning Outcomes

1. Improve accuracy in alignment and shape
2. Improve precision in space, in timing and rhythm, and in focus/intent
3. Learn combinations and movement dynamics quickly
4. Begin to integrate performance techniques while working in the classroom setting
5. Use a concentrated attitude and an open, creative mind to approach the work in an artistic manner unique to your abilities
6. Listen, see and apply all the information given within one class period and over the semester
7. Self-awareness and mindfulness: how much space do you take in the class and why? How aware are you of those around you, and those you are dancing with?
8. Release of weight to create controlled momentum
9. Locating center and moving from there

DANC 2157. Hip-Hop Dance II
2 Credits (2)

This course covers hip hop dance and its relationship to other aspects of hip-hop culture, music, and media, with an emphasis on creativity, individuality, and expression. Coursework may include street styles, breaking, and various regional forms. This is an intermediate level dance course. May be repeated up to 6 credits.

Learning Outcomes

1. Recognize and articulate the fundamentals of various styles of hip hop dance technique and vocabulary.
2. Contextualize the history and cultural aspects of hip hop dance.
3. Examine the relationship between dance and other aspects of hip hop culture such as music and media representation.
4. Demonstrate improvement in overall physical capability, musicality, and movement memory.
5. Appreciate hip hop dance as an artform and a discipline.

DANC 2170. Commercial Dance
2 Credits (2)

This course delves into the dynamic world of commercial dance, focusing on the foundational techniques, stylistic nuances, and performance

demands of commercial jazz and hip-hop. Students will explore the historical evolution, influential choreographers, and current trends within these vibrant dance forms as they apply to the entertainment industry (music videos, live concerts, film, television, and touring). Emphasis will be placed on developing versatility, adaptability, stage presence, and the ability to quickly learn and execute complex choreography.

Learning Outcomes

1. Demonstrate proficiency in core techniques and stylistic elements of commercial jazz and various hip-hop styles (breaking, popping, locking, house, new school).
2. Execute complex choreographic phrases with musicality, dynamics, and performance quality.
3. Analyze and articulate the historical and cultural contexts of commercial jazz and hip-hop.
4. Identify and apply strategies for quick retention and execution of choreography.
5. Develop a heightened sense of stage presence, adaptability, and versatility in performance.
6. Understand the professional expectations and demands of the commercial dance industry.
7. Work collaboratively in a studio setting, demonstrating professionalism and respect.

DANC 2270. Dance Improvisation
2 Credits (2)

An introduction to the practice of dance improvisation focusing on play and discovery as methods for generating movement and exploring the full potential of the communicative, authentic body in motion. Course content includes concepts in Body, Effort, Shape, Space, Kinesthetic Response, Scoring, and Contact. Offered Spring of even years.

Prerequisite: DANC 1150.

Learning Outcomes

1. Understand the core concepts of exploration and authenticity and the importance of these ideas to a modern dancer and choreographer.
2. Demonstrate immediacy of presence, both physically and mentally, in the way that they responding to both choices and instincts in the moment.
3. Connect the concepts learned in Modern dance technique to the study of dance improvisation and the concepts of this class to outside work as dancers, students, and citizens.
4. Access the constantly expanding movement vocabulary which will inform their work moving forward in dance technique and composition.
5. Improvise confidently both individually and as part of a group.

DANC 2310. Bronze American Rhythm
2 Credits (2)

Bronze level American Rhythm patterns, techniques, and partnering with emphasis on elements of dance. May be repeated up to 6 credits.

Learning Outcomes

1. Learn to dance the Bronze DIVIDA Manual in American Rhythm
2. Develop Bronze level dance technique
3. Gain deeper understanding of the Elements of Dance
4. Develop rhythmic accuracy in movement, ability to dance on time discover phrasing
5. Further develop lead follow skills that will enable you to dance at more advanced levels

DANC 2311. Bronze American Smooth
2 Credits (2)

Bronze level American Smooth patterns, technique, and partnering with an emphasis on the elements of dance. May be repeated up to 4 credits.

Learning Outcomes

1. Learn to dance the Bronze DIVIDA Manual in International Latin
2. Develop Bronze level dance technique
3. Gain deeper understanding of the Elements of Dance
4. Develop rhythmic accuracy in movement, ability to dance on time discover phrasing
5. Further develop lead follow skills that will enable you to dance at more advanced levels

DANC 2320. Bronze International Latin
2 Credits (2)

This is the style of Latin dance that is danced around the globe and is featured in the World DanceSport Championships. Students will learn the Bronze Level figures and techniques in four (4) International Style dances: Rumba, Cha Cha, Samba & Jive. May be repeated up to 6 credits.

Learning Outcomes

1. Learn to dance the Bronze DIVIDA Material for the International Latin Syllabus
2. Develop Bronze level dance technique
3. Gain deeper understanding of the Elements of Dance
4. Develop Smooth accuracy in movement, ability to dance on time discover phrasing
5. Further develop lead follow skills that will enable you to dance more advanced levels

DANC 2321. Bronze International Standard
2 Credits (2)

This is the style of Ballroom dance that is performed around the globe and is featured in the World DanceSport Championships. Learn the Bronze Level figures and techniques in five (5) International Style dances: Waltz, Tango, Viennese Waltz, Foxtrot & Quickstep. Students will focus on understanding technical elements of dance, memorizing and performing routines. May be repeated up to 6 credits.

Learning Outcomes

1. Learn to dance the Bronze DIVIDA Manual in International Standard
2. Develop Bronze level dance technique
3. Gain deeper understanding of the Elements of Dance
4. Develop Smooth accuracy in movement, ability to dance on time discover phrasing
5. Further develop lead follow skills that will enable you to dance at more advanced levels

DANC 2460. Dance for Musical Theatre
2 Credits (2)

This course will supplement the dance technique curriculum specifically in support of the study of Musical Theatre. Students will practice various social, world, and theatrical dance forms, learn selections from iconic choreography, experience mock dance auditions, and explore the skill of dance composition for musical theatre repertory. Offered every Spring. May be repeated up to 4 credits.

Prerequisite: DANC 1130 or DANC 1160.

Learning Outcomes

1. Participate successfully in dance techniques and styles outside of the basic tap, jazz, ballet, and modern dance curriculum.
2. Recognize and contextualize musical theatre history and repertory through exposure to significant historical choreography and choreographers.

3. Understand and excel at the skill of taking part in a musical theatre dance audition.
4. Demonstrate improvement in overall physical capability, musicality, and movement memory.
5. Appreciate the practice of musical theatre dance as an artform and a discipline.

DANC 3110. DanceSport Pedagogy: Smooth
3 Credits (3)
In this teacher education course, students will begin to develop skills necessary in becoming a successful, professional Ballroom Dance Instructor. Students will gain technical mastery of Bronze level figures in the four (4) American Style Smooth Ballroom Dances to include the Waltz, Foxtrot, Tango and Viennese Waltz. Students will gain practical teaching experience in the area of Group Class Instruction with required in class practicums. May be repeated up to 12 credits.
Prerequisite: DANC 2311.
Learning Outcomes
1. Students will understand several philosophies of teaching
2. They will gain teaching skills through practical experience.
3. The students will teach both group and private lessons.
4. The student will gain knowledge about learning styles.

DANC 3114. DanceSport Ensemble
1 Credit (1)
Involvement with the DanceSport performance ensemble rehearsal and performance process. May substitute for 1 credit of the Contemporary Dance Ensemble course in the Dance Major. May be taken in every semester of undergraduate study or for up to 8 hours credit. Students can enroll by audition only. Consent of the instructor is required. May be repeated up to 8 credits.
Learning Outcomes
1. Collaborate in the process of creating a work of Latin or Ballroom dance.
2. Participate in the process of producing a dance concert with fully realized technical elements including lighting and costumes.
3. Apply the knowledge and skills that are being developed in the study of dance technique, choreography, and pedagogy to the culminating performance experience.
4. Demonstrate a more developed sense of artistry, energy, ingenuity, and presence onstage.

DANC 3130. Ballet III
2 Credits (2)
The theory and practice of ballet technique at the advanced level. A high level of technical accomplishment, artistry, and professionalism is expected. May be repeated twice for a maximum of 6 credits. May be repeated up to 6 credits.
Prerequisite: DANC 2130.
Learning Outcomes
1. Achieve a greater clarity of line, released use of turnout, and expressivity in port de bras and epaulement, demonstrating improved adagio and allegro skills at the advanced level.
2. Experience the idiosyncrasies of the Cecchetti, Vaganova, and Bournonville techniques and differentiate the Romantic, Classical, Neo-Classical, and Contemporary styles.
3. Apply experience from other disciplines such as modern dance to the exercise of ballet, referencing concepts such as body patterning and energy pathways.
4. Demonstrate an increased level of physical and artistic achievement and professionalism.

DANC 3150. Modern Dance III
2 Credits (2)
The theory and practice of modern dance technique at the advanced level. A high level of technical accomplishment, artistry, and professionalism is expected. Course may be repeated twice for a maximum of 6 credits. May be repeated up to 6 credits.
Prerequisite: DANC 2150.
Learning Outcomes
1. Delve into movement concepts with a greater sense of risk and challenge at the advanced level.
2. Achieve an increased mastery of alignment, control, and efficiency, taking full advantage of the knowledge of body patterning and energy pathways.
3. Improvise solo, in an ensemble, and with a partner, demonstrating the application of instinct and choice in the authentic body.
4. Increase the student driven problem-solving skill that is essential to a professional modern dance artist.
5. Demonstrate a high level of physical and artistic achievement.

DANC 3210. Music for Dancers
2 Credits (2)
This course is designed to deepen dancers' understanding of musical principles and their direct application to dance. Students will explore fundamental concepts of rhythm, tempo, dynamics, form, and style, learning how to listen analytically and respond expressively to various musical genres. The class will integrate theoretical knowledge with practical movement exercises, fostering a more nuanced and musical approach to dance performance and choreography. No prior musical training is required, but a basic understanding of dance technique is recommended.
Learning Outcomes
1. Identify and articulate fundamental musical elements such as rhythm, tempo, meter, and dynamics.
2. Analyze musical structures and forms (AABA, verse-chorus) and apply this understanding to dance.
3. Develop a heightened sense of musicality and timing in their movement.
4. Respond expressively to different musical genres and styles.
5. Utilize musical cues to inform choreographic choices and improvisation.
6. Understand the relationship between music and dance history, recognizing key periods and influential artists.
7. Communicate effectively about musical concepts using appropriate terminology.

DANC 3250. Dance Repertory
1 Credit (1)
This course is designed to immerse students in the process of learning, rehearsing, and performing existing dance works (repertory). Students will gain practical experience in various choreographic styles and performance practices, developing their technical proficiency, artistic interpretation, and collaborative skills. The class will focus on understanding choreographic intent, adapting to different movement vocabularies, and preparing works for presentation. Prior dance experience is required, and students should be prepared for rigorous physical and mental engagement. May be taken in every semester of

undergraduate study or for up to 8 hours credit. May be repeated up to 8 credits.

Learning Outcomes

1. Accurately learn and reproduce complex choreographic sequences from existing repertory.
2. Develop a deeper understanding of various choreographic styles and their historical contexts.
3. Enhance technical proficiency, musicality, and performance quality in diverse dance forms.
4. Cultivate artistic interpretation and expressiveness within a choreographic framework.
5. Collaborate effectively with peers and instructors in a rehearsal setting.
6. Understand the process of preparing a dance work for public performance.
7. Apply critical thinking to analyze and discuss choreographic choices and performance aesthetics.

DANC 3265. Dance Composition I
3 Credits (3)

An introduction to the basic tools of dance composition, beginning with improvisation and including body, space, time, energy, and elements of design. Offered Fall of even years.

Prerequisite: DANC 2270.

Learning Outcomes

1. Understand the core improvisational concepts of exploration, authenticity, instinct, and choice, and the importance of these ideas to a modern dancer and choreographer.
2. Connect the concepts learned in Modern I to the study of dance improvisation and composition and the concepts of this class to outside work as dancers, students, and citizens.
3. Build a constantly expanding movement vocabulary.
4. Recognize and use the basic components of dance composition- body, space, time, and energy- and explore the roles of invention and communication in the creation of contemporary dances.
5. Develop the communication skills necessary to articulate and defend academic and artistic choices and to give and receive feedback.
6. Begin building a body of creative work and developing a sense of personal values as an individual and as an artist.

DANC 3310. Silver American Rhythm
3 Credits (3)

Silver level American Rhythm patterns and technique with emphasis on performance. May be repeated up to 9 credits.

Prerequisite: DANC 2310.

Learning Outcomes

1. To enhance advanced dance sport skills beyond Bronze Level

DANC 3311. Silver American Smooth
3 Credits (3)

Silver level American Smooth patterns and technique with emphasis on performance. May be repeated up to 9 credits.

Prerequisite: DANC 2311.

Learning Outcomes

1. Advance introductory skill levels and enhancing technique towards Gold level

DANC 3320. Silver International Latin
3 Credits (3)

Students will learn Silver Level syllabus figures in four (4) International Style dances: Rumba, Cha Cha, Samba & Jive and Bronze Level figures in Paso Doble. Continued training and practice in International Style Latin dance technique. May be repeated up to 9 credits.

Prerequisite: DANC 2320.

Learning Outcomes

1. Learn and work towards mastery for the four different styles of dances in Dance Sport

DANC 3321. Silver International Standard
3 Credits (3)

Learn Silver Level syllabus figures in the five (5) International Style Standard dances: Waltz, Tango, Viennese Waltz, Foxtrot & Quickstep. Students will focus on increased technical understanding to increase their ability in partnering and musicality. May be repeated up to 9 credits.

Prerequisite: DANC 2321.

DANC 3350. Dance Pedagogy I
3 Credits (3)

This course will include discussion of human development, body patterning, teaching methods, the structure and analysis of course content, and educational values as they apply to teaching creative movement and dance technique. Student must have one semester each of ballet and modern technique or permission of the instructor to enroll. Offered Spring of odd years.

Prerequisite: DANC 2130 and DANC 2150.

Learning Outcomes

1. Understand the basic progression of human development and how the study of Creative Movement and Dance can aid in that development physically, cognitively, and emotionally.
2. Recognize basic sociological and developmental demographic factors and determine how to develop lessons that are appropriate, safe, and constructive.
3. Communicate clearly, assertively, thoughtfully, appropriately, and constructively, recognizing communication as a vital skill in education.
4. Expand upon an existing syllabus of terminology, rhythmic structures, and movement vocabulary that is necessary in a comprehensive elementary dance education.
5. Practice executing a basic dance class structure including short and long-term lesson plans and a variety of teaching methods.
6. Begin developing a system of personal values and a philosophy of education that will engender an effective, ethical, and responsible teaching practice.

DANC 3510V. World Dance
3 Credits (3)

Examination of dance forms from a cross-cultural perspective, focusing on the role of dance in different cultures around the globe. Same as HNRS 347V. May be repeated up to 3 credits.

Learning Outcomes

1. An understanding of the social importance of dance in diverse cultural settings
2. A familiarity with the importance of dance as a vehicle through which various identities (i.e. cultural, gender and personal), roles (i.e. social and status) and values (i.e., personal and cultural) are identified and expressed.
3. An understanding of dance as a form of non-verbal communication.
4. The ability to discuss and compare culture's dance forms.

5. The ability to recognize how other art forms, religions, and political climates affect cultural identity.

DANC 3610. Dance History
3 Credits (3)
A survey of dance history from ancient Greece to the 21st century. Major emphasis on the development of dance as a Theatrical artform, on Ballet and Modern dance in Europe, Russia, and the U.S., and on criticism and theory of choreography and performance. Offered Fall of even years.
Learning Outcomes
1. Quantify factual knowledge of the progression of dance including primitive forms, court dance, ballet, and modern dance.
2. Recognize and contextualize important choreography, dancers, choreographers, composers, events, and phenomena in the history of Western Theatrical dance.
3. Discuss some of the root problems that dance historians face, such as the imperfect nature of documentation.
4. Understand how history shapes contemporary practices in dance.
5. Watch dance critically in order to derive choreographic intention and meaning in the work.
6. Articulate and support an informed point of view, both verbally and in writing, about works of concert dance.

DANC 3710. Somatics and Anatomy of Movement
3 Credits (3)
This course combines the study of human anatomy and physiology with the principles of Somatics in various forms to address dance movement in terms of body connectivity, efficiency, and access to full physical capability. Student should complete one semester of Modern Dance technique before enrolling. Offered Fall of odd years.
Learning Outcomes
1. Understand the mechanics of basic human anatomy and physiology, including but not limited to bones, muscles, and joints, and explore the way that this quantitative knowledge can help in understanding and developing the dancer's kinesthetic abiity.
2. Recognize the vitality of basic components of wellness, including nutrition and injury prevention and treatment, and the impact that these issues have on dance as a professional practice.
3. Integrate the basic principles of various somatic fields outside of ballet and modern dance technique into their personal artistic practice and understand the ways that these additional methods can enhance their physical capability.
4. Apply their knowledge of physiology, wellness, and somatic systems to the study and practice of dance pedagogy.

DANC 3720. Dance Technology and Design
3 Credits (3)
This course explores the integration of technology into the creative process, focusing on projects in graphic design and filmmaking. Students will learn the fundamentals of photography, publicity design, sound editing and design, film documentation of live dance, and Dance for the Camera, and will be introduced to software including Photoshop and Final Cut. Offered Spring of odd years.
Prerequisite: DANC 3265.
Learning Outcomes
1. Demonstrate proficiency with some of the relevant technology, software, and tools that are used in producing digital images and video.
2. Effectively promote themselves and their work in their communities and online as 21st century artists and professionals must be prepared to do.
3. Think more broadly about the capabilities of their creative work, beginning with the choreographic process, with respect for the way that technology can enhance the artform of concert dance, and produce choreography in non-traditional formats.
4. Apply the skill of articulating specific and purposeful artistic choices, as is also being developed in technique, pedagogy, and composition classes.

DANC 4250. Dance Pedagogy II
3 Credits (3)
The theory and practice of dance pedagogy focusing in greater depth on technique and branching into professional preparation, including dance studio management. Coursework will include application of somatic and anatomical principles and diverse teaching methods in many disciplines, plus the creation of a business plan and professional portfolio. Outside field experience in teaching dance technique will be required. Offered Spring of even years.
Prerequisite: DANC 3350.
Learning Outcomes
1. Demonstrate a deepening understanding of both theoretical and practical aspects of dance pedagogy, organizing the knowledge, skills, and artistic content of dance into effective, ethical, and responsible teaching practices.
2. Give and receive constructive critical feedback to and from their peers.
3. More effectively communicate with their students to answer questions and address concerns in the classroom.
4. Integrate artifacts, readings, and teaching tools which facilitate critical thinking and technical development in the dance class.
5. Prepare and implement a plan to establish and run a school of dance as a business.
6. Continue formulating an expanding system of educational values regarding the rights and responsibilities of the teacher, the student, and the institution.

DANC 4265. Dance Composition II
3 Credits (3)
Using the tools introduced in Dance Composition I, students will explore new methods of generating movement, delving into language, rhythmic and musical studies, props and architecture, sources of inspiration, and meaning making. Students will also be guided to consider the integration of technical and theatrical elements into the choreographic process and the relationship between their artistic work and their personal and social values.
Prerequisite: DANC 3265.
Learning Outcomes
1. Surpass the principles learned in Choreography I to create increasingly complex contemporary work, informed by new points of inspiration, broader subject matter, and greater relevance.
2. Demonstrate a deepening understanding of the choreographic process as an exercise in Meaning-Making, using an unlimited movement vocabulary applied with absolute clarity.
3. Articulate the choices in craft and intention that are the underpinnings for the creation of work that is reflective of the artist's personal and social values.

4. Create a wide and diverse body of work, utilizing multiple dancers, various styles of music, and varied creative processes.

DANC 4266. Advanced Independent Projects
1-3 Credits (1-3)
Independent work in dance practice, pedagogy, composition, or theory under faculty guidance. Intended to allow the student to broaden their experience and expertise in an artistic or academic area of dance beyond the published coursework. This course may substitute for Special Topics within the dance major if a project of sufficient depth and rigor is proposed. Consent of Instructor required. May be repeated up to 6 credits.
Learning Outcomes
1. Demonstrate development in the skill of self-driven learning.
2. Apply strong practices of inquiry and discovery, developed in other cross-disciplinary coursework, to their own personal areas of research and creative interest.
3. Exhibit a deeper understanding of specific artistic, academic, or theoretical field within the study of dance, reflective of the student's goals and values.

DANC 4310. Gold American Rhythm
3 Credits (2+2P)
Advanced level American Rhythm dance technique and partnering work with choreography and performance emphasized. Includes cultural history and pedagogy methods. May be repeated up to 6 credits.
Prerequisite: DANC 3310.
Learning Outcomes
1. To enhance dance sport skills beyond Silver Rhythm

DANC 4311. Gold American Smooth
3 Credits (3)
Gold level American Smooth technique and choreography with an emphasis on performance and competition dancing. May be repeated up to 9 credits.
Prerequisite: DANC 3311.
Learning Outcomes
1. Continue to work towards mastery of dance sport perfection through advanced training

DANC 4320. Gold International Latin
3 Credits (3)
Students will complete all syllabus figures through the Gold level in the Rumba, Cha Cha, Samba, Jive and Paso Doble. Advanced training and practice in International Style Latin dance technique. May be repeated up to 9 credits.
Prerequisite: DANC 3320.

DANC 4321. Gold International Standard
3 Credits (3)
Students will learn Gold Level syllabus figures in the five (5) International Style Standard dances: Waltz, Tango, Viennese Waltz, Foxtrot & Quickstep. Students will focus on physical and cognitive mastery of standard dance technique and elements as well as high-level performance ability, musicality and choreography. May be repeated up to 9 credits.
Prerequisite: DANC 3321.

DANC 4610. DanceSport Certification Preparation
3 Credits (3)
The Professional Certification process offers extraordinary benefits to dance teachers, deeply enriching their dancing and teaching, and greatly expanding their career opportunities. This intensive course is designed to fully prepare students in taking the DVIDA and/or ISTD exams in the Smooth, Rhythm, Standard or Latin dances depending on course offered. See subtitle for specific style being taught in schedule of classes. May be repeated up to 12 credits.

DANC 4710. Senior Project
3 Credits (3)
As a capstone to the undergraduate study of dance, majors will select a research topic of interest to them and use the information gathered to inform the choreographic or pedagogical process. The project will include both academic and creative components. Students must be in Senior standing. Consent of Instructor required.
Learning Outcomes
1. Synthesize the complete undergraduate study of dance technique, performance, pedagogy, and choreography.
2. Connect the practice of academic research to the choreographic or pedagogical process.
3. Demonstrate a reinforced understanding of dance as an art form and the essential practices of creation, communication, meaning making, and reflection.
4. Present a professional portfolio appropriate to a dance artist, including a cover letter, CV, resume, and statement of teaching philosophy.

DANC 4996. Special Topics
1-3 Credits (1-3)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 3 credits.
Learning Outcomes
1. Varies

DANC 4997. Problems
1-6 Credits (1-6)
Problems in dance education, dance pedagogy, dance performance and independent work in their solutions. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

DHYG - DENTAL HYGIENE/HYGIENIST

DHYG 2210. Preclinical Dental Hygiene Seminar
3 Credits (3)
This foundational course provides dental hygiene students with the introductory knowledge, skills, and attitudes essential for success in the clinical setting emphasizing scientific principles, current theory, prevention of disease transmission, ethical and professional patient treatment and clinical preparation for comprehensive patient care.
Learning Outcomes
1. Describe infection control protocols for safe dental hygiene practice.
2. Identify equipment and materials for sterilization and disinfection.
3. Explain ergonomics and positioning strategies for safe patient and operator interaction.
4. Discuss time and motion management principles for clinical efficiency.
5. Describe protocols for medical emergency prevention and management.
6. Demonstrate the ability to obtain and record a comprehensive health history.
7. Identify key anatomical landmarks for patient assessment and charting.

8. Describe the properties and applications of preventive pharmacological agents.
9. List diagnostic and screening tools used in clinical examinations. 1
10. Recognize the importance of consistent patient assessment based on professional standards.

DHYG 2212. Preclinical Dental Hygiene
3 Credits (3P)
The Preclinical Dental Hygiene course introduces students to the fundamental principles of patient care, infection control, and clinical techniques. Students will develop foundational skills in instrumentation, patient assessment, and treatment planning, preparing them for direct patient care in future clinical courses. Specific clinical requirements are set for this program and may not be transferrable to other programs.
Learning Outcomes
1. Demonstrate universal precautions in clinical practice.
2. Apply methods of sterilization and disinfection.
3. Show proper patient/operator positioning techniques.
4. Demonstrate basic strategies for preventing medical emergencies.
5. Perform comprehensive patient assessments.
6. Apply fundamental principles of treatment planning.
7. Demonstrate proper instrumentation techniques for clinical care.
8. Practice ethical and professional behavior in patient interactions.

DHYG 2213. Oral Histology and Embryology
2 Credits (2)
This course provides a comprehensive introduction to the microscopic structures of the oral tissues and their embryological formation.
Learning Outcomes
1. Define and explain the concepts of dental histology and embryology.
2. Describe the embryological development, morphology, and histology of the human dentition and its associated structures.

DHYG 2214. Head and Neck Anatomy
3 Credits (3)
This course provides a comprehensive study of the anatomy and physiology of the head and neck regions with a specific emphasis on oral structures and their functions.
Learning Outcomes
1. Discuss the clinical applications of the study of head and neck anatomy by dental professionals.
2. Identify the anatomical structures of the head and neck.
3. Discuss normal anatomic variation and how it applies to different structures of the head and neck.
4. Identify deviations from normal, and how it applies to different structures of the head and neck.
5. Integrate the knowledge of head and neck anatomy into clinical practice of patient examination, dental radiology, and the future use of local anesthetics.

DHYG 2215. Tooth Anatomy and Morphology
2 Credits (2+1P)
This course provides a comprehensive study of human dentition, including their development and relationships within the oral cavity. Key areas of focus include universal charting, numbering systems, cavity classification, and laboratory activities enhance observational and clinical skills. May be repeated up to 2 credits.
Learning Outcomes
1. Describe the anatomy, physiology and stages of the human dentitions.
2. Explain the concept of occlusion and malocclusion.
3. Describe dental numbering systems and tooth identification.
4. Explain the eruption process and the eruption schedule for primary and permanent dentitions.

DHYG 2216. Dental Radiology
3 Credits (3)
This course focuses on the principles and techniques of dental radiography. Students will study radiation physics, hygiene, and safety protocols. Emphasis is placed on the fundamentals of intraoral and extraoral radiographic techniques, including exposure, quality assurance, and interpretation of radiographs. The course also covers patient selection criteria and explores other ancillary radiographic techniques.
Learning Outcomes
1. Explain the principles of radiation physics in the production of x-rays.
2. Discuss the effects of ionizing radiation on living tissues and implement appropriate safety measures.
3. Recognize appropriate receptors and exposure factors.
4. Differentiate intraoral and extraoral radiographic techniques including landmarks and interpretation.
5. Explain infection control protocols during all radiographic procedures.
6. Recognize legal and ethical considerations related to dental radiography.
7. Develop communication strategies as related to dental radiology.

DHYG 2216L. Dental Radiology Lab
1 Credit (1P)
The laboratory emphasizes first-hand observations and hands-on performance of skill competencies that support the concepts taught in the theory course. May be repeated up to 1 credit.
Learning Outcomes
1. Produce high-quality dental radiographs in a safe, legal and ethical manner.
2. Effectively communicate with and manage patients during radiographic procedures.

DHYG 2220. Clinical Dental Hygiene Seminar I
3 Credits (3)
A continuation of clinical skills, patient assessment, treatment, scheduling, preventive techniques and application of dental hygiene procedures at the intermediate level. Work-based instruction that helps students synthesize new knowledge, apply previous knowledge or gain experience managing the workflow. Practical experience is simultaneously related to theory. Direct supervision is provided by the clinical faculty.
Learning Outcomes
1. Explain fundamental principles of infection control and patient safety.
2. Describe methods for assessing oral health conditions.
3. Discuss strategies for ensuring efficiency and safety in clinical practice.
4. Analyze techniques used in preventive dental care.
5. Identify factors that influence patient health and treatment considerations.
6. Interpret patient assessment data for informed decision-making.
7. Discuss protocols for referrals and emergency management.
8. Evaluate approaches to patient education and communication.
9. Examine ethical and professional responsibilities in dental care. 1
10. Integrate evidence-based concepts into dental hygiene practice.

DHYG 2222. Clinical Dental Hygiene I
4 Credits (4P)
Building upon the foundational skills acquired in Preclinical Dental Hygiene, this course transitions students into the clinical setting where they begin providing care to patients. Emphasis is placed on applying infection control protocols, conducting comprehensive assessments, and implementing basic treatment plans with close faculty supervision. Specific clinical requirements are set for this program and may not be transferrable to other programs.
Learning Outcomes
1. Apply universal precautions in clinical care.
2. Perform effective sterilization and disinfection procedures.
3. Show proper patient/operator positioning during treatment.
4. Demonstrate emergency prevention strategies in patient care.
5. Conduct thorough patient assessments.
6. Implement treatment plans based on patient assessment.
7. Apply instrumentation techniques to remove deposits effectively.
8. Demonstrate ethical reasoning in clinical decision-making.

DHYG 2223. General and Oral Pathology
3 Credits (3)
Introduction to general pathology with focused study of diseases and disorders of the oral cavity and their interrelationship with body systems; developmental anomalies of the teeth and jaws; manifestations of disease in the oral cavity, head and neck.
Learning Outcomes
1. Describe pathological processes and their effects on the immune system and body organ systems.
2. Differentiate oral conditions based on clinical and radiographic characteristics for accurate diagnosis.
3. Assess oral lesions to determine their significance and the need for referral.
4. Communicate effectively about oral disease manifestations with healthcare professionals and patients.
5. Integrate oral pathology knowledge into treatment planning, patient education, and evidence-based care.

DHYG 2224. Periodontology
3 Credits (3)
Study of normal and diseased periodontium to include the structural, functional and environmental factors. Emphasis on etiology, pathology, evaluation of disease, treatment modalities, and therapeutic and preventative periodontics relative to the hygienist's role as a co-therapist in a contemporary practice setting.
Learning Outcomes
1. Describe the characteristics of healthy and diseased periodontium to support accurate diagnosis.
2. Classify periodontal diseases to guide treatment planning.
3. Explain the causes and progression of periodontal diseases and their impact on the periodontium.
4. Identify key considerations for periodontal surgical and nonsurgical treatments.
5. Discuss the influence of systemic health factors on periodontal disease progression and management.

DHYG 2225. Dental Materials
2 Credits (2)
Covers the composition, properties, classifications, uses, and manipulation of materials commonly used in dentistry. Topics also include legal, ethical, and safety issues related to the use of dental materials. May be repeated up to 2 credits.
Learning Outcomes
1. Explain the properties, composition, handling, storage, dispensing and disposal of dental materials used chairside and in the laboratory.
2. Describe the legal and ethical considerations for using dental materials in a safe and responsible manner.
3. Describe the role of the dental auxiliary in the selection, preparation, and placement of dental materials.

DHYG 2225L. Dental Materials Laboratory
1 Credit (1P)
The laboratory emphasizes first-hand observations and hands-on performance of skill competencies that support the concepts taught in the theory course. May be repeated up to 1 credit.
Learning Outcomes
1. Demonstrate the handling, storage, dispensing and disposal of dental materials used chairside and in the laboratory.
2. Demonstrate the role of the dental auxiliary in the legal, ethical, and safe use of dental materials.

DHYG 2226. Medical and Dental Emergencies
2 Credits (2)
This course provides an overview of medical and dental emergencies encountered most frequently in the dental setting. The course also focuses on the recognition, prevention, preparation and management of these emergencies. It also provides the student with knowledge and techniques on how to address those emergencies should they occur.
Learning Outcomes
1. Describe the components and purpose of an emergency kit in managing medical emergencies in a dental setting.
2. Apply treatment protocols for managing medical emergencies during dental care.
3. Recognize abnormal vital signs and their implications for emergency intervention.
4. Explain the key steps in preparing a dental office for effective emergency management.
5. Demonstrate techniques for managing airway obstructions and foreign body aspirations in emergencies.

DHYG 2227. Clinical Dental Hygiene II
2 Credits (2)
Clinic II advances students' clinical competencies by refining their instrumentation techniques, treatment planning, and patient management skills. With increased independence, students will provide care for patients with varying oral health needs while learning to evaluate treatment effectiveness and make appropriate modifications. Specific clinical requirements are set for this program and may not be transferrable to other programs.
Learning Outcomes
1. Maintain universal precautions in all patient interactions.
2. Demonstrate adherence to sterilization and disinfection standards.
3. Apply patient/operator positioning to optimize clinical efficiency.
4. Assess patient risk factors to prevent medical emergencies.
5. Perform individualized treatment procedures.
6. Demonstrate precision in instrumentation techniques.
7. Evaluate patient responses and adjust treatment accordingly.
8. Apply ethical and professional standards to clinical practice.

DHYG 2228. Pain and Anxiety Management
2 Credits (2)
Study of the application of various physical, chemical, and psychological modalities to the prevention and treatment of preoperative and postoperative patient anxiety and pain. Emphasis on administration of local anesthesia and nitrous oxide.
Learning Outcomes
1. Explain the anatomy and physiology of nerve conduction, including pain transmission mechanisms and how they are influenced by local anesthetics.
2. Discuss the pharmacological properties, actions, contraindications, and potential adverse reactions of local anesthetic agents, vasoconstrictors, and nitrous oxide.
3. Evaluate the effects of local anesthetics on the central nervous system (CNS) and cardiovascular system (CVS), including recognition and management of adverse reactions.
4. Describe the biotransformation processes of esters and amides, the concept of drug half-life, and the clinical relevance of pKa and pH in anesthesia.
5. Identify clinical signs and symptoms of adverse reactions to local anesthetics and vasoconstrictors, and describe appropriate management protocols for these reactions.
6. List and explain the maximum recommended doses for local anesthetics and vasoconstrictors, and discuss dose modifications for children, adults, and patients with compromised health
7. Describe the steps to recognize and manage medical emergencies related to anesthesia administration, including syncope, allergic reactions, and cardiovascular complications.
8. Evaluate patient medical and dental histories to identify risk factors that may influence the selection of anesthetic agents and necessitate medical consultation.
9. Discuss proper protocols for handling sharps, preventing cross-contamination, and managing equipment used in local anesthesia. 1
10. Explain the importance of emergency preparedness in the dental office, including recognizing symptoms of undiagnosed medical conditions, responding to adverse drug reactions, and implementing emergency protocols to ensure patient safety.

DHYG 2228L. Pain and Anxiety Management Clinical
1 Credit (1P)
Clinical application of concepts learned in Pain and Anxiety Management. Emphasis on the administration and techniques of local anesthesia and monitoring nitrous oxide.
Prerequisite: C or better in DHYG 2228.
Learning Outcomes
1. Demonstrate the proper technique for administering local anesthetic injections, including infiltrations and nerve blocks, to ensure effective pain control and patient comfort.
2. Apply knowledge of intraoral landmarks to accurately and safely perform various local anesthetic injections, such as the ASA, PSA, IA, and mental nerve blocks.
3. Evaluate a patient's medical and dental history to identify contraindications and determine the appropriate anesthetic agents, vasoconstrictors, and techniques for treatment.
4. Administer nitrous oxide-oxygen sedation safely and effectively, monitoring the patient's physiological and psychological responses throughout the procedure.
5. Identify and manage adverse reactions or medical emergencies associated with the administration of local anesthetics, vasoconstrictors, or nitrous oxide, including syncope, allergic reactions, or toxicity.
6. Calculate and adjust dosages of local anesthetics, vasoconstrictors, and nitrous oxide based on patient factors such as age, weight, medical history, and health status.
7. Ensure proper handling and disposal of sharps and other equipment to maintain infection control and safety during anesthetic administration.
8. Educate patients about the procedure, expected outcomes, dosage safety, and post-operative considerations associated with local anesthesia and nitrous oxide sedation.

DHYG 2230. Clinical Dental Hygiene Seminar III
2 Credits (2)
Continuing development of a theoretical framework of dental hygiene treatment with advancement of dental hygiene proficiency in all areas of dental hygiene treatment. Presentation and discussion of case histories from patients and preventive measures employed against disease concurrent with clinical practice with emphasis on special needs patients. May be repeated up to 2 credits.
Learning Outcomes
1. Discuss advanced concepts in periodontal therapy and patient care.
2. Apply pharmacological principles to dental hygiene treatment.
3. Evaluate patient outcomes to guide treatment decisions.
4. Explore interdisciplinary approaches to comprehensive patient care.
5. Develop strategies for managing medical emergencies in a clinical setting.
6. Assess risk factors affecting oral and systemic health.
7. Discuss approaches to patient education and disease prevention.
8. Analyze patient documentation and follow-up care planning.
9. Examine strategies for long-term patient management and referrals. 1
10. Recognize the importance of self-assessment and ongoing professional development.

DHYG 2232. Clinical Dental Hygiene III
5 Credits (5P)
Clinic III, students manage more complex cases, requiring advanced critical thinking and problem-solving skills. They will integrate diagnostic tools, adapt treatment strategies, and demonstrate greater autonomy in decision-making. Emphasis is placed on professional judgment, ethical considerations, and comprehensive patient care. Specific clinical requirements are set for this program and may not be transferrable to other programs.
Learning Outcomes
1. Implement universal precautions.
2. Evaluate sterilization and disinfection protocols for effectiveness.
3. Demonstrate advanced patient/operator positioning techniques.
4. Develop strategies for managing medical emergencies.
5. Integrate diagnostic and assessment techniques into treatment planning.
6. Demonstrate critical thinking in managing complex patient cases.
7. Assess the effectiveness of treatment outcomes.
8. Apply ethical reasoning and professionalism in clinical decision-making.

DHYG 2233. Pharmacology
3 Credits (3)
Study of the pharmacologic aspects of drugs and drug groups with which the dentist and dental hygienist are directly and indirectly concerned.

Emphasis is placed on nomenclature, origin, physical and chemical properties, preparation, modes of administration and effects of drugs upon the body systems.

Learning Outcomes

1. Identify the effects of commonly used drugs on dental treatment.
2. Describe strategies for managing drug interactions, medical emergencies, and oral manifestations related to drug use in dental practice.
3. Apply pharmacological principles to the management of patient care in a clinical dental setting.
4. Explain approaches to ensuring safe dental care for patients with complex medical histories.
5. Incorporate pharmacological knowledge and ethical considerations into dental care practices.

DHYG 2234. Research Methodology
2 Credits (2)

This course provides an introduction to the principles and application of research methods in social, behavioral and medical research.

Learning Outcomes

1. Explain how oral health research and the process of scientific inquiry knowledge development and daily practice.
2. Explain how an evidence-based decision-making approach enhances critical thinking and professional decision-making regarding patient care.
3. Describe the scientific method and research process.
4. Use the Internet and electronic resources in research and understand how they relate to dental hygiene education, practice and research.
5. Conduct an effective literature search using electronic databases (such as PubMed, MEDLINE, and CINAHL), professional journals, government documents, product literature and other print publications, video and other forms of multimedia.
6. Develop a PICO (or equivalent) research question to address an identified practice problem.
7. Discuss different research designs and when each is appropriate to use.
8. Explain the elements necessary to obtain valid and reliable results for observational, exploratory and experimental research.
9. Evaluate oral health research articles applying concepts of research design and methodology. 1
10. Interpret oral health data by proper application of statistical principles and tests. 1
11. Critically analyze different print and electronic information sources and apply to the practice of dental hygiene. 1
12. Gain an appreciation for the role of research in evidence-based dental hygiene practice.

DHYG 2240. Clinical Dental Hygiene Seminar IV
3 Credits (3)

A continuation of information to prepare the student for advanced clinical practice. Provides an in-depth study of dental hygiene care for diverse patient populations and provides a forum for evaluation of the service project from Dental Public Health, and synthesis of all dental hygiene knowledge, skills and attitudes into a case presentation.

Learning Outcomes

1. Explore advanced concepts in dental hygiene care and patient management.
2. Discuss strategies for handling medical emergencies in a clinical setting.
3. Analyze patient assessment data to support interdisciplinary treatment planning.
4. Evaluate the effectiveness of dental hygiene interventions for long-term patient outcomes.
5. Examine professional responsibilities in mentoring and education within the field.
6. Develop strategies for addressing barriers to oral health care in diverse populations.
7. Explore approaches to collaborative, patient-centered care in dental hygiene practice.
8. Assess clinical practices using evidence-based research to support continuous improvement.
9. Discuss the legal, ethical, and professional considerations in patient documentation. 1
10. Recognize the role of dental hygienists in leadership, research, and advocacy for oral health.

DHYG 2242. Clinical Dental Hygiene IV
5 Credits (16P)

As the final clinical course, Clinic 4 prepares students for professional practice by refining their ability to manage diverse and complex patient cases with confidence and competence. Students will demonstrate mastery of clinical skills, collaborate with healthcare professionals, and develop strategies for lifelong learning and ethical practice in dental hygiene. Specific clinical requirements are set for this program and may not be transferrable to other programs.

Learning Outcomes

1. Implement universal precautions across all clinical settings.
2. Develop an evidence-based approach to sterilization and disinfection.
3. Demonstrate mastery of patient/operator positioning.
4. Create a risk management plan for emergency prevention and response.
5. Synthesize patient data to develop comprehensive treatment plans.
6. Lead interprofessional collaboration to enhance patient care.
7. Design a system for evaluating treatment effectiveness.
8. Advocate for ethical and professional excellence in clinical practice.

DHYG 2243. Principles of Practice
2 Credits (2)

Examination of the dental hygienist's role in both traditional and non-traditional employment settings. Career planning, resume preparation and interviewing are practices. An understanding of the law, professional ethics of dental hygiene and the need for lifelong learning are emphasized. Future roles of the dental hygienist and emerging issues in dental hygiene will be explored.

Learning Outcomes

1. Analyze the core values found in the Codes of Ethics of professional dental organizations and their application to dental hygiene practice.
2. Compare the ethical theories.
3. Demonstrate an ethical decision-making framework by applying it to case-based scenarios and defending the chosen course of action.
4. Evaluate the differences between different legal frameworks for the licensing and practice of dental hygienists.
5. Create a protocol for addressing cultural competence and sensitivity in patient care delivery, including strategies to overcome health literacy challenges.

DHYG 2244. Dental Public Health Education
3 Credits (3)

Study of principles and concepts of community public health and dental health education. Emphasis on dental epidemiology and statistical methods, community assessment, educational planning, implementation, and evaluation, scientific review of literature, and classroom presentation.

Learning Outcomes

1. Participate in community programs to prevent oral diseases and promote health.
2. Deliver evidence-based oral health care and education to diverse populations.
3. Develop strategies for implementing and evaluating oral health programs.
4. Advocate for oral health promotion through collaboration with various stakeholders.
5. Apply scientific research to evaluate dental products, techniques, and policies for informed decision-making.

DHYG 2996. Special Topics in Dental Hygiene
1 Credit (4P)
Varies. May be repeated up to 2 credits.

Learning Outcomes

1. Varies.

DRFT-DRAFTING

DRFT 100. Introduction to Architecture, Engineering, & Construction
3 Credits (3)
Introduction to and exploration of careers in the fields of architecture, engineering, and construction. Specific fields to include: architecture, civil engineering, mechanical engineering, structural engineering, engineering technology, residential construction, commercial construction, geographical information systems (GIS), surveying, sustainable design, and green building

Learning Outcomes

1. Prepare accurate written technical documents,
2. Produce drawing documents that are technically sound,
3. Develop and practice productive work skills, and
4. Upgrade technical knowledge and skills to keep pace with real-world changes
5. Describe different career options in architecture, engineering, and construction,
6. Define the roles of different design professionals and support staff,
7. Explain related educational and professional licensing requirements,
8. Articulate employer expectations,
9. Explore related courses and programs of study at DACC and NMSU, and 1
10. Develop good workplace skills and professional, productive work habits.

DRFT 105. Technical Drawing for Industry
3 Credits (2+2P)
Technical sketching, basic CAD, and interpretation of drawings with visualization, speed and accuracy highly emphasized. Areas of focus include various trades such as machine parts, welding, heating and cooling, and general building sketches/plan interpretation.

DRFT 108. Drafting Concepts/Descriptive Geometry
2 Credits (1+2P)
Basic manual drafting skills, sketching, terminology and visualization. Graphical solutions utilizing applied concepts of space, planar, linear and point analyses. Metric and S.I. units introduced. May be repeated up to 2 credits.

Learning Outcomes

1. Analyze the parallels and distinctions between drafting and design within the Engineering and Architectural domains.
2. Outline the attributes of linear, two-dimensional, and three-dimensional graphic portrayal.
3. Sketch fundamental geometric shapes in linear, two-dimensional, and three-dimensional formats.
4. Explain the characteristics of an Architectural and Engineering Scale.
5. Apply appropriate Architectural or Engineering Scale to dimension drawings accurately.
6. Identify and expound upon the following concepts: a) Plan view, b) Elevation view, c) Section view.
7. Generate precise, readable, and meticulous drawings in Plan, Elevation, and Section views.

DRFT 109. Computer Drafting Fundamentals
3 Credits (2+2P)
Introduction to principles and fundamentals of drafting using both manual drawing techniques and computer-aided drafting (CAD) applications. Crosslisted with: E T 109 and C E 109. May be repeated up to 3 credits.

Learning Outcomes

1. Describe related career options/pathways.
2. Explain and apply common drafting terms, concepts, and conventions.
3. Utilize various AutoCAD commands and Coordinate Entry methods to produce accurate and precise Two-Dimensional drawings.
4. Setup AutoCAD working environment, drawings, styles, and applicable settings.
5. Navigate the AutoCAD user interface efficiently.
6. Apply different drafting methods, strategies, and processes.
7. Utilize AutoCAD to produce basic 2D CAD working drawings.
8. Measure utilizing scales accurately.
9. Create drawings with different scales and units. 1
10. Plot drawings produced in AutoCAD at various scales and on various sheet sizes. 1
11. Utilize the two Drawing Environments: Paper Space and Model Space. 1
12. Manage AutoCAD drawing files.

DRFT 112. Drafting Concepts/Computer Drafting Fundamentals I
4 Credits (2+4P)
Basic drafting skills, terminology, and visualization. Introduction to principles and fundamentals of computer-aided drafting. Same as E T 106.
Prerequisites: OECS 207, OECS 125 or consent of instructor.

DRFT 113. Drafting Concepts/Computer Drafting Fundamentals II
4 Credits (2+4P)
Drafting for mechanical/industrial applications; machine part detailing, assemblies in orthographic, isometric, auxiliary, oblique, and sectional views. Two-dimensional AutoCAD with introduction to 3-D AutoCAD. Same as E T 216. Restricted to: Community Colleges only.
Prerequisite: DRFT 112.

DRFT 114. Introduction to Solid Modeling
3 Credits (2+2P)

Introduction to 3D mechanical parametric solid modeling and basic assembly creation utilizing Autodesk Inventor as well as other applicable solid modeling software packages. Creation of 2D working drawings from 3D solid models and 3D models for machining/manufacturing purposes will be emphasized. Application of Geometric Dimensioning and Tolerancing (GD&T), material properties, and industry standard fastening and manufacturing practices methods will be introduced. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Create 3D solid models.
2. Read and interpret 2D technical drawings.
3. Read and interpret 3D technical drawings.
4. Define and sketch the standard, sectional, and auxiliary views of a given object.
5. Annotate working mechanical drawings following industry standards.
6. Dimension working mechanical drawings following industry standards.
7. Identify standard threads callouts.
8. Identify standard fasteners callouts.
9. Identify standard metal shapes and sizes. 1
10. Produce sheet and assembly drawings. 1
11. Manage Electronic files.

DRFT 115. General Construction Safety
3 Credits (3)

Overview of general construction safety related to building, highway and road construction, and surveying field work for entry-level individuals. Students will also have the opportunity to earn a 10-hour construction industry OSHA card.

Learning Outcomes

1. Discuss the general history of OSHA.
2. Discuss the general history of the U.S. safety movement.
3. Utilize the OSHA web site as a basic safety resource.
4. Utilize the Call Before You Dig website as a basic safety resource.
5. Recognize construction site hazards.
6. Identify construction site hazards.
7. Avoid construction site hazards.
8. Follow proper basic first aid procedures in an emergency.
9. Avoid exposure to blood-borne pathogens in an emergency situation. 1
10. Interpret hazard communication. 1
11. Recognize proper lifting techniques. 1
12. Recognize personal protective equipment.

DRFT 124. Introduction to Geometric Dimensioning and Tolerancing
3 Credits (2+2P)

Introduction to geometric dimensioning and tolerancing (GD&T) for mechanical and print reading in mechanical engineering technology and manufacturing industries. Related industry standards will also be introduced and explored. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Analyze and interpret mechanical engineering drawings and associated information accurately.
2. Apply and utilize terminology related to Geometric Dimensioning and Tolerancing (GDT) effectively.
3. Interpret and explain dimensioning symbols used in engineering drawings, ensuring clear understanding of their representation and significance.
4. Interpret and explain GDT modifiers and symbols, comprehending their purpose and impact on the design and manufacturing process.
5. Apply GDT rules and concepts to engineering drawings, ensuring adherence to industry standards and specifications.
6. Apply datum system concepts appropriately, understanding their role in establishing reference points for dimensional control.
7. Explain the characteristics and key features of different types of tolerances, such as bilateral, unilateral, and geometric tolerances, comprehending their implications on part functionality and manufacturing processes.

DRFT 130. General Building Codes
3 Credits (2+2P)

Interpretation of the Building Code, local zoning codes, A.D.A. Standards and the Model Energy Code to study construction and design requirements and perform basic plan checking. Restricted to: Community Colleges only.

Learning Outcomes

1. Navigate, interpret, and apply Codes as necessary to meet different agency or governmental entities' requirements for their approval.
2. Develop critical thinking strategies to develop a preliminary design and plan to check for code compliance.
3. Classify occupancy classification of buildings and structures.
4. Determine "Location on Property" requirements of buildings and structures.
5. Classify occupant loads of buildings and structures.
6. Calculate exit requirements of buildings and structures.
7. Determine fire rating of building elements.
8. Define specific construction requirements based on types of construction and materials.
9. Determine the number of plumbing fixture counts based on occupancy group and occupant load. 1
10. Determine accessibility requirements of buildings and structures.

DRFT 135. Electronics Drafting I
3 Credits (2+2P)

Drafting as it relates to device symbols; wiring, cabling, harness diagrams and assembly drawings; integrated circuits and printed circuit boards; schematic, flow and logic diagrams; industrial controls and electric power fields. Drawings produced using various CAD software packages.
Prerequisites: DRFT 108 and DRFT 109.

DRFT 143. Civil Drafting Fundamentals
3 Credits (2+2P)

Introduction to drafting in the field of Civil Engineering. Drawings, projects, and terminologies related to topographic, contour drawings, plan and profiles, and street/highway layout. Restricted to Community Colleges only. Taught with E T 143 and SUR 143.
Prerequisite: DRFT 109.

Learning Outcomes

1. Use appropriate drafting/technical terminology.
2. Identify of the different types of Civil Engineering work drawing plan sets.
3. Understanding and the use of the terminologies used in the industry.
4. Use AutoCAD Civil 3D.

5. Enter appropriate data into AutoCAD software in order to retrieve necessary outcomes.
6. Plot/Print different types of civil engineering working plans.
7. Read, interpret and understand engineering drawings.
8. Define and understand the different types of engineering drawings.

DRFT 151. Construction Principles and Print Reading
3 Credits (2+2P)
Introduction to construction materials, methods, and basic cost estimating and print reading applicable in today's residential, commercial, and public works industry. Instruction by print reading and interpretation, field trips, and actual job-site visits and progress evaluation.
Learning Outcomes
1. Read, Interpret, and Reference Construction Working Drawings and Construction Specifications.
2. Perform basic sketches related to construction details, plans, etc.
3. Apply standard working drawing/drafting practices including appropriate scale, units, linetypes, text, dimensions, etc.
4. Differentiate among the various construction/design disciplines including Civil/Survey, Structural, Architectural, Mechanical, Plumbing, Electrical, etc.
5. Know the basic principles related to the following processes: Construction Document Development, Bidding, Permitting, and Construction.
6. Identify common construction materials and quality control practices associated with the various construction disciplines listed above.
7. Know basic construction methods associated with the various construction disciplines listed above.
8. Conduct safe construction observations for the sole purpose of documenting construction materials, methods, and progress.
9. Utilize proper, technical construction terminology. 1
10. Conduct material research, and utilize the organization standards of the Construction Specifications Institute. 1
11. Document construction phases by visiting construction sites and developing a digital, construction project portfolio.

DRFT 153. Survey Drafting Applications
3 Credits (2+2P)
Introduction to drafting in the field of survey engineering. Drawings, projects and terminologies related to Point Data, topography, land/boundary surveys, legal descriptions and plat surveys. Using the current Autodesk software. Taught with SUR 143. Restricted to: Community Colleges only.
Prerequisite: DRFT 109.
Learning Outcomes
1. Use appropriate drafting/technical terminology.
2. Identify different types of survey work drawings.
3. Understand and use terminologies used in the industry.
4. Use AutoCAD Civil 3D.
5. Enter appropriate data into AutoCAD software in order to retrieve necessary outcomes.
6. Plot/Print different types of civil engineering working plans
7. Read, interpret and understand surveying drawings.

DRFT 163. Civil Infrastructure Detailing
3 Credits (2+2P)
Infrastructure detailing related to civil engineering projects including: ponding, roadway, sewer, and storm-water structures; concrete foundations; and related utility details. Restricted to Community Colleges campuses
Prerequisite(s): DRFT 109.
Learning Outcomes
1. l. Prepare accurate written technical documents,
2. Produce drawing documents that are technically sound,
3. Develop and practice productive work skills, and
4. Upgrade technical knowledge and skills to keep pace with real-world changes DRFT 163 Course Competencies l. Create applicable details utilizing AutoCAD and other software packages,
5. Interpret local design standards, applicable codes, and industry practices,
6. Apply local design standards,
7. Apply applicable codes,
8. Follow standards industry practices,
9. Design applicable details within given parameters, and
10. Develop good workplace skills and professional, productive work habits.

DRFT 164. Intermediate Mechanical Drafting/Solid Modeling
3 Credits (2+2P)
Intermediate 3D mechanical parametric solid modeling and assembly creation utilizing Solidworks as well as other applicable parametric modeling software packages. Creation of 2D working drawings from 3D solid models, 3D models for machining/manufacturing, and assemblies will be emphasized. Geometric Dimensioning and Tolerancing (GD&T), material properties, and industry standards and manufacturing practices and methods will be further explored. Restricted to Community Colleges campuses only.
Learning Outcomes
1. Recognize standard views, auxiliary views and sectional views of a given object.
2. Dimension working mechanical drawings following appropriate industry standards.
3. Apply Geometric Dimensioning and Tolerancing (GDT) practices and standards to working drawings.
4. Identify standard thread and fastener callouts.
5. Apply standard thread and fastener specifications.
6. Create 3D solid models.
7. Produce sheet and assembly drawings.
8. Manage Electronic files.

DRFT 165. Introduction to Building Information Modeling
3 Credits (2+2P)
Introduction to Building Information Modeling (BIM) in the development of virtual 3D building models, construction documents, renderings and basic animations related to architectural, structural, and mechanical/electrical/plumbing building components. Utilizes the latest BIM technologies in the integration one, parametric BIM. Restricted to Community Colleges campuses only.
Learning Outcomes
1. Demonstrate proficiency in creating comprehensive 3D architectural project models using Revit Architecture, through guided tutorials and independent work.
2. Transform architectural project models into functional working drawings, ensuring accurate representation of design elements and documentation standards.

3. Develop a solid understanding of the essential tools and features commonly used in Revit Architecture, enabling efficient and effective modeling and documentation.
4. Cultivate project file management skills, including organizing, naming, and version control, to maintain a structured and easily navigable digital workspace.

DRFT 180. Residential Drafting
3 Credits (2+2P)
Basic residential drafting including, floor plans, foundation plans, sections, roof plans, exterior and interior elevations, and site plans. Applicable residential building and zoning codes, construction methods and materials, adaptable residential design, and drawing and sheet layout for architectural drafting will be introduced. Restricted to Community Colleges campuses only.
Prerequisite: A C- or better in DRFT 109.
Learning Outcomes
1. Establish AutoCAD drawings for Architectural projects, ensuring appropriate settings, units, and templates are utilized.
2. Apply relevant building codes to residential drafting projects, ensuring compliance with safety and regulatory requirements.
3. Apply design standards specific to residential drafting projects, incorporating principles of functionality, aesthetics, and spatial planning.
4. Generate a comprehensive residential floor plan working drawing, accurately representing the layout and dimensions of interior spaces.
5. Produce residential foundation plan working drawings, depicting the structural elements and dimensions of the foundation system for a residential project.
6. Create a detailed residential wall section working drawing, illustrating the construction and composition of walls in a residential structure.
7. Develop residential exterior elevation working drawings, showcasing the external appearance, materials, and architectural features of a residential building.
8. Generate a residential interior elevation working drawing, highlighting the vertical surfaces, materials, and design elements within the interior spaces of a residential project.
9. Produce a residential site plan working drawing, depicting the placement of buildings, landscape features, and utilities within the property boundaries. 1
10. Coordinate details and references consistently throughout a set of residential working drawings, ensuring accuracy and clarity in the documentation. 1
11. Set drawings to scale, including the layout of multiple scaled drawings on one sheet, allowing for efficient presentation and communication of design information.

DRFT 181. Commercial Drafting
3 Credits (2+2P)
Drafting principles, plan coordination, and code analysis applicable in the development of working drawings for commercial, public, and industrial building projects. Students will utilize National Cad Standards, ADA Standards, and will be introduced to modern office practice. Restricted to Community Colleges campuses.
Prerequisite: DRFT 109.
Learning Outcomes
1. Setup AutoCAD drawings for architectural projects.
2. Apply building code to residential drafting projects.
3. Apply design standards to residential drafting projects.
4. Produce a residential floor plan working drawing.
5. Produce residential foundation plan working drawings.
6. Produce a residential wall section working drawing.
7. Produce residential exterior elevation working drawings.
8. Produce a residential interior elevation working drawing.
9. Produce a residential site plan working drawing. 1
10. Coordinate details and referencing throughout a set of residential working drawings. 1
11. Set drawings to scale, including multiple scaled drawing on one sheet layout.

DRFT 190. Finding and Maintaining Employment
2 Credits (2)
Techniques in self-evaluations, resume writing, application completion, job interviewing, and job retention. Exposure to work ethics, employee attitudes, and employer expectations. May be repeated up to 2 credits.
Learning Outcomes
1. Develop an understanding of utilizing online tools for effective self-promotion in professional contexts.
2. Gather relevant documents to enhance employability, including resumes, cover letters, and supporting materials.
3. Create a comprehensive portfolio that encompasses a print-ready resume, video resume, and well-crafted cover letter.
4. Demonstrate the ability to set realistic and meaningful professional and personal goals, aligning them with career aspirations.
5. Exhibit positive interview techniques, showcasing effective communication skills, professionalism, and confidence.
6. Display a thorough comprehension of workplace ethics, including principles of integrity, accountability, and respect.
7. Evaluate personal performance as an employee, analyzing strengths, areas for improvement, and opportunities for growth.

DRFT 204. Geographic Information Systems Technology
3 Credits (2+2P)
The use of digital information for which various digitized data creation methods are captured. Users will capture, store, analyze and manage spatially referenced data in a modeled mapping procedure.
Learning Outcomes
1. Present projects and critiques using visual, oral, and written communication skills.
2. Prepare written technical documents use appropriate drafting/technical terminology.
3. Produce documents that are technically sound.
4. Analyze information to develop solutions to technical aspects of a problem/situation.
5. Upgrade knowledge and skills to keep pace with real-world changes.
6. Produce projects that respect the intellectual property of others.
7. Participate in activities of professional organization and community service.
8. Demonstrate professionalism with regard to attendance, punctuality and contribution to course.
9. Demonstrate professional demeanor. 1
10. Practice productive work skills. 1
11. Create an employment portfolio.

DRFT 214. Advanced Plans and Sheet Sets from 3D Models
3 Credits (2+2P)

Using 3D mechanical parametric solid modeling and assemblies that utilizes Inventor, Solidworks, and/or other applicable solid modeling and parametric modeling software packages to create advanced drawings and sheet sets. Creation of complete working drawing sets and/or sheet sets, PDF documents, and assembly drawings will be emphasized. Developing and designing parts and assemblies to meet client needs will be introduced and explored. Restricted to Community Colleges campuses only.
Prerequisite/Corequisite: A minimum grade of C- in DRFT 114 or DRFT 164.

Learning Outcomes

1. Recognize standard views, auxiliary views and sectional vies of a given object.
2. Evaluate shop drawings and hand drawings.
3. Create PDFs and 3D PDFs from Three-Dimensional models and assemblies.
4. Dimension working mechanical drawings following appropriate industry standards.
5. Apply Geometric Dimensioning and Tolerancing (GDT) practices and standards to working drawings.
6. Identify standard callouts.
7. Apply standard thread and fastener specifications.
8. Produce assembly drawings.
9. Produce working drawing sets and/or sheet sets. 1
10. Interpret client needs/instructions.

DRFT 222. Introduction to Geomatics
3 Credits (2+3P)
Theory and practice of geomatics as applied to plane surveying in the areas of linear measurements, angle measurements, area determination, differential and trigonometric leveling, and topographic mapping. Crosslisted with: SUR 222.
Prerequisite: MATH 1250G or MATH 1430G.

Learning Outcomes

1. Various

DRFT 230. Building Systems Drafting
3 Credits (2+2P)
Development of working drawings for electrical, plumbing, and HVAC systems, for residential and commercial building through the applications of both 2D Drafting and 3D Building Information Modeling (BIM) techniques. Basics of project setup, National CAD Standards, ADA Standards, modern office practice, code analysis, as well as Sustainability and LEED for new construction. Restricted to: Community Colleges only.
Prerequisite: DRFT 180 or DRFT 181.

Learning Outcomes

1. Differentiate between three phases of electrical installation: temporary, rough-in, and finish.
2. Define basic electrical terms.
3. Cite basic rules of electrical circuit design.
4. Specify methods of wiring a home with energy conservation techniques.
5. Draft basic electrical symbols, including switches, duplex receptacle outlets, ceiling and wall-mounted lights, and circuit lines.
6. Identify basic service specification requirements, including service capacity, service entrance, meter base, and distribution panel locations.
7. Create and utilize symbols legends and schedules used in preparing electrical plans.
8. Identify plumbing fixtures and materials typically included in residential and commercial plans.
9. Cite sizing standards of plumbing piping. 1
10. Specify methods to conserve energy in the plumbing installation. 1
11. Draft plumbing lines and symbols with proper line weights and abbreviations. 1
12. Describe drainage and vent systems. 1
13. Differentiate between public and private sewage disposal systems, and identify basic component of each system. 1
14. Create and utilize symbols legends and schedules used in preparing plumbing plans. 1
15. Identify code requirements related to heating and cooling equipment and duct systems. 1
16. Explain how differing heating and cooling systems work. 1
17. Contrast zonal and central heating systems and list the advantages and disadvantages of each. 1
18. List the code requirements for HVAC systems. 1
19. Define basic HVAC terminology and identify basic HVAC symbols. 2
20. Describe how schedules are used in HVAC drawings, and cite the kind of information included in schedules. 2
21. Create and utilize symbols legends and schedules used in preparing HVAC plans.

DRFT 240. Structural Systems Drafting
3 Credits (2+2P)
Study of foundations, wall systems, floor systems and roof systems in residential, commercial and industrial design/construction. Produce structural drawings including foundation plans, wall and building sections, floor and roof framing plans, shop drawings and details; schedules, materials lists and specifications. Use of various software.
Prerequisite/Corequisite: DRFT 180 or DRFT 181. Restricted to Community Colleges campuses only.

Learning Outcomes

1. Have a basic understanding of Structural Systems.
2. Have a knowledge of the different types of materials used in Structural Design.
3. Understand the complete lifecycle of a project as it pertains the Structural Systems.
4. Be able to take basic hand sketches and turn them into usable construction documents.
5. Project File management skills.

DRFT 242. Roadway Development Drafting
3 Credits (2+2P)
Advanced civil/survey technology and drafting related to roadway development. Emphasis is on relevant terminology, codes/standards, and the production of complex working drawings such as topographical/grading, drainage, master utilities, roadway P P/details/etc., according to agency standards. Restricted to Community Colleges campuses only.
Prerequisite: DRFT 143.

Learning Outcomes

1. Become familiar with industry terminology.
2. Utilize file management.
3. Configure AutoCAD for the civil drafting environment.
4. Recognize and utilize line types associated with Civil Drafting.
5. Create a standardized layering system for duplication of drawings.
6. Understand industry standards and conventions for roadway development.

7. Utilize design standards in the creation of roadway development drawings.
8. Generate roadway alignments.
9. Generate existing ground profiles. 1
10. Generate proposed finish ground roadway profiles while adhering to design standards. 1
11. Create utility plans that incorporate main lines, service lines, and all associated fittings. 1
12. Understand utility terminology and standards. 1
13. Determine flow line, BOC elevations, etc. 1
14. Understand the concepts of super elevated roadways roadway transitions. 1
15. Generate finish grade surfaces.

DRFT 243. Land Development Drafting
3 Credits (2+2P)
Advanced civil/survey technology and drafting related to land development. Emphasis is on relevant terminology codes/standards, and the production of complex working drawings such as subdivision plats, local utility and drainage plans, construction details roadway P P, etc., according to local development/ agency standards.
Prerequisite: DRFT 143 and DRFT 153.
Learning Outcomes
1. Use appropriate drafting/technical terminology.
2. Produce documents that are technically sound.
3. Analyze information to develop solutions to technical aspects of a problem/situation.
4. Upgrade knowledge and skills to keep pace with real-world changes.
5. Demonstrate professionalism.
6. Practice productive work skills.
7. Read engineering drawings.
8. Produce complex engineering drawings.
9. Read and interpret design standards related to land development and subdivision design. 1
10. Plot or print to industry size sheets of paper.

DRFT 250. Principles of Detailing and Design
3 Credits (2+2P)
Advanced practice in construction documentation in the development and coordination of working drawings & specifications. In particular, will utilize Architectural Graphic Standards, National CAD Standards, and ADA standards to develop detail drawings related to Architectural, Civil, Structural and Building Mechanical systems. Will also be introduced to basic principles, factors, and process of building design such as space planning, site analysis, and basic architectural programming.
Prerequisite/Corequisite: DRFT 180 or DRFT 181. Restricted to Community Colleges campuses only.
Learning Outcomes
1. Experience producing the various types of detailed working drawings and related information for Civil, Residential Commercial Projects.
2. Industry Standards: Architectural Graphic Standards, National CAD Standards, Building, and Land Development Codes, etc.
3. Internet Research methods for construction materials/methods, construction documents, CAD details, etc.
4. Architectural design process, including programming, schematic design documents, design development documents, and construction documents.
5. Sustainability and LEED in architecture.
6. AutoCAD software for 2-D Drafting.
7. Revit software for Building Information Modeling (BIM).
8. Accuracy, legibility, neatness, and professional appearance of drawings.
9. Drafting skills and speed. 1
10. Work ethics, professionalism, and productive work habits. 1
11. Teamwork and presentations.

DRFT 254. Spatial Data Processing
3 Credits (2+2P)
Utilizes the tools and technologies of GIS, processing volumes of geodata identifying a numerical, coded or listed map. Involves the analysis of spatial data from various diverse applications and place in a descriptive mapping process. Restricted to Community Colleges campuses only.
Prerequisite: DRFT 204.
Learning Outcomes
1. Present projects and critiques using visual, oral, and written communication skills.
2. Prepare written technical documents use appropriate drafting/ technical terminology.
3. Produce documents that are technically sound.
4. Analyze information to develop solutions to technical aspects of a problem/situation.
5. Upgrade knowledge and skills to keep pace with real-world changes.
6. Produce projects that respect the intellectual property of others.
7. Participate in activities of professional organization and community service.
8. Demonstrate professionalism with regard to attendance, punctuality and contribution to course.
9. Demonstrate professional demeanor. 1
10. Practice productive work skills. 1
11. Create an employment portfolio.

DRFT 255. Independent Study
1-3 Credits (1-3)
Instructor-approved projects in drafting or related topics specific to the student's individual areas of interest and relevant to the drafting and graphics technology curriculum. Consent of instructor required. May be repeated for a maximum of 6 credits.

DRFT 258. Introduction to Infraworks
3 Credits (2+2P)
Introduction to the utilization of Infraworks software for the conceptualization, optimization, and visualization of infrastructure projects in the context of the built and natural environment. Restricted to Community Colleges campuses
Prerequisite(s): DRFT 143.
Learning Outcomes
1. Prepare accurate written technical documents,
2. Produce drawing documents that are technically sound,
3. Develop and practice productive work skills, and
4. Upgrade technical knowledge and skills to keep pace with real-world changes DRFT 253 Course Competencies I. Navigate within a 3D drawing/modeling space,
5. Connect drawings to data sources,
6. Stylize data sources,
7. Create models elements,
8. Analyze models,

9. Collaborate on a project with others,
10. Communicate design, and
11. Develop good workplace skills and professional, productive work habits.

DRFT 265. Advanced Building Information Modeling Applications
3 Credits (2+2P)
Advanced applications of Building Information Modeling (BIM) including the creation of, and practice in collaborative work sets, data and design analyses, energy modeling and analysis, preliminary LEED analysis, construction take-offs & estimation, and construction animation, through use of various BIM and related software. Restricted to: Community Colleges only.
Prerequisite: DRFT 165.
Learning Outcomes
1. Create full 3D Structural project model by "converting" Revit Architectural model.
2. Perform advanced Revit tasks including Family Editing Creation, Phasing, and Work-sharing.
3. Have a working knowledge of the tools that the majority of users will use to work with Revit and Navisworks.
4. Perform basic Navisworks tasks including Clash Detection and Timeliner.
5. Improve Project File management skills in particular.
6. Improve efficiency in use of Revit.

DRFT 274. GIS Theory and Analysis
3 Credits (2+2P)
Analyzes the hypothesis in which location and spatial data sufficiently quantifies the appropriate statistical methodology. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): DRFT 254.

DRFT 276. Computer Rendering and Animation I
3 Credits (2+2P)
Introduction to technical applications of computer generated renderings and animations for the architecture and engineering fields. 3D models, photo-realistic renderings, and basic animation movie files will be produced utilizing industry standard modeling and animation software.

DRFT 288. Portfolio Development
3 Credits (2+2P)
Production of a portfolio consisting of previously produced student work related to the student's individualized degree option. Process shall include the compilation and organization of working and presentation drawings, construction documents, BIM Models, and renderings/animations. Students will learn the basics of design layout and online portfolio documentation. Job search and resume preparation activities will also be required. Production of new material and content may also be required. This course is designed as a last semester course in the Drafting & Design curricula. Consent of Instructor. Restricted to Community Colleges campuses only.
Learning Outcomes
1. Produce a professional quality portfolio.
2. Produce working drawings (if required).
3. Prepare a professional resume.
4. Prepare for a job interview.
5. Conduct a job search.
6. Work independently.
7. Practice professional networking skills.

DRFT 290. Special Topics
1-4 Credits (1-4)
Topics subtitled in the Schedule of Classes. May be repeated for a maximum of 12 credits.

DRFT 291. Cooperative Experience
1-6 Credits (1-6)
Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. Student meets with advisor weekly. Graded S/U.
Prerequisite: consent of instructor.

DRFT 295. Professional Development and Leadership DAGA
1 Credit (1)
Students gain experience in leadership, team building, performing community service, and membership and/or leadership in a student organization. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

E E-ELECTRICAL ENGINEERING

E E 200. Linear Algebra, Probability and Statistics Applications
4 Credits (3+3P)
The theory of linear algebra (vectors and matrices) and probability (random variables and random processes) with application to electrical engineering. Computer programming to solve problems in linear algebra and probability.
Prerequisite: C- or better in (ENGR 140 or CSCI 2210) and (MATH 1521G or MATH 1521H or ENGR 190).
Learning Outcomes
1. Perform vector and matrix operations, including matrix inversion, eigen analysis, finding basis and dimension of vector spaces and rank of a matrix, and solving a set of linear equations.
2. Calculate probabilities using probability mass, density, and cumulative distribution functions for single and multiple, discrete and continuous random variables, and relate them to electrical engineering applications.
3. Perform simple parameter estimation, such as finding sample mean and variance, and relate to confidence intervals.
4. Describe random processes in the context of signal processing and communications systems problems.
5. Use MATLAB to solve problems involving linear algebra and probability, including designing and performing simple numerical experiments.

E E 240. Multivariate and Vector Calculus Applications
3 Credits (3)
Vector algebra, cylindrical and spherical coordinates, partial derivatives, multiple integrals. Calculus of vector functions through electrostatic applications. Divergence, gradient, curl, divergence theorem, Stokes's theorem, Coulomb's Law, Gauss's Law, electric field, electric potential. Applications in Matlab.
Prerequisite: C- or better in (MATH 1521G or MATH 1521H or ENGR 190) and ENGR 140.
Learning Outcomes
1. Students will demonstrate conceptual understanding of the fundamental principles and theories in vector calculus
2. Students will analyze and solve problems using vector calculus in three coordinate systems

E E 300. Cornerstone Design
2 Credits (1+3P)

Application and realization of engineering principles to a guided team-based design project. Formulation and implementation of test procedures, evaluation of alternate solutions and oral and written communication of the design and test results.
Prerequisite: C- or better in ENGR 140 and ENGR 230 and E E 200.
Learning Outcomes

1. Formulate and implement test procedures for validation of requirements.
2. Evaluate alternative design solutions.
3. Document test procedures and design solutions.
4. Implement design to include a printed-circuit board, electronics and coding.
5. Communicate the design and validation both orally and in writing to a wide range of target audiences.
6. Work in teams.

E E 317. Semiconductor Devices and Electronics I
4 Credits (3+3P)
Analysis and design of opamp circuits, diode circuits and single-transistor MOS and BJT amplifiers. Introduction to solid-slate semiconductor devices.
Prerequisite: C- or better in ENGR 230 and CHEM 1215G.
Learning Outcomes

1. Analysis and design of single time-constant circuits, op-amp circuits, and linear power supplies.
2. Understanding of solid-state devices.
3. Biasing and small-signal analysis of MOS and BJT single transistor amplifiers.
4. Using computer tools to simulate electronic circuits.
5. Testing electronic circuits using power supplies, function generators, digital multi-meters, and oscilloscopes.
6. Writing and documenting laboratory results.

E E 320. Signals and Systems I
3 Credits (3)
Introduction to the modeling and analysis of continuous- and discrete-time signals and systems using time- and frequency-domain methods suitable for both mathematical approaches and computer-aided simulations.
Prerequisite: C- or better in (ENGR 190 or MATH 1521G or MATH 1521H).
Learning Outcomes

1. Understand different types of signals (continuous-time, discrete-time, periodic, etc.) and how these signals are represented mathematically and in a computer.
2. Understand systems representations (e.g., impulse responses), implementations (e.g., convolution and difference/differential equations), and properties (e.g., linearity).
3. Gain insight into transform-domain analysis for signals and systems.
4. Develop the ability to apply transform domain and LTI analysis to simple applications in signal processing, communications, and controls using Matlab.

E E 325. Signals and Systems II
4 Credits (3+3P)
Introduction to communication systems including amplitude and frequency modulation. Introduction to control systems including linear feedback systems, root-locus analysis, and graphical representations. Introduction to digital signal processing including sampling, digital filtering, and spectral analysis.
Prerequisite: C- or better in E E 200 and E E 320.
Learning Outcomes

1. To model, analyze, simulate, and perform calculations with continuous- and discrete-time systems.
2. To develop an understanding of basic modulations in communication systems.
3. To gain insight into the basics of control systems.
4. To develop insight into filtering and analysis of digital signals.
5. To learn how to use MATLAB and SIMULINK to perform analysis, design, and simulation of communication, control, and signal processing systems.

E E 333. AC Circuit Analysis and Introduction to Power Systems
3 Credits (2+3P)
Steady-state analysis of AC circuits, three-phase circuits, and an introduction to power systems.
Prerequisite: C- or better in ENGR 230.
Learning Outcomes

1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession which will establish background for further studies in power systems.
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To understand measurement, analysis, simulation and design techniques, through laboratory exercises involving hardware and software.

E E 340. Fields and Waves
4 Credits (3+3P)
Static electromagnetic field. Maxwell's equation and time-varying electromagnetic fields. Generalized plane wave propagation, reflection, transmission, superposition and polarization. Transmission line theory. Extensions to optical wave propagation. Applications including Time Domain Reflectrometry (TDR) and fiber optic transmission. Laboratory experience with RF/microwave test equipment and optical apparatus.
Prerequisite: C- or better in ENGR 230 and E E 240.
Learning Outcomes

1. Students will demonstrate an understanding of the fundamental principles, theories, and equations (such as Maxwell's) governing transmission lines, static and time-varying fields, propagation, reflection and transmission of plane waves, waveguides, and antennas.
2. Students will analyze and solve electromagnetic-related problems by applying fundamental principles, theories, and equations (such as Maxwell's equations).
3. Students will demonstrate effective team work.
4. Students will demonstrate the use of RF/microwave test equipment to perform basic RF circuit measurements.

E E 362. Introduction to Computer Organization
4 Credits (3+3P)

Concepts of modern computer organization, CPU control, pipelining, memory hierarchies, memory mapping, hardware-software interface, and operating systems.
Prerequisite: C- or better in ENGR 120 and ENGR 130 and ENGR 140 and MATH 1250G.

Learning Outcomes

1. Be conversant with fundamental concepts of computer organization.
2. Compare and contrast organizational features of different computer.
3. Understand the use of microprocessors and peripheral devices in practical applications.

E E 400. Undergraduate Research
1-3 Credits
Directed undergraduate research. May be repeated for a maximum of 9 credits.
Prerequisite: consent of the department head.

E E 403. Geometric Algebra
3 Credits (3)
Geometric algebra provides a common mathematical language for many areas of physics (classical and quantum mechanics, electrodynamics, special and general relativity), computer science (graphics, robotics, computer vision), engineering, and other fields. Topics include: the geometric product and multivectors; Euclidean, Lorentzian, Galilean, and Projective Geometries; Complex, Hyperbolic, and Dual Numbers; Quaternions and Rotations. Taught with E E 576.
Prerequisite: C- or better in E E 320.

Learning Outcomes

1. Formulate and solve problems related to multivectors and the geometric product while building geometric intuition.
2. Formulate and solve problems related to complex, hyperbolic, and dual numbers as well as quaternions.
3. Formulate and solve problems related to non-Euclidean spaces including Lorentzian, Galilean, and projective geometries.

E E 405. Electricity Markets
3 Credits (3)
Power systems operation in regulated and competitive environments. Topics include: basics of microeconomics; linear programming, duality; electricity market pricing and settlement; RTO operation. Taught with E E 502.
Prerequisite: C- or better in E E 431.

Learning Outcomes

1. Understand basic microeconomic principles, basics of market power, Cournot equilibrium
2. Understand basics of linear programming, the primal dual problems, economic interpretation of dual variables, basics of mixed integer programming
3. Understand dispatch optimization problems in the electric energy markets including economic dispatch, unit commitment
4. Understand motivation and objectives of market design, including uniform vs. pay-as-bid pricing, locational marginal prices (LMPs), dual of the DCOPF and the various terms (load payment, congestion rent, etc.), pricing issues in non-convex markets, financial transmission rights, ancillary services market

E E 406. Quantum Computing
3 Credits (3)
This course is an introduction to quantum computing (QC), emphasizing the underlying theory. Topics covered include single and multiple qubit systems, state transformations, algorithms, subsystems, and error correction. The course is intended to be accessible to a wide audience of engineers, mathematicians, and scientists; no previous exposure to quantum physics is required. It is highly recommended that students have completed a college-level linear algebra course. Taught concurrently with E E 506.

Learning Outcomes

1. Explain the quantum computing paradigm.
2. Apply the principles of quantum mechanics for computation.
3. Analyze quantum algorithms and evaluate possible quantum speedups.
4. Describe the framework of quantum error correction codes.

E E 408. Noncooperative Game Theory
3 Credits (3)
The purpose of this course is to teach students to formulate problems as mathematical games and provide the basic tools to solve them. The course covers: Static games, starting with two-player zero-sum games and eventually building up to n-player non-zero sum games. Saddle-points and Nash equilibria will be covered. Dynamic optimization (dynamic programming) for discrete and continuous time. Dynamic games, both open and closed-loop policies. The intended audience includes (but is not restricted to) students in engineering and computer science. The class is heavily project-oriented and the students are strongly encouraged to choose a project that is relevant to their own area of research. Taught with E E 553.
Prerequisite: C- or better in E E 200 or ((MATH 2415 or MATH 480) and (STAT 371 or STAT470) and (CSCI 1720 or CSCI 2210)) or equivalent.

Learning Outcomes

1. Comprehend the key principles of noncooperative game theory.
2. Apply the Minimax Theorem and evaluating mixed saddle-point equilibria.
3. Analyze stochastic policies for games in extensive form, and apply them to the existence and computation of saddle-point equilibria.
4. Comprehend games with N-players.
5. Analyze potential games and evaluate Nash equilibria for potential games.
6. Analyze dynamic games: the optimal control of a dynamical system.
7. Evaluate the saddle-point equilibria of zero-sum discrete-time and continuous-time dynamic games in state-feedback policies.

E E 409. Hardware & Software Codesign
3 Credits (3)
This course introduces the concept and techniques of designing electronic systems that integrates both hardware and software components. Topics include nature of hardware and software, dataflow modeling, software and hardware implementations of dataflows, analysis of control flows and dataflows, FSM with Datapath, microprogramming, embedded cores, and trade-offs between hardware and software components, etc. Students gain experience in implementing hardware and software co-design solutions for solving real-world problems through hands-on laboratory/project on a programmable System-on-Chip (SoC) platform that integrates a dual-core ARM Cortex-A9 processor and FPGA fabrics. Students develop a fundamental understanding of state-of-the-art practices in developing codesign solutions to problems that prepare them well for industrial and academic careers in this field. Taught with E E 556.
Prerequisite: C- or better in ENGR 140 and ENGR 130 and (E E 362 or C S 473).

Learning Outcomes

1. Formulate and solve problems related to basic concepts and methodologies in hardware/software co-design.

2. Analyze concurrent specification of an algorithm to be partitioned into software (C code) and hardware (HDL) components.
3. Design and implement both the software and hardware components integration as a solution to real-world problems to achieve optimal performance, power and cost.
4. Descrbe various types of system architectures regarding their attributes including speed, energy, design complexity, design cost, etc.
5. Experience working with commercially available Computer-Aided Design (CAD) development tools such as Xilinx Vivado
6. Experience working in translation between C code and HDL of practical problems and verify/test the solution on FPGA SoC architecture

E E 412. ASIC Design
3 Credits (3)
This course provides students with experiential knowledge of modern application specific integrated circuits. Topics include ASIC packaging and testing, I/O pads and ESD, Verilog programming and simulation, FPGA verification, Register-transfer level synthesis, timing and area optimization, floorplanning and routing, digital interfaces, full custom and standard cell design, post-layout simulation, and PCB schematics and layout. Taught with E E 512.
Prerequisite: C - or better in E E 480.
Learning Outcomes
1. Cadence ASIC design tools and design flow
2. Verilog programming, simulation, and FPGA verification
3. Padring, I/O, and ESD for ASIC
4. CMOS standard cell library for large scale digital circuit
5. MOSIS Tapeout options and ASIC package selections
6. Typical digital interfaces
7. Allegro PCB schematic and layout, ASIC testing
8. Digital Signal Processing Circuits implementation in ASIC

E E 431. Power System Analysis
3 Credits (3)
Analysis of a power system in the steady-state. Includes the development of models and analysis procedures for major power system components and for power networks. Taught with E E 542.
Prerequisite: C- or better in E E 333.
Learning Outcomes
1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession.
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system.
6. To convey to the student a thorough understanding of both the theory and the mechanics involved in the modeling and analysis of power system components and networks.
7. To study how such modeling and analysis is used in the design/planning of power systems.
8. To establish background for further studies in power systems.

E E 432. Power Electronics
3 Credits (2+3P)
Basic principles of power electronics and its applications to power supplies, electric machine control, and power systems. Taught with E E 537.
Prerequisite: C- or better in E E 317 and E E 333.
Learning Outcomes
1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession. To establish background for further studies in power systems
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To convey to the student a thorough understanding of both the theory and the mechanics involved in the modeling and analysis of power system components and networks
7. To study how such modeling and analysis is used in the design/planning of power systems

E E 433. Power System Operation
3 Credits (3)
Basics of power system operation; linear programming, economic dispatch, mixed integer programing, power system security and contingency analysis; RTO operation; generation control; renewable integration.
Prerequisite: C- or better in E E 431.
Learning Outcomes
1. Understand basic microeconomic principles, basics of market power, Cournot equilibrium.
2. Understand basics of linear programming and can use software to solve simple linear programming problems.
3. Understand the different between AC and DC power flow. Understand dispatch optimization problems in the electric energy markets including economic dispatch, unit commitment.
4. Understand the control schemes in power system, including governor repose, automatic generation control.
5. Understand the power system security including N-I criteria, contingency analysis, and security constraints.

E E 434. Numerical Computational Methods for Smart Grid
3 Credits (3)
This course reviews modeling of power system and provides a comprehensive study of the various computational methods and software packages that form the basis of many analytical studies of power systems. It presents the analytical background of the algorithms used in many commercially available software packages, thereby enabling the student to make more informed decisions in their use of the software and correctly interpret their results. The course provides a

balanced discussion of the theory and applications of the algorithms. Taught with EE 503.
Prerequisite: C- or better in E E 493.
Learning Outcomes
1. Review models of power system components and formulate popular problems for the applications of computational tools to be studied.
2. Acquaint students with various computational tools used in solving many advanced problems in power systems and other research areas.
3. Demonstrate knowledge in the strengths and weaknesses of the various computational tools by selecting and using the appropriate method to solve a given problem.
4. Demonstrate problem-solving skills in successfully addressing a complicated numerical problem relating to the student's research area.

E E 435. Smart Grid Technologies
3 Credits (3)
Technical concepts of smart grid and microgrid devices, operation principles and methodologies. Taught with EE 504.
Prerequisite: C- or better in E E 493.
Learning Outcomes
1. Review models of power system components and formulate problems and challenges of transitioning of a traditional power grid to a smart grid concept.
2. Be familiar with various current research topics and problems in modern power systems and other research areas.
3. Demonstrate knowledge in the strengths and weaknesses of the various technologies in modern power systems.
4. Demonstrate problem-solving skills in successfully addressing a complicated numerical problem relating to the student's research area, as applicable to power systems.

E E 440. Photovoltaic Devices and Systems
3 Credits (3)
Technical concepts of photovoltaics, with primary focus on solar cell technology. Solar cell device level operation, packaging, and manufacturing. Design of photovoltaic systems for stand-alone or grid-tied operation. Business-case analysis using real-life scenarios of photovoltaic system solutions. Taught with E E 540.
Prerequisite: C- or better in E E 317.
Learning Outcomes
1. Name at least three different types of photovoltaic materials and cells;
2. Derive equations governing operation of photovoltaic cells;
3. Design and create electrical engineering drawings for photovoltaic systems of different nameplate capacity;
4. Describe principles of operation of the "balance of the system" (BOS) components of the photovoltaic system.

E E 444. Advanced Image Processing
3 Credits (3)
Advanced topics in image processing including segmentation, feature extraction, object recognition, image understanding, big data, and applications. Taught with E E 588.
Prerequisite: C- or better in (E E 446 or E E 596).
Learning Outcomes
1. Implement and analyze segmentation of color and grayscale images.
2. Implement and analyze morphological analysis of binary images
3. Implement and analyze compression of images
4. Implement and analyze feature extraction and classification of images
5. Implement and analyze convolutional neural networks (CNNs) for classification of images

E E 446. Digital Image Processing
3 Credits (3)
Two-dimensional transform theory, color images, image enhancement, restoration, segmentation, compression and understanding. Taught with E E 596.
Prerequisite: C- or better in E E 325.
Learning Outcomes
1. Analyze human visual perception and the implications to science and society
2. Formulate and analyze problems that utilize the mathematics behind multidimensional image processing
3. Formulate and analyze problems involving multidimensional transformation transform-domain processing
4. Formulate and analyze problems related to color image acquisition, processing, and display
5. Implementing image processing algorithms on computers in Matlab or python

E E 447. Neural Signal Processing
3 Credits (3)
Cross-disciplinary course focused on the acquisition and processing of neural signals. Students in this class will be learn about basic brain structure, different brain signal acquisition techniques (fMRI, EEG, MEG, etc.), neural modeling, and EEG signal processing. To perform EEG signal processing, students will learn and use Matlab along with an EEG analysis package. Taught with E E 597.
Prerequisite: C- or better in E E 325.
Learning Outcomes
1. Demonstrate understanding and skill in the Structure and basic operation of the human brain
2. Demonstrate understanding and skill in processing of EEG brain signals using Matlab and EEGLAB
3. Demonstrate understanding and skill in EEG-related neural modeling
4. Demonstrate understanding and skill in brain signal types and acquisition

E E 448. Signal Compression
3 Credits (3)
Fundamentals of information source encoding and decoding. Includes information theory bounds on source coding, lossless coding algorithms, scalar quantizing and vector quantizing. Taught with E E 573.
Prerequisite: C- or better in E E 200.
Learning Outcomes
1. Formulate and analyze problems related to rate-distortion tradeoffs in compression
2. Formulate and analyze problems related to scalar and vector quantization
3. Formulate and analyze problems related to transform coding
4. Formulate and analyze problems related to entropy coding (Huffman arithmetic)
5. Formulate and analyze problems related to standardized codecs, including MPEG, JPEG, MP3
6. Formulate and analyze problems related to compressive sensing/ sampling

E E 449. Smart Antennas
3 Credits (3)
Smart antenna and adaptive array concepts and fundamentals, uniform and plannar arrays, optimum array processing. Adaptive beamforming algorithms and architectures: gradient-based algorithms, sample matrix inversion, least mean square, recursive least mean square, sidelobes cancellers, direction of arrival estimations, effects of mutual coupling and its mitigation. Taught with E E 549.
Prerequisite: C- or better in E E 325 and E E 340.
Learning Outcomes
1. Antenna and Array fundamentals.
2. Smart Antenna and Adaptive Array concepts: Uniform and Planar Arrays; Array steering; Array performance criteria; Error effects on beamforming.
3. Adaptive Beamforming Algorithms and Architectures: gradient-based algorithms, Sample Matrix Inversion; Least Mean Square; Recursive Least Mean Square; Sidelobes cancellers; Direction of Arrival estimations; Effects of mutual coupling and its mitigation.
4. Applications: Angle of arrival estimation; Diversity combining; Nulling for jammer suppression and clutter cancellation, etc.

E E 452. Introduction to Radar
3 Credits (3)
Basic concepts of radar. Radar equation; detection theory. AM, FM, and CW radars. Analysis of tracking, search, MTI, and imaging radar. Recommended foundation: E E 496. Taught with E E 548.
Prerequisite: C- or better in E E 325 and E E 340.
Learning Outcomes
1. Students will demonstrate an understanding of fundamental principles of various types of radar systems and their applications.
2. Students will learn to analyze a given radar system.
3. Students will learn to use simulation techniques to design a radar system that will yield desired characteristics.
4. Students will experience working in groups/teams.

E E 453. Microwave Engineering
3 Credits (3)
Techniques for microwave measurements and communication system design, including transmissions lines, waveguides, and components. Microwave network analysis and active device design. Taught with E E 521.
Prerequisite: C- or better in E E 340.
Learning Outcomes
1. Students will demonstrate an understanding of fundamental principles and theories related to microwave systems, components, and devices.
2. Students will analyze and solve microwave engineering-related problems using the fundamental microwave engineering theories and principles.
3. Students will demonstrate the use of microwave engineering design tools.
4. Students will demonstrate effective team work.
5. Students will demonstrate an understanding the impact of engineering solutions in a global, economic, environmental, and societal context.
6. Students will demonstrate an understanding of the knowledge of contemporary professional, societal and global issues.

E E 454. Antennas and Radiation
4 Credits (3+3P)
Basic antenna analysis and design. Fundamental antenna concepts and radiation integrals. Study of wire antennas, aperture antennas, arrays, reflectors, and broadband antennas. Taught with E E 541.
Prerequisite: C- or better in E E 340.
Learning Outcomes
1. Students will demonstrate an understanding of the fundamental principles, theories, and equations governing antenna radiation, antenna arrays, and matching, etc.
2. Students will analyze and solve the antenna-related radiation problems, antenna structures.
3. Students will demonstrate the use of antenna synthesis techniques and simulation software to solve antenna related problems.
4. Students will demonstrate effective team work.
5. Students will demonstrate an understanding the impact of engineering solutions in a global, economic, environmental, and societal context.
6. Students will demonstrate an understanding of the knowledge of contemporary professional, societal and global issues.

E E 458. Hardware Security and Trust
3 Credits (3)
This course introduces and investigates recent technology development for the design and evaluation of secure and trustworthy hardware and embedded systems. Topics include IoT security, cryptography, hardware security primitives, authentication and key generation, invasive and non-invasive attacks and countermeasures, IC piracy and intellectual property protection, hardware trojans, and secure boot. Taught with E E 558.
Prerequisite: C- or better in E E 362.
Learning Outcomes
1. Understand the security goals of information security.
2. Understand cryptography basics and their applications.
3. Formulate and analyze problems related to security threats in integrated circuits, electronic devices and semiconductor supply chain.
4. Formulate and analyze problems related to security countermeasures to the threats of integrated circuits and electronic devices.
5. Use metrics to measure and assess the security level of security mechanisms or primitives in hardware security applications.
6. Analyze and assess potential security vulnerabilities in hardware and embedded systems.
7. Learn state-of-art security mechanisms and research topics in the hardware and embedded security area.

E E 460. Space System Mission Design and Analysis
3 Credits (3)
Satellite system design, including development, fabrication, launch, and operations. A systems engineering approach to concepts, methodologies, models, and tools for space systems. Students must be in junior standing to enroll.
Learning Outcomes
1. Apply knowledge from science, math and engineering to satellite design.
2. Experience the “system engineering” of satellite design through the design of a space mission.
3. Understand the professional and ethical responsibilities related to satellite design.
4. Understand the impact of satellite related engineering solutions in a global, economic, environmental, and societal context.

5. Maintain a knowledge of contemporary professional, societal and global issues as they relate to satellites.

E E 462. Computer Systems Architecture
3 Credits (3)
The course covers uniprocessors, caches, memory systems, virtual memory, storage systems, with introduction to multiprocessor and distributed computer architectures; models of parallel computation; processing element and interconnection network structures, and nontraditional architectures. Taught with E E 562.
Prerequisite: C- or better in E E 362 and (CSCI 1240 or CSCI 4510 or CSCI 1210 or CSCI 4505 or CSCI 1720 or CSCI 2210).
Learning Outcomes
1. Recognize the basic principles and current practices of computer architectures of processors, memory systems, interconnects, and input/output systems.
2. Reason about the issues that influence the architectures of processors, memory systems, interconnects, and input/output systems.
3. Evaluate and improve computer system performance through analysis and computer simulation.
4. Solve and implement a small research problem in computer architecture.

E E 465. Machine Learning I
3 Credits (3)
An undergraduate-level introduction to machine learning algorithms, including supervised and unsupervised learning methods. Topics covered include clustering, linear regression models, linear discriminant functions, feed-forward neural networks, statistical pattern classification and regression, maximum likelihood, naive Bayes, non-parametric density estimation, mixture models, decision trees, and ensemble learning. Taught with E E 565.
Prerequisite: C- or better in E E 200.
Learning Outcomes
1. Formulate and solve problems related to the basic concepts and mathematical techniques of machine learning.
2. Gain an understanding of machine learning algorithms/methods by solving problems using software.
3. Gain experience doing independent study and research.
4. Formulate and solve problems related to the basics of regression, classification, and unsupervised learning.
5. Gain practical experience through project-based assignments and technical report writing.

E E 467. ARM SOC Design
3 Credits (3)
The course aims to produce students who are capable of developing ARM-based SoCs from high level functional specifications to design, implementation and testing on real FPGA hardware using standard hardware description and software programming languages. Taught with E E 567.
Prerequisite: C- or better in E E 362 and E E 317.
Learning Outcomes
1. Formulate and solve problems requiring knowledge and understanding of ARM processor architectures and ARM-based SoCs.
2. Capture the design of ARM-based SoCs in a standard hardware description language.
3. Conduct low-level software design for ARM-based SoCs and high-level application development.
4. Demonstrate the ability to use and choose between different techniques for digital system design and capture.
5. Evaluate implementation results (speed, area, power) and correlate them with the corresponding high level design and capture.
6. Demonstrate the ability to use a commercial tools to develop ARM-based SoCs.

E E 473. Introduction to Optics
3 Credits (3)
The nature of light, geometrical optics, basic optical instruments, wave optics, aberrations, polarization, and diffraction. Elements of optical radiometry, lasers and fiber optics. Crosslisted with: PHYS 473.
Prerequisite(s): C- or better in PHYS 1320G or PHYS 2120.
Learning Outcomes
1. Conduct computations and designs using concepts of geometrical optics, including reflection, refraction, imaging, and thin lens models.
2. Conduct computations and designs using concepts of optical instrumentation, including stops, pupils, prisms, aberrations, cameras, magnifiers, microscopes, and telescopes.
3. Apply wave equations including harmonic waves, complex waves, plane waves, spherical waves, electromagnetic waves, and superposition of waves.
4. Apply properties of lasers to computations and designs including quantization of light, black bodies, EM radiation, and light-matter interaction.
5. Use properties of interference, interferometry, coherence, and diffraction in computations and designs.

E E 475. Control Systems Synthesis
3 Credits (3)
An advanced perspective of linear modern control system analysis and design, including the essential algebraic, structural, and numerical properties of linear dynamical systems. Computer-aided solution of real-world design problems. Taught with E E 551.
Prerequisite: C- or better in E E 407.
Learning Outcomes
1. Understand the concepts of Model Identification and Parameter Estimation (least-square identification of a auto-regressive model; nonparametric identification in the time domain; and nonparametric identification in the frequency domain).
2. Understand Robust Control techniques (Nyquist-plots, small-gain, and passivity).
3. Understand Optimal control techniques (LQR/LQG for state-space systems and time-optimal controller for the positioning of a mass using force actuation).
4. Understand Nonlinear control techniques (Lyapunov's stability method; feedback linearization controller for a fully actuated 2nd order mechanical system; backstepping for triangular nonlinear systems; actuator limitations).

E E 478. Fundamentals of Photonics
4 Credits (3+3P)
Ray, wave and guided optics, lasers and thermal sources, radiometry, photon detection and signal-to-noise ratio. Elements of photonic crystals, polarization, acousto-optics, electro-optics, and optical nanostructures. Recommended foundation: E E 473 /PHYS 473. Taught with E E 528.
Prerequisite: C- or better in PHYS 1320G or PHYS 2120.
Learning Outcomes
1. Understand the fundamentals of the different theories of light including ray, wave, electromagnetic (vector) and photon optics,

and how these theories are represented mathematically and on a computer.
2. Develop the ability to perform calculations for the different theories (ray tracing, wave interference, polarization calculus, photon detection) to determine the propagation characteristics and describe the manipulation of light.
3. Gain insight and experience with materials and devices for manipulating and detecting light (glass, mirrors, lenses, fiber optics, polarization elements, liquid crystals, semiconductors, and photodiodes).
4. Apply the theoretical, mathematical, and practical understanding of optics to describe real-world applications of light technology with supporting analysis and calculations.

E E 480. Introduction to Analog and Digital VLSI
3 Credits (3)
Introduction to analog and digital VLSI circuits implemented in CMOS technology. Design of differential amplifiers, opamps, CMOS logic, flip-flops, and adders. Introduction to VLSI fabrication process. Taught with E E 510.
Prerequisite: C- or better in E E 317.
Learning Outcomes
1. Explain the basic concepts of CMOS VLSI system design.
2. Formulate and solve problems related to pseudo ideal operation of MOS transistors as switches and implementation with transistors of basic and complex Boolean functions.
3. Use modern software tools to simulate integrated circuits.
4. Formulate and solve problems related to operation and design of basic analog building blocks.
5. Formulate and solve problems related to operation and design of basic digital building blocks.
6. Formulate and solve problems related to key aspects of performance characteristics (speed, power dissipation, Silicon area) of VLSI systems and how to size transistors in order to achieve desired performance specifications.

E E 485. Analog VLSI Design
3 Credits (2+3P)
Analysis, design, simulation, layout and verification of CMOS analog building blocks, including references, opamps, switches and comparators. Teams implement a complex analog IC. Taught with E E 523.
Prerequisite: C- or better in E E 320 and E E 480.
Learning Outcomes
1. Analysis, design, simulation, and layout of current mirrors, current sources, and voltage references.
2. Analysis, design, simulation, and layout of differential and operational amplifiers.
3. Analysis, design, simulation, and layout of switched-capacitor circuits.
4. Using VLSI CAD tools for simulating and laying out analog integrated circuits.
5. Writing laboratory reports and project documentation.

E E 490. Selected Topics
1-3 Credits
Selected topics. Subtitled courses will have varied topics and learning outcomes and will be listed in the course schedule. Non subtitled courses may be used as independent study with the approval and oversight of a faculty member. May be repeated up to 9 credits.
Learning Outcomes
1. Varies and dependent on subject matter taught under this selected topics course.

E E 492. Introduction to Control Systems
3 Credits (3)
This course provides an introduction to the analysis of control systems. The main focus will be on techniques in classical control theory. System dynamics and modeling techniques in both the frequency domain and the time domain will be covered. Students will learn how to transform linear dynamical systems between state-space and frequency domains, and evaluate conditions for stability in each domain. Students will analyze and characterize both the transient and steady-state response, and examine root locus, Bode, and Nyquist plots. Concepts of robust control, including tradeoffs between sensitivity and performance, will be emphasized throughout. Applications will range across electrical, mechanical, chemical, biomedical, and biological systems. Laboratory activities include modeling, analysis and simulation of physical processes.
Prerequisite: C- or better in E E 325 and MATH 392.
Learning Outcomes
1. Obtain mathematical models of electrical and mechanical systems from their idealized elements.
2. Derive the transfer function of a control system.
3. Apply their mathematical knowledge to determine the response of a linear system to various types of inputs.
4. Develop familiarity and confidence with analyzing transient and steady state responses of a linear system.
5. Apply their mathematical knowledge to understand the concept of stability.
6. Develop familiarity and confidence with controller design based on Routh-Hurwitz, Root locus and P, PI, PID modes of control.
7. Develop proficiency in systems simulation using MATLAB and SIMULINK.

E E 493. Power System Faults and Stability
3 Credits (3)
Analysis of a power system under abnormal operating conditions. Topics include symmetrical three-phase faults, theory of symmetrical components, unsymmetrical faults, system protection, and power system stability. Taught with E E 543.
Prerequisite: C- or better in E E 431.
Learning Outcomes
1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession.
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system.

6. To understand measurement, analysis, simulation and design techniques, through laboratory exercises involving hardware and software.
7. To establish background for further studies in power systems.

E E 495. Introduction to Digital Signal Processing
3 Credits (3)
Undergraduate treatment of sampling/reconstruction, quantization, discrete-time systems, digital filtering, z-transforms, transfer functions, digital filter realizations, discrete Fourier transform (DFT) and fast Fourier transform (FFT), finite impulse response (FIR) and infinite impulse response (IIR) filter design, and digital signal processing (DSP) applications.
Prerequisite: C- or better in E E 325.
Learning Outcomes
1. The student should be comfortable with the theory and practice of digital signal processing including sampling and reconstruction and quantization effects.
2. The student should be comfortable with the theory and practice of digital signal processing including discrete-time systems, digital filtering, and digital filter realizations.
3. The student should be comfortable with the theory and practice of digital signal processing including z-transform analysis.
4. The student should be comfortable with the theory and practice of digital signal processing including discrete Fourier transform (DFT) and fast Fourier transform (FFT).
5. The student should be comfortable with the theory and practice of digital signal processing including finite impulse response (FIR) and infinite impulse response (IIR) filter design.

E E 496. Introduction to Communication Systems
3 Credits (3)
Introduction to the analysis of signals in the frequency and time domains. A study of baseband digital transmission systems and digital/analog RF transmission systems. Introduction to telecom systems as well as satellite systems.
Prerequisite: C- or better in E E 325.
Learning Outcomes
1. To analyze signals in time and frequency domains.
2. To mathematically describe analog modulation and demodulation techniques and relate these through electronic subsystems to form communications transmitters and receivers.
3. To apply basic digital communication operations and solve numerical problems on introductory digital communications principles.
4. To identify and explain the roles of basic communication blocks in a few practical systems, and to discuss contemporary issues, impact of the solutions and professional and ethical aspects.

E E 497. Digital Communication Systems I
3 Credits (3)
Techniques for transmitting digital data over commercial networks. Topics include baseband and bandpass data transmission and synchronization techniques. Recommended foundation: E E 496. Taught with: E E 581.
Prerequisite: C- or better in E E 325.
Learning Outcomes
1. Analyze bandwidth and error performance of baseband and bandpass signals through mathematical explanations and simulated experimental data.
2. Evaluate channel code structures and their performance.
3. Analyze communication system issues involving link budgets, synchronization and resource allocations.
4. Develop a wider perspective recognizing contemporary technologies, impact of the solutions and professional and ethical responsibilities.

E E 501. Research Topics in Electrical and Computer Engineering
1 Credit (1)
Ethics and methods of engineering research; contemporary research topics in electrical and computer engineering.

E E 502. Electricity Markets
3 Credits (3)
Power systems operation in regulated and competitive environments. Topics include: basics of microeconomics; linear programming, duality; electricity market pricing and settlement; RTO operation. Recommended foundation: E E 431. Taught with: E E 405.
Learning Outcomes
1. Understand basic microeconomic principles, basics of market power, Cournot equilibrium
2. Understand basics of linear programming, the primal dual problems, economic interpretation of dual variables, basics of mixed integer programming
3. Understand dispatch optimization problems in the electric energy markets including economic dispatch, unit commitment
4. Understand motivation and objectives of market design, including uniform vs. pay-as-bid pricing, locational marginal prices (LMPs), dual of the DCOPF and the various terms (load payment, congestion rent, etc.), pricing issues in non-convex markets, financial transmission rights, ancillary services market

E E 503. Numerical Computational Methods for Smart Grid
3 Credits
This course reviews modeling of power system and provides a comprehensive study of the various computational methods and software packages that form the basis of many analytical studies of power systems. It presents the analytical background of the algorithms used in many commercially available software packages, thereby enabling the student to make more informed decisions in their use of the software and correctly interpret their results. The course provides a balanced discussion of the theory and applications of the algorithms. Taught with EE434.
Prerequisite: C- or better in EE493 or EE543 or equivalent.
Learning Outcomes
1. Review models of power system components and formulate popular problems for the applications of computational tools to be studied.
2. Acquaint students with various computational tools used in solving many advanced problems in power systems and other research areas.
3. Demonstrate knowledge in the strengths and weaknesses of the various computational tools by selecting and using the appropriate method to solve a given problem.
4. Demonstrate problem-solving skills in successfully addressing a complicated numerical problem relating to the student's research area.

E E 504. Smart Grid Technologies
3 Credits
Technical concepts of smart grid and microgrid devices, operation principles and methodologies. Taught with EE 435.
Prerequisite: C- or better in E E 493 or E E 543 or equivalent.

Learning Outcomes

1. Review models of power system components and formulate problems and challenges of transitioning of a traditional power grid to a smart grid concept.
2. Be familiar with various current research topics and problems in modern power systems and other research areas.
3. Demonstrate knowledge in the strengths and weaknesses of the various technologies in modern power systems.
4. Demonstrate problem-solving skills in successfully addressing a complicated numerical problem relating to the student's research area, as applicable to power systems.

E E 505. Application of Optimization Techniques in Power Systems
3 Credits

This course explores the dynamic intersection of optimization methods and the real-world application in power systems. will gain an in-depth understanding of how to formulate and solve complex optimization challenges in power generation, transmission, and distribution. This course covers primal and dual problems, mixed integer programming, and solving techniques such as branch and bound. Students. Additionally, the course covers decomposition algorithms, such as Benders decomposition and Lagrangian relaxation, facet defining valid inequalities, resolution theorems, certificates of unboundedness and infeasibility, as well as the application of stochastic programming and robust optimization to navigate the uncertainties inherent in the energy sector. By the end of this course, students will be equipped to address pressing issues in power system operation, planning, and decision-making using advanced optimization techniques.
Prerequisite: C- or better in E E 431 or E E 542 or equivalent.

Learning Outcomes

1. Understand basics of linear programming and can use software to solve simple linear programming problems.
2. Understand stochastic programming and can use Benders decomposition techniques to solve stochastic programming problems in parallel.
3. Understand robust optimization and can use robust optimization in unit commitment and planning.

E E 506. Quantum Computing
3 Credits (3)

This course is an introduction to quantum computing (QC), emphasizing the underlying theory. Topics covered include single and multiple qubit systems, state transformations, algorithms, subsystems, and error correction. The course is intended to be accessible to a wide audience of engineers, mathematicians, and scientists; no previous exposure to quantum physics is required. It is highly recommended that students have completed a college-level linear algebra course. Taught with E E 406.

Learning Outcomes

1. Explain the quantum computing paradigm.
2. Apply the principles of quantum mechanics for computation.
3. Analyze quantum algorithms and evaluate possible quantum speedups.
4. Describe the framework of quantum error correction codes.

E E 507. Data Analytics and AI for the Smart Grid
3 Credits

This course explores the application of data analytics and artificial intelligence in enhancing smart grid operations. This course equips students with the skills to analyze smart grid data, implement AI strategies for grid optimization, and innovate solutions for real-world challenges. Through a mix of theoretical understanding and practical exercises, students will learn to make effective decisions, forecast loads, and integrate renewable energy resources. Recommended foundation: C S 453 or equivalent or proficiency in python programming.
Prerequisite: C- or better in E E 431 or E E 542 or equivalent.

Learning Outcomes

1. Grasp the core principles of smart grid technology, data analytics, and AI, and how these technologies can help enhance power grid operation and control.
2. Gain proficiency in applying various data analytics methods to real-world smart grid data, enabling effective decision-making and problem-solving in grid management.
3. Develop the capability to design and implement AI algorithms and machine learning models that optimize smart grid operations, including load forecasting and renewable energy integration.
4. Cultivate the skills to critically analyze and interpret complex datasets, drawing meaningful insights pertinent to smart grid operations and maintenance.
5. Encourage innovation and application of learned concepts to address real-world challenges in the smart grid sector, fostering a mindset of continuous improvement and adaptation to emerging technologies.
6. Enhance teamwork and communication skills, essential for collaborative problem-solving in multi-disciplinary environments typical of the smart grid ecosystem.
7. Stay abreast of the latest trends and developments in the field of smart grids, data analytics, and AI, preparing students for a future of ongoing learning and adaptation in a rapidly evolving sector.

E E 510. Introduction to Analog and Digital VLSI
3 Credits (3)

Introduction to analog and digital VLSI circuits implemented in CMOS technology. Design of differential amplifiers, opamps, CMOS logic, flip-flops, and adders. Introduction to VLSI fabrication process. Recommended foundation: E E 362 and E E 317 Taught with E E 480.

Learning Outcomes

1. Explain the basic concepts of CMOS VLSI system design
2. Formulate and solve problems related to pseudo ideal operation of MOS transistors as switches and implementation with transistors of basic and complex Boolean functions
3. Use modern software tools to simulate integrated circuits
4. Formulate and solve problems related to operation and design of basic analog building blocks
5. Formulate and solve problems related to operation and design of basic digital building blocks
6. Formulate and solve problems related to key aspects of performance characteristics (speed, power dissipation, Silicon area..) of VLSI systems and how to size transistors in order to achieve desired performance specifications.

E E 512. ASIC Design
3 Credits (3)

This course provides students with experiential knowledge of modern application specific integrated circuits. Topics include ASIC packaging and testing, I/O pads and ESD, Verilog programming and simulation, FPGA verification, Register-transfer level synthesis, timing and area optimization, floorplanning and routing, digital interfaces, full custom and standard cell design, post-layout simulation, and PCB schematics and layout. Recommended foundation: E E 480. Taught with E E 412.

Learning Outcomes

1. Cadence ASIC design tools and design flow
2. Verilog programming, simulation, and FPGA verification

3. Padring, I/O, and ESD for ASIC
4. CMOS standard cell library for large scale digital circuit
5. MOSIS Tapeout options and ASIC package selections
6. Typical digital interfaces
7. Allegro PCB schematic and layout, ASIC testing
8. Digital Signal Processing Circuits implementation in ASIC

E E 521. Microwave Engineering
3 Credits (3)
Techniques for microwave measurements and communication system design, including transmission lines, waveguides, and components. Microwave network analysis and active device design. Recommended foundation: E E 340. Taught with: E E 453.

Learning Outcomes
1. Students will demonstrate an understanding of fundamental principles and theories related to microwave systems, components, and devices.
2. Students will analyze and solve microwave engineering-related problems using the fundamental microwave engineering theories and principles.
3. Students will demonstrate the use of microwave engineering design tools.
4. Students will demonstrate effective team work.
5. Students will demonstrate an understanding the impact of engineering solutions in a global, economic, environmental, and societal context.
6. Students will demonstrate an understanding of the knowledge of contemporary professional, societal and global issues.

E E 523. Analog VLSI Design
3 Credits (2+3P)
Analysis, design, simulation, layout and verification of CMOS analog building blocks, including references, opamps, switches and comparators. Teams implement a complex analog IC. Recommended foundation: E E 320 and E E 480. Taught with: E E 485.

Learning Outcomes
1. Students completing the course with a grade of C or better will perform satisfactorily on analysis, design, simulation, and layout of current mirrors, current sources, and voltage references.
2. Students completing the course with a grade of C or better will perform satisfactorily on analysis, design, simulation, and layout of differential and operational amplifiers.
3. Students completing the course with a grade of C or better will perform satisfactorily on analysis, design, simulation, and layout of switched-capacitor circuits.
4. Students completing the course with a grade of C or better will perform satisfactorily on using VLSI CAD tools for simulating and laying out analog integrated circuits.
5. Students completing the course with a grade of C or better will perform satisfactorily on writing laboratory reports and project documentation.

E E 528. Fundamentals of Photonics
4 Credits (3+3P)
Ray, wave and guided optics, lasers and thermal sources, radiometry, photon detection and signal-to-noise ratio. Elements of photonic crystals, polarization, acousto-optics, electro-optics, and optical nanostructures. Recommended foundation (PHYS 1320G or PHYS2120) and (E E 473 or PHYS 473), Taught with E E 478. Crosslisted with PHYS 528.

Learning Outcomes
1. Describe the fundamental properties of light.
2. Formulate the concepts of ray, wave, and photon optics mathematically.
3. Represent and incorporate basic elements of an optical system.
4. Perform an analysis of a simple photonic/optical system mathematically by hand and with computer tools such as MATLAB.
5. Discuss ethical, societal, and professional issues related to photonics and optics.

E E 533. Power System Operation
3 Credits (3)
Basics of power system operation; linear programming, economic dispatch, mixed integer programing, power system security and contingency analysis; RTO operation; generation control; renewable integration. Taught concurrently with E E 433.
Prerequisite: C- or better in E E 431 or E E 542 or equivalent.

Learning Outcomes
1. Understand basic microeconomic principles, basics of market power, Cournot equilibrium.
2. Understand basics of linear programming and can use software to solve simple linear programming problems.
3. Understand the different between AC and DC power flow. Understand dispatch optimization problems in the electric energy markets including economic dispatch, unit commitment.
4. Understand the control schemes in power system, including governor repose, automatic generation control.
5. Understand the power system security including N-1 criteria, contingency analysis, and security constraints.

E E 534. Power System Relaying
3 Credits (3)
Fundamental relay operating principles and characteristics. Current, voltage, directional, differential relays; distance relays; pilot relaying schemes. Standard protective schemes for system protection. Operating principles and overview of digital relays. Recommended foundation: E E 493.

Learning Outcomes
1. Identify and explain the function of commonly used relay elements and relaying schemes.
2. Set up and use Fault, Powerflow and Stability studies to synthesize data for relay schemes and settings for typical problems.
3. Apply analysis and design principles to design protection systems.

E E 537. Power Electronics
3 Credits (2+3P)
Basic principles of power electronics and its applications to power supplies, electric machine control, and power systems. Recommended foundation: E E 317 and E E 333. Taught with: E E 432.

Learning Outcomes
1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession. To establish background for further studies in power systems
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.

4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system
6. To convey to the student a thorough understanding of both the theory and the mechanics involved in the modeling and analysis of power system components and networks
7. To study how such modeling and analysis is used in the design/planning of power systems

E E 540. Photovoltaic Devices and Systems
3 Credits (3)
Technical concepts of photovoltaics, with primary focus on solar cell technology. Solar cell device level operation, packaging, and manufacturing. Design of photovoltaic systems for stand-alone or grid-tied operation. Business-case analysis using real-life scenarios of photovoltaic system solutions. Recommended foundation: E E 317. Taught with: E E 440.

Learning Outcomes
1. Name at least three different types of photovoltaic materials and cells.
2. Derive equations governing operation of photovoltaic cells.
3. Design and create electrical engineering drawings for photovoltaic systems of different nameplate capacity.
4. Describe principles of operation of the "balance of the system" (BOS) components of the photovoltaic system.

E E 541. Antennas and Radiation
4 Credits (3+3P)
Basic antenna analysis and design. Fundamental antenna concepts and radiation integrals. Study of wire antennas, aperture antennas, arrays, reflectors, and broadband antennas. Recommended foundation is E E 340. Taught with E E 454.

Learning Outcomes
1. Students will demonstrate an understanding of the fundamental principles, theories, and equations governing antenna radiation, antenna arrays, and matching, etc.
2. Students will analyze and solve the antenna-related radiation problems, antenna structures.
3. Students will demonstrate the use of antenna synthesis techniques and simulation software to solve antenna related problems
4. Students will demonstrate effective team work
5. Students will demonstrate an understanding the impact of engineering solutions in a global, economic, environmental, and societal context
6. Students will demonstrate an understanding of the knowledge of contemporary professional, societal and global issues

E E 542. Power System Analysis
3 Credits (3)
Analysis of a power system in the steady-state. Includes the development of models and analysis procedures for major power system components and for power networks. Recommended foundation: E E 333. Taught with E E 431.

Learning Outcomes
1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession.
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system.
6. To convey to the student a thorough understanding of both the theory and the mechanics involved in the modeling and analysis of power system components and networks.
7. To study how such modeling and analysis is used in the design/planning of power systems.
8. To establish background for further studies in power systems.

E E 543. Power System Faults and Stability
3 Credits (3)
Analysis of a power system under abnormal operating conditions. Topics include symmetrical three-phase faults, theory of symmetrical components, unsymmetrical faults, system protection, and power system stability. Recommended foundation: E E 431 or E E 542 or equivalent. Taught with: E E 493.

Learning Outcomes
1. To introduce students to the basic structure and requirements of any electric power supply system and the nature of power systems engineering and the profession.
2. To develop an understanding of components in a power system and to understand the basic electromagnetic and electromechanical principles involved in these components.
3. To develop an understanding of the physical-principles—to-electric-equivalent circuit approach to the analysis and design of components and systems.
4. To develop skills in equivalent circuit based analysis techniques building upon competencies developed in prior coursework.
5. To explore analysis and design principles for the complete power system.
6. To understand measurement, analysis, simulation and design techniques, through laboratory exercises involving hardware and software.
7. To establish background for further studies in power systems.

E E 544. Distribution Systems
3 Credits (3)
Concepts and techniques associated with the design and operation of electrical distribution systems. Recommended foundation: E E 542 and E E 543.

Learning Outcomes
1. Describe how distribution systems evolve as a function of load growth; identify traditional and modern distribution components and architectures.
2. Develop proper models and analytical methods to study distribution.
3. Use standard tools for distribution system analysis and design.
4. Assess issues in Resource integration and identify engineering solutions.

E E 545. Digital Signal Processing II
3 Credits (3)

Non-ideal sampling and reconstruction, oversampling and noise shaping in A/D and D/A, finite word length effects, random signals, spectral analysis, multirate filter banks and wavelets, and applications. Recommended foundation: E E 395.

Learning Outcomes

1. The student should be comfortable with the theory and practice of data compressing including quantization: Scalar, differential, and vector.
2. The student should be comfortable with the theory and practice of data compressing including transform coding: DCT, Wavelet.
3. The student should be comfortable with the theory and practice of data compressing including entropy Coding (Huffman Arithmetic).
4. The student should be comfortable with the theory and practice of data compressing including standardized codecs, including MPEG, JPEG, MP3s.

E E 548. Introduction to Radar
3 Credits (3)

Basic concepts of radar. Radar equation; detection theory, AM, FM, and CW radars. Analysis of tracking, search, MTI, and image radar. Recommended foundation: E E 325, E E 340 and E E 496. Taught with: E E 452.

Learning Outcomes

1. Students will demonstrate an understanding of fundamental principles of various types of radar systems and their applications.
2. Students will learn to analyze a given radar system.
3. Students will learn to use simulation techniques to design a radar system that will yield desired characteristics.
4. Students will experience working in groups/teams.

E E 549. Smart Antennas
3 Credits (3)

Smart antenna and adaptive array concepts and fundamentals, uniform and plannar arrays, optimum array processing. Adaptive beamforming algorithms and architectures: gradient-based algorithms, sample matrix inversion, least mean square, recursive least mean square, sidelobes cancellers, direction of arrival estimations, effects of mutual coupling and its mitigation. Recommended foundation: E E 325 and E E 340. Crosslisted with: E E 449.

Learning Outcomes

1. Antenna and Array fundamentals.
2. Smart Antenna and Adaptive Array concepts: Uniform and Planar Arrays; Array steering; Array performance criteria; Error effects on beamforming.
3. Adaptive Beamforming Algorithms and Architectures: gradient-based algorithms, Sample Matrix Inversion; Least Mean Square; Recursive Least Mean Square; Sidelobes cancellers; Direction of Arrival estimations; Effects of mutual coupling and its mitigation.
4. Applications: Angle of arrival estimation; Diversity combining; Nulling for jammer suppression and clutter cancellation, etc.

E E 551. Control Systems Synthesis
3 Credits (3)

An advanced perspective of linear modern control system analysis and design, including the essential algebraic, structural, and numerical properties of linear dynamical systems. Computer-aided solution of real-world design problems. Recommended foundation: E E 407. Taught with E E 475.

Learning Outcomes

1. Understand the concepts of Model Identification and Parameter Estimation (least-square identification of an auto-regressive model; nonparametric identification in the time domain; and nonparametric identification in the frequency domain).
2. Understand Robust Control techniques (Nyquist-plots, small-gain, and passivity).
3. Understand Optimal control techniques (LQR/LQG for state-space systems and time-optimal controller for the positioning of a mass using force actuation).
4. Understand Nonlinear control techniques (Lyapunov's stability method; feedback linearization controller for a fully actuated 2nd order mechanical system; backstepping for triangular nonlinear systems; actuator limitations).

E E 553. Noncooperative Game Theory
3 Credits (3)

The purpose of this course is to teach students to formulate problems as mathematical games and provide the basic tools to solve them. The course covers: Static games, starting with two-player zero-sum games and eventually building up to n-player non-zero sum games. Saddle-points and Nash equilibria will be covered. Dynamic optimization (dynamic programming) for discrete and continuous time. Dynamic games, both open and closed-loop policies. The intended audience includes (but is not restricted to) students in engineering and computer science. The class is heavily project-oriented and the students are strongly encouraged to choose a project that is relevant to their own area of research. Recommended foundation: undergraduate linear algebra and probability. Taught with E E 408.

Learning Outcomes

1. Comprehend the key principles of noncooperative game theory.
2. Apply the Minimax Theorem and evaluating mixed saddle-point equilibria.
3. Analyze stochastic policies for games in extensive form, and apply them to the existence and computation of saddle-point equilibria.
4. Comprehend games with N-players.
5. Analyze potential games and evaluate Nash equilibria for potential games.
6. Analyze dynamic games: the optimal control of a dynamical system.
7. Evaluate the saddle-point equilibria of zero-sum discrete-time and continuous-time dynamic games in state-feedback policies.

E E 556. Hardware & Software Codesign
3 Credits (3)

This course introduces the concept and techniques of designing electronic systems that integrates both hardware and software components. Topics include nature of hardware and software, dataflow modeling, software and hardware implementations of dataflows, analysis of control flows and dataflows, FSM with Datapath, microprogramming, embedded cores, and trade-offs between hardware and software components, etc. Students gain experience in implementing hardware and software co-design solutions for solving real-world problems through hands-on laboratory/project on a programmable System-on-Chip (SoC) platform that integrates a dual-core ARM Cortex-A9 processor and FPGA fabrics. Students develop a fundamental understanding of state-of-the-art practices in developing codesign solutions to problems that prepare them well for industrial and academic careers in this field. Recommended foundation ENGR 140, ENGR 130, (E E 362 or C S 473). Taught with E E 409.

Learning Outcomes

1. Formulate and solve problems related to basic concepts and methodologies in hardware/software co-design.

2. Analyze concurrent specification of an algorithm to be partitioned into software (C code) and hardware (HDL) components.
3. Design and implement both the software and hardware components integration as a solution to real-world problems to achieve optimal performance, power and cost.
4. Descrbe various types of system architectures regarding their attributes including speed, energy, design complexity, design cost, etc.
5. Experience working with commercially available Computer-Aided Design (CAD) development tools such as Xilinx Vivado.
6. Experience working in translation between C code and HDL of practical problems and verify/test the solution on FPGA SoC architecture.

E E 558. Hardware Security and Trust
3 Credits (3)
This course introduces and investigates recent technology development for the design and evaluation of secure and trustworthy hardware and embedded systems. Topics include IoT security, cryptography, hardware security primitives, authentication and key generation, invasive and non-invasive attacks and countermeasures, IC piracy and intellectual property protection, hardware trojans, and secure boot. Recommended foundation: E E 362. Taught with: E E 458.
Learning Outcomes
1. Students completing the course with a grade of C or better will perform satisfactorily on understanding of security goals of information security.
2. Students completing the course with a grade of C or better will perform satisfactorily on understanding of Cryptography basics and their applications.
3. Students completing the course with a grade of C or better will perform satisfactorily on security threats in integrated circuits, electronic devices and semiconductor supply chain.
4. Students completing the course with a grade of C or better will perform satisfactorily on security countermeasures to the threats of integrated circuits and electronic devices.
5. Students completing the course with a grade of C or better will perform satisfactorily on metrics used to measure and assess the security level of security mechanisms or primitives in hardware security applications.
6. Students completing the course with a grade of C or better will perform satisfactorily on analysis and assessment of potential security vulnerabilities in hardware and embedded systems.
7. Students completing the course with a grade of C or better will perform satisfactorily on state-of-art security mechanisms and research topics in the hardware and embedded security area.

E E 562. Computer Systems Architecture
3 Credits (3)
The course covers uniprocessors, caches, memory systems, virtual memory, storage systems, with introduction to multiprocessor and distributed computer architectures; models of parallel computation; processing element and interconnection network structures, and nontraditional architectures. Recommended foundation is E E 362. Taught with: E E 462.
Learning Outcomes
1. Recognize the basic principles and current practices of computer architectures of processors, memory systems, interconnects, and input/output systems.
2. Reason about the issues that influence the architectures of processors, memory systems, interconnects, and input/output systems.
3. Evaluate and improve computer system performance through analysis and computer simulation.
4. Solve and implement a small research problem in computer architecture.

E E 563. Computer Performance Analysis I
3 Credits (3)
Issues involved and techniques used to analyze performance of a computer system. Topics covered include computer system workloads; statistical analysis techniques such as principal component analysis, confidence interval, and linear regression; design and analysis of experiments; queuing system analysis; computer system simulation; and random number generation. Recommended foundation: E E 200 and E E 462.
Learning Outcomes
1. Specify performance requirements for computing systems.
2. Evaluate design alternatives for computing systems.
3. Compare two or more computing systems.
4. Determine the optimal value of a parameter (tuning) for computing systems.
5. Find performance bottlenecks in computing systems.
6. Characterize the load on the system (workload characterization).
7. Predict the performance at future workloads (forecasting).

E E 564. Architectural Concepts II
3 Credits (3)
Advanced topics related to computer architecture, guided by the current literature. Students are expected to have knowledge of computer architectures equivalent to C S 473 and of operating systems equivalent to C S 474.
Learning Outcomes
1. Be able to explain the features in a modern multicore CPU architecture
2. Be able to utilize hardware counter features of a CPU in performance evaluation
3. Be able to explain the architecture of GPUs and their capabilities and drawbacks
4. Be able to evaluate novel cutting-edge architectural features and designs
5. Be able to present a research paper to an advanced audience

E E 565. Machine Learning I
3 Credits (3)
A graduate-level introduction to machine learning algorithms, including supervised and unsupervised learning methods. Topics covered include clustering, linear regression models, linear discriminant functions, feed-forward neural networks, statistical pattern classification and regression, maximum likelihood, naive Bayes, non-parametric density estimation, mixture models, decision trees, and ensemble learning. Recommended foundation: E E 200, E E 571, and MATH 480. Taught with: E E 465.
Learning Outcomes
1. Formulate and solve problems related to the basic concepts and mathematical techniques of machine learning.
2. Gain an understanding of machine learning algorithms/methods by solving problems using software.
3. Gain experience doing independent study and research.

4. Formulate and solve problems related to the basics of regression, classification, and unsupervised learning.
5. Gain practical experience through project-based assignments and technical report writing.

E E 567. ARM SOC Design
3 Credits (3)
The course aims to produce students who are capable of developing ARM-based SoCs from high level functional specifications to design, implementation and testing on real FPGA hardware using standard hardware description and software programming languages. Recommended foundation E E 362 and E E 317. Taught with: E E 467.
Learning Outcomes
1. Formulate and solve problems requiring knowledge and understanding of ARM processor architectures and ARM-based SoCs.
2. Capture the design of ARM-based SoCs in a standard hardware description language.
3. Conduct low-level software design for ARM-based SoCs and high-level application development.
4. Demonstrate the ability to use and choose between different techniques for digital system design and capture.
5. Evaluate implementation results (e.g. speed, area, power) and correlate them with the corresponding high level design and capture.
6. Demonstrate the ability to use a commercial tools to develop ARM-based SoCs.

E E 571. Random Signal Analysis
3 Credits (3)
Application of probability and random variables to problems in communication systems, analysis of random signal and noise in linear and nonlinear systems. Recommended foundation E E 200 and E E 240. May be repeated up to 3 credits.
Learning Outcomes
1. To specify sample space and solve problems requiring probability computations based on axioms of probabilities and basic properties of event probabilities.
2. To characterize discrete and continuous random variables through various functions, example distributions, and moment calculations. To describe and compute probabilities involving multiple random variables in electrical engineering problems.
3. To analyze different notions of convergence, limit theorems, and specify their significance in communication system applications.
4. To describe and characterize random processes relevant to electrical engineering in general, and communications systems in particular. To perform differentiation and integration of random processes and to analyze specific classes of random processes including random walk, Gaussian processes, and AR processes.
5. To relate the significance of random processes to problems in electrical engineering, and solve problems involving power spectral density and transfer functions.

E E 572. Modern Coding Theory
3 Credits (3)
Error control techniques for digital transmission and storage systems. Introduction to basic coding bounds, linear and cyclic block codes, Reed-Solomon codes, convolutional codes, maximum likelihood decoding, maximum a posteriori probability decoding, factor graphs, low density parity check codes, turbo codes, iterative decoding. Applications to data networks, space and satellite transmission, and data modems. Recommended foundation: E E 200 and E E 496.
Learning Outcomes
1. Describe components of a digital communications/storage system. Characterize different modulation schemes and channel models.
2. Construct linear codes and describe them by generator and parity-check matrices, determine important code parameters such as minimum distance and rate, and prove code properties using basic algebra.
3. Describe and characterize important classical linear block and convolutional codes, including their encoding and decoding algorithms.
4. Derive and compute analytical performance bounds for coded systems.
5. Explain the characteristics and properties of modern turbo and LDPC codes. Analyze and implement their iterative decoding algorithms for various channel models.

E E 573. Signal Compression
3 Credits (3)
Fundamentals of information source encoding and decoding. Includes information theory bounds on source coding, lossless coding algorithms, scalar quantizing and vector quantizing. Recommended foundation E E 200. Taught with E E 448.
Learning Outcomes
1. Formulate and analyze problems related to rate-distortion tradeoffs in compression
2. Formulate and analyze problems related to scalar and vector quantization
3. Formulate and analyze problems related to transform coding
4. Formulate and analyze problems related to entropy coding (Huffman arithmetic)
5. Formulate and analyze problems related to standardized codecs, including MPEG, JPEG, MP3
6. Formulate and analyze problems related to compressive sensing/sampling

E E 576. Geometric Algebra
3 Credits (3)
Geometric algebra provides a common mathematical language for many areas of physics (classical and quantum mechanics, electrodynamics, special and general relativity), computer science (graphics, robotics, computer vision), engineering, and other fields. Topics include: the geometric product and multivectors; Euclidean, Lorentzian, Galilean, and Projective Geometries; Complex, Hyperbolic, and Dual Numbers; Quaternions and Rotations. Recommended foundation E E 320. Taught with E E 403.
Learning Outcomes
1. Formulate and solve problems related to multivectors and the geometric product while building geometric intuition.
2. Formulate and solve problems related to complex, hyperbolic, and dual numbers as well as quaternions.
3. Formulate and solve problems related to non-Euclidean spaces including Lorentzian, Galilean, and projective geometries.

E E 577. Fourier Methods in Electro-Optics
3 Credits (3)
Linear systems theory, convolution and Fourier transformation are applied to one-dimensional and two dimensional signals encountered in electro-optical systems. Applications in diffraction, coherent and incoherent imaging, and optical signal processing. Recommended foundation: E E 320 and E E 528. Crosslisted with: PHYS 577.

Learning Outcomes

1. Describe the mathematical properties of the two-dimensional Fourier transform and apply the transform to the analysis of linear optical systems.
2. Explain the basic concepts of scalar diffraction theory.
3. Apply the Fresnel and Fraunhofer approximations to calculate optical propagation characteristics and diffraction patterns for common optical applications.
4. Apply Fourier methods to model and analyze the performance of basic optical imaging systems.
5. Discuss ethical, societal, and professional issues related to photonics and optics.

E E 578. Optical System Design
3 Credits (3)
Optical design software is used to study optical systems involving lenses, mirrors, windows and relay optics. Systems considered include camera lenses, microscopes and telescopes. Recommended foundation: E E/PHYS 473, E E/PHYS 528 and E E/PHYS 577. Taught with: PHYS 578.
Learning Outcomes

1. Apply basic geometrical optics design concepts for lenses, mirrors and simple optical systems.
2. Model sequential optical systems in Zemax OpticStudio.
3. Apply merit functions to optimize optical system performance.
4. Discuss ethical, societal, and professional issues related to optics and photonics.

E E 581. Digital Communication Systems I
3 Credits (3)
Techniques for transmitting digital data over commercial networks. Topics include baseband and bandpass data transmission and synchronization techniques. Recommended foundation: E E 200, E E 325, and E E 496. Crosslisted with: E E 497.
Learning Outcomes

1. Analyze bandwidth and error performance of baseband and bandpass signals through mathematical explanations and simulated experimental data.
2. Evaluate channel code structures and their performance.
3. Analyze communication system issues involving link budgets, synchronization and resource allocations.
4. Develop a wider perspective recognizing contemporary technologies, impact of the solutions and professional and ethical responsibilities.

E E 583. Wireless Communications
3 Credits (3)
Cellular networks, wireless channels and channel models, modulation and demodulation, MIMO, diversity and multiplexing, OFDM, wireless standards including LTE and WiMAX. Recommended foundation: E E 571 and E E 325.
Learning Outcomes

1. Analyze mobile radio propagation.
2. Evaluate various modulations, multiple access and fading channel mitigation techniques.
3. Discuss concepts and issues related to cellular systems.
4. Discuss wireless standards and current topics.

E E 586. Information Theory
3 Credits (3)
This class is a study of Shannon's measure of information and discusses mutual information, entropy, and channel capacity, the noiseless source coding theorem, the noisy channel coding theorem, channel coding and random coding bounds, rate-distortion theory, and data compression. Restricted to: Main campus only. Crosslisted with: MATH 509
Prerequisite(s): E E 571 or MATH 515.
Learning Outcomes

1. Quantify information using random variables and solve problems regarding entropy, mutual information, and relative entropy.
2. Characterize source coding techniques for a single random variable: employ standard techniques such as Shannon, Fano, and Huffman coding; describe universal source coding and Lempel-Ziv coding.
3. Describe coding for sources with memory and compare lossy and lossless source coding.
4. Describe the problem of channel coding. Use Fano's inequality, define and determine channel capacity, compute error exponents.
5. Characterize the Gaussian channel. Explain the characteristics and properties of channel codes, including convolutional and polar codes.

E E 587. Deep Learning for Image Processing
3 Credits (3)
Implementation and analysis of deep learning architectures for image processing. Specific projects will be adjusted according to current state-of-the-art research, but may include such topics as networks for: segmentation of images, captioning of images, understanding of images at a human interpretable level, visualization of network behavior, incorporation of temporal information from image sequences.
Prerequisite: E E 446 or E E 596.
Learning Outcomes

1. Read, synthesize, and discuss academic research papers describing deep learning architectures for image processing.
2. Install, run, modify, and analyze results from third-party software (e.g., from github) implementing deep learning architectures for image processing.
3. Present project results orally.
4. Present project results in a written report following the conventions expected of technical writing in engineering disciplines.

E E 588. Advanced Image Processing
3 Credits (3)
Advanced topics in image processing including segmentation, feature extraction, object recognition, image understanding, big data, and applications. Taught with: E E 444.
Prerequisite: C- or better in E E 446 or E E 596 or equivalent.
Learning Outcomes

1. Analyze human visual perception and the implications to science and society.
2. Formulate and analyze problems that utilize the mathematics behind multidimensional image processing.
3. Formulate and analyze problems involving multidimensional transformation transform-domain processing.
4. Formulate and analyze problems related to color image acquisition, processing, and display.
5. Implementing image processing algorithms on computers in Matlab or python.

E E 590. Selected Topics
1-9 Credits
May be repeated for a maximum of 18 credits.

E E 596. Digital Image Processing
3 Credits (3)

Two-dimensional transform theory, color images, image enhancement, restoration, segmentation, compression and understanding. Recommended foundation E E 325. Taught with: E E 446.

Learning Outcomes

1. Analyze human visual perception and the implications to science and society.
2. Formulate and analyze problems that utilize the mathematics behind multidimensional image processing.
3. Formulate and analyze problems involving multidimensional transformation transform-domain processing.
4. Formulate and analyze problems related to color image acquisition, processing, and display.
5. Implementing image processing algorithms on computers in Matlab or python.

E E 597. Neural Signal Processing
3 Credits (3)

Cross-disciplinary course focused on the acquisition and processing of neural signals. Students in this class will be learn about basic brain structure, different brain signal acquisition techniques (fMRI, EEG, MEG, etc.), neural modeling, and EEG signal processing. To perform EEG signal processing, students will learn and use Matlab along with an EEG analysis package. Recommended foundation E E 325. Taught with: E E 447.

Learning Outcomes

1. Demonstrate understanding and skill in the Structure and basic operation of the human brain.
2. Demonstrate understanding and skill in processing of EEG brain signals using Matlab and EEGLAB.
3. Demonstrate understanding and skill in EEG-related neural modeling.
4. Demonstrate understanding and skill in brain signal types and acquisition.

E E 598. Master's Technical Report
1-9 Credits (1-9)

Individual investigation, either analytical or experimental, culminating in a technical report. May be repeated up to 18 credits.

Learning Outcomes

1. Varies.

E E 599. Master's Thesis
1-15 Credits (1-15)

Thesis. May be repeated up to 88 credits.

Learning Outcomes

1. Varies.

E E 600. Doctoral Research
1-15 Credits

Research. May be repeated up to 88 credits.

Learning Outcomes

1. Varies.

E E 690. Selected Topics
1-9 Credits

Selected topics. Subtitled courses will have varied topics and learning outcomes and will be listed in the course schedule. Not subtitled courses may be used as independent study with the approval and oversight of a faculty member. May be repeated up to 9 credits.

Learning Outcomes

1. Varies, dependent on subject matter taught under this selected topics course.

E E 700. Doctoral Dissertation
1-15 Credits (1-15)

Dissertation. May be repeated up to 88 credits.

Learning Outcomes

1. Varies.

E T-ENGINEERING TECHNOLOGY

E T 101. Introduction to Engineering Technology and Geomatics
1 Credit (1)

An introduction to geomatics and the various engineering technology disciplines, the engineering approach to problem solving, and the design process. Projects emphasize the importance of teamwork, written & oral communication skills, as well as ethical responsibilities.

Learning Outcomes

1. Develop a basic understanding of all programs in the Engineering Technology and Surveying Engineering Department.
2. Create a solid curriculum plan for their degree program.
3. Describe the Engineering Design Process.
4. Define and visit campus support programs and student engineering programs.
5. Describe and discuss communication skills in the engineering profession.

E T 104. Soldering Techniques
1 Credit (3P)

Fundamentals of soldering, desoldering, and quality inspection of printed circuit boards.

E T 109. Computer Drafting Fundamentals
3 Credits (2+2P)

Introduction to principles and fundamentals of drafting using both manual drawing techniques and computer-aided drafting (CAD) applications. Crosslisted with: DRFT 109 and C E 109. May be repeated up to 3 credits.

Learning Outcomes

1. Describe related career options/pathways.
2. Explain and apply common drafting terms, concepts, and conventions.
3. Utilize various AutoCAD commands and Coordinate Entry methods to produce accurate and precise Two-Dimensional drawings.
4. Setup AutoCAD working environment, drawings, styles, and applicable settings.
5. Navigate the AutoCAD user interface efficiently.
6. Apply different drafting methods, strategies, and processes.
7. Utilize AutoCAD to produce basic 2D CAD working drawings.
8. Measure utilizing scales accurately.
9. Create drawings with different scales and units. 1
10. Plot drawings produced in AutoCAD at various scales and on various sheet sizes. 1
11. Utilize the two Drawing Environments: Paper Space and Model Space. 1
12. Manage AutoCAD drawing files.

E T 110. Introduction to 3-D Modeling (Solid Works)
3 Credits (2+3P)

Introduction to SolidWorks, a 3-D modeling software. The foundation for designing mechanical parts and assemblies.

E T 120. Computation Software
2-3 Credits (2-3)

The use of spreadsheet software in the field of engineering technology.

E T 125. Introduction to Renewable Energy
3 Credits (3)
Renewable energy systems, including topics in thermal-solar photovoltaic, wind, geothermal systems, and other current topics. Theory, practical applications, safety considerations and the economics of alternative renewable energy systems compared to conventional systems.

E T 143. Civil Drafting Fundamentals
3 Credits (2+2P)
Introduction to drafting in the field of Civil Engineering. Drawings, projects, and terminologies related to topographic, contour drawings, plan and profiles, and street/highway layout. Restricted to Community Colleges only. Taught with DRFT 143 and SUR 143.
Prerequisite: DRFT 109.
Learning Outcomes
1. Use appropriate drafting/technical terminology.
2. Identify of the different types of Civil Engineering work drawing plan sets.
3. Understanding and the use of the terminologies used in the industry.
4. Use AutoCAD Civil 3D.
5. Enter appropriate data into AutoCAD software in order to retrieve necessary outcomes.
6. Plot/Print different types of civil engineering working plans.
7. Read, interpret and understand engineering drawings.
8. Define and understand the different types of engineering drawings.

E T 153. Fundamentals of Networking Communications
3 Credits (3)
Introduction to networking basics, including computer hardware and software, electricity, networking terminology, protocols, LANs, WANs, OSI model, IP addressing, and design and documentation of basic network and structure cabling.
Learning Outcomes
1. Students will identify network types/protocols utilizing the OSI reference model and compute numbering system network problems.
2. Students will explain issues related to managing and documenting network environments.
3. Students will list, compare, and discuss industry standards for addressing computers on a network.
4. Students will list and distinguish between computer networking historical milestones.
5. Students will identify, compare, and evaluate networking data transport techniques.
6. Students will identify and compare network transmission media and build/evaluate network cabling.
7. Students will discuss IT industry certifications and summarize current technology trends.

E T 154. Construction Methods and Communications
3 Credits (3)
Blueprint reading, specifications, and introduction to materials used in construction. May be repeated up to 3 credits.
Learning Outcomes
1. Students will develop a basic knowledge of AutoCad Civil Three-Dimensional software as they relate to the civil drafting process.
2. Students will become familiar with a basic understanding of computers, drafting, and trigonometry as required.
3. Use of long-term projects will be utilized to simulate real-world work environments to aid the understanding and applying vocabulary on surveying drafting plans.
4. An ability to apply current knowledge and adapt to emerging applications of mathematics, science, engineering, and technology.

E T 155. Network Operating Systems I
3 Credits (3+1P)
Introduction to a computer network operating system. May not be used as part of an E T degree program on main campus. Restricted to: Community Colleges only.
Prerequisite(s): E T 120 or E T 122.

E T 156. Introduction to Information Security
2 Credits (2)
This course introduces information security terminology, historical evolution of digital security, types of PC and network system vulnerabilities and types of information loss. In addition, methods of information protection and integrity, intrusion detection, and recovery of data are introduced.
Prerequisite(s)/Corequisite(s): E T 120. Restricted to Community Colleges campuses only.

E T 160. Windows Fundamentals for IET
3 Credits (3)
Fundamental review of the Windows operating system including installation and upgrades as well as managing applications, files, folders, devices and maintenance.
Learning Outcomes
1. Properly deploy the Windows OS.
2. Manage Windows OS data and devices.
3. Apply network and connection configurations.
4. Provide Windows OS maintenance.

E T 182. Introduction to Digital Logic
2 Credits (1.5+1.5P)
An introduction to logic design and the basic building blocks of digital systems. Topics include numbering systems, Boolean algebra, digital logic theory, combinational logic, and applications such as adders. Includes hands-on laboratory
Prerequisite: A grade of C- or better in MATH 1220G or higher.
Learning Outcomes
1. Demonstrate ability to convert numerical values to commonly-used digital representations and their use for arithmetic and logical functions.
2. Demonstrate understanding of Boolean logic functions and truth tables.
3. Demonstrate ability to simplify logic expressions.
4. Demonstrate understanding of combinational logic functions, and the ability to build digital circuits using breadboards.

E T 183. Applied DC Circuits
3 Credits (2+2P)
Application of Ohm's law, Kirchhoff's laws, Thevenin's, and Norton's theorems to the analysis of DC passive circuits. Embedded Lab.
Prerequisite(s)/Corequisite(s): MATH 1220G.

E T 183 L. Applied DC Circuits Lab
1 Credit (2P)
DC applied circuits lab.
Corequisite(s): E T 183.

E T 184. Applied AC Circuits
2-3 Credits (1-2+2P)
Application of circuit laws and theorems to analysis of AC passive circuits. Resonant circuit, polyphase circuit and magnetic circuit topics are introduced. Embedded Lab.
Prerequisite: A grade of C- or better in ENGR 120.
Learning Outcomes
1. Analyze and design AC circuits, including ideal op-amps, using concepts of voltage, current, power, Kirchhoff's laws, and network theorems.
2. Design simple systems involving AC circuits.

E T 190. Applied Circuits
4 Credits (3+2P)
Application of Ohm's law, Kirchhoff's laws, and Thevenin's theorems to the analysis of AC and DC passive circuits. Electronic circuit topics are introduced. Embedded lab. May be repeated up to 4 credits.
Prerequisite/Corequisite: MATH 1250G or higher.
Learning Outcomes
1. Analyze and design DC and AC circuits, including ideal op-amps, using concepts of voltage, current, power, Kirchhoff's laws, and network theorems.
2. Design simple systems involving DC and AC circuits.

E T 191. Applied Circuits Laboratory
1 Credit (2P)
Applied Circuits Lab

E T 200. Special Topics
1-3 Credits
Directed study or project. May be repeated for a maximum of 6 credits.
Prerequisite: consent of department head.

E T 210. Advanced 3-D Modeling (Solid Works)
3 Credits (3)
Advanced 3-D modeling techniques to prepare for the Certification of SolidWorks Associate (CSWA) exam.
Prerequisite: A grade of C- or better in ENGR 110.
Learning Outcomes
1. Properly operate a CAD system in the most efficient manner.
2. Generate and easily update Part models.
3. Ability to create complex assembly models.
4. Create usable production drawings from Three-Dimensional CAD models.
5. Understand the basic fundamentals of available add-in software compatible with SolidWorks (FEA, CAM, PDM).
6. Work in a group and operate effectively on a team.
7. Use creative and technical thinking skills in design.

E T 217. Manufacturing Processes
3 Credits (2+3P)
Introduction to manufacturing and processing, including: casting, forming, and machining. Emphasis on creating products with the appropriate techniques. Crosslisted with: I E 217.
Prerequisite(s): A grade of C- or better in either E T 110 or ENGR 110 and C- or better in MATH 1220G.
Learning Outcomes
1. Identify the different manufacturing processes and their applications.
2. Use, set up, and calibrate measuring tools.
3. Apply geometric tolerances to engineering drawings.
4. Demonstrate basic knowledge of materials and material properties.
5. Demonstrate basic knowledge of GM codes and their application.
6. Proficiently use CAM packages such as SolidWorks CAM.
7. Identify different tooling, their use, and manufacturing application.

E T 217 L. Manufacturing Processes Lab
1 Credit (3P)
Hands-on laboratory in machine shop to apply topics from E T 217, including: casting, forming, and machining.
Corequisite: E T 217.
Learning Outcomes
1. Various

E T 220. Internship
1-6 Credits
Internship requiring an approved number of hours of varied and progressive experience in the field of study. The scope and other requirements of the internship are stated in an individualized syllabus and through a memorandum of understanding between the faculty mentor and the industry partner. May be repeated up to 6 credits. Consent of Instructor required.
Prerequisite(s): E T 283.

E T 240. Applied Statics
3 Credits (3)
Fundamental topics of applied statics, including force system analysis, equilibrium, free body diagrams, methods of joints and sections, distributed loads, friction, centroids, area moments, and shear and moment diagrams.
Prerequisite(s)/Corequisite(s): MATH 1430G or MATH 1511G.
Prerequisite(s): PHYS 1230G or PHYS 1310G.

E T 241. Applied Dynamics
3 Credits (3)
The foundation for understanding particles and bodies in motion and the forces involved, including: projectile motion, Newton's Laws of Motion, conservation of energy, and impulse and momentum.
Prerequisite: A grade of C- or better in either E T 240 or ENGR 233.
Prerequisite/Corequisite: (MATH 1440 or MATH 1521G or MATH 1521H).
Learning Outcomes
1. Various

E T 246. Electronic Devices I
4 Credits (3+3P)
Solid-state devices including diodes, bipolar-transistors, and field effect transistors. Use of these devices in rectifier circuits, small signal and power amplifiers.
Prerequisite: A grade of C- or better in one of the following: E T 190 or E T 183 or ENGR 120.
Prerequisite/Corequisite: E T 184 or ENGR 230.
Learning Outcomes
1. Describe semiconductor devices and their properties.
2. Apply the characteristics of diodes to analyze diode rectifier and regulator circuits.
3. Apply the characteristics of bipolar junction transistors (BJTs) to analyze BJT amplifier circuits.
4. Apply the characteristics of metal-oxide-semiconductor field-effect transistors (MOSFETs) to analyze MOSFET amplifier circuits.
5. Describe and analyze complementary MOS (CMOS) digital circuits.
6. Learn to solder and layout printed-circuit boards (PCBs).
7. Design, simulate, and test diode and transistor-amplifier circuits.

E T 253. Networking Operating Systems II
3 Credits (3+1P)
Introduction to a computer network operating system. May not be used as part of an E T degree program on main campus. Restricted to Community Colleges campuses only.
Prerequisite: E T 120 and E T 153.
Learning Outcomes
1. Identify Linux utilities and terminology.
2. Use the Linux filesystem.
3. Install, administer, and manage a Linux system.
4. Utilize Linux user/group management.
5. Install software packages.
6. Apply data management skills.

E T 254. Concrete Technology
3 Credits (2+2P)
Fundamentals of aggregates, Portland cement, and asphalt used in design and construction. May be repeated up to 3 credits.
Learning Outcomes
1. Define the fundamentals of aggregates and their use in construction including concrete and asphalt.
2. Define the types of concrete and their uses.
3. Prepare and test concrete mix designs.
4. Executing tests for AASHTO Certification.

E T 255. Linux System Administration
3 Credits (3)
Operating systems applications and interfacing with an introduction to systems administration. Topics include Shell Programming, Programming Tools, Database Management, System Backups, Security, Setup and Maintenance of Linux Servers.
Learning Outcomes
1. Describe the key features of the Linux operating system.
2. Plan the Linux Filesystem to match system requirements.
3. Design BASH scripts to optimize common Linux operations.
4. Interpret Linux performance data to solve hardware and software issues.
5. Students will demonstrate the Core Linux System Administration.
6. Students will be able to link the use of shell commands to managing Linux server daemons and software.
7. Students will apply these concepts to build application servers running Linux, Apache, MySQL, and PHP (LAMP); Tomcat, CUPS print servers; and create backup solutions.
8. Students will apply problem analysis, object-oriented structured logic, and development concepts.
9. Students will demonstrate an understanding of theory and hands-on experience administrating a Linux Based server.

E T 256. Networking Operating Systems III
3 Credits (3+1P)
Introduction to a computer network operating system. May not be used as part of an E T degree program on main campus. Restricted to Community Colleges campuses only.
Prerequisite(s): E T 253.

E T 262. Software Technology I
3 Credits (2+2P)
An introduction to computer programming concepts as applied to engineering technology. Includes basic logic design, algorithm development, debugging and documentation. History and use of computers and their impact on society.
Prerequisite/Corequisite: (E T 182 or ENGR 130) or (MATH 1250G or MATH 1430G).
Learning Outcomes
1. Set up and use a rich programming environment for programming with C
2. Analyze existing code
3. Employ effective use of basic programming and basic troubleshooting
4. Write, debug and test code given software requirements
5. Apply testing and documentation best practices
6. Transfer programming knowledge and apply coding knowledge

E T 272. Electronic Devices II
4 Credits (3+3P)
Operational amplifiers, positive and negative feedback, computer aided circuit analysis. In addition circuits include integrator, differentiators and phase shift networks.
Prerequisite: A grade of C- or better in E T 246.
Learning Outcomes
1. Design ideal operational amplifier (opamp) circuits.
2. Determine the frequency response of BJT and MOSFET amplifier circuits.
3. Predict the impact of non-ideal properties of opamps on opamp circuits.
4. Design opamp integrator and differentiator circuits.
5. Implement electronic wave-generating and wave-shaping circuits.
6. Solder and layout surface-mount printed-circuit boards (PCBs).
7. Simulate and test opamp and transistor-amplifier circuits.

E T 273. Advanced Networking Communications
4 Credits (2+4P)
Explores advanced networking communications to include Wireless Networking, Virtualization and Cloud Computing, Subnets and VLANs, Network Risk Management, Network Security Design, Network Performance, and WANS. The course covers the examination objectives and detailed preparation for students to take the CompTIA Network+ exam.
Prerequisite: E T 153.
Learning Outcomes
1. Identify, describe, and apply wireless transmission characteristics and standards.
2. Explain the benefits of cloud virtualization and cloud computing.
3. Explain the purpose of network segmentation and describe how VLANs work and how they are used.
4. Identify basic concepts of network risk management and configure devices for increased security.
5. Identify network design security features and discuss options in network access control.
6. Use tools to evaluate network performance and discuss best practices for incident response and disaster recovery.
7. Explain characteristics of WAN technology and troubleshoot connection methods.

E T 276. Electronic Communications
3 Credits (2+2P)
Antennas, transmission devices, A-M and F-M transmission and detection, pulse systems, microwave systems.

Prerequisite(s): E T 246.

E T 280. Web Design and Multimedia
3 Credits (3)
Introduction to front-end web development including webpage design, structure, layout, positioning, responsiveness, and foundational layers of how the web works. Video, audio, and other digital presentation tools are covered.
Learning Outcomes
1. Create multiple frontend development micro-components.
2. Create single and multi-page websites.
3. Use flexbox, grid, and media queries and different design patterns.
4. Employ effective use of web development and basic troubleshooting.
5. Build small web site projects.

E T 282. Digital Electronics
4 Credits (3+3P)
Applications of digital integrated circuits, multiplexers, counters, arithmetic circuits, and microprocessors.
Prerequisite(s)/Corequisite(s): (E T 190 or E T 184). Prerequisite(s): E T 182.

E T 283. Hardware PC Maintenance
3 Credits (3+1P)
Installing, configuring, troubleshooting, and maintaining personal computer hardware components.
Prerequisite(s): E T 120 or E T 122.

E T 284. Software PC Maintenance
3 Credits (3+1P)
Installing, configuring, troubleshooting, and maintaining personal computer operating systems.
Prerequisite(s): E T 120 or E T 122.

E T 285. Advanced Information Security
3 Credits (3)
The course covers detailed analysis of network security, including security operations and policy adherence; internal and external vulnerabilities; methods of identifying, controlling and managing system access, and the protection of system information.
Prerequisite(s)/Corequisite(s): E T 283. Prerequisite(s): E T 156.

E T 286. Information Security Certification Preparation
4 Credits (4)
The course covers the examination objectives and detailed preparation for a certification in information security.
Prerequisite(s): E T 285.

E T 291. PC Forensics and Investigation
3 Credits (3)
Introduction to computer forensics and investigative fundamentals. Topics include understanding computer forensic and investigation law and requirements, processing crime and incident scenes, and the extraction, preservation, analysis and presentation of computer-related evidence.
Prerequisite(s): E T 120 or E T 122.

E T 300. Special Topics
1-3 Credits
Directed study or project. May be repeated for a maximum of 6 credits.
Prerequisite: consent of department head.

E T 305. Introduction to Product Design
3 Credits (2+3P)
The process of designing an innovative product for a real customer. Working through ideas, prototypes, 3-D models, concept validation, and entrepreneurship.
Prerequisite: A grade of C- or better in (COMM 1115G or COMM 1130G or AXED 2120G or HNRS 2175G) or consent of instructor for non-MET majors.
Prerequisite/Corequisite: E T 210 and E T 217.
Learning Outcomes
1. Learn and follow design process.
2. Develop experience working in a team to solve a design problem.
3. Develop experience presenting ideas and concepts orally.
4. Learn and apply creative problem-solving techniques.
5. Perform interviews with customer.
6. Translate customer needs into product specifications.
7. Design novel product for customer.
8. Build low-resolution prototype of product.
9. Develop a recognition of the importance of innovation and entrepreneurship.

E T 306. Thermodynamics and Laboratory Applications
4 Credits (3+3P)
Fundamentals of thermodynamics, including the first and second laws, properties of substances, and thermodynamic cycles, with a focus on power generation and refrigeration, application of thermodynamic principles to laboratory-scale systems, testing, instrumentation, and data collection, energy conversion assessment and system performance.
Prerequisite: A grade of C- or better in the following: CHEM 1120G and ENGR 233 and (PHYS 1240G or PHYS 1320G) and (PHYS 1240L or PHYS 1320L).
Prerequisite/Corequisite: ENGR 140 and (ENGR 190 or MATH 1521G or MATH 1521H).
Learning Outcomes
1. Explain and apply fundamental and applied thermodynamics (including laws, substance properties, and cycles in power generation and refrigeration).
2. Solve real-world problems using thermodynamic theory in energy systems.
3. Utilize tools and methods to analyze and solve applied thermodynamics problems, including instrumentation and data analysis.
4. Collect, analyze, and interpret experimental data to determine thermodynamic properties.
5. Communicate results effectively through written reports and presentations.
6. Assess the performance of thermodynamic systems, including refrigeration cycles, heat engines, and power plants.

E T 306 L. Thermodynamics Lab
1 Credit (3P)
Applications of thermodynamic theory to lab devices. Practice in testing, instrumentation, and data collection.
Prerequisite: A grade of C- or better in the following: CHEM 1120G and ENGR 233 and (PHYS 1240G or PHYS 1320G) and (PHYS 1240L or PHYS 1320L).
Prerequisite/Corequisite: (E T 306 or pre-approved equivalent) and ENGR 140 and (ENGR 190 or MATH 1521G or MATH 1521H).
Learning Outcomes
1. Effectively communicate results of laboratory work and in-class studies in written formal technical reports.

2. Present one lab experiment through a PowerPoint presentation.
3. Find thermodynamic properties through lab experiments.
4. Describe performance indicators of a laboratory refrigeration cycle and a heat engine.
5. Describe power plant operation.

E T 308. Fluid Technology
3 Credits (3)
Application of basic principles of fluid mechanics to practical applied problems.
Prerequisite: A grade of C- or better in both, (ENGR 190 or MATH 1511G or MATH 1511H) and (E T 240 or ENGR 233).
Corequisite: E T 308 L.
Learning Outcomes
1. Solve hydrostatic problems.
2. Describe and measure physical properties of a fluid.
3. Describe the motion of fluids.
4. Apply conservation equations.
5. Design pipeline and pump systems.

E T 308 L. Fluid Technology Lab
1 Credit (3P)
Measurements in fluid statics, dynamics, and hydraulic systems.
Corequisite: E T 308.
Learning Outcomes
1. Effectively communicate results of laboratory work and in-class studies in written formal memoranda.
2. Experimentally find properties of fluids.
3. Experiment head losses in pipe flows.
4. Analyze pipeline systems and open channel flows.
5. Analyze flow regimes and equipment selection.

E T 309V. Manufacturing: History and Technology
3 Credits (3)
The history of manufacturing, the technology on which it is based, and its impact on society.

E T 310. Applied Strength of Materials
3 Credits (3)
Application of principles of strength of materials to practical design and analysis problems.
Prerequisite: A grade of C- or better in E T 240 or ENGR 233.
Corequisite: E T 310 L.
Prerequisite/Corequisite: ENGR 190 or MATH 1521G or MATH 1521H.
Learning Outcomes
1. To obtain knowledge of basic engineering materials and their use in civil and mechanical construction.
2. To perform basic structural analysis, stress, strain and deformation calculations as they apply to current engineering practices.
3. To conduct appropriate experiments in the laboratory as they apply to straight of materials and be able to interpret the results.
4. To effectively communicate results of laboratory work and in-class studies in written memoranda, business letters, and formal technical reports.
5. To recognize that the field of engineering materials is constantly changing and therefore, needs to be studied throughout one's career.

E T 310 L. Applied Strength of Materials Lab
1 Credit (3P)
Testing and analyzing the physical properties of materials. Cursory review of Excel, PowerPoint, FEA, Instron machine, and testing standards.
Corequisite: E T 310.
Learning Outcomes
1. Effectively communicate results of laboratory work and in-class studies in written formal memoranda.
2. Demonstrate an understanding of the tensile, compressive, shear, torsional and buckling properties of basic materials through hands-on testing per ASTM Standards.
3. Evaluate the results of the hands-on laboratory testing through modeling exercises using SOLIDWORKS simulations.
4. Effectively communicate industry practices through oral presentations of ASTM standards.

E T 314. Communications Systems I
3 Credits (3)
Circuits and devices used for transmission, reception, and processing of RF signals. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better in both, E T 246 and (MATH 1250G or higher).
Learning Outcomes
1. Analyze analog and digital communication systems.
2. Apply the fundamental communication concepts of AM and FM techniques.
3. Build an AM/FM communication system.
4. Apply basic antenna theory and satellite communication theory.

E T 317. Advanced Manufacturing and Design
3 Credits (3)
Advanced 3-D modeling with current engineering design practices. Students will use SolidWorks add-ins such as CAMWorks, Product Data Mangement (PDM), and Model-Based Definition in conguction with Geometric Dimensioning and Tolerancing (GD&T) practices. Students will have the opportunity to take the Certification SolidWorks Profesional Exam (CSWP).
Prerequisite: A grade of C- or better in both, E T 210 and E T 217 or ENGR 217.
Learning Outcomes
1. Create manufacturing drawing packages in accordance with ANSI.
2. Relate design data using proper geometric dimensioning and tolerancing practices.
3. Knowledge of advanced manufacturing processes.
4. Knowledge of requirements design for manufacturability (DFM).
5. Write and understand G-Code toolpaths.
6. Use CAD/CAM systems to create toolpaths.
7. Operate and setup CNC machining center.
8. Work in a group and operate effectively on a team.
9. Use creative and technical thinking skills in design.

E T 324. Signal Processing and Filtering
4 Credits (3+3P)
Application of digital and analog signal conversion models. Discrete time signals and systems. Time and frequency domain concepts. Presentation of Fourier and Z transforms. Application of analog and digital signal filtering with and without feedback.
Prerequisite: A grade of C- or better in E T 272, and ENGR 140, and (ENGR 190 or (MATH 1521G or MATH 1521H, or higher)).
Prerequisite/Corequisite: (PHYS 1240G or PHYS 1320G) and (PHYS 1240L or PHYS 1320L).

Learning Outcomes

1. Analyze signals and systems and differentiate between discrete and continuous-time signals and systems.
2. Determine the impulse response of a differential or difference equation.
3. Apply the convolution theorem for continuous-time signals to determine the response of linear systems.
4. Evaluate the Fourier series of periodic signals.
5. Apply bilateral Laplace transforms for continuous signals and Z transforms for discrete signals.
6. Apply the Sampling theorem, reconstruction, aliasing, and Nyquist's theorem to represent continuous-time signals in discrete time.
7. Design and analyze signals and systems using the programming language MATLAB and /or Simulink.

E T 328. Kinematics of Machines
3 Credits (2+3P)
Kinematic analysis of machine elements using linkages, cams, and gears. Applied design of mechanical systems using SolidWorks simulation and Excel modeling.
Prerequisite: A grade of C- or better in both, E T 210 and (E T 241 or ENGR 234).
Prerequisite/Corequisite: E T 305.
Learning Outcomes

1. Design mechanical device with specific points of motion to solve engineering problem.
2. Develop experience working in a team to solve a design problem.
3. Develop experience presenting technical concepts in writing and orally.
4. Develop understanding of classic four bar mechanisms, including crank-rocker, crank-crank, double-rocker, and crank-slider.
5. Using algebra and trigonometry, analyze points of motion for displacement, velocity, and acceleration.
6. Using SolidWorks Motion Analysis, analyze points of motion for displacement, velocity, and acceleration.
7. Reverse-engineer a Franz Rouleaux mechanism.

E T 332. Applied Design of Structures I
4 Credits (3+3P)
An introduction to structural analysis and design. Use of various building codes for development of allowable and factored loads on structures. Allowable stress and strength design concepts for structural components using concrete and steel. Required use of computer software such as spreadsheets, databases, and self-developed programs and design aids.
Prerequisite: A grade of C- or better in both, E T 310 and (ENGR 190 or MATH 1521G or higher).
Learning Outcomes

1. Demonstrate mastery of the knowledge, techniques, skills and use of modern tools of their disciplines.
2. Design structural components of a system, component, or process to meet desired needs.
3. Identify, formulate, and solve structural analysis problems.
4. Describe professional and ethical responsibility.
5. Communicate effectively with peers and faculty.

E T 339. Introduction to Digital Forensics and Incident Response
3 Credits (2+3P)
Introduction to the skills required to perform digital forensics and incident response on Windows operating systems. Topics include: live response, evidence acquisition, Windows operating system artifacts, documentation and reporting.
Prerequisite: A grade of C- or better in both, E T 255 and E T 160.
Learning Outcomes

1. To understand Digital Forensics terms and definitions and why digital forensics is needed.
2. To study what is required and how to perform digital forensics.
3. To become familiar and aware of the hindrances/obstacles that affects effective digital/computer forensic operations.
4. To learn about the tools and procedures for how deleted data is recovered during digital forensic operations.
5. To use forensic tools and procedures to perform digital forensic operations on Windows operating systems, Emails, Mobile devices, and Communication networks (Computer, wireless, cellular networks).
6. To learn about incident response and procedures.

E T 344. Microprocessor Systems
3 Credits (2+3P)
Microcomputer and/or microcontroller systems, applications and architectures with an emphasis on software using high-level and assembly programming languages. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better in both, (E T 182 or ENGR 130) and (MATH 1250G or higher).
Prerequisite/Corequisite: E T 362.
Learning Outcomes

1. Compare and contrast microprocessor architectures and their characteristics.
2. Configure a Nios II microprocessor architecture core on an FPGA.
3. Write programs in assembly language targeting the Nios II microprocessor.
4. Write programs in C targeting the Nios II microprocessor.
5. Present, demonstrate and document a team project.

E T 354. Soil and Foundation Technology
4 Credits (3+3P)
Fundamentals of investigation of soil properties and their importance in design, construction, and testing as related to buildings, roads, dams, and other structures. Design of foundations considering slope stability, bearing capacity and settlement.
Prerequisite: A grade of C- or better in E T 254.
Prerequisite/Corequisite: E T 310.
Learning Outcomes

1. Demonstrate an understanding of the basic soil types and the accepted soil classification systems: USCS, AASHTO, USDA.
2. Demonstrate an understanding of the various engineering properties of soils and how they apply to the built environment: compaction, permeability, consolidation, shear strength and stress distribution.
3. Perform advance calculations on lateral earth pressure, retaining structures and slope stability.
4. Perform basic designs of shallow foundations and pile structures.
5. Demonstrate an ability to perform laboratory tests: soil classification, Atterburg Limits, compaction (proctors), permeability, shear strength, and compression. Confirm these abilities through completion of the NMDOT soil testing certification program.

E T 355. Site/Land Development and Layout
3 Credits (3)
Techniques, methods, and takeoffs for infrastructure layout, site plan design, grading, earthwork, utilities, road construction. Students must be in Junior or Senior standing to enroll.

Prerequisite: A grade of C- or better in E T 143 or DRFT 143 or DRFT 153.
Learning Outcomes

1. Describe the purpose of Land Development and its process.
2. Define Feasibility and Programming (Environmental policy, Environmental Site Feasibility, Engineering Feasibility) for land development.
3. Base Map Preparation (Control Surveys, Boundary Surveys Topographic Surveys).
4. Examine Flood Plain Studies (FEMA) and Preliminary Hydrological Analysis.
5. Compute the TOC/Intensity of rainfall on a property, runoff for pre/post-development, and peak flow.
6. Implement types of Grading - Earthwork (end section method)/ production estimations/Preliminary layout/Grading work Grid Method).
7. Analyze asphalt designs for different types of cross-sections.

E T 356. Applied Power Technologies
4 Credits (3+3P)
Basic elements of modern power systems, energy sources, substation configuration, load cycles, and three-phase circuits. Students will gain experience in power factor correction, transmission line configurations and impedance, voltage regulation of transformers, and the per-unit system. Study of load flow, fault analysis, and economic operations is included. Students must be in junior or senior standing in order to enroll.
Prerequisite: A grade of C- or better in the following: (ENGR 190 or MATH 1511G or MATH 1511H) and E T 272 and ((PHYS 1240G and PHYS 1240L) or (PHYS 1320 and PHYS 1320L)).
Learning Outcomes

1. To apply concepts of electronics, magnetism and induction.
2. To solve single and three phase transformers circuits.
3. To understand different operations of DC machines and generators.
4. To analyze single phase and three phase power circuits in per-unit analysis.
5. To analyze transmission lines for power loss and power efficiency.
6. To understand power flow, fault analysis and economic operations of the power system generation and transmission.
7. To describe modern power systems, energy sources and substation configurations.

E T 360V. Technology in Business and Society
3 Credits (3)
Examination of how technology affects business and society with specific attention to understanding the role of technical personnel and their interaction with nontechnical personnel. May be repeated up to 3 credits.
Learning Outcomes

1. Understand the impact of technology on business and society.
2. Understand the importance of technical personnel in implementing technology within businesses.

E T 362. Applied Software Development with Python
3 Credits (3)
This course explores various real-world applications of Python in modern software development. Students will engage in hands-on projects, including web applications, database-driven solutions, selected hardware-based applications, and other emerging technologies, while applying object-oriented programming (OOP) principles. The curriculum is designed to adapt to evolving industry needs.
Prerequisite: A grade of C- or better in ENGR 140.
Prerequisite/Corequisite: MATH 1250G or Higher.
Learning Outcomes

1. Configure and utilize various programming environments to meet real-world application needs.
2. Analyze and modify existing codebases.
3. Develop and troubleshoot Python applications.
4. Implement Object-Oriented Programming (OOP) principles.
5. Apply testing, debugging, and documentation best practices.

E T 377. Computer Networking I
3 Credits (2+2P)
Topics include the principles and structure of the OSI model, IP addressing, media, LANs, TCP/IP networks, routing protocols (RIPv2, EIGRP, OSPF) and their advanced functionality, as well as VLANs and inter-VLAN communication. This course focuses on the architecture of networks, the configuration of devices, how to identify and resolve common issues, and troubleshooting (from physical to transport layers).
Prerequisite: A grade of C- or better in both, (E T 182 or ENGR 130) and (MATH 1250G or Higher).
Learning Outcomes

1. Define and distinguish the role of a network administrator (from other roles in the IT world)
2. Identify the OSI model, its layers, and relationship to TCP/IP model
3. Identify different cable media and networking devices and their use
4. Design, configure, and troubleshoot basic networks.
5. Identify MAC, IPv4, and IPv6 addressing
6. Apply different techniques for IP allocation and subnet design (IPv4)
7. Use Cisco IOS software for basic switch and router configurations
8. Configure and troubleshoot basic setup for static and dynamic routing protocols

E T 381. Renewable Energy Technologies
3 Credits (3)
Renewable energy systems, including topics in thermal-solar, photovoltaic, wind, geothermal systems, and other current topics. Theory, practical applications, safety considerations and the economics of alternative renewable energy systems compared to conventional systems.
Prerequisite: A grade of C- or better in MATH 1220G or higher.
Learning Outcomes

1. Define renewable energy sources.
2. Understand the current state of the art of renewable energy technologies and performance improvements. This includes solar, wind, hydro, ocean, biomass, and geothermal energies.
3. Understand the benefits and disadvantages of using renewable resources.
4. Research or design a renewable energy system as a class project.

E T 382. Solar Energy Technologies
3 Credits (2+3P)
Solar energy technologies, including topics in passive, solar thermal, and photovoltaic systems. Theory, practical applications, safety considerations and the economics of solar renewable energy systems compared to conventional systems.
Prerequisite: A grade of C- or better in MATH 1220G.
Learning Outcomes

1. Define renewable energy sources.
2. Understand the current state of the art of photovoltaic and solar thermal energy technologies and performance improvements.

3. Evaluate the economics of implementing a solar system.
4. Design and size a PV or solar thermal energy system as a class project.

E T 384. Wind and Water Energy Technologies
3 Credits (3)
Wind and Water energy technologies, including topics in small and large scale systems. Theory, practical applications, safety considerations and the economics of wind and water renewable energy systems compared to conventional systems.
Prerequisite: A grade of C- or better in MATH 1220G or higher.
Learning Outcomes
1. Define renewable energy sources.
2. Understand the current state of the art of wind and water energy technologies and performance improvements.
3. Evaluate the economics of implementing wind or water systems.
4. Design and size a wind or water energy system as a class project.

E T 386. Sustainable Construction and Green Building Design
3 Credits (3)
Sustainable Building materials, methods, and techniques including green architecture and design, codes, standards and specifications.
Prerequisite: A grade of C- or better in MATH 1220G or higher.
Learning Outcomes
1. Demonstrate an understanding of the basic principles of Green Building: sustainability, life-cycle costing, triple bottom line, return periods and unintended consequences.
2. Interpret the various categories present in the LEED certification process and other green certification systems commonly used.
3. Evaluate different "green" technologies as they apply to the student's area of interest.
4. Evaluate energy efficiency scenarios and resulting cost analyses using RETScreen and RESCheck softwares.
5. Navigate the various certification opportunities as they apply to the Green Building industry.

E T 396. Heat Transfer and Applications
3 Credits (2+3P)
Fundamentals of conduction, convection, and radiation heat transfer. Application of heat transfer, thermodynamics, and fluid mechanics principles to thermal system analysis and design.
Prerequisite: A grade of C- or better in both E T 306 and E T 308.
Learning Outcomes
1. Understand the concepts and basic principles of fundamental and applied heat transfer.
2. Model and solve engineering problems involving one, two, or three heat transfer modes: conduction, convection, and radiation.
3. Analyze the performance of industrial equipment like heat exchangers.
4. Validate theoretical concepts through heat transfer lab experiments.

E T 398. Digital Systems
4 Credits (3+3P)
Analysis, design, implementation, and testing of digital systems, including microprocessor blocks, using state machine logic, FPGAs, and hardware description language programming. May be repeated up to 4 credits.
Prerequisite: A grade of C- or better in both (E T 282 or ENGR 130) and (MATH 1250G or higher).
Prerequisite/Corequisite: E T 362.
Learning Outcomes
1. Apply design, synthesis, and analysis methods for digital systems that incorporate programmable logic devices (FPGAs).
2. Utilize CAD tools such as Altera Quartus II to design digital systems.
3. Evaluate and apply methods to analyze the timing behavior and to detect timing hazards in digital circuits.
4. Apply methods for analysis and design of sequential digital circuits with feedback.
5. Design complex circuits using VHSIC Hardware Description Language (VHDL) for programming FGPA systems.

E T 400. Special Topics
1-3 Credits
Directed study or project. May be repeated for a maximum of 6 credits.
Prerequisite: consent of department head.

E T 402. Instrumentation
3 Credits (2+3P)
Sensors/transducers, signal conditioning and transmission for measurement and control systems. Student project in an area of instrumentation and/or control is required.
Prerequisite/Corequisite: E T 396 or E T 398.
Learning Outcomes
1. Apply physical concepts, operational principles, and components of basic instrumentation and control in industrial process systems.
2. Learn relevant problem-solving methods and aspects of good practice.
3. Use LabView data acquisition systems, PLC ladder logic, and basic Arduino controllers.
4. Prototype a control system through a class project.

E T 410. Senior Seminar
1 Credit (1)
Transition from academics to business and industry. Students must be senior standing in E T majors to enroll. May be repeated up to 1 credit.
Learning Outcomes
1. Explain the path to professional licensure (CET, ECET, MET).
2. Implement a plan to test and pass the fundamental exam (CET, ECET, MET).
3. Identify and work towards completing different certifications used in industry, and work towards (IET).

E T 412. Highway Technology
3 Credits (3)
Road-vehicle performance, geometric alignment, traffic analysis, highway materials, pavement design, and plan and profile development.
Prerequisite: A grade of C- or better in E T 354.
Learning Outcomes
1. Design of a roadway including geometric design, materials selection, pavement design, and drainage.
2. Develop an understanding of design criteria based on traffic characteristics.
3. Interpret the purpose of course requirements, gather correct resources, present criteria, study alternatives, and finally develop a design.

E T 414. Communications Systems
3 Credits (3)
Circuits and devices used for transmission, reception, and processing of RF signals.

Prerequisite: A grade of C- or better in both, E T 246 and (MATH 1250G or higher).

Learning Outcomes

1. Analyze analog and digital communication systems.
2. Apply the fundamental communication concepts of AM and FM techniques.
3. Build an AM/FM communication system.
4. Apply basic antenna theory and satellite communication theory.

E T 418. Applied Hydraulics

3 Credits (3)

Introduction to hydrology, hydraulic equations, hydraulic cross-sections, control structures, and collection and distribution of water, wastewater, and storm runoff using closed conduit and open channel flow. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in E T 308.

Learning Outcomes

1. Perform basic rainfall/runoff calculations using the Rational Method, TR-fifty-five and the Unit Hydrograph method.
2. Design hydraulic conveyance structures using Manning's equation and basic culvert equations, both by hand and various software packages.
3. Perform advanced calculations of pipe flow and head loss, both by hand and various software packages.
4. Evaluate pumping scenarios and pumping design, both by hand and various software packages.
5. Demonstrate an understanding of basic groundwater hydraulics.

E T 420. Senior Internship

1-6 Credits

Internship requiring an approved number of hours of varied and progressive experience in the field of study. The scope and other requirements of the internship are stated in an individualized syllabus and through a memorandum of understanding between the faculty mentor and the industry partner. Taken in the senior year of program.

Prerequisites: Senior standing in E T.

E T 421. Senior Project

3 Credits (3)

Project in an area of civil engineering technology conducted under the direction of civil engineering technology faculty member. Project must be one that can be completed within a semester and of sufficient complexity for 3 credits. Taken last semester of program. May be repeated up to 3 credits.

Learning Outcomes

1. Write a transmittal letter in a format consistent with industry practices.
2. Develop a scheduling table delineating the various project stages.
3. Develop a table of contents to organize all work documents.
4. Use the knowledge learned in CET courses to develop/design a project and prepare a professionally written report.
5. Communicate effectively with the faculty advisor and industry mentor.
6. Develop skills to work independently or in teams on a self-paced project.

E T 426. Analysis and Design of Machine Elements

3 Credits (2+3P)

Analysis and design of power transmission components, including: gears, sprockets, belts, chains, bearings, and shafts. Experiential design project using SolidWorks and Excel modeling.

Prerequisite: A grade of C- or better in both ENGR 234 and E T 310.

Prerequisite/Corequisite: E T 305.

Learning Outcomes

1. Design mechanical device with specific machine elements to solve engineering problem.
2. Develop experience working in a team to solve design problems.
3. Develop experience presenting technical concepts in writing and orally.
4. Apply strength of materials concepts to design machine elements.
5. Learn about various types of machine elements, including shafts, sheaves, gears, sprockets, bearings, fasteners, retaining rings, o-rings, and motors.
6. Analyze the performance of various types of machine elements, including shafts, sheaves, gears, sprockets, and bearings.
7. Using SolidWorks Simulation, design and analyze machine elements and mechanical systems.
8. Conduct FEA simulation and validate results mathematically.

E T 432. Applied Design of Structures II

4 Credits (3+3P)

Continuation of E T 332. Design of structural systems and study of their responses. Wood and masonry systems included.

Prerequisite: A grade of C- or better in E T 332.

Learning Outcomes

1. Demonstrate mastery of the knowledge, techniques, skills and use of modern tools of their disciplines.
2. Design a system, component, or process to meet desired needs.
3. To effectively function as a member of a team while designing, constructing and testing structural scale model.
4. To identify, formulate, and solve engineering problems including material selection and cost analysis.
5. Recognize of professional and ethical responsibility.

E T 435. Senior Project

3 Credits (2+3P)

Capstone course. Practical application of student's cumulative knowledge to an assigned design projects. Design principles, teamwork, and project management skills are stressed. Demonstration of written and oral communication skills via project documentation and presentation of results. Must be graduating senior. Consent of Instructor required.

Learning Outcomes

1. Demonstrate an ability to apply knowledge, techniques, skills and modern tools of mathematics, science, engineering, and technology to solve broadly-defined engineering problems appropriate to the discipline.
2. Demonstrate an ability to design systems, components, or processes meeting specified needs for broadly-defined engineering problems appropriate to the discipline.
3. Demonstrate an ability to apply written, oral, and graphical communication in broadly-defined technical and non-technical environments; and an ability to identify and use appropriate technical literature.
4. Demonstrate an ability to conduct standard tests, measurements, and experiments and to analyze and interpret the results to improve processes.
5. Demonstrate an ability to function effectively as a member as well as a leader on technical teams.

E T 439. Advanced Digital Forensics and Incident Response
3 Credits (3)
Advanced topics in digital forensics and incident response. Topics include network analysis and advanced cybersecurity concepts.
Prerequisite: A grade of C- or better in both, E T 339 and E T 377.
Learning Outcomes
1. Students will become familiar with tools and processes to analyze and detect memory resident processes that include malware, rootkits, and user recoverable data.
2. Students will also have exposure to methods and processes used by hackers to penetrate and compromise targets.

E T 444. Computer Hardware Senior Design
3 Credits (2+3P)
The design, development, implementation, documentation, and formal demonstration of a computer hardware system. Emphasis on interfacing FPGA to peripheral devices using VHDL. A student project is required. Students must be in senior standing to enroll. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better in both, E T 362 and E T 398.
Learning Outcomes
1. To design, analyze and simplify digital logic circuits for practical problems.
2. To understand basic and complex digital logic circuits, such as memory, registers, and other arithmetic circuits.
3. To design sequential digital circuits using basic digital gates in Moore and Mealy model.
4. To design Finite State Machines and implement them on an FPGA board.
5. To interface different sensors and user inputs in VHDL and implement them on an FPGA board.
6. To complete a design project, working in teams, solving a real-life problem, and demonstrate their practical solution.

E T 452. Advanced Automated Control Systems
3 Credits (2+3P)
This course introduces students to the fundamentals of automated control systems used in industrial, manufacturing, and process environments. Emphasis is placed on control theory, programmable logic controllers (PLCs), human-machine interfaces (HMIs), SCADA systems, panel hardware, and industrial networking. Students will engage in hands-on labs and simulations to design, program, and integrate automated systems that reflect real-world industry standards.
Prerequisite: A grade of C- or better in E T 402.
Learning Outcomes
1. Design and implement automated control systems using foundational principles of control logic and industrial system architecture.
2. Program programmable logic controllers (PLCs) using ladder logic and apply them to real-world automation tasks involving digital and analog inputs and outputs.
3. Develop and configure human-machine interfaces (HMIs) that enable effective operator control, process visualization, and system monitoring.
4. Integrate PLCs and HMIs with supervisory control and data acquisition (SCADA) systems for centralized control, data logging, and alarm management.
5. Apply data acquisition techniques using sensors and signal processing to monitor and analyze process performance.
6. Configure and troubleshoot industrial networking systems, ensuring reliable communication between PLCs, HMIs, SCADA, and robotic systems.
7. Understand and apply robotics principles in automation, including basic programming, simulation, and integration of robotic tasks into larger control systems.
8. Demonstrate safety, documentation, and system organization standards relevant to hardware interfacing, device selection, and industrial protocols.
9. Collaborate in teams to design and present a fully integrated automated system, incorporating PLC logic, HMI screens, SCADA functionality, DAQ elements, and optional robotics.

E T 455. Cost Estimating and Scheduling
3 Credits (3)
Methods and techniques in construction estimating including final bid preparation, construction planning and scheduling using various network methods and other techniques.
Prerequisite: junior or senior standing in E T.

E T 456. Applied Power Technologies II
3 Credits (2+3P)
This course focuses on fault analysis, protective systems, transient stability, and economic operation of power systems. Students apply analytical techniques and simulation tools to assess and optimize power system performance under dynamic conditions.
Prerequisite: A grade of C- or better in E T 356.
Learning Outcomes
1. Perform symmetrical and unsymmetrical fault analyses.
2. Interpret sequence networks and analyze faulted systems.
3. Understand protective relay schemes and coordination.
4. Analyze rotor angle and frequency stability.
5. Apply methods for economic dispatch and system optimization.

E T 458. Web Development and Database Applications
3 Credits (3)
Design, planning, and building of interactive and dynamic web applications which are customizable and contain real-time information. Topics include relational databases, object oriented programming, secure-coding practices and web security, user authentication and personalization, as well as front-end and back-end technology integration.
Prerequisite: A grade of C- or better in both, E T 362 and E T 280.
Learning Outcomes
1. Setting up a development server
2. Read, design, and write code for backend web dev.
3. Design, create, and access databases that support web applications.
4. Implement effective security and authentication on Web applications

E T 459. Construction Technology and Management
3 Credits (3)
This is a Technical Specialty course that builds on topics presented in the construction sequence thus far: E T 154, E T 254, E T 354, and E T 355. The course introduces students to the different civil engineering approach to construction and management, including planning, construction estimating & scheduling, foundations, formwork, concrete work, steel fabrication and erection installation, equipment basics, quality control, and safety. Methods and techniques involved in construction including use of Primavera Project Management® software.
Prerequisite/Corequisite: E T 354 and E T 355.

Learning Outcomes

1. Understand the basic concepts of construction planning, cost estimation, scheduling, and types of project management
2. Obtain basic knowledge on techniques to construct structures based on site condition
3. Develop work breakdown system and quantity take-offs
4. Develop project cost estimation for different construction projects
5. Prepare work schedule for construction project
6. Identify and implement the suitable method and equipment to construct various structures.

E T 463. Enterprise Linux Administration
3 Credits (3)
Advanced Linux Includes an advanced look at the use of Coding repositories, Linux-based containers, virtual machines, and scripting tools including Dockerfiles, Vagrantfiles, and Ansible.
Prerequisite: A grade of C- or better in both, E T 255 and E T 362.
Learning Outcomes

1. Demonstrate the ability to use Software Versioning systems using Windows and Linux.
2. Apply best practices with versioning repositories when creating software.
3. Deploy single and clustered microservice containers to support a web application.
4. Use script-based code to deploy and configure a full stack web server.
5. Use infrustructure management software to deploy defined roles in multiple environments.

E T 464. Windows Enterprise Administration
3 Credits (3)
Installation, configuration, and maintenance of Windows Enterprise services which includes Active Directory, distributed file systems, SQL Server, Web Server, Authentication Procedures, and enterprise elasticity. Topics covered include: Server Maintenance and Troubleshooting Methodologies.
Prerequisite: A grade of C- or better in E T 160 and (E T 262 or ENGR 140 or C S 172).
Learning Outcomes

1. Set up and use a Windows Enterprise environment with Active Directory.
2. Use best practices to design an organizational Structure and define AD DS Objects.
3. Deploy an AD DS embedded DHCP server with IPvfour and IPvsix.
4. Analyze existing cmd shell and PowerShell code for process automation.
5. Deploy security and user settings using Group Policy.
6. Apply version updates and establish an intra-domain trust relationship.
7. Employ effective use of the WDS service to deploy template images.

E T 471. Transportation Engineering and Technology
3 Credits (3)
Learn the principles of transportation engineering and technology with a focus on highway engineering and traffic analysis. Provide a basic skill set that will allow a student to address most of the transportation problems. Provide a foundation for future coursework in transportation should a student wish to pursue further coursework in the field.
Prerequisite: A grade of C- or better in E T 354.
Learning Outcomes

1. To introduce students to techniques for designing a roadway including geometric design, materials selection, pavement design, and drainage.
2. To help students develop an understanding of design criteria based on traffic characteristics.
3. Assess student's ability to: interpret the purpose of course requirements, gather correct resources, present criteria, study alternatives, and finally develop a design.

E T 472. Intelligent Transportation Systems (ITS)
3 Credits (3)
Traffic flow theory, telecommunication and information technology application in transportation, system architecture and standards, transportation management, incident and emergency management, corridor management, dynamic route guidance, in-vehicle systems, and traffic signal timing. Consent of instructor required. May be repeated up to 3 credits.
Learning Outcomes

1. Demonstrate traffic flow theory, telecommunication, and information technology applications in transportation.
2. Discover Intelligent Transportation System (ITS) architecture and standards, transportation management, incident and emergency management, corridor management, dynamic route guidance and in-vehicle systems, and traffic signal timing.
3. Apply knowledge of the ITS to select traffic engineering as a career path or apply the knowledge in their engineering or engineering technology career.

E T 475. Special Topics in Information Technology
3 Credits (3)
Contemporary topics in Information Technology.
Prerequisite: A grade of C- or better in both, ((E T 362 or ICT 362) and (E T 377 or ICT 377)), or Consent of Instructor.
Learning Outcomes

1. Students will learn two way Bluetooth, Wi-Fi, and NFC communication technologies
2. The student will practice building and programming IOT prototype devices
3. The student will develop customer value proposition and perform one round of customer discovery
4. The student will prototype their IOT device
5. The student will demonstrate their IOT device
6. The student will learn to integrate IOT devices into IT architecture

E T 477. Computer Networking II
3 Credits (2+2P)
Advanced concepts in computer network design and applications including managing the campus network infrastructure (LANs and virtual LANs), network services (DNS and DHCP), network security and firewall, network monitoring and forensics, wireless networks, high-speed optical networks and Internet.
Prerequisite: A grade of C- or better in E T 377.
Learning Outcomes

1. Demonstrate an understanding of key fundamental concepts of networking.
2. Apply networking concepts to design networks for real-life application scenarios using applicable software.
3. Configure network hardware such as computers, switches, and routers.

4. Troubleshoot, analyze, and solve network problems with applicable software.

E T 480. Innovation and Product Development
3 Credits (3)
Experiential product design and development. Students will learn about different types of innovation, business models, and methods for developing products. Students will apply the scientific method to develop a product idea of their own. Students will propose ideas, develop hypotheses, test hypotheses, and iterate until they have validated their product idea or identified a need to pivot.
Learning Outcomes
1. The student will be able to apply the scientific method to design a product.
2. The student will be able to develop a plan to learn about the Product-Market-Fit of their innovation.
3. The student will be able to describe the basics of Business Models and Product-Market-Fit.

E T 483. Mobile App Programming and Development
3 Credits (3)
Planning and creation of mobile device applications. Programming tools and technical design considerations. Entrepreneurship and App development.
Prerequisite: A grade of C- or better in both, ICT 152 and (E T 377 or ICT 377)), or Consent of Instructor.
Learning Outcomes
1. The student will learn to create a modern and flexible mobile device User Interface using Java
2. The student will develop a high functioning prototype their mobile app
3. The student will implement a business model canvas including development of a customer value proposition and a minimum of one round of customer discovery
4. The student will implement database and information storage using a mobile device
5. The student will implement the developer's dashboard for their mobile app
6. Student will publish and monetize their mobile app

E T 485. White Hat System Testing
3 Credits (3)
System penetration testing and repair. Review of methods utilized to gain access to unprotected systems. Testing system repairs and fixes for future prevention. Test documentation.
Prerequisite: A grade of C- or better in both, ((E T 362 or ICT 362) and (E T 377 or ICT 377)), or Consent of Instructor.
Learning Outcomes
1. The student will practice modern methods for penetration testing
2. The student will demonstrate advanced ethical hacking methods
3. The student will evaluate in-place security systems
4. The student will run-through simulated attacks and system break-ins
5. The student will learn to prepare detailed reports on system vulnerabilities and weaknesses

E T 490. Selected Topics
1-3 Credits
Selected topics in engineering technology and related areas.
Prerequisite: consent of instructor.

E T 505. Special Topics in Information Technology
3 Credits (3)
Contemporary topics in Information Technology Restricted to: M-IT majors. May be repeated up to 9 credits.
Learning Outcomes
1. Various

E T 513. AI Data Center Designs and Technologies
3 Credits (3)
A study of current Artificial Intelligence Data Center Designs and related Networking Technologies. Data Center Architecture designs for optimization of Artificial Intelligence/Machine Learning clusters and networks. Graduate standing or consent of instructor.
Learning Outcomes
1. Apply AI/ML Workloads and Architecture Designs.
2. Evaluate AI/ML Cluster Design Scalability.
3. Create AI Front-end and Back-end Network Designs.
4. Leverage IP Fabric Designs for Dynamic Data Load Balancing.

E T 515. AI and Cybersecurity Risk in Critical Infrastructure Systems
3 Credits (3)
This course explores the role of artificial intelligence in managing cybersecurity risk within critical infrastructure systems, including energy, transportation, manufacturing, and water systems. Students will study how machine learning models can help identify vulnerabilities, detect anomalies, and forecast failure or attack events across complex, distributed OT environments.
Prerequisite: Graduate standing or consent of instructor.
Learning Outcomes
1. Design AI-based monitoring systems for detecting and managing cyber risk in critical infrastructure.
2. Apply ML models to ICS data to identify anomalies, forecast threats, and guide mitigation.
3. Incorporate AI tools into compliance-driven cyber risk management strategies.
4. Critically assess the use of AI in environments where human safety and system availability are paramount.

E T 520. From IT Tech to IT Manager
3 Credits (3)
This course provides the essential knowledge and skills to move from IT technician role to an IT manager role. This course will provide IT management basics and how tech skills are utilized in an IT administrative role.
Learning Outcomes
1. Understand: Explain the key principles and methodologies of IT Management.
2. Apply: IT Strategies and development roadmaps.
3. Analyze: Operations and capacity management.
4. Create: A corporate design for a comprehensive IT staff management plan.

E T 539. Advanced Enterprise Security
3 Credits (3)
This course provides the student with an overview of enterprise cybersecurity and a foundation for understanding the critical issues of protecting digital and information assets. Restricted to: M-IT majors.
Learning Outcomes
1. Demonstrate an understanding of information security concepts and risk management.

2. Demonstrate an understanding of Intrusion Detection and Prevention Systems and Other Security Tools.
3. Demonstrate an understanding of cryptographic techniques.
4. Demonstrate an understanding of authentication methods.
5. Demonstrate an understanding of access control systems.
6. Demonstrate an understanding of various network security controls.
7. Demonstrate an understanding of the legal, ethical, and professional issues in information security.

E T 540. Risk Management for IT Managers
3 Credits (3)
This course provides a comprehensive framework for designing, developing, and implementing an effective cyber risk management program. Students will explore the key principles and practices necessary to manage cyber risks in today's dynamic and challenging environment.
Learning Outcomes
1. Understand: Explain the key principles and methodologies of cyber risk management.
2. Apply: Implement practical insights and real-world examples to manage and mitigate cyber risks.
3. Analyze: Evaluate modern cyber threats and challenges to develop effective risk management strategies.
4. Create: Design a comprehensive cyber risk management plan to establish trust and ensure organizational compliance.

E T 550. AI: Ethics, Privacy, and Governance
3 Credits (3)
This course explores the ethical and privacy challenges that arise when artificial intelligence is applied in scientific research, engineering systems, and real-world decision-making. As AI technologies are increasingly embedded into tools, platforms, and infrastructures across disciplines—from biomedical research and environmental modeling to manufacturing and social systems—the implications for human autonomy, fairness, data protection, and accountability become critically important.
Prerequisite: Graduate standing or consent of instructor.
Learning Outcomes
1. Critically analyze the ethical and privacy implications of AI use in scientific and engineering contexts.
2. Identify and mitigate algorithmic bias, privacy risks, and governance gaps in AI-driven systems.
3. Apply ethical reasoning and privacy-aware design principles to their own research or professional work.
4. Interpret and operationalize regulatory requirements for data use in AI-enabled projects.

E T 551. Enterprise Architecture I
3 Credits (3)
A study of current enterprise architecture methodologies, tools, and techniques. Restricted to: M-IT majors.
Learning Outcomes
1. Demonstrate the ability to utilize and develop architectural enterprise artifacts.
2. Assess multiple enterprise architecture methodologies.
3. Demonstrate IT architecture landscaping capability.
4. Assess integrating IT initiatives utilizing the enterprise architecture processes.

E T 552. Enterprise Architecture II
3 Credits (3)
Advanced topics in enterprise architecture including availability, access, and architecture map development. Restricted to: M-IT majors.
Prerequisite: A grade of C- or better in E T 551.
Learning Outcomes
1. Demonstrate the differences and similarities in multiple enterprise architectures.
2. Demonstrate the ability for independent research on enterprise architectures.
3. Assess architectural artifacts for impact on IT planning and implementation.

E T 555. Virtualization
3 Credits (3)
An analysis and review of system and IT virtualization techniques. Restricted to: M-IT majors.
Learning Outcomes
1. Demonstrate a basic knowledge of the use of Virtual Environments in Information Technology.
2. Demonstrate knowledge in current software used to manage virtual environments.
3. Demonstrate the ability to architect virtual system networks and topology.
4. Students will be exposed to emerging technologies used in complex virtual network design.
5. Students will have the tools to select and deploy need based virtual environments.

E T 560. Strategic Leadership for IT Managers
3 Credits (3)
This course explores the role of IT leaders in shaping and executing business strategy.
Learning Outcomes
1. Analyze the roles and responsibilities of IT leaders to understand their impact on organizational success.
2. Evaluate Strategic IT Governance frameworks and integrate IT initiatives with strategic planning to align with organizational goals.
3. Critically assess case studies and real-world projects to develop practical skills in leading IT departments and managing projects effectively.
4. Design strategies that leverage IT to optimize systems and processes, and manage business relationships to enhance organizational efficiency.

E T 562. Development and Operations
3 Credits (3)
Software development including Python scripting. Operations programming. Restricted to: M-IT majors.
Learning Outcomes
1. Demonstrate a basic knowledge of Operations Management and it's relationship to DevOps.
2. Demonstrate knowledge in current software used in DevOps.
3. Apply DevOps practices to a software deployment workflow.
4. Demonstrate the ability to define a Continuous Integration pipeline with automated testing.
5. Students will apply the continuous feedback principles to project monitoring.
6. Apply best practices to build security into DevOp projects.

E T 577. Advanced Computer Networking
3 Credits (3)

Advanced networking design and analysis. Modernization of infrastructures. Restricted to: M-IT majors.

Learning Outcomes

1. Identify and classify communication network problems.
2. Devise and propose solutions to real-life problems that require communication network technology.
3. Capture network traffic with Wireshark protocol Analyzer.
4. Analyze network traffic with Wireshark protocol Analyzer.
5. Troubleshoot basic network issues.
6. Identify, differentiate, and use IPv4 and IPv6 schemes for address allocation in network design.
7. Apply different techniques to mitigate Quality of Service (QoS) issues in Communication networks.
8. Describe and discuss the evolution of communication network concepts and state of the art in modern communication networks such as Network Virtualization, Software Defined Networks, Cloud computing, Internet of Things, and 5G.

E T 580. IT Innovation and Product Development
3 Credits (3)

Experiential product design and development in information technology. Students will learn about different types of innovation, business models, and methods for developing products. Students will apply the scientific method to develop a product idea of their own related to their field of study. Students will propose ideas, develop hypotheses, test hypotheses, and iterate until they have validated their product idea or identified a need to pivot. Experience in industry and student perspectives are discussed to support the development of their innovations.

Learning Outcomes

1. The student will be able to apply the scientific method to design a product, software, or service.
2. The student will be able to develop a plan to learn about the Product-Market-Fit of their innovation.
3. The student will be able to describe the basics of Business Models and Product-Market-Fit.
4. The student will be able to explain how course concepts relate to the field of information technology.

E T 583. Mobile App Programming and Development
3 Credits (3)

Planning and creation of mobile device applications. Programming tools and technical design considerations. Entrepreneurship and App development. Restricted to: M-IT majors.

Learning Outcomes

1. Demonstrate a basic knowledge of Mobile App development architecture and planning.
2. Demonstrate knowledge in current software used in the creation and maintenance of Mobile Apps.
3. Apply Mobile App software deployment workflow best practices.
4. Demonstrate the ability to create automated multi-form factor user interfaces.
5. Apply best practices to mobile device UI design interfaces.

E T 584. Cyber Threat Intelligence
3 Credits (3)

This course explores the identification, analysis, and application of cyber threat intelligence to enhance security operations. Students will examine threat actors, attack techniques, and intelligence frameworks while learning to collect, assess, and communicate actionable threat data. Through hands-on exercises and case studies, students will develop proactive defense strategies and integrate intelligence into cybersecurity decision-making.

Learning Outcomes

1. Analyze cyber threats, threat actors, and attack techniques to assess risk and potential impact.
2. Utilize cyber threat intelligence frameworks and methodologies to collect, process, and analyze threat data.
3. Develop intelligence reports that provide actionable insights for security operations and decision-making.
4. Evaluate the effectiveness of various threat intelligence sources, tools, and platforms in real-world security applications.
5. Design proactive defense strategies that integrate cyber threat intelligence to enhance an organization's security posture.

E T 585. White Hat System Testing
3 Credits (3)

System penetration testing and repair. Review of methods utilized to gain access to unprotected systems. Testing system repairs and fixes for future prevention. Test documentation. Restricted to: M-IT majors.

Learning Outcomes

1. Describe cryptology.
2. Identify common information-gathering tools and techniques.
3. Perform system hacking, and web and database attacks.
4. Analyze vulnerabilities exploited by hackers.
5. Identify common types of malware and the threats they pose.
6. Perform network traffic analysis and sniffing by using appropriate tools.
7. Identify security controls and defensive technologies.

E T 595. Capstone Projects in Information Technology
3 Credits (3)

Capstone course. Practical application of student's cumulative Information Technology knowledge to an assigned design projects. Project management skills.

Learning Outcomes

1. Demonstrate ability to manage complex work-related IT technical projects.
2. Demonstrate the ability to create an IT engineering project timeline.
3. Demonstrate the ability to self-motivate and organize project timeline.
4. Demonstrate the ability to work in teams and execute project.
5. Demonstrate advanced project goal setting, skills assessment, and weekly updates.

ECDV-ECONOMIC DEVELOPMENT

ECDV 550. Introduction to Local and Regional Development
3 Credits (3)

Serves as the introductory course in the Doctor of Economic Development program. Overview of the economic development field.

ECDV 590. Special Topics
1-3 Credits (1-3)

Selected topics in the area of Economic Development. Subtitle reflects content. May be repeated up to 9 credits. Consent of instructor required.

ECDV 596. Individual Study
1-3 Credits (1-3)

Individual studies directed by consenting faculty with the prior approval of the Department Head. May be repeated up to 6 credits.

ECDV 661. Regional Economic Modeling
3 Credits (3)
Introduction to the tools and methods of regional economic development analysis.
Learning Outcomes
1. Learn the tools and methods of regional economic development analysis.

ECDV 664. Population Economics
3 Credits (3)
Examines the causes and consequences of demographic change. Examines theories of basic demographic processes, population projection and estimation. Consent of instructor required.
Learning Outcomes
1. Train students to learn the qualitative and quantitative studies and methods for the economic development based on population theories.

ECDV 668. Economic Development Finance
3 Credits (3)
Focuses on the tools and methods of economic development finance.

ECDV 670. Research in Economic Development
3 Credits (3)
Intense examination of the academic literature on economic development at all levels.
Prerequisites: ECDV 651, ECDV 661 and ECDV 662.

ECDV 671. Sustainable Economic Development
3 Credits (3)
Focuses on the interconnections between economic development and the environment. Provides a broad set of tools and ideas related to the impacts of human activities on the environment.
Learning Outcomes
1. Understand the interconnections between economic development and the environment. Gain experience with a broad set of tools and ideas related to the impacts of human activities on the environment.

ECDV 673. Research Methods
3 Credits (3)
An overview of alternative research methods and tools. Students explore quantitative and qualitative research methods as alternatives and complements to statistical methods. Research design, ethics, and presentation are emphasized.
Prerequisites: AEEC 501, AEEC 502 and AEEC 540.

ECDV 681. Urban Economic Development
3 Credits (3)
Examines causes and consequences of economic change in urban and metropolitan areas. Covers both theory and tools for analysis.
Learning Outcomes
1. Learn causes and consequences of economic change in urban and metropolitan areas, under the studies of theories and practices.

ECDV 682. Rural Development
3 Credits (3)
Examines causes and consequences of economic change in rural areas, communities and small, open economies. Covers both theory and tools for analysis.
Learning Outcomes
1. Learn causes and consequences of economic change in rural areas, communities and small, open economies under the studies of theories and practices.

ECDV 683. Seminar in National Economic Development
3 Credits (3)
Explores specific examples and cases of rural and urban economic development. Involves applied analysis of specific rural and/or urban economic issues/projects.
Learning Outcomes
1. Learn and understand specific examples and cases of rural and urban economic development. Gain experience with applied analysis of specific rural and/or urban economic issues/projects.

ECDV 692. Seminar in Economic Development
3 Credits (3)
Seminars in selected topics in economic development. Subtitle reflects content. May be repeated up to 9 credits.
Prerequisite: Completion of at least nine semester hours of ECDV courses.

ECDV 694. Internship
1-9 Credits (1-9)
Field internship in Economic Development. May be repeated up to 9 credits.
Learning Outcomes
1. Gain field experience and training in Economic Development.

ECDV 699. Doctoral Project
1-9 Credits (1-9)
Doctoral Project. May be repeated up to 9 credits. Completion of all DED coursework and successful completion of comprehensive exams.

ECED-EARLY CHILDHOOD EDUCATION

ECED 1110. Child Growth, Development, and Learning
3 Credits (3)
This basic course in the growth, development, and learning of young children, prenatal through age eight, provides students with the theoretical foundation for becoming competent early childhood professionals. The course includes knowledge of how young children grow, develop and learn. Major theories of child development are integrated with all domains of development, including biological-physical, social, cultural, emotional, cognitive and language. The adult's role in supporting each child's growth, development and learning is emphasized. May be repeated up to 3 credits.
Learning Outcomes
1. Incorporate understanding of developmental stages, processes, and theories of growth, development, and learning into developmentally appropriate practice. A.one
2. Demonstrate knowledge of the interaction between maturation and environmental factors that influence physical, social, emotional, cognitive, and cultural domains in the healthy development of each child. A.two
3. Demonstrate knowledge of the significance of individual differences in development and learning.
4. Demonstrate knowledge of how certain differences may be associated with rate of development and developmental patterns associated with developmental delays and/or specific disabilities. A.three
5. Demonstrate knowledge of the similarities between children who are developing typically and those with diverse abilities. A.four
6. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years. A.seven

7. Demonstrate knowledge of the developmental sequence of language and literacy, including the influence of culture and home factors. A.eight
8. Demonstrate knowledge of how children acquire and use verbal, non-verbal, and alternative means of communication. A.nine
9. Demonstrate knowledge of the relationship among emotions, behaviors, and communication skills to assist children in identifying and expressing their feelings in appropriate ways. A.ten 1
10. Use appropriate guidance to support the development of self-regulatory capacities in young children. A.eleven

ECED 1115. Health, Safety, and Nutrition
2 Credits (2)
This course provides information related to standards and practices that promote children's physical and mental well-being sound nutritional practices, and maintenance of safe learning environments. It includes information for developing sound health and safety management procedures for indoor and outdoor learning environments for young children. The course examines the many scheduling factors that are important for children's total development, healthy nutrition, physical activity, and rest. May be repeated up to 2 credits.

Learning Outcomes

1. Recognize and respond to each child's physical health, intellectual and emotional well-being, and nutritional and safety needs. B.one
2. Articulate an understanding of indoor and outdoor learning environments that provide opportunities for children to put into practice healthy behaviors (physically, socially and emotionally). B.two
3. Use appropriate health appraisal and management procedures and makes referrals when necessary. B.three
4. Recognize signs of emotional distress, child abuse, and neglect in young children and use procedures appropriate to the situation, such as initiating discussions with families, referring to appropriate professionals,and, in cases of suspected abuse or neglect, reporting to designated authorities. B.four
5. Establish an environment that provides opportunities and reinforcement for children's practice of healthy behaviors that promote appropriate nutrition and physical and psychological well-being. B.five
6. Provide a consistent daily schedule for rest/sleep, as developmentally appropriate. B.six
7. Implement health care and educational activities for children and families based on health and a.nutritional information that is responsive to diverse cultures. B.seven
8. Assist young children and their families, as individually appropriate, in developing decision-making and interpersonal skills that enable them to make healthy choices and establish health-promoting behaviors. B.eight

ECED 1120. Guiding Young Children
3 Credits (3)
This course explores various theories of child guidance and the practical applications of each. It provides developmentally appropriate methods for guiding children and effective strategies and suggestions for facilitating positive social interactions. Strategies for preventing challenging behaviors through the use of environment, routines and schedule will be presented Emphasis is placed on helping children become self- responsible, competent, independent, and cooperative learners and including families as part of the guidance approach. May be repeated up to 3 credits.

Learning Outcomes

1. Apply knowledge of cultural and linguistic diversity and the significance of socio-cultural and political contexts for development and learning and recognize that children are best understood in the contexts of family, culture and society. A.six
2. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years. A.seven
3. Demonstrate knowledge of the relationship among emotions, behaviors, and communication skills to assist children in identifying and expressing their feelings in appropriate ways. A.ten
4. Use appropriate guidance to support the development of self-regulatory capacities in young children. A.eleven
5. Recognize and respond to each child's physical health, intellectual and emotional well-being, and nutritional and safety needs. B.one
6. Demonstrate knowledge and skill in building positive, reciprocal relationships with families. C.one
7. Demonstrate knowledge of and respect for variations across cultures, in terms of family strengths,expectations, values, and child-rearing practices. C.four
8. Demonstrate the ability to incorporate the families' desires and goals for their children into classroom or intervention strategies. C.seven
9. Demonstrate knowledge and skills in developmentally appropriate guidance techniques and strategies that provide opportunities to assist children in development positive thoughts and feelings about themselves and others through cooperative interaction with peers and adults. E.three 1
10. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.seven 1
11. Demonstrate knowledge of assessment techniques, interpretation of assessment information in the application of this

ECED 1125. Assessment of Children and Evaluation of Programs
3 Credits (3)
This basic course familiarizes students with a variety of culturally appropriate assessment methods and instruments, including systematic observation of typically and non-typically developing children. The course addresses the development and use of formative and summative assessment and evaluation instruments to ensure comprehensive quality of the total environment for children, families, and the community. Students will develop skills for evaluating the assessment process and involving other teachers, professionals and families in the process. May be repeated up to 3 credits.
Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H or ENGL 1110M).

Learning Outcomes

1. Demonstrate ability to choose valid tools that are developmentally, culturally, and linguistically appropriate; use the tools correctly; make appropriate referrals; and interpret assessment results, with the goal of obtaining valid, useful information to inform practice and decision making. F.one
2. Demonstrate knowledge of maintaining appropriate records of children's development and behavior that safeguard confidentiality and privacy. F.two
3. Demonstrate knowledge of the educator's role as a participating member of the assessment process as described and mandated by state and federal regulations for Individual family service plans (IFSP) and individual education plans (IEP). F.three

4. Demonstrate understanding of the influences of environmental factors, cultural/linguistic differences, and diverse ways of learning on assessment outcomes. F.four
5. Involve the family and, as appropriate, other team members in assessing the child's development, strengths, and needs in order to set goals for the child. F.five
6. Articulate an understanding of the distinctions and definitions of assessment concepts (e.g., screening, diagnostic assessment, standardized, testing, accountability assessment). F.six
7. Apply understanding of assessment concepts toward selection of appropriate formal assessment measures, critiquing the limitations of inappropriate measures, and discussing assessment issues as part of interdisciplinary teams. F.seven
8. Articulate an understanding that responsible assessment is legally and ethically grounded and guided by sound professional. It standards is collaborative and open with the goal of supporting diverse children and families. F.eight
9. Demonstrate knowledge of assessment techniques, interpretation of assessment information in the Application of this data to curriculum development and/or intervention planning. F.nine 1
10. Demonstrate knowledge of a variety of techniques and procedures to evaluate and modify program goals for young children and their families. F.ten 1
11. Demonstrate knowledge and use of program evaluation to ensure comprehensive quality of the total Environment for children, families, and the community. F.eleven 1
12. Use both self and collaborative evaluations as part of ongoing program evaluations. F.twelve

ECED 1130. Family and Community Collaboration
3 Credits (3)
This beginning course examines the involvement of families and communities from diverse cultural and linguistic backgrounds in early childhood programs. Ways to establishes collaborative relationships with families in early childhood settings is discussed. Families' goals and desires for their children will be supported through culturally responsive strategies. May be repeated up to 3 credits.
Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H or ENGL 1110M).
Learning Outcomes
1. Demonstrate knowledge and skill in building positive, reciprocal relationships with families. C.one
2. Articulate an understanding of a safe and welcoming environment for families and community members. C.two
3. Develop and maintain ongoing contact with families through a variety of communication strategies. C.three
4. Demonstrate knowledge of and respect for variations across cultures, in terms of family strengths, expectations, values, and child-rearing practices. C.four
5. Articulate understanding of the complexity and dynamics of family systems. C.five
6. Demonstrate understanding of the importance of families as the primary educator of their child. C.six
7. Involve families and community members in contributing to the learning environment. C.nine
8. Demonstrate ability to communicate to families the program's policies, procedures, and those procedural safeguards that are mandated by state and federal regulations. C.eleven
9. Apply knowledge of family theory and research to understand family and community characteristics including socioeconomic conditions; family structures, relationships, stressors, and supports (including the impact of having a child with diverse abilities); home language and ethnicity. C.twelve 1
10. Demonstrate knowledge of and skill to access community resources that assist families and contribute directly or indirectly to children's positive development such as mental health services, health care, adult education, English language instruction, and economic assistance. C.thirteen 1
11. Demonstrate effective written and oral communication skills when working with children, families, and early care, education, and family support professionals. E.fourteen 1
12. Demonstrate a commitment to leadership and advocacy for excellence in programs and services for young children and their families. G.six

ECED 2110. Professionalism
2 Credits (2)
This course provides a broad-based orientation to the field of early care and education. Early childhood history, philosophy, ethics and advocacy are introduced. Basic principles of early childhood systems are explored. Multiple perspectives on early care and education are introduced. Professional responsibilities such as cultural responsiveness and reflective practice are examined. May be repeated up to 2 credits.
Learning Outcomes
1. Recognize signs of emotional distress, child abuse, and neglect in young children and use procedures appropriate to the situation, such as initiating discussions with families, referring to appropriate professionals, and, in cases of suspected abuse or neglect, reporting to designated authorities. B.four
2. Demonstrate ability to communicate to families the program's policies, procedures, and those procedural safeguards that are mandated by state and federal regulations. C.eleven
3. Use both self and collaborative evaluations as part of ongoing program evaluations. F.twelve
4. Demonstrate ability to adhere to early childhood professional codes of ethical conduct and issues of confidentiality. G.one
5. Demonstrate awareness of federal, state, and local regulations, and public policies regarding programs and services for children birth through eight years of age. G.two
6. Demonstrate understanding of conditions of children, families, and professionals; the historical and current issues and trends; legal issues; and legislation and other public policies affecting children, families, and programs for young children and the early childhood profession. G.three
7. Demonstrate critical reflection of one's own professional and educational practices from community, state, national, and global perspectives. G.four
8. Demonstrate understanding of the early childhood profession, its multiple historical, philosophical, and social foundations, and how these foundations influence current thought and practice. G.five
9. Demonstrate knowledge in technology resources to engage in ongoing professional development. G.seven

ECED 2115. Introduction to Language, Literacy, and Reading
3 Credits (3)
This course is designed to prepare early childhood professionals for promoting children's emergent literacy and reading development. Through a developmental approach, the course addresses ways in which

early childhood professionals can foster young children's oral language development, phonemic awareness, and literacy problem solving skills, fluency, vocabulary, and comprehension. . This course provides the foundation for early childhood professionals to become knowledgeable about literacy development in young children. Instructional approaches and theory-based and research based strategies to support the emergent literacy and reading skills of native speakers and English language learners will be presented. May be repeated up to 3 credits.
Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H, or ENGL 1110M).

Learning Outcomes

1. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years. A.seven
2. Demonstrate knowledge of the developmental sequence of language and literacy, including the influence of culture and home factors. A.eight
3. Demonstrate knowledge of how children acquire and use verbal, non-verbal, and alternative means of communication. A.nine
4. Develop partnerships with family members to promote early literacy in the home. C.eight
5. Establish partnerships with community members in promoting literacy. C.ten
6. Demonstrate knowledge of the reading and writing components of emergent literacy at each developmental level. D.four
7. Provide and use anti-bias materials/literature and experiences in all content areas of the curriculum. D.seven
8. Create and manage a literacy-rich environment that is responsive to each child's unique path of development. E.nine
9. Use a variety of strategies during adult-child and child-child interactions and facilitate communication and dialogue of expressive language and thought. E.ten 1
10. Demonstrate a variety of developmentally appropriate instructional strategies that facilitate the development of literacy skills. E.eleven

ECED 2120. Curriculum Development through Play Birth through Age 4 (PreK)
3 Credits (3)
The beginning curriculum course places play at the center of curriculum in developmentally appropriate early childhood programs. It addresses content that is relevant for children birth through age four in developmentally and culturally sensitive ways of integrating content into teaching and learning experiences. Information on adapting content areas to meet the needs of children with special needs and the development of IFSPs is included. Curriculum development in all areas, including literacy, numeracy, the arts, health, science, social skills, and adaptive learning for children, birth through age four, is emphasized. Consent of instructor required. May be repeated up to 3 credits.
Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H or ENGL 1110M).
Corequisite: ECED 2121.

Learning Outcomes

1. Use appropriate guidance to support the development of self-regulatory capacities in young children. A.eleven
2. Demonstrate knowledge of relevant content for young children and developmentally appropriate ways of integrating content into teaching and learning experiences for children from birth to four years of age. D.one
3. Demonstrate the integration of knowledge of how young children develop and learn with knowledge of the concepts, inquiry tools, and structure of content areas appropriate for different developmental levels. D.two
4. Adapt content to meet the needs of each child, including the development of individualized family service plans (IFSP) or individualized education plans (IEP) for children with diverse abilities through the team process with families and other team members. D.six
5. Demonstrate knowledge of varying program models and learning environments that meet the individual needs of all young children, including those with diverse abilities. E.one
6. Create environments that encourage active involvement, initiative, responsibility, and a growing sense of autonomy through the selection and use of materials and equipment that are suitable to individual learning, developmental levels, diverse abilities, and the language and cultures in New Mexico. E.two
7. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four
8. Demonstrate understanding that each child's creative expression is unique and can be encouraged through diverse ways, including creative play. E.five
9. Plan blocks of uninterrupted time for children to persist at self-chosen activities, both indoors and outdoors. E.six 1
10. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.seven 1
11. Use and explain the rationale for developmentally appropriate methods that include play, small group projects, open-ended questioning, group discussion, problem solving, cooperative learning and inquiry experiences to help young children develop intellectual curiosity, solve problems, and make decisions. E.eight 1
12. Demonstrate a variety of developmentally appropriate instructional strategies that facilitate the development of emergent literacy skills. E.eleven 1
13. Demonstrate knowledge of assessment techniques, interpretation of assessment information in the application of this data to curriculum development of intervention planning. F.

ECED 2121. Curriculum Development through Play Birth through Age 4 (PreK) Practicum
2 Credits (2)
The beginning practicum course is a co-requisite with the course Curriculum Development through Play – Birth through Age 4. The field based component of this course will provide experiences that address curriculum content that is relevant for children birth through age four in developmentally and culturally sensitive ways of integrating content into teaching and learning experiences. Information on adapting content areas to meet the needs of children with special needs and the development of IFSPs is included. Curriculum development in all areas, including literacy, numeracy, the arts, health, science, social skills, and adaptive learning for children, birth through age four, is emphasized. Consent of instructor required. May be repeated up to 2 credits.
Prerequisite: ECED 1110 and (ENGL 1110G or ENGL 1110H or ENGL 1110M).
Corequisite: ECED 2120.

Learning Outcomes

1. Provide a variety of activities that facilitate development of the whole child in the following areas: Physical/motor, social/emotional, language/cognitive and adaptive/living skills. A.five
2. Develop, implement and evaluate an integrated curriculum that focuses on children's development and interests, using their language, home experiences, and cultural values. D.five
3. Provides and uses anti-bias materials and literature, and experiences in all content areas of the curriculum. D.seven
4. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four
5. Demonstrate understanding that each child's creative expression is unique and can be encouraged through diverse ways, including creative play. E.five
6. Plan blocks of uninterrupted time for children to persist at self-chosen activities, both indoors and outdoors. E.six
7. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.seven
8. Use and explain the rationale for developmentally appropriate methods that include play, small group projects, open-ended questioning, group discussion, problem solving, cooperative learning and inquiry experiences to help young children develop intellectual curiosity, solve problems, and make decisions. E.eight

ECED 2130. Curriculum Development and Implementation Age 3 (PreK) through Grade 3
3 Credits (3)

The curriculum course focuses on developmentally appropriate curriculum content in early childhood programs, age 3 through third grade. Development and implementation of curriculum in all content areas, including literacy, numeracy, the arts, health and emotional wellness, science, motor and social skills, is emphasized. Information on adapting content areas to meet the needs of children with special needs and the development of IEP's is included. Consent of instructor required. May be repeated up to 3 credits.

Prerequisite: ECED 1110, ECED 2120 and ECED 2121 (ENGL 1110G or ENGL 1110H or ENGL 1110M).

Corequisite: ECED 2131.

Learning Outcomes

1. Use appropriate guidance to support the development of self-regulatory capacities in young children. A.Eleven
2. Demonstrate the integration of knowledge of how young children develop and learn with knowledge of the concepts, inquiry tools, and structure of content areas appropriate for different developmental levels. D.Two
3. Demonstrate knowledge of what is important in each content area, why it is of value, and how it links with early and later understandings within and across areas. D.Three
4. Demonstrate knowledge of the language, reading and writing components of emergent literacy at each developmental level. D.Four
5. Adapt content to meet the needs of each child, including the development of individualized family service plans (IFSP) or individualized education plans (IEP) for children with diverse abilities through the team process with families and other team members. D.Six
6. Demonstrate knowledge of varying program models and learning environments that meet the individual needs of all young children, including those with diverse abilities. E.One
7. Create environments that encourage active involvement, initiative, responsibility, and a growing sense of autonomy through the selection and use of materials and equipment that are suitable to individual learning, developmental levels, diverse abilities, and the language and cultures in New Mexico. E.Two
8. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.Four
9. Demonstrate understanding that each child's creative expression is unique and can be encouraged through diverse ways, including creative play. E.Five 1
10. Plan blocks of uninterrupted time for children to persist at self-chosen activities, both indoors and outdoors. E.Six 1
11. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.Seven 1
12. Demonstrate knowledge of developmentally appropriate uses of technology, including assistive technology. E.Twelve 1
13. Demonstrate knowledge of assessment techniques, interpretation of assessment information in the application of this data to curriculum development of intervention planning. F.Nine

ECED 2131. Curriculum Development and Implementation Age 3 (PreK) through Grade 3 Practicum
2 Credits (2)

The beginning practicum course is a co-requisite with the course Curriculum Development and Implementation: Age 3 through Grade 3. The field based component of this course will provide experiences that address developmentally appropriate curriculum content in early childhood programs, age 3 through third grade. Development and implementation of curriculum in all content areas, including literacy, numeracy, the arts, health and emotional wellness, science, motor and social skills is emphasized. Information on adapting content areas to meet the needs of children with special needs and the development of IEPs is included. Consent of instructor required. May be repeated up to 2 credits.

Prerequisite: ECED 1110 (ENGL 1110G or ENGL 1110H or ENGL 1110M), ECED 2120, and ECED 2121.

Corequisite: ECED 2130.

Learning Outcomes

1. Provide a variety of activities that facilitate development of the whole child in the following areas: Physical/motor, social/emotional, language/cognitive and adaptive/living skills. A.Five
2. Develop, implement and evaluate an integrated curriculum that focuses on children's development and interests, using their language, home experiences, and cultural values. D.Five
3. Provides and uses anti-bias materials and literature, and experiences in all content areas of the curriculum. D.Seven
4. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.Four
5. Demonstrate understanding that each child's creative expression is unique and can be encouraged through diverse ways, including creative play. E.Five

6. Plan blocks of uninterrupted time for children to persist at self-chosen activities, both indoors and outdoors. E.Six
7. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.Seven
8. Use and explain the rationale for developmentally appropriate methods that include play, small group projects, open-ended questioning, group discussion, problem solving, cooperative learning and inquiry experiences to help young children develop intellectual curiosity, solve problems, and make decisions. E.Eight

ECED 2140. Effective Program Development for Diverse Learners and their Families
3 Credits (3)
This course addresses the role of a director/administrator in the implementation of family-centered programming that includes individually appropriate and culturally responsive curriculum in a healthy and safe learning environment for all children and their families. May be repeated up to 3 credits.
Learning Outcomes
1. Describe important aspects of leadership that an administrator in an early childhood setting must demonstrate.
2. Identify and describe ways in which classrooms can have a multicultural environment.
3. Observe a classroom and identify, using photographs good practice with classroom environment.
4. Describe important aspects of a good early childhood curriculum
5. Describe how culture and socioeconomic factors influence classroom environment.

ECED 2141. Effective Program Development for Diverse Learners and their Families Practicum
2 Credits (2)
Provides opportunities for students to apply knowledge gained from Curriculum for Diverse Learners and their Families in a practicum setting. Consent of instructor required. Restricted to ECED majors. May be repeated up to 2 credits.
Corequisite: ECED 2140.
Learning Outcomes
1. Describe the requirements to maintain and enhance the physical and mental health, safety, and nutrition components of a program: Demonstrate knowledge of facility management to include evaluation, maintenance, security, and meeting applicable codes; Demonstrate knowledge of planning for appropriate indoor and outdoor environments; Identify ways to support early childhood educators in the selection of appropriate materials and equipment for the environment; Demonstrate knowledge of the impact of the environment on children's learning and development.
2. Demonstrate knowledge of early care and education curriculum that is individually, culturally, linguistically, and developmentally responsive: Describe a variety of curriculum goals and teaching strategies; Describe the importance of ongoing curriculum assessment and planning, and collaboration with teachers, families and community entities; Identify ways to support early childhood educators in curriculum assessment and planning.
3. Demonstrate knowledge of family/community involvement in effective program development: Describe the importance of supporting families as partners in early care and education program development; Describe both informal and formal communication systems with families that encourage information sharing and joint decision making; Identify strategies for resolving conflicts and supporting families with diverse backgrounds and parenting expectations; Identify the range of family needs including transitional periods; Identify within the community the network to support families with their special needs; Describe a "family friendly" inclusive philosophy
4. Demonstrate knowledge of a director's role as an educational leader in an inclusive setting: Describe what a director does in supporting the instructional component of the program for children, staff, and families; Identify resources that a director might use to keep current with information relating to the instructional component of the program; Describe ways to involve teachers in instructional decision making.

ECED 2215. Program Management
3 Credits (3)
This course emphasizes the technical knowledge necessary to develop and maintain an effective early care and education program. It focuses on sound financial management and vision, the laws and legal issues that affect programs, and state and national standards such as accreditation. Consent of instructor required. May be repeated up to 3 credits.
Learning Outcomes
1. Develop a comprehensive program philosophy.
2. Demonstrate the ability to develop systems that are effective for quality program operation.
3. Create a program budget and understand the Income and Expense sides and what affects each part.
4. Model best practices that integrate various leadership styles.

ECED 2280. Professional Relationships
3 Credits (3)
This course addresses staff relations that will foster diverse professional relationships with families, communities and boards. Topics of staff recruitment, retention, support and supervision will lay the foundation for positive personnel, family and community relationships. Consent of instructor required. May be repeated up to 3 credits.
Corequisite: ECED 2281.
Learning Outcomes
1. Interview an administrator and write a paper describing personnel management, staff support, supervision, and professional development.
2. Identify and describe ethical and legal requirements in maintaining a professional relationship with subordinates, the community, clients, and fellow administrators.
3. Identify and describe technologies which may be used in an early childhood setting.
4. Identify and describe legal and ethical considerations in the employment of others.

ECED 2281. Professional Relationships Practicum
2 Credits (2)
Practical experience in the development of staff relationship that will foster professional relationships with families, communities and boards. Issues of staff recruitment, retention, support and supervision will lay a foundation for positive personnel management. Consent of instructor required. Restricted to ECED majors.
Corequisite(s): ECED 2280.
Learning Outcomes
1. Demonstrate knowledge of personnel management, staff support, supervision, and professional development within a diverse and inclusive organization: Describe methods for recruiting and retaining a diverse staff; Describe job descriptions for each position; Review

a sampling of personnel policies and procedures; Review a variety of staff handbooks; Explain why on-going system of supervision should include regular meetings for professional goal setting, self-assessment, and feedback; Review program needs to effectively manage the work of the program including scheduling, covering ratios, initial orientation, in-service, staff meeting, etc.

2. Demonstrate an awareness of appropriate communication and collaboration skills: Improve written and oral communication skills; Describe strategies for resolving conflicts; Explain how to promote consensus building as a decision making process.
3. Demonstrate knowledge that promotes effective professional relationships with families, communities, and board members: Describe methods for demonstrating respect, understanding, and appreciation for all people; Identify the aspects of culture that facilitate relationship building among people; Describe how to build a common vision and develop long range program plans with parents, staff, board, and the community; Communicate program goals to visitors, prospective parents, volunteers, and board members; Describe how public relations and marketing strategies can impact programs; Review assessment tools that identify needs for early care, education and family support; Develop a personal professional development plan; Describe methods to work effectively with a board and advisory group.
4. Demonstrate knowledge of technology uses and skill acquisition: Describe how to use technology resources to engage in ongoing professional development and lifelong learning; Describe how you will use technology to communicate and collaborate in your leadership role

ECED 3110. Research in Child, Growth, Development and Learning
3 Credits (3)
This advanced course in child growth, development, and learning builds upon the foundational material covered in the basic course in child growth, development, and learning. An integration of major theories of child development is provided by focusing on contemporary research in all aspects of development, including bio-ecological, social-affective, cognitive, language, and the methodological aspects of research in early childhood development and education. Restricted to ECED majors (TEP and Zero-to-Four) and ECED minors. May be repeated up to 3 credits.
Prerequisite: ECED 1110;.
Learning Outcomes

1. Incorporate understanding of developmental stages, processes and theories of growth, development, and learning into developmentally appropriate practice. (I.A)
2. Demonstrate knowledge of the interaction between maturation and environmental factors that influence physical, social, emotional, cognitive, and cultural domains in the healthy development of each child

ECED 3120. Family, Language, and Culture
3 Credits (3)
This course analyzes the interrelationships between family, language, and culture as connected to children's development and learning. In this course, language is understood as a human activity and higher mental process which build on the children's families, community, and cultural background. Restricted to: ECED majors (TEP and Zero-to-Four) and ECED minors.
Prerequisite: ECED 1130.
Corequisite: ECED 3110, ECED 4110, ECED 4120.
Learning Outcomes

1. Apply knowledge of cultural and linguistic diversity and the significance of socio-cultural and political contexts for development and learning and recognize that children are best understood in the contexts of family, culture, and society.
2. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years.

ECED 3210. Emergent Literacy
3 Credits (3)
This advanced course is designed to prepare early childhood professionals to study literacy development, specifically oral language, writing and reading. This course focuses on children from birth through age 4, including children with special needs. Through a developmental approach, the course addresses: 1) recent theory and research that translates into practical strategies, assessment materials and preparation of rich literacy environments, 2) the socio-cultural contexts in which children develop literacy, 3) culturally, linguistically and developmentally appropriate literacy curricula, 4) processes used to determine the appropriateness of various literacy strategies, 5) assessment, evaluation, and accountability and 5) literacy leadership. Restricted to: Zero-to-Four majors. May be repeated up to 3 credits.
Prerequisite: ECED 2115.
Learning Outcomes

1. Demonstrate knowledge of the developmental sequence of language and literacy, including the influence of culture and home factors. A. eight
2. Knowledge of how children acquire and use verbal, non-verbal and alternative means of communication. A. nine
3. Develop partnerships with family members to promote early literacy in the home. C. eight
4. Establish partnerships with community members in promoting literacy. C.ten
5. Knowledge of the language, reading and writing components of emergent literacy at each developmental level. D. four
6. Create and manage a literacy-rich environment that is responsive to each child's unique path of development. E. nine
7. Use a variety of language strategies during adult-child and child-child interactions and facilitate dialogue of expressive language and thought. E. ten
8. A variety of developmentally appropriate instructional strategies that facilitate the development of emergent literacy skills. E. eleven
9. Demonstrate and facilitate conceptual understanding of family roles in the development of their infant and toddler, including support for family acquisition of knowledge concerning infant and toddler's growth, learning and development and cultural and linguistic diversity represented within the home setting. H. one 1
10. Apply theoretical knowledge f and ability to provide screening and assessment unique for infants and toddlers. H. two 1
11. Articulate and demonstrate conceptual understanding of respectful, responsive, and reciprocal interactions that serve as basis for infant/toddler curriculum and learning environments. H. five 1
12. An understanding and applications of flexible teaching approaches that span a continuum from child-initiated to adult-directed and from free exploration to scaffolded support or teacher modeling. I. three 1
13. Link child characteristics, needs, and interests with informal opportunities to build children's language, concept development, and skills. I. five 1

14. Establish priorities for high-quality and meaningful language and pre-literacy experiences across the developmental continuum, using language, pre-reading and pre-writing to facilitate skill development while strengthening children's cultural identity. I. eleven 1
15. Knowledge of second- language acquisition and bilingualism including the diversity of home language environments. I. tweleve Conceptual knowledge of the principles and standards derived from professional organizations for curriculum decision- making. I. fifteen

ECED 3996. Special Topics
1-3 Credits (1-3)
Each course will be identified by a qualifying subtitle. A maximum of 3 credits in any one semester and a grand total of 6 credits. May be repeated up to 6 credits.
Learning Outcomes
1. Engage in the study of an ECED topic.

ECED 4110. Young Children with Diverse Abilities
3 Credits (3)
Addresses competencies for working with young children with exceptionalities, ages three-eight, and their families. Public school, private school, Head Start and other models are included. Taught with ECED 5110. Restricted to ECED majors (TEP and Zero-to-Four) and ECED Minors. May be repeated up to 3 credits.
Prerequisite: SPED 3105.
Corequisite: ECED 4120.
Learning Outcomes
1. Demonstrate knowledge of the significance of individual differences in development and learning.
2. Demonstrate knowledge of how certain differences may be associated with rate of development and developmental patterns associated with developmental delays or specific disabilities.
3. Demonstrate knowledge of the similarities between children who are developing typically and those with diverse disabilities.

ECED 4120. Assessment of Young Children, Birth-Eight
3 Credits (3)
Covers instruments and procedures for assessing young children and their families in order to determine atypical development. Screening, diagnosis, program planning, placement and evaluation issues are covered. Restricted to ECED Majors (TEP and Zero-to-Four) and ECED Minors.
Prerequisite: SPED 3105.
Corequisite: ECED 3110, ECED 3120, ECED 4110.
Learning Outcomes
1. Understand the technical aspects of early childhood assessments.
2. Conduct and utilize assessments.
3. Collaborate with other professionals.

ECED 4210. Integrated Early Childhood Curriculum
4 Credits (4)
This advanced course focuses on developmentally appropriate content, learning environments, and curriculum implementation for children birth through age 4. It emphasizes integration of content areas (the arts, literacy, math, health/emotional wellness, science, social studies, motor, and adaptive living skills) and the development of rich learning environments for infants, toddlers, and preschool children. Restricted to: Zero-to-Four majors. May be repeated up to 4 credits.
Prerequisite: ECED 1115, ECED 2120, ECED 2121, ECED 2130, ECED 2131, ECED 2110, and ECED 1120.
Corequisite: ECED 4211.
Learning Outcomes
1. Develop, implement and evaluate an integrated curriculum that focuses on children's development and interests, using their language, home experiences, and cultural values. D.five
2. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four

ECED 4211. Integrated Curriculum Practicum
2 Credits (2)
The advanced practicum course is a field based course that will provide opportunities for the integration of content areas (the arts, literacy, math, health/emotional wellness, science, social studies, motor, and adaptive living skills) and the development of rich learning environments for infants, toddlers, and preschool children. Restricted to Zero-to-Four majors. May be repeated up to 2 credits.
Prerequisite: ECED 1115, ECED 2120, ECED 2121, ECED 2130, ECED 2131, ECED 2110, ECED 1120.
Corequisite: ECED 4210.
Learning Outcomes
1. Develop, implement and evaluate an integrated curriculum that focuses on children's development and interests, using their language, home experiences, and cultural values. D.five
2. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four
3. Demonstrate understanding of the influence of the physical setting, schedule, routines, and transitions on children and use these experiences to promote children's development and learning. E.seven
4. Use and explain the rationale for developmentally appropriate methods that include play, small group projects, open-ended questioning, group discussion, problem solving, cooperative learning and inquiry experiences to help young children develop intellectual curiosity, solve problems, and make decisions. E.eight
5. Demonstrate an understanding and application of flexible teaching approaches that span a continuum from child-initiated to adult-directed and from free exploration to scaffolded support or teacher modeling. I.three

ECED 4220. Advanced Caregiving for Infants and Toddlers
3 Credits (3)
The advanced field-based course is intended to assist students to define and implement advanced elements of quality programming for all infants, toddlers in safe, healthy, responsive caring environments. The experiences in the approved setting will support strong nurturing relationships, cultural competence, diverse learning needs and styles of every child, appropriate guidance techniques and partnership with the families, cultures, and community represented. Students are assisted through the course in advancing their ability to observe, discuss, and implement elements of quality programming for infants and toddlers in home, small-group or whole-group care situations. Restricted to: Zero-to-Four majors. May be repeated up to 3 credits.
Prerequisite: ECED 2120 and ECED 2121; ECED 2130 and ECED 2131.
Learning Outcomes
1. The primary goal of your participation in this course is to develop an increased understanding of infant/toddler (Birth through age three) development and developmentally appropriate care/education practices.

ECED 4250. Teaching and Learning Math and Science
4 Credits (4)
Standards, principles, and practices in teaching mathematics and science to young children in preschool through grade 3. An emphasis is placed on developing a content-rich integrated math and science curriculum that focuses on children's development and interests, includes appropriate content, processes, environment, and materials with an emphasis on problem-solving as the major means of constructing basic concepts. Field experience required. Restricted to: TEP-ECED majors.
Corequisite: ECED 4310, ECED 4260, ECED 4320.
Learning Outcomes

1. The arithmetic of real numbers and their subsets of rational numbers, integers, and whole numbers including a large repertoire of interpretations of the four basic operations and ways they can be applied, and an understanding of place value and its implications for ordering numbers and estimation.
2. Three dimensional geometry based on the concept of distance, and two dimensional geometry as a method of drawing plans and representing three dimensional objects.
3. Measurement of length, perimeter, area, time, weights, and temperature.
4. Handling money problems such as cost and unit price.
5. Demonstrate understanding and skill in the constructions of solids, measurements of their volumes and surface areas, drawing their projections, and making plans for their construction; defining relevant variables and writing formulas describing their relationships in problem-solving activities; and using measurement tools and appropriate techniques for recording data and displaying results.
6. Facilitate curriculum with open-ended activities that promote children's expansion of the material learned, and in which children learn to use a variety of mathematical skills and concepts, including problem solving, reasoning, and logic.
7. Provide opportunities for children to learn how to use tools, technology, and manipulatives in problem solving.
8. Establish a classroom environment of respect for cultural diversity and gender equity in which all children develop skills in communicating, discussing, and displaying mathematical ideas.
9. Demonstrate understanding and apply the fundamental concepts in the subject matter of science including physical, life, and earth and space sciences as well as concepts in science and technology, science in personal and social perspectives, the history and nature of science, the unifying concepts of science, and the inquiry process scientists use in discovery of new knowledge to build a base for scientific inquiry. 1
10. Apply the scientific method to develop children's abilities to identify and communicate a problem, and to design, implement, and evaluate a solution. 1
11. Demonstrate the ability to integrate a variety of technologies into planned science activities. 1
12. Establish a classroom environment of respect for cultural diversity and gender equity where all children participate fully in science learning and support play in young children's learning and development from age Pre-K-grade three. 1
13. Demonstrate sound knowledge and skills in using technology as a teaching and learning tool. 1
14. Demonstrate the ability to analyze and critique early childhood curriculum experiences in terms of the relationship of the experiences to the research base and professional standards. 1
15. Facilitate family involvement so that families are engaged with curriculum planning, assessing of children's learning, and planning for children's transitions to new programs. 1
16. Demonstrate conceptual knowledge of the principles and standards derived from professional content organizations (zero to three, NAEYC, DEC) for curriculum-decision making. 1
17. Demonstrate the use of reflective practice.

ECED 4260. Teaching and Learning Social Studies, Fine Arts and Movement
3 Credits (3)
The course focuses on the aims, scope, and integration of methods of teaching social studies, the fine arts and movement across the curriculum. This course emphasizes an integrated approach to teaching the what and why of social studies; assessing student learning; planning units, lessons, and activities; effective instructional strategies; and knowledge of social studies content. Concepts of expressive art include the visual arts, music, movement and drama. Restricted to: TEP-ECED majors.
Corequisites: ECED 4310, ECED 4250, ECED 4320.
Learning Outcomes

1. Demonstrate an understanding of the principles of teaching and learning processes that underscore social studies concepts and can translate these into meaningful learning activities focusing on inquiry, authenticity, and collaboration.
2. Demonstrate understanding that social studies encompass history, geography, anthropology, archeology, economics, political science, psychology, sociology, and the interdisciplinary relationship of all facets of social studies.
3. Demonstrate understanding that the definition of social studies requires that children be socially aware of and are active participants in local, state, national, and global issues; and that children recognize and respect diverse local and global perspectives concerning cultures other than their own.
4. Implement a variety of teaching strategies to assist children to use multiple resources including primary (documents, artifacts/regalia, direct observation, human resources, personal background) and secondary (e.g., books, newspapers, internet) as part of the inquiry/research process.
5. Create curriculum experiences that provide opportunities for children to appreciate the historical development of democratic values, institutions, nations, and cultures.
6. Demonstrate the ability to plan for and engage children in activities that require them to formulate, analyze, synthesize, and critique issues by using well-reasoned, clearly supported arguments, policies, and positions.
7. Demonstrate the ability to plan for and engage children in the presentation of social studies knowledge using a variety of sign systems including writing, charts, graphs, maps, art, music, drama, dance, and technology.
8. Demonstrate an understanding and implementation of arts activities such as history, art making, appreciation, and criticism through dance, music, theater, and the visual arts, appropriate to young children's developmental levels interests.
9. Demonstrate knowledge of the distinctions, connections, and integration between arts disciplines and arts experiences and encourages study and active participation that leads to skill development and appreciation. 1
10. Facilitate curriculum in which children communicate at a basic level in the four (4) art disciplines of dance, music, theater, and

visual arts, including knowledge and skills in the use of basic vocabularies, materials, tools, techniques, and thinking processes of each discipline. 1

11. Create a classroom environment with exemplary works of art from a variety of cultures and historical periods and provide opportunities for students to discuss and respond to them.1
12. Demonstrate an understanding of motor skill development in young children and apply knowledge of age and developmentally appropriate psychomotor and cognitive activities. 1
13. Create and use appropriate instructional cues and prompts for motor skills, rhythms, and physical activity. 1
14. Apply an understanding of child development knowledge coupled with child performance data to make informed instructional decisions. 1
15. Support play in young children's learning and development from age Pre-K - grade three. 1
16. Demonstrate sound knowledge and skills in using technology as a teaching and learning tool. 1
17. Demonstrate the ability to analyze and critique early childhood curriculum experiences in terms of the relationship of the experiences to the research base and professional standards. 1
18. Facilitate family involvement so that families are engaged with curriculum planning, assessing of children's learning, and planning for children's transitions to new programs. 1
19. Demonstrate conceptual knowledge of the principles and standards derived from 139 professional content organizations (zero to three, NAEYC, DEC) for curriculum decision making. 2
20. Demonstrate the use of reflective practice.

ECED 4310. Early Primary Field Placement
2 Credits (4P)
The field practicum is a co-requisite course with Teaching and Learning Reading and Writing; Teaching and Learning Math and Science; Teaching and Learning Social Studies, Fine Arts and Movement. The field based component will provide experiences that address curriculum content and practice teaching that is relevant for early primary children in developmentally and culturally sensitive ways. Graded: S/U Grading (S/U, Audit). Restricted to: TEP-ECED majors. May be repeated up to 2 credits.
Corequisite: ECED 4250, ECED 4260, ECED 4320.
Learning Outcomes

1. Demonstrate the ability to work collaboratively with educational assistants, volunteers, and others to individualize the curriculum and to meet program goals.
2. Demonstrate skill in collaboration with professionals from other disciplines (e.g., mental health, psychology, speech and language) when planning curriculum and teaching strategies for young children with diverse abilities.
3. Demonstrate an understanding and application of flexible teaching approaches that span a continuum from child-initiated to an adult-directed and from free exploration to scaffolded support or teacher modeling.
4. Apply an understanding of young children's need for balance, order, depth, variety, and challenge through curriculum planning, routines, and scheduling (e.g., daily, weekly, and longer-term).
5. Link child characteristics, needs, and interests with informal opportunities to build children's language, concept development, and skills.
6. Apply knowledge to create environments that enrich and extent children's play including intervention strategies (i.e., questioning), respect of cultural diversity and gender equity. Support play in young children's learning and development from age Pre-K - grade three.
7. Demonstrate the ability to promote positive social interactions and engage children in learning activities while actively working to increase social and emotional competence of all children.
8. Demonstrate the ability to analyze and critique early childhood curriculum experiences in terms of the relationship of the experiences to the research base and professional standards.
9. Facilitate family involvement so that families are engaged with curriculum planning, assessing of children's learning, and planning for children's transitions to new programs. 1
10. Demonstrate conceptual knowledge of the principles and standards derived from professional content organizations (zero to three, NAEYC, DEC) for curriculum-decision making. Demonstrate the use of reflective practice.

ECED 4320. Teaching and Learning Reading and Writing
3 Credits (3)
The foundation of this course is on understanding the reading process including the relationship between reading, writing, listening, and speaking; individual needs and abilities in reading instruction; and how to organize classrooms and select materials to support literacy development. Concepts of phonemic awareness, phonic instruction, vocabulary development, fluency and comprehension are integrated with the developmentally appropriate use of authentic assessment techniques, language/literacy immersion, and multicultural children's literature. Restricted to: TEP-ECED majors.
Prerequisite: ECED 2115.
Corequisite: ECED 4310, ECED 4250, ECED 4260.
Learning Outcomes

1. This course will focus on the following New Mexico early childhood teacher education competencies and New Mexico State University's conceptual framework for teacher preparation.
2. Articulate an understanding of developmental theories and processes and their implications for appropriate methods of teaching reading in the K-third grade classroom.
3. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework.
4. Provide and use anti-bias literacy materials and experiences, including primary language materials.
5. Plan appropriate whole group, small group, and individual activities that include appropriate accommodations for working with children with special needs.
6. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer.
7. Understand the role of family in literacy development.
8. Respect and promote the use of the child's home language for learning.
9. Demonstrate knowledge of, and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need. 1
10. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society. Our focus will be on rigorous inquiry about literacy education in U.S. schools and methods of literacy instruction. We will be examining how invisible cultural, historical, political, and social contexts have influenced and continue to influence teachers and schools. In your observations of reading and literacy education in your field experience it is critical that you become aware of these

subtle but pervasive influences. To achieve this, we will focus our inquiry this semester on the following questions: What is literacy in early childhood education? ; Is that different from literacy outside of school?; How do young children use and pursue literacy? How do I promote literacy for all the children with whom I work?

ECED 4810. Student Teaching/Seminar Early Childhood
3 Credits (3)
Discussion of early childhood school issues related to student teaching.
Corequisite(s): SPED 4810.
Learning Outcomes
1. Synthesis of knowledge and skills appropriate to teaching in PreK - 3rd grade educational settings.

ECED 4996. Topics
3 Credits (3)
Offered under various subtitles which indicate the subject matter to be covered. May be repeated up to 9 credits.
Learning Outcomes
1. Engage in the study of an ECED topic.

ECED 4998. Field Experience (Infants Pre-K)
1 Credit (1)
Supervised field experiences in early childhood settings: infants, toddlers, and pre-K programs. May be repeated up to 1 credit.
Learning Outcomes
1. Engage in an ECED field experience.

ECED 5110. Working with Young Children with Special Needs, Ages 3-8
3 Credits (3)
Addresses competencies for working with young children with exceptionalities, ages three eight, and their families. Public school, private school, Head Start and other models are included. Taught with ECED 4110 with differentiated assignments for graduate students. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate knowledge of the significance of individual differences in development and learning.
2. Demonstrate knowledge of how certain differences may be associated with rate of development and developmental patterns associated with developmental delays or specific disabilities. A.three
3. Demonstrate knowledge of the similarities between children who are developing typically and those with diverse disabilities. A.four
4. Demonstrate knowledge of how children acquire and use verbal, non-verbal, and alternative means of communication. A.nine
5. Demonstrate understanding of the importance of families as the primary educator of their child. C.six
6. Demonstrate the ability to incorporate the families' desires and goals for their children into classroom or intervention strategies. C.seven
7. Demonstrate ability to communicate to families the program's policies, procedures, and those procedural safeguards that are mandated by state and federal regulations. C.eleven
8. Apply knowledge of family theory and research to understand family and community characteristics including socioeconomic conditions, family structures, relationships, stressors, and supports (including the impact of having a child with divers abilities), home language, and ethnicity. C.tweleve
9. Adapt content to meet the needs of each child, including the development of individualized family service programs (IFSP) or individualized education programs (IEP) for children with diverse abilities through the team process with families and other team members. D.six 1
10. Create environments that encourage active involvement, initiative, responsibility, and a growing sense of autonomy through the selection and use of materials and equipment that are suitable to individual learning, developmental levels, diverse abilities, and the language and cultures in New Mexico. E.two 1
11. Create and manage inclusive learning environments that provide individual and cooperative opportunities for children to construct their own knowledge through various strategies that include decision-making, problem solving, and inquiry experiences. E.four 1
12. Demonstrate knowledge of developmentally appropriate uses of technology, including assistive technology. E.tweleve 1
13. Demonstrate knowledge of maintaining appropriate records of children's development and behavior that safeguards confidentiality and privacy. F.two 1
14. Demonstrate knowledge of the educator's role as a participating member of the assessment process as described and mandated by state and federal regulations for individual family service programs (IFSP) and individual service programs (IEP). F.three 1
15. Articulate an understanding that responsible assessment is legally and ethically grounded and guided by sound professional standards. It is collaborative and open with the goal of supporting diverse children and families. F.eight 1
16. Demonstrate knowledge of a variety of techniques and procedures to evaluate and modify program goals for young children and their families. F.ten 1
17. Demonstrate ability to work collaboratively as an advocate with families and IFSP and IEP team members to provide developmentally supportive environments. H.three 1
18. Demonstrate content knowledge (e.g., art, music, movement, science, math, literacy, social studies, and technology) and familiarity with a wide variety of resources in academic disciplines and apply that knowledge in the development, implementation, and evaluation of curriculum. I.one

ECED 5120. Assessment of Young Children, Birth Eight
3 Credits (3)
Covers instruments and procedures for assessing young children and their families in order to determine atypical development. Screening, diagnosis, program planning, placement and evaluation issues are covered. Same as ECED 4120. May be repeated up to 3 credits.
Prerequisite: ECED 5110 or consent of instructor.
Learning Outcomes
1. UNDERSTAND THE TECHNICAL ASPECTS OF EARLY CHILDHOOD ASSESSMENTS -Define and understand the benefits and concerns of assessment, types of assessment, and best practices for early childhood assessments and their targeted populations.
2. CONDUCT AND UTILIZE ASSESSMENTS- Demonstrate proficiency in using a variety of assessment tools to: screen children; assess current skill levels; determine strengths and weaknesses; supplement assessments when warranted; and incorporate data for instructional plans.
3. COLLABORATE WITH OTHER PROFESSIONALS – Utilize transdisciplinary practices with all vested participants when conducting screenings, evaluations, and making recommendations.
4. COLLABORATE WITH FAMILIES- Demonstrate proficiency in obtaining information from parents about their expectations, needs, and priorities when assessing and making early childhood instructional recommendations.

5. EVALUATE PROGRAMS- Implement best practices in program design, advocate for children's services, and articulate/safeguard student IFSP/IEPs according to each child's developmental needs.

ECED 5130. Working with Parents of Young Children
3 Credits (3)
Techniques for setting up home and classroom visitations, communicating with parents, and establishing special programs. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate a deep understanding of the theory, philosophy and goals of multicultural education
2. Develop a knowledge base of the essential concepts to address language, culture, class, gender, and exceptionalities within the theoretical constructs of multicultural education.
3. Develop a personal and social astuteness to the characteristics of culturally, linguistically, and ethnically distinct students while keeping in mind the uniqueness of their persona within a contextually rich school and community milieu.
4. Explore multicultural education strategies that well enhance one's future pedagogical repertoire.
5. Provide learning opportunities to develop multicultural and cross-cultural perspectives for application into future learning environments.
6. Develop an active sense of commitment to collaborative efforts in order to best meet our goals as committed learners and educators who will teach with and facilitate multicultural curriculum in a variety of pluralistic settings.
7. Develop an array of perspective skills in order to accommodate the dynamics of culture change, pluralism, cultural sensitivity, and cultural democracy that occur within classrooms.
8. Demonstrate growth in the dispositions identified in the "Teacher Candidate Disposition" document.

ECED 5210. Leadership and Advocacy in Early Childhood
3 Credits (3)
The course explores a multidisciplinary approach to early childhood educational leadership, advocacy and change. The course focuses on leadership in its many forms: in teaching, administration, policy, research, and ethics. In addition, we will examine the theory and practice of change to gain an understanding of what contributes to advocating for policy and community change. Students will gain a deeper understanding of themselves as leaders, and ways to improve early education to promote social justice in programs and systems serving families and young children. May be repeated up to 3 credits.
Learning Outcomes
1. Examine and evaluate a multidisciplinary approach to early childhood educational leadership.
2. Examine leadership in its many forms: in teaching, administration, policy, research, and ethics.
3. Utilize theory and practice of advocacy leadership for policy and community change.
4. Develop a statement of leadership philosophy.

ECED 5220. Play in the Early Childhood Curriculum
3 Credits (3)
Advanced exploration of the development of curriculum based on children's play. A means of exploring and learning the patterns of human living, communications, and experiences congruous with developing interests and capacities. Restricted to majors. May be repeated up to 3 credits.
Learning Outcomes
1. Incorporate understanding of play stages, development, and theories of play in early childhood education into developmentally appropriate practice. (I.A)
2. Demonstrate knowledge of the different types of play (sociodramatic, constructive, rough tumble, games with rule) and their uses in classrooms to promote learning. (I.B)
3. Demonstrate knowledge of the significance of guiding young children's play to enhance learning in early childhood classrooms. (I.C)
4. Demonstrate knowledge of social influences on play and young children's development of gender identity. Provide and use anti-bias materials and experiences in all areas of the curriculum. (I.D)
5. Provide a variety of play activities that facilitate development of the whole child in all areas, physical/motor, social/emotional, language/cognitive and adaptive/living skills. (I.E)
6. Apply knowledge of cultural and play diversity and the significance of socio-cultural political contexts for development and learning and recognize that children are best understood in the contexts of family, culture, and society. (I.F)
7. Demonstrate knowledge of the many functions play serves in the cognitive, social, and emotional aspects of development in the formative years.
8. Develop and demonstrate skills in selecting quality play activities for young children. (I.G)
9. Demonstrate knowledge of the developmental sequences of play development, including the influence of culture and home factors. (I.H) 1
10. Demonstrate knowledge of how young children acquire and use technology play to promote learning. (I.I) 1
11. Demonstrate knowledge of how play is used to support standards and assessment in early childhood education. (I.J)

ECED 5230. Curriculum in Early Childhood Education
3 Credits (3)
Development and implementation of curriculum and materials for teaching young children. May be repeated up to 3 credits.
Learning Outcomes
1. Understand and implement appropriate ECED curriculum.

ECED 5310. Issues in Early Childhood Education
3 Credits (3)
Examines current trends and problems through readings of theoretical, empirical, and applied literature. May be repeated up to 3 credits.
Learning Outcomes
1. Examine the foundations of literacy development in early childhood.
2. Analyze sociocultural and critical perspectives in early literacy research, theory, and practice.
3. Apply grounded perspectives on topical issues in literacy development in early childhood.
4. Evaluate the literacies embedded in your own teaching/learning and the ones embedded in the communities in which they work.
5. Create sound theoretical and methodological frameworks in an early literacy project. Identify and use various genres in children's literature.

ECED 5410. Seminar on Child Development, Assessment and Well-being of Young Children
3 Credits (3)
This course will reintroduce you to the world of young children in a variety of early childhood settings. It focuses on early childhood development, observation of young children and evaluation of classrooms, child well-being, and the many ways in young children learn. Sessions will bridge theory to practice as we explore your internship experiences and gain deeper understanding of your role as an early care and education professional. May be repeated up to 3 credits.
Learning Outcomes
1. Incorporate understanding of developmental stages, process, and theories of growth, development, and learning into developmentally appropriate practice.
2. Demonstrate knowledge of the interaction between maturation and environmental factors that influence physical, social, emotional, cognitive, and cultural domains in the healthy development of each child.
3. Demonstrate knowledge of the similarities between children who are developing typically and those with special needs.
4. Provide a variety of activities that facilitate development of the whole child in the following areas: physical/motor, social/emotional, language/cognitive, and adaptive/living skills. (I.E)
5. Demonstrate knowledge of the many functions that language serves in the cognitive, social, and emotional aspects of development in the formative years. (I.G)
6. Demonstrate knowledge of the developmental sequence of language and literacy, including the influence of culture and home factors. (I.H)
7. Recognize signs of emotional distress, child abuse, and neglect in young children and use procedures appropriate to the situation, such as initiating discussions with families, referring to appropriate professionals, and, in cases of suspected abuse or neglect, reporting to designated authorities. B.four
8. Demonstrate ability to adhere to early childhood education professional codes of ethical conduct and issues of confidentiality. G.one
9. Demonstrate awareness of federal, state, and local regulations, and public policies regarding programs and services for children birth through eight years of age. G.two 1
10. Demonstrate critical reflection of one's own professional and educational practices from community, state, national, and global perspectives. G.four 1
11. Demonstrate knowledge in technology resources to engage in ongoing professional development. G.seven 1
12. Articulate an understanding of indoor and outdoor learning environments that provide opportunities for children to put into practice healthy behaviors (physically, socially, and emotionally). B.two 1
13. Use appropriate health appraisal and management procedures and make referrals when necessary. B.three 1
14. Establish an environment that provides opportunities and reinforcement for children's practice of healthy behaviors that promote appropriate nutrition and physical and psychological well-being. B.five 1
15. Implement health care and educational activities for children and families based on health and nutritional information that is responsive to diverse cultures. B.seven

ECED 5420. Science/Math Curriculum
3 Credits (2+2P)
Methods and materials for developmentally appropriate practices in teaching science and math for young children. May be repeated up to 3 credits.
Learning Outcomes
1. Synthesis of knowledge and skills appropriate to teaching in PreK - third grade educational settings.

ECED 5510. Advanced Teaching and Learning of Literacy
3 Credits (3)
This advanced graduate early literacy course reviews the reading process including the relationship between reading, writing, listening, and speaking; individual needs and abilities in reading instruction; and how to organize classrooms and select materials to support literacy development. Concepts of phonemic awareness, phonic instruction, vocabulary development,fluency and comprehension are integrated with the developmentally appropriate use of authentic assessment techniques, language/literacy immersion, and multicultural children's literature.
Learning Outcomes
1. This course will focus on the following New Mexico early childhood teacher education competencies and New Mexico State University's conceptual framework for teacher preparation.
2. Articulate an understanding of developmental theories and processes and their implications for appropriate methods of teaching reading in the K-third grade classroom.
3. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework.
4. Provide and use anti-bias literacy materials and experiences, including primary language materials.
5. Plan appropriate whole group, small group, and individual activities that include appropriate accommodations for working with children with special needs.
6. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer.
7. Understand the role of family in literacy development.
8. Respect and promote the use of the child's home language for learning.
9. Demonstrate knowledge of, and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need. 1
10. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society. Our focus will be on rigorous inquiry about literacy education in U.S. schools and methods of literacy instruction. We will be examining how invisible cultural, historical, political, and social contexts have influenced and continue to influence teachers and schools. In your observations of reading and literacy education in your field experience it is critical that you become aware of these subtle but pervasive influences. To achieve this, we will focus our inquiry this semester on the following questions: What is literacy in early childhood education? Is that different from literacy outside of school? How do young children use and pursue literacy? How do I promote literacy for all the children with whom I work?

ECED 5520. Literacy Development in Early Childhood
3 Credits (3)

Advanced theory, research, and practice relating to early childhood reading. May be repeated up to 3 credits.

Learning Outcomes

1. This course will focus on the following New Mexico early childhood teacher education competencies and New Mexico State University's conceptual framework for teacher preparation.
2. Articulate an understanding of developmental theories and processes and their implications for appropriate methods of teaching reading in the K-third grade classroom.
3. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework.
4. Provide and use anti-bias literacy materials and experiences, including primary language materials.
5. Plan appropriate whole group, small group, and individual activities that include appropriate accommodations for working with children with special needs.
6. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer.
7. Understand the role of family in literacy development.
8. Respect and promote the use of the child's home language for learning.
9. Demonstrate knowledge of, and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need. 1
10. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society. Our focus will be on rigorous inquiry about literacy education in U.S. schools and methods of literacy instruction. We will be examining how invisible cultural, historical, political, and social contexts have influenced and continue to influence teachers and schools. In your observations of reading and literacy education in your field experience it is critical that you become aware of these subtle but pervasive influences. To achieve this, we will focus our inquiry this semester on the following questions: What is literacy in early childhood education? Is that different from literacy outside of school? How do young children use and pursue literacy? How do I promote literacy for all the children with whom I work?

ECED 5810. Student Teaching/Seminar
3 Credits (3)

Provides student teaching experience in a variety of settings with young children ages birth 8. Restricted to: TEP-ECED majors. Students must be Admitted into student teaching to enroll. May be repeated up to 3 credits.

Learning Outcomes

1. Our mission is to serve the people of New Mexico through education, research, extension education, and public service with specific emphasis on innovative practices, overcoming barriers to learning, international activities, technology, and literacy for the diverse populations of New Mexico, surrounding states and border communities.

ECED 6110. History and Philosophy of Early Childhood Education
3 Credits (3)

Critical analysis of the historical development and philosophical underpinnings of the field of early childhood education as it relates to current practice. Restricted to doctoral-level students of any major. May be repeated up to 3 credits.

Learning Outcomes

1. Examine the historical figures in early childhood education that have influenced current practices and discourses.
2. Identify theoretical, scientific, and philosophical foundations in early childhood education that have defined childhood learning and development.
3. Critically examine the history of institutions and federal policies of early childhood education within the context of multiculturalism

ECED 6996. Selected Topics in Early Childhood Education
1-6 Credits (1-6)

Offered under various subtitles. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of an ECED topic.

ECON-ECONOMICS

ECON 1110G. Survey of Economics
3 Credits (3)

This course will develop students' economics literacy and teaches students how economics relates to the everyday life of individuals, businesses and society in general. The course will also introduce students to the roles different levels of governments play in influencing the economy. At the conclusion of the course, students will be able to identify economic causes for various political and social problems at national and international levels, and have a better understanding of everyday economic issues that are reported in media and public forums.

Learning Outcomes

1. Gain and demonstrate a contextual understanding of economic terms and concepts.
2. Recognize and analyze common economic issues which relate to individual markets and the aggregate economy.
3. Learn basic economic principles that influence global trading and challenges relating to globalization.
4. Outline the implications of various economic policies on individuals and on economies.
5. Demonstrate ability to use diagrams and graphs to explain economic principles, policies and their applications.
6. Appreciate and understand how individual decisions and actions, as a member of society, affect economies locally, nationally and internationally.
7. Explain the roles of governments in influencing buyer and seller behavior in the market and how government failure occurs when intervention fails to improve or actually worsens economic outcomes.
8. Be able to apply course concepts to interpret, evaluate and think critically about economic events and policies, especially as regularly reported in the media and other public forums.

ECON 2110G. Macroeconomic Principles
3 Credits (3)

Macroeconomics is the study of national and global economies. Topics include output, unemployment and inflation; and how they are affected by financial systems, fiscal and monetary policies.

Learning Outcomes

1. Explain the concepts of opportunity cost, comparative advantage and exchange.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium and use supply and demand curves to analyze responses of markets to external events.

3. Explain the circular flow model and use the concepts of aggregate demand and aggregate supply to analyze the response of the economy to disturbances.
4. Explain the concepts of gross domestic product, inflation and unemployment and how they are measured.
5. Describe the determinants of the demand for money, the supply of money and interest rates and the role of financial institutions in the economy.
6. Define fiscal policy and monetary policies and how these affect the economy.
7. Students will be able to identify the causes of prosperity, growth, and economic change over time and explain the mechanisms through which these causes operate in the economy.

ECON 2120G. Microeconomics Principles
3 Credits (3)
This course will provide a broad overview of microeconomics. Microeconomics is the study of issues specific to households, firms, or industries with an emphasis on the role of markets. Topics discussed will include household and firm behavior, demand and supply,government intervention, market structures, and the efficient allocation of resources.
Learning Outcomes
1. Explain the concept of opportunity cost.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium.
3. Use supply and demand curves to analyze responses of markets to external events.
4. Use supply and demand analysis to examine the impact of government intervention.
5. Explain and calculate price elasticity of demand and other elasticities.
6. Demonstrate an understanding of producer choice, including cost and break-even analysis.
7. Compare and contrast the following market structures: perfect competition, monopoly, monopolistic competition, and oligopoly.

ECON 2120H. Principles of Microeconomics Honors
3 Credits (3)
Microeconomic theory and public policy: supply and demand, theory of the firm, market allocation of resources, income distribution, competition and monopoly, governmental regulation of businesses and unions. Must be a Crimson Scholar.
Learning Outcomes
1. Explain the concept of opportunity cost.
2. Demonstrate knowledge of the laws of supply and demand and equilibrium.
3. Use supply and demand curves to analyze responses of markets to external events.
4. Use supply and demand analysis to examine the impact of government intervention.
5. Explain and calculate price elasticity of demand and other elasticities.
6. Demonstrate an understanding of producer choice, including cost and break-even analysis.
7. Compare and contrast the following market structures: perfect competition, monopoly, monopolistic competition, and oligopoly.

ECON 304. Money and Banking
3 Credits (3)
Income measurement and determination, monetary and fiscal policies. May be repeated up to 3 credits.
Prerequisite: ECON 2110G or ECON 2110H or equivalent.
Learning Outcomes
1. Understand the role of the financial system in the economy.
2. Identify the components of the financial system.
3. Understand the related concepts of net present value and yield to maturity.
4. Understand the structure and role of the federal reserve system.
5. Understand the role of monetary policy in determining economic activity.

ECON 311. Intermediate Macroeconomic Theory
3 Credits (3)
Analysis of gross domestic product, the Classical, Keynesian, and Neo-Keynesian theories of income, employment, inflation and growth.
Prerequisite: ECON 2110G or ECON 2110H.
Learning Outcomes
1. Learn the uses and abuses of macroeconomic data
2. Learn the role of economic theory in understanding economic issues and forecasting economic behavior
3. Learn the causes and consequences of short-run economic fluctuations and long-run economic growth
4. Learn the role of government in the macroeconomy
5. By the end of the class, you should be able to describe the state of the macroeconomy and analyze the consequences of economic policy actions from several perspectives

ECON 312. Intermediate Microeconomic Theory
3 Credits (3)
Contemporary economic theory with emphasis upon value and distribution.
Prerequisite: ECON 2120G or ECON 2120H or equivalent.
Learning Outcomes
1. Gain an understanding of the language of Intermediate Microeconomics.
2. Know the underlying structure of economic models such as supply and demand, consumer theory, producer theory and market structure.
3. Understand the assumptions of economic models.
4. Be able to solve a supply and demand model.
5. Demonstrate critical thinking skills by applying economic models to a wide variety of policy questions.

ECON 324V. Developing Nations
3 Credits (3)
Economic analysis of problems related to development of developing nations. Issues such as growth, industrialization, poverty, population, international trade, foreign debt, and international economic relations.

ECON 325V. Economic Development of Latin America
3 Credits (3)
Economic analysis of problems related to development in Latin America, including the agrarian problem, debt and austerity programs, industrialization, inflation and unemployment, the drug trade, U.S.-Latin American relations, development strategies. Also individual countries problems. May be repeated up to 3 credits.
Learning Outcomes
1. Identify the basic components of economic growth and development
2. Understand how Latin America fell behind other regions in terms of economic development

3. Compare various policies implemented to support economic development in Latin America, as well as the successes and failures of these policies
4. Gain a basic understanding of how to conduct independent research to be demonstrated by the completion of a term paper addressing an issue related to economic development in a nation or region of Latin America

ECON 332. Public Finance
3 Credits (3)
This course will examine the roles of government in modern, market-oriented, mixed economies. It will examine justifications for government participation in resource allocation, income distribution, and economic stabilization focusing primarily on the fiscal functions of government, taxation and public expenditure. Students will apply basic microeconomic analysis to analyze the impacts of public taxation and expenditures on economic decisions made elsewhere in the economy. In this course the emphasis will be on understanding the workings of public finance in fiscal federalist systems like the United States, but the principles taught will be applicable across other economic systems. Prerequisites: ECON 2120G or ECON 2120H

ECON 335V. Business and Government
3 Credits (3)
Relation of government to business through regulation; political, legal, and social implications. Crosslisted with: MGMT 335G

ECON 337V. Natural Resource Economics
3 Credits (3)
Gain insight into important natural resource problems of our time. Apply economic principles to problems in the preservation, use, and development of agricultural, range, mineral, water, forestry, fishery, and environmental resources. Understand the use of cost-benefit analysis for government natural-resource projects, policies, and programs. Same as AEEC 337V.
Prerequisite: ECON 1110G or ECON 2120G or ECON 2120H.

ECON 345. Energy Economics
3 Credits (3)
Examines the economics of energy production including oil, coal, natural gas, renewables, and conservation as a substitute for energy production. Emphasis is on federal and state regulatory framework, and resulting public policy issues from a regional and national perspective.
Prerequisite(s): (ECON 2110G or ECON 2110H), (ECON 2120G or ECON 2120H).

ECON 384V. Water Resource Economics
3 Credits (3)
Use of economic principles to evaluate current and emerging issues in water resources. Applications focus on use of economic methods of analysis to current policy decisions surrounding agricultural, municipal, industrial, and environmental uses of water. Same as AEEC 384V.
Prerequisite: AEEC 1110 or ECON 2120G or ECON 2120H.

ECON 405. Introductory Econometrics
3 Credits (3)
Multiple regression and correlation applied to economics and business; inference techniques; significance tests; simultaneous equations, estimation, and problems.
Prerequisite: MATH 1350G or A ST 311 (or equivalent).
Learning Outcomes
1. Demonstrate knowledge of probability and statistics and basic expected value theory.
2. Define the relationship between population statistics and sample statistics.
3. Explain the method of ordinary least squares.
4. Understand multiple regression, correlation, inference techniques, and significance tests.
5. Interpret basic econometric results.

ECON 445. Oil and Natural Gas Economics
3 Credits (3)
Examines the economics of oil and gas production. Topics covered include transportation, refining, federal and state regulatory framework, and resulting public policy issues from a regional and national perspective.
Prerequisite: (ECON 2110G or ECON 2110H), (ECON 2120G or ECON 2120H).
Learning Outcomes
1. Oil and Natural Gas Production
2. Oil and Natural Gas Transportation and Storage
3. Advanced oil and gas market analysis
4. Economic analysis of government energy policy and regulation

ECON 449. Open Economy Macroeconomics
3 Credits (3)
This course studies theoretical and empirical macroeconomics in international dimension. It covers from the fundamental concepts of national income and growth, monetary/fiscal and exchange rate policies, foreign exchange markets, international trade and finance, and regionalization/economic integration to the impact analysis of these macroeconomic fundamentals in the open economy. Crosslisted with: I B 449.
Prerequisite(s): BFIN 341 OR ECON 311.

ECON 450. International Economics
3 Credits (3)
Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations. Crosslisted with: I B 450
Prerequisite(s): ECON 2110G or ECON 2110H and ECON 2120G or ECON 2120H.

ECON 457. Mathematical Economics
3 Credits (3)
Application of mathematical tools, especially the calculus, to economic theory.
Prerequisite(s): MATH 1430G or equivalent.

ECON 461. Environmental Economics
3 Credits (3)
Economic foundations for public decision-making about environmental resources utilizing tools from intermediate microeconomic theory. Emphasis on the welfare economic approach for the provision of public goods with specific emphasis on market failure, externalities, benefit-cost analysis, and methods for valuing environmental resources and human health.
Prerequisite: ECON 2120G Principles of Microeconomics.
Learning Outcomes
1. Students will develop an understanding of environmental economics and interactions between the natural environment, markets, and politics and regulation.
2. Students will develop familiarity with the tools of economic analysis and will develop marketable skills in benefit-cost analysis, non-market valuation, natural resource management and valuation, program evaluation, survey research and applied data analysis.

ECON 471. Electricity Economics
3 Credits (3)
Regulatory policy and economic analysis related to the Electric Industry. Topics include characteristics of a utility and legal justification for regulation; characteristics and functions of a regulatory commission; history and structure of the industry; technology and network design; revenue requirements; cost allocation; and basic retail rate design. Crosslisted with: ECON 571.
Prerequisite(s): ECON 345.

ECON 490. Selected Topics
1-3 Credits
Current topics in economics. Subject matter to be designated for each semester.

ECON 498. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated for a maximum of 3 credits.
Prerequisite: junior or above standing and consent of instructor.

ECON 503. Managerial Economics
3 Credits (3)
Theory and application of microeconomics to the management of organizations. May be repeated up to 3 credits.
Prerequisite: Graduate students only.
Learning Outcomes
1. Apply and explain economic and business concepts and terminology.
2. Develop critical thinking skill to solve economic- and business-related problems.
3. Solve economic- and business-related problems using quantitative information.
4. Apply and relate ethical implication in economic and business contexts.
5. Analyze economic and business case studies.
6. Demonstrate critical and efficient course engagement between/among peers in the traditional/online environment.

ECON 511. The Economics of Imperfect Markets
3 Credits (3)
A rigorous course in microeconomics covering uncertainty and information, game theory, general equilibrium, market power and market failures.
Learning Outcomes
1. Students should be able to demonstrate an understanding of the microeconomic underpinnings of general equilibrium theory, as well as welfare economics.
2. Students should be able to examine externalities, and be able to examine decision making under cases of risk and uncertainty.
3. Further, students will have a good understanding of the theory behind economic impact analysis, and a grasp of modern economic impact analysis software.

ECON 545. Econometrics II
3 Credits (3)
Application of statistical techniques to estimation of economic relationships: demand functions, production and cost functions, and macroeconomic equations.
Prerequisite: AEEC 5240.
Learning Outcomes
1. To learn and use statistical techniques to estimate economic relationships: demand functions, production and cost functions, and macroeconomic equations.

ECON 550. Special Topics
1-3 Credits
Seminars in selected current topics in the various areas of economics. Prerequisites vary according to the topic being offered.

ECON 571. Regulatory Policy and Industry Analysis: Electricity I
3 Credits (3)
Regulatory policy and economic analysis related to the Electric Industry. Topics include: characteristics of a utility and legal justification for regulation; characteristics and functions of a regulatory commission; history and structure of the industry; technology and network design; revenue requirements; cost allocation; and basic retail rate design.

ECON 572. Regulatory Policy and Industrial Analysis: Water and Natural Gas
3 Credits (3)
Regulatory policy and economic analysis related to the Natural Gas and Water industries. Topics include: history and structure of the industry; technology and network design; revenue requirements; cost allocation; and retail rate design.

ECON 573. Regulatory Policy and Industry Analysis: Electricity II
3 Credits (3)
Regulatory policy and economic analysis related to the Electric industry. Topics include: optimal generation mix; ancillary services; environmental policies; rate case procedures and strategies for effective testimony; advanced retail rate design; wholesale exchanges; unbundled transmission tariffs; market institutions and how different markets function; state and federal deregulation policies; Federal Energy Regulatory Commission orders and policies; demand-side management; and regulatory treatment of non-traditional retail services. Consent of instructor required.
Prerequisite(s): ECON 571 or consent of instructor.

ECON 574. Advanced Seminar Regulatory Policy and Industry Analysis
3 Credits (3)
Advanced seminar and writing course specializing in regulatory policy and regulatory casework. Topics Include: special policy & regulatory issues in telecommunications, electricity, natural gas, and water; preparation of written testimony; expert witness effectiveness including cross-examination; and contested case management. This course involves extensive reading and writing assignments. Consent of instructor required.
Prerequisite(s): ECON 571 or consent of instructor.

ECON 596. Independent Study
3 Credits (3)
Individual study program. Each offering will cover a subtitle. Maximum of 3 credits in a semester and 6 credits in a program. Consent of instructor required.

EDLT-EDUCATIONAL TECHNOLOGY

EDLT 2110. Integrating Technology with Teaching
3 Credits (3)
Considers impact of technology on communication and knowledge development; engages students in the design of technology-integrated lessons with a constructivist approach.
Prerequisite: ENGL 1110G.

Learning Outcomes

1. Students will demonstrate a sound understanding of technology operations and concepts.
2. Students will plan and design effective learning environments and experiences supported by technology.
3. Students will implement curriculum plans that include methods and strategies for applying technology to maximize learning.
4. Students will apply technology to facilitate a variety of effective assessment and evaluation strategies.
5. Students will use technology to enhance their productivity and professional practice.
6. Students will better understand the social, ethical, legal, and human issues surrounding the use of technology on PreK-12 schools and apply that knowledge into future practice.

EDLT 3110. Integrating Technology with Teaching
3 Credits (3)

Considers impact of technology on communication and knowledge development; engages students in the design of technology-integrated lessons with a constructivist approach. May be repeated up to 3 credits.

Learning Outcomes

1. Students will demonstrate a sound understanding of technology operations and concepts.
2. Students will plan and design effective learning environments and experiences supported by technology.
3. Students will implement curriculum plans that include methods and strategies for applying technology to maximize learning.
4. Students will apply technology to facilitate a variety of effective assessment and evaluation strategies.
5. Students will use technology to enhance their productivity and professional practice.
6. Students will better understand the social, ethical, legal, and human issues surrounding the use of technology on PreK-Tweleve schools and apply that knowledge into future practice.

EDLT 5110. Foundations of Learning Design & Technology
3 Credits (3)

This course covers how to access, use, design, and evaluate instructional resources on the Internet, for blended and online learning environments. May be repeated up to 3 credits.

Learning Outcomes

1. Provide a rationale for using a systematic approach to learning design. Identify and summarize the major elements commonly included in instructional development models.
2. Define terms used to describe the phases and strategies of the learning design process.Conduct a needs assessment.
3. Demonstrate the following competency in the completion of an instructional development project: a) identify an instructional problem, b) analyze learners and learning contexts, c) plan and implement a goal analysis, d) specify terminal and enabling learning objectives, e) design criterion measures, f) prepare appropriate testing instruments and procedures, g) select appropriate instructional strategies, h) select appropriate instructional media (delivery systems), i) construct a prototype product, j) plan and conduct formative evaluations, and k) specify revisions resulting from formative evaluation.
4. Compare and contrast various instructional design perspectives and philosophies. Develop effective and efficient instructional products.

EDLT 5120. Critical Digital Literacy
3 Credits (3)

Explore, evaluate and use a variety of multimedia authoring tools including website, video, audio, image editing and apps (iOS/Android) for educational applications. May be repeated up to 3 credits.

Learning Outcomes

1. Considers impact of technology on communication and knowledge development; engages students in the design of technology-integrated lessons with a constructivist approach.

EDLT 5130. Technology and Language Learning
3 Credits (3)

Use of technology to enhance second language and dual language programs. Organized around technology enhanced communicative and interactive language learning environments. May be repeated up to 3 credits.

Learning Outcomes

1. Considers use of technology to enhance second language and dual language programs. Organized around technology enhanced communicative and interactive language learning environments

EDLT 5140. Fostering Online Learning Communities
3 Credits (3)

Examines theoretical and practical aspects of communication and collaboration and their impact on the formation of online learning communities for those teaching adults in higher education, business, or government settings. May be repeated up to 3 credits.

Learning Outcomes

1. Examine theoretical and practical aspects of communication and collaboration and their impact on the formation of online learning communities for those teaching adults in higher education, business, or government settings.

EDLT 5210. Social Media in Blended and Online Learning Environments
3 Credits (3)

This course will explore the role of social media in online and blended learning environments through practical hands-on activities, critical dialogue, and collaborative projects which will prepare you to utilize social media personally and pedagogically. May be repeated up to 3 credits.

Learning Outcomes

1. Describe and give examples of social media for use in your blended and online learning environments.
2. Actively engage, communicate and collaborate using social media, both inside the classroom and in appropriate social media-based learning environments.
3. Evaluate, analyze, and synthesize readings, research, and other information about social media in education.
4. Access, utilize, design, evaluate, and assess learning activities using social media.

EDLT 5220. Culturally Responsive Teaching with Technology
3 Credits (3)

This course explores the use of critical pedagogy, culturally sustaining pedagogy, and project-based learning supported by computer-based applications. May be repeated up to 3 credits.

Learning Outcomes

1. Explain the primary concepts of critical pedagogy based on the writing of Paulo Freire.
2. Describe theories and practices that support culturally responsive and sustaining pedagogies.

3. Evaluate the connections and tensions between critical pedagogy, culturally sustaining pedagogies, and the use of technology.
4. Plan a culturally sustaining project-based unit of study using digital technology.

EDLT 5230. Designing and Organizing Online Learning Environments
3 Credits (3)
Explores the theories, models, approaches, technologies, and methods of online teaching and adult learning. Provides a foundation for examining the roles and characteristics of the online teacher and learner for those teaching adults in higher education, business, or government settings. May be repeated up to 3 credits.
Learning Outcomes
1. Design and organize effective online learning.

EDLT 5240. Online Teaching and Learning
3 Credits (3)
This course provides a survey of theories, models and methods used to design and deliver online education through the use of technologies in K-12, higher education, business/industry, and continuing education. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate an awareness of equity social justice issues related to online education.
2. Critique and reflect upon diverse design frameworks,
3. Develop online resources for use in your professional and personal educational pursuits,
4. Explore and participate in the use of emerging technologies for online education.
5. Identify and discuss the impact of different technological innovations on society with particular emphasis on education,
6. Analyze and evaluate the use of technologies for teaching and learning in culturally relevant and responsive ways.

EDLT 5250. Tools and Techniques for Online Teaching
3 Credits (3)
Examines the theoretical and practical implications of various asynchronous and synchronous tools and their impact on teaching and learning through research and hands-on experience. May be repeated up to 3 credits.
Learning Outcomes
1. Implement effective online teaching.

EDLT 5310. Design and Implementation of Synchronous Online Instruction
3 Credits (3)
This course provides hands-on experiences as well as the theoretical and research basis for synchronous online instruction including web conferencing. May be repeated up to 3 credits.
Learning Outcomes
1. Evaluate best practices, based on research and theoretical foundation, of interaction and engagement in the design and delivery of synchronous online instruction.
2. Demonstrate the skillful use of the technology tools and strategies for synchronous online instruction.
3. Design, develop, and implement the delivery of a web conference event, first with a partner or team and then individually by the end of the course.
4. Use self- and peer-evaluation for continuous improvement of synchronous online instruction with a focus on web conferencing events.

EDLT 5320. Universal Design in Online Course Design
3 Credits (3)
Examines theory, practical application of strategies, and global and policy implications of universal design (UD)in online learning environments. May be repeated up to 3 credits.
Learning Outcomes
1. Understand and implement universal design.

EDLT 5330. Emerging Technology Tools and Techniques
3 Credits (3)
This course examines the theory, research, and practice of emerging technologies for educational practice and their impact on online teaching and learning. May be repeated up to 3 credits.
Learning Outcomes
1. Implement effective techniques.

EDLT 5992. Directed Study
3 Credits (3)
Supervised academic work. Consent of Instructor required. May be repeated up to 3 credits.
Learning Outcomes
1. Engage in the study of an EDLT topic.

EDLT 5999. Capstone
3 Credits (3)
The capstone course provides an opportunity to demonstrate teaching and learning in blended and fully online environments. Demonstrate competencies with best practices in culturally responsive teaching, learning/educational technology, online pedagogy, portfolio creation, and curriculum development for blended and online delivery using emerging technologies. May be repeated up to 3 credits.
Learning Outcomes
1. Apply teaching and learning standards to review blended or online courses for learning environments.
2. Demonstrate proficiency using the tools of learning management systems.
3. Apply best practices in instructional design for blended/online courses
4. Explain how research and practice inform your course instructional design decisions.
5. Create a blended or online learning course that meets online teaching standards
6. Demonstrate participation in an online learning community.

EDLT 6110. Foundations of Learning Design & Technology
3 Credits (3)
This course covers how to access, use, design, and evaluate instructional resources on the Internet, for blended and online learning environments. Includes a theoretical and research component for doctoral students. May be repeated up to 3 credits.
Learning Outcomes
1. Provide a rationale for using a systematic approach to learning design. Identify and summarize the major elements commonly included in instructional development models.
2. Define terms used to describe the phases and strategies of the learning design process. Conduct a needs assessment.

3. Demonstrate the following competency in the completion of an instructional development project: a) identify an instructional problem, b) analyze learners and learning contexts, c) plan and implement a goal analysis, d) specify terminal and enabling learning objectives, e) design criterion measures, f) prepare appropriate testing instruments and procedures, g) select appropriate instructional strategies, h) select appropriate instructional media (delivery systems), i) construct a prototype product, j) plan and conduct formative evaluations, and k) specify revisions resulting from formative evaluation.
4. Compare and contrast various instructional design perspectives and philosophies. Develop effective and efficient instructional products.

EDLT 6120. Emerging Models for Learning Design & Technology
3 Credits (3)
Integration of technology into content areas. May be repeated up to 3 credits.
Learning Outcomes
1. Understand emerging EDLT models.

EDLT 6210. Current Research in Learning and Technology
3 Credits (3)
Explores models and methods for examining and researching the impact of technology on learning and education. May be repeated up to 3 credits.
Learning Outcomes
1. Understand current technology research.

EDLT 6220. Multimedia, Authoring and Curriculum Design
3 Credits (3)
Explore, evaluate and use a variety of multimedia authoring tools including website, video, audio, image editing and apps (iOS/Android) for educational applications. Includes additional theoretical research component for doctoral students. May be repeated up to 3 credits.
Learning Outcomes
1. Facilitate effective technology learning environments.

EDLT 6230. Technology, Society, and Education
3 Credits (3)
Investigates models of the change process, examines speculations related to the directions and dynamics of change in an era of electronic technologies, explores shifts in the cultural and personal activities and relations of humans, and speculates on concomitant educational implications. May be repeated up to 3 credits.
Learning Outcomes
1. Understand technology and pedagogy.

EDLT 6240. Online Teaching and Learning
3 Credits (3)
This course provides a survey of theories; models and methods used to design and deliver online education through the use of technologies in K-12, higher education, business/industry, and continuing education. Topics covered include accreditation, assessment, culturally responsive course design, current trends and best practices, hybrid and blended learning, learning management systems, online support services, social justice issues in online education, learner engagement, and retention.
Learning Outcomes
1. Implement effective digital pedagogy.

EDLT 6998. Advanced Fieldwork
3 Credits (3)
Fieldwork in learning technologies provides opportunities to integrate theory and practice through research, teaching and/or development. May be repeated up to 3 credits.
Learning Outcomes
1. Examine the historical figures in early childhood education that have influenced current practices and discourses. Identify theoretical, scientific, and philosophical foundations in early childhood education that have defined childhood learning and development. Critically examine the history of institutions and federal policies of early childhood education within the context of multiculturalism

EDUC-EDUCATION

EDUC 1110. Freshman Orientation
1 Credit (1)
Introduction to the university and to the College of Education. Discussion of planning for individualized education program and field experience. Restricted to Las Cruces campus only. May be repeated up to 1 credit.
Learning Outcomes
1. Demonstrates knowledge of and uses theories, approaches, methods, and techniques for teaching, reading, writing, and other academic skills in English and the native language.
2. Demonstrates knowledge of and applies management techniques appropriate to classrooms containing students who have varying levels of proficiency and academic experience in both languages.
3. Community/Family Involvement- The bilingual teacher: (a)Recognizes the importance of parental and community involvement for facilitating the learner's successful integration to his/her school environment. (b) Demonstrates knowledge of the teaching and learning patterns of the students' home environment and incorporates these into the instructional areas of program.
4. Assessment- The bilingual teacher: (a) Assesses oral and written language proficiency in academic areas in both languages utilizing the results for instructional placement, prescription, and evaluation. (b) Evaluates the growth of the learner's native and second language in the context of the curriculum. (c) Continuously assesses and adjusts her or his own language use in the classroom in order to maximize learner comprehension and verbal participation

EDUC 1120. Introduction to Education
2 Credits (2)
Introduction to the historical, philosophical, sociological foundations of education, current trends, and issues in education; especially as it relates to a multicultural environment. Students will use those foundations to develop effective strategies related to problems, issues and responsibilities in the field of education. Restricted to Las Cruces campus only. May be repeated up to 2 credits.
Learning Outcomes
1. Describe the teaching and learning of various American education settings including early childhood, elementary, middle school, high school, and special education.
2. Describe how teachers use educational theory and the results of research of students' learning.
3. Explain the techniques for establishing a positive and supportive environment in the classroom
4. Identify and describe instructional strategies supported by current research to promote thinking skills of all learners.
5. Recognize the teachers' role and responsibilities in an increasingly diverse, multicultural society.

EDUC 1140. Math for Paraprofessionals
3 Credits (3)
Applied math skills for paraprofessionals working with children. May be repeated up to 3 credits.

Prerequisite: CCDM 103 N.

Learning Outcomes

1. Students will plan developmentally appropriate math activities for young children.
2. Students will plan adaptations to math activities for children with diverse abilities.
3. Students will demonstrate understanding of recent research in methods of teaching mathematics.
4. Students will demonstrate understanding of early childhood theories as they relate to the teaching of mathematics.
5. Students will demonstrate understanding of unique needs of children from diverse economic or cultural backgrounds.

EDUC 1150. Math for Paraprofessionals II

3 Credits (3)

Applied math skills for paraprofessionals working under the direction of a teacher. May be repeated up to 3 credits.

Prerequisite: EDUC 1140.

Learning Outcomes

1. Students will plan developmentally appropriate math activities for young children.
2. Students will plan adaptations to math activities for children with diverse abilities.
3. Students will demonstrate understanding of recent research in methods of teaching mathematics.
4. Students will demonstrate understanding of early childhood theories as they relate to the teaching of mathematics.
5. Students will demonstrate understanding of unique needs of children from diverse economic or cultural backgrounds.

EDUC 1185. Introduction to Secondary Education and Youth

3 Credits (3)

Introductory course for students considering a career in secondary education. Includes historical, philosophical, and sociological foundations, program organization, critical dispositions, and understanding the context of schools and youth. Practicum required. Restricted to: Secondary Ed majors. Traditional Grading with RR.

Learning Outcomes

1. Articulate the attributes of an education professional entering the field.
2. Differentiate and summarize the major educational philosophies and historical events that have influenced the progression of educational practice.
3. Describe the role of law in education with emphasis on the rights and responsibilities of teachers and learners.
4. Develop a preliminary personal philosophy of teaching and learning.
5. Discuss the characteristics and roles of the teacher, the student, and the school in today's education.
6. Identify effective teaching methods, instructional strategies and learning styles.
7. Evaluate the Lesson Planning Process using various lesson planning templates, formats, and rubrics.
8. Explain classroom management techniques.
9. Identify different types of diversity in the classroom environment, particularly in high-needs schools. 1
10. Describe how learning differences are manifested in schools, particularly in high-needs schools. 1
11. Describe how teachers use multiple methods of assessment to engage learners in their own growth, to monitor learner progress. 1
12. Describe how teachers use multiple methods of assessment to modify instruction and inform decision making. 1
13. Identify the role of Standards and High Stakes Testing in the life of an educational professional. 1
14. Complete 24 hours internship in a classroom, preferably a bilingual classroom in a high-needs school. 1
15. Document and reflect on your observations throughout your internship. 1
16. Construct an individualized map to teacher licensure in the State of New Mexico.

EDUC 1995. Field Experience I

1 Credit (1)

Introduction to public school teaching, school visits, classroom observations and discussion seminar. May be repeated up to 1 credit.

Learning Outcomes

1. Demonstrate an understanding of personal attitudes and motivations for entering the field of education.
2. Identify effective teaching strategies that enhance student learning outcomes.
3. Identify classroom management techniques and learning styles.
4. Develop observational skills and reflective thinking skills.
5. Evaluate instructional methods that enhance upper level thinking skills in children.

EDUC 1996. Special Topics in Education

1 Credit (1)

Supervised study in a specific area of interest. Each course shall be designated by a qualifying subtitle. May be repeated up to 9 credits.

Learning Outcomes

1. Varies

EDUC 1998. Internship I

3 Credits (3)

Supervised experience in elementary education settings. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

EDUC 2710. Pre-Teacher Preparation

3 Credits (3)

Assists students in developing the necessary competencies needed for acceptance to the Teacher Education Program. Course content includes basic skill development, test taking skills, and completion of teacher preparation packet. May be repeated up to 6 credits.

Learning Outcomes

1. Investigate the process and requirements of the Teacher Education Program
2. Read critically about teacher's experiences and write brief reactions
3. Discuss philosophies of education and draft a written personal philosophy of education
4. Discuss the nature of education for students with diverse languages, cultures and abilities
5. Draft personal position statements concerning education for students with disabilities and diverse cultures

EDUC 2998. Internship II

3 Credits (3)

Supervised experience in junior high settings. May be repeated up to 3 credits.

Prerequisite: must be a co-op student.

Learning Outcomes

1. Varies

EDUC 3110V. Multicultural Issues in Society
3 Credits (3)

Conceptual manifestations of culture, race, ethnicity, class, gender, exceptionalities, language, and bilingualism within and across society. May be repeated up to 3 credits.

Learning Outcomes

1. Understand what is meant by "multicultural education" and respond to the issues and challenges involved as learners, educators, and education stakeholders;
2. Reflect on definitions of power and privilege, critique understandings of difference, and examine the multi-faceted ways in which multicultural education can be enacted in pedagogy, curriculum, and educational organizations;
3. Examine the intersections between race, class, gender, sexuality, language, and citizenship status and try to assess their impact on teaching and learning;
4. Evaluate their own identities, biases, and position in the curricula and schooling experience.

EDUC 3120. Multicultural Education
3 Credits (2+2P)

The conceptual manifestations of culture, race and ethnicity, class, gender, sexual orientation, exceptionalities, language, bilingualism, and global citzenship within the schooling process. May be repeated up to 3 credits.

Learning Outcomes

1. Understand what is meant by "multicultural education" and respond to the issues and challenges involved as learners, educators, and education stakeholders;
2. Reflect on definitions of power and privilege, critique understandings of difference, and examine the multi-faceted ways in which multicultural education can be enacted in pedagogy, curriculum, and educational organizations;
3. Examine the intersections between race, class, gender, sexuality, language, and citizenship status and try to assess their impact on teaching and learning;
4. Evaluate their own identities, biases, and position in the curricula and schooling experience.

EDUC 3210. Sheltered English Instruction for the ESL Classroom
3 Credits (3)

Addresses the acquisition of English proficiency by speakers of other languages. May be repeated up to 3 credits.

EDUC 3220. Language, Literacy, and Culture in the ESL Classrooms
3 Credits (3)

Framework and strategies for developing the written abilities of second language learners. May be repeated up to 3 credits.

EDUC 3996. Special Topics in Education
1-3 Credits (1-3)

Offered under various subtitles in the Schedule of Classes. May be taken for a maximum of 3 cr. per semester and a total of 6 credits overall. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of a specific education topic.

EDUC 3997. Secondary Field Experience
3 Credits (2+2P)

Develop professional skills, dispositions, and understanding of secondary bilingual youth, content, and pedagogy through discussion seminar and interactions with public education mentor teachers. Focused observations, study of classroom language and culture, introduction to lesson planning and student assessment. Requires 32 hours of practicum field experience. Taught with: BLED 3110. May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement effective practices in secondary education.

EDUC 3998. Secondary Education Practicum
1 Credit (1P)

Develop professional skills, dispositions, and understanding of secondary youth, content, and pedagogy through discussion seminar and practicum with public education mentor teachers. Practicum includes focused observations, study of classroom language and culture, introduction to lesson planning and student assessment. Requires 45 hours of practicum field experience. Placements are coordinated between NMSU Teacher Education Program and NM School Districts. Students are required to secure their own transportation to and from the field experience school site. May be repeated up to 3 credits.

Corequisite: EDUC 3997.

Learning Outcomes

1. Students will attain at least an Effective rating (3 average) for a 45-hour secondary classroom practicum.
2. Students will portray the high-yield strategies for teaching during their own teaching episodes.
3. Students will interact with public school teachers to discover strategies for remote teaching and learning.
4. Students will synthesize field experiences through focused observation and follow-up reporting.
5. Students will produce lesson plans that include appropriate objectives, standards, teaching strategies, differentiation techniques, and aligned assessment.
6. Students will teach secondary classes under supervision of the course instructor and university supervisor.
7. Students will interpret teaching evaluations in order to self-assess overall teaching performance.

EDUC 4310. Methods of Teaching Elementary School Science
3 Credits (2+2P)

Methods and materials for teaching elementary school science. Includes components of lessons and the use of multimedia.Students must complete 9 hours of science from biology, chemistry, physics, and earth sciences, with no more than 3 hours from any one department. Restricted to: TEP-EED majors. May be repeated up to 3 credits.

Learning Outcomes

1. Create, teach, and assess research based, hands-on, elementary science lessons.
2. Create, teach, and assess research based, hands-on, elementary science lessons that meet the diverse needs of all learners in all aspects of science instruction.
3. Develop assessment tools to evaluate learner's science knowledge.
4. Identify and use appropriate NMSTEM Ready State science standards for lesson planning.
5. Integrate science with all subjects.
6. Discuss the advantages and the importance of membership in national/international professional organizations (NSTA) as well as subscribing to professional journals.

7. Identify science educational resources available using a variety of technological tools to enhance learning.
8. Demonstrate competence and confidence in teaching science.
9. Demonstrate basic classroom management skills.

EDUC 4320. Methods of Teaching Elementary School Mathematics
3 Credits (3)
Content, theories of cognition, and instructional approaches for the teaching of mathematics in the elementary grades.
Prerequisite: MATH 1134.
Corequisite: EDUC 4310, SPED 3120, READ 4310.
Learning Outcomes
1. Identify what makes a 'good mathematical task', and how a good task can support students' learning.
2. Understand how children make sense of key mathematics concepts.
3. Understand how tools (including manipulatives, calculators, and other technology) assist children in their thinking and problem solving.
4. Identify your role as a teacher in a math classroom.
5. Practice teaching elementary mathematics activities using a constructivist approach and reflect upon your teaching.
6. Adjust lessons and instruction based on students' needs.
7. Develop a stance of inquiry, explore habits of mind, examine and your own mathematical knowledge and develop the mathematical knowledge needed for effective teaching.
8. Experience mathematics through thinking, reasoning, discourse/communicating, and developing math ideas with understanding so that as teachers you can facilitate learning as you work with students in this process.
9. Begin to develop your knowledge and skills to effectively support ALL learners; in particular students with special needs and bilingual/English Language Learners in mathematics.

EDUC 4330. Methods of Teaching Elementary School Social Studies
3 Credits (2+2P)
Focus on social studies curriculum and instruction including student-centered approaches, active learning, educational technology, nontextual curriculum, integration, multicultural education, authentic assessment, and practical applications. May be repeated up to 3 credits.
Learning Outcomes
1. Understanding of equity and social justice through Social Studies education;
2. Navigating the public-schools and how to integrate Social Studies lessons;
3. Lesson planning and delivering Social Studies instruction;
4. How to evaluate information found online for quality and truth; and
5. Critiquing instructional materials and resources.

EDUC 4410. Teaching Science at the Middle and High School Level
3 Credits (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in science. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of science for students in grades 6-12. Practicum required. Taught with EDUC 5410. May be repeated up to 3 credits.
Learning Outcomes
1. Understand and implement effective practices for teaching and learning in the secondary science classroom.

EDUC 4420. Teaching Mathematics at the Middle and High School Level
3 Credits (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in mathematics. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of mathematics. Practicum required. Taught with EDUC 5420. May be repeated up to 3 credits.
Learning Outcomes
1. Understand and implement effective practices for teaching and learning in the secondary mathematics classroom.

EDUC 4430. Teaching Social Studies at the Middle and High School Level
3 Credits (2+2P)
Integrating content knowledge and pedagogy for the middle and high school teacher in social studies. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of social studies. Practicum required. Taught with EDUC 5430. May be repeated up to 3 credits.
Learning Outcomes
1. Understand and implement effective practices for teaching and learning in the secondary social studies classroom.

EDUC 4440. Teaching Language Arts at the Middle and High School Level
3 Credits (2+2P)
Implications of cognition and language development for appropriate secondary instructional practices. Focus on construction of meaning, student-centered response to literature, writing process, print and oral language development, based on socio-psycholinguistic research and theory. Practicum required. Taught with EDUC 5440. May be repeated up to 3 credits.
Learning Outcomes
1. Students will evaluate ELA and SS resources and synthesize important domains of education, including history, seminal texts, current events/trends, and formative learning theories such as global learning.
2. Students will summarize classroom literacy, language, and culture of ELA/SS classrooms.
3. Students will identify authentic assessment and effective instructional strategies and materials that can be used to deliver engaging lessons in ELA/SS reading, writing, and literature study.
4. Students will justify their personal teaching philosophy in relation to the study of the history of ELA/SS education, literacy learning theories, teaching pedagogy, and field experiences.
5. Students will assemble a professional, culminating reflective portfolio that demonstrates the ability to self-assess strengths and needs based on the NM-Teach standards.

EDUC 4510. Data Literacy and Assessment
3 Credits (3)
Methods for selecting, constructing, and using multiple methods of assessment to monitor learner progress and improve student learning. Students will learn to analyze and use classroom and standardized assessment data to understand patterns and gaps in learning, to guide planning and instruction, and employ technology to support practice. May be repeated up to 6 credits.
Learning Outcomes
1. Understand and implement effective data literacy and assessment procedures.

EDUC 4520. Contemporary Issues in Education
3 Credits (2+2P)
Discussion of contemporary issues including: classroom management, motivation, conferences, professional organizations, professional ethics, community influences, cultural pluralism, reform movements,

instructional influences, and educational technology. Requires field experience component in a school or community setting. May be repeated up to 3 credits.

Learning Outcomes

1. Understand important issues and practices in contemporary education.

EDUC 4530. Science for Educators
3 Credits (3)

This course will focus on the exploration of key central science concepts and how to connect learners to resources, tools of inquiry, and collaborative problem solving related to authentic local and global issues in classroom, lab, and digital science environments. Topics include: The nature of science, Physical Science, Life Science, Earth and Space Science.

Learning Outcomes

1. Understand primary science content and knowledge for K-12 classrooms.

EDUC 4540. Teaching History
3 Credits (3)

Philosophical and practical issues of teaching history and social studies are explored. Designed to help prospective teachers at all levels clarify their views about studying history and social studies. A variety of pedagogical strategies for teaching history and social studies are explored. This course offers a review of the New Mexico Social Studies Standards for teaching.

Learning Outcomes

1. Rethink and teach students to rethink history through multiple perspectives.
2. Utilize Bloom's Taxonomy and level of questioning.
3. Build essential questioning versus comprehensive questioning.
4. Utilize Webb's Depth of Knowledge.
5. Develop strong objectives for teaching and learning.
6. Initiate discussion in a classroom setting.
7. Build a Google classroom.
8. Create unit-based assigned on a topic in history (lesson and assessment development).
9. Utilize web resources that will include Open Education Resources or OER's. 1
10. Appraise the NM standards for Social Studies to develop lessons that actualize the standards.

EDUC 4810. Elementary Student Teaching
9 Credits (9)

Synthesis of knowledge and skills appropriate to teaching in elementary schools. May be repeated up to 9 credits.

Corequisite: EDUC 4811.

Learning Outcomes

1. Synthesis of knowledge and skills appropriate to teaching in PreK - 3rd grade educational settings.

EDUC 4811. Elementary Student Teaching Seminar
3 Credits (3)

Discussion of elementary school issues related to student teaching. Taken concurrently with EDUC 4810. May be repeated up to 3 credits.

Corequisite: EDUC 4810.

Learning Outcomes

1. Candidates demonstrate an understanding of the critical concepts and principles in their discipline and of the pedagogical content knowledge necessary to engage students' learning of concepts and principles in the discipline.
2. Candidates create and implement learning experiences that motivate K-8 students, establish a positive learning environment, and support K-8 students' understanding of the central concepts and principles in the content discipline.
3. Candidates design, adapt, and select a variety of valid and reliable assessments and employ analytical skills necessary to inform ongoing planning and instruction, as well as to understand, and help students understand their own, progress and growth.
4. Candidates engage students in reasoning and collaborative problem solving related authentic local, state, national, and global issues, incorporating new technologies and instructional tools appropriate to such tasks.
5. Candidates design and implement appropriate and challenging learning experiences, based on an understanding of how children learn and develop and they ensure inclusive learning environments that encourage and help all K-8 students reach their full potential across a range of learner goals.
6. Candidates work with K-8 students and families to create classroom cultures that support individual and collaborative learning and encourage positive social interaction, engagement in learning, and independence.
7. Candidates build strong relationships with students, families, colleagues, other professionals, and community members, so that all are communicating effectively and collaborating for student growth, development, and well-being.
8. Candidates reflect on their personal biases and access resources that deepen their own understanding of cultural, ethnic, gender, sexual orientation, language, and learning differences to build stronger relationships and to adapt practice to meet the needs of each learner.
9. Candidates use research and evidence to continually evaluate and improve their practice, particularly the effects of their choices and actions on others, and they adapt their teaching to meet the needs of each learner.

EDUC 4820. Secondary Student Teaching
9 Credits (9)

Synthesis of knowledge and skills appropriate to teaching in secondary schools. May be repeated up to 9 credits.

Learning Outcomes

1. Carry out effective student teaching in a secondary classroom.

EDUC 4821. Middle and High School Student Teaching Seminar
3 Credits (3)

Discussion of secondary school issues related to student teaching. Taken concurrently with EDUC 4820. May be repeated up to 3 credits.

Corequisite(s): EDUC 4820.

Learning Outcomes

1. Carry out effective student teaching in a secondary classroom.

EDUC 4992. Directed Study Courses in Education
1-3 Credits (1-3)

Each course shall be identified by a qualifying subtitle. Maximum of 3 credits in any one semester and a grand total of 6 credits. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of a specific education topic.

EDUC 4996. Topics
1-3 Credits (1-3)

Offered under various subtitles which indicate the subject matter to be covered. A maximum of 3 credits in any one semester and a grand total of 3 credits. May be repeated up to 3 credits.

Learning Outcomes

1. Engage in the study of a specific education topic.

EDUC 4998. Secondary Education Advanced Practicum
1 Credit (1P)

Develop professional skills, dispositions, and understanding of secondary youth, content, and pedagogy through discussion seminar and practicum with public education mentor teachers. Practicum includes focused observations, study of classroom language and culture, introduction to lesson planning and student assessment. Requires 45 hours of practicum field experience. Placements are coordinated between NMSU Teacher Education Program and NM school districts. Students are required to secure their own transportation to and from the field experience school site. May be repeated up to 3 credits.

Learning Outcomes

1. Students will attain at least an Effective rating (3 average) for a 45-hour secondary classroom practicum.
2. Students will portray the high-yield strategies for teaching during their own teaching episodes.
3. Students will interact with public school teachers to discover strategies for remote teaching and learning.
4. Students will synthesize field experiences through focused observation and follow-up reporting.
5. Students will produce lesson plans that include appropriate objectives, standards, teaching strategies, differentiation techniques, and aligned assessment.
6. Students will teach secondary classes under supervision of the course instructor and university supervisor.
7. Students will interpret teaching evaluations in order to self-assess overall teaching performance.

EDUC 5110. Exploration in Education
3 Credits (3+3P)

Overview of elementary and secondary schooling. Includes opportunities to gain teaching experience in diverse settings.

Learning Outcomes

1. Explore important concepts and knowledge necessary to carry out effective practices in K-12 classroom settings.

EDUC 5120. Multicultural Education
3 Credits (2+2P)

Conceptual manifestations of culture, race, and ethnicity, class, gender, exceptionalities, language and bilingualism within the schooling process. Taught with EDUC 3120 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze the influence on learning of such social identities as race, class, sexual orientation, language, and gender.
2. Deconstruct tacit knowledges about learners and the learning process.
3. Distinguish among the structural and discursive forces that hamper particular students' educational attainment.
4. Evaluate one's own personal response to oppression in educational settings.
5. Support a pedagogical perspective and school level strategies targeted towards a more just and equitable education in your classroom.

EDUC 5130. Technology and Pedagogy
3 Credits (3)

Critical analysis, design, and evaluation of computer-based technologies in teaching and learning for diverse communities. Students must be in Graduate standing. May be repeated up to 3 credits.

Learning Outcomes

1. Understand the relationship between curriculum and pedagogy.

EDUC 5140. Research in Curriculum and Pedagogy
3 Credits (3)

An introduction to qualitative and quantitative designs for research in curriculum and instruction, with emphasis on action research. May be repeated up to 3 credits.

Learning Outcomes

1. Locate metrics useful for evaluating the quality of published research;
2. Identify the claims and supportive evidence presented in published empirical research;
3. Weigh the evidence presented in published empirical research;
4. Analyze the alignment of methods used in published empirical research with associated frameworks and research questions;
5. Synthesize a narrow body of literature in their field of interest.

EDUC 5150. Classroom Management
3 Credits (3)

Strategies for managing classroom settings and determining appropriate modification of instructional approaches to meet changing classroom situations. May be repeated up to 3 credits.

Learning Outcomes

1. Understand effective practices in K-12 classroom management.

EDUC 5160. Curriculum and Pedagogy
3 Credits (3)

Introduction, reconstruction, and other connections among historical, philosophical, sociocultural, psychological, and theoretical foundations of curriculum and pedagogy and their application to culturally and linguistically diverse teaching and learning settings. May be repeated up to 3 credits.

Learning Outcomes

1. Describe the historical development of standards, curriculum, and assessment in the USA;
2. Critically analyze the major influences on the historical development of standards, curriculum, and assessment:
3. Explain the positive and negative impacts these major influences have had on current standards, curriculum, and assessment;
4. Students will be able to express attainable planned actions to advocate for socially just and equitable systems within their school, district, community, and profession;
5. Construct a coherent pedagogical perspective that draws on the theories and perspectives discussed throughout the course;
6. Create a plan for a lesson that puts into action the curricular and pedagogical perspectives that place value in, and make space for, the diversity of individual social development within and between cultures.

EDUC 5170. Action Research Projects
3 Credits (3)

Deeper explorations and connections among foundations of curriculum and pedagogy and their application to culturally and linguistically diverse teaching and learning settings through action research projects, approaches to assessment, and agency. May be repeated up to 3 credits.

Learning Outcomes

1. Understanding of Action Research
2. Develop an Action Research plan: Question Development; Data collection plan; Analysis
3. Analysis to Action for teaching: Applying data results to planning; Decision-making for changes in teaching
4. Presentation of Research: Research writing process

EDUC 5210. Sheltered English Instruction for the ESL Classroom
3 Credits (3)

Addresses the acquisition of English proficiency vie the SIOP (Sheltered Instruction Observational Protocol)a research validated model for lesson planning and implementation that provides English learners with access to grade-level standards.

EDUC 5220. Language, Literacy and Culture in the ESL Classrooms
3 Credits (3)

Framework and strategies for developing the written abilities of second language learners. Explore different theories of language, culture and literacy by analyzing the interconnections between language, culture and literacy.

EDUC 5310. Methods of Teaching Elementary School Science
3 Credits (2+2P)

Methods and materials for teaching elementary school science. Includes components of lessons, planning and teaching lessons in schools, and multimedia. Students should have 9 hours of science from biology, chemistry, physics, and earth science with no more than 3 hours from any one department to enroll in this course. Taught with EDUC 4310 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Corequisite: ECED 5810; EDUC 5320; READ 5310.

Learning Outcomes

1. Create, teach, and assess research based, hands-on, elementary science lessons;
2. Create, teach, and assess research based, hands-on, elementary science lessons that meet the diverse needs of all learners in all aspects of science instruction;
3. Develop assessment tools to evaluate learner's science knowledge;
4. Identify and use appropriate NMSTEM Ready!State science standards for lesson planning;
5. Integrate science with all subjects;
6. Discuss the advantages and the importance of membership in national/international professional organizations(e.g. NSTA) as well as subscribing to professional journals;
7. Identify science educational resources available using a variety of technological tools to enhance learning;
8. Demonstrate competence and confidence in teaching science;
9. Demonstrate basic classroom management skills.

EDUC 5320. Methods of Teaching Elementary School Mathematics
3 Credits (2+2P)

Content, theories of cognition, and instructional approaches for the teaching of mathematics in the elementary grades. Taught with EDUC 4320 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Prerequisite: MATH 1134.

Corequisite: ECED 5810; EDUC 5310; READ 5310.

Learning Outcomes

1. Identify what makes a 'good mathematical task', and how a good task can support students' learning;
2. Understand how children make sense of key mathematics concepts;
3. Understand how tools (including manipulatives, calculators, and other technology) assist children in their thinking and problem solving;
4. Identify your role as a teacher in a math classroom;
5. Practice teaching elementary mathematics activities using a constructivist approach and reflect upon your teaching;
6. Adjust lessons and instruction based on students' needs;
7. Develop a stance of inquiry, explore habits of mind, examine and your own mathematical knowledge and develop the mathematical knowledge needed for effective teaching;
8. Experience mathematics through thinking, reasoning, discourse/communicating, and developing math ideas with understanding so that as teachers you can facilitate learning as you work with students in this process;
9. Begin to develop your knowledge and skills to effectively support ALL learners; in particular students with special needs and bilingual/English Language Learners in mathematics

EDUC 5330. Methods of Teaching Elementary School Social Studies
3 Credits (2+2P)

Focus on social studies curriculum and instruction including student-centered approaches, active learning, educational technology, nontextual curriculum, integration, multicultural education, authentic assessment, and practical applications. Taught with EDUC 4330 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Corequisite: READ 5320.

Learning Outcomes

1. Understanding of equity and social justice through Social Studies education;
2. Navigating the public-schools and how to integrate Social Studies lessons;
3. Lesson planning and delivering Social Studies instruction;
4. How to evaluate information found online for quality and truth; and
5. Critiquing instructional materials and resources.

EDUC 5410. Teaching Science at the Middle and High School Level
3 Credits (2+2P)

Integrating content knowledge and pedagogy for the middle and high school teacher in science. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of science for student in grades 6-12. Practicum required. Same as EDUC 463 with differentiated assignments for graduate students. TEP required May be repeated up to 3 credits.

Prerequisite: EDUC 5120 & EDUC 5110.

Learning Outcomes

1. Understand and implement effective practices for teaching and learning in the secondary science classroom.

EDUC 5420. Teaching Mathematics at the Middle and High School Level
3 Credits (2+2P)

Integrating content knowledge and pedagogy for the middle and high school teacher in mathematics. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of students in 6-12 setting settings for mathematics. Same as EDUC 4420 with differentiated assignments for graduate students. TEP required May be repeated up to 3 credits.

Prerequisite: EDUC 5120 & EDUC 5110.

Learning Outcomes

1. Understand and implement effective practices for teaching and learning in the secondary mathematics classroom.

EDUC 5430. Teaching Social Studies at the Middle and High School Level
3 Credits (2+2P)

Integrating content knowledge and pedagogy for the middle and high school teacher in social studies. The focus will be on a variety of instructional strategies and pedagogical skills that will enhance the learning of social studies for student in grades 6-12. Practicum required. Same as EDUC 4430 with differentiated assignments for graduate students. TEP required May be repeated up to 3 credits.
Prerequisite: EDUC 5120 & EDUC 5110.

Learning Outcomes

1. Understand and implement effective practices for teaching and learning in the secondary social studies classroom.

EDUC 5440. Teaching Language Arts at the Middle and High School Level
3 Credits (2+2P)

Implications of cognition and language development for appropriate secondary instructional practices. Focus on construction of meaning, student-centered response to literature, writing process, print and oral language development, based on socio-psycholinguistic research and theory. Practicum required. Same as EDUC 4440 with differentiated assignments for graduate students. TEP required. May be repeated up to 3 credits.
Prerequisite: EDUC 5120 & EDUC 5110.

Learning Outcomes

1. Students will evaluate ELA and SS resources and synthesize important domains of education, including history, seminal texts, current events/trends, and formative learning theories such as global learning.
2. Students will summarize classroom literacy, language, and culture of ELA/SS classrooms.
3. Students will identify authentic assessment and effective instructional strategies and materials that can be used to deliver engaging lessons in ELA/SS reading, writing, and literature study.
4. Students will justify their personal teaching philosophy in relation to the study of the history of ELA/SS education, literacy learning theories, teaching pedagogy, and field experiences.
5. Students will assemble a professional, culminating reflective portfolio that demonstrates the ability to self-assess strengths and needs based on the NM-Teach standards.

EDUC 5510. Elementary Science Development
3 Credits (3)

Understanding of the research on elementary development of science and its application in the classroom. Focus on how elementary students come to understand topics in the physical sciences, life sciences, and earth and space sciences. Includes applications to engineering and technology. Course assignments require working with elementary students. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.

Learning Outcomes

1. To put current research on elementary students' development of science into practice.
2. To analyze student thinking to construct models of cognitive structures.
3. To select, sequence, and administer tasks to test models of students' cognitive structures.
4. To develop and facilitate a classroom lesson plan to build on models of students' cognitive structures.
5. To reflect on observations of student learning in relation to current research on elementary students' development of science.

EDUC 5520. Elementary Mathematics Development I
3 Credits (3)

Understanding of the research on elementary development of mathematics and its application in the classroom. Focus on how elementary students come to understand counting, the base 10 number system, and connections between early number understanding, geometric representations, fractions, and operations in later grades. Course assignments require working with elementary students. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.

Learning Outcomes

1. To put current research on elementary students' development of mathematics into practice.
2. To analyze student thinking to construct models of cognitive structures.
3. To select, sequence, and administer tasks to test models of students' cognitive structures.
4. To develop and facilitate a classroom lesson plan to build on models of students' cognitive structures.
5. To reflect on observations of student learning in relation to current research on elementary students' development of mathematics.

EDUC 5530. Elementary Mathematics Development 2
3 Credits (3)

Understanding of the research on elementary development of mathematics and its application in the classroom. Focus on how elementary students develop multiplicative reasoning from a foundation of additive reasoning, connections to geometric representations, and how multiplicative reasoning supports development of understanding of fractions, ratios, and rate—which leads to proportional reasoning. Course assignments require working with elementary students. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.

Learning Outcomes

1. To put current research on elementary students' development of science into practice.
2. To analyze student thinking to construct models of cognitive structures.
3. To select, sequence, and administer tasks to test models of students' cognitive structures.
4. To develop and facilitate a classroom lesson plan to build on models of students' cognitive structures.
5. To reflect on observations of student learning in relation to current research on elementary students' development of science.

EDUC 5540. Leadership Advocacy in Elementary Mathematics and Science
3 Credits (3)

This course focuses on development of elementary mathematics and science specialists' leadership qualities necessary to promote and advocate for positive change through active participation with other professionals and in their own professional growth that draws upon current research in their respective fields, development of professional development programs, evaluation of educational structures that impact equitable access to high quality instruction, and communication with stakeholders directly and indirectly associated with education

institutions. Consent of Instructor required. Restricted to: Master of Arts in Education: Elementary Mathematics and Science majors.

Learning Outcomes

1. To leverage current research on elementary students' development of mathematics science to enact change in teaching practice and education policy.
2. To make use of leadership skills to facilitate discussion with education stakeholders, school and district administrators, and teaching professionals.
3. To make use of leadership skills to collaborate with education stakeholders, school and district administrators, and teaching professionals.
4. To examine current mathematics and science teaching practice within a school or district and create a professional development plan that aligns with current research on best practices.
5. To examine current mathematics and science teaching practice within a school or district and create a professional development plan that aligns with district and/or school mission and vision.

EDUC 5810. Student Teaching
6 Credits (6)

Integrated with EDUC 5811. Student is assigned to an elementary or secondary classroom for 14-16 weeks. Elementary or secondary.
Corequisite: EDUC 5811.

Learning Outcomes

1. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.
4. The teacher candidate understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.
5. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
6. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues
7. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
8. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.
9. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways. 1
10. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner.

EDUC 5811. Teaching Methods Laboratory
3 Credits (3)

Practical application of previously learned content. Students must have a Bachelors degree and admission to the Graduate School and departmental special program. May be repeated up to 3 credits.

Learning Outcomes

1. Candidates demonstrate an understanding of the critical concepts and principles in their discipline and of the pedagogical content knowledge necessary to engage students' learning of concepts and principles in the discipline;
2. Candidates create and implement learning experiences that motivate K-8 students, establish a positive learning environment, and support K-8 students' understanding of the central concepts and principles in the content discipline;
3. Candidates design, adapt, and select a variety of valid and reliable assessments and employ analytical skills necessary to inform ongoing planning and instruction, as well as to understand, and help students understand their own, progress and growth;
4. Candidates engage students in reasoning and collaborative problem solving related authentic local, state, national, and global issues, incorporating new technologies and instructional tools appropriate to such tasks. Candidates use research and evidence to continually evaluate and improve their practice, particularly the effects of their choices and actions on others, and they adapt their teaching to meet the needs of each learner;
5. Candidates design and implement appropriate and challenging learning experiences, based on an understanding of how children learn and develop. They ensure inclusive learning environments that encourage and help all K-8 students reach their full potential across a range of learner goals;
6. Candidates work with K-8 students and families to create classroom cultures that support individual and collaborative learning and encourage positive social interaction, engagement in learning, and independence;
7. Candidates build strong relationships with students, families, colleagues, other professionals, and community members, so that all are communicating effectively and collaborating for student growth, development, and well-being;
8. Candidates reflect on their personal biases and access resources that deepen their own understanding of cultural, ethnic, gender, sexual orientation, language, and learning differences to build stronger relationships and to adapt practice to meet the needs of each learner.

EDUC 5990. Master's Thesis
1-6 Credits (1-6)

Thesis. A minimum of four credits and a maximum of six credits (thesis hours) can be counted toward the MA degree. The thesis hours require the permission of the course instructor. May be repeated up to 15 credits. May be repeated up to 15 credits.

Learning Outcomes

1. Graduate students at the Master of Arts level pursuing a research focus degree learn how to prepare for basic research study.
2. Graduate students at the Master of Arts level pursuing a research focus degree learn how to submit IRB for a research study.
3. Graduate students at the Master of Arts level pursuing a research focus degree learn how to conduct a comprehensive study.
4. Graduate students at the Master of Arts level pursuing a research focus degree learn how to summarize the research and write the results in a thesis.
5. Graduate students at the Master of Arts level pursuing a research focus degree learn how to present results from research and defend the results.

EDUC 5991. Special Research Programs
1-3 Credits (1-3)
Individual investigations either analytical or experimental. Maximum of 3 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in a specific research topic.

EDUC 5992. Directed Study Courses in Education
1-3 Credits (1-3)
Each course will be identified by a qualifying subtitle. Maximum of 3 credits in any one semester and a total of 6 credits overall. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in a specific education topic.

EDUC 5993. Secondary Education Graduate Practicum
1 Credit (1P)
Develop professional skills, dispositions, and understanding of secondary youth, content, and pedagogy through discussion seminar and practicum with public education mentor teachers. Practicum includes focused observations, study of classroom language and culture, introduction to lesson planning and student assessment. Requires 45 hours of practicum field experience. Placements are coordinated between NMSU Teacher Education Program and NM school districts. Students are required to secure their own transportation to and from the field experience school site. May be repeated up to 3 credits.

Learning Outcomes

1. Students will attain at least an Effective rating (3 average) for a 45-hour secondary classroom practicum.
2. Students will portray the high-yield strategies for teaching during their own teaching episodes.
3. Students will interact with public school teachers to discover strategies for remote teaching and learning.
4. Students will synthesize field experiences through focused observation and follow-up reporting.
5. Students will produce lesson plans that include appropriate objectives, standards, teaching strategies, differentiation techniques, and aligned assessment.
6. Students will teach secondary classes under supervision of the course instructor and university supervisor.
7. Students will interpret teaching evaluations in order to self-assess overall teaching performance.

EDUC 5996. Special Topics
1-3 Credits (1-3)
Course subtitled in the Schedule of Classes. A maximum of 3 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits.

Learning Outcomes

1. Engage in the study of a specific education topic.

EDUC 5997. Capstone Research Project
1-3 Credits (1-3)
Capstone project. Maximum of 3 credits per semester and a total of 6 credits overall. Consent of Instructor required. Restricted to: Admittance into the Master of Arts in Education: Elementary Mathematics and Science program.

Learning Outcomes

1. To investigate a problem or issue in education.
2. To communicate results of the investigation in a scholarly manner.

EDUC 5998. Social Studies/Language Arts Methods Internship
3 Credits (3)
Elementary alternative licensure process course designed to introduce intern licensed teachers to methods of instruction of social studies and language arts. University supervision provided simultaneously with EDUC 5998. Restricted to CI and HSS non-degree students. May be repeated up to 3 credits.

Learning Outcomes

1. Carry out a successful intership in social studies and language arts teaching methods.

EDUC 6110. Curriculum for a Diverse Society
3 Credits (3)
Builds upon knowledge of the foundations of curriculum and professional experience in an educational setting. Focus on the role of the curriculum leader in understanding curriculum theory, designing curriculum, and implementing curriculum in various settings. May be repeated up to 3 credits.

Learning Outcomes

1. Reflect on the significance of the teachers' professional role in schools;
2. Analyze the notion of curriculum in a broader sense along with the concepts of culture and diversity;
3. Develop understanding of the fundamental theoretical constructs in organizing the way we interact and live in our society;
4. Assume the commitment to challenge the taken for granted assumptions that have led schools to be places where inequities have been perpetuated;
5. Take on the challenge of transforming schools into public social spheres where hope is promoted, looked for, and risks are taken and faced.

EDUC 6120. Pedagogy of Learning in a Diverse Society
3 Credits (3)
Builds upon knowledge of the foundations of instruction and professional experience in teaching and learning. Focus on diverse theories of instruction with relevant practices in pluralistic settings and multicultural interactions of teaching and learning. May be repeated up to 3 credits.

Learning Outcomes

1. Instill a personal discipline that will establish clarity into your plan of studies to operationalize the direction of your research project;
2. Develop a deeper and thicker knowledge base, language facility, and chronological understanding that impact contemporary theoretical/philosophical paradigms;

3. Create a critical reflection on many of the contemporary issues/findings of recent brain research, its implications for pedagogy and andragogy and central to teaching and learning;
4. Articulate several of the diverse historical forces that legitimate certain teaching and learning practices, theories/issues in contemporary schooling life, and delegitimize other theories/issues just as easily;
5. Create a sense of collegiality and community with your seminar colleagues inside and outside of this course

EDUC 6210. Curricular Mediation for Democratic Communities
3 Credits (3)
Problematization of the various relationships, roles, and leadership considerations which emerge within educational institutions, their structures, and their culturally democratic practices in the classroom, community, and society. Restricted to doctoral-level students of any major. Same as BLED 6210. May be repeated up to 3 credits.

EDUC 6220. Praxis and Reflexivity
3 Credits (3)
The cyclical research processes of continuous self and systemic (re)evaluation vis-a-vis classroom, community, and society with an eye toward reflection, growth, change, and larger forms of social agency. Restricted to doctoral-level students of any major. Same as BLED 6220, READ 6220. May be repeated up to 3 credits.
Learning Outcomes
1. Students develop a more sound understanding of their research agenda.
2. Students will gain a better understanding of research in society, generally, and in education, specifically.
3. Students will work as a community of learners that struggles to understand our influence on educational policy and practice.
4. Students will synthesize reading material and create discussion opportunities for the entire class.
5. Students will complete writing assignments the social, ethical, legal, and human issues surrounding the use of technology uses, data literacy, and PreK-12 schools and apply that knowledge into future research.

EDUC 6230. Research in Praxis: Qualitative Research II
3 Credits (3)
This course offers a more in-depth view of research and research paradigms, theories, methods, approaches, and tools and is a sequential next step beyond Qualitative Research I. Concepts are developed to encourage research from problem formulation to interpretation of results as reflected by students' own scholarly engagements. Course activities can include alternative community-or-school-based research aimed at investigating and transforming educational realities with the participants for their own scholarly growth and development. Students will experience the dynamic between research theory and practice in education.
Learning Outcomes
1. Develop processes required for research problems within educational settings, design relevant qualitative research strategies.
2. Examine research problems, determine relevant sources, practice data collection/analysis methods, and assess the results of such efforts.

EDUC 6310. Critical Theory and Pedagogy
3 Credits (3)
Covers the various schools of thought on pedagogy, the historical and philosophical foundations embedded in these schools, and their impact on educational settings. Restricted to doctoral-level students of any major. Same as BLED 6310. May be repeated up to 3 credits.

EDUC 6320. Social Justice Issues in Education
3 Credits (3)
Covers the systems of oppression located within the constructs of power and hegemony and their impact on schooling. Restricted to doctoral-level students of any major. Same as BLED 6320. May be repeated up to 3 credits.

EDUC 6330. Critical Race Theory & Storytelling in Educational Spaces
3 Credits (3)
An upper-level doctoral course focusing on the philosophical, theoretical, and methodological origins and practices of CRT and the sister frameworks that emerged from CRT, i.e., AsianCrit, BlackCrit, FemCrit, LatCrit, QueerCrit, TribalCrit, and WhiteCrit within educational spaces. May be repeated up to 3 credits.
Learning Outcomes
1. Articulate the major tenets and assumptions of critical race theory (CRT);
2. Evaluate CRT's usefulness in educational research and what makes a CRT analysis unique or different from other analyses;
3. Synthesize research conduced by CRT scholars and the effect of racial injustice on students of color;
4. Analyze and disrupt majoritarian narratives (stories) that perpetuate racial injustice in the U.S., with a focus on institutions that intersect with educational systems.

EDUC 6340. Theoretical Frameworks and Research Design Topics
3 Credits (3)
This course offers an in-depth view of research and research paradigms, theories, methods, approaches, and tools. This course strives to encourage development of a research paradigm from problem formulation to interpretation of results. May be repeated up to 3 credits.
Learning Outcomes
1. Identify frameworks of research including affordances and challenges based on research goals.
2. Develop concepts related to previous explorations of research paradigms, approaches, methods, and tools reflect on your own research activity.
3. Conceptualize the tasks and processes of research problems within educational settings, design relevant research strategies.
4. Examine problems via heuristics to consider select pertinent data sources, data collection methods, and data analysis methods.

EDUC 6410. Current Research in Educational Practice
3 Credits (3)
A seminar for doctoral and education specialist students emphasizing current research and educational practices. May be repeated up to 3 credits.
Learning Outcomes
1. Engage in the study of a specific education research topic.

EDUC 6420. Evaluation of Quantitative Research in Education
3 Credits (3)
A doctoral-level exploration of a broad range of quantitative research designs and methodologies for collection and analysis of data as applied to critical review of the literature. May be repeated up to 3 credits.
Learning Outcomes
1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select

pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts.

EDUC 6430. Advanced Statistics
3 Credits (3)
An intermediate course focusing on more advanced theories and techniques of inferential statistics as applied to education and psychology. Includes ANOVA, planned contrasts, ANCOVA, simple regression, and non-parametrics. A computer package will be the primary tool for data analysis.
Prerequisite: EDUC 6420 or equivalent course work.
Learning Outcomes
1. Demonstrates knowledge of and uses theories, approaches, methods, and techniques for research in education.
2. Demonstrates knowledge of and applies research techniques appropriate to a research problem.

EDUC 6440. Qualitative Research I
3 Credits (3)
This course offers an examination of qualitative research approaches used in educational and social settings, with a focus upon research design, field relations, data collection and analysis, and writing from a qualitative perspective. May be repeated up to 3 credits.
Learning Outcomes
1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts.

EDUC 6910. Dissertation Seminar
3 Credits (3)
Dissertation seminar course for doctoral students utilizing a qualitative research design. May be repeated up to 3 credits.
Learning Outcomes
1. To investigate a problem or issue in education.
2. Prepare the first three chapters of a dissertation.

EDUC 6990. Practicum
2-6 Credits (2-6)
Provision for field inquiries and experiences designed to prepare the doctoral student for assuming responsibilities in the areas of curriculum and instruction. Students must be in post-master's standing. May be repeated up to 6 credits.
Learning Outcomes
1. Plan course of study with with faculty advisor or instructor.
2. Set practicum expectations for semester.

EDUC 6991. Doctoral Research
1-15 Credits (1-15)
Research. May be repeated up to 88 credits.
Learning Outcomes
1. Engage in a specific research topic.

EDUC 6996. Selected Topics
1-6 Credits (1-6)
Offered under various subtitles which indicate the subject matter covered. May be repeated up to 99 credits.
Learning Outcomes
1. Engage in the study of an ECED topic.

EDUC 6997. Independent Study Topics
1-3 Credits (1-3)
A problem and seminar course for those pursuing an advanced graduate degree. Course subtitled in the Schedule of Classes. May be repeated up to 99 credits.
Learning Outcomes
1. Plan course of study with with faculty advisor or instructor
2. Set course expectations.

EDUC 6998. Internship in Curriculum and Instruction
3-6 Credits (3-6)
For those pursuing an advanced graduate degree to meet the requirement for field work. Each course to bear an appropriate subtitle. May be repeated up to 6 credits.
Learning Outcomes
1. Complete an educational internship.

EDUC 6999. Ed.S. Thesis
1-15 Credits (1-15)
Offered primarily for those pursuing the research requirements for the Ed.S. degree. Course may be repeated up to a maximum allowed for this degree. Each research project will be designated by a qualifying subtitle. May be repeated up to 88 credits.
Learning Outcomes
1. To investigate a problem or issue in education.
2. Prepare the a complete doctoral project.

EDUC 7000. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation. May be repeated up to 88 credits.
Learning Outcomes
1. Complete all phases of dissertation.
2. Defend dissertation

ELAD-EDUCATIONAL LEADERSHIP ADMINISTRATION

ELAD 2210. Leadership and Change in Education
3 Credits (3)
This course will introduce students to the challenges and key strategies in initiating, implementing, and sustaining educational change and reform. In the first part of the course, participants will learn about the challenges of educational change in the United States and the role that they as school leaders play in facilitating change and reform. The course continues with an examination of how culture, micro-politics, and power structures support or impede national and global change initiatives. The last part of the course offers suggestions for change agents including community organizing, culture building, and embracing sustainable leadership practices. Participants will learn how to apply the change theories and concepts introduced in the course to practice through course readings, online discussions with the instructor and colleagues, group work, active examination of daily practice in schools, and personal reflection. May be repeated up to 3 credits.
Learning Outcomes
1. Students will be able to communicate in clear manners that articulate, convey and deepen the understandings others have of issues affecting their communities.
2. Students will be able to collaborate on democratic processes.

3. Students will be able to communicate engage in critical social analysis and how the status quo fits into a larger movement for social change.

ELAD 2340. Multicultural Leadership in Education
3 Credits (3)
Introduction to the social and cultural constructions of gender, class, and race. Students will critically apply theoretical constructs to everyday life and discuss the intersection of gender and race with class inequality in national and global contexts. Using a social justice framework, readings, and assignments integrate a variety of racial/ethnic groups while considering the effects of historically uneven resource distribution, unearned privilege, forms of domination and subordination, immigration status, and cultural representation and ideologies. Participants will learn how to apply the change theories and concepts introduced in the course to practice through course readings, online discussions with the instructor and colleagues, group work, active examination of daily practice in schools, and personal reflection. May be repeated up to 3 credits.
Learning Outcomes
1. Students will develop awareness of their own social identities.
2. Students will recognize differences among various communities, perspectives, and world-views.
3. Students will describe how privilege and biases impact our communities and systems.
4. Students will create meaningful peer-to-peer relationships.
5. Students will understand the impact of their actions on community members.
6. Students will identify their leadership skills to shape social change on and off campus.
7. Students will act on opportunities to promote social change.
8. Students will use academic resources including advising, computers, printing, library, and space.

ELAD 2996. Special Topics in Educational Leadership
1-3 Credits (1-3)
Special topics course in education for undergraduate students. Course will be identified by a subtitle. May be repeated up to 12 credits.
Learning Outcomes
1. Students will be able to engage in systems thinking which aids in seeing how individual situations are shaped by a broader contexts
2. Students will be able to understand how to apply theoretical frameworks for understanding social problems.
3. Students will be able to help develop leadership capacity in others.
4. Students will be able to gain an understanding of cultural competence, which recognizes that diverse perspectives strengthen the dialogue and approaches to solving social problems.

ELAD 3110V. Introduction to Educational Leadership in a Global Society
3 Credits (3)
Multinational educational systems covered through knowledge of the U.S. system of education promoting critical leadership roles every citizen plays in the success of educational systems. May be repeated up to 3 credits.
Learning Outcomes
1. Students will share reflections on issues of national and global importance in the field of educational leadership.

ELAD 3210. Current Issues In Educational Leadership
3 Credits (3)
This course addresses issues such as the rise in international education, education's costs, social media's role and influence, changes in state and national funding trends, student and faculty/staff diversity, among others. The focus of this course is centered on the actions and responses of administrators to the current issues they are facing. May be repeated up to 3 credits.
Learning Outcomes
1. Students will identify the overarching issues that leaders in educational institutions are or will be facing;
2. Students will articulate a more multicultural perspective through which to view the possible impact of these current issues on both those within the institution and those who are impacted by these institutions;
3. Students will reconstruct their perspective to allow for a greater awareness of the how these current issues might differentially impact culturally, linguistically, and socio-economically diverse populations;
4. Students will criticize inequitable examples of unfair educational policy and explore ways in which to develop culturally responsive practices when addressing current issues

ELAD 3996. Special Topics in Education
1-3 Credits (1-3)
Special topics course in education for undergraduate students. Course will be identified by a subtitle. May be repeated up to 12 credits.
Learning Outcomes
1. Objectives change based on course content.

ELAD 4110. Management of Student Services
3 Credits (3)
History and overview of student services (e.g., admissions, counseling, registration, financial aid, housing, food services, student organizations) for early entry level positions. This course will provide students with an examination of foundations and principals of student services. Important theories and essential competencies needed in order to be successful will be explored through a social justice perspective of leadership. May be repeated up to 3 credits.
Learning Outcomes
1. Explain the origins of student services concerning social and historical events programs.
2. Describe the theoretical foundations and development of student services.
3. Evaluate the organizational and administrative models for the delivery of student services
4. Critique inequity issues in student services as they relate to institutions of higher education and how social justice action might improve or eliminate such inequities.
5. Explain the primary legal foundations, ethical standards, and daily operation of student services programs.

ELAD 4120. Principles of Education Law and Policy
3 Credits (3)
Overview of the use of law and policy in schools and higher education. May be repeated up to 3 credits.
Learning Outcomes
1. Analyze the options on policy issues using the statutes, cases, regulations, and legislative history as their tools.
2. Evaluate legal developments in higher education.
3. Synthesis legal trends in their particular area of professional interest.
4. Compare and contrast how higher education law differs between private and public higher education.

ELAD 4130. Principles of Education Budgeting and Finance
3 Credits (3)
Analysis of budget and finance practices in education. Restricted to: E AD majors. May be repeated up to 3 credits.
Learning Outcomes
1. Identify opportunities to use research and individual projects to explore issues related to topics of interest to them
2. Describe ways in which budget and finance skills are important to administrators in college and university settings
3. Distinguish how financial and budgetary issues vary with respect to state, private, and various funding sources within higher education

ELAD 4410. Foundation for School Library Specialists
3 Credits (3)
Elements of librarianship. Introduction to the history, purpose, and role of the school library. Overview of current issues and legislation affecting school libraries. Taught with ELAD 5410. May be repeated up to 3 credits.
Learning Outcomes
1. Understand basic competencies for library specialists.

ELAD 4420. Administration of the School Library
3 Credits (3)
Principles and practices related to the function, structure, and management of school libraries. May be repeated up to 3 credits.
Learning Outcomes
1. Understand basic competencies for library administration.

ELAD 4510. Elements of Research
3 Credits (3)
This course provides students with a foundation for understanding educational research. The course will also provide grounding in proper writing format for use in the education profession. Students will be introduced to various research paradigms and the symbiosis of theory and practice. Besides introducing students to the symbiosis of theory and practice, students will complete assignments and activities that demonstrate the use of that symbiosis. Ultimately, students will be able to use the knowledge they gain through the course to be able to critique educational research. May be repeated up to 3 credits.
Learning Outcomes
1. Define what good research entails
2. Critique journal articles dealing with educational leadership
3. Use proper APA format in writing papers and written discussion
4. Use ethical standards for decision making in research

ELAD 4998. Internship
3 Credits (3)
The undergraduate Educational Leadership major requires that students complete two internships. Internships provide students with either experience working in an area of administration that is different from the student's regular job or experience conducting research for a program or project. Each internship placement site and scope of work is determined through consultation with the course instructor. Students must complete 120 hours of work with the selected internship site. Student must be an E AD major and be within (at least) one year of graduation. May be repeated up to 6 credits.
Learning Outcomes
1. Students will gain experience in a work/administrative setting under the supervision of a experienced administrator.

ELAD 5110. The Principalship
3 Credits (3)
Key issues surrounding the role of school-site leaders. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or better; .
Learning Outcomes
1. Students will examine the complexities of school leadership.
2. Students will create a school culture representative of their own core values.
3. Students will assess the role and importance of the principal in facilitating change, managing conflict, promoting an active anti-racist environment, celebrating diversity, and establishing accountability for all students' learning.

ELAD 5120. Leadership and Administration of Bilingual Education
3 Credits (3)
Concepts and practical approaches to improving the education of English languages learners through higher education. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or higher; .
Learning Outcomes
1. Examine the complexity and overarching issues encompassing the role of the school leader as it pertains to the broader and narrower goals of bilingual education
2. Develop critical understandings of educating equitably, involving the development and sustainability of bilingual education programs which focus on making schooling meaningful and comprehensible for the millions of children whose home languages are different from the dominant language of school and society

ELAD 5130. Basing Decision on Data: Pk-12
3 Credits (3)
Analysis of accountability data and other evidence to support educational decision making. Disaggregating and interpreting assessment data to guide improvement of instruction. Moving from evidence to plans for action. The course must be passed with a grade of "B" or higher. Consent of instructor is required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or better.
Learning Outcomes
1. Identify various types of data and their uses in decision-making
2. Identify federal and state assessment programs, as well as local assessment requirements, and the policies that drive them
3. Explain how data from multiple sources is used to inform decision making about student achievement

ELAD 5140. Educational Financial Management
3 Credits (3)
Educational finance and business applications. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or better; .
Learning Outcomes
1. Understand and be able to use and explain to lay people the technical language used to discuss education finance issues.
2. Analyze, interpret, and present financial data, trends, and issues to various publics served by the schools and outline possible actions and their implications

ELAD 5150. Public School Law
3 Credits (3)

Legal processes of education, major court decisions, and the legislative process will be studied. The course must be passed with a grade of "B" or better. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or better; .
Learning Outcomes
1. Understand the critical issues involved in applying the law fairly and justly
2. Understand the complex nature of the federal, state, and local authority levels as they relate to applying statutory and constitutional law

ELAD 5160. Management of Educational Change: Public Schools
3 Credits (3)
Leadership in implementing innovations in education. The course must be passed with a grade of "B" or higher. Consent of instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or better.
Learning Outcomes
1. Students will gain insight into how the structure of schools in the United States impacts the success of failure of educational change and reform.
2. Students will understand the role of implementing or resisting educational change efforts

ELAD 5170. Special Education Administration
3 Credits (3)
Competencies for the administration of special education programs with an emphasis upon New Mexico public school standards. The course must be passed with a grade of "B" or better. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or better.
Learning Outcomes
1. Knowledge of interactive systems and sub-systems and the influence of internal and external environments on the supervisory and improvement processes.
2. Understanding of research and effective professional development practices tied to curriculum, improvement of instructional delivery and student achievement.

ELAD 5180. Internship Public Schools Part I
3 Credits (3)
First half of a practical internship in Pk-12 schools under supervision of school administrator. The course must be passed with a grade of "B" or higher. Consent of Instructor required. 3 years of Pk-12 teaching experience required. Restricted to: E AD majors. . May be repeated up to 3 credits.
Prerequisite: 18 cr. of ELAD course work; 3.0 GPA or better.
Learning Outcomes
1. A clear understanding of the roles and responsibilities of the school leader in an adaptive, culturally diverse and changing environment
2. Provide a platform for prospective leaders to analytically reflect on the complexity of ethical cases in which the school administrator is likely to confront in the scope of his/her administrative career in public education

ELAD 5185. Internship: Public Schools Part II
3 Credits (3)
Second half of a practical internship in Pk-12 administrative setting under supervision of experienced higher education administrator. Internship site determined by class instructor and graduate student. The class must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to: E AD majors. May be repeated up to 3 credits.
Prerequisite: ELAD 5180; 3.0 GPA or better.
Learning Outcomes
1. A understanding of the roles and responsibilities of the school leader in an adaptive, culturally diverse and changing environment.
2. Provide a platform for prospective leaders to analytically reflect on the complexity of ethical cases in which the school administrator is likely to confront in the scope of his/her administrative career in public education.

ELAD 5210. Community College Administration
3 Credits (3)
An overview of the history, role, objectives and patterns governing the effectiveness of the community college. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or better; .
Learning Outcomes
1. Understand the purpose of higher education and how this purpose has changed and affected various types of community colleges and universities and groups of people;
2. Consider how organization, governance, and finance in higher education vary by institutional type, control, and mission;

ELAD 5215. Higher Education Administration
3 Credits (3)
This course provides an overview of higher education in the United States including history, mission, and governance, in the context of organizational theory. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or better.
Learning Outcomes
1. Understand the purpose of higher education and how this purpose has changed and affected various types of community colleges and universities and groups of people
2. Consider how organization, governance, and finance in higher education vary by institutional type, control and mission
3. Gain familiarity with major issues facing U.S. higher education

ELAD 5220. Management of Educational Change: Higher Education
3 Credits (3)
Leadership in implementing innovations in education in higher education. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to: E AD majors.
Prerequisite: 3.0 GPA or better.
Learning Outcomes
1. Student will gain the insight into how the structure of schools in the United States impacts the success or failure of educational change.
2. Student will understand the role of implementing or resisting educational change efforts

ELAD 5230. Higher Education Finance and Funding
3 Credits (3)
This course examines the impact and process of financing and funding higher education. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Identify opportunities to use research and individual projects to explore issues related to issues of topics of interest
2. Describe the ways in which budget and finance skills are important to administrators in college and university settings
3. Distinguish how financial and budgetary issues vary with respect to state, private, and various funding sources within higher education

ELAD 5240. Management of Student Services in Higher Education
3 Credits (3)

History and overview of student services (e.g., admissions, counseling, registration, financial aid, housing, food services, student organizations) and a review of management components used in student services. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Explain the origins of student services in relationship to social and historical events
2. Describe the theoretical foundations and development of student services.
3. Evaluate the organizational and administrative models for the delivery of student services programs.

ELAD 5250. Higher Education Law
3 Credits (3)

This course is designed to review the impact of the legal process and the judiciary on higher education. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better.

Learning Outcomes

1. Analyze the options on policy issues using the statues, cases, regulations, and legislative history as their tool.
2. Evaluate legal developments in higher education.
3. Synthesis legal trends in their particular area of professional interest.

ELAD 5260. Administration of Adult and Continuing Education
3 Credits (3)

Administration of programs in public schools, higher education, community and nontraditional educational settings. The class must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze adult education theory and the intersection of social justice to inform adult education program planning.
2. Assess the needs of specific populations for adult education programming

ELAD 5270. Basing Decision on Data: Higher Education.
3 Credits (3)

Analysis of accountability data and other evidence to support educational decision making. Disaggregating and interpreting assessment data to guide improvement of instruction. Moving from evidence to plans for action. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Learning Outcomes

1. Participants will understand the importance of using assessment data in decision-making and identify reasons why these skills are important to educational leaders in college and university settings.
2. Participants will evaluate the assessment structure of one institution or department in higher education, using a criteria-based measurement tool (rubric).
3. Participants will reflect on possibilities of using assessment data to further social justice outcomes in higher education.

ELAD 5280. Internship: Higher Education Part I
3 Credits (3)

First half of practical internship in administrative setting under supervision of experienced higher education administrator. Internship site determined by class instructor and graduate student. The course must be passed with a grade of "B" or higher. Restricted to: E AD majors. May be repeated up to 3 credits.

Prerequisite: 15 credits of ELAD coursework and consent of instructor; .

Learning Outcomes

1. Understand the roles and responsibilities of the school leader in an adaptive, culturally diverse and changing environment
2. Will provide a platform for leaders to analytically reflect on the complexity of ethical cases in which the administrator will confront in the scope of administrative role

ELAD 5285. Internship: Higher Education Part II
3 Credits (3)

Second half of a practical internship in an administrative setting under supervision of an experienced higher education administrator. Internship placement determined by class instructor and graduate student. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to: E AD majors. May be repeated up to 3 credits.

Learning Outcomes

1. Enhance knowledge and practice of higher education administration, keeping in mind that experiences should provide opportunities for thoughtful examination of the diversity of the ways and manners in which office supervisors and staff conduct their work.
2. Provide practical experience and opportunity to examine and apply learned theoretical concepts within a supportive, supervised environment.
3. Develop skills related to higher education management and leadership.

ELAD 5310. Leadership for Social Justice and Equity
3 Credits (3)

Examine cultural diversity and how appropriate understanding, leadership and instructional strategies can be used to reach all learners. Enhances understanding of what it means to be an educator in culturally diverse contexts. The course must be passed with a grade of "B" or higher. Consent of instructor required. Restricted to E AD majors. May be repeated up to 3 credits.

Prerequisite: 3.0 GPA or better, .

Learning Outcomes

1. Acquired knowledge of multicultural issues as they relate to race, ethnicity, class, and gender and how these factors intersect with current educational leadership trends;
2. Developed a more multicultural perspective which will lead to greater awareness of the needs of culturally, linguistically, and socio-economically diverse students and an ability to develop/enhance an

educational leadership lens designed to promote equity and access for all students;

ELAD 5320. Educational Leadership, Supervision, and Evaluation
3 Credits (3)
Leadership, supervision, and evaluation in Pk-12 and post secondary education. The course must be passed with a grade of "B" or better. Consent of Instructor required. Restricted to E AD majors May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or higher; .
Learning Outcomes
1. To acquire a basic knowledge of the processes, persons, and practices of educational leadership and supervision.
2. To develop personalized understandings of leadership and supervisory roles.
3. To relate leadership and supervision theory to practice.
4. To develop a concept of good administrative/supervisory practice.
5. To develop a diverse awareness of leadership and supervisory issues and techniques.

ELAD 5410. Foundation for School Library Specialists
3 Credits (3)
Elements of librarianship. Introduction to the history, purpose, and role of the school library. Overview of current issues and legislation affecting school libraries. Same as ELAD 4410. May be repeated up to 3 credits.
Learning Outcomes
1. Understand basic competencies for library specialists.

ELAD 5510. Elements of Research
3 Credits (3)
Survey and analysis of research methods and designs focusing on sound educational research and its presentation. The course must be passed with a grade of "B" or higher. Consent of Instructor required. Restricted to E AD majors. May be repeated up to 3 credits.
Prerequisite: 3.0 GPA or better; .
Learning Outcomes
1. Explain the purpose of research
2. Analyze the need for research by practicing educational administrators
3. Describe the differences between qualitative research and quantitative research

ELAD 5992. Special Problems.
1-3 Credits (1-3)
Offered under various subtitles which indicate the subject matter covered. May be taken for a maximum of 3 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits.
Learning Outcomes
1. Objectives will vary based on course content.

ELAD 5996. Special Topics
1-6 Credits (1-6)
Offered under various subtitles which indicate the subject matter covered. May be taken for a maximum of 6 credits. May be repeated up to 6 credits.
Learning Outcomes
1. Objectives change based on course content.

ELAD 5997. Independent Studies
1-3 Credits (1-3)
Individual investigation in special topic areas. Requires prior approval of project advisor. May be repeated up to 9 credits.
Learning Outcomes
1. Objectives change based on course content.

ELAD 6110. Organizational Theory
3 Credits (3)
The overarching objectives of this class is to prepare educational leaders who comprehend the complexities of educational organizations, especially those with significant underrepresented populations; to initiate or maintain leaders' commitment to educational programs that embrace all learners; and to promote within leaders an understanding of the necessity of upholding social justice, primarily as it applies to issues, such as race, ethnicity, class, ability, religion, and gender. Consent of Instructor required. Restricted to: E AD majors.
Learning Outcomes
1. Understand and implement organizational theory.

ELAD 6120. Elements of Research
3 Credits (3)
Advanced survey and analysis of research methods and designs focusing on sound educational research and its presentation. Consent of Instructor required. May be repeated up to 3 credits.
Learning Outcomes
1. Evaluate self within educational research, Analyze what good research entails
2. Use proper APA (7th ed.) format in writing papers and in written discussions
3. Synthesize scholarly literature, Understand social justice in research and practice
4. Work on small pieces of active research to gain an understanding of what it entails

ELAD 6210. Quantitative Research I
3 Credits (3)
Explores quantitative research methods, the rationale and assumptions that guide statistical decisions, beginning level statistical analyses, and how all of these are applied in the field of educational leadership. May be repeated up to 3 credits.
Learning Outcomes
1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts.

ELAD 6220. Qualitative Research I
3 Credits (3)
Explores qualitative research methods and models and their application in the field of educational leadership. May be repeated up to 3 credits.
Learning Outcomes
1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts.

ELAD 6310. Concepts of Leadership in Education
3 Credits (3)
Survey of concepts of leadership in general and educational leadership in particular. Consideration of implications for practice. May be repeated up to 3 credits.

Learning Outcomes

1. Understand and implement important concepts central to effective educational leadership

ELAD 6320. Foundations of Educational Administration
3 Credits (3)
Advanced course about the political, economic, and social forces on policy making and governance of Pk-12 and postsecondary education. May be repeated up to 3 credits.
Learning Outcomes

1. Students will gain an understanding of the concepts of school leadership, and the political, social and economic contexts that impact schools.

ELAD 6410. Quantitative Research II
3 Credits (3)
Intermediate quantitative methods of research, statistical analyses, and their application in the field of educational leadership. Restricted to Doctoral students only. May be repeated up to 3 credits.
Prerequisite: ELAD 6210.
Learning Outcomes

1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts in more detail than in Qualitative Research I.
2. Students will conduct a mini study to prepare for dissertation seminar.

ELAD 6510. Qualitative Research II
3 Credits (3)
Advanced qualitative methods of research and implementation in the field of educational leadership. May be repeated up to 3 credits.
Prerequisite: ELAD 6220.
Learning Outcomes

1. Identify the tasks and processes required to formulate appropriate research problems within educational settings, design relevant qualitative research strategies; for examining such problems, select pertinent data sources, data collection methods, and data analysis methods, and assess the results of such efforts in more detail than in Qualitative Research I.
2. Students will conduct a mini study to prepare for dissertation seminar.

ELAD 6520. Public School Law
3 Credits (3)
Advanced course in which the legal processes of education, major court decisions, and the legislative process will be studied. Consent of Instructor required. May be repeated up to 3 credits.
Learning Outcomes

1. The student will articulate an understanding of basic legal concepts through examination and discussion of relevant court cases.

ELAD 6525. Higher Education Law
3 Credits (3)
This advanced course is designed to review the impact of the judiciary on higher education. The legal standing of institutions of higher education on issues of staff rights, student rights, and tort liability will be addressed. In addition, the impact of local ordinances, state and federal laws and regulations will be examined. Consent of Instructor required. May be repeated up to 3 credits.

Learning Outcomes

1. Consider CRT's usefulness in educational research and what makes a CRT analysis unique or different from other analyses.

ELAD 6610. Scholarly Writing and the Southwest Border
3 Credits (3)
This course is designed to provide doctoral-level students with an opportunity to engage with scholarly and academic writing in a meaningful manner. Scholarly writing and academic writing are often used interchangeably. They will be used in that manner for this course. Generally defined, academic writing refers to a particular style of expression that researchers use to define the intellectual boundaries of their disciplines and their areas of expertise. Scholarly writing is the specific genre of writing that is used in all academic fields. For this course, the scholarly writing is contained to the context of the Southwest Border and Borderland issues. This is designed in consideration of and relates to the Department and Program's mission, which takes into account social justice and border education issues. Additionally, the course will cover topics associated with scholarly writing that include, but not limited to: formal language, tone, precision, clarity, word choice, and assumptive statements versus research-supported rationale. Consent of Instructor required. Restricted to: E AD majors.
Learning Outcomes

1. Understand and implement place-based writing through and about the Southwest Border.

ELAD 6620. Evaluation Design in Education
3 Credits (3)
Advanced course that focuses on evaluation and accountability models; application to educational programs. Consent of Instructor required. May be repeated up to 3 credits.
Learning Outcomes

1. Objectives change based on course content.

ELAD 6630. Educational Financial Management
3 Credits (3)
This advanced course offers an overview of economic and financial concerns relating to the public school system of the United States. Consent of Instructor required. May be repeated up to 3 credits.
Learning Outcomes

1. Students will gain an understanding of the basic concepts of school budgeting and finance practices.

ELAD 6635. Higher Education Finance and Funding
3 Credits (3)
This advanced course examines the impact and process of financing and funding higher education. The course is an examination of higher education finance as it relates to operational budgets, capital budgets, and policy issues which impact the financing of higher education. Consent of Instructor required. May be repeated up to 3 credits.
Learning Outcomes

1. Students will study the impact of the higher education budget on various departments and services at the university level.

ELAD 6710. The Professoriate
3 Credits (3)
The purpose of this course is to explore the body of scholarly knowledge and research appropriate for the study of American higher education, the context in which teaching and learning occurs, and faculty's roles in the process. We will discuss the number, variety, and purpose of the various types of institutions; the different roles that faculty members play within these institutions; how faculty work is assessed and valued within the outside of the university; administrative regulations related to faculty

work; current issues related to the general state of the professoriate; as well as how does one prepare to enter the professoriate.

ELAD 6910. Dissertation Seminar
3 Credits (3)
Same as CEPY 6450. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Consent of Instructor required. May be repeated up to 3 credits.
Learning Outcomes
1. Formulate a research purpose and driving question about a specific topic.

ELAD 6991. Doctoral Research
1-15 Credits (1-15)
Research. Consent of Instructor required. Thesis/Dissertation Grading. May be repeated up to 88 credits.
Learning Outcomes
1. Objectives for this course include submitting a pre-proposal, proposal, and final copy of the dissertation for committee consideration.

ELAD 6996. Selected Topics
1-6 Credits (1-6)
Offered under various subtitles which indicate the subject matter covered. May be repeated up to 99 credits.
Learning Outcomes
1. Objectives change based on course content.

ELAD 6998. Advanced Internship
1-6 Credits (1-6)
For those pursuing an advanced degree to meet the field work requirement. To bear an appropriate subtitle. May be repeated up to 6 credits.
Learning Outcomes
1. Students will gain experience in a work/administrative setting under the supervision of a experienced administrator.

ELAD 7000. Doctoral Dissertation
1-9 Credits (1-9)
Dissertation. Minimum of 3 credits per regular semester. May be taken for a maximum of 36 credits. Consent of instructor required. May be repeated up to 36 credits.
Learning Outcomes
1. Objectives for this course include submitting a pre-proposal, proposal, and final copy of the dissertation for committee consideration.

ELT-ELECTRONICS TECHNOLOGY

ELT 103. Math Study Skills for Electronics
1 Credit (1)
Covers specific math study skills and critical thinking processes to reinforce practical applications of math and its use with electronics. The student will be introduced to electronic mathematical formulas during the problem-solving steps required for circuit analysis. May be repeated up to 4 credits.
Prerequisite(s)/Corequisite(s): E T 183 OR E T 184. Restricted to Community Colleges only.

ELT 105. Basic Electricity and Electronics
3 Credits (2+2P)
Fundamentals of electricity and electronics, basic circuit devices, meters, transistors, integrated circuits and other solid state devices, computers, fiber optics, and industrial application topics. Minimum math proficiency of CCDM 103 or CCDM 104 required or math placement into CCDM 114 or higher. Restricted to: Community Colleges only. Crosslisted with: AERT 111 May be repeated up to 3 credits.
Learning Outcomes
1. Recall and state Ohm's Law and its components (current, resistance, voltage).
2. Demonstrate an understanding of the distinctions between formulas, equations, and expressions, and identify appropriate usage for each in different situations.
3. Apply knowledge and skills to solve problems in series and parallel electronic circuits.
4. Analyze graphs related to electronic circuits and evaluate values derived from those graphs.
5. Evaluate basic principles, formulas, the superposition theorem, and the Thevenin theorem to solve simple problems in electronics and general engineering.
6. Synthesize knowledge and skills to design and develop solutions for complex problems in electronics and engineering, incorporating the principles and theorems learned.

ELT 110. Electronics I
4 Credits (3+3P)
Fundamentals of electronics including: components, schematics, Ohm's law, Thevenin's and Norton's theorems, and series/parallel circuits incorporating passive, active and magnetic elements. Introduction to AC circuits. Crosslisted with: AERT123. Restricted to: Community Colleges only.
Learning Outcomes
1. Describe Ohm's Law and its components (current, resistance, voltage).
2. Cite the differences between formulas, equations, and expressions, and determine appropriate usage for each in various situations.
3. Apply acquired knowledge and skills to solve problems involving series and parallel electronic circuits.
4. Evaluate fundamental principles, formulas, the superposition theorem, and the Thevenin theorem to solve straightforward problems in electronics and general engineering.
5. Analyze graphs pertaining to electronic circuits and interpret values obtained from those graphs.
6. Integrate knowledge and skills to design and develop solutions for intricate problems in electronics and engineering, incorporating learned principles and theorems.
7. Apply acquired knowledge and skills to solve problems involving series and parallel electronic circuits.

ELT 120. Mathematics for Electronics
4 Credits (4)
Includes fundamental mathematics, algebra, sine, cosine, and other elementary functions as they specifically apply to the operation, manipulation, and evaluation of direct current (DC) and alternating current (AC) circuits. Minimum math proficiency of CCDM 114 required or math placement into MATH 1215 or higher. Restricted to: Community Colleges only. Crosslisted with: AERT 124
Learning Outcomes
1. Calculate and find solutions for linear and quadratic equations.
2. Evaluate logarithmic and exponential functions to solve problems in electronics and general engineering.
3. Analyze given trigonometric problems and determine which trigonometric function is appropriate to solve them.

4. Demonstrate an understanding of the distinctions between formulas, equations, and expressions, and will work through examples of each type to determine their appropriate usage in different situations.
5. Solve problems pertaining to both series and parallel electronic circuits.

ELT 135. Electronics II
4 Credits (3+3P)
Analysis of AC circuits, filters, and resonance. Introduction to solid state fundamentals including diodes and rectifier circuits, voltage regulators, various transistors and transistor characteristics, amplification and amplifiers, photoelectric effects, gates and timing circuits. Restricted to Community College Campuses Only. May be repeated up to 4 credits.
Prerequisite: A grade of C- or better in ELT 110 and ELT 120.
Learning Outcomes
1. Identify and solve alternating current and voltage circuits and do analysis of AC circuits.
2. Demonstrate by drawing series and parallel RC circuits, measure power in RC circuits, and trouble shoot for applications.
3. Recognize types of inductors, inductors in series and parallel, inductors in DC and AC circuits and select correct inductors for their applications.
4. Measure voltages, currents in series and parallel RL circuits, power in RL circuits, and find troubleshooting faults for basic applications.
5. Test RLC circuits for series and parallel designs and solve RLC resonance circuits and filters and their applications.
6. Identify self and mutual inductance; recognize types of transformers and their characteristics, test loading a transformer, do impedance matching in transformer applications and troubleshooting.
7. Apply, identify and solve time response of RC and RL integrators and differentiators for wave pulses, troubleshooting and applications.

ELT 155. Electronics CAD and PCB Design
3 Credits (2+2P)
Introduction to and the use of commercially available CAD software covering schematic representation of electronic components and circuits. Printed circuit board layout techniques including proper schematic capture, netlist generation, design rule checking and manual routing covered.
Learning Outcomes
1. Design and develop a schematic using the specified software.
2. Generate a schematic symbol for a component.
3. Develop a PCB footprint for a component.
4. Produce a board outline based on given design guidelines.
5. Create a netlist from a schematic.

ELT 160. Digital Electronics I
4 Credits (3+3P)
Number systems, codes, Boolean algebra, logic gates, Karnaugh maps, combination circuits, flip-flops, and digital troubleshooting techniques. Restricted to Community College Campuses Only. May be repeated up to 4 credits.
Prerequisite: A grade of C- or better in ELT 110 and (ELT 120 or MATH 1215).
Learning Outcomes
1. Explan why the binary, binary-coded decimal (BCD), and hexadecimal number systems are used in electronics.
2. Convert between the decimal, binary, binary-coded decimal (BCD), and hexadecimal number systems.
3. Identify each of the six basic logic gating symbols, their truth tables, and their logic expressions.
4. Constuct a truth table and logic expression for each of the six basic gating symbols.
5. Draw a parallel adder circuit and solve for the binary outputs when given binary input values.
6. Formulate using Boolean algebra, Demorgan's theorem or Karnaugh Mapping to minimize a digital logic circuit.
7. Design, Construct and test simple logic gate circuits.
8. Construct and test a simple R-S (Latch) and "D" type flip-flop.

ELT 175. Soldering Practices
3 Credits (2+2P)
Methods and techniques of hand soldering in the production of high quality and reliable soldering connections. Restricted to: Community Colleges only. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate the correct techniques for tinning and maintaining a soldering iron.
2. Compare and contrast the advantages and disadvantages of different proper soldering techniques.
3. Define the different types of mechanical strippers and how they should be used.
4. Install a wire into a turret terminal, a cup terminal, and a pierced tab terminal in accordance with established criteria.
5. Express three types of terminations used for surface mount components.
6. Describe the types of terminations normally used for making repairs.

ELT 205. Semiconductor Devices
4 Credits (3+3P)
Analysis and trouble shooting of linear electronic circuits including amplifiers, op-amps, power supplies, and oscillators. Restricted to Community College Campuses Only. May be repeated up to 4 credits.
Prerequisite: A grade of C- or better in ELT 110 and ELT 135.
Learning Outcomes
1. Explain the conditions which exist at the PN junction of an unbiased diode, a forward-biased diode, and reverse biased diode.
2. Diagram a half-wave, full-wave, and bridge rectifier circuits and explain how they function.
3. Define the characteristics of amplifiers, including classes of operation and efficiencies.
4. Describe several JFET and MOSFET applications.
5. Explain the difference between passive and active filters.
6. Practice a positive attitude and the soft skills necessary for successful employment in the electronics industry.

ELT 215. Microprocessor Applications I
4 Credits (3+2P)
Fundamentals of microprocessor architecture and assembly language with an emphasis on hardware interfacing applications.
Prerequisite(s)/Corequisite(s): ELT 235. Prerequisite(s): ELT 160. Restricted to: Community Colleges only.

ELT 220. Electronic Communication Systems
4 Credits (3+2P)
Principles and applications of circuits and devices used in the transmission, reception, and processing of RF, microwave, digital and telecommunications systems. Restricted to Community College Campuses Only. May be repeated up to 4 credits.

Prerequisite: A grade of C- or better in ELT 135.
Prerequisite/Corequisite: ELT 205.

Learning Outcomes

1. Analyze the relationship between current, resistance, and voltage to compute values for filters and filter gains.
2. Demonstrate an understanding of the distinctions between formulas, equations, and expressions, and their respective applications in different situations.
3. Employ the necessary skills to solve problems modulation/demolition processes and circuits.
4. Evaluate the effectiveness and efficiency of communication circuits.
5. Apply fundamental principles and formulas to solve straightforward problems in communication.

ELT 221. Cooperative Experience I
1-6 Credits

Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. Student will meet in a weekly class. Graded S/U.
Prerequisite: consent of instructor.

ELT 222. Cooperative Experience II
1-6 Credits

Continuation of ELT 221. Maximum of 6 credits. Graded S/U.
Prerequisite: consent of instructor.

ELT 225. Computer Applications for Technicians
3 Credits (2+2P)

An overview of computer hardware, software applications, operating systems, high level programming languages and networking systems. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate network security measures, identify potential vulnerabilities, and reflect on the importance of implementing appropriate security protocols to protect network systems from unauthorized access and potential threats.
2. Design and configure network infrastructures that meet specific requirements and performance criteria.
3. Identify and interpret network management and administration principles, troubleshoot network issues, and provide appropriate support to ensure the smooth operation of computer networks.
4. Evaluate and compare different network protocols, IP addressing schemes, and network reference models and standards, and synthesize this information to design efficient and secure network systems.
5. Apply their knowledge of computer hardware, software applications, operating systems, high-level programming languages, and networking systems to solve practical problems and analyze different network topologies and technologies.
6. Define and explain the fundamental concepts of computer hardware, software applications, operating systems, high-level programming languages,and networking systems.

ELT 230. Microprocessor Applications II
4 Credits (3+2P)

Advanced microprocessor interfacing techniques. Topics in A/D and D/A conversion, I/O port address decoding, direct memory accessing, and peripheral device interfacing applications.
Prerequisite: ELT 215.

ELT 235. Digital Electronics II
3 Credits (2+2P)

Sequential logic circuits, latches, counters, shift-registers, fault analysis and troubleshooting of digital IC s, multiplexers, timers, encoders/decoders, arithmetic circuits, pulse shaping, and memory devices. Restricted to: Community Colleges only. May be repeated up to 3 credits.
Prerequisite: A grade of C- for better in ELT 160.

Learning Outcomes

1. Describe the operations of different types of Flip-Flops and data registers, and explain the practical timing limitations of sequential logic circuits.
2. Produce timing measurements and apply practical circuits to solve switch debouncing and noise issues.
3. Analyze timing waveforms using test equipment and draw digital timing diagrams. They will also understand how multivibrators and oscillators function as timing sources, and be able to interface common devices to digital systems for control and data acquisition.
4. Describe the major types of memory devices and storage media, and recognize the fundamental use of microprocessors and microcontrollers.
5. Illustrate how multivibrators and oscillators function as timing sources, and interface common devices to digital systems for control and data acquisition.
6. Develop positive work habits necessary for success in the workplace.

ELT 240. Introduction to Photonics
4 Credits (3+2P)

Nature of light, light emitters, lasers, detectors, fiber optics communications systems, and other applications of light to electronics. May be repeated up to 4 credits.
Prerequisite: A C- or better in ELT 135 or consent of instructor.

Learning Outcomes

1. Analyze different scenarios and effectively apply appropriate techniques and methodologies to address challenges in fiber optic communication.
2. Express the differences between light detectors used in fiber optic communication compared to detectors used in electronics communication.
3. Interpret and solve problems related to signal attenuation, gain, and noise using logarithmic and exponential functions.
4. Evaluate and compare various types of detectors used in fiber optic communication systems.
5. Classify the characteristics and advantages of different detectors and make informed decisions on selecting the best detectors for specific applications.

ELT 245. Radar: Principles and Applications
3 Credits (3)

Explores the principles of operation for microwave radar applications and supporting subsystems.
Prerequisite: E T 246.

Learning Outcomes

1. Students will analyze the various factors that comprise the Radar Equation and apply the equation in calculations for various scenarios.
2. Students will explain the principles of Moving Target Indication, Pulse Doppler, Phased Array, and Synthetic Aperture Radars, and their advantages and disadvantages.
3. Students will analyze and calculate the effects of clutter and environmental noise, earth surface scattering, and atmospheric attenuation, diffraction, and refraction on radar propagation.

4. Students will analyze the performance of supporting radar subsystems, including transmitters, receivers, antennas, tracking servos, and signal processing.
5. Students will explain the kinds of information that can be obtained from radar signals and perform calculations associated with range determination, target motion resolution, and error.
6. Students will explain the use of telemetry, and correlate test radar and telemetry measurements.
7. Students will explain and compare radar countermeasures and analyze their effect on radar return cross-sections.

ELT 250. Electronics Systems Analysis
2 Credits (1+3P)
Capstone course emphasizing a systems approach to troubleshooting and maintaining complex electronics systems. Includes program review in preparation for technician certification. May be repeated up to 2 credits.
Learning Outcomes
1. Develop an understanding of the fundamental concepts and principles related to measurement, conversions, and control temperature as it relates to strain, pressure, motion, and power.
2. Interpret and analyze electrical instrumentation circuits and systems, as well as the principles and methodologies involved in process control.
3. Analyze the characteristics and advantages of different control systems and synthesize their understanding to select the most suitable control system for a given application.
4. Correlate different scenarios and select appropriate measurement and control techniques to address engineering challenges.

ELT 260. Instrumentation Control and Signal Conditioning
4 Credits (3+2P)
Introduction to sensors and transducers, signal conditioning and transmission for measuring and process control systems. Includes AD, DA converter, small servos and actuators. Prerequisite:ELT 205.

ELT 265. Special Topics
1-6 Credits
Topic to be announced in the Schedule of Classes.

ELT 270. Biomedical Equipment Instrumentation
4 Credits (3+2P)
Principles and applications of electronic circuits and devices used in biomedical equipment. Skills taught to include evaluating, troubleshooting and repairing various types of medical equipment.
Prerequisite(s)/Corequisite(s): ELT 260. Prerequisite(s): ELT 205. Restricted to: Community Colleges only.

ELTR-ELECTRICAL

ELTR 1115. National Electric Code
3 Credits (3)
Provides students with a basic understanding of the National Electrical Codes and how they apply to residential, commercial, and renewable energy systems such as photovoltaic electrical generating systems. How the NEC Codes apply to a Industrial Setting.
Prerequisite: ELTR 1120.
Learning Outcomes
1. Be able to navigate and interpret the various Sections and Articles found within the National Electric Code.
2. Demonstrate the NEC in the system design of the code.
3. Demonstrate how to apply the NEC Code to Solar Installations.
4. Demonstrate how to load wiring calculations to comply with NEC regulations for both Commercial and Residential.
5. Apply knowledge of the NEC Codes to commercial and industrial applications.

ELTR 1120. Electrical Theory I
4 Credits (3+3P)
Covers the basic concepts of DC and AC theory with emphasis on electron theory, units of electrical measurement, NEC terminology, and selection of branch circuit conductors. Upon successful completion of this course the student will define the following concepts and demonstrate her/his ability to apply them to the electrical trade by means of written examinations and assignments, with a minimum accuracy of 71%.
Learning Outcomes
1. Describe the components of an electrical circuit, electron theory, structure of an atom, properties of conductors, semiconductors, and insulators, sources of electricity, and the conversion of electrical energy.
2. Demonstrate and identify the characteristics of DC circuits, units of electrical measurement, characteristics of current, resistance, and voltage in a circuit, characteristics of a combination circuit, electrical components.
3. Apply the National Electrical Code, definitions and division of articles in the NEC.
4. Interpret NEC applications to residential wiring and the NEC enforcement on electrical codes, selection and calculation of conductor maximum ampacity including correction for ambient temperature of Branch circuit conductors, production of a sinusoidal wave.
5. Know key differences between AC and DC current, applications and theory of electrical components such as inductors, capacitors and transformers.

ELTR 1130. Introduction to Electrical Power Systems
2 Credits (2)
An overview of electrical power systems, equipment, safety practices, first aid and CPR. Students must be accepted into the electrical lineworker program before enrolling in this course. Restricted to: OEET majors.
Corequisite: ELTR 1120.
Learning Outcomes
1. List and discuss the major components of the electrical power grid and their operating functions.
2. Work as a team member with strong work ethics and a commitment to quality.
3. Adhere to OSHA ANSI working safety standards.

ELTR 1140. Basic Motor Controls
5 Credits (2+6P)
Developing schematics and wiring simple manual and electromechanical control devices.
Prerequisite: ELTR 1120 or consent of instructor.
Learning Outcomes
1. Describe the results of problems solving either orally or in writing.
2. Memorize and recall facts, procedures, and vocabulary pertaining to a motor and its characteristics.
3. Solve application problems using the appropriate design approach as a tool.

4. Express symbols and schematics designs as quantities in meaningful circuit analysis.
5. Evaluate current flow from a variety of electrical systems, utilizing rules for ladder diagrams.
6. Estimate the circuit response; compare estimated and actual responses for consistency.
7. Simplify, solve, evaluate and design various circuits and utilize needed learned interpretations.
8. Describe the results of problems solving either orally or in writing.
9. Explain sequential logic processes. 1
10. Simplify, solve, evaluate and graph various types of AC/DC electrical motor design circuits. 1
11. Simplify, solve, evaluate and programs various electrical installations. 1
12. Describe the results of problems solving either orally or in writing. 1
13. Explain sequential analysis processes as they relate to electrical systems and installation of motors. 1
14. Integrate various strategies and techniques from different areas of motor controls to application problems. 1
15. Express ladder diagrams in meaningful design interpretation.

ELTR 1160. Electrical Lineworker Lab I
6 Credits (12P)
Climbing and work on utility poles using ropes and rigging, pole setting and an introduction to transmission and distribution line construction. Maintenance and troubleshooting to include the use of hot sticks. Students must be accepted into the electrical lineworker program before enrolling in this course. Restricted to: OEET majors.
Corequisite: ELTR 1120.
Learning Outcomes
1. List and discuss the major components of the electrical power grid and their operating functions.
2. Work as a team member with strong work ethics and a commitment to quality.
3. Adhere to OSHA ANSI working safety standards.

ELTR 1165. Electrical Lineworker II
6 Credits (12P)
Practice in the installation of electrical power lines including transformers, voltage regulators, and surge arrestors. Also advanced hot sticking procedures, troubleshooting, underground systems procedures, and pole-top rescue. Students must be accepted into the electrical lineworker program before enrolling in this course. Restricted to: OEET majors.
Learning Outcomes
1. Professionally communicate in oral and written forms.
2. Work effectively in a team-based environment.
3. Accurately perform electrical related calculations and interpret results for the purpose of repair or installation of electrical power systems.
4. Demonstrate the use of current industry techniques and equipment to diagnose electrical power systems and perform appropriate repairs.
5. Demonstrate the use of current industry techniques and equipment to perform the service and maintenance of electrical power and systems.
6. Demonstrate the use of current industry techniques and equipment in the installation of electrical power lines and associated equipment.
7. Demonstrate understanding of basic electrical principals as they relate to the installation and maintenance of electrical power systems.
8. Determine the appropriate ethical action that should occur in a given circumstance.
9. Demonstrate the ability to perform lineworker duties in a safe manner.

ELTR 1220. Introduction to Wiring Lab
3 Credits (2+3P)
Covers safety, tools, materials, single pole switches, receptacles, overcurrent protection, three- and four-way switches, pilot switches, door chimes, dryer and range receptacles and swamp coolers. Analyze Blueprint applications as it applies to electrical installations. NEC requirements for light commercial applications.
Learning Outcomes
1. Demonstrate and describe jobsite safety procedures.
2. Demonstrate the ability to install electrical circuits such as single-pole, three and four way lighting circuits, heating and cooling system circuits, door chime circuits, and residential and light commercial branch-circuits.
3. Demonstrate and/or describe the function of Overcurrent Protection in an electrical system.
4. Demonstrate the ability to analyze blueprint applications as it applies to electrical installations.
5. Demonstrate the ability to analyze the National Electrical Code as it applies to electrical installations.

ELTR 1230. Residential Wiring II
3 Credits (2+3P)
Introduction to electrical raceways and fittings; electrical conductors and cables; basic electrical construction drawings, residential electrical services, and electrical test equipment.
Prerequisite: C- or better in ELTR 1220.
Learning Outcomes
1. Demonstrate Hand Bending.
2. Demonstrate Raceway and fittings.
3. Identify Conductors and Cables.
4. Interpret Basic Electrical Construction Drawings.
5. Define Residential Electrical Services.
6. Demonstrate Electrical Test Equipment.

ELTR 1996. Topics in Electricity
1-6 Credits
Varies. May be repeated up to 6 credits.
Learning Outcomes
1. Varies.

ELTR 2120. Electrical Power Systems II
3 Credits (2+2P)
Theory of power generation and distribution with emphasis on three phase systems to include transformers, voltage regulators, surge arrestors. Includes troubleshooting. Students must be accepted into the electrical lineworker program before enrolling in this course. Restricted to: OEET majors.
Learning Outcomes
1. Professionally communicate in oral and written forms.
2. Work effectively in a team-based environment.
3. Accurately perform electrical related calculations and interpret results for the purpose of repair or installation of electrical power systems.

4. Demonstrate the use of current industry techniques and equipment to diagnose electrical power systems and perform appropriate repairs.
5. Demonstrate the use of current industry techniques and equipment to perform the service and maintenance of electrical power and systems.
6. Demonstrate the use of current industry techniques and equipment in the installation of electrical power lines and associated equipment.
7. Demonstrate understanding of basic electrical principals as they relate to the installation and maintenance of electrical power systems.
8. Determine the appropriate ethical action that should occur in a given circumstance.
9. Demonstrate the ability to perform lineworker duties in a safe manner.

ELTR 2891. Electrical Apprenticeship V
6 Credits (6)
Commercial/industrial applications for electricians. Blueprint interpretation, commercial construction types and processes, wiring methods, wiring materials, and motor controls.
Learning Outcomes
1. Varies.

ELTR 2892. Electrical Apprenticeship VI
6 Credits (6)
In-depth commercial applications to include commercial/industrial service calculations, mobile home parks, multi-family dwellings, and commercial fire/security systems.
Prerequisite: ELTR 2891 and consent of instructor.
Learning Outcomes
1. Varies.

ELTR 2893. Electrical Apprenticeship VII
6 Credits (6)
Control devices in commercial/industrial applications; emphasis on logic in-line diagrams, time delay starters, reversing starters, and manual/magnetic solenoids.
Prerequisite: ELTR 2892 and consent of instructor.
Learning Outcomes
1. Varies.

ELTR 2894. Electrical Apprenticeship VIII
6 Credits (6)
Miscellaneous topics for the journeyperson electrician to include power distribution/transmission, solid state controls and relays, photoelectric and proximity controls and programmable controllers.
Prerequisite: ELTR 2893.
Learning Outcomes
1. Varies.

ELTR 2995. Electrical Cooperative Experience
1-4 Credits (1-4)
Supervised cooperative work program. Student is employed in an approved occupation and is supervised and rated by the employer and instructor. Student will meet in a weekly class.
Learning Outcomes
1. Varies.

ENGL-ENGLISH

ENGL 1105M. Introduction to Academic Writing for Multilingual Students
3 Credits (3)
This course is offered to international and domestic multilingual students. The purpose of this course is to provide students with review and practice opportunities to develop writing fluency and coherence, grammar awareness, and academic vocabulary necessary to be successful in ENGL 1110M and/or ENGL 471M.
Prerequisite: Placement in ENGL 1105M through NMSU's English Language Placement Test (ELPT), or an ACT score of 13-15, or#placement with an academic advisor using the English Self-Placement Canvas#Course, or#consent of instructor.
Learning Outcomes
1. Create well-organized, coherent paragraphs alone or in essay format.
2. Integrate a variety of sentence structures in connected discourse.
3. Portray, with general mastery, basic grammatical forms with very few errors.
4. Summarize or paraphrase information from source readings correctly.
5. Analyze readings for meaning and main ideas through annotation.
6. Integrate APA style format for in-text citations and references into their writing.

ENGL 1110G. Composition I
4 Credits (4)
In this course, students will read, write, and think about a variety of issues and texts.They will develop reading and writing skills that will help with the writing required in their fields of study and other personal and professional contexts. Students will learn to analyze rhetorical situations in terms of audience, contexts, purpose, mediums, and technologies and apply this knowledge to their reading and writing. They will also gain an understanding of how writing and other modes of communication work together for rhetorical purposes. Students will learn to analyze the rhetorical context of any writing task and compose with purpose, audience, and genre in mind. Students will reflect on their own writing processes, learn to workshop drafts with other writers,and practice techniques for writing, revising, and editing. May be repeated up to 4 credits.
Prerequisite: ACT standard score in English of 16 or higher, or an Accuplacer score 250 or higher, or an SAT score of 400 or higher or a C- or higher in either CCDE 110N or CCDS 119N.
Learning Outcomes
1. Analyze communication through reading and writing skills.
2. Employ writing processes such as planning, organizing, composing, and revising.
3. Express a primary purpose and organize supporting points logically.
4. Use and document research evidence appropriate for college-level writing.
5. Employ academic writing styles appropriate for different genres and audiences.
6. Identify and correct grammatical and mechanical errors in their writing.

ENGL 1110H. Composition I Honors
4 Credits (4)
In this course, students will read, write, and think about a variety of issues and texts.They will develop reading and writing skills that will help with the writing required in their fields of study and other personal and professional contexts. Students will learn to analyze rhetorical situations in terms of audience, contexts, purpose, mediums, and technologies and apply this knowledge to their reading and writing. They will also gain an understanding of how writing and other modes of communication work together for rhetorical purposes. Students will learn to analyze the rhetorical context of any writing task and compose with purpose,

audience, and genre in mind. Students will reflect on their own writing processes, learn to workshop drafts with other writers,and practice techniques for writing, revising, and editing.

Learning Outcomes

1. Analyze communication through reading and writing skills.
2. Employ writing processes such as planning, organizing, composing, and revising.
3. Express a primary purpose and organize supporting points logically.
4. Use and document research evidence appropriate for college-level writing.
5. Employ academic writing styles appropriate for different genres and audiences.
6. Identify and correct grammatical and mechanical errors in their writing.

ENGL 1110M. Composition I Multilingual
4 Credits (4)

In this course, students will read, write, and think about a variety of issues and texts.They will develop reading and writing skills that will help with the writing required in their fields of study and other personal and professional contexts. Students will learn to analyze rhetorical situations in terms of audience, contexts, purpose, mediums, and technologies and apply this knowledge to their reading and writing. They will also gain an understanding of how writing and other modes of communication work together for rhetorical purposes. Students will learn to analyze the rhetorical context of any writing task and compose with purpose, audience, and genre in mind. Students will reflect on their own writing processes, learn to workshop drafts with other writers,and practice techniques for writing, revising, and editing. May be repeated up to 4 credits.

Prerequisite: ACT standard score in English of 16 or higher, or an Accuplacer score 250 or higher, or an SAT score of 400 or higher or CCDE 1110 N.

Learning Outcomes

1. Analyze communication through reading and writing skills.
2. Employ writing processes such as planning, organizing, composing, and revising.
3. Express a primary purpose and organize supporting points logically.
4. Use and document research evidence appropriate for college-level writing.
5. Employ academic writing styles appropriate for different genres and audiences.
6. Identify and correct grammatical and mechanical errors in their writing.

ENGL 1120. Composition II
2 Credits (2)

In this course, students will explore argument in multiple genres. Research and writing practices emphasize summary, analysis, evaluation, and integration of secondary sources. Students will analyze rhetorical situations in terms of audience, contexts, purpose, mediums, and technologies and apply this knowledge to their reading, writing, and research. Students will sharpen their understanding of how writing and other modes of communication work together for rhetorical purposes. The emphasis of this course will be on research methods.

Prerequisite: successful completion of ENGL 1110G or ENGL 1110H or ENGL 1110M.

Learning Outcomes

1. Analyze the rhetorical situation for purpose, main ideas, support, audience, and organizational strategies in a variety of genres.
2. Employ writing processes such as planning, organizing, composing, and revising.
3. Use a variety of research methods to gather appropriate, credible information.
4. Evaluate sources, claims, and evidence for their relevance, credibility, and purpose.
5. Quote, paraphrase, and summarize sources ethically, citing and documenting them appropriately.
6. Integrate information from sources to effectively support claims as well as other purposes (to provide background information, evidence/examples, illustrate an alternative view, etc.).
7. Use an appropriate voice (including syntax and word choice).

ENGL 1410G. Introduction to Literature
3 Credits (3)

In this course, students will examine a variety of literary genres, including fiction, poetry, and drama. Students will identify common literary elements in each genre, understanding how specific elements influence meaning.

Learning Outcomes

1. Identify, define, and understand basic literary conventions and themes in fiction, poetry and drama.
2. Write reasonable, well-supported analyses of literature that ethically integrate evidence from texts

ENGL 2130G. Advanced Composition
3 Credits (3)

This course is for students who are striving for fluency, maturity, clarity and significance in their writing. It is an intermediate writing course that builds on and refines writing skills acquired in previous courses. It focuses on non-fiction writing for the professions, business, science, technical fields, academe and/or the popular press. Short works of master writers are studied for ideas, styleand structure.

Learning Outcomes

1. Students will examine and apply different writing styles and modes used by masters of personal essay and keep a reading response journal of assigned readings as demonstrated by scoring a 70% in faculty designed assignments.
2. Students will develop a sense of audience by discussing their papers with each other in small groups during class or by reading each other's papers and participating in positive, helpful peer reviews as demonstrated by scoring a 70% in faculty designed assignments.

ENGL 2210G. Professional and Technical Communication
3 Credits (3)

Professional and Technical Communication will introduce students to the different types of documents and correspondence that they will create in their professional careers. This course emphasizes the importance of audience, document design, and the use of technology in designing, developing, and delivering documents. This course will provide students with experience in professional correspondence and communicating technical information to a non-technical audience.

Prerequisite(s): Grade of C- or better in ENGL 1110G or the equivalent.

Learning Outcomes

1. Choose professional communication appropriate for audiences and situations.
2. Write in different genres of professional communication.
3. Identify the purpose of a work-related communication and assess the audiences' informational needs and organizational constraints.

4. Employ appropriate design/visuals to support and enhance various texts.
5. Demonstrate effective collaboration and presentation skills.
6. Integrate research and information from credible sources into professional communication.

ENGL 2210H. Professional and Technical Communication Honors
3 Credits (3)
Professional and Technical Communication writing for Crimson Scholars/ Honors students will introduce students to the different types of documents and correspondence that they will create in their professional careers. This course emphasizes the importance of audience, document design, and the use of technology in designing, developing, and delivering documents. This course will provide students with experience in professional correspondence and communicating technical information to a non-technical audience. 3.5 GPA is also required. Restricted to Las Cruces campus only.
Prerequisite(s): grade of C- or better in ENGL 1110G or the equivalent; approval of the honors college.
Learning Outcomes
1. Choose professional communication appropriate for audiences and situations.
2. Write in different genres of professional communication.
3. Identify the purpose of a work-related communication and assess the audiences' informational needs and organizational constraints.
4. Employ appropriate design/visuals to support and enhance various texts.
5. Demonstrate effective collaboration and presentation skills.
6. Integrate research and information from credible sources into professional communication.

ENGL 2210M. Professional and Technical Communication for Multilingual Students
3 Credits (3)
Professional and Technical Communication will introduce students to the different types of documents and correspondence that they will create in their professional careers. This course emphasizes the importance of audience, document design, and the use of technology in designing, developing, and delivering documents. This course will provide students with experience in professional correspondence and communicating technical information to a non-technical audience. NMSU specific description: In this course, students will explore the unique advantages and challenges of being multilingual writers. This course is designed for international and domestic multilingual students.
Prerequisite: Grade of C- or better in ENGL 1110G or ENGL 1110H or ENGL 1110M.
Learning Outcomes
1. Choose professional communication appropriate for audiences and situations.
2. Write in different genres of professional communication.
3. Identify the purpose of a work-related communication and assess the audiences' informational needs and organizational constraints.
4. Employ appropriate design/visuals to support and enhance various texts.
5. Demonstrate effective collaboration and presentation skills.
6. Integrate research and information from credible sources into professional communication.

ENGL 2215G. Advanced Technical and Professional Communication
3 Credits (3)
Theory and practice of writing in technical and professional fields, individualized to each student s field. Emphasizes efficient writing processes and effective written products. May be repeated up to 3 credits. Restricted to Las Cruces campus only.
Prerequisite(s): Junior or above standing, or consent of instructor.
Learning Outcomes
1. To complicate the definition of "technical and scientific communication" and its relationship(s) to studying and practicing "rhetoric."
2. To complicate our relationship to concepts like "science", "knowledge, "objectivity," neutrality, "clarity," etc.
3. To use a community-based approach to study and practice technical and scientific documents within various discourse communities.
4. To study and practice different genres (i.e. memos, letters, e-mails, reports, proposals, and instruction sets) attending to issues of audience and purpose within discourse communities.
5. To practice some mindful reading strategies that allow you to attend to the use of language and its material and discursive effects in different situations.
6. To examine the material effects of producing, circulating, and consuming technical and scientific texts on the bodies of people within different contexts.
7. To complicate our understanding of "ethics," "responsibility," and "accountability" toward ourselves and others.
8. To work collaboratively and individually to research, to analyze, and to write about public debates regarding the conduct of science and technology.
9. To understand and use basic principles of document design attending to issues of usability and accessibility. 1
10. To articulate the relationship between technical and scientific communication and issues of inclusion and social justice in the world.

ENGL 2221G. Writing in the Humanities and Social Science
3 Credits (3)
Theory and practice in interpreting texts from various disciplines in the humanities and social sciences. Strategies for researching, evaluating, constructing, and writing researched arguments. Course subtitled in the Schedule of Classes. May be repeated up to 3 credits.
Prerequisite(s): Grade of C- or better in ENGL 1110G or ENGL 1110H, or ENGL 1110M.
Learning Outcomes
1. Develop the ability to interpret and respond to humanities and social sciences texts
2. Analyze and evaluate cultural artifacts such as texts, images, and practices as a means of academic inquiry
3. Critique arguments offered in the readings to determine the underlying methodology as well as underlying values
4. Construct a rhetorical argument with evidence appropriate for an explicit audience and purpose
5. Use written, visual, or oral strategies to persuade, inform, or engage, considering situation, audience, purpose, aesthetics, and diverse points of view
6. Practice effective research strategies, and integrate research correctly and ethically from credible sources
7. Understand and apply components of the writing process such as planning, collaborating, organizing, composing, revising, and editing

ENGL 2280. History of Argument
3 Credits (3)
Investigates the major figures and movements in rhetoric from the classical period to modern rhetorical theory, examining relations between rhetorical teaching and practice, culture, epistemology, and ideology. Main campus only. Prerequisite(s): ENGL 1110G, or ENGL 1110GH, or ENGL 1110M

Learning Outcomes

1. Understand how rhetoric, argument, and persuasion work. Become familiar with the key terms and various contexts in which rhetoric, argument, and persuasion function and the contingencies that influence their use and effectiveness;
2. be familiar with the broad history and major figures of western rhetoric;
3. apply a number of approaches used to analyze and construct/deconstruct rhetorical arguments, including (but not limited to) Aristotelian appeals and commonplaces, stasis theory, toulmin analysis, pentadic/dramatistic analysis, fallacy analysis, and rogerian analysis;
4. complete an analysis as well as design and present a project regarding a contemporary issue or concern about which you feel deep passion and commitment; and
5. Improve general critical thinking and communication skills, both oral and written.

ENGL 2310G. Introduction to Creative Writing
3 Credits (3)
This course will introduce students to the basic elements of creative writing, including short fiction, poetry, and creative nonfiction. Students will read and study published works as models, but the focus of this "workshop" course is on students revising and reflecting on their own writing. Throughout this course, students will be expected to read poetry, fiction, and nonfiction closely, and analyze the craft features employed. They will be expected to write frequently in each of these genres. May be repeated up to 3 credits.
Prerequisite: C- or better in ENGL 1110G or ENGL 1110H or ENGL 1110M.

Learning Outcomes

1. Participate in a constructive conversation and community about creative writing.
2. Read and critically engage with a variety of texts.
3. Compose creative works in various genres of creative writing.
4. Provide respectful, honest, and critical feedback to peers about their work.
5. Revise creative work based on peer feedback and critique.
6. Develop thoughtful workshop reflection on students' own writing and writing process.
7. Evaluate and engage with publication process.

ENGL 2381. Script Development and Storyboarding
3 Credits (3)
Examines effective writing principles for creating storyboards that communicate the overall picture of a project, timing, scene complexity, emotion and resource requirements. Crosslisted with: FDMA 2381.

Learning Outcomes

1. develop a story idea into a complete storyboard
2. describe and visualize the creative aspects of a media project from conception to completion
3. write a scene in the professional script format
4. deliver a professional verbal and visual presentation of a story idea to an audience
5. the ability to conceive, illustrate and plan a visual project
6. proficiency in oral, written, and visual communication via storyboarding, script writing and verbal presentations

ENGL 2382. Narrative: Principles of Story Across the Media
3 Credits (3)
Examines the various strategies of written and visual storytelling, narrative structure and its principal components (plot, theme, character, imagery, symbolism, point of view) with an attempt to connect them to elements of contemporary forms of media expression, including screenwriting, playwriting, writing for documentaries and animation, etc. Crosslisted with: FDMA 2382

Learning Outcomes

1. Identify use the building blocks of storytelling: plot, theme, character, imagery,
2. Symbolism and point of view
3. Develop these building blocks into a cohesive narrative within a written document
4. Effectively communicate in different written formats
5. Create design documents for varied genres of media: narrative short, documentary, 6 Animation, commercial/industrial video, computer game
6. Describe how a written narrative can be translated into a visual medium

ENGL 2520G. Film as Literature
3 Credits (3+3P)
The purpose of this course is to teach students how to analyze film as a visual text. Students will learn to analyze films, film techniques, eras, and genres. Students will also identify significant trends and developments in film-making, examining the ways in which film reflects and creates cultural trends and values.
Prerequisites: C- or better in ENGL 1110G or ENGL 1110H or ENGL 1110M.

Learning Outcomes

1. Develop an understanding of the cultural, historical, and technical contexts for various films.
2. Identify, define, and analyze basic film techniques used in different genres and time periods.
3. Analyze how film uses literature by studying different sources of adaptation.
4. Demonstrate an understanding of film in its various aspects by writing film analysis, reviews, and/or other projects.

ENGL 2521. The Bible as Literature
3 Credits (3)
Develops informed readings of Hebrew and Christian scriptures. Emphasizes understanding Biblical literary forms, techniques, themes; historical, cultural contexts for interpretation; authorship, composition, audience for individual books; development of Biblical canon.

Learning Outcomes

1. Develop and articulate historically informed and textually supported arguments regarding the form and meaning of biblical texts
2. Express arguments and explication in clear, organized,
3. Understand the Jewish and Christian scriptures as cultural artifacts, using some fundamental techniques of literary analysis and interpretation, especially: thematic interpretation, stylistic analysis, narrative analysis, poetics, and the rhetorical analysis of figurative language.

4. Use socio-historically informed interpretive methods focused on these fundamental contextual questions : 1) who probably wrote and edited these texts, 2) why and how they most likely did so, 3) how their earliest audiences probably responded to them, and 4) why and how they were later combined to form the canonical Jewish and Christian bibles read today.
5. Know in detail substantial selections of representative, influential, and historically informative biblical texts
6. Distinguish literary critical and historical analysis of the Bible from those based on faith, tradition, authority, and theology
7. Recognize, understand, and analyze the forms, genres, and techniques used by biblical authors
8. Become familiar with and be able to use essential knowledge of the historical, cultural, and geographical contexts of Biblical writing
9. Learn how evaluate texts as historical documents, as well as how doing so relates to and differs from literary critical analysis and interpretation 1
10. Become familiar with common and influential scholarly, critical, and aesthetic ways of reading Biblical texts from a contemporary perspective 1
11. Understand the cultural influence of the Bible and its relevance for other areas of scholarly and artistic work

ENGL 2610G. American Literature I
3 Credits (3)
This course surveys American literature from the colonial period to the mid-nineteenth century. This course provides students with the contexts and documents necessary to understand the origins of American Literature and the aesthetic, cultural, and ideological debates central to early American culture.
Learning Outcomes
1. Recognize the traditions of American literature and their connection to issues of culture, race, class, and gender.
2. Demonstrate familiarity with a variety of major works by American authors.
3. Explore the various influences and sources of American literature.
4. Apply effective analytic and interpretive strategies to American literary works using academic conventions of citation and style.

ENGL 2620G. American Literature II
3 Credits (3)
This course surveys American literature from the mid-nineteenth-century to the contemporary period. This course provides students with the contexts and documents necessary to understand American literature and the aesthetic, cultural, and ideological debates central to American culture.
Learning Outcomes
1. Recognize the traditions of American literature and their connection to issues of culture, race, class, and gender.
2. Demonstrate familiarity with a variety of major works by American authors.
3. Explore the various influences and sources of American literature.
4. Apply effective analytic and interpretive strategies to American literary works using academic conventions of citation and style.

ENGL 2630G. British Literature I
3 Credits (3)
This course offers a study of British literature from its origins in Old English to the 18th century. This survey covers specific literary works--essays, short stories, novels, poems, and plays--as well as the social, cultural, and intellectual currents that influenced the literature.
Learning Outcomes
1. Read and discuss representative works of British writers from its origins in Old English to the 18th century to understand cultural and historical movements which influenced those writers and their works.
2. Identify the characteristics of various British literary genres, such as the essay, novel, short story, poetry, and dramatic literature.
3. Apply effective analytic and interpretive strategies to British literary works using academic conventions of citation and style.

ENGL 2640G. British Literature II
3 Credits (3)
This course offers a study of British literature from the 18th century to the present. This survey covers specific literary works--essays, short stories, novels, poems, and plays--as well as the social, cultural, and intellectual currents that influenced the literature.
Learning Outcomes
1. Read and discuss representative works of British writers from the 18th century to the present to understand cultural and historical movements, which influenced those writers,and their works.
2. Identify the characteristics of various British literary genres, such as the essay, novel, short story, poetry, and dramatic literature.
3. Apply effective analytic and interpretive strategies to British literary works using academic conventions of citation and style.

ENGL 2650G. World Literature I
3 Credits (3)
In this course, students will read representative world masterpieces from ancient, medieval and Renaissance literature. Students will broaden their understanding of literature and their knowledge of other cultures through exploration of how literature represents individuals, ideas and customs of the world cultures. The course focuses strongly on examining the ways literature and culture intersect and define each other.
Learning Outcomes
1. Identify and comprehend key authors and literary works from ancient periods to the Enlightenment.
2. Understand each text's historical and cultural context.
3. Identify and analyze a variety of literary forms, including poetry, plays, and philosophical and religious texts.
4. Compare works from different cultures and historical periods examining genre, style, and content or theme.
5. Analyze how literary works reflect historical, national, cultural, and ethnic differences.

ENGL 2675. Transatlantic Literatures
3 Credits (3)
This course tracks the production, circulation, and reception of literary works in transatlantic contexts over at least 150 years. Students examine a variety of documents to map transformations in form, genre, and medium across historical and geographic contexts. Students consider how colonization, exile, displacement, and migration have track the production, circulation, and reception of literary works in transatlantic contexts over at least 150 years reinforced or contested national literary traditions.
Learning Outcomes
1. Track the production, circulation, and reception of literary works in transatlantic contexts over at least 150 years
2. Identify and analyze a variety of documents to map transformations in form, genre, and medium across historical and geographic contexts

3. Explain how colonization, exile, displacement, and migration have reinforced or contested national literary traditions.

ENGL 2996. Special Topics
1-3 Credits
Emphasis on a literary and/or writing subject chosen for the semester. Repeatable for a unlimited credit under different subtitles.
Learning Outcomes
1. Varies

ENGL 301. Theory and Criticism: Rhetoric and Culture
3 Credits (3)
Introduction to rhetorical criticism with an emphasis on understanding the theoretical and cultural underpinnings for the rhetorical analyses of texts.

ENGL 302. Theory and Criticism: Literature and Culture
3 Credits (3)
Introduction to literary criticism, from its classical beginnings through contemporary critical approaches.

ENGL 303. Theory and Criticism: Film, Media and Culture
3 Credits (3)
Surveys classical and contemporary film theory. Explores the relationship of theory to textual analysis and filmmaking practices. Includes auteurism semiotics, psychoanalysis, and other theories, as well as theories of other media.

ENGL 304. Creative Writing: Prose
3 Credits (3)
Imaginative writing, chiefly prose narrative. Repeatable for a maximum of 9 credits.

ENGL 306. Creative Writing: Poetry
3 Credits (3)
Introduction to the writing of poetry. Repeatable for a total of 9 credits.

ENGL 307. Creative Writing: Creative Nonfiction
3 Credits (3)
Introduction to creative nonfiction. Skills emphasized will include the personal voice, powers of observation and reflection, advocacy, argument, and a creative, powerful use of language. Repeatable for a maximum of 9 credits.

ENGL 308. Creative Writing: Playwriting
3 Credits (3)
Technique of one-act playwriting, and analysis of dramatic structure. Crosslisted with: THEA 308

ENGL 309. Screenwriting I
3 Credits (3)
Writing intensive. Students learn the craft of screenwriting, honing skills in writing dialogue and visual narrative, crafting dynamic characters and dramatic action. Original student scripts will be performed and discussed in class. Consent of instructor required. Crosslisted with: CMI 309 and THTR 306
Prerequisite(s): ENGL 235 or CMI 235.

ENGL 310. Critical Writing
3 Credits (3)
A course in critical reading, writing, and research designed to prepare English majors for upper-division courses.

ENGL 312. Digital & Visual Rhetoric
3 Credits (3)
Includes discussion of how digital and visual media shape our everyday lives. Prepares students to analyze media ecologies - moving from messages embedded in individual photographs to the physical infrastructures that make the internet work - and engage with media ethics.
Learning Outcomes
1. Conceptualize and articulate roles digital and visual media play in production of culture.
2. Describe media representation of individuals and communities in multiple, complex ways.
3. Demonstrate familiarity with public and academic conversations surrounding media ethics.
4. Discuss how technical limitations and media histories shape representational practices.
5. Use terms and ideas from course reading to engage media objects in day-to-day life.

ENGL 313. Media Literacy & Social Justice
3 Credits (3)
Examines how information and misinformation spread through the media, while considering how this affects current social justice movements.
Learning Outcomes
1. Develop the ability to interpret and respond to current media texts as well as humanities and social sciences texts.
2. Analyze and evaluate cultural artifacts such as texts, images, and practices as a means of academic inquiry.
3. Critique arguments offered in the readings to determine the underlying methodology as well as underlying values.
4. Construct rhetorical arguments with evidence appropriate for an explicit audience and purpose.
5. Use written, visual, or oral strategies to persuade, inform, or engage, considering situation, audience, purpose, aesthetics, and diverse points of view.
6. Practice effective research strategies, and integrate research correctly and ethically from credible sources.
7. Understand and apply components of the writing process such as planning, collaborating, organizing, composing, revising, and editing.

ENGL 314. Public Writing and Rhetorics
3 Credits (3)
Invites students to study and practice writing for public audiences, considering its ethical, political, and technological contexts and consequences.
Learning Outcomes
1. Conceptualize and articulate the complex relationship(s) between writing and publics.
2. Propose, develop, and produce a defined, purpose-based and public-facing text.
3. Identify and integrate research in support of writing project.
4. Use relevant genre, media, and technological conventions in support of writing project.

ENGL 315. Writing for the Web
3 Credits (3)
Introduction to writing for the World Wide Web through practical application and analysis on both theory and research. Allows hands-on learning in a computer classroom.

ENGL 323. American Drama
3 Credits (3)
Masterworks of American drama by noted American playwrights. Crosslisted with: THEA 323

ENGL 326. Cultural Identity and Representation Across the Media
3 Credits (3)
Considers complex relationships between representation and culture including how images and language shape racial, ethnic, gender, sexual, and class identities. Examines theories from several disciplines. Includes lecture, discussion and production exercises.

ENGL 327V. Shakespeare around the Globe
3 Credits (3)
Introduction to multicultural issues in Shakespeare's plays and to adaptations of Shakespeare's plays in other cultures.

ENGL 328V. Literature of Science Fiction and Fantasy
3 Credits (3)
Survey and critical examination of the development of science fiction and fantasy as literature genres through selected authors and texts.

ENGL 339V. Chicana/o Literature
3 Credits (3)
Introduction to Chicano novels, short stories and selected creative nonfiction.

ENGL 354. Form and Technique in Fiction
3 Credits (3)
Literature course designed for fiction writers, especially those English majors in the Creative Writing emphasis. The course combines the study of published fiction with the study of craft. Some of the assignments will require the student to write original fiction based on exercises provided by the instructor. Repeatable for up to 9 credits.

ENGL 356. Form and Technique in Poetry
3 Credits (3)
Literature course designed for poets, especially those English majors in the Creative Writing emphasis. The course combines the study of published poetry with the study of craft. Some of the assignments will require the student to write original poems based on exercises provided by the instructor. Repeatable for up to 9 credits.

ENGL 363. Literature for Children and Young Adults
3 Credits (3)
A comparative, historical survey of literature for young (K to 12th grade) readers. Emphasis on critical evaluation.
Prerequisite: junior or above standing.

ENGL 380V. Women Writers
3 Credits (3)
Introduction to multicultural women's traditions through intensive study of works by women writers. Crosslisted with: GNDR 380V.

ENGL 392V. Mythology
3 Credits (3)
Greek and Roman mythology and its impact on European and English literature. Readings in myths, classical plays, and other literature with mythological interest, including nonclassical myths.

ENGL 394V. Southwestern Literature
3 Credits (3)
Introduction to multicultural literature of the Southwest: oral folk literature, literary fiction (classic and contemporary), nonfiction and poetry.

ENGL 399. Special Topics
3 Credits (3)
Emphasis on a theme, genre, figure, or technique chosen for study during the semester. Repeatable under different subtitles.

ENGL 400. Independent Study: Upper Division
1-3 Credits
For students with demonstrated aptitude for independent work. Approval of instructor required before registration. Repeatable under different subtitles.

ENGL 403. Web Design and Development
3 Credits (3)
Combines study and practice of web design and development as rhetoric, technical, processual, and collaborative.
Learning Outcomes
1. Read and write HTML without the use of an editor
2. Design and format web pages via CSS
3. Understand what JavaScript is and how it's used
4. Understand the methods for accessibility
5. Create usable, aesthetically pleasing, and functional websites

ENGL 404. User Experience and Assistance
3 Credits (3)
Includes theories and discussions of users, usability, accessibility, disability, design, embodiment, and ethics to prepare students to understand, write for, and collaborate with users and audiences in technical and professional communication contexts.
Learning Outcomes
1. Understand histories and politics that inform contemporary best practices and ethics conversations associated with the development of user-oriented documentation
2. Develop a robust vocabulary that permits engagement in both academic and industry-based conversations about users, access, and documentation
3. Discuss pros, cons, and nuances of multiple user-centered research methods
4. Produce professional user-assistance documents and discuss the ethics of design decisions.

ENGL 405. Chaucer
3 Credits (3)
Principal works, with emphasis on The Canterbury Tales.

ENGL 407. Milton
3 Credits (3)
Studies in Milton's works, including Paradise Lost.
Learning Outcomes
1. Analyze Milton’s poetry using the methods of close reading;
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Milton’s poetry and prose;
3. Demonstrate ability to locate Milton’s writings in historical and cultural context;
4. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a Working Bibliography and Research Paper on a topic related to our course material.

ENGL 408. Shakespeare I
3 Credits (3)
Study in Shakespeare’s early poems and plays. Repeatable for up to six credits under different subtitles.
Learning Outcomes
1. Analyze Shakespeare’s poetry using the methods of close reading
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Shakespeare’s poems and plays;

3. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance

ENGL 409. Shakespeare II
3 Credits (3)
Study in Shakespeare's later plays. ENGL 408 is not a prerequisite. Repeatable for up to six credits under different subtitles. Crosslisted with THEA 409.
Learning Outcomes
1. Analyze Shakespeare's poetry using the methods of close reading;
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays;
3. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance.

ENGL 412. Writing in the Workplace
3 Credits (3)
Study of workplace writing practices, including a focus on research-based, theoretical, and pedagogical approaches to professional communication.

ENGL 413. Advanced Creative Writing: Prose Workshop
3 Credits (3)
Imaginative writing, chiefly the narrative. May be repeated up to 12 credits.
Prerequisite(s): ENGL 304 or consent of instructor.

ENGL 414. Advanced Creative Writing: Poetry Workshop
3 Credits (3)
For advanced writers of poetry. Repeatable for a total of 12 credits.
Prerequisite(s): ENGL 306 or consent of instructor.

ENGL 416. Approaches to Literature
3 Credits (3)
Understanding, appreciation, techniques of instruction in the high school.
Prerequisite: at least 6 credits in upper-division English courses.

ENGL 417. Advanced Study in Critical Theory
3 Credits (3)
Advanced study of one or more major trends in theoretical inquiry within English studies. Some prior study of theory, such as English 301-303, strongly recommended. Repeatable under different subtitles.

ENGL 419. Modern Rhetorical Theory
3 Credits (3)
Major figures in rhetorical theory, with particular emphasis on developments in rhetorical theory in the twentieth century.

ENGL 422. Advanced Study in a Literary Form or Genre
3 Credits (3)
Close study of a topic in a particular literary form or genre. May be repeated under different subtitles.

ENGL 423. Advanced Study in a Major Author
3 Credits (3)
Close study of selected works by a major author. May be repeated under different subtitles.

ENGL 430. Online Publishing
3 Credits (3)
This three-credit course provides a theoretical background for online publishing and design as well as hands on experience publishing an online arts magazine.

ENGL 431. Technical Editing
3 Credits (3)
Uses workshops, readings, hands-on projects, and discussion to improve skills in gathering, writing, designing, and editing technical information. For students interested in technical communication as well as students interested in developing strengths in communicating in scientific and technical fields.

ENGL 433. Victorian Literature
3 Credits (3)
Intensive study of major writers and critical topics from the Victorian period. Repeatable under different subtitles.

ENGL 442. Modern and Contemporary American Poetry
3 Credits (3)
Studies the development of American poetry from World War I to the present. Repeatable under a different subtitle. May be repeated up to 6 credits.

ENGL 445. Postmodern Fiction
3 Credits (3)
Study of the various forms of formally innovative experimental fiction produced since 1945, with a focus on the relationship between literary history and its sociohistorical contexts. Some texts will be read in translation. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 446. Advanced Creative Writing: Nonfiction Prose
3 Credits (3)
This workshop-format class for advanced writers will examine the many varieties of Creative Nonfiction. Students should be prepared for a rigorous reading load of published nonfiction and student submissions. Because of the workshop format, every student is expected to contribute extensively to every class, both in printed form and oral comments. Taught with ENGL 546. May be repeated up to 12 credits.
Prerequisite(s): ENGL 307 or consent of instructor.

ENGL 449. Advanced Study in Writing
3 Credits (3)
Close study of a topic in composition, rhetoric and/or technical and professional communication. Repeatable for a maximum of 6 credits with permission of department.

ENGL 453. World Literatures
3 Credits (3)
Study of one or more literary traditions exclusive of those originating in Europe and the United States. Readings will include texts in translation. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 458. Latino/a Literature and Culture
3 Credits (3)
Focuses on established and emergent Latino/a literary and cultural production. Incorporates both literary and sociocultural readings of texts. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 460. Proposal Writing
3 Credits (3)
Developing proposals and grants in a workshop setting.

ENGL 469. Advanced Study in American Literature
3 Credits (3)
Covers selected works for a particular period of American literary history. Repeatable under different subtitles.

ENGL 470. Approaches to Composition
3 Credits (3)
Theory and practice of teaching writing. Discussion and application of classroom practices, definition of standards, and evaluation of student writing.

ENGL 471 M. Scholarly Writing for International Graduate Students
3 Credits (3)
This course is designed for international graduate students with an emphasis on strengthening academic writing skills, analyzing scholarly articles, writing research papers and reports, reviewing English grammar, and citing in APA style. Graded: S/U grading. May be repeated up to 3 credits. Graded: S/U grading.
Prerequisite: Placement in ENGL 471 M through NMSU's English Language Placement Test (ELPT), or#successful completion of#ENGL 1105M, or consent of instructor.
Learning Outcomes
1. Differentiate between genres in the discourses of their chosen disciplines.
2. Write part-genres (problem-solutions and Methods and Discussion sections) and genres (book/article reviews and research papers).
3. Analyze writing conventions in peer-reviewed, scholarly articles in their chosen disciplines.
4. Develop academic research abilities.
5. Apply analytical skills to the discourses of their chosen disciplines to explore how effective academic writing is achieved.
6. Incorporate APA style format for in-text citations and references into their writing.

ENGL 478. Document Design
3 Credits (3)
Advanced study in writing, with an emphasis on the computer as a tool for designing visually informative text. Includes theory and research in document design and the use of page composition and graphics software.

ENGL 479. Computers and Writing
3 Credits (3)
This course will trace the history of computers and composition as a field by looking at the work of important scholars including Selfe, Hawisher, Johnson-Eilola, and Wysocki. We will then focus on specific ways new media might be integrated into composition classrooms. The course will include discussions, student facilitations, and experimentation with technologies.

ENGL 481. Women's Literature
3 Credits (3)
Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles.

ENGL 485 M. International Teaching Assistant Development
1-3 Credits (1-3)
Prepares international graduate students for teaching assignments in their field of study and work at NMSU. Assists international/multilingual graduate students in developing communication and teaching studies necessary to fulfill duties their duties as teaching assistants at NMSU.
Learning Outcomes
1. Demonstrate effective communication strategies as an instructor.
2. Apply a variety of teaching strategies to present and explain content in your academic field.
3. Demonstrate understanding of different aspects of undergraduate education in the United States.
4. Demonstrate understanding of diverse student populations at NMSU.

ENGL 489. Cultural Studies: Literature and Theory
3 Credits (3)
Examines the theory and practice of cultural studies in relation to the variety of discourse describable as literary, including autobiography, avant-garde writing, nonfiction prose, the essay, online writing, folklore, and popular genre fiction (such as mystery, romance, thriller, or horror). Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 497. Internship
3-6 Credits (3-6)
Supervised technical and professional communication internship in business, industry, government, or the university. Repeatable for a total of 6 credits. Consent of instructor required.

ENGL 500. Supervised Study
1-3 Credits
To prepare the student for the master s degree examinations by special studies in fields not covered in routine course work.
Prerequisite: consent of instructor.

ENGL 501. Online Publishing
3 Credits (3)
This three-credit course provides a theoretical background for online publishing and design as well as hands-on experience publishing an online arts magazine. Taught with ENGL 430.

ENGL 502. Critical Conversations in Technical and Professional Communication
3 Credits (3)
Introduces students to critical histories, theories, and key concepts in technical and professional communication across academic and industry boundaries.
Learning Outcomes
1. Understand the histories and politics of emergence of technical and professional communication as a field of study and expertise;
2. Identify and track key concepts, terms, and conversations that give shape to technical and professional communication;
3. Draw on a range of theories and methodologies to articulate and critique the function and effects of technical and professional communication;
4. Participate in disciplinary conversations through research and writing.

ENGL 503. Web Design and Development
3 Credits (3)
Combines study and practice of web design and development as rhetorical, technical, processual, and collaborative.
Learning Outcomes
1. Read and write HTML without the use of an editor
2. Design and format web pages via CSS
3. Understand what JavaScript is and how it's used
4. Understand the methods for accessibility

ENGL 504. User Experience and Assistance
3 Credits (3)
Includes theories and discussions of users, usability, accessibility, disability, design, embodiment, and ethics to prepare students to understand, write for, and collaborate with users and audiences in technical and professional communication contexts.

Learning Outcomes

1. Understand histories and politics that inform contemporary best practices and ethics conversations associated with the development of user-oriented documentation
2. Develop a robust vocabulary that permits engagement in both academic and industry-based conversations about users, access, and documentation
3. Discuss pros, cons, and nuances of multiple user-centered research methods
4. Produce professional user-assistance documents and discuss the ethics of design decisions

ENGL 505. Graduate Study in Chaucer
3 Credits (3)
Principal works, with emphasis on the Canterbury Tales. Requirements include independent directed research. May be repeated up to 3 credits.

ENGL 507. Special Topics in Rhetoric and Technical and Professional Communication
3 Credits (3)
Seminar course centered on contemporary issues in rhetoric and technical and professional communication. Repeatable under different subtitles, for up to 6 credits.

Learning Outcomes

1. Use rhetoric inquiry and theory to contextualize and study technical and professional communication.
2. Understand the disciplinary overlaps, tensions, and possibilities among rhetoric and technical and professional communication.
3. Track a contemporary thematic trend, issue, or question through rhetoric and technical and professional communication.

ENGL 508. Graduate Study in Shakespeare I
3 Credits (3)
Graduate study in Shakespeare's early poems and plays. Requirements include independent directed research. Repeatable for up to six credits under different subtitles.

Learning Outcomes

1. Analyze Shakespeare's poetry using the methods of close reading
2. Demonstrate graduate-level ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays
3. Demonstrate graduate-level skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance

ENGL 509. Graduate Study in Shakespeare II
3 Credits (3)
Study in Shakespeare's late poems and plays. Requirements include independent directed research. Repeatable for up to six credits under different subtitles.

Learning Outcomes

1. Analyze Shakespeare's poetry using the methods of close reading
2. Demonstrate graduate-level ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays;
3. Demonstrate graduate-level skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance

ENGL 510. Proseminar in Rhetoric and Professional Communication
3 Credits (3)
Introduction to research in rhetoric and professional communication. Taught with ENGL 610.

ENGL 512. Graduate Study in Writing in the Workplace
3 Credits (3)
Study of workplace writing practices, including a focus on research-based, theoretical, and pedagogical approaches to professional communication.

ENGL 513. Creative Writing Workshop: Fiction
3 Credits (3)
Advanced creative writing prose workshop. Imaginative writing, chiefly the narrative. Graduate level workshop for students who are not in the English Department MFA program. May be repeated for a maximum of 12 credits. Taught with ENGL 413 with additional work required at the graduate level.

ENGL 514. Creative Writing Workshop: Poetry
3 Credits (3)
Creative writing poetry workshop for advanced writers of poetry. Graduate level works for students who are not in the English Department MFA program. Repeatable for a maximum of 12 credits. Taught with ENGL 414 with additional work required at the graduate level.

ENGL 516. Graduate Study in Approaches to Literature
3 Credits (3)
Understanding, appreciation, techniques of instruction in the high school. Requirements include independent directed research.
Prerequisite: at least 6 credits in upper-division English courses.

ENGL 517. Graduate Study in Critical Theory
3 Credits (3)
Advanced study of one or more major trends in theoretical inquiry within English studies. Some prior study of theory, such as English 301, 302, or 303, strongly recommended. Repeatable under different subtitles.

ENGL 518. History of Rhetoric
3 Credits (3)
An investigation of the crucial writings that have shaped Western attitudes towards and practice of rhetoric. Course will examine key texts from the Greeks through the Enlightenment, especially as they have influenced contemporary rhetorical theory.

ENGL 519. Graduate Study in Modern Rhetorical Theory
3 Credits (3)
Major figures in rhetorical theory, with particular emphasis on developments in rhetorical theory in the 20th century. Students will be responsible for all requirements of ENGL 419 and will in addition undertake independent directed research.

ENGL 521. Graduate Study in a Literary Period or Movement
3 Credits (3)
Close study of a topic in a particular literary period or movement. Requirements include independent directed research. Repeatable under different subtitles.

ENGL 522. Graduate Study in a Literary Form or Genre
3 Credits (3)
Close study of a topic in a particular literary form or genre. Requirements include independent directed research. Repeatable under different subtitles.

ENGL 523. Graduate Study of a Major Author
3 Credits (3)
Close study of selected works of a major author. Requirements include independent directed research. Repeatable under different subtitles.

ENGL 524. Graduate Study in a Major Text
3 Credits (3)
Close study of a major text. Requirements include independent directed research. Repeatable under different subtitles.

ENGL 525. Graduate Study in Comparative Literature
3 Credits (3)
Close study of a selection on non-English literary works read in translation. English-language works from a similar literary period or genre may also be read. Requirements include independent directed research. Repeatable under different subtitles.
Prerequisite: graduate standing or consent of instructor.

ENGL 526. Special Topics in Critical Theory
3 Credits (3)
Study of a specific historical or theoretical topic, trend, or movement in Critical Theory. Repeatable under different subtitles.

ENGL 527. Graduate Study in Film and Digital Media
3 Credits (3)
Offers close graduate study of a form or genre, a major figure or style, a historical period or movement, or a major theme or text. Topics vary from semester to semester.

ENGL 531. Technical Editing
3 Credits (3)
Uses workshops, readings, hands-on projects, and discussion to improve skills in gathering, writing, designing, and editing technical information. For students interested in technical communication as well as students interested in developing strengths in communicating in scientific and technical fields.

ENGL 533. Victorian Literature
3 Credits (3)
Intensive study of major writers and critical topics from the Victorian period. Repeatable under different subtitles.

ENGL 534. Graduate Study: Form and Technique in Fiction
3 Credits (3)
Advanced study of issues in form and technique in fiction, including point of view, scene and dialogue, and story structure. Repeatable for a maximum of 6 credits.

ENGL 535. Graduate Study: Form and Technique in Poetry
3 Credits (3)
Advanced study of issues in form and technique in poetry, including voice, tone, syntax, and structure. Repeatable for a maximum of 12 credits.

ENGL 536. The Borderlands Writing Project
3-6 Credits (3-6)
Intensive month-long seminar for practicing teachers and educators designed to improve the teaching of writing and the writing process and literacy and reading in schools and other educational contexts. Reading, discussing, and writing about current professional literature; completing teacher inquiry; and planning action research. Participants complete personal and professional writing, as well as additional professional development activities. By invitation only. Affiliated with the National Writing Project. Consent of instructor required. Crosslisted with: RDG 536

ENGL 542. Modern and Contemporary American Poetry
3 Credits (3)
Studies the development of American poetry from World War I to the present. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 543. Multimedia Theory and Production
3 Credits (3)
Issues, theories, and production practices underlying design of multimedia, including rhetorical choices, aesthetic approaches, usability concerns, and diverse academic and popular discourses contributing to continued development of digital texts. Taught with ENGL 643.

ENGL 544. Modern British Fiction
3 Credits (3)
Study of the fiction produced in the British Isles in the 20th and 21st centuries. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 545. Postmodern Fiction
3 Credits (3)
Study of the various forms of formally innovative experimental fiction produced since 1945, with a focus on the relationship between literary history and its sociohistorical contexts. Some texts will be read in translation. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 546. Advanced Creative Writing: Nonfiction Prose
3 Credits (3)
This graduate-level workshop will examine the many varieties of Creative Nonfiction. Students should be prepared for a rigorous reading load of published nonfiction and student submissions. Because of the workshop format, every student is expected to contribute extensively to every class, both in printed form and oral comments. Taught with ENGL 446 with additional work required at the graduate level. Consent of Instructor required. Crosslisted with: ENGL 446.

ENGL 548. Graduate Study in Empirical Research
3 Credits (3)
Introduction to empirical research methods in composition, professional communication, and rhetoric.

ENGL 549. Graduate Study in Writing
3 Credits (3)
Close study of a topic in composition, rhetoric, and/or technical and professional communication. Topics vary. Repeatable for a maximum of 6 credits.

ENGL 550. Graduate Study in Literacy
3 Credits (3)
Studies in literacy theory and literacy research. Topics may vary. Taught with ENGL 650.

ENGL 552. Graduate Study in History of the English Language
3 Credits (3)
This course examines the history of the English language from its Indo-European origins through its development into an international language. The aim is to describe the English language formally and to trace linguistic change over time. Samples of written English will illustrate various stages in the development of English. Also considered are contemporary social and political issues related to language, including the problem of 'standard English' and the uses of language in advertising, the media, and politics.

ENGL 553. World Literatures
3 Credits (3)
Study of one or more literary traditions exclusive of those originating in Europe and the United States. Readings will include texts in translation. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 555. Graduate Study in Rhetoric of Scientific Literature
3 Credits (3)
Intensive study of the rhetoric of selected works of scientific literature.

ENGL 558. Latino/a Literature and Culture
3 Credits (3)

Focuses on established and emergent Latino/a literary and cultural production. Incorporates both literary and sociocultural readings of texts. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 560. Proposal and Grant Writing
3 Credits (3)
Developing proposals and grants in a workshop setting.

ENGL 561. Topics in Writing Program Administration
3 Credits (3)
Explores issues, theories, and research underlying the design of writing programs and the administration of writing centers. Repeatable for a maximum of 6 credits. Taught with ENGL 661.

ENGL 563. Graduate Study in English Literature
3 Credits (3)
Covers selected works for a particular period of English literary history. Repeatable under different subtitles.

ENGL 564. History and Theory of Composition Studies
3 Credits (3)
Studies in the history and theory of composition as a discipline. Taught with ENGL 664.

ENGL 565. Intercultural Rhetoric and Professional Communication
3 Credits (3)
Examines rhetorical traditions in intercultural professional, technical, academic, and governmental contexts. Taught with ENGL 665.

ENGL 567. Documentary Film Theory and Criticism
3 Credits (3+3P)
Course offers critical survey of documentary film theory and criticism including considerations of the epistemological assumptions, rhetorical choices, aesthetic approaches, political circumstances of historical and contemporary documentary film.

ENGL 568. Rhetoric and Cultural Studies
3 Credits (3)
Explores intersections between rhetoric and cultural studies. Examines theories and practices of texts and discourses in political and cultural contexts. Taught with ENGL 668.

ENGL 569. Graduate in American Literature
3 Credits (3)
A group of works from a particular period of American literary history. Repeatable under different subtitles.

ENGL 570. Graduate Study in Approaches to Composition
3 Credits (3)
Theory and practice of teaching writing, including classroom practices, definition of standards, and evaluation of student writing. Requirements include independent directed research.

ENGL 571. Composition Pedagogy and Practicum
3 Credits (3)
Examines the pedagogical implications of contemporary composition theory and research. Focuses on teaching composition at the college level. Consent of instructor required.

ENGL 572. Technical-Professional Communication Pedagogies
3 Credits (3)
Combines theoretical and practical attention to the pedagogies that underwrite the teaching of technical and professional communication; culminates in the development of a TPC course proposal, syllabus, and rationale. For Graduate students only.

Learning Outcomes

1. Engage with research and scholarship that reflects a range of approaches to conceptualize the purposes and goals of technical and professional communication courses;
2. Articulate a range of possibilities for and responsibilities of technical and professional communication pedagogy;
3. Compose and substantiate a teaching philosophy and course plan for teaching technical and professional communication.

ENGL 574. Workshop: Advanced Writing Prose
3 Credits (3)
Intensive practice in prose writing, primarily fiction, in a workshop environment with peer criticism. Repeatable for a total of 15 credits. Consent of instructor required.

ENGL 575. Workshop: Advanced Writing Poetry
3 Credits (3)
Intensive practice in poetry writing in a workshop environment with peer criticism. Repeatable for a total of 15 credits. Consent of instructor required.

ENGL 576. Workshop: Advanced Writing Playwriting
3 Credits (3)
Intensive practice in dramatic writing in a workshop environment with peer criticism. Repeatable for a total of 9 credits. Consent of instructor required.

ENGL 577. Workshop: Advanced Technical and Professional Writing
3 Credits (3)
Intensive practice in technical and professional writing and editing in a workshop environment. May be repeated for a total of 6 credits. Consent of instructor required.

ENGL 578. Topics in Rhetoric and Technology
3 Credits (3)
Explores intersections between rhetoric and technology, approaches may highlight theory, media production, and/or research. Repeatable for a maximum of 6 credits. Taught with ENGL 678.

ENGL 579. Computers and Writing
3 Credits (3)
This course will trace the history of computers and composition as a field by looking at the work of important scholars including Selfe, Hawisher, Johnson-Eilola, and Wysocki. We will then focus on specific ways new media might be integrated into composition classrooms. The course will include discussions, student facilitations, and experimentation with technologies.

ENGL 580. Graduate Problems in Creative Writing
3 Credits (3)
Independent study in creative writing. Consent of instructor required. Repeatable for a total of 9 credits.

ENGL 581. Women's Literature
3 Credits (3)
Intensive study of literature by women, in particular historical, aesthetic, cultural, or intellectual contexts. Repeatable under different subtitles.

ENGL 582. Gender and Popular Culture
3 Credits (3)
Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 583. Critical Writing Studies
3 Credits (3)
Overview of current and historical approaches to the critical study of gender and language: how gender theoretically manifests in linguistic, social, cultural, academic, and professional contexts.

ENGL 584. Workshop: Advanced Academic Writing for International Students
3 Credits (3)
This workshop-based course is for graduate-level multilingual writers from all disciplines who want to improve their English academic writing in an intensive and collaborative environment. Students will propose a major writing project to workshop throughout the semester, such as dissertation, thesis, comprehensive exams, etc. Some of the topics covered will be academic language, cohesion/coherence, organization, and supporting academic arguments. Other topics to be determined by needs of the class.) 4.Consent of instructor.
Prerequisite(s): 1.Be classified as a graduate student by the Graduate School 2.Be classified as an international student whose first language is not English 3.Have a major writing project in progress (comprehensive exams, thesis, dissertation, conference paper, etc.

ENGL 585. Advanced Writing Workshop: RPC Capstone
3 Credits (3)
Students work to develop and revise their chosen Master's program Capstone Project (a portfolio, thesis or master essay) in consultation with instructor and classmates. Students provide and receive feedback on their work-in-progress. Consent of Instructor required.

ENGL 589. Cultural Studies: Literature and Theory
3 Credits (3)
Examines the theory and practice of cultural studies in relation to the variety of discourse describable as literary, including autobiography, avant-garde writing, nonfiction prose, the essay, online writing, folklore, and popular genre fiction (such as mystery, romance, thriller, or horror). Repeatable under different subtitles. May be repeated up to 6 credits.

ENGL 590. Master's Seminar in Rhetoric
3 Credits (3)
Studies in theories of and issues in rhetoric. Topics may vary from year to year. Repeatable for a total of 9 credits.

ENGL 592. Master's Theory, Practice, and Profession
3 Credits (3)
Students will study major poetics/narratology pieces in the field and other related professional topics such as literary citizenship, publishing, and job seeking skills. Students will also propose and develop a year-long project in one of the above categories, such as a community reading or workshop, a conference panel proposal, a paper presentation, a chapbook press launch, writing/placing literary book reviews, or work on an outreach project. Must be taken in each of the last two semesters of the MFA and currently with ENGL 594 (Master's Workshop). Restricted to MFA-Creative Writing students, or by consent of instructor.
Learning Outcomes
1. Understand, analyze, and effectively use the critical discourse of poetics/narratology/craft in the field of creative writing
2. Design and execute an outreach or professional project that contributes to a creative writing community
3. Explore applications of their training in professional contexts.
4. Analyze how students' own reading, writing, and research respond to existing leadership in professional creative writing communities, help provide new leadership, and answer community needs.

ENGL 594. Master's Workshop
3 Credits (3)
Students will submit a draft of their thesis project, in their major genre, for workshop critique. Revision of the thesis draft will be submitted to the instructor. Restricted to MFA Creative Writing students, or by consent of instructor. Must be taken in each of the last two semesters of the MFA, and concurrently with ENGL 592 (Master's Theory, Practice, and Profession).
Learning Outcomes
1. Understand, analyze, and effectively use the critical discourse of the field of creative writing to discuss a thesis.
2. Examine how their thesis operates with the genre and within the context of contemporary literature.
3. Critically contextualize their thesis and those of their peers
4. Apply various revision strategies across a thesis-length manuscript, responding to the critiques of the instructor and their peers
5. Achieve the standards of publication of the University's thesis editor and learn those of the publishing environment in their genre.

ENGL 595. Master's Workshop: Poetry
3-6 Credits (3-6)
Students will submit a draft of thesis project for workshop critique. Revision of the thesis draft submitted to the instructor. Restricted to MFA CW majors.
Prerequisite(s): Enrolled in MFA penultimate semester.

ENGL 596. Master's Workshop: Fiction
3-6 Credits (3)
Students will submit a draft of thesis project for workshop critique. Revision of the thesis draft submitted to the instructor. Restricted to MFA CW majors.
Prerequisite(s): Enrolled in MFA penultimate semester.

ENGL 597. Internship in Technical and Professional Communication
3-6 Credits (3-6)
Supervised technical and professional communication in business, industry, government, or the university. May be repeated for a total of 6 credits. Consent of instructor required.

ENGL 598. Master's Essay
3 Credits (3)
Students electing the master essay option complete revision of a scholarly essay of 25-30 pages, the approximate length of a journal article, and reformulation of this essay to the 7-8 pages appropriate for presentation at a conference. This option also requires research of appropriate publication venues and a final oral defense of the project. A supervising faculty member will approve the selected essay, guide revision, and help students form an examining committee, which consists of at least two members of the graduate English faculty and one member of the graduate faculty from outside the department. Students are encouraged to undertake the Master Essay process in the first half of their third semester of full time graduate work, or soon after completing 18 hours of course work. This option is the preferred exam option, particularly for those students who intend to pursue Ph.D. study. Consent of instructor required.

ENGL 599. Master's Thesis
1-15 Credits
Thesis.

ENGL 600. Doctoral Research
1-15 Credits
Assigns credit for research performed prior to the doctoral comprehensive examination.

ENGL 601. Qualitative Research
3 Credits (3)
Theory and practice of designing research studies and of collecting and analyzing data. Emphasis on qualitative methods of research in composition, professional communication, and rhetoric.

ENGL 604. Digital Research Methods
3 Credits (3)
This course will serve as one of the core methods courses in the RPC PhD program, focusing on "digital" methods in rhetorical studies. As such, the aim of this class is to help you begin to gain confidence in conducting research in rhetoric, professional communication, and composition using digital methods. In this course we will assume that digital methods in rhetoric take broadly two forms: first, digital methods of acquisition, processing, and presentation of research data. And second, digital methods of production and circulation of rhetorical objects. The former closely resembles the methods of "digital humanities" while the latter will be closer to media archaeology and "critical making" practices. In all cases, we will relate these tools and methods to key questions and theories in our field, asking how and why we might apply digital methods in rhetorical scholarship.
Prerequisite(s): graduate standing.

ENGL 610. Proseminar in Rhetoric and Professional Communication
3 Credits (3)
Introduction to research in rhetoric and professional communication. Required of and limited to students enrolled in the Ph.D. program in Rhetoric and Professional Communication.

ENGL 643. Multimedia Theory and Production
3 Credits (3)
Issues, theories, and production practices underlying design of multimedia, including rhetorical choices, aesthetic approaches, usability concerns, and diverse academic and popular discourses contributing to continued development of digital texts. Taught with ENGL 543.

ENGL 649. Graduate Study in Writing
3 Credits (3)
Close study of a topic in composition, rhetoric, and/or technical and profession communication. Repeatable for a total of 6 credits.

ENGL 650. Graduate Study in Literacy
3 Credits (3)
Studies in literacy theory and literacy research. Topics may vary. Taught with ENGL 550.

ENGL 661. Topics in Writing Program Administration
3 Credits (3)
Explores issues, theories, and research underlying writing programs and the administration of writing centers. Repeatable for a maximum of 6 credits. Taught with ENGL 561.

ENGL 664. History and Theory of Composition Studies
3 Credits (3)
Studies in the history and theory of composition as a discipline. Taught with ENGL 564.

ENGL 665. Intercultural Rhetoric and Professional Communication
3 Credits (3)
Examines rhetorical traditions in intercultural professional, technical, academic, and governmental contexts. Taught with ENGL 565.

ENGL 668. Rhetoric and Cultural Studies
3 Credits (3)
Explores intersections between rhetoric and cultural studies. Examines theories and practices of texts and discourses in political and cultural contexts. Taught with ENGL 568.

ENGL 678. Topics in Rhetoric and Technology
3 Credits (3)
Explores intersections between rhetoric and technology, approaches may highlight theory, media production, and/or research. Repeatable for a maximum of 6 credits. Taught with ENGL 578.

ENGL 683. Critical Writing Studies
3 Credits (3)
This course investigates the field of Writing Studies as a distinct field of study, related to but not synonymous with Composition Studies. While debates surrounding the relationships among Writing Studies and Composition Studies flourish, this course centers on the former—investigating writing as a practice, process, and object that merits attention in its own right. Such attention will be grounded in contemporary critical and cultural theory that contests writing as a positive or neutral sign (i.e. activity theory, posthumanism, ecocriticism, new materialism, new media studies; feminist, queer, critical race or decolonial theory). Crosslisted with: ENGL 583.
Prerequisite(s): graduate standing.

ENGL 690. Doctoral Seminar in Rhetoric
3 Credits (3)
Studies in theories of and issues in rhetoric. Topics may vary from year to year. Repeatable for a maximum of 9 credits.

ENGL 700. Doctoral Dissertation
1-15 Credits
Dissertation.

ENGR-ENGINEERING

ENGR 100G. Introduction to Engineering
3 Credits (2+3P)
An introduction to the various engineering disciplines, the engineering approach to problem solving, and the design process. Projects emphasize the importance of teamwork, written & oral communication skills, as well as ethical responsibilities. May be repeated up to 3 credits.
Prerequisite(s)/Corequisite(s): MATH 1220G or above.
Learning Outcomes

1. Analyze the engineering road maps and have a solid curriculum plan for each semester including summers.
2. Discuss the importance of information on engineering student organizations.
3. Demonstrate an understanding of the design process from initial conception to final solution through the application of critical thinking while learning important team building skills approaches to problem solving.
4. Identify the different engineering fields,the engineering profession, career paths open to engineers, and the process to professional licensure.
5. Apply clear communication and critical thinking skills by collecting, organizing, and analyzing data in a complete, clearly written, and oral presentation of their work.
6. Make use of basic knowledge and skills in Microsoft Excel to complete engineering assignments.
7. Identity, compute, and apply how dimensions, length, time, mass, force, temperature, electric current, energy and power, and related parameters are related to the different fields of engineering.
8. recognize ethical and professional responsibilities in engineering situations and make informed judgements.

ENGR 100GH. Introduction to Engineering Honors
3 Credits (2+3P)
An introduction to the various engineering disciplines, the engineering approach to problem solving, and the design process. Projects emphasize the importance of teamwork, written & oral communication skills, as well as ethical responsibilities. May be repeated up to 3 credits. Crosslisted with: ENGR 100.

Prerequisite(s)/Corequisite(s): MATH 1220G or above.

Learning Outcomes

1. Analyze the engineering road maps and have a solid curriculum plan for each semester including summers.
2. Discuss the importance of information on engineering student organizations.
3. Demonstrate an understanding of the design process from initial conception to final solution through the application of critical thinking while learning important team building skills approaches to problem solving.
4. Identify the different engineering fields,the engineering profession, career paths open to engineers, and the process to professional licensure.
5. Apply clear communication and critical thinking skills by collecting, organizing, and analyzing data in a complete, clearly written, and oral presentation of their work.
6. Make use of basic knowledge and skills in Microsoft Excel to complete engineering assignments.
7. Identity, compute, and apply how dimensions, length, time, mass, force, temperature, electric current, energy and power, and related parameters are related to the different fields of engineering.
8. recognize ethical and professional responsibilities in engineering situations and make informed judgements.

ENGR 110. Introduction to Engineering Design
3 Credits (2+3P)

Sketching and orthographic projection. Covers detail and assembly working drawings, dimensioning, tolerance specification, and design project

Learning Outcomes

1. Students will learn the fundamentals of part modeling and assemblies using modeling techniques in the SolidWorks solid modeling software.
2. They will learn how to put these parts and assemblies into production drawings using proper Geometric Dimensioning.

ENGR 111. Mathematics for Engineering Applications
3 Credits (3)

An introduction to engineering mathematics and basic programming skills needed to perform elementary data manipulation and analysis. Consent of Instructor required.

Prerequisite(s)/Corequisite(s): MATH 1250G. Prerequisite(s): MATH 1220G.

ENGR 120. DC Circuit Analysis
4 Credits (3+3P)

An introduction to DC circuit analysis using Ohm's law, Kirchoff's laws, and Thevenin's theorem. Topics include delta-wye and source transformations, node-voltage and mesh-current analysis, and superposition.

Prerequisite/Corequisite: MATH 1250G.

Learning Outcomes

1. Convert decimal numbers to engineering notation using metric prefixes and units.
2. Relate electric charge, current, resistance, voltage, energy, and power.
3. Analyze circuits with voltage and current sources, ideal and real, independent and dependent.
4. Apply Ohm's Law and Kirchoff's Voltage and Current Laws to DC circuits.
5. Create equivalent circuits using series/parallel combinations, delta-wye and source transformations, and Thevinin's Theorem.
6. Analyze circuits using the node voltage method, mesh current method, and superposition.
7. Create a functioning prototype of DC circuits, including taking voltage, current, and resistance measurements.

ENGR 130. Digital Logic
4 Credits (3+3P)

An introduction to logic design and the basic building blocks of digital systems. Topics include numbering systems, Boolean algebra, digital logic theory, combinational logic, sequential logic, and applications such as adders, multiplexers, encoders, counters, and registers. Includes hands-on laboratory.

Prerequisite: A grade of C- or better in MATH 1220G or higher.

Learning Outcomes

1. Explain the behavior of the six logic gates using the truth table (AND, OR, NOT, NAND, NOR, XOR, XNOR).
2. Create the truth tables for any logic gate or Boolean function.
3. Apply Boolean Algebra rules OR K-maps to any logic function expression to simplify it.
4. Create complete circuit designs using combinational logic functions and sequential logic functions.
5. Convert numerical values to the commonly used digital representations.
6. Apply arithmetic operations using different numbering systems.
7. Build digital circuits using breadboard and Integrated circuits.

ENGR 140. Introduction to Programming and Embedded Systems
4 Credits (3+3P)

An introduction to programming and to the field of embedded systems. Starting from the basic concepts of programming, this course uses microcontrollers, sensors, motors, and other peripheral devices to support the learning and application of the problem-solving process through embedded systems. This course focuses on reading, writing, debugging, testing, and documenting computer programs.

Prerequisite/Corequisite: E T 182 or ENGR 130 or PHYS 1310G.

Learning Outcomes

1. Set up and use a rich programming environment for programming.
2. Employ effective use of the problem-solving process.
3. Analyze existing code.
4. Write, debug and test code given software requirements.
5. Apply testing and documentation best practices.
6. Transfer and apply programming knowledge to an Arduino-based environment.

ENGR 190. Introduction to Engineering Mathematics
4 Credits (4)

Engineering applications involving involved Math topics most heavily used in first and second-year engineering courses. Topics include engineering applications of algebra, trigonometry, vectors, complex numbers, sinusoids and signals, systems of equations and matrices, derivatives, integrals and differential equations.

Prerequisite: A grade of C- or better in MATH 1250G or higher.

Learning Outcomes

1. Ability to solve systems of linear equations by use of matrices
2. Ability to use complex numbers and periodic function to solve engineering problems
3. Ability to solve problems using various coordinate system

4. Write and Solve problems with 2-D 3D vectors
5. Write and Solve problems with derivatives
6. Write and solve problems with integrals

ENGR 198. Special Topics in Engineering
1-3 Credits
Directed individual study of topics in engineering. Written reports covering work required. May be repeated for a maximum of 6 credits. Restricted to engineering majors. Graded S/U.
Prerequisite: consent of academic dean.

ENGR 217. Manufacturing Processes
3 Credits (3)
An introduction to modern manufacturing processes and their application. Students will be introduced to manufacturing concepts such as traditional and non-traditional machining operations, tooling, material selection, thermal joining, geometric dimensioning & tolerancing, metrology, additive manufacturing, assembly and inspection, g-code, and automated manufacturing using CAM packages.
Prerequisite: A grade of C- or better in both, ENGR 110 and (MATH 1220G or higher).
Learning Outcomes
1. Identify the different manufacturing processes and their applications
2. Use, set up, and calibrate measuring tools.
3. Apply geometric tolerances to engineering drawings
4. Demonstrate basic knowledge of materials and material properties
5. Demonstrate basic knowledge of GM codes and their application
6. Proficiently use CAM packages such as SolidWorks CAM
7. Identify different tooling, their use, and manufacturing application

ENGR 217 L. Manufacturing Processes Lab
1 Credit (3P)
A hands-on application of the concepts introduced in ENGR 217. This lab will expose the students to hands-on exercises and manufacturing methods used in industry.
Corequisite: ENGR 217.
Learning Outcomes
1. Understand how a product goes from design to being manufactured
2. Gain knowledge of industry tools and technology
3. Learn how to design for manufacturing
4. Engage students in critical thinking and the design process
5. Gain an appreciation for, and skills for effective communication, teamwork, ethics
6. Increase student knowledge of Geometric Dimensioning and Tolerancing (GDT)
7. Use of other tools such as drawing software, mathematics, economics, etc. knowledge of dimensions, length, time, mass, force, temperature, electric current, energy and power, and related parameters in engineering
8. Understand industry and NMSU safety practices and apply them whenever applicable.

ENGR 230. AC Circuit Analysis
4 Credits (3+3P)
An introduction to AC circuit analysis techniques, RC/RL and RLC transients, phasors, complex power, filter response, and operational amplifiers.
Prerequisite: A grade of C- or better in both, ENGR 120 and (MATH 1440 or MATH 1521G or higher) or ENGR 190)).
Learning Outcomes
1. Apply Ohm's Law and Kirchoff's Laws to AC circuits.
2. Determine transient responses of RL/RC and RLC circuits.
3. Use phasor techniques to analyze AC circuits.
4. Compute RMS quantities and complex power.
5. Analyze and design Op-Amp circuits.
6. Design and proto-type AC circuits and measure AC voltages and currents.

ENGR 233. Engineering Mechanics I
3 Credits (3)
Engineering mechanics using vector methods. Force systems, resultants, equilibrium, distributed forces, area moments, and friction.
Prerequisite: A grade of C- or better in ENGR 190 or MATH 1521G.
Prerequisite/Corequisite: PHYS 1310G or PHYS 1230G.
Learning Outcomes
1. Have an understanding of the force systems, resultants, equilibrium, distributed forces, area moments, and friction.
2. Be able to apply the acquired knowledge to formulate, solve and interpret solutions of engineering mechanics problems.

ENGR 234. Engineering Mechanics II
3 Credits (3)
Kinetics of particles, kinematics and kinetics rigid bodies, systems of particles, energy and momentum principles, and kinetics of rigid bodies in three dimensions.
Prerequisite: A grade of C- or better in M E 236 or C E 233 or ENGR 233.
Learning Outcomes
1. Have a good understanding of the kinetics of particles, kinematics and kinetics rigid bodies, energy and momentum principles, and kinetics of rigid bodies.
2. Be able to apply the acquired knowledge to formulate, solve and interpret solutions of engineering mechanics problems

ENGR 398. Engineering Leadership Seminar
3 Credits (3)
This course introduces students to concepts and skills related to leadership positions held at the University in the College of Engineering. The course will provide theory and practice in leadership; provide skills in effective oral communications and presentation, team building skills, and general knowledge of NMSU and the College of Engineering. May be repeated up to 18 credits. Consent of Instructor required.

ENGR 400. Special Topics
1-3 Credits (1-3)
Directed study or project. Students must be in Junior/Senior level standing to enroll. May be repeated up to 6 credits.
Learning Outcomes
1. The Learning goals will be dependent on the what subject matter taught under the ENGR 400 course.

ENGR 401. Engineering Capstone I
3 Credits (1+6P)
Seniors will work in teams to apply a systematic design process to real world multidisciplinary problems. Problems selected from a broad spectrum of interest areas. Students will utilize the knowledge and skills acquired in earlier course work, and incorporate appropriate engineering standards and multiple realistic constraints.Emphasis is placed on the design process, the technical aspects of the design, and the development of a prototype that meets design objectives. 1st of 2 course sequence.
Prerequisite: Grade of C- or better in (I E 424, and I E 451) or a grade of C- or better in E E 300 or a grade of C- or better in M E 326 or a grade of C- or

better in PHYS 395 or a grade of C- or better in E T 396 or a grade of C- or better in E T 344.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

ENGR 402. Engineering Capstone II
3 Credits (1+6P)

Seniors will work in teams to apply a systematic design process to real world multidisciplinary problems. Problems are selected from a broad spectrum of interest areas. Students will utilize the knowledge and skills acquired in earlier course work, and incorporate appropriate engineering standards and multiple realistic constraints. Emphasis is placed on the design process, the technical aspects of the design, and the development of a prototype that meets design objectives. Students must be a Senior to enroll in this course.

Prerequisite: A grade of C- or better in ENGR 401.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

ENTR-ENTREPRENEURSHIP AND INNOVATION

ENTR 1110. Entrepreneurship
3 Credits (3)

Introduces students to the concept of entrepreneurship and to the process of business startups. May be repeated up to 3 credits.

Prerequisite: BUSA 1110.

Learning Outcomes

1. Identify the unique characteristics of an entrepreneur.
2. Identify opportunities and conduct needs analysis.
3. Develop value proposition/market fit for proposed products and services.
4. Develop an appropriate business model.
5. Identify availability of necessary resources.

ENVE-ENVIRONMENTAL ENGINEERING

ENVE 450. Aquatic Chemistry
3 Credits (3)

Theoretical aspects of physical chemistry applied to the solution of environmental engineering problems. Emphasis on acid-base reactions, precipitation-dissolution reactions, complexation, and redox reactions. Same as ENVE 550.

Prerequisite: C- or better grade in C E 256.

Learning Outcomes

1. Students will be able to use fundamental principles of physical chemistry as applied to acid-base, precipitation-dissolution, complexation, and redox reactions to determine the composition of waters, including natural waters and waters encountered in water and wastewater treatment processes.

ENVE 451. Unit Processes/Operation of Water Treatment
3 Credits (3)

Theory and applications of unit processes in environmental engineering. Physical and chemical water treatment methods are emphasized. Crosslisted with: ENVE 551.

Prerequisite: C- or better grade in C E 356.

Learning Outcomes

1. Students will be able to use fundamental reactor design principles to design unit operations for water treatment, including sedimentation, coagulation, flocculation, filtration, and disinfection.

ENVE 452. Unit Processes/Operation of Wastewater Treatment
3 Credits (3)

Theory and applications of unit processes in environmental engineering. Biological wastewater treatment methods are emphasized. Crosslisted with: ENVE 552.

Prerequisite: C- or better grade in C E 356.

Learning Outcomes

1. Students will be able to use fundamental reactor design principles to design unit operations for wastewater treatment, including sedimentation, aerobic and anaerobic microbial treatment, and disinfection.

ENVE 456. Environmental Engineering Design
3 Credits (3)

Design of chemical, physical, and biological operations and processes involved in water and wastewater treatment. Student can also be a graduate student to enroll if they have not completed C E 356.
Prerequisite: C- or better grade in C E 356.

Learning Outcomes

1. Students will be able to incorporate knowledge from previously taken engineering design and economics courses to complete an environmental design and solve a real world problem.
2. Students will be able to communicate and explain their solution approach to a variety of audiences using different communication methods.

ENVE 459. Environmental Microbiology
3 Credits (3)

An introduction to the diverse roles of microorganisms in natural and engineered environments. The topics include cellular architecture, energetics, and growth; population and community dynamics; water and soil microbiology; biogeochemical cycling; and microorganisms in biodegradation and bioremediation of contaminants. Students must be a Senior or in Graduate Standing to enroll.

Learning Outcomes

1. Students will be able to demonstrate the significance of microbial processes in natural and engineered processes.

ENVE 487. Air Pollution Control Systems Design
3 Credits (3)

An introduction to sources and nature of air pollution, regulations, and risk analysis. Detailed study of air pollution control technologies and design of air pollution control equipment. Students must be a Senior or in graduate standing to enroll.

Learning Outcomes

1. Students will be able to explain the source and nature of air pollution.
2. Students will be able to relate air pollution to regulations using a risk analysis approach.
3. Students will be able to design air pollution control systems.

ENVE 504. Advanced Environmental Engineering Design
3 Credits (3)

Advanced engineering design covering the subject matter of the Environmental Engineering capstone undergraduate design course plus an additional report or project. May be subtitled. Consent of instructor required.

Learning Outcomes

1. Students will be able to incorporate knowledge from previously taken engineering design and economics courses to complete an environmental design and solve a real world problem.
2. Students will be able to communicate and explain their solution approach to a variety of audiences using different communication methods.

ENVE 550. Aquatic Chemistry
3 Credits (3)

Theoretical aspects of physical chemistry applied to the solution of environmental engineering problems. Emphasis on carbonate equilibria solubility, buffering and redox conditions. May be repeated up to 3 credits. Consent of Instructor required. Crosslisted with: ENVE 450.
Prerequisite(s): C E 256.

ENVE 551. Unit Processes/Operation of Water Treatment
3 Credits (3)

Theory and applications with unit processes in environmental engineering. Physical / chemical treatment methods emphasized. May be repeated up to 3 credits. Crosslisted with: ENVE 451.
Prerequisite(s): C E 356.

ENVE 552. Unit Processes/Operation of Wastewater Treatment
3 Credits (3)

Theory and applications with unit processes in environmental engineering. Biological treatment methods emphasized. May be repeated up to 3 credits. Crosslisted with: ENVE 452.
Prerequisite(s): Consent of instructor.

ENVE 556. Advanced Water Treatment and Reuse
3 Credits (3)

Overview of both the theoretical and practical aspects of advanced water treatment technologies and water reuse applications. Basic design features of the processes are presented, with emphasis on the underlying principles, including why and how a process works, what the significant variables are, and what the limitations of the process are. Problem solving skills and technical communication skills are emphasized.
Prerequisite: ENVE 551.

Learning Outcomes

1. Students will be able to design advanced water treatment processes, including membrane filtration, electrodialysis, ion exchange, advanced oxidation, photolysis, and distillation.
2. Students will gain knowledge in water reuse applications including water quality criteria, regulations, and implementation issues.

ENVE 557. Surface Water Quality Modeling
3 Credits (3)

Modeling the impacts of waste disposal practices on surface waters. Emphasis on fate and transport of bacteria, dissolved oxygen, nutrients, and toxicants in rivers, lakes, and tidal waters. Students must be in Graduate standing to enroll.

Learning Outcomes

1. The students will be able to use mathematical models to model the transport of constituents important for water quality, such as bacteria, viruses, nutrients, contaminants, and oxygen, in aqueous environments.

ENVE 598. Special Research Programs
1-3 Credits

Individual investigations either analytical or experimental. May be repeated up to 6 credits.

Learning Outcomes

1. Students will develop knowledge related to the specific environmental engineering special topic selected for research.

ENVE 599. Master's Thesis
15 Credits

Thesis. May be repeated up to 88 credits.

Learning Outcomes

1. Students will progress toward completion of their research thesis.

ENVE 630. Fate and Transport of Environmental Contaminants
3 Credits (3)

Modeling of transport phenomena in natural and engineered systems for predicting the fate of contaminants in the air, soil, sediment, and water compartments of the ecosystem.
Prerequisite: ENVE 557.

Learning Outcomes

1. The students will be able to use mathematical models to model the transport of contaminants in gas, aqueous, and soil environments.

ENVS-ENVIRONMENTAL SCIENCE

ENVS 1110G. Environmental Science I
4 Credits (3+2P)
Introduction to environmental science as related to the protection, remediation, and sustainability of land, air, water, and food resources. Emphasis on the use of the scientific method and critical thinking skills in understanding environmental issues.
Learning Outcomes
1. Students will learn to critically analyze cause-and-effect relationships in the environment
2. Students will integrate and synthesize knowledge and draw appropriate conclusions based on the scientific method

ENVS 2111. Environmental Engineering and Science
3 Credits (3)
Principles in environmental engineering and science: physical chemical systems and biological processes as applied to pollution control. Crosslisted with: C E 256.
Prerequisite: (C- or better grade in CHEM 1215G) and (C- or better grade in MATH 1511G or ENGR 190).
Learning Outcomes
1. To understand the nature of water quality parameters in the context of Civil Engineering and Environmental Science (Water Treatment/ Wastewater Treatment/Environmental Science).
2. To learn to apply engineering and scientific solutions to water quality problems.
3. To understand environmental regulations and their consequences on the design of pollution control systems.

ENVS 2111L. Environmental Science Laboratory
1 Credit (1)
Laboratory experiments associated with the material presented in ENVS 2111. Same as C E 256 L.
Corequisite(s): ENVS 2111.
Learning Outcomes
1. List typical analyses commonly performed to evaluate physical, chemical, and microbiological parameters used to describe water quality.
2. Follow experimental procedures listed in the class laboratory manual, or other publications such as Standards Methods, to perform common water quality analyses.
3. Evaluate, analyze, and discuss experimental results and present the conclusions in the form of a professional report

ENVS 300. Special Topics
1-4 Credits
Special subjects and credits to be announced in the Schedule of Classes. Consent of instructor required. Maximum of 4 credits per semester. Restricted to majors.

ENVS 301. Principles of Ecology
3 Credits (3)
A survey of ecology including general theory, the adaptations of organisms, population dynamics, species interactions, and the structure and function of natural communities and ecosystems. Crosslisted with: BIOL 301
Prerequisite(s): BIOL 2610G, A ST 311, and grade of C or better in MATH 1511G or Math Placement Exam score adequate to enroll in mathematics courses beyond MATH 1511G.

ENVS 312. Emergency Response to Hazardous Material Incidents
2 Credits (2)
EPA approved Environmental Response Training Program Course 165.15. In compliance with OSHA 29 CFR 1910.120. Normally taken during last year of study.
Prerequisite: Same as E T 312 and WERC 312.
Learning Outcomes
1. Satisfy OSHA training requirements for members of hazardous materials response teams and for environmental personnel requiring access to superfund sites.
2. Recognize, evaluate, and safely control an incident involving the release or potential release of hazardous materials.
3. Participate in mock scenarios using self-contained breathing apparatus, fully encapsulated suits, and a variety of equipment to test hazardous levels.

ENVS 361. Basic Toxicology
3 Credits (3)
Introduction to the principles of toxicology, discussion of toxic agents, environmental problems, testing procedures, and regulations. Prior course work in biology and chemistry recommended.
Prerequisite: CHEM 2120 or CHEM 313 or ANSC 1170 and BIOL 2610G or BIOL 2110G.
Learning Outcomes
1. Learn how toxins are absorbed, distributed, metabolized, and excreted from living systems.
2. Demonstrate how metabolism can appreciably alter the toxicity of compounds as well as dictate the resultant toxicity with an emphasis on target organ(s).
3. Explain the specific mechanism(s) of actions of toxins targeting the liver, lung, kidney, and nervous systems.
4. Delineate how certain toxins induce cancer and/or promote the development of cancer.
5. Understand how and why certain plants and animals are poisonous and venomous, specifically linking discreet chemicals or complex mixtures to the resultant toxic manifestation.

ENVS 370. Environmental Soil Science
3 Credits (3)
Continuation of SOIL 2110 that emphasizes soil properties and processes that directly relate to environmental pollution problems. Same as SOIL 370.
Prerequisite: SOIL 2110.
Learning Outcomes
1. Connect soil science to the environment.
2. Describe several contaminants and their methods of remediation.
3. Design a remediation plan based on environmental transport mechanisms.
4. Demonstrate a clear understanding of the direct and indirect costs (consequences) associated with poor soil and water management.

ENVS 391. Internship
3 Credits (3)
Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. Maximum of 3 credits toward a degree. Consent of Instructor required. Graded: S/U Grading (S/U, Audit).

ENVS 422. Environmental Chemistry
3 Credits (3)

Chemistry of organic and metal ion pollutants in the environment and principles important to their remediation including bioremediation. Restricted to: Main campus only. Crosslisted with: CHEM 422
Prerequisite(s): CHEM 1225G and either CHEM 2120 or CHEM 313.
Learning Outcomes

1. Describe and explain the solid, liquid, and gas phases of the environment and how they interact.
2. Understand the chemical reactions and processes that occur between various phases of the environment.
3. Learn how the chemical processes can be managed to promote environmental remediation, including the techniques and calculations used.

ENVS 447. Seminar
1 Credit (1)
Organization, preparation, and presentation of current topics in agronomy, environmental sciences, horticulture, and soil science. Crosslisted with: AGRO 447, HORT 447 and SOIL 447.
Learning Outcomes

1. Develop professional communication skills through teamwork, case study preparation and presentation, data interpretation, and role-playing in mock interviews.
2. Prepare a professional resume, personal statement of goals for graduate school or permanent employment and make a Case Study presentation to faculty and peers.

ENVS 449. Special Problems
1-3 Credits
Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and 6 credits toward a degree. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: E S majors.

ENVS 451. Special Topics
1-4 Credits (1-4)
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.

ENVS 452. Geohydrology
3-4 Credits (3+1P)
Origin, occurrence, and movement of fluids in porous media and assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. Crosslisted with: C E 452 and GEOL 452.
Learning Outcomes

1. An understanding of the movement of water in porous media and its effects on aquifers.
2. An understanding of the development and conservation of ground water resources.

ENVS 457. Water Measurement
3 Credits (3)
The fundamentals of measuring water will be covered. Participants will learn about measurement techniques that are used to estimate evapotranspiration as well as commonly used water measurement structures to estimate water use. The benefits and problems that are associated with using each measurement will be discussed. Students will also learn about the principles of how to use water measurement as a management tool.
Prerequisite(s): MATH 1215 or higher, or consent of Instructor.

ENVS 460. Introduction to Air Pollution
3 Credits (3)
An introduction to the physics and chemistry of tropospheric air pollution including sources of air pollution, local and long-range transport, instrumentation, regulatory requirements, control technology.
Prerequisite: PHYS 1310G, CHEM 1225G, MATH 1511G.
Learning Outcomes

1. Gain experience in critical thinking and assessment and presenting the results in a clear and concise manner.
2. Describe and communicate air pollution issues.
3. Develop skills for approaching air quality problems and calculating air quality data analysis.
4. Gain practical experience in operating air pollution instrumentation and sample collection.
5. Communicate science using social media.

ENVS 462. Sampling and Analysis of Environmental Contaminants
3 Credits (1+6P)
Theory, application, methodology, and instrumentation used in the sampling and analysis of environmental contaminants. May be repeated up to 3 credits. Same as ENVE 462.
Prerequisite: ENVS 2111 or C E 256.
Learning Outcomes

1. Plan and execute the collection of relevant and useful data for environmental projects based on procedures outlined by the EPA, DOD, and DOE.
2. Understand the importance of careful planning, implementation, and assessment of environmental chemical data collection.
3. Work in teams to master the scientific method, including originating a question, collecting and analyzing samples, and presenting the findings orally and in professionally written reports.

ENVS 470. Environmental Impacts of Land Use and Contaminant Remediation
3 Credits (3)
The course will cover the integrated assessment of soil erosion, contaminant transport in soil and water, and contaminant remediation from site scale to watershed scales. Understanding of the controlling factors for each type land use impact will be gained through the use of risk assessment, case studies, and computer modeling. Case studies will illustrate the processes under various environmental applications. This course will also cover the application of solute transport principles and methods for the remediation of contaminated soil and groundwater. It will also discuss the contaminated site characterization, monitoring, and remediation design. Discussions of innovative methodologies will be supported with case studies.
Learning Outcomes

1. Apply knowledge of mathematics, science, and engineering to identify, formulate, and solve environmental problems.
2. Function on multidisciplinary teams and exhibit professional and ethical responsibility and communicate findings effectively.
3. Recognize the need for, and an ability to engage in, life-long learning.
4. Describe contemporary land-use impact and cleanup issues.
5. Use the techniques, skills, and modern environmental science and engineering tools necessary for current industry practice.

ENVS 505. Research Orientation
4 Credits (3+2P)

Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: HORT 505, SOIL 505 and AGRO 505.

Learning Outcomes

1. Gain insight into the nature of scientific research and skills vital for graduate research and future careers in science.
2. Navigate graduate school processes and protocols.
3. Demonstrate critical thinking.
4. Generate a scientific hypothesis.
5. Communicate science effectively in written and oral formats, including drafting a proposal for thesis or dissertation research.

ENVS 596. Master's Proposal
1 Credit (1)
Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, HORT 596, GENE 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.
Prerequisite: Master level graduate students.
Learning Outcomes

1. Student will review academic literature and draft a research proposal.

ENVS 599. Master's Thesis
1-15 Credits
Thesis Graded: Thesis/Disertation.

EPWS-ETMLGY/PLNT PTHLGY/WD SCI

EPWS 1110G. Applied Biology
3 Credits (3)
Introduction to applied biology and ecology focusing on insects, plants and pathogens in natural areas, crops and urban settings. EPWS 1110L is strongly recommended to take in the same semester. May be repeated up to 3 credits.

Learning Outcomes

1. Students will learn about the Department of Entomology Plant Pathology and Weed Science and will have the opportunity to meet the Las Cruces-based faculty in the department.
2. By the end of this course students will have gained a broad understanding of the pests in a wide range of systems, their interactions with other organisms, and the methods available to minimize the influence of pests on target commodities.

EPWS 1110L. Applied Biology Lab
1 Credit (1)
Study of applied biology and ecology of insects, plants and pathogens in natural areas, crops, and urban settings. EPWS 1110 strongly recommended to take in the same semester. May be repeated up to 1 credits. Restricted to Las Cruces campus only.

Learning Outcomes

1. Students will learn about the Department of Entomology Plant Pathology and Weed Science and will have the opportunity to meet the Las Cruces-based faculty in the department.
2. By the end of this course students will have gained a broad understanding of the pests in a wide range of systems, their interactions with other organisms, and the methods available to minimize the influence of pests on target commodities.

EPWS 2996. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

Learning Outcomes

1. Varies

EPWS 300. Special Topics
1-4 Credits
Specific topics and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

EPWS 301. Agricultural Biotechnology
3 Credits (2+2P)
The principles of molecular biology will be introduced and used to explore the past, present, and future applications of biotechnology in agriculture. Specific topics include methodologies for making transgenic plants with increased pest resistance, the use of biotechnology in pest detection, and improving nutritional value. The laboratory will provide students with hands-on experience with equipment used for biotechnology research.
Prerequisites: CHEM 1225G, BIOL 2610G, or BIOL 2110G.

EPWS 302. General Entomology
4 Credits (4)
An introduction to the biology and classification of insects. Lecture covers life histories, classification, ecology and behavior of insect orders and families. Laboratory focuses on identification of insect orders and families. May be repeated up to 4 credits.
Prerequisite: BIOL 2610G, or BIOL 2110G.

Learning Outcomes

1. Have a detailed understanding of the biology and taxonomy of insects.
2. Be able to identify all insect orders.
3. Be able to sight identify common families of North American Insects.
4. Be able to properly curate insect specimens.

EPWS 302 H. General Entomology Honors
4 Credits (4)
An introduction to the biology and classification of insects. Lecture covers life histories, classification, ecology and behavior of insects orders and families. Laboratory focuses on identification of insect orders and families. Students in the Honors section will be given the opportunity to enhance their understanding of entomology with a more detailed examination into the lives of these fascinating organisms.
Prerequisite: BIOL 2610G, or BIOL 2110G.

Learning Outcomes

1. Have a detailed understanding of the biology and taxonomy of insects.
2. Be able to identify all insect orders.
3. Be able to sight identify common families of North American Insects.
4. Be able to properly curate insect specimens.

EPWS 303. Economic Entomology
3 Credits (3+2P)
Identification and life cycles of insects of economic significance, their relationship to humans and agriculture including biological interactions and controls. May be repeated up to 3 credits.
Prerequisite: BIOL 2610G, or BIOL 2110G.

Learning Outcomes

1. Know the names and functions of insect arthropod organs and how these organisms sense the environment and maintain homeostasis within their environment.

2. Understand the importance of naming and classifying insects and be able to name the important orders and families of pest and beneficial insects.
3. Define what a pest arthropod and how to establish economic thresholds for pests.
4. Understand pest management theory and tactics and be able to describe including pest management with natural enemies, environmental manipulation, insecticides, biopesticides, sterile insect technique and others.

EPWS 310. Plant Pathology
4 Credits (3+2P)
Causes and methods of prevention and treatment of diseases in plants.
Prerequisite(s): BIOL 2610G, or BIOL 2110G.

EPWS 310 H. Plant Pathology Honors
4 Credits (4)
Cause and methods of prevention and treatment of diseases in plants. Students with an Honors designation will have additional project and report assignments.
Prerequisite(s): BIOL 2610G, or BIOL 2110G.

EPWS 311. Introduction to Weed Science
4 Credits (3+2P)
Principles of weed science, with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Identification of local weeds. Taught with AGRO 311. May be repeated up to 4 credits.
Prerequisite: CHEM 1215G, and BIOL 2110G.
Learning Outcomes
1. Describe the environmental conditions and inherent traits that promote the growth and persistence of weed populations in managed and natural ecosystems.
2. Predict causes and consequences of weed management failures in agricultural and natural ecosystems.
3. Apply knowledge of herbicidal, mechanical and cultural weed control to develop integrated strategies for weed problems.
4. Classify herbicides based on injury symptoms, mode of action, site of action, translocation, selectivity, potential uses and potential dangers.
5. Identify common weeds found in southern New Mexico by providing correctly spelled botanical and common names, as well as lifecycles.
6. Demonstrate the ability to safely apply herbicide solutions including: perform the activities and calculations to ensure that a sprayer delivers the appropriate amount of solution over the sprayed area, interpret herbicide labels to identify guidelines for safety, dosage and application procedures, and perform the calculations necessary for determining appropriate amounts of herbicide, carrier and adjuvant to add to a spray tank.

EPWS 314. Plant Physiology
3 Credits (3)
Overview of photosynthesis, respiration, water relations of plants, minerals and organic nutrition, growth and development. Same as BIOL 314.
Prerequisite: BIOL 2110G, CHEM 1225G.
Learning Outcomes
1. Summarize the chemical and physical bases for processes in plants involving water relations, metabolism, and growth.
2. Compare and contrast forms of photosynthesis that are adaptive, and not adaptive, to heat and drought.
3. Explain physiological mechanisms supporting plant tolerance to abiotic and biotic stresses.
4. Predict consequences of environmental change on physiological processes and growth of individual plants.
5. Apply course concepts to real-world scenarios that involve plant function and plant development.

EPWS 325V. Insects, Humans, and the Environment
3 Credits (3)
Overview of the interactions of the world's largest group of organisms with humans. Emphasizing the role of insects in the development of human cultures, including health, food and fiber production, art, music, and environmental issues; with discussions of historic, present day, and future impacts in underdeveloped, developing, and developed civilizations.
Learning Outcomes
1. Have an understanding and appreciation of the importance of insects and other arthropods to humans and the natural world.
2. Have a basic understanding of the biology of important insect groups.

EPWS 373. Fungal Biology
3 Credits (2+2P)
Introduction to the taxonomy, morphology, physiology, and ecology of fungi. Same as BIOL 373. May be repeated up to 3 credits.
Prerequisite: EPWS 310 or BIOL 311, or consent of instructor.
Learning Outcomes
1. To describe the importance of fungi in our environment.
2. To explore the morphology and physiology of major groups of fungi.
3. To describe the associations of fungi with humans, animals, and plants.

EPWS 380V. Science & Society
3 Credits (3)
Analysis and evaluation of how human activities affect the earth's environment or ecosystems. Several examples, from global issues to local issues will be studied in detail. Current science and the intersection of science and public policy will be discussed in relation to problems like world population, agricultural productivity, deforestation, medical advances, and future prospects for the environment.
Learning Outcomes
1. Become familiar with current science topics affecting society such as climate change, pandemics, vaccinations and the anti-vaccination movement, food production, and others to be discussed in class.
2. Improve critical thinking skills and become comfortable with evaluating claims using a data and evidence based approaches.
3. Gain an appreciation of how science affects society and how fake science can hurt society.

EPWS 390. Internship
1-3 Credits
Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. Maximum of 3 credits. May be repeated up to 3 credits.
Learning Outcomes
1. Varies.

EPWS 420. Environmental Behavior of Pesticides
3 Credits (3)
Behavior of pesticide compounds in the environment, their function toward target and non target pest organisms including humans, effect of environmental conditions on pesticide function, ecology of organisms involved in pesticides degradation,overview of environmental regulation.

CHEM 2115 recommended prior to course. May be repeated up to 3 credits.

EPWS 440. Tropical Insect Ecology
3 Credits (3)
This course is designed to expose students to world of insects and other arthropods living in a variety of tropical environments. We will explore multiple habitats in search of these fascinating organisms. Students will gain valuable experience on the biology, identification, field sampling techniques, and ecology of tropical arthropods. We will examine the biodiversity of these important organisms and gain a better understanding of their diminishing habitats.
Learning Outcomes
1. Students will gain experience in the biology and identification of tropical insects and other arthropods.
2. Students will gain experience in insect biodiversity and proper field sampling techniques in a variety of habitats.
3. Students will gain experience on the issues affecting threatened habitats.

EPWS 447. Seminar
1 Credit (1)
Organization and techniques for the oral presentation of research information. Restricted to: Main campus only.

EPWS 447 H. Seminar Honors
1 Credit (1)
Organization and techniques for the oral presentation of research information. Students taking EPWS 447 H will have the additional assignment of making a poster on either scientific research or a scientific topic.
Prerequisite(s): Honors eligibility requirements.

EPWS 449. Special Problems
1-3 Credits
Individual investigation in specific areas of entomology, plant pathology or plant physiology. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits.
Learning Outcomes
1. Varies.

EPWS 451. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits.
Learning Outcomes
1. Varies.

EPWS 455. Advanced Integrated Pest Management
3 Credits (3)
Examination of factors affecting the biology and ecology, population evaluations, and control of insect, disease, and weed pests with an emphasis on integrating management practices. Credit cannot be given for both EPWS 455 and EPWS 505. Taught with: EPWS 505.
Prerequisite: Either EPWS 303 or EPWS 310 or EPWS 311, or consent of instructor.
Learning Outcomes
1. Understand the basic tenets of pest management.
2. Classify the different pest groups and their ecology.
3. Comprehend the variety of management strategies.
4. Understand how management effects the ecosystem.
5. Comprehend a systems approach to management.
6. Critically analyze, develop, present, and discuss pest management systems.

EPWS 456. Biological Control
3 Credits (3)
Principles of plant and animal suppression using living organisms. Interaction of biological control organisms with biotic and abiotic factors will be stressed. Credit cannot be given for both EPWS 456 and EPWS 506. Students should complete an introductory course in entomology prior to enrollment.
Learning Outcomes
1. Summarize the basic concepts of biological control of arthropods, weeds, and some pathogens.
2. Explain the benefits, challenges, and risks of biological control technologies.
3. Apply course concepts to real-world scenarios that involve biological control.

EPWS 462. Parasitology
3 Credits (3)
Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife.
Learning Outcomes
1. Students will learn about the major parasites of human, domestic animals, and wildlife.
2. Students will learn how to detect, identify, and manage parasites in the above mentioned mediums.

EPWS 471. Plant Mineral Nutrition
3 Credits (3)
Same as HORT 471 and AGRO 471.

EPWS 486. Plant Virology
3 Credits (3)
An overview of viral pathogens associated with infectious plant disease. Includes pathogens, replication, genetics, transmission, and movement of plant viruses.
Learning Outcomes
1. Understand the basic tenets of plant virology.
2. Determine different plant virus groups.
3. Comprehend the variety of genome strategies and organization.
4. Understand viral replication processes.
5. Comprehend transmission and viral ecology/epidemiology.
6. Critically analyze, present, and discuss current journal articles in plant virology.

EPWS 492. Diagnosing Plant Disorders
3 Credits (2+3P)
Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as AGRO 492 and HORT 492. May be repeated up to 3 credits.
Prerequisite: EPWS 303, EPWS 310.
Learning Outcomes
1. To describe the major types of plant disorders.
2. To identify the biotic and abiotic agents causing plant disorders.
3. To define the approaches used in diagnosing plant disorders.

EPWS 502. General Entomology
4 Credits (4)
An introduction to the biology and classification of insects. Lecture covers life histories, classification, ecology and behavior of insect orders

and families. Laboratory focuses on identification of insect orders and families.
Prerequisite: BIOL 2610G or BIOL 2110G.
Learning Outcomes
1. Have a detailed understanding of the biology and taxonomy of insects.
2. Be able to identify all insect orders.
3. Be able to sight identify common families of North American Insects.
4. Be able to properly curate insect specimens.

EPWS 505. Advanced Integrated Pest Management
3 Credits (3)
Examination of the factors affecting the biology and ecology, population evaluations, and control of insect, disease, and weed pests, with an emphasis on integrating management practices. Crosslisted with: EPWS 455.
Prerequisite(s): EPWS 303 or EPWS 310 or EPWS 311 or consent of instructor.

EPWS 506. Biological Control
3 Credits (3)
Principles of plant and animal pest suppression using living organisms. Interaction of biological control organisms with biotic and abiotic factors will be stressed. Individual paper or project required. An introductory course in entomology should be completed before enrollment. Credit cannot be given for both EPWS 456 and EPWS 506.
Learning Outcomes
1. Summarize the basic concepts of biological control of arthropods, weeds, and some pathogens.
2. Explain the benefits, challenges, and risks of biological control technologies.
3. Apply course concepts to real-world scenarios that involve biological control.

EPWS 511. Introduction to Weed Science (f)
4 Credits (3+2P)
Covers the principles of weed science with emphasis on characteristics of invasive plants, methods of integrated weed management, and current issues impacting weed management. Includes identification of local weeds. Research paper required for graduate credit. Taught with AGRO 511. May be repeated up to 4 credits.
Prerequisite: CHEM 1215G and BIOL 2110G.
Learning Outcomes
1. Describe the environmental conditions and inherent traits that promote the growth and persistence of weed populations in managed and natural ecosystems.
2. Predict causes and consequences of weed management failures in agricultural and natural ecosystems.
3. Apply knowledge of herbicidal, mechanical and cultural weed control to develop integrated strategies for weed problems.
4. Classify herbicides based on injury symptoms, mode of action, site of action, translocation, selectivity, potential uses and potential dangers.
5. Identify common weeds found in southern New Mexico by providing correctly spelled botanical and common names, as well as lifecycles.
6. Demonstrate the ability to safely apply herbicide solutions includes: perform the activities and calculations to ensure that a sprayer delivers the appropriate amount of solution over the sprayed area, interpret herbicide labels to identify guidelines for safety, dosage and application procedures, and perform the calculations necessary for determining appropriate amounts of herbicide, carrier and adjuvant to add to a spray tank.

EPWS 513. Introduction to Scientific Writing
3 Credits (3)
Students will learn how to communicate, through written format, to both the scientific community and diverse audiences. Students will be introduced to new technologies and new genres of scientific writing. Students will also learn basic reviewing and writing skills that underlie efficient preparation of literature reviews, scientific manuscripts, project reports, blog-posts, opinion or perspective pieces for more popular venues, advocacy articles for legislators, and descriptive pieces for popular venues such as newspapers, magazines, and broadcast media. Emphasis will be on the communication of experimental findings in peer-reviewed scientific journals.
Learning Outcomes
1. Students will review the basics of rhetoric and the technology of language.
2. Students will learn how to overcome writing barriers and gain confidence in their writing skills.
3. Students will improve their writing skills so that manuscript preparation becomes more efficient and productive.
4. Students will learn professional standards for the conduct of ethical reporting of scientific results.
5. Students will learn to recognize structural and stylistic elements in scientific articles that help researchers achieve certain communication goals.
6. Students will learn the basics of table, figure, diagram, and image presentation in manuscripts.
7. Literature reviews, framed so that they answer an important question in the field, and lead to peer-reviewed publication, may also be prepared. (With permission of the instructor.)

EPWS 514. Plant Physiology
3 Credits (3)
Overview of photosynthesis, respiration, water relations of plants, minerals and organic nutrition, growth and development.
Prerequisite: BIOL 2110G, CHEM 1225G.
Learning Outcomes
1. Summarize the chemical and physical bases for processes in plants involving water relations, metabolism, and growth.
2. Compare and contrast forms of photosynthesis that are adaptive, and not adaptive, to heat and drought.
3. Explain physiological mechanisms supporting plant tolerance to abiotic and biotic stresses.
4. Predict consequences of environmental change on physiological processes and growth of individual plants.
5. Apply course concepts to real-world scenarios that involve plant function and plant development.

EPWS 520. Environmental Behavior of Pesticides (so)
3 Credits (3)
Behavior of these compounds in the environment, their function toward target and non target pest organisms including humans, effect of environmental conditions on pesticide function, ecology of organisms involved in pesticides degradation,overview of environmental regulation. CHEM 2115 recommended prior to course. May be repeated up to 3 credits.

EPWS 525. Scientific Writing- How to be a Productive and Effective Writing
1-3 Credits (1-3)
Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Crosslisted with: AGRO 525, HORT 525 and SOIL 525.

EPWS 549. Special Problems
1-4 Credits
Individual investigation in specific areas of entomology, plant pathology, and weed science. Maximum of 4 credits per semester and a total of 6 credits.

EPWS 551. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

EPWS 560. Ecology and Management of Invasive Plant Species
3 Credits (3)
An overview of the causes and consequences of plant invasions and invasive plant management, with a focus on critical examination of current literature and paradigms.
Learning Outcomes
1. Students will gain practical and theoretical knowledge to facilitate improved vegetation management by engaging in critical thinking and discussion on a wide variety of topics related to invasive plants.
2. Students will understand why plants invade and how to facilitate prevention of invasion in natural and rangeland areas
3. Further, students will gain knowledge of the tools and practices of invasive plant management.

EPWS 562. Parasitology
3 Credits (3)
Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife.
Learning Outcomes
1. Students will learn about the major parasites of human, domestic animals, and wildlife.
2. Students will learn how to detect, identify, and manage parasites in the above mentioned mediums.

EPWS 562 L. Parasitology Lab
1 Credit (1)
Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife.
Learning Outcomes
1. Students will learn how to conduct lab work to analyze, detect, and identify major parasites of human, domestic animals and wildlife.

EPWS 573. Fungal Biology
3 Credits (2+2P)
Introduction to the taxonomy, morphology, physiology, and ecology of fungi. Same as BIOL 573. May be repeated up to 3 credits.
Prerequisite: EPWS 310 or consent of instructor.
Learning Outcomes
1. To describe the importance of fungi in our environment.
2. To explore the morphology and physiology of major groups of fungi.
3. To describe the associations of fungi with humans, animals, and plants.

EPWS 590. Graduate Seminar
1 Credit (1)
Review of current scientific literature in entomology, plant pathology, and weed science, and verbal presentation of information. No more than 2 credits toward a degree. May be repeated up to 2 credits.
Learning Outcomes
1. To expose students to the fundamentals of speaking, including organization, listening, gestures, vocal variety, and language.
2. To understand components of abstracts for professional meetings and learn to write abstracts.
3. To understand and gain practice in preparation of PowerPoint presentations.
4. To present a professional PowerPoint talk on a scientific topic.
5. To become familiar with components of and preparation of posters for professional meetings.

EPWS 598. Graduate Internship
1-6 Credits
Supervised professional on-the-job learning experience. Limited to Master of Agriculture candidates. Not more than 6 credits toward the degree.

EPWS 599. Master's Thesis
15 Credits
Thesis.

EPWS 606. Biological Control
3 Credits (3)
An introduction to biological control that relies on ecological relationships among populations and the direct or indirect effects of these relationships to humans.
Learning Outcomes
1. Summarize the basic concepts of biological control of arthropods, weeds, and some pathogens.
2. Explain the benefits, challenges, and risks of biological control technologies.
3. Apply course concepts to real-world scenarios that involve biological control.

EPWS 613. Introduction to Scientific Writing
3 Credits (3)
Students will learn how to communicate, through written format, to both the scientific community and diverse audiences. Students will be introduced to new technologies and new genres of scientific writing. Students will also learn basic reviewing and writing skills that underlie efficient preparation of literature reviews, scientific manuscripts, project reports, blog-posts, opinion or perspective pieces for more popular venues, advocacy articles for legislators, and descriptive pieces for popular venues such as newspapers, magazines, and broadcast media. Emphasis will be on the communication of experimental findings in peer-reviewed scientific journals.
Learning Outcomes
1. Students will review the basics of rhetoric and the technology of language.
2. Students will learn how to overcome writing barriers and gain confidence in their writing skills.
3. Students will improve their writing skills so that manuscript preparation becomes more efficient and productive.
4. Students will learn professional standards for the conduct of ethical reporting of scientific results.

5. Students will learn to recognize structural and stylistic elements in scientific articles that help researchers achieve certain communication goals.
6. Students will learn the basics of table, figure, diagram, and image presentation in manuscripts.
7. Literature reviews, framed so that they answer an important question in the field, and lead to peer-reviewed publication, may also be prepared. (With permission of the instructor.)

EPWS 625. Advanced Scientific Writing
3 Credits (3)
The class is intended for graduate students who have obtained data from their graduate research program and are engaged in the analyses of their results (typically at or beyond the midway mark of their research program). At the end of the semester, it is anticipated that Ph.D. students enrolled in the 625 level offering shall have completed a manuscript that is essentially ready for submission to a journal. Master of Science students may also reach this level of completion, but it is dependent on each student's specific situation.
Learning Outcomes
1. Students will learn how to overcome writing barriers and develop a writing schedule.
2. Students will learn how to better organize the results of their experiments into effective tables and figures.
3. Students will improve their writing skills so that manuscript preparation becomes more efficient and productive.
4. Students will learn how to successfully navigate a manuscript through the entire manuscript preparation, revision, review and publishing process.
5. Students will learn professional standards for the conduct of ethical reporting of scientific results.
6. Students will learn professional standards for conducting objective, rigorous reviews of scientific manuscripts.
7. Students will successfully communicate their research findings to the scientific community through publication in peer-reviewed, scientific journals.

EPWS 640. Tropical Insect Ecology
3 Credits (3)
This course is designed to expose students to world of insects and other arthropods living in a variety of tropical environments. We will explore multiple habitats in search of these fascinating organisms. Students will gain valuable experience on the biology, identification, field sampling techniques, and ecology of tropical arthropods. We will examine the biodiversity of these important organisms and gain a better understanding of their diminishing habitats.
Learning Outcomes
1. Students will gain experience in the biology and identification of tropical insects and other arthropods.
2. Students will gain experience in insect biodiversity and proper field sampling techniques in a variety of habitats.
3. Students will gain experience on the issues affecting threatened habitats.

EPWS 660. Ecology and Management of Invasive Plant Species
3 Credits (3)
An overview of the causes and consequences of plant invasions and invasive plant management, with a focus on critical examination of current literature and paradigms.
Learning Outcomes
1. Students will gain practical and theoretical knowledge to facilitate improved vegetation management by engaging in critical thinking and discussion on a wide variety of topics related to invasive plants.
2. Students will understand why plants invade and how to facilitate prevention of invasion in natural and rangeland areas.
3. Further, students will gain knowledge of the tools and practices of invasive plant management.

EPWS 662. Parasitology
3 Credits (3)
Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife. May be repeated up to 3 credits.
Learning Outcomes
1. Students will learn about the major parasites of human, domestic animals, and wildlife.
2. Students will learn how to detect, identify, and manage parasites in the above mentioned mediums.

EPWS 662 L. Parasitology Lab
1 Credit (1)
Introduction to classification, biology, ecology and management of the major parasites of human, domestic animals and wildlife.
Learning Outcomes
1. Students will learn how to conduct lab work to analyze, detect, and identify major parasites of human, domestic animals and wildlife.

EPWS 675. Urban Entomology
3 Credits (3)
Study of insects and related arthropods in urban settings, about their impact on humans and damages to building. Principles of Integrate Pest Management (IPM) strategies with emphasis on current control techniques for detection, control and monitoring. May be repeated up to 3 credits.
Prerequisite: Either BIOL 2610G or BIOL 2110G.
Learning Outcomes
1. Students will learn about arthropods commonly located in urban environments.
2. Students will learn how to properly manage Pests and strategies implemented in modern pest management.
3. Students will gain sufficient knowledge in how to detect, monitor, control, and implement pest management strategies in the modern world.

EPWS 690. Doctoral Seminar
1 Credit (1)
Current research discussions presented by doctoral level graduate students. Not more than 2 credits toward the degree. May be repeated up to 2 credits.
Learning Outcomes
1. Students will learn how to gather, structure, and give oral presentations of research at the doctoral level.

EPWS 6991. Doctoral Research
1-15 Credits (1-15)
Research. May be repeated up to 88 credits.
Learning Outcomes
1. Varies based on research being conducted and type of outcome being sought.

EPWS 6996. Advanced Topics
1-6 Credits (1-6)
Topics of current interest, designated by title and credit. Maximum of 6 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits.
Learning Outcomes
1. Student learning outcomes will varied based on type of research, topic, or subject being taught.

EPWS 7000. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation. May be repeated up to 88 credits.
Learning Outcomes
1. Varies.

FCSC-FAMILY & CONSUMER SCI

FCSC 2250. Overview of Family and Consumer Sciences Teaching
3 Credits (3)
Overview of planning and teaching skills. Supervised experiences in observing and directing the learning of secondary family and consumer sciences students. Philosophy and history of the profession.
Learning Outcomes
1. Explain the foci of FCS—past, present and future.
2. Begin to develop a professional role in FCS.
3. Formulate a personal philosophy of FCS, and of teaching.
4. Explain the teaching process.
5. Give examples of roles, responsibilities and qualities of effective and ethical teachers.
6. Assess the characteristics, backgrounds, and needs of learner audiences.
7. Explain various learning theories/principles.
8. Illustrate how various input factors influence teaching decisions.
9. Plan a researched based student-centered lesson with a learning activity in a FCS content area. 1
10. Give examples of ways to evaluate learner growth.1
11. Present a FCS content-based lesson effectively to learners using PowerPoint presentation software and a selected teaching method. 1
12. Evaluate one's own teaching and the teaching of others. 1
13. Exhibit increased confidence in one's abilities as a teacher/educator.1
14. Exhibit excitement about assuming the teacher/educator role.

FCSC 2330. Housing and Interior Design
3 Credits (3)
Investigation of types of housing and factors impacting housing decisions for families. Selection, planning, and arrangement of interior components of homes to meet the needs of the family. Restricted to Las Cruces campus only.
Learning Outcomes
1. Differentiate between different architectural designs (i.e., Cape Cod, contemporary, craftsman, ranch, southern colonial, Spanish, Victorian, pueblo, New Mexican territorial, and territorial revival) and be able to identify historical, cultural, demographic, geographical, and environmental influences on style and aesthetics.
2. Analyze the fundamentals of housing for all families and cultures and understand the role housing plays in the ecological model of human ecology.
3. Define elements of design as related to housing and interiors (i.e., color, form, line, space texture).
4. Define principles of design as related to housing and interiors (i.e., balance emphasis, harmony, proportion, unity).
5. Compare and contrast the different periods of interior design from the 20th century to the present.
6. Analyze the influence of historical and cultural factors in the development of current interior trends.
7. Select and arrange interiors that are functional and aesthetically pleasing to designated interior design situations.
8. Identify, describe and make application of textiles as related to various furniture and interior design styles.
9. Design a three-dimensional tiny house or an interior space, using all concepts learned.

FCSC 3110. Management Concepts in Family and Consumer Sciences Teaching
3 Credits (3)
Incorporation and application of management concepts in family and consumer sciences subject matter. Practical experience teaching management and ways to use management skills to plan, implement, and evaluate the teaching-learning transaction. May be repeated up to 3 credits.

FCSC 4110. Teaching in Informal Family and Consumer Sciences Settings
3 Credits (3)
Learning principles and theories with application in informal family and consumer sciences education situations. Includes supervised experience in use of teaching strategies. May be repeated up to 3 credits.
Prerequisite: overall GPA of at least 2.5 or consent of instructor.

FCSC 4120. Career and Technical Education Programs
3 Credits (3)
History and development of career and technical programs. Ancillary functions of family and consumer sciences teachers, including student evaluation and leadership development for students. Experiences in extension programs and teaching. Ethical issues and concerns of educators are introduced. Lifelong leadership development and evaluation tools for educators are explored. May be repeated up to 3 credits.

FCSC 4510. Teaching Methods I for Family and Consumer Sciences
3 Credits (3)
Methods and strategies for teaching Family & Consumer Sciences content in middle and secondary schools. Organization and development of curriculum. May be repeated up to 3 credits.
Prerequisite: FCSC 2250 and FCSC 3110 and an overall GPA of 2.75, admitted to FCSE program; completion of NES Essential Basic Skills Tests I, II, & III; Human Nutrition Education Majors.
Corequisite: FCSC 4120.
Learning Outcomes
1. Methods and strategies for teaching Family Consumer Sciences content in middle and secondary schools.
2. Organization and development of curriculum.

FCSC 4520. Teaching Methods II for Family and Consumer Sciences
3 Credits (3)
Planning, preparation, and strategies for teaching family and consumer sciences in middle and secondary schools. Preparation for employment. Restricted to: FCSE majors and Human Nutrition Education Majors. May be repeated up to 3 credits.
Prerequisite: FCSC 4510; overall GPA of 2.75,admitted to program.

Learning Outcomes

1. Planning, preparation, and strategies for teaching family and consumer sciences in middle and secondary schools.
2. Preparation for employment.

FCSC 4810. Supervised Teaching in Family and Consumer Sciences
12 Credits (12)
Seventy (70) days of full-time supervised teaching in selected middle or secondary schools. May be repeated up to 12 credits. Restricted to: FCSE majors.
Prerequisite: FCSC 4510, an overall GPA of 2.75, and admitted to FCSE Program.
Corequisite: FCSC 4520.

FCSC 4815. Research Methods in Family and Consumer Sciences
3 Credits (3)
Introduction to research design and methodology in Family and Consumer Sciences. Overview of common research designs and data collection strategies. Prepares students to critique published research and perform basic skills including hypotheses development and conducting a literature search. May be repeated up to 3 credits.

FCSC 492. Special Problems
1-4 Credits
Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and 6 credits toward degree.

FCSC 4997. Special Problems
1-4 Credits
Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and 6 credits toward degree.

FCSC 500. Research Methods
3 Credits (3)
This course covers the critical evaluation of research literature, development of research proposals and principles of program evaluation. Students will be introduced to the application of qualitative or quantitative methods. Students will be expected to develop research questions and test hypotheses using statistical analysis and a variety of methodologies.

FCSC 547. Graduate Study in Teaching Methods II
3 Credits (3)
Planning, preparation, and strategies for teaching family and consumer sciences in the secondary schools. Additional assignments beyond FCSC 447 required for students registering in FCSC 547.

FCSC 548. Graduate Study in Supervised Teaching in Family and Consumer Sciences
12 Credits (70P)
Seventy of full-time, supervised teaching in selected schools. Additional assignments beyond FCSC 448 required for students registering in FCSC 548. Consent of Instructor required.
Prerequisite(s): FCSC 446 or FCSC 546, and consent of instructor.

FCSC 5815. Research Methods
3 Credits (3)
This course covers the critical evaluation of research literature, development of research proposals and principles of program evaluation. Students will be introduced to the application of qualitative or quantitative methods. Students will be expected to develop research questions and test hypotheses using statistical analysis and a variety of methodologies.

FCSC 590. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits toward a degree, 4 credits per semester.

FCSC 5991. Special Research Programs
1-4 Credits
Individual investigations, either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree. May be repeated up to 4 credits.

FCSC 5996. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits toward a degree, 4 credits per semester.

FCSC 5999. Master's Thesis
1-15 Credits
May be repeated up to 88 credits.

FCST-FAMILY AND CHILD STUDIES

FCST 1130. Interpersonal Skills in Intimate Relationships
3 Credits (3)
Developing social skills within friendships, dating relationships, marriage, parenting, and families.
Learning Outcomes

1. To understand several theories that explain why some people have healthy interpersonal relationships while others do not.
2. To gain insight about one's self.
3. To learn and improve upon selected relationship skills that improve quality of life.
4. To learn skills that improve interpersonal relationships

FCST 2110. Infancy Through Middle Childhood in the Family
3 Credits (3)
This course discusses research and theory relevant to prenatal development and the physical, mental, and socio- emotional development of the child from birth through age 12. This developmental period will be examined across different cultures and in real world contexts. Attitudes, knowledge, and skills needed for working with young children and their families will be introduced. Restricted to Las Cruces campus only.
Learning Outcomes

1. Evaluate how genes and the environment interact to impact human development from prenatal stages through age twelve.
2. Assess the effects of environmental influences on the developing fetus.
3. Discuss the capacities of newborn development through age twelve.
4. Evaluate how individuals and couples change during the transition to parenthood.
5. Analyze the physical, cognitive, and social-emotional development of the child from birth through age twelve.

FCST 2135. Adolescent Development and the Family
3 Credits (3)
Research and theory relevant to the physical, mental, social, and emotional development of the children ages 12 to 18. Attitudes, knowledge, and skills related to working with adolescents in the family system. Observation in a variety of settings may be required.

Learning Outcomes

1. Compare adolescents of today with adolescents of the past.
2. Describe the physical, cognitive, and psychosocial development of the adolescent in the family system and evaluate individual differences in development.
3. Contrast ways in which culture impacts adolescent development.
4. Assess effective parenting strategies with adolescents.
5. Analyze the influence of family, peers, school, and work on adolescent development.

FCST 2140. Adult Development and Aging
3 Credits (3)
Research and theory related to the physical, mental, social, and emotional development of older adults. Attitudes, knowledge, and skills related to working with older adults in the family system, including normative, and nonnormative transitions.

Learning Outcomes

1. Contrast theories of adult development and aging and apply theories to adult behavior.
2. Hypothesize how physical, emotional, cognitive, and psychosocial aspects of adult development change over time.
3. Describe multicultural factors that impact attitudes toward aging and coping with aging family members.
4. Evaluate ways in which special issues (including but limited to Alzheimer's Disease, heart disease, end of life issues) impact aging.
5. Devise a conceptualization of one's own perspective in dealing with aging and aging family members.

FCST 3110V. Introduction to Child Advocacy
3 Credits (3)
Historical review and evolution of child welfare policies, initiatives and factors that influence child welfare service. Child welfare policies and services specific to the state of New Mexico are infused throughout the course. May be repeated up to 3 credits.

Learning Outcomes

1. To understand how to apply a model of critical thinking/analysis to child maltreatment issues using a systems framework.
2. Compare and contrast historical trends in child maltreatment an child advocacy.
3. Analyze individual, family and community risk factors for maltreatment.
4. Explain cultural issues related to assessing and working with diverse families.

FCST 3120V. Family Ethnicities and Subcultures
3 Credits (3)
Comparative study of American family subsystems with respect to selected social, economic, and cultural backgrounds. Interaction of these subsystems in American society. Differentiated assignments for graduate students. May be repeated up to 3 credits.

FCST 3210. Family Resource Management
3 Credits (3)
This course provides an understanding of the decision-making process of families concerning the utilization of financial, personal, environmental, and social resources. In particular, the class will focus on how families develop, exchange, and allocate resources throughout the lifespan with the expectation that the most effective resource management decisions are made from positions of knowledge and understanding. May be repeated up to 3 credits.

FCST 3220. Family Dynamics
3 Credits (3)
The dynamics of family relationships and changes influencing contemporary families. Interaction between the family and other social systems will be examined. Open to nonmajors.

Learning Outcomes

1. Apply theories to families throughout the family life cycle.
2. Appraise family development as an institution in society.
3. Identify the components of intra-familial dynamics.

FCST 3230. Parenting and Child Guidance
3 Credits (3)
Theories, principles, and skills essential for parents and professionals in guiding children within the family system. Problem prevention techniques are stressed. May be repeated up to 3 credits.

FCST 4310. Community Programs in Family Life
3 Credits (3)
The purpose of this course is for students to learn through class lectures, readings, and community based activities, about issues related to the formulation, delivery, and evaluation of family life education programs in the local community and through virtual delivery. Students will also learn about conducting needs assessments in the community, and evaluating programs after their implementation in preparation for jobs in the field of Family Science.

Learning Outcomes

1. Identify conceptual frameworks suitable in the development of family life programs.
2. Demonstrate knowledge and understanding of techniques and strategies useful in the delivery of family life education programs.
3. Conduct needs assessments and critiques of existing family life/parent education programs and methods of delivering information to parents and families.
4. Apply evaluation strategies for analyzing program effectiveness.
5. Demonstrate knowledge of the legal, moral, and ethical dimensions of family life education and certification standards.

FCST 4997. Special Problems
1-4 Credits
Individual research in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 6 credits. May be repeated up to 6 credits.

FCST 4998. Field Experience: Issues and Ethics
3 Credits (3)
Supervised work experience in community agencies providing services to family systems. Discussion of professional issues and ethical dilemmas. A total of 6 credits must be taken. Restricted to: FCS majors. Students must be in junior standing to enroll. May be repeated up to 6 credits.
Prerequisite: FCST 3220 or equivalent, and an overall GPA of at least 2.5.

Learning Outcomes

1. Complete 150 hours of professional experience.
2. Illustrate the interrelationship of theory, research, and intervention strategies through reflective writing.
3. Evaluate ethical issues in family life education and human services through class discussions and case studies.
4. Employs ethical decisions making using professional guidelines and rubrics.

FCST 5110. Infancy Through Middle Childhood in the Family
3 Credits (3)

Research and theory relevant to prenatal development and the physical, mental, and socio-emotional development of the child from birth to age 5. Attitudes, knowledge, and skills needed for working with young children and their families.

FCST 5120. Family Ethnicities and Subcultures
3 Credits (3)
Comparative study of American family subsystems with respect to selected social, economic and cultural backgrounds. Interaction of these subsystems in American society. Students responsible for all requirements for FCST 449V plus additional work. May be repeated up to 3 credits.

FCST 5135. Adolescent Development and the Family
3 Credits (3)
Advanced study in research and theory relevant to the physical, mental, social, and emotional development of the child, ages 12-18. Attitudes, knowledge, and skills related to working with adolescents in the family system.

Learning Outcomes

1. Compare adolescents of today with adolescents of the past.
2. Contrast ways in which culture impacts adolescent development.
3. Assess effective interventions with adolescents.
4. Analyze the influence of family, peers, school, and work on adolescent development.
5. Assess effective parenting strategies with adolescents.

FCST 5140. Adult Development and Aging
3 Credits (3)
Advanced study in research and theory related to the physical, mental, social, and emotional development of older adults. Attitudes, knowledge, and skills related to working with older adults in the family system, including normative and non-normative role transitions. May be repeated up to 3 credits.

FCST 5210. Family Law and Ethics
3 Credits (3)
Study of selected aspects of federal and state laws and ethical issues as they relate to the family system.

FCST 5220. The Business and Practice of Marriage and Family Therapy
1 Credit (1)
This seminar course will provide students with an overview of the business and practice of Marriage and Family Therapy to the end that they will understand how to develop and maintain a private practice in the field of MFT. Restricted to: FCS (MFT) majors. Graded: S/U Grading (S/U, Audit).

FCST 5230. Parenting and Child Guidance
3 Credits (3)
Theories, principles, and skills essential for parents and professionals in guiding children within the family system. Problem prevention techniques are stressed.

FCST 5310. Family Dysfunction and Diagnosis
3 Credits (3)
A study of the development of abnormal behavior patterns and characteristics to include the major mental and personality disorders and how these can influence and impact family systems. Emphasis is on the symptomology and/or life circumstances and events described in the various diagnostic categories.
Prerequisite(s): Students must be enrolled in a clinical program (i.e MFT, CEP, MSW).

FCST 5320. Theories of Marriage and Family Therapy
3 Credits (3)
A balanced study of major theories, research, applications and principles of marriage and family therapy. This course will examine major therapy models and the theories they are derived from as well as the effectiveness of specific therapy models for specific mental health disorders through research.

FCST 5330. Strategies in Family Therapy
3 Credits (3)
Effective intervention strategies in family therapy practice. Live and taped role plays of interventions for various family problems required. Constructive approaches for working with family systems and third-party payers.

FCST 5340. The Family System
3 Credits (3)
Contemporary family interaction: concepts, composition, resource and environment.

FCST 5410. Sexuality and Family Dynamics
3 Credits (3)
Psychosocial and physiological aspects of human sexuality from a life span and family systems perspective.

FCST 5420. Contemporary Marriage and Family Issues
3 Credits (3)
Investigation of one of the following topics each semester: dual career marriages, nontraditional relationships, aged in marriage.

FCST 5430. Family Crises and Rehabilitation
3 Credits (3)
Examination of the major crises experienced by families. Emphasis on family system functioning rather than individual functioning. Preventative measures, positive coping strategies, and therapeutic intervention approaches examined.

FCST 5990. Supervised Clinical Practice
1-9 Credits (2-18P)
Supervised clinical experience in Marriage and Family Therapy. Includes reviews of audio, video, and/or live sessions and case presentations. Maximum of 9 credits toward a degree. May be repeated up to 20 credits.

FCST 5991. Special Research Programs
1-4 Credits
Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

FCST 5996. Special Topics
1-4 Credits
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree.

FCST 5998. Supervised Practicum
1-9 Credits
Supervised experience in organizations providing services to families and children. Course subtitled in the Schedule of Classes. May be repeated for a maximum of 9 credits. Graded S/U.
Prerequisite: consent of instructor.

FCST 5999. Master's Thesis
15 Credits
Thesis

FCST 1130. Interpersonal Skills in Intimate Relationships
3 Credits (3)
Developing social skills within friendships, dating relationships, marriage, parenting, and families.

Learning Outcomes

1. To understand several theories that explain why some people have healthy interpersonal relationships while others do not.
2. To gain insight about one's self.
3. To learn and improve upon selected relationship skills that improve quality of life.
4. To learn skills that improve interpersonal relationships

FCST 2110. Infancy Through Middle Childhood in the Family
3 Credits (3)
This course discusses research and theory relevant to prenatal development and the physical, mental, and socio- emotional development of the child from birth through age 12. This developmental period will be examined across different cultures and in real world contexts. Attitudes, knowledge, and skills needed for working with young children and their families will be introduced. Restricted to Las Cruces campus only.
Learning Outcomes

1. Evaluate how genes and the environment interact to impact human development from prenatal stages through age twelve.
2. Assess the effects of environmental influences on the developing fetus.
3. Discuss the capacities of newborn development through age twelve.
4. Evaluate how individuals and couples change during the transition to parenthood.
5. Analyze the physical, cognitive, and social-emotional development of the child from birth through age twelve.

FCST 2135. Adolescent Development and the Family
3 Credits (3)
Research and theory relevant to the physical, mental, social, and emotional development of the children ages 12 to 18. Attitudes, knowledge, and skills related to working with adolescents in the family system. Observation in a variety of settings may be required.
Learning Outcomes

1. Compare adolescents of today with adolescents of the past.
2. Describe the physical, cognitive, and psychosocial development of the adolescent in the family system and evaluate individual differences in development.
3. Contrast ways in which culture impacts adolescent development.
4. Assess effective parenting strategies with adolescents.
5. Analyze the influence of family, peers, school, and work on adolescent development.

FCST 2140. Adult Development and Aging
3 Credits (3)
Research and theory related to the physical, mental, social, and emotional development of older adults. Attitudes, knowledge, and skills related to working with older adults in the family system, including normative, and nonnormative transitions.
Learning Outcomes

1. Contrast theories of adult development and aging and apply theories to adult behavior.
2. Hypothesize how physical, emotional, cognitive, and psychosocial aspects of adult development change over time.
3. Describe multicultural factors that impact attitudes toward aging and coping with aging family members.
4. Evaluate ways in which special issues (including but limited to Alzheimer's Disease, heart disease, end of life issues) impact aging.
5. Devise a conceptualization of one's own perspective in dealing with aging and aging family members.

FCST 3110V. Introduction to Child Advocacy
3 Credits (3)
Historical review and evolution of child welfare policies, initiatives and factors that influence child welfare service. Child welfare policies and services specific to the state of New Mexico are infused throughout the course. May be repeated up to 3 credits.
Learning Outcomes

1. To understand how to apply a model of critical thinking/analysis to child maltreatment issues using a systems framework.
2. Compare and contrast historical trends in child maltreatment an child advocacy.
3. Analyze individual, family and community risk factors for maltreatment.
4. Explain cultural issues related to assessing and working with diverse families.

FCST 3120V. Family Ethnicities and Subcultures
3 Credits (3)
Comparative study of American family subsystems with respect to selected social, economic, and cultural backgrounds. Interaction of these subsystems in American society. Differentiated assignments for graduate students. May be repeated up to 3 credits.

FCST 3210. Family Resource Management
3 Credits (3)
This course provides an understanding of the decision-making process of families concerning the utilization of financial, personal, environmental, and social resources. In particular, the class will focus on how families develop, exchange, and allocate resources throughout the lifespan with the expectation that the most effective resource management decisions are made from positions of knowledge and understanding. May be repeated up to 3 credits.

FCST 3220. Family Dynamics
3 Credits (3)
The dynamics of family relationships and changes influencing contemporary families. Interaction between the family and other social systems will be examined. Open to nonmajors.
Learning Outcomes

1. Apply theories to families throughout the family life cycle.
2. Appraise family development as an institution in society.
3. Identify the components of intra-familial dynamics.

FCST 3230. Parenting and Child Guidance
3 Credits (3)
Theories, principles, and skills essential for parents and professionals in guiding children within the family system. Problem prevention techniques are stressed. May be repeated up to 3 credits.

FCST 4310. Community Programs in Family Life
3 Credits (3)
The purpose of this course is for students to learn through class lectures, readings, and community based activities, about issues related to the formulation, delivery, and evaluation of family life education programs in the local community and through virtual delivery. Students will also learn about conducting needs assessments in the community, and evaluating programs after their implementation in preparation for jobs in the field of Family Science.

Learning Outcomes

1. Identify conceptual frameworks suitable in the development of family life programs.
2. Demonstrate knowledge and understanding of techniques and strategies useful in the delivery of family life education programs.
3. Conduct needs assessments and critiques of existing family life/parent education programs and methods of delivering information to parents and families.
4. Apply evaluation strategies for analyzing program effectiveness.
5. Demonstrate knowledge of the legal, moral, and ethical dimensions of family life education and certification standards.

FCST 4997. Special Problems
1-4 Credits
Individual research in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 6 credits. May be repeated up to 6 credits.

FCST 4998. Field Experience: Issues and Ethics
3 Credits (3)
Supervised work experience in community agencies providing services to family systems. Discussion of professional issues and ethical dilemmas. A total of 6 credits must be taken. Restricted to: FCS majors. Students must be in junior standing to enroll. May be repeated up to 6 credits.
Prerequisite: FCST 3220 or equivalent, and an overall GPA of at least 2.5.
Learning Outcomes

1. Complete 150 hours of professional experience.
2. Illustrate the interrelationship of theory, research, and intervention strategies through reflective writing.
3. Evaluate ethical issues in family life education and human services through class discussions and case studies.
4. Employs ethical decisions making using professional guidelines and rubrics.

FCST 5110. Infancy Through Middle Childhood in the Family
3 Credits (3)
Research and theory relevant to prenatal development and the physical, mental, and socio-emotional development of the child from birth to age 5. Attitudes, knowledge, and skills needed for working with young children and their families.

FCST 5120. Family Ethnicities and Subcultures
3 Credits (3)
Comparative study of American family subsystems with respect to selected social, economic and cultural backgrounds. Interaction of these subsystems in American society. Students responsible for all requirements for FCST 449V plus additional work. May be repeated up to 3 credits.

FCST 5135. Adolescent Development and the Family
3 Credits (3)
Advanced study in research and theory relevant to the physical, mental, social, and emotional development of the child, ages 12-18. Attitudes, knowledge, and skills related to working with adolescents in the family system.
Learning Outcomes

1. Compare adolescents of today with adolescents of the past.
2. Contrast ways in which culture impacts adolescent development.
3. Assess effective interventions with adolescents.
4. Analyze the influence of family, peers, school, and work on adolescent development.
5. Assess effective parenting strategies with adolescents.

FCST 5140. Adult Development and Aging
3 Credits (3)
Advanced study in research and theory related to the physical, mental, social, and emotional development of older adults. Attitudes, knowledge, and skills related to working with older adults in the family system, including normative and non-normative role transitions. May be repeated up to 3 credits.

FCST 5210. Family Law and Ethics
3 Credits (3)
Study of selected aspects of federal and state laws and ethical issues as they relate to the family system.

FCST 5220. The Business and Practice of Marriage and Family Therapy
1 Credit (1)
This seminar course will provide students with an overview of the business and practice of Marriage and Family Therapy to the end that they will understand how to develop and maintain a private practice in the field of MFT. Restricted to: FCS (MFT) majors. Graded: S/U Grading (S/U, Audit).

FCST 5230. Parenting and Child Guidance
3 Credits (3)
Theories, principles, and skills essential for parents and professionals in guiding children within the family system. Problem prevention techniques are stressed.

FCST 524. Supervised Practicum
1-9 Credits
Supervised experience in organizations providing services to families and children. Course subtitled in the Schedule of Classes. May be repeated for a maximum of 9 credits. Graded S/U.
Prerequisite: consent of instructor.

FCST 525. Supervised Clinical Practice
1-9 Credits (2-18P)
Supervised clinical experience in Marriage and Family Therapy. Includes reviews of audio, video, and/or live sessions and case presentations. Maximum of 9 credits toward a degree. May be repeated up to 20 credits.

FCST 5310. Family Dysfunction and Diagnosis
3 Credits (3)
A study of the development of abnormal behavior patterns and characteristics to include the major mental and personality disorders and how these can influence and impact family systems. Emphasis is on the symptomology and/or life circumstances and events described in the various diagnostic categories.
Prerequisite(s): Students must be enrolled in a clinical program (i.e MFT, CEP, MSW).

FCST 5320. Theories of Marriage and Family Therapy
3 Credits (3)
A balanced study of major theories, research, applications and principles of marriage and family therapy. This course will examine major therapy models and the theories they are derived from as well as the effectiveness of specific therapy models for specific mental health disorders through research.

FCST 5330. Strategies in Family Therapy
3 Credits (3)
Effective intervention strategies in family therapy practice. Live and taped role plays of interventions for various family problems required.

Constructive approaches for working with family systems and third-party payers.

FCST 5340. The Family System
3 Credits (3)
Contemporary family interaction: concepts, composition, resource and environment.

FCST 5410. Sexuality and Family Dynamics
3 Credits (3)
Psychosocial and physiological aspects of human sexuality from a life span and family systems perspective.

FCST 5420. Contemporary Marriage and Family Issues
3 Credits (3)
Investigation of one of the following topics each semester: dual career marriages, nontraditional relationships, aged in marriage.

FCST 5430. Family Crises and Rehabilitation
3 Credits (3)
Examination of the major crises experienced by families. Emphasis on family system functioning rather than individual functioning. Preventative measures, positive coping strategies, and therapeutic intervention approaches examined.

FCST 548. Adult Development and Aging
3 Credits (3)
Advanced study in research and theory related to the physical, mental, social, and emotional development of older adults. Attitudes, knowledge, and skills related to working with older adults in the family system, including normative and non-normative role transitions. May be repeated up to 3 credits.

FCST 549. Family Ethnicities and Subcultures
3 Credits (3)
Comparative study of American family subsystems with respect to selected social, economic and cultural backgrounds. Interaction of these subsystems in American society. Students responsible for all requirements for FCST 449V plus additional work. May be repeated up to 3 credits.

FCST 562. The Business and Practice of Marriage and Family Therapy
1 Credit (1)
This seminar course will provide students with an overview of the business and practice of Marriage and Family Therapy to the end that they will understand how to develop and maintain a private practice in the field of MFT. Restricted to: FCS (MFT) majors. Graded: S/U Grading (S/U, Audit).

FCST 572. Family Dysfunction and Diagnosis
3 Credits (3)
A study of the development of abnormal behavior patterns and characteristics to include the major mental and personality disorders and how these can influence and impact family systems. Emphasis is on the symptomology and/or life circumstances and events described in the various diagnostic categories.
Prerequisite(s): Students must be enrolled in a clinical program (i.e MFT, CEP, MSW).

FCST 582. Theories of Marriage and Family Therapy
3 Credits (3)
A balanced study of major theories, research, applications and principles of marriage and family therapy. This course will examine major therapy models and the theories they are derived from as well as the effectiveness of specific therapy models for specific mental health disorders through research.

FCST 583. Parenting and Child Guidance
3 Credits (3)
Theories, principles, and skills essential for parents and professionals in guiding children within the family system. Problem prevention techniques are stressed.

FCST 584. Family Law and Ethics
3 Credits (3)
Study of selected aspects of federal and state laws and ethical issues as they relate to the family system.

FCST 585. The Family System
3 Credits (3)
Contemporary family interaction: concepts, composition, resource and environment.

FCST 586. Sexuality and Family Dynamics
3 Credits (3)
Psychosocial and physiological aspects of human sexuality from a life span and family systems perspective.

FCST 587. Contemporary Marriage and Family Issues
3 Credits (3)
Investigation of one of the following topics each semester: dual career marriages, nontraditional relationships, aged in marriage.

FCST 589. Family Crises and Rehabilitation
3 Credits (3)
Examination of the major crises experienced by families. Emphasis on family system functioning rather than individual functioning. Preventative measures, positive coping strategies, and therapeutic intervention approaches examined.

FCST 590. Special Topics
1-4 Credits
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree.

FCST 592. Strategies in Family Therapy
3 Credits (3)
Effective intervention strategies in family therapy practice. Live and taped role plays of interventions for various family problems required. Constructive approaches for working with family systems and third-party payers.

FCST 598. Special Research Programs
1-4 Credits
Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

FCST 599. Master's Thesis
15 Credits
Thesis

FCST 5990. Supervised Clinical Practice
1-9 Credits (2-18P)
Supervised clinical experience in Marriage and Family Therapy. Includes reviews of audio, video, and/or live sessions and case presentations. Maximum of 9 credits toward a degree. May be repeated up to 20 credits.

FCST 5991. Special Research Programs
1-4 Credits
Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.

FCST 5996. Special Topics
1-4 Credits
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree.

FCST 5998. Supervised Practicum
1-9 Credits
Supervised experience in organizations providing services to families and children. Course subtitled in the Schedule of Classes. May be repeated for a maximum of 9 credits. Graded S/U.
Prerequisite: consent of instructor.

FCST 5999. Master's Thesis
15 Credits
Thesis

FDMA-FILM & DIGITAL MEDIA ARTS

FDMA 1120. Desktop Publishing
3 Credits (2+2P)
This course is designed to teach introductory skills for designing and creating publications and presentations with layout software. The course will focus on graphics and typographic design, fonts, and other skills for print and web publishing.
Learning Outcomes
1. Demonstrate knowledge of fundamental features and navigation of desktop publishing software.
2. Combine text and images for effective communication.
3. Develop a balanced composition through use of color, contrast, and alignment.
4. Place images within a composition and wrap around text.
5. Produce documents with professional layout and typography skills.
6. Create attractive and effective designs.
7. Combine knowledge of typography, images, and design principles to produce professional print and web media.
8. Create or add to a professional design portfolio for future use.

FDMA 1210. Digital Video Production I
3 Credits (2+4P)
An introduction to digital video production. Students learn camera operation, lights and audio equipment. Hands-on production is completed in the studio and on location.
Learning Outcomes
1. Plan and produce a digital video project
2. Apply post-production workflow
3. Work in team and as individual to complete digital video projects.

FDMA 1220. Introduction to Digital Video Editing
3 Credits (3)
In this course, students learn the basics of the post-production process for non-linear video editing. Students work with multiple video formats and create short movies for multiple distribution platforms. Skills include media management and professional terminology. Sections on the Main Campus will be restricted to CMI students.
Learning Outcomes
1. Define concepts related to digital video editing.
2. Use non-linear video editing software for editing a short film
3. Enhance storytelling through the use of continuity, timing, cutaways, intercutting, compositing, transitioning, jump cutting, montaging and animating.
4. Use text, titles, transitions, video effects, sound effects, dialogue, and visual assets for digital video editing.

FDMA 1360. Web Design I
3 Credits (2+2P)
This course provides an introduction to web development techniques, theory, and design. Students will learn HTML, CSS application, and strategies for effective site navigation and design, along with industry standard web editing software to develop various websites. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): ARTS 1520 OR FDMA 1515.
Learning Outcomes
1. Acquire and utilize web design terminology.
2. Create basic web pages using HTML.
3. Demonstrate how to use industry-standard, web editing software.
4. Design professional pages that are easy to navigate and quick to load.
5. Develop a basic comprehension of CSS
6. Prepare and export a variety of graphics to be used online.
7. Compare and contrast designing for web media vs. print media.
8. Analyze the importance of web presence in today's business/social climate

FDMA 1410. Audio Production I
3 Credits (2+2P)
Students will learn about and apply essential tools and techniques in analog and digital audio production. Topics include acoustic science, microphones, recording and mixing techniques, analog and digital audio hardware and software, including, multi-track, computer-based recording and editing systems. Restricted to: Community Colleges only. May be repeated up to 3 credits.
Learning Outcomes
1. Apply tools and techniques in analog and digital audio production
2. Illustrate the fundamentals of acoustic science.
3. Model professional behavior used in audio recording.

FDMA 1415. Principles of Sound
3 Credits (2+2P)
The creation of a professional quality original media soundtrack is possible for relatively low production/post production cost. This class is designed to give the student and overview of creating sound for a variety of digital media. Topics include acoustic principles, sound design, audio hardware, recording techniques; and editing, processing, and multi-track mixing, using software applications. Restricted to: Community Colleges only.
Prerequisite(s)/Corequisite(s): FDMA 1220.
Learning Outcomes
1. Record and edit wild sound effects and synced dialogue
2. Discover, upload, and edit on-linemusic, ambience and sound effect loops
3. Implement audio design theories
4. Create an aesthetic soundtrack which incorporates multiple elements and dimensions
5. Design, edit, process, mix and master a synced multi-track soundtrack
6. Demonstrate capable use of digital audio production and post-production workflow
7. Produce short audio projects which meet media industry technical standards

FDMA 1510. Introduction to 3D Animation
3 Credits (3)
This course provides an overview of 3D animation production processes. Students will be introduced to basic story development and the creation

of computer-generated assets and cinematic sequences. The course will survey specialty areas of digital animation and various software and techniques applied in entertainment and information media. Students will review and critique other's animation, as well as plan and produce original animation for review by classmates and as part of a CGI demo reel.
Prerequisite(s): FDMA 2382 or FDMA 2381 or consent of instructor.
Learning Outcomes

1. Demonstrate a fundamental understanding of 3D animation history and principles.
2. Analyze animation work of other artists.
3. Appropriately utilize the various media technologies for digital 3D animation.
4. Demonstrate and apply basic techniques of digital 3D animation.
5. Demonstrate and apply basic processes of creating CGI for a narrative. 6 .Apply some basic strategies for developing and creating a story visually, and create original animations.
6. Present original animations to instructor and classmates for critique.
7. Create a CGI demo reel of work completed during the course.

FDMA 1515. Introduction to Digital Image Editing - Photoshop
3 Credits (2+2P)
In this course, students will learn how to use the tools in Adobe Photoshop to create new images and edit existing images. Tools used will include selections, layers, and adjustments, among other pixel editing tools. Basic composition and output will be emphasized in all projects. May be repeated for a maximum of 6 credits.
Learning Outcomes

1. Make and refine selections
2. Adjust color and tone in an image
3. Eliminate unwanted objects in an image
4. Apply layers to organize and create effects
5. Create brushes, styles and vector shapes
6. Prepare image for print and screen output
7. Apply masking and layers to non-destructively edit an image
8. Effectively utilize blending modes and layer styles 1
9. Apply adjustment layers 1
10. Apply design principles including typography

FDMA 1531. Evolution of Electronic Games
3 Credits (2+2P)
Focus on the evolution of video games and how they have shaped mainstream entertainment. May be repeated up to 6 credits.
Learning Outcomes

1. Analyze the historical development of video games from early arcade machines to modern consoles and mobile platforms.
2. Evaluate the impact of technological advancements on video game design, graphics, and gameplay mechanics.
3. Identify key milestones, influential games, creators, and major companies that shaped the video game industry.
4. Examine how video games have influenced and been influenced by other forms of media and popular culture.
5. Assess the social, cultural, and economic impacts of video games as they evolved into a mainstream form of entertainment.
6. Discuss current trends and predict future directions in video game development and the gaming industry.

FDMA 1535. Introduction to Illustrator
3 Credits (2+2P)
Students receive instruction on vector graphics creation using vector illustration software. The students will create professional-quality artwork for print publishing and multimedia graphics. Instruction includes creating and manipulating basic shapes, drawing with the pen tool, using various brushes, working with type and preparing graphics for web, print, and digital publication. May be repeated for a maximum of 6 credits.
Learning Outcomes

1. Apply a variety of shape blending options
2. Create and apply new gradients
3. Apply Gradient Meshes and Envelopes
4. Create symbols, brushes and vector shapes
5. Apply Pathfinder and other effects
6. Effectively utilize the pen tool to draw and edit shapes
7. Effectively utilize Vector tools
8. Prepare image for print and screen output
9. Apply clipping masks 1
10. Prepare image for use in another program 1
11. Apply design principles including typography

FDMA 1536. Advanced Computer Illustration
3 Credits (2+2P)
Advanced techniques in 2D vector drawing and fundamentals of 3D illustration for use in print, web, and multimedia applications. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): FDMA 1535.
Learning Outcomes

1. Demonstrate proficiency in using advanced features of Illustrator.
2. Identify and create different illustrator/art styles using advanced techniques for shading, perspective, light, reflection.
3. Produce high quality digital imagery incorporating basic principles of composition.
4. Create a series of illustrations demonstrating a design competency in layout foundation and illustrative moods or client/project based solutions.
5. Create high quality portfolio pieces that demonstrate an advanced knowledge of design, composition and Illustrator techniques.
6. The students will produce finished printed portfolio pieces demonstrating a comprehensive knowledge of typographical, design, illustrative and layout skills

FDMA 1545. Introduction to Photography & Digital Imaging
3 Credits (2+2P)
This course is a study of the principles and techniques of photography using digital equipment, and discusses how digital cameras, imaging editing, and technology have changed the world of photography. Students will learn about studies in resolution, lighting, software, editing, printing, and web applications. They will gain fundamental knowledge in the rapidly expanding technology of photography and imaging, and be able to incorporate the knowledge into all areas of digital graphics.
Learning Outcomes

1. Exhibit proper usage of the principles and techniques of photography using digital equipment.
2. Utilize features and techniques of a digital camera with proper use of lenses, settings, and flashes.
3. Create photo collections that represent proper use of technical skills.
4. Demonstrate proficiency in planning, lighting, capturing, and distributing photographic projects which show ability to create photographs artistically and to tell a story or express an idea.

5. Utilize appropriate software to create original projects.
6. Demonstrate knowledge in post-production of photos as to sizing, sampling, resolution, and exporting.
7. Produce original projects which respect intellectual property of others.
8. Create a digital portfolio of work completed during the course.

FDMA 1555. Introduction to the Creative Media Industry
3 Credits (3)
This class is an introductory course for students who are beginning their understanding of Media and how it affects them and our society. It offers a broad-stroked view of the entire industry including Marketing, Production, History, Jobs, Design, Architecture, New Media Literacy, and industry standards. Students will listen to experts in the field, get involved in open discussions about the industry and use new information to complete hands-on individual & group assignments.
Learning Outcomes
1. The basic philosophies and methods that guide people working in the Creative Media industry.
2. Knowledge of a wide variety of different jobs, qualifications and paradigms used in the industry.
3. Marketing, Production, Budgets, History, New Media, Inspiration and other aspects of the industry.
4. An accurate view of the Creative Media field.

FDMA 1630. Principles of Design
3 Credits (2+2P)
This course will explore how we see and use visuals to communicate information. Students will develop critical thinking skills in applying concepts of basic design principles. Students will apply the concepts with hands-on and analysis assignments. These concepts will then be applied to design for advertising, print, digital media, and web design. The business of design will also be covered with emphasis on client relations and networking Restricted to: Community Colleges only. Prerequisite(s): FDMA 1535
Learning Outcomes
1. Practice Creativity
2. Plan a Design project
3. Demonstrate the effective use of Emphasis Contrast
4. Demonstrate the effective use of Balance and Alignment
5. Demonstrate the effective use of Harmony and Repetition
6. Demonstrate the effective use of Flow, Movement, and Rhythm
7. Demonstrate the effective use of Simplicity and Economy
8. Effectively apply basic color theory
9. Demonstrate the effective use of Typography principles 1
10. Apply design principles to Screen Print Projects 1
11. Develop client relations

FDMA 1710. 2D Animation
3 Credits (2+2P)
Concepts and techniques in storyboarding and creating interactive 2D animations for web, multimedia and video.
Prerequisite(s): FDMA 1535.
Learning Outcomes
1. Be able to correctly storyboard an animation scene
2. Define and demonstrate basic animation terminology and principles.
3. Produce a complete hand drawn animation using industry standard software and processes.

FDMA 1715. 2-D Compositing & FX
3 Credits (3)
This course will familiarize students with the process of compositing and creating special effects for animation using industry standard software. Students will learn how to assemble an animated scene and use advanced 3D lighting, spacing, and digital effects to achieve a dynamic, professionally rendered look.
Prerequisite: FDMA 2710.
Learning Outcomes
1. The goal of this class is for students to learn how to use advanced compositing and effects tools in order to achieve a more dynamic and professional visual look for their animations or motion graphics.
2. By the end of the class, you should be proficient animation compositors that can assemble and synthesize a basic animation into a rendered, visually sophisticated piece.
3. Students who pass this class will have a basic to intermediate knowledge of Adobe After Effects

FDMA 1720. 3-D Character Design
3 Credits (2+4P)
Focus on designing a character and then taking that design and building it in 3D using intermediate modeling techniques. May be repeated for a maximum of 6 credits.
Prerequisite(s): FDMA 1510 or FDMA 2530.
Learning Outcomes
1. Translate concept art into a low and high resolution 3D model using proper modeling techniques
2. Use Polygon modeling techniques to create a 3D character
3. Layout UVs and utilize Adobe Photoshop to texture a model.

FDMA 1996. Selected Topics
1-4 Credits (1-4)
Specific titles to be announced in the Schedule of Classes. May be repeated for a maximum of 18 credits. Restricted to Community Colleges campuses only.
Learning Outcomes
1. Varies

FDMA 2120. Film Crew I/ Introduction to Film and Media Workflow
9 Credits (9)
An introduction to the film industry. This class teaches film production processes, film crew hierarchy, film production set-safety and etiquette and provides hands-on training in industry standard film production equipment. Students complete the semester by participating as a below-the-line crew member on a short film. Restricted to: Community Colleges only.
Learning Outcomes
1. Explain film production processes; Interpret call sheets and deal memos, model basic on-set protocols and professional behavior
2. Assist producers and directors in completing a professional film project
3. Work effectively in production crew positions in a group environment.
4. Recognize and articulate specific film production structure, from original concept to final release

FDMA 2125. Film Crew II
9 Credits (9)
The second course designed to train students to become working members of film crews. It will be taught by working film professionals. Content will be lecture and hands-on. Students complete the semester by

working as part of an actual film crew as below-the-line and above-the-line crew members. Restricted to: Community Colleges only.
Prerequisite(s): FDMA 2120.
Learning Outcomes

1. Understand film production processes used to produce a film
2. Manage craft area job functions
3. Model on-set protocols and professional behaviors
4. Assist producers and directors in completing a professional film project

FDMA 2144. Pre-production Management
3 Credits (2+2P)
Pre-production planning paperwork breakdowns, budgeting, and scheduling; taking a project from start to finish from a producers standpoint.
Prerequisite(s): FDMA 1210.
Learning Outcomes

1. Demonstrate proficiency in various areas of pre-production
2. Create a script breakdown, budget, production and post-production schedule, and management plan and timeline that are technically sound.
3. Use features of pre-production and project management software, to foresee and plan the pre-production, production, and post-production stages of a project
4. Demonstrate understanding of the processes of supporting and managing a project, through the pre-production, production, and post-production stages to completion
5. Work collaboratively and communicate effectively with the pre-production and management teams to produce the desired finished project.

FDMA 2150. Desktop Publishing II
3 Credits (2+2P)
This class will enhance and build upon student layout/design skills developed in the Introduction to Desktop Publishing course, incorporating intermediate to advanced concepts in typography and layout design. Upon completion of this course, students will be able to use page layout software to prepare a variety of documents for presentation and critique, including newsletters, instructional flyers, and other complex design/typographic pieces May be repeated up to 6 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): FDMA 1120.
Learning Outcomes

1. Build upon knowledge of design and design terminology.
2. Exhibit intermediate to advanced design principles using type, layout, and color.
3. Demonstrate skill in intermediate to advanced concepts and features of page layout software.
4. Exhibit knowledge of styles, tables, images and clipping paths and interactive documents as well as printing preparations and procedures.
5. Create layouts for print, web, and other media that demonstrate an intermediate to advanced knowledge in typography and layout design.
6. Format and produce newsletters and instructional flyers, as well as larger, complex projects such as packaging mechanicals, multiple master page documents, and books.
7. Assess works of graphic design for quality and effectiveness.
8. Utilize produced material to create or add to a design portfolio for future use.

FDMA 2210. Digital Video Production II
3 Credits (2+2P)
Advanced techniques of the tools and application of professional film making. May be repeated for a maximum of 6 credits.
Prerequisite: FDMA 1210.
Learning Outcomes

1. Demonstrate the ability to produce and manage a video project: Produce a script, storyboard, and production schedule for a video project designed for a specific audience.
2. Demonstrate proficiency in producing quality digital video footage and audio tracks: Shoot to the script and storyboard using a variety of camera and lighting techniques; Produce a finished complex sound track including narration, music, and sound effect.
3. Demonstrate ability to produce and edit a professional quality video project: Integrate all production aspects of the project including video, audio, graphics, titles, transitions, and effects. Guide the project through the final production stages.
4. Develop competency in digital video distribution using various formats and techniques: Distribute project in various formats which could include DVD and web posting.

FDMA 2241. Advanced Camera Techniques
3 Credits (2+2P)
Professional camera techniques and training for electronic news gathering and studio filmmaking. Utilizes high-end handheld shooting techniques, cranes, dollies, and steadicam training. May be repeated for a maximum of 6 credits.
Prerequisite(s): FDMA 1210.
Learning Outcomes

1. Students knowledge of high-end video camera operation and features.
2. Students must know all the working features of the video production equipment being used during the course in order to achieve the desired footage as required by the instructor.
3. Demonstrate proficiency in producing quality digital video footage.
4. Individuals must acquire the knowledge of different shooting styles in different productions situations and use those acquired skills to produce the appropriate video footage.
5. Using the proper lighting in different on location shooting styles.
6. Skill of each individual utilizing the usage of high-end camera equipment such as dollies, cranes and Steadicam.
7. Each individual must work as a team player to create professional style video footage.

FDMA 2285. Digital Video Production and Editing II
3 Credits (2+2P)
Advanced features of digital video, audio/music, and titling production software. Included are color correction, vector scopes, motion effects, and advanced editing techniques used by filmmakers. Restricted to Community Colleges campuses only. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): FDMA 1220.
Learning Outcomes

1. intermediate to advanced video editing create short films and training videos, create TV quality commercials, direct a news broadcast, and work as a mentor to students on digital media equipment

FDMA 2287. Digital Design Studio
1-3 Credits
A design studio environment in which students obtain real-world experience while providing service to college and non-profit associations with faculty supervision using a variety of media. Can be used with permission to fulfill cooperative requirement. May be repeated for a maximum of 6 credits.
Prerequisite(s): FDMA 1630 or ARTS 1712.
Learning Outcomes
1. Demonstrate competency in the use of InDesign software.
2. Create appropriate visual solutions based on target marketing information.
3. Demonstrate competency in the design and production of advertising and promotional materials.
4. Present ideas and concepts effectively and competently.
5. Visually demonstrate design solutions to be used in a portfolio.

FDMA 2310. History of Cinema I
3 Credits (3)
This course surveys the history of cinema - investigating the process by which the original "cinema of attractions" evolved into a globally dominant form of visual storytelling. We will explore the development of cinema both as an art form and as an industry, and consider the technological, economic, cultural factors, as well as many key international movements that helped shape it. Restricted to: G-CMI, DFM, ANVE majors.
Learning Outcomes
1. Gain a greater appreciation for the history of cinema
2. Develop knowledge of the key eras in the history of U.S. cinema
3. Learn the characteristics of major movements in international cinema
4. Understand the various elements that go into telling a story in cinema: screenplay, narrative devices, director, producer, talent, production design, cinematography, editing, sound design
5. Learn how major genres in U.S. cinema have evolved in the past 100+ years
6. Gain a basic understanding of the operations and organization of the Hollywood film industry, from the studio system until today
7. Gain an awareness of the shifts inthe film industry that present new opportunities for independent filmmakers
8. Understand the importance of learning about the history of cinema to the process of becoming a filmmaker
9. Strengthen public speaking skills

FDMA 2311. History of Animation
3 Credits (3)
Explores the history of Animation as an art form and industry through readings, screenings, lecture and periodic guest speakers. Restricted to: G-CMI, ANVE, DFM majors. Restricted to Las Cruces campus only.
Learning Outcomes
1. To expand your knowledge of the history of animation and its evolution to the modern day.
2. To expand your ability to view animation critically and to understand its early connections to cartooning as well as its ongoing cultural presence and relevance.
3. To expand your comfort with accessing information and completing assignments both online and independently. Canvas will be utilized for many of our readings and for some response assignments.

FDMA 2312. History of Media Design
3 Credits (3)
An introduction to the principles of design history and theory within a chronological framework of historical and emerging media.
Learning Outcomes
1. Introduction to visual communication: Defines design media; Discuss universal design principles and strengthen student basic design skills.
2. Historical technological development and design: Prehistoric communication; Beginnings of alphabet and written language; Movable type and the printing press; Industrial revolution; Digital Age; Designers and Trends; Personalities and their influence and contributions
3. Identify design styles and discuss the relevance of how design influences: Idea generation; Trend sources; Influences or appropriation; Propaganda and advertising.

FDMA 2325. Advanced Photoshop
3 Credits (2+2P)
This course expands on the Photoshop skill set to develop proficiency with selections, masking, channels, filters, color correction, painting tools, vector integration, video, special effects, and compositing techniques. The focus is on the core image-editing tools of Photoshop that can be universally applied to photography, print, film or the web. The material is covered in production-oriented projects and students develop work suitable for portfolios. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): FDMA 1515.
Learning Outcomes
1. Create effects using advanced blending techniques
2. Effectively utilize advanced masking techniques
3. Refine Selections with advanced techniques
4. Assess Adjust color in an image
5. Utilize advanced photo enhancement techniques
6. Alter images using Photoshop painting techniques
7. Create brush presets
8. Create vector elements with paths
9. Add manipulate type on a path 1
10. Create advanced special effects 1
11. Apply vanishing point warping 1
12. Create a video clip 1
13. Apply color adjustments to video

FDMA 2326. Digital Photography and Imaging II
3 Credits (2+2P)
Provide understanding and skills needed for advanced digital capture, editing, optimizing and manipulating photographic images for print, web and multimedia applications. The course will prepare students to make more advanced technical and more refined aesthetic decisions relative to specific photographic applications. Restricted to: Alamogordo campus, Carlsbad campus, Dona Ana campus.
Prerequisite(s): FDMA 1545.
Learning Outcomes
1. Apply proper exposure techniques.
2. Practice effective composition techniques.
3. Demonstrate knowledge of working with Camera RAW files.
4. Demonstrate proper image adjustment and correction techniques.
5. Successfully apply the basics of HDR digital photography.
6. Apply techniques for modifying light.

FDMA 2360. Web Design II
3 Credits (2+2P)
In this course, students will refine their skills in coding and web graphic design as well as be introduced to methods in constructing sites that adhere to the standards of responsive web design. Students will expand their knowledge of HTML and CSS using a code editor, and they will both analyze existing websites and also construct an interactive website. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): FDMA 1360.
Learning Outcomes
1. Plan and produce web design mockups.
2. Demonstrate a proficiency in HTML/CSS coding.
3. Utilize basic web scripts.
4. Integrate animation into web design.
5. Create fully functional websites using one or more web editors.
6. Make a website "live."
7. Evaluate web designs for aesthetics and functionality.
8. Demonstrate the utilization of responsive design.

FDMA 2365. Web Design for Small Business
3 Credits (2+2P)
Technology and techniques for designing and building a web presence for small business. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): FDMA 1360.
Learning Outcomes
1. Learning advanced tools and techniques for creating and maintaining complex Business web sites. We will be using CSS, PHP, HTML, Photoshop, and Wordpress.
2. design a complete and fully functional online web business.
3. understand and develop a plan to better manage a web store/ business.
4. review basic design guidelines in preparing a variety of web applications for business.
5. develop technical skills in using various web based solutions.
6. reinforce your knowledge of web design software.
7. introduce alternate sources of data, communication and financial solutions.

FDMA 2381. Storyboarding
3 Credits (3)
Examines effective writing principles to create storyboards that communicate the overall picture of a project, timing, scene complexity, emotion and resource requirements. Further, the purpose of this course is to introduce students to the principles of visual storytelling—in film--through the use of the storyboard. In other words, to show how storyboards are critical "architectural component" of the filmmaking process, used as a blueprint (or guide) to communicate the complex elemnts of a film story. Crosslisted with: ENGL 2381. Restricted to: DFM,ANVE, G-CMI majors. Restricted to Las Cruces campus only.
Learning Outcomes
1. Learn to conceive and draw original images.
2. Learn to use images to tell a story.
3. Design, develop, and order images (shots) into storyboarded scenes.
4. Understand how storyboarded sequences are a tool in the process of filmmaking.
5. Understand how the storyboard image is translated from the written page.
6. Build scenes from the scripted sequences into a storyboard.

FDMA 2382. Principles of Story Across the Media
3 Credits (3)
The purpose of this course is to help students understand the basic elements of narrative structure (e.g. character, dramatic conflict, theme, etc.) and how these elements may be used effectively in media expression. Crosslisted with: ENGL 2382. Restricted to: G-CMI, DFM, ANVE majors. Restricted to Las Cruces campus only.
Learning Outcomes
1. Identify the elements of storytelling in scripted text or improvised performance
2. Understand how these elements work together across different media
3. Apply these elements of storytelling in original work
4. Appreciate and master these elements for independent or collaborative work

FDMA 2410. Audio Production II
3 Credits (2+2P)
Students will use skills developed in the Audio Production I course to produce audio projects utilizing a variety of analog and digital audio hardware and software, including continued use of multi-track, computer-based recording and editing systems, as well as exploring more advanced audio techniques and concepts. Restricted to: Community Colleges only. May be repeated up to 6 credits.
Prerequisite: FDMA 1410.
Learning Outcomes
1. Apply analog and digital audio hardware and software in audio recording.
2. Apply common professional set-up practices of audio production facilities.
3. Produce audio projects, sync sound recordings, and audio dialogue replacement (ADR) demonstrating technical expertise.
4. Perform an audio mix and master for a final professional product.
5. Analyze and compare existing audio productions for quality.

FDMA 2510. Introduction to Sound Design for Film
3 Credits (3)
This couse is an introduction to the principles, techniques and applications of sound design and film scoring. Students learn how sound affects storytelling in a film, examine the role of sound from the script to screen, and the professional process of creating a soundtrack. Students learn how to use sound equipment in a production environment and execute basic techniques used to develop a soundtrack. Crosslisted with: FDMA 1415.
Prerequisite(s)/Corequisite(s): FDMA 2382. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.
Learning Outcomes
1. Compare the properties and propagation of sound and importance of sound to the storytelling aspect of filmmaking
2. Learn the process of designing a soundtrack for film and recording live audio dialogue for use in post-production editing.
3. Learn methods of capturing sound including live audio recording, dialogue recording, foley, orchestration and audio dialogue replacement
4. Design a soundtrack for motion media project.

FDMA 2520. Introduction to Cinematography
3 Credits (3)
The Director of Photography (or Cinematographer), in close collaboration with the Director and Production Designer, helps determine the look of a film. This course is designed to intorduce students to the technical and aesthetic fundamentals of creating, developing, and collaborating on the visual elements of storytelling, using camera framing, lensing, and lighting fundamentals such as shadows, light and color. May be repeated up to 6 credits. only. Prerequisite(s)/Corequisite(s): FDMA 2382 (Las Cruces Campus) or FDMA 1210 (Community College Campus(es)
Learning Outcomes
1. Define and explain the fundamental concepts of cinematography, such as exposure, lighting solutions, and color temperature.
2. Understand how cinematography brings the Director's vision to reality.
3. Demonstrate proficiency in plotting and executing interior and exterior lighting solutions.

FDMA 2530. Introduction to 3D Modeling
3 Credits (3)
This course will introduce 3D modeling methods and current practices. Students will learn preliminary and detailed modeling techniques using industry standard software. Methods will emphasize formal and functional aspects of modeling as they apply to mechanical, organic, and sculpted topology for application in animation, games, and information media. May be repeated for a maximum of 6 credits.
Learning Outcomes
1. Identify the role of a 3D modeler in a production pipeline within various fields of digital animation.
2. Apply techniques in modeling mechanical and organic objects.
3. Utilize tools available in professional 3D modeling software.
4. Create simple animations and renders.
5. Present original animations to instructor and classmates for critique.
6. Create a demo reel of work completed during the course.

FDMA 2535. Digital Illustration Techniques
3 Credits (3)
Introductory course examining traditional artistic expressions and translating visual art experiences into a digital art medium to enhance visual storytelling. Students acquire basic principles of drawing and painting through hands-on experience manipulating tonal value, composition, form development, light and shadow, color theory, rendering realism, and graphic design. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.
Learning Outcomes
1. Be familiar with the CMI computer system, facilities, equipment and policies.
2. Appropriately utilize the various media technologies available at CMI for digital illustration.
3. Understand the different roles and areas of digital illustration.
4. Understand and apply some basic techniques of digital illustration.
5. Understand and apply some basic processes of creating pleasing images based on knowledge of traditional art principles.
6. Begin to apply some basic strategies for developing and creating aesthetically pleasing images.

FDMA 2570. Creative Media Studio
3 Credits (2+2P)
A studio environment where students specialize in creating film-festival quality and portfolio-ready projects under the supervision of faculty. May be repeated for a maximum of 6 credits.
Prerequisite(s): FDMA 1210 and FDMA 1220 or FDMA 2530.
Learning Outcomes
1. Students will work together to create portfolio-quality work in a studio environment.
2. Through classroom discussion and reporting the students will collaborate to produce a professional quality "vertical slice" game concept within a defined timeline and financial budget

FDMA 2710. Beginning 2-D Animation
3 Credits (3)
Students will learn the basics of digital 2D animation by working through a variety of exercises, creating an original storyboard, and animating five or more shots utilizing industry standard software. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.
Learning Outcomes
1. The student will demonstrate an overall knowledge of computers as a tool of the animation artist and be able to produce simple animations using the techniques learned in class.
2. Use major software tools with ease
3. Manage time lines through key frames
4. Build storyboards
5. Demonstrate knowledge of 2-D and animation terminology
6. Produce actions, set environments and constraints for 2-D animation
7. Render full animation.

FDMA 2715. Special Effects
3 Credits (2+4P)
Creating advanced virtual special effects for both rigid and soft bodies. Using MEL, dynamic principles, mixing nodes, and advanced particle systems. How to drive particles over surfaces, add texture to flow, create surface tensions, and use collision events to drive texture. Study of integrating computer-generated images with real-life video and audio.
Prerequisite(s): FDMA 2530 or FDMA 2765.

FDMA 2720. 3D Animation
3 Credits (3)
Overview of the essentials and principles of 3D animation; creative methods for using industry standard tools to produce the illusion of movement for storytelling and creating 3D effects. Topics include, keyframe and curve animation, kinematics, cycle animation, camera animation, deformers, dynamics and constraints.
Prerequisite: FDMA 1510, FDMA 2710 or consent of instructor.
Learning Outcomes
1. Clearly describe the role of an animator in cinema, gaming and related fields.
2. Recognize leading animators and their methods.
3. Demonstrate knowledge of advances in contemporary animation.
4. Utilize current industry standard animation tools.
5. Apply fundamental animation processes and techniques

FDMA 2725. Rigging for 3D Animation
3 Credits (3)
This course will introduce principles and practices of current 3D animation rigging. Students will develop fundamental methods necessary to create character rigs. Students will learn aesthetic, technical, and optimization concepts as they apply to organic and mechanical designs. Topics will include: hierarchies, constraints, deformation rigging, skeleton

creation, skinning, forward and inverse kinematics, controls, body and facial rigging. Restricted to: DFM, ANVE majors.
Prerequisite(s): FDMA 1510.
Learning Outcomes
1. Understand what Rigging is and the role it plays in the world of cinema and video games.
2. Be familiar with industry professionals and their techniques and approaches to rigging.
3. Understand and be able to apply the fundamentals of rigging to industry standard applications.
4. Demonstrate ability to rig basic to intermediate machines, bipeds and quadrapeds

FDMA 2730. Advanced Character Animation
3 Credits (2+2P)
Focus on complex rigging techniques as well as utilizing advanced animation functions to blend multiple animations into complex animations. May be repeated for a maximum of 6 credits. Restricted to: Community Colleges only.
Prerequisite(s): FDMA 2530.
Learning Outcomes
1. Create skeletal riggings for use with a 3D model
2. Attach riggings to a 3D model using Smooth and rigid binding and refine the bindings so that they are properly weighted
3. Animate a 3D model using skeletal and vertex animation techniques

FDMA 2745. Light, Shade, Render
3 Credits (3)
This course will explore the theory and practice of 3D lighting and rendering methodologies. Techniques covered will implement cameras, lighting sources, textures, surface-mapping and algorithmic rendering to produce stylized and photo realistic images. Topics covered will include direct and indirect lighting, shaders that simulate physical substances and effects, rendering multiple passes and simulating physical lens effects. Restricted to: DFM,ANVE majors. Restricted to Las Cruces campus only.
Prerequisite: FDMA 1510 OR FDMA 2530, or Consent of Instructor.
Learning Outcomes
1. Understand the role of lighting and surfacing to tell a story.
2. Be familiar with leading lighting artist and their approaches.
3. Utilize the software implemented in the entertainment industry.
4. Understand and apply fundamental lighting and rendering techniques.
5. Demonstrate ability to create successfully rendered scenes from concept through production.

FDMA 2750. Digital Sculpting
3 Credits (3)
Introduce students to the 3D Sculpting programs which are the industry standard sculpting programs. Students will learn how to create complex high polygon sculpts and normal maps and transfer the models into 3D studio Max and Autodesk Maya. May be repeated up to 6 credits. Restricted to: Community Colleges only.
Prerequisite(s): FDMA 2530.
Learning Outcomes
1. Demonstrate communication skills through written critiques and explanations
2. Students will demonstrate visual communication skills through critiques, written explanations, and storyboarding
3. Demonstrate a working knowledge of Zbrush's interface
4. Demonstrate a working knowledge of Zpheres and how they are best used to create sculpts
5. Demonstrate a working knowledge of painting a mesh using Spotlight
6. Demonstrate a working knowledge of retopologizing and exporting the mesh
7. Demonstrate a working knowledge of integrating the full Zbrush pipeline into Unity and Unreal

FDMA 2755. Drawing for Animation
3 Credits (3)
Introductory study of the human and animal form in relation to animation. Students learn fundamentals and exaggeration of the figure, as related to proportion, rhythm, mechanics, and motion. Areas of focus are: basic form, proportion, shape, contour, gesture, anatomy, portraiture, perspective, clothing effects and drawing from observation. Restricted to: CMT,DFM,ANVE majors.
Learning Outcomes
1. Students will have an opportunity to gain hands on experience using industry standard state of the art animation software.
2. Understand what the basics of drawing the human form.
3. Have a general understanding of human anatomy as needed for the artist.
4. Be able to design the human form from imagination.

FDMA 2770. Critical Game Studies
3 Credits (2+2P)
Focus on creating a complete design document utilizing techniques and standards used in the industry today. May be repeated up to 6 credits.
Learning Outcomes
1. Develop a comprehensive game design document that adheres to industry standards, incorporating elements such as gameplay mechanics, narrative structure, and user interface design.
2. Critically analyze existing game design documents to identify strengths, weaknesses, and areas for improvement.
3. Apply advanced game design techniques to create innovative and engaging game concepts.
4. Evaluate the ethical and cultural implications of game design choices and their impact on diverse audiences.
5. Collaborate effectively in a team setting to produce a cohesive and well-documented game design project.
6. Present and defend game design concepts and documents to peers and industry professionals, demonstrating clear communication and critical thinking skills.

FDMA 2775. Game Tools and Techniques
3 Credits (2+2P)
Focus on the different engines and gaming technologies that power the games of today. May be repeated for a maximum of 6 credits.
Prerequisite(s): FDMA 2770.
Learning Outcomes
1. Students will develop rapid prototyping techniques.
2. Through classroom exercises the students will gain competency in industry-standard game creation engines and tools, and learn to work together in groups to create rapid prototypes.
3. This includes creating art, sound and music, and creating basic scripts within an engine.

FDMA 2785. Level Design Concepts
3 Credits (2+2P)

Focus on the design and creation of video game levels. Dealing with the challenges and pitfalls of different video game genres. May be repeated for a maximum of 6 credits. Prerequisite(s): FDMA 2770

Learning Outcomes

1. Students will develop level design skills.
2. Through classroom exercises the students will gain a comfortable competency with designing levels both on paper and digitally.
3. This includes creating first person shooter levels, third person levels, multiplayer level design, and more.

FDMA 2993. Workshops (Advanced Photography)
1 Credit (1)
This is a series of 1-credit workshops offering specialized and intense advanced skill training and upgrading applications of photography for commercial purposes and training in photographic skills and styles presented by a variety of professional lecturers. May be repeated up to 7 credits. Restricted to Community Colleges only.
Prerequisite(s): FDMA 1545.
Learning Outcomes

1. Varies

FDMA 2994. Portfolio Design & Development
1-3 Credits
Personalized design and creation of the student's professional portfolio including hard-copy, demo reel, and online. May be repeated up to 6 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.
Learning Outcomes

1. Varies

FDMA 2995. Film Crew Cooperative Experience
3-6 Credits (3-6)
Industry production experience in specific craft areas for film crew technicians who have successfully completed two semesters of FTTP. Restricted to: Dona Ana campus, Carlsbad campus.
Prerequisite(s): FDMA 2125.
Learning Outcomes

1. Varies

FDMA 2996. Special Topics
1-4 Credits
Specific topics to be announced in the Schedule of Classes. May be repeated for a maximum of 18 credits.
Learning Outcomes

1. Varies

FDMA 2997. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with prior approval of department head. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): Minimum GPA of 3.0 and sophomore standing.
Learning Outcomes

1. Varies

FDMA 2998. Internship
1-3 Credits
Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships may be paid or unpaid. Students are supervised/evaluated by both the employer and the instructor. May be repeated up to 9 credits. Consent of Instructor required. Graded: S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only. Consent of instructor required.
Learning Outcomes

1. Varies

FDMA 301. Sound Design II
3 Credits (3)
Mixing and balancing dialogue, sound effects and music in postproduction. Study the role of sound effects, foley, soundtrack choices, and music supervision. Restricted to: DFM, ANVE majors.
Prerequisite: FDMA 2510.
Learning Outcomes

1. Apply advanced techniques for cleaning and restoring dialogue audio to enhance clarity and quality in post-production.
2. Design complex sound mixes that creatively solve audio challenges and support the emotional tone of visual media.
3. Evaluate the narrative function of sound in documentary and fictional film through critical analysis and hands-on project work.

FDMA 303. Cinema Review and Critique
3 Credits (3)
This course develops students' skills in critically viewing and evaluating films across genres, periods, and cultural contexts. Through screenings of classic, independent, and contemporary world cinema, students will learn to identify and analyze key cinematic elements such as narrative, mise en scène, cinematography, and editing. Emphasis is placed on developing a precise critical vocabulary and applying theoretical and historical frameworks to both oral discussions and written critiques. By the end of the course, students will be able to craft persuasive film reviews and analytical essays that demonstrate sophisticated engagement with cinema as an art form and cultural product. Restricted to: DFM, ANVE majors.
Prerequisite: FDMA 2382.
Learning Outcomes

1. Analyze films using critical frameworks and cinematic terminology to evaluate narrative structure, thematic content, and stylistic choices.
2. Compose persuasive and well-organized film reviews and critical essays that demonstrate advanced film literacy and audience awareness.
3. Present informed analyses of key film scenes, connecting cinematic techniques to historical, cultural, and aesthetic contexts.

FDMA 304. Independent Filmmaking
3 Credits (3)
This course is designed to enhance student knowledge about independent film in the U.S. Through a series of screenings, readings and lectures, students will learn how to take an idea, obtain the script, create a budget, finance the project, direct the shoot, edit the film, attend festivals, secure an agent, and then market, sell and distribute around the world. Students will gain an appreciation of the history of American independent filmmaking. Students will apply this knowledge in their written assignments, and a critical comparative essay. Restricted to ANVE, DFM Majors.
Learning Outcomes

1. Students will acquire greater proficiency in independent filmmaking and planning.
2. Students will gain an understanding of the history of independent filmmaking and where the industry stands today.
3. Students will improve their ability to write about film in an organized, articulate, and effective manner.

4. Students will hone critical thinking skills by engaging in comparative analysis of independent films.

FDMA 305. Business of Filmmaking/Animation
3 Credits (3)
This course provides an in-depth exploration of the film industry's economic, legal, and organizational frameworks, from development through distribution. Students will examine the roles of unions, guilds, and key industry stakeholders; learn fundamentals of financing models, tax incentives, and contract structures; and analyze how technological and market shifts—such as streaming and global distribution—continue to reshape the business of filmmaking. Through case studies and project-based work, students will gain practical insights into budgeting, producing, and pitching film projects, preparing them for professional participation in an evolving media landscape.
Prerequisite: FDMA 2382.
Learning Outcomes
1. Explain the roles of key stakeholders in the film industry—such as producers, investors, agents, and distributors—and how they contribute to the development, financing, and distribution of a film.
2. Analyze current trends, tax incentives, and financing strategies affecting the production and distribution of feature films in a changing media landscape.
3. Develop and deliver a compelling film pitch that demonstrates an understanding of industry expectations, project viability, and the economic and legal considerations of filmmaking.

FDMA 307. Writing for Television
3 Credits (3)
Students will examine and apply various strategies of storytelling, narrative structure and its principle components as they relate to a wide cross-section of television platforms, genres and formats. Restricted to ANVE, DFM Majors.
Prerequisite: FDMA 2382.
Learning Outcomes
1. By the end of this course, students should be able to identify the building blocks of storytelling, including conflict, structure, plot, theme, character, and point of view.
2. By the end of this course, students should be able to understand how these building clocks work together to effectively communicate in all types of scripted television, including streaming platforms such as Amazon and Netflix.
3. By the end of this course, students should be able to have a better understanding and mastery of writing mechanics.
4. By the end of this course, students should be able to present a verbal and written pitch for an original TV series and one cold open.

FDMA 308. Writing for Animation
3 Credits (3)
This class explores methods for, and approaches to, writing for animation. Students study and produce scripts for a range of animation outlets while engaging in writing exercises based on character and story development.
Prerequisite: FDMA 2382 or consent of instructor.
Learning Outcomes
1. Analyze scripts for animated content by applying principles of character design, world-building, and narrative structure.
2. Apply industry-standard formats and techniques to write and revise scripts suitable for various animation platforms and genres.
3. Construct and present an effective short, original work that communicates a compelling animated concept to potential collaborators or producers.

FDMA 309. Screenwriting I
3 Credits (3)
Writing intensive. Students learn the craft of screenwriting, honing skills in writing dialogue and visual narrative, crafting dynamic characters and dramatic action. Original student scripts will be performed and discussed in class. Crosslisted with: ENGL 309 and THEA 306.
Prerequisite: FDMA 2382 or consent of instructor.
Learning Outcomes
1. Apply the fundamentals of three-act structure, including inciting incident, major plot points, and climax, to develop original screenplays.
2. Construct compelling characters and scenes by integrating conflict, visual storytelling, character arcs, and thematic elements.
3. Demonstrate proficiency in industry-standard screenplay formatting and use of visual language in written scripts.

FDMA 310. Cinematography II
3 Credits (3)
Advanced tools of the cinematographer, lighting and composition techniques. Artistic and technological elements of cinematography. Restricted to: DFM,ANVE majors.
Prerequisite: FDMA 2520.
Learning Outcomes
1. Apply advanced cinematography techniques—including camera movement, lighting, and lens selection—to shape the visual style of a narrative or documentary film.
2. Design and execute lighting and composition plans that enhance story, tone, and character within a cinematic framework.
3. Evaluate visual and technical choices made during production in relation to artistic intent, storytelling goals, and professional standards of cinematography.

FDMA 311. Editing II
3 Credits (3)
Advanced techniques in digital films using professional non-linear editing systems. Restricted to: DFM,ANVE majors.
Prerequisite: FDMA 1220.
Learning Outcomes
1. Demonstrate advanced proficiency in editing tools, including software, workflow organization, basic color correction, compositing, and sound design.
2. Evaluate footage and performance to make editorial decisions that strengthen narrative coherence, pacing, and emotional impact.
3. Incorporate feedback and collaborate effectively with directors and peers to revise and polish edited scenes that align with the overall storytelling vision.

FDMA 312. Post Production Color Grading
3 Credits (3)
Color grading is an important part of the overall look of a film. It used to be a craft that only a small number of people knew how to do. However, due to advances in technology and business models, more and more people are diving into color grading. This class is an introductory look into the art and techniques of color grading. Restricted to: DFM, ANVE majors.
Prerequisite: FDMA 1220.

Learning Outcomes

1. Demonstrate proficiency in DaVinci Resolve by completing the official Beginner's Guide curriculum and passing the Blackmagic Design Certification Exam.
2. Analyze the digital image pipeline—including codecs, compression, and color workflows—to make informed technical and aesthetic decisions in postproduction.
3. Apply principles of color theory and visual storytelling to enhance mood, focus, and emotional tone through color grading and image manipulation.

FDMA 314. Acting for Film
3 Credits (3)
Techniques for film and television acting. In-depth analysis of film performance creation among actor, director, writer, cinematographer, and editor. Restricted to: THTR,DFM majors.
Prerequisite: FDMA 2382.
Learning Outcomes

1. Apply acting techniques, character research, and improvisational strategies to create authentic and emotionally resonant on-camera performances.
2. Analyze scenes and scripts to interpret character objectives, subtext, and emotional beats from the perspective of a screen actor.
3. Demonstrate an understanding of film acting vocabulary, camera awareness, and performance timing by crafting and performing roles suitable for inclusion in a professional acting reel.

FDMA 318. Documentary Production
3 Credits (3)
Survey of theory and history of documentary film making including viewings and discussions of notable films and directors. Class works with actual documentary project. May be repeated up to 6 credits. Restricted to: ANVE, DFM majors.
Prerequisite: FDMA 1220, FDMA 2520.
Learning Outcomes

1. Analyze documentary forms, storytelling strategies, and ethical considerations to inform the development of original nonfiction projects.
2. Produce short documentary films—individually and collaboratively—that demonstrate technical proficiency in shooting, sound, and editing.
3. Develop research-driven proposals and pitch presentations that effectively communicate concept, story, and social relevance to an intended audience.

FDMA 320. Race and Gender in Film
3 Credits (3)
In this course students will analyze film as an art form as well as be exposed to Race and Gender Feminist Film Theory. We will consider the role of ilm in our understandings of sex, gender and sexuality. Through discussions and writing we will work to discern relevant social, political, ideological, and aesthetic concepts in the media we examine. Crosslisted with: ENGL 399, GNDR 450 and GNDR 550.

FDMA 325. Film Festival Production
3 Credits (3)
A course for students interested in learning about the processes of orchestrating an independent film festival. Students will engage in a professional environment with other film students and filmmakers, as well as learn about film event administration and organization. May be repeated up to 6 credits.

Learning Outcomes

1. Analyze the role of film festivals within the independent film industry, including programming trends, audience engagement, and professional networking opportunities.
2. Develop programming proposals and event concepts—such as film selections, panels, and presentations—based on research into current festival practices and audience needs.
3. Organize and execute components of a live film festival, demonstrating proficiency in event logistics, collaboration, and professional communication with filmmakers and industry partners.

FDMA 327. 2D Rigging
3 Credits (3)
This course will introduce industry-standard 2D rigging principles and practices. Using node-based technology, students will learn aesthetic and technical concepts of 2D rigging to build a variety of fully functional, 360-degree 2D rigs of their own designs. Topics include: victor-based art, node structures and groups, articulation points, deformations, drawing substitutions, and master controllers for efficient animation. Restricted to ANVE Majors.
Prerequisite: FDMA 2710.
Prerequisite/Corequisite: FDMA 2755.
Learning Outcomes

1. Students will learn how to use drawing and rigging tools in Toon Boom Harmony Premium to create strong character designs and functional 2D rigs.
2. By the end of the class, students should be proficient rigging artists who can design a character and assemble a 2D rig for that character, as well as animate the character rig.

FDMA 328. Producing
3 Credits (3)
Examines the role of the Producer, essential to every film production. The course will revolve around the best practices in organizational design, the production process, the budgeting process, financial controls, scheduling, insurance and distribution.
Prerequisite/Corequisite: FDMA 2510, FDMA 1220, FDMA 2382.
Restricted to: ANVE,DFM majors.
Learning Outcomes

1. Plan and organize film productions by creating budgets, schedules, and logistical frameworks that ensure efficient project execution.
2. Manage collaborative workflows across multiple production teams, demonstrating leadership and effective communication throughout the filmmaking process.
3. Evaluate distribution strategies and financial considerations—including insurance and financial controls—to ensure professional standards and project viability.

FDMA 332. 3D Character Animation
3 Credits (3)
Essentials and principles of 3D character animation. Techniques and craft of breathing life into characters through movement, including dynamic poses, blocking action, run and walk cycles, lip synching and realism. Students will plan and produce original animation for review by classmates and as part of of a CGI demo reel. THEA 1221, Acting and FDMA 2510, Sound Design are recommended. Restricted to: DFM,ANVE majors.
Prerequisite: THEA 1210 (or FDMA 314 or FDMA 348), FDMA 1510 and FDMA 2720 or consent of instructor.

Learning Outcomes

1. Understand the character animation pipeline.
2. Understand basic body mechanics and how to represent them with a 3D character
3. Understand the twelve principles of animation on a deeper level and be able to apply them in individual work
4. Developing a vocabulary and critical eye in order to critique each other's work.

FDMA 341. Visual Effects I
3 Credits (3)
This course will educate students on the fundamental principles, skills, and artistry needed to successfully integrate live action footage and computer generated imagery into technically correct and narrative engaging cinematic shots. Topics include: Cinematography for visual effects; Green screen setup/lighting/keying; Intermediate compositing techniques; Editing, color correction and grading. Restricted to ANVE, DFM Majors. May be repeated up to 3 credits.
Prerequisite: FDMA 1510, FDMA 2530, FDMA 2745 (or consent of instructor).
Learning Outcomes

1. At the end of this class, students will produce (alone or in a group), an engaging, well-thought out and professionally executed visual story from scratch - using a combination of live action plates, green screen elements and seamlessly integrated CGI elements.
2. Students will become fluent in setting up and operating a professional camera proper cinematography techniques.
3. Students will shoot green screen elements/plate using proper cinematography techniques.
4. Students will become fluent in editing software to edit an engaging narrative.
5. Students will become fluent in node-based compositing software to produce seamless, photoreal integrations of CGI elements and green screen mattes in live action plates.
6. Students will use color-correction and color grading techniques and use color as a narrative element.
7. Students will correctly adhere to established production standards and protocols.

FDMA 348. Acting for Animation
3 Credits (3)
This course explores performance techniques relevant to animators including 2D and 3D animation and motion capture. Students learn to create dynamic, dramatic performances and believable character interactions for animation based reference. Students learn to analyze scripts, sound, acting, action and performance for production. Topics include: acting theory, emotional/mental states, character movement and style, dynamic facial expression, scene construction, posing, layering and rhythm, simplification and exaggeration, and lip sync. Restricted to: ANVE,DFM majors. May be repeated up to 3 credits.
Learning Outcomes

1. Understand the different roles and character mindsets of digital animation in cinema.
2. Understand and apply some basic acting skills into animation reference.
3. Understand and apply some basic processes of creating reference for a narrative.
4. Begin to apply some basic strategies for developing and creating a story visually.

FDMA 350. Intermediate 2D Animation
3 Credits (3)
Students will begin to refine their animation skills by animating more complex characters utilizing the Principles of Animation. They will practice these advanced drawing and motion techniques in a variety of exercises and projects using industry standard software. Areas of focus include: squash and stretch, cloth simulation, the successive breaking of joints, and biped walk cycles.
Prerequisite: FDMA 1510 and FDMA 2710.
Learning Outcomes

1. Students will refine foundational animation skills.
2. Students will learn and show proficiency in related industry-standard software.
3. Students will apply skills to more advanced projects than in previous 2D courses.

FDMA 360. Previsualization
3 Credits (3)
Implements 3D animation tools in preproduction shot and sequence design for motion picture and broadcast industries; including 3D storyboarding, technical planning and editing basics. LC Campus Only. Restricted to ANVE, DFM majors.
Prerequisite: FDMA 1510, FDMA 2530, and FDMA 2720 or consent of instructor.
Learning Outcomes

1. Apply 3D animation and storyboarding tools to design previsualized sequences that communicate camera movement, composition, and timing.
2. Integrate previsualization into the broader preproduction workflow to support technical planning for live-action and animated productions.
3. Evaluate previsualization sequences for clarity, feasibility, and effectiveness in communicating narrative and technical intent to production teams.

FDMA 362. Motion Graphics
3 Credits (3)
Students will learn the industry standard motion graphics techniques through a variety of exercises and projects that combine animation, text, visual effects, and sound. Restricted to: ANVE, DFM majors.
Prerequisite: FDMA 1715.
Learning Outcomes

1. Understand the context for and learn to create, combine, and animate text with graphics.
2. Explore various applications of creative techniques, including motion graphic design for commercials, logos, informative videos, UI design, and basic character rigging.
3. Learn to use industry-standard motion graphic softwares.

FDMA 365. Character Design and Development
3 Credits (3)
Digital character design for the entertainment industry. Provides insight into the process of creating iconic characters. Traditional and contemporary character designers are explored. Industry workflow is introduced and necessary skills are developed to design detailed 3D characters from concept through production. Restricted to ANVE, DFM majors. May be repeated up to 3 credits.
Prerequisite: FDMA 1510, FDMA 2530 and FDMA 2535, or consent of instructor.
Learning Outcomes

1. Understand the role of a character in cinema and gaming.
2. Become familiar with leading character designers and their approach.

3. Utilize current industry standard methods.
4. Understand and apply fundamental character design techniques.
5. Demonstrate a strong ability to design and create characters from concept through production.

FDMA 395. Directing I
3 Credits (3)
This introductory course in directing explores the essential skills required to bring a script to life on screen and stage. Students will learn the director's role in interpreting text, shaping visual and performance styles, and collaborating effectively with actors, designers, and production teams. Through practical scene work, students will develop foundational abilities in blocking, shot composition, rehearsal techniques, and storytelling, while building confidence as creative leaders in the filmmaking process. Restricted to: DFM,ANVE majors.
Prerequisite: FDMA 2510, AND FDMA 2520, AND FDMA 1220.
Learning Outcomes
1. Interpret scripts and translate narrative elements into visual and performance concepts for short scene work.
2. Demonstrate basic directing techniques—including blocking, shot composition, and rehearsal strategies—while working with actors and production collaborators.
3. Develop organizational and communication strategies to manage relationships between creative and technical team members during production.

FDMA 396. Directing II
3 Credits (3)
This advanced directing course deepens students' understanding of the director's role in preproduction and production planning. Students will learn to perform detailed script breakdowns, develop casting strategies, and design ground plans and shot coverage. The course emphasizes leadership in assembling and managing a creative team—including cinematographers, designers, and sound specialists—while introducing practical skills in budgeting and scheduling. Through hands-on projects, students will refine their ability to translate story concepts into fully realized production plans.
Prerequisite: FDMA 395.
Learning Outcomes
1. Break down scripts to identify technical, logistical, and creative requirements for casting, design, and shot planning.
2. Assemble and lead a creative team by selecting key collaborators and guiding artistic and technical decisions during preproduction.
3. Develop production plans—including ground plans, shot coverage, budgets, and schedules—that ensure an organized and efficient shoot.

FDMA 397. Practicum
1-3 Credits (1-3)
Practical application of the student's field of study in a project environment. May be repeated up to 9 credits.
Learning Outcomes
1. Varies.

FDMA 398. Special Topics
3 Credits (3)
This course addresses specific subjects and issues as identified by the department. Topics and credits to be announced in the Schedule of classes. May be repeated up to 12 credits.
Learning Outcomes
1. Varies depending on topic and instructor.

FDMA 400. Directed Studies
1-6 Credits (1-6)
Directed study course in CMI under the supervision of a CMI faculty member. May be repeated up to 9 credits.
Learning Outcomes
1. Varies depending on topic and instructor.

FDMA 401. Motion Capture Techniques
3 Credits (3)
Students will implement industry standard motion capture techniques and essential skills to capture and integrate performance for movie making, 3D animation and game production. Students will learn how to use the motion capture system, equipment and workflow, and polish performances using industry standard software. Concepts covered will consist of exploring motion capture setup, shooting, data tracking, and animation correction and enhancement. Restricted to ANVE, DFM majors. May be repeated up to 3 credits.
Prerequisite: FDMA 1510, FDMA 2720 and FDMA 2725 (or consent of instructor).
Learning Outcomes
1. Understand and demonstrate basic approaches to integrating live actors with computer generated imagery.
2. Understand the role of motion capture in cinema, advertising and related fields.
3. Build familiarity with leading motion capture companies and their approaches.
4. Become knowledgeable of the history of motion capture.
5. Become knowledgeable of current advances in motion capture.
6. Learn to utilize industry standard motion capture software.
7. Demonstrate a strong ability to produce believable imagery from concept through final production.

FDMA 410. Cinematography III
3 Credits (3)
This advanced cinematography course explores high-end digital workflows, from image acquisition to post-production color grading. Building on skills from earlier cinematography courses, students learn about the digital imaging pipeline, gaining expertise in camera operation, rig building, and data management. Emphasis is placed on integrating production and post-production processes, understanding the impact of color and image pipelines, and achieving cinematic quality that meets industry standards for high-end productions. Restricted to: DFM, ANVE majors.
Prerequisite: FDMA 310.
Learning Outcomes
1. Operate professional digital cinema cameras and configure camera rigs for high-end image acquisition.
2. Manage on-set and post-production workflows, including data handling, transcoding, and color grading, to ensure image integrity and efficiency.
3. Integrate cinematography and post-production techniques to create visually cohesive projects that meet artistic and technical objectives.

FDMA 422. Environmental Filmmaking
3 Credits (3)
As a documentary workshop in social-impact filmmaking, this course focuses on the transformative power of visual storytelling to address the pressing environmental issues of our times. Students will watch a

variety of environmental films, and make their own short documentary and media projects, telling solutions-oriented stories about environmental issues. This course is designed to give students the opportunity to collaborate with environmental NGOs, foundations, and NMSU faculty and students in other departments working on environmental issues in the Southwest and Borderlands region. By harnessing the power of visual storytelling to address the pressing challenges of our times, students will be empowered to become content creators and change makers having impact in the world. Restricted to DFM majors. May be repeated up to 3 credits.
Prerequisite: FDMA 1220, FDMA 2510, FDMA 2520.
Learning Outcomes
1. To understand the basic elements of the climate crisis.
2. To explore the power of visual storytelling to address pressing environmental issues.
3. To learn basic strategies used by filmmakers to create social impact films, including calls to action.
4. To study effective case-studies of impact documentaries exploring climate issues, oceans/rivers, energy policy and the extinction crisis.
5. To give comparative presentations that connect films screened outside of the class with films watched in class.
6. To explore the ethics of documentary filmmaking.
7. To identify and build relationships with local non-profits and researchers working on environmental issues in the region.
8. To learn industry-standard documentary research and interview skills.
9. To produce, film and edit (in teams) a short impact documentary about selected subjects.

FDMA 433. Sets and Environments
3 Credits (3)
Digital environment design and creation for movies and games from concept to production; including illustration, modeling, matte painting, texturing, lighting, rendering, integration, and camera projection. Restricted to ANVE, DFM majors. May be repeated up to 3 credits.
Prerequisite: FDMA 1510, FDMA 2530, and FDMA 2535 or consent of instructor.
Learning Outcomes
1. Understand the role of digital production design in cinema.
2. Become familiar with the work of leading digital artists involved in production design for the entertainment and gaming industries.
3. Utilize the software implemented in the entertainment industry.
4. Understand and apply fundamental digital set design techniques.
5. Demonstrate a strong ability to design and create digital set and environments from concept through production.

FDMA 450. Advanced 2D Animation
3 Credits (3)
This course will cover the more advanced aspects of 2D Animation. Students will demonstrate their mastery of the principles of animation through a variety of exercises and projects focusing on: automated and manual lip sync, full motion character animation, acting, smears, and quadruped animation. Restricted to ANVE, DFM majors. May be repeated up to 3 credits.
Prerequisite: FDMA 350.
Learning Outcomes
1. Students will gain experience mastering Disney's Principles of animation.
2. Students will complete exercises to animate both humans and animals.
3. Students will gain proficiency in lip syncing and acting using industry standard software.

FDMA 451. Dynamics and Effects
3 Credits (3)
This course educates students in photoreal 3D simulation techniques focusing on particle simulations, rigid body dynamics and fluid simulations. Students will complete several professional grade VFX shots involving explosions, fire, destruction, dust and debris.
Prerequisite: FDMA 1510.
Learning Outcomes
1. Students will exhibit high level competency in critical thinking and independent problem solving.
2. Students will understand and apply procedural methodologies; and complete several professional quality, portfolio-ready simulation shots using industry-standard techniques.
3. Students will produce work at a pace to meet with the production schedule.
4. Students will implement critiques on their work-in-progress to iteratively improve production quality.

FDMA 480. Screenwriting II
3 Credits (3)
This advanced screenwriting course builds upon the foundational skills developed in Screenwriting I, focusing on rewriting, peer feedback, and deeper exploration of character and theme. Students will write two short scripts (10–15 pages each) and participate in intensive workshop sessions where scripts are read aloud, analyzed, and refined. Emphasis is placed on the revision process—incorporating feedback, strengthening dialogue and structure, and sharpening character arcs—to prepare students for more complex screenwriting projects and professional critique environments. May be repeated up to 6 credits. Restricted to ENGL, DFM, ANVE majors. Crosslisted with: ENGL 480.
Prerequisite: ENGL 309 or FDMA 309 or THEA 306 or consent of instructor.
Learning Outcomes
1. Revise original short screenplays by integrating peer and instructor feedback to improve structure, dialogue, and character development.
2. Critique peer screenplays constructively using narrative and character analysis frameworks to support collaborative workshop environments.
3. Refine storytelling techniques, including theme development and emotional resonance, to create polished scripts suitable for production or portfolio inclusion.

FDMA 490. Advanced Screenwriting
3 Credits (3)
Students will prepare a 30-60 page screenplay. Script analysis will be in an advanced workshop format. Scripts will be read and discussed, scenes performed and reactions analyzed to consider effect of dialogue, character development, etc. This course is aimed at preparing writers for the professional market. Consent of instructor required. May be repeated up to 6 credits.

FDMA 491. 3D Production Studio I
6 Credits (6)
The course is the first semester of a year-long effort to complete a culminating project that is a story-driven short film, which can be either full CGI, or live action with visual effects. In Production Studio I the emphasis will be on the pre-production phase, including analysis and critique, pipeline organization and project management. Pre-production consists of: Pitch, Script, Visual and sound references, Storyboards, 3D

Previsualization, Scheduling/Project Management. Restricted to ANVE majors.
Prerequisite: FDMA 308 or FDMA 309, FDMA 341.
Prerequisite/Corequisite: FDMA 332, FDMA 360, FDMA 365, FDMA 433.
Learning Outcomes

1. Demonstrate an ability to create a transformational story.
2. Exhibit proficiency in visual storytelling, structure, and character development.
3. Develop a story appropriate to the chosen production approach.
4. Create storyboards/animatics to direct the cinematic aspects of the story.
5. Design the production visually in terms of characters and environment.
6. Learn to implement critiques of work to improve production quality.

FDMA 492. 2D Production Studio I
6 Credits (6)
Students will work through the pre-production process on short animated films. They will write a script, create a storyboard, and record voice over/dialogue to create an animatic. Additional exercises will then be assigned to augment the skill set of the student according to the needs of each student. Restricted to ANVE majors.
Prerequisite: FDMA 1715 and FDMA 450.
Learning Outcomes

1. Students will synthesize animation techniques to produce a completed animatic.
2. Students will show proficiency in storytelling towards the development of a short script for production.
3. Students will demonstrate proficiency in industry standard animation softwares and production practices.

FDMA 493. 3D Production Studio II
6 Credits (6)
The course is the final semester of a year-long concentration on a culminating project. Emphasis will be on the production, post-production, and distribution of the work created during 3D Production Studio I. Students will produce a professional quality and industry-standard visual story that will help them gain entry into professional employment. The overall objective is for students to execute their artistic vision with exceptional creative and technical proficiency - resulting in a story-driven and captivating cinematic experience. Restricted to ANVE majors.
Prerequisite: FDMA 491.
Learning Outcomes

1. Students will complete the process of transforming their story from script to screen.
2. Students will demonstrate mastery of craft as a digital artist.
3. Students will learn to direct the cinematic aspects of the story.
4. Students will show proficiency in the production workflow, and complete a deliverable short film by the end of the production schedule.

FDMA 494. 2D Production Studio II
6 Credits (6)
Students will produce the short animated films they developed in 2D Production Studio I. They will animate, composite, and edit their shorts into a final piece for presentation in a showcase. Restricted to ANVE majors.
Prerequisite: FDMA 492.
Learning Outcomes

1. To complete a final project (either short film or demo reel) that demonstrates synthesis of animation techniques taught in earlier classes.
2. To translate animatics from 2D Production Studio I into keyframes and then in-between their keyframes to get clean, smooth animations.

FDMA 495. Internship
1-12 Credits (1-12)
This internship course provides students the opportunity to gain supervised professional experience in media-related industries. Students apply and expand upon classroom learning in real-world environments. Through hands-on work and faculty-guided reflection, students will strengthen technical expertise, professional communication, and industry knowledge, preparing them for future careers in the evolving media landscape. May be repeated up to 18 credits.
Learning Outcomes

1. Apply technical and creative skills from coursework to professional tasks and responsibilities in media-related industries.
2. Demonstrate effective professional communication, teamwork, and problem-solving skills in real-world media related environments.
3. Reflect on internship experiences to analyze industry practices, assess personal growth, and identify future career goals within media fields.

FDMA 497. Portfolio Design and Development
3 Credits (3)
This advanced capstone course focuses on preparing students for professional careers in film and media by developing polished portfolios, resumes, and personal branding materials. Students conduct a deep dive into industry sectors and career pathways, identifying opportunities that align with their individual goals. Emphasis is placed on creating a personal website that showcases their best work, articulates their professional identity, and serves as a tool for securing employment or freelance opportunities after graduation. The course also integrates industry best practices for networking, marketing, and career planning.
Prerequisite: FDMA 2382.
Learning Outcomes

1. Assemble a professional portfolio and website that effectively showcase individual strengths, completed projects, and career objectives.
2. Analyze industry trends, roles, and personal career goals to design a targeted career plan and marketing strategy.
3. Refine professional materials—including resumes, personal statements, and digital presence—to meet industry standards and support job placement or freelance work.

FDMA 500. Graduate Problems in Creative Media
1-3 Credits (1-3)
Independent study in an area of Creative Media. The curriculum will be designed by the student taking the course with consultation from the assigned instructor. Consent of instructor required. May be repeated up to 9 credits.
Learning Outcomes

1. Student will outline an idea for a project or research study, including a timeline for various milestone completion.
2. Student will work with a faculty member to determine the final deliverable outcome, adjusting the timeline and finalized expectations as needed throughout the semester.

FDMA 501. Special Topics
3 Credits (3)
This course is a graduate-level course that addresses specific subjects and issues as identified by the department. Topics and credits to be announced in the Schedule of classes. This class may be cross listed with FDMA 398 Special Topics, or another FDMA course, and if so, graduate students will be expected to perform extra work or complete longer assignments. May be repeated up to 9 credits.
Learning Outcomes
1. The learning objectives will depend on the subject matter being covered in the special topics class, and may include completion of a creative work or research in an area of creative media.

FDMA 550. MFA Form & Technique
3 Credits (3)
Advanced study of issues in form and technique in creative writing, including point of view, scene and dialogue, and story structure. May be repeated up to 6 credits.
Learning Outcomes
1. By the end of this course, students will have completed advanced study of issues in form and technique in their major genre.
2. Students will finish the course with a greater understanding of point of view, scene and dialogue, and story structure, among other creative writing concerns.

FDMA 570. MFA Workshop
3 Credits (3)
Intensive practice in creative writing in a workshop environment with peer criticism. May be repeated up to 15 credits.
Learning Outcomes
1. Provide a workshop environment for graduate students taking creative writing classes as part of the MFA in Creative Writing.

FDMA 592. MFA Theory, Practice and Professionalism
1-2 Credits (1-2)
Students will study major poetics/narratology pieces in the field and other related professional topics such as literary citizenship, publishing, and job seeking skills. Students will also propose and develop a semester-long project in one of the categories, such as a community reading or workshop, a conference panel proposal, a paper presentation, a chapbook press launch, writing/placing literary book reviews, or work on an outreach project. Must be taken in one of the last two semesters of the MFA and currently with FDMA 594 MFA Thesis Workshop. Restricted to MFA-Creative Writing students, or by consent of instructor. May be repeated up to 4 credits.
Corequisite: FDMA 594.
Learning Outcomes
1. By the end of this course, students will understand, analyze, and effectively use the critical discourse of poetics/narratology/craft in the field of creative writing.
2. Design and execute an outreach or professional project that contributes to a creative writing community.
3. Explore applications of their training in professional contexts.
4. Analyze how students' own reading, writing, and research respond to existing leadership in professional creative writing communities, help provide new leadership, and answer community needs.

FDMA 594. MFA Thesis Workshop
3 Credits (3)
Students will submit a draft of their thesis project, in their major genre, for workshop critique. Revision of the thesis draft will be submitted to the instructor. Restricted to MFA Creative Writing students, or by consent of instructor. Must be taken in each of the last two semesters of the MFA, and concurrently with FDMA 592 MFA Theory, Practice and Profession). May be repeated up to 6 credits.
Corequisite: FDMA 592.
Learning Outcomes
1. Understand, analyze, and effectively use the critical discourse of the field of creative writing to discuss a thesis.
2. Examine how their thesis operates with the genre and within the context of contemporary literature.
3. Critically contextualize their thesis and those of their peers.
4. Apply various revision strategies across a thesis-length manuscript, responding to the critiques of the instructor and their peers.
5. Achieve the standards of publication of the University's thesis editor and learn those of the publishing environment in their genre.

FDMA 595. Master of Fine Arts Graduate Internship
1-12 Credits (1-12)
Internship credit is dependent upon placement in a supervised professional environment. Consent of instructor required. May be repeated up to 12 credits.
Learning Outcomes
1. Students will gain professional experiences that will add to their resumes and benefit their professional goals and development.

FDMA 599. MFA Thesis
3 Credits (3)
Students pursuing the MFA in Creative Writing are required to complete 6 credits of MFA Thesis. May be repeated up to 6 credits.
Learning Outcomes
1. Students will use these hours to work on a creative thesis as part of the MFA Creative Writing program.

FIRE-FIRE INVESTIGATION

FIRE 102. Fire Fighter I and II
12 Credits (12)
This course will train the student as outlined in NFPA 1001, Fire Fighter Professional Qualifications. Firefighter I & II Certification issued through the New Mexico Firefighter's Training Academy (NMFTA) upon successful completion [International Fire Service Accreditation Congress (IFSAC) & Pro Board accredited]. Consent of Instructor required.
Prerequisite/Corequisite: FIRE 115, FIRE 252, OEEM 103. Restricted to Dona Ana campus only.
Learning Outcomes
1. Describe basic fire department organizational structure and operating procedures.
2. Recognize probable fire behaviors and how to manage them appropriately.
3. Identify and manage hazardous materials.
4. Identify characteristics of building construction; recognize signs of building collapse.
5. Demonstrate the safe use, cleaning, refilling, inspecting, and storing of SCBA bottles.
6. Identify and properly use portable fire extinguishers.
7. Identify and properly tie knots used in the fire service; use and maintain various types of rope used in the fire service.
8. Conduct search and rescue drills as a member of Fire Company.
9. Identify and appropriately use techniques for forcible entry tools. 1
10. Identify and demonstrate knowledge and techniques used with fire service ground and aerial ladders. 1

11. Apply ventilation practices to effectively ventilate buildings. 1
12. Learning fundamentals of water supply and securing water sources. 1
13. Demonstrate coupling, loading, and rolling fire hose. 1
14. Demonstrate hydrant connections using various lays and connections. 1
15. Identify and operate nozzles and smooth bore tips for fire streams. 1
16. Become familiar with strategies and tactics in fire extinguishment. 1
17. Become familiar with use and operation of fire sprinklers. 1
18. Perform salvage and overhaul operations. 1
19. Identify and use various fire service communications systems. 2
20. Define the types of special rescues encountered by fire fighters. 2
21. Describe the steps of a special rescue. 2
22. Describe the general procedures at a special rescue scene. 2
23. Describe how to safely approach and assist at a vehicle or machinery rescue incident. 2
24. Describe how to safely approach and assist at a confined space rescue incident. 2
25. Describe how to safely approach and assist at a rope rescue incident.

FIRE 112. Principles of Emergency Services
3 Credits (3)
This course provides an overview to fire protection and emergency services including career opportunities in fire protection and related fields. The organization and function of public and private fire protection services is studied including how fire departments fit as part of local government. An overview of laws and regulations affecting the fire service is explored along with specific fire protection functions and responsibilities including basic fire chemistry and physics, introduction to fire strategy and tactics and life safety initiatives.
Learning Outcomes
1. Illustrate and explain the history and culture of the fire service.
2. Differentiate between fire service training and education and explain the value of higher education to the professionalization of the fire service.
3. List and describe the major organizations that provide emergency response service and illustrate how they interrelate.
4. Identify fire protection and emergency service careers in both the public and private sectors.
5. Define the role of national, state, and local support organizations in fire and emergency services.
6. Discuss and describe the scope, purpose, and organizational structure of fire and emergency services.
7. Describe the common types of fire and emergency service facilities, equipment, and apparatus.
8. Compare and contrast effective management concepts for various emergency situations.
9. Identify and explain the components of fire prevention including code enforcement, public information, and public and private fire protection systems. 1
10. Recognize the components of career preparation and goal setting. 1
11. Describe the importance of wellness and fitness as it relates to emergency services.

FIRE 114. Fire Behavior and Combustion
3 Credits (3)
This course explores the theories and fundamentals of how and why fires start, spread, and are controlled. Restricted to: Community colleges only.
Learning Outcomes
1. Identify physical properties or the three states of matter.
2. Categorize the components of fire.
3. Explain the physical and chemical properties of fire.
4. Describe and apply the process of burning.
5. Define and use basic terms and concepts associated with the chemistry and dynamics of fire.
6. Discuss various materials and their relationship to fires as fuel.
7. Demonstrate knowledge of the characteristics of water as a fire suppression agent.
8. Explain types of suppression agents and strategies.
9. Compare and contrast differing methods and techniques of fire extinguishments.

FIRE 115. Hazardous Materials Awareness and Operations
3 Credits (3)
This course will train the student to the Hazardous Materials Awareness and Operations level as outlined in NFPA 472, Standard for Competence of Responders to Hazardous Materials/Weapons of Mass Destruction Incidents and OSHA 29 CFR 1910.120. Hazardous Materials Awareness and Operations certification issued through the New Mexico Firefighter's Training Academy upon successful completion (IFSAC accredited).
Learning Outcomes
1. Identify the definition of hazardous materials (or dangerous goods, in Canada) and WMD.
2. Identify typical container shapes that can indicate hazardous materials/WMD.
3. Identify the UN/DOT hazard classes and divisions of hazardous materials and identify common examples of materials in each hazard class or division.
4. Identify the difference between hazardous materials/WMD incidents and other incidents.
5. Identify typical occupancies and locations in the community where hazardous materials/WMD are manufactured, transported, stored, used, or disposed of.
6. Identify facility and transportation markings and colors that indicate hazardous materials/WMD.
7. Identify sources of information for determining the correct mass decontamination procedures and identify how to access those resources in a hazardous material/WMD incident.
8. Identify the supplies and equipment required to set up and implement technical decontamination operations.
9. Identify procedures, equipment, and safety precautions for communicating with crowds and crowd management techniques that can be used at incidents where a large number of people might potentially be contaminated. 1
10. Describe products potentially encountered in the incident associated with WMD suspicious letter, package, illicit laboratory, WMD agent and environmental crimes. 1
11. Describe the procedures for maintaining the evidentiary integrity of any item removed from the crime scene. 1
12. Select the personal protective equipment required to support evidence preservation and sampling at hazardous materials/WMD incidents based upon local procedures. 1
13. Select the personal protective equipment required to support victim rescue and recovery at hazardous materials/WMD incidents based on local procedures.

FIRE 120. Fire Protection Hydraulics and Water Supply
3 Credits (3)
This course will train students on skill requirements for becoming a safe and effective fire apparatus driver/operator. The focus will be on pump operation, construction, testing, and mathematical calculation required for effective pump operation and fire control. Responsibilities of the driver/operator will be taught and assessed consistent with applicable NFPA standards and the New Mexico Firefighters' Training Academy (NMFTA) guidelines. Students who meet all course requirements will be eligible for International Fire Service Accreditation Congress (IFSAC) certification through the NMFTA. Consent of Instructor required. Restricted to Community Colleges campuses.
Prerequisite/Corequisite: FIRE 128.
Learning Outcomes
1. Define and explain hydraulic applications within the fire service.
2. Analyze the chemical and physical properties of water including latent heat and specific heat.
3. Examine the use of water as an extinguishing agent and how it relates to BUT's absorbed and generated steam.
4. Calculate pressure, force an area using hydraulic formulas.
5. Explain the six principles of pressure as they apply to water.
6. Discuss the use of basic fireground formulas to estimate effective pump operations.
7. Explain and apply the formulas used by the fire service, determining: Gallons per minute, nozzle pressure, friction loss, and pump discharge pressure.
8. Identify the pumps used by the fire service and demonstrate their operations.
9. Discuss the importance of understanding pump operating principles and construction. 1
10. Analyze the laws of physics that permit drafting operations. 1
11. Explain and apply the formulas used by the fire service for determining: vertical and horizontal range of fire streams, nozzle reaction, back pressure, and relay operations. 1
12. Identify the source of water used for firefighting. 1
13. Evaluate other fire ground formulas used for the proper operation of sprinkler systems, standpipes, and hydrants. 1
14. List and discuss the role of hose, nozzles, and appliances used during pump operations. 1
15. Distinguish among types of foam used in the fire service. 1
16. Identify foam application techniques. 1
17. Install and operate an inline foam eductor. 1
18. Evaluate the relationship of flow, pressure, shape, and nozzle reaction in the design and operation of a nozzle.

FIRE 126. Fire Prevention
3 Credits (3)
This course will educate students about the principles and techniques of fire prevention and life-safety inspection and code compliance in accordance to NFPA 1031, Standard for Professional Qualifications for Fire Inspector and Plan Examiner, Level I. Students who meet all course requirements will be eligible for International Fire Service Accreditation Congress (IFSAC) certification through the New Mexico Firefighters' Training Academy (NMFTA). Restricted to Community Colleges campuses only.
Learning Outcomes
1. Define the national fire problem and the role of fire prevention.
2. Identify and describe fire prevention organizations and associations.
3. Define laws, rules, regulations, and codes and identify those relevant to fire prevention of the authority having jurisdiction.
4. Define the functions of a fire prevention bureau.
5. Describe inspection practices and procedures.
6. Identify and describe the standards for professional qualifications for Fire Marshal, Plan examine, Fire Inspector, Fire and Life Safety Educator, and Fire Investigator.
7. List opportunities in professional development for fire prevention personnel.
8. Describe the history and philosophy of fire prevention.

FIRE 128. Apparatus and Equipment
2 Credits (2)
The course will train students on attitude and skill requirements for becoming a safe and effective fire apparatus driver/operator. The focus will be on apparatus inspection, operation, maintenance, and specification. Responsibilities of the driver/operator will be taught and assessed consistent with applicable NFPA standards and the New Mexico Firefighters' Training Academy (NMFTA) guidelines. Students pursuing certification must posses a current and valid New Mexico driver's license. Students who meet all course requirements will be eligible for International Fire Service Accreditation Congress (IFSAC) certification through the NMFTA. Restricted to Community Colleges campuses only.
Learning Outcomes
1. Identify the pumps used by the fire service and demonstrate their operations.
2. Discuss the importance of understanding pump operating principles and construction.
3. Identify the sources of water used for firefighting.
4. Assess the basic attributes of a good driver and how basic vehicle operations, defensive driving, speed, and environmental conditions affect safe driving.
5. Explain the importance of preventive maintenance and its documentation.
6. Describe features and capacities of various fire department apparatus.
7. Identify the considerations taken when selecting qualified driver/operators.
8. Safely drive fire apparatus and successfully complete the NFPA obstacle course.
9. Describe apparatus positioning as it applies to different types of apparatus. 1
10. Describe the characteristics of water. 1
11. Summarize facts about performance testing of fire pumps. 1
12. Distinguish among performance tests for puming apparatus.

FIRE 130. Principles of Fire and Emergency Services Safety and Survival
3 Credits (3)
This course introduces the basic principles and history related to the national firefighter life safety initiatives, focusing on the need for cultural and behavior change throughout the emergency services. Consent of instructor required. Restricted to: Community colleges only.
Learning Outcomes
1. Define cultural change.
2. Evaluate methods for enhancing accountability.
3. Apply risk management techniques.
4. List steps for eliminating unsafe acts.

5. Identify training and certification standards.
6. identify medical and fitness standards.
7. Explain how using available technology enhances safety.
8. Identify the NIOSH top five and apply them to case studies in evaluating prevention measures.
9. Describe the importance of establishing response standards. 1
10. Evaluate considerations for response to violent incidents. 1
11. Evaluate methods for providing emotional support.

FIRE 200. Special Topics
1-12 Credits (1-12)
Specific subjects to be announced in the Schedule of Classes. Course may be repeated for credit as topics change. May be repeated up to 12 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.

FIRE 201. Independent Study
1-3 Credits
Research on an approved topic to meet graduation requirements. Meets or exceeds NFPA standards. May be repeated for total of 9 credits.
Prerequisite: consent of instructor.

FIRE 203. Fire and Emergency Services Administration
3 Credits (3)
This course will provide students entry-level training in company operations and administration at the first-line supervisory level. The student will learn how to effectively manage human resources and community/public relations. Students will learn about fire department organization and administration; including budgets, reports, and planning. Students will learn the process involved in fire inspection, investigation, public education, emergency service delivery, and safety, per NFPA Standard 1021, Fire Officer Professional Qualifications.
Learning Outcomes
1. Acknowledge career development opportunities and strategies for success.
2. Recognize the need for effective communication skills both written and verbal.
3. Identify and explain the concept of span and control, effective delegation, and division of labor.
4. Select and implement the appropriate disciplinary action based upon an employee's conduct.
5. Explain the history of management and supervision methods and procedures.
6. Discuss the various levels of leadership, roles, and responsibilities within the organization.
7. Describe the traits of effective versus ineffective management styles.
8. Identify the importance of ethics as it relates to fire and emergency services.
9. Identify the roles of the National Incident Management System (NIMS) and Incident Management System (ICS).

FIRE 210. Building Construction for Fire Protection
3 Credits (3)
This course provides the components of building construction related to firefighter and life safety. The elements of construction and design of structures are shown to be key factors when inspecting buildings, preplanning fire operations, and operating at emergencies. Restricted to: Community colleges only.
Learning Outcomes
1. Describe building construction as it relates to firefighter safety, building codes, fire prevention, code inspection, firefighting strategy, and tactics.
2. Classify major types of building construction in accordance with a local/model building code.
3. Analyze the hazards and tactical considerations associated with the various types of building construction.
4. Explain the different loads and stresses that are placed on a building and their interrelationships.
5. Identify the function of each principle structural component in typical building design.
6. Differentiate between fire resistance, flame spread, and describe the testing procedures used to establish ratings for each.
7. Classify occupancy designations of the building code.
8. identify the indicators of potential structural failure as they relate to firefighter safety.
9. Identify the role of GIS as it relates to building construction.

FIRE 214. Hazardous Materials Technician
3 Credits (3)
Knowledge and skills about hazardous materials mitigation needed to certify as a Hazardous Materials Technician Level III. Meets or exceeds NFPA 471, 472, 473 standards, and OSHA 1910.102 part Q, and New Mexico HMER plan.
Prerequisite/Corequisite: FIRE 216.
Learning Outcomes
1. Acquire the skills and knowledge required to perform the functions of a firefighter.
2. Apply the appropriate critical thinking skills necessary to develop an incident action plan using appropriate strategies and tactics to safely manage incidents.

FIRE 215. Hazardous Materials Technician Manipulative Skills
4 Credits (4P)
Successful students will learn to perform as hazardous materials technicians, in a lab setting. They will learn how to respond to hazardous materials / weapons of mass destruction (WMD) incidents using a risk-based response process by which they analyze problems involving hazardous materials/WMD. Students will select applicable decontamination procedures and control a release using specialized protective clothing and control equipment. Incident termination will include following industry accepted practices and documentation while maintaining scene control and safety.
Prerequisite: FIRE 115, FIRE 216.
Corequisite: FIRE 214.
Learning Outcomes
1. Acquire the skills and knowledge required to perform the functions of a firefighter.
2. Apply the appropriate critical thinking skills necessary to develop an incident action plan using appropriate strategies and tactics to safely manage incidents.

FIRE 216. Hazardous Materials Chemistry
3 Credits (3)
This course provides basic chemistry relating to the categories of hazardous materials including recognition, identification, reactivity, and health hazards encountered by emergency services. Restricted to: Community colleges only. May be repeated up to 3 credits.

Learning Outcomes

1. Acquire the skills and knowledge required to perform the functions of a firefighter.

FIRE 220. Cooperative Experience I
1-3 Credits
Supervised cooperative work program. Student is employed in an approved occupation and rated by the employer and instructor. May be repeated for a maximum of 6 credits. Graded S/U.
Prerequisite: consent of instructor.

FIRE 221. Cooperative Experience II
3 Credits (3)
Apply advanced firefighting knowledge and skills while working with fire protection agencies. Meets or exceeds NFPA standards. Consent of instructor required. Graded: S/U. Restricted to: Community Colleges only.
Prerequisite(s): FIRE 220.

FIRE 223. Fire Investigations I
3 Credits (3)
This course meets the requirements set forth in NFPA 1033 Professional Qualifications for Fire Investigator. This course will give a comprehensive understanding of the principles of fire investigation, scene examination, documentation, evidence collection/preservation, interview techniques, and post-incident investigations. Student who meet all course requirements are eligible for International Fire Service Accreditation Congress (IFSAC) certification through New Mexico Firefighters' Training Academy (NMFTA). Restricted to Community Colleges campuses only.
Learning Outcomes

1. The student will be able to understand fire science, fire chemistry, thermodynamics, fire dynamics, and exploding of dynamics.
2. The student will be able to understand fire investigations, fire investigations methodology, fire investigation technology, and fire analysis.
3. The student will be able to understand evidence documentation, collection, and preservation.
4. The student will be able to understand computer fire modeling, failure analysis and analytical tools, fire protection systems, electricity and electrical systems, and hazardous materials.

FIRE 224. Strategy and Tactics
3 Credits (3)
Provides an in-depth analysis of the principles of fire control through utilization of personnel, equipment and extinguishing agents on the fire ground. Covers the development of systematic action plans for emergency situations. Includes recognizing and prioritizing emergency scene needs and developing related strategies, tactics and contingencies. Educates students on how resources should be deployed to implement those plans. Restricted to Community Colleges campuses only.
Learning Outcomes

1. Explain the importance of a fire ground commander.
2. Explain the importance of having standard operating procedures during fire ground operations.
3. Analyze fires by their classification and identify what constitutes a fuel.
4. Describe heat transfer and identify their distinct characteristics.
5. Describe the phases that a fire progresses through and their specific approach to extinguishment.
6. Describe the methods for making proper assumptions in fire situations.
7. Identify and list unique building construction techniques, and their specific approach to extinguishment.
8. Identify the principles behind reduce, fire control, and fire stream operations.
9. Evaluate fire scenarios and apply the appropriate tactics and strategies.

FIRE 225. Fire Protection Systems
3 Credits (3)
This course provides information relating to the features and design and operation of fire alarm systems, water-based fire suppression systems, special hazard fire suppression systems, water supply for fire protection and portable fire extinguishers. Restricted to: Community colleges only.

FIRE 230. Fire Service Instructor
3 Credits (3)
Provides the instructor candidate with methods and techniques of instruction including oral communications, preparing lesson plans, writing performance objectives, use of audio and other training aids, and the selection, evaluation and preparation of performance tests. Meets and exceeds NFPA 1041 Level I standards. Restricted to: Community Colleges only.
Learning Outcomes

1. The student shall be able to summarize professional responsibilities of the fire and emergency services instructor.
2. The student shall be able to discuss characteristics of adult learning and describe the different learning domains and learning styles.
3. The student shall be able discuss instructional preparation as it relates to training aid selection, class continuity, and class consistency.
4. The student shall be able discuss instructional materials and equipment and how they are used in the classroom and training environments.
5. The student shall be able discuss the classroom and training ground environments.
6. The student shall be able to discuss skills-based training and safely.

FIRE 232. Firefighter Internship
3 Credits (3)
Application of knowledge, skills and abilities in a fire service department, as a firefighter intern and integrated member of a fire affiliated agency. Restricted to majors.
Prerequisites: FIRE 101, FIRE 102, FIRE 115, FIRE 202 and EMT-B and consent of instructor.

FIRE 252. Vehicle Extrication
2 Credits (1+2P)
This course will train the student to the Vehicle & Machinery Extrication level I as outlined in NFPA 1006, Standard for Technical Rescuer Professional Qualifications. Vehicle & Machinery Extrication certification issued through the New Mexico Firefighter's Training Academy upon successful completion (IFSAC accredited). May be repeated up to 2 credits.
Learning Outcomes

1. Define extrication, disentanglement, and rescue.
2. Identify organizations relevant to extrication operations.
3. Describe the roles performed by organizations relevant to extrication operations.
4. Identify the responsibilities of the rescue organizations.

FREN-FRENCH

FREN 1110. French I
4 Credits (4)
Intended for students with no previous exposure to French, this course develops basic listening, speaking, reading, and writing skills aiming toward the ACTFL novice-high level. This is an introductory course designed to teach the student to communicate in French in everyday situations and to develop an understanding of French and Francophone cultures through the identification of cultural products and practices, of cultural perspectives, and the ability to function at a survival level in an authentic cultural content. This course will also develop the student's sense of personal and social responsibility through the identification of social issues.

Learning Outcomes

1. Students can communicate and exchange information about familiar topics using phrases and simple sentences, sometimes supported by memorized language.
2. Students can usually handle short social interactions in everyday situations by asking and answering simple questions
3. Students can write short messages and notes on familiar topics related to everyday life.
4. Students can often understand words, phrases, and simple sentences related to everyday life.
5. Students can recognize pieces of information and sometimes understand the main topic of what is being said.
6. Students can understand familiar words, phrases, and sentences within short and simple texts related to everyday life.
7. Students can sometimes understand the main idea of what they have read.
8. Students can identify beliefs, behaviors and cultural artifactsof the French-speaking world.
9. In English, students will engage with social issues confronting the French-speaking world to develop their sense of personal and social responsibility.

FREN 1120. French II
4 Credits (4)
A continuation of French 1,students will develop a broader foundation in skills gained during the first semester, including understanding, speaking, reading and writing French aiming toward the ACTFL intermediate-low level. This course is designed to increase student fluency in French as applied to everyday situations. Students will also learn to recognize and understand various French and Francophone products,practices, and perspectives, identifying common cultural patterns, describing basic cultural viewpoints, and further developing their sense of personal and social responsibility through the investigation of cultural issues. May be repeated up to 4 credits.

Learning Outcomes

1. Students can participate in conversations on a number of familiar topics using simple sentences.
2. Students can handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can write briefly about most familiar topics and present information using a series of simple sentences.
4. Students can understand the main idea in short, simple messages and presentations on familiar topics.
5. Students can understand the main idea of simple conversations that they overhear.
6. Students can understand the main idea of short and simple texts when the topic is familiar.
7. Students can describe and make comparisons between decisions about beliefs, behaviors and cultural artifacts of the French-speaking world.
8. Students will engage with social issues confronting the French-speaking world to continue to develop their sense of personal and social responsibility

FREN 2110. French III
3 Credits (3)
In this third semester course, students will continue to develop a broader foundation in skills gained during the first year, including understanding, speaking, reading and writing French aiming toward the ACTFL intermediate-mid level.This course is designed to teach the student to communicate in a more sustained way in areas of personal interest and in everyday situations. Students will engage in and analyze various French and Francophone products, practices, and perspectives, as well as continue to develop their sense of personal and social responsibility through comparison and contrast of cultural perspectives. May be repeated up to 3 credits.

Learning Outcomes

1. Students can participate in conversations on familiar topics using sentences and series of sentences.
2. Students can engage in short social interactions in everyday situations by asking and answering a variety of questions. Students can usually say what they want to say about themselves and their everyday life.
3. Students can write on a wide variety of familiar topics using connected sentences.
4. Students can understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies.
5. Students can understand the main idea of conversations that they overhear.
6. Students can understand the main idea of texts related to everyday life and personal interests or studies.
7. Students can analyze beliefs, behaviors and cultural artifacts of the French-speaking world, and discuss the nature and value of French and Francophone products, practices, and perspectives.
8. Students will engage with social issues confronting the French-speaking world to continue to develop their sense of personal and social responsibility

FREN 2120G. French IV
3 Credits (3)
In this fourth semester course, students will continue to broaden and refine skills gained during previous semesters, including understanding, speaking, reading and writing French aiming at the ACTFL intermediate-high level. This course is designed to teach the student to communicate in a more sustained way in situations that go beyond the everyday. Students will evaluate various French and Francophone products,practices, and create ways to demonstrate their sense of personal and social responsibility through participation in cultural interaction. May be repeated up to 3 credits.

Learning Outcomes

1. Students can participate with ease and confidence in conversations on familiar topics. They can usually describe people, places, and things. They can usually talk about events and experiences in various time frames.

2. Students can handle social interactions in everyday situations, sometimes even when there is an unexpected complication.
3. Students can write about topics related to school, work, and community in a generally organized way. They can write some simple paragraphs about events and experiences in various time frames.
4. Students can easily understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies.
5. Students can usually understand a few details of what I overhear in conversations, even when something unexpected is expressed. The student can sometimes follow what they hear about events and experiences in various time frames.
6. Students can understand the main idea of texts with topics related to everyday life, personal interests, and studies, as well as sometimes follow stories and descriptions about events and experiences in various time frames.
7. Students can analyze beliefs, behaviors and cultural artifacts of the French-speaking world, and recognize and discuss the representations and controversies of French and Francophone products, practices, and perspectives.
8. Students demonstrate the essential skills of Critical Thinking, Personal and Social Responsibility, and Information and Digital Literacy, as per the New Mexico General Education Curriculum

FREN 2135G. Frontiers and Border Crossings in the French-Speaking World
3 Credits (3)
An exploration of frontiers and borders in the French-speaking world: geographical, linguistic, cultural, and symbolic
Learning Outcomes
1. Articulate the diversity of boundaries (geographical, literal, gender, cultural, symbolic) and the role they play in negotiating cultural identities in the Francophone world.
2. Critically analyze and communicate orally and in writing the nuances of frontiers, border crossings, and their expressions in the course texts.
3. Describe, through the study of French and Francophone borders and frontiers, how cultural contexts and human practices influence individuals and societies.
4. Apply the knowledge and skills gained though the study of boundaries in the francophone world to analogous settings and to students' personal academic goals.
5. Demonstrate information literacy and technological skills in researching and presenting themes related to the readings and to the films screened
6. Reflect on the effects of geographical, social, linguistic, and symbolic boundaries and crossings as expressed in the course content on individuals.

FREN 306. Topics in French Culture and Civilization
1-3 Credits (1-3)
Selected topics focusing on French culture and civilization. This course is linked to FLIP (Faculty-Led International Programs) when applicable. May be repeated up to 4 credits.
Learning Outcomes
1. Recognize the arrondissements of Paris and describe their identifying characteristics.
2. Navigate through Paris effectively and knowingly.
3. Communicate effectively with native speakers of the language.
4. Exemplify qualities of a good guest in a francophone culture.
5. Talk knowledgeably about a topic related to Paris and Parisians.

FREN 315. French Grammar
3 Credits (3)
A thorough review of French grammar through the study of grammatical elements and the use of grammatical exercises. May be repeated up to 3 credits.
Learning Outcomes
1. By the end of the course, students should be familiar with a review of grammar for all tenses, pronouns, adverbs, adjectives.
2. Students should attain the intermediate high level in all areas (Listening, Speaking, Reading, Writing, Attitudinal / Cultural) on the American Council on the Teaching of Foreign Languages (ACTFL) scale.
3. By the end of the course, students should be familiar with spoken speech at paragraph level.
4. By the end of the course, students should be familiar with writing a narrative in the past and future tenses.

FREN 316. Writing for Expression and Communication
3 Credits (3)
Examination of writing in French for various purposes and development of interpersonal, presentational, and interpretative skills of written communication. May be repeated up to 6 credits.
Prerequisite: FREN 2120G or permission of the instructor.
Learning Outcomes
1. To assimilate strategies to develop the discipline of writing.
2. To develop critical thinking to self-correct and to refine one's skills.
3. To develop familiarity with tools (dictionaries, style manuals, grammars) needed to improve one's writing.
4. To develop awareness of grammatical and syntactical accuracy.
5. To develop confidence in one's writing so to acquire professional skills.

FREN 325. Intermediate Conversation
3 Credits (3)
French conversation through intensive oral practice with emphasis on vocabulary acquisition and pronunciation. May be repeated up to 3 credits.
Learning Outcomes
1. To enhance active vocabulary acquisition.
2. To provide opportunities for the learner's speech to progress from short utterances to more connected, sustained speech.
3. To address pronunciation issues.
4. To enhance presentation skills.
5. To improve auditory proficiency.
6. Based on the scale established by the American Council on the Teaching of Foreign Languages (ACTFL), the performance goals for the course are: (A) Listening Intermediate High, (B) Speaking Intermediate High, (C) Reading Advanced Low, (D) Writing Intermediate High.

FREN 330. Business French
3 Credits (3)
An introduction to standard language within the corporate world in French-speaking countries. Students practice reading, writing, listening, speaking and expanding their vocabulary in professional fields related to business.

Learning Outcomes

1. Use business and legal vocabulary.
2. Demonstrate basic competency in French corporate etiquette.
3. Interact in a culturally appropriate manner in common business situations, including meetings, sales calls, business letters, and e-mails.
4. Demonstrate familiarity in using French in business-related situations.

FREN 352. French Phonetics
3 Credits (3)
Systematic description of modern French pronunciation. Corrective exercises for foreign learners. Formal study of spelling/pronunciation relationships. May be repeated up to 6 credits.
Learning Outcomes

1. By the end of the semester, students will have acquired a systematic, comprehensive review and enhancement of French pronunciation, and an elevated aural comprehension. Non-native speakers of French will be able to participate more easily in verbal communication; and the intermediate high level in all areas (Listening, Speaking, Reading, Writing, Attitudinal / Cultural) on the American Council on the Teaching of Foreign Languages (ACTFL) scale.
2. Students will be able to pronounce words, using the International Phonetic alphabet.
3. Students will be able to read short texts and be understood by non-sympathetic speakers of French.
4. Students will sharpen their aural skills in language recognition.

FREN 362. Contemporary French Culture
3 Credits (3)
Institutions, lifestyles and popular attitudes in modern France.
Learning Outcomes

1. Learning what is particular to various cities and towns in France.
2. Learning what are some characteristics of everyday life in France.
3. Learning what are some cultural traditions, art forms, or artifacts of France.
4. Learning what are some current events impacting France.

FREN 365V. Perspectives in French Culture
3 Credits (3)
Examines components of French culture through literature, films and other sources. Taught in English. Does not satisfy Arts and Sciences second language requirement. Does not satisfy French major or minor requirements.

FREN 378. Studies in Francophone Cultures
3 Credits (3)
Studies of representative Francophone cultures through their history, literature, music and films.
Prerequisite: FREN 2120 or consent of instructor.

FREN 380. Readings in French Literature
3 Credits (3)
Selected readings in the literature of France, from the Middle Ages to the twentieth century. May be repeated up to 6 credits.
Learning Outcomes

1. To introduce students to readings from a variety of genres, from the Middle Ages to the twentieth century.
2. To teach students to make the transition from intermediate language courses to upper-level literature courses, not only by historical overview, but by offering reading strategies, including pre-reading and post-reading exercises.
3. To afford students plenty of opportunity to improve reading skills.
4. To enhance speaking and listening skills necessary for more in-depth study of literature.
5. To increase general literary, culture and attitudinal expertise for those intending to major/minor in French.

FREN 381. Survey of French Literature I
3 Credits (3)
Literary movements, authors and selected texts of the Middle Ages through the eighteenth century.
Prerequisite: FREN 2120 or consent of instructor.

FREN 382. Survey of French Literature II
3 Credits (3)
Literary movements, authors and selected texts of the nineteenth and twentieth centuries.
Prerequisite: FREN 2120 or consent of instructor.

FREN 386. Contemporary Women Writers in French
3 Credits (3)
Exploration of literary texts by contemporary women writers in France and the Francophone world; emphasizes the cultural contexts that have defined women's relationship to writing. Selections will vary from year to year.
Prerequisite: FREN 2120 or consent of instructor.

FREN 410. Paris: History and Cultures
3 Credits (3)
An in-depth look at history and culture of Paris from its origins to the present.
Prerequisite(s): FREN 212 or consent of instructor.

FREN 425. Advanced French Conversation
3 Credits (3)
Mastery of spoken French language through discussion of personal readings and group work to develop vocabulary, syntactical and conversational skills. The class is conducted entirely in French.
Prerequisite(s): FREN 325 or consent of instructor.

FREN 449. French for Specific Purposes
3 Credits (3)
Directed reading for students to satisfy language requirement for master's or doctoral programs. May be repeated up to 6 credits.

FREN 451. Special Topics in French
1-3 Credits
Selected topics relating to the cultures or literatures of the countries where French is spoken will be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.
Prerequisite: consent of instructor.

FREN 453. Independent Studies in French
1-3 Credits
Individualized, self-paced projects for advanced students. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

FREN 478. Studies in Francophone Cultures Around the World
3 Credits (3)
Advanced studies of representative Francophone cultures through their history, literature, music and films.
Prerequisite: FREN 2120 or consent of instructor.

FREN 486. Advanced Contemporary Women Writers in French
3 Credits (3)
Advanced study of literary texts by contemporary women writers in France and the Francophone world; emphasizes the cultural contexts

that have defined women's relationship to writing. Selections will vary from year to year.
Prerequisite: FREN 2120 or consent of instructor.

FREN 649. Readings in Transborder and Global Human Dynamics
3 Credits (3)
Individualized study of selected readings and topics in French and francophone transborder and global human dynamics. Admission to the PhD program in Transborder and Global Human Dynamics required for enrollment. May be repeated up to 9 credits.
Learning Outcomes
1. Identification of a topic for further study, involving French or francophone-related transborder issues.
2. Compilation of a biography to comprise the readings.
3. Demonstration of knowledge of contexts and issues raised by the readings.
4. Articulation of pertinence of readings to course of study.

FSTE-FOOD SCIENCE & TECHNOLOGY

FSTE 1120. ACES in the Hole Foods I
4 Credits (4)
Food production activities related to operation of ACES in the Hole Foods, a student-run food company that will give FSTE majors hands-on experience in all aspects of developing, producing and marketing food products Restricted to Las Cruces campus only. Students enrolled in this class must possess A Food Handler Card
Learning Outcomes
1. Apply basic scientific principles, procedures, techniques and standards in the production of food products.
2. Apply principles of sanitation and safety to the production of food products.
3. Assist in the development and evaluation of new and/or existing food products made for human consumption.
4. Prepare a resume and portfolio

FSTE 2110G. Food Science I
4 Credits (3+2P)
The scientific study of the principles involved in the preparation and evaluation of foods. May be repeated up to 4 credits.
Learning Outcomes
1. Explain basic scientific principles involved in the preparation of high quality food products.
2. Utilize scientific inquiry in the experimental investigation of factors influencing the chemical, physical and sensory properties of food products.
3. Apply basic scientific principles, procedures, techniques and standards in the preparation of all types of high quality food products.
4. Use basic methods of quantitative analysis to critically evaluate quality characteristics of food.
5. Use sensory science techniques and terminology to critically evaluate acceptability and quality characteristics of food.
6. Describe high quality characteristics of a variety of food products using appropriate terminology.
7. Apply principles of sanitation and safety to food preparation.

FSTE 2120. ACES in the Hole Foods II
4 Credits (8P)
Food production activities related to operation of ACES in the Hole Foods, a student-run food company that will give FSTE majors hands-on experience in all aspects of developing, producing and marketing food products. Student must also have a Food Handler Card to enroll in this course.
Prerequisite(s): FSTE 1120.
Learning Outcomes
1. Apply basic scientific principles, procedures, techniques and standards in the production of food products.
2. Apply principles of sanitation and safety to the production of food products.
3. Assist in the development and evaluation of new and/or existing food products made for human consumption.
4. Prepare a resume and portfolio

FSTE 2130G. Survey of Food and Agricultural Issues
3 Credits (3)
Survey of food and agricultural issues, including: geography of food production and consumption; human-agricultural-natural resource relations; agriculture in the United States and abroad; modern agribusiness; food safety; food, agriculture, and natural resources policy; ethical questions; role and impact of technology. Crosslisted with AEEC 2130G.
Learning Outcomes
1. Understand of global agriculture including production techniques used in various geographical regions, consumption trends, and political and social constraints.
2. Synthesis information about agricultural issues and make informed arguments
3. Articulately discuss modern issues in agriculture
4. Write coherent arguments relative to personal beliefs regarding agricultural issues

FSTE 2996. Special Topics
1-4 Credits
Specific topics and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.
Learning Outcomes
1. Varies

FSTE 3110. Professional Development in Food Science
1 Credit (1)
Covers essential elements of career management including preparation for a successful internship. Students must have a Food Handler Card. Restricted to: FSTE majors. Graded S/U.
Prerequisite: FSTE 2120.
Learning Outcomes
1. Describe their Jung Type.
2. Articulate their personal mission.
3. Identify their personal strengths and weaknesses.
4. Establish short and long term career goals.
5. Prepare an effective cover letter.
6. Develop a professional resume.
7. Understand the dos and dont's of interviewing.
8. Properly dress for interviewing.
9. Understand the factors to consider when deciding what job offer to accept. 1
10. Understand the objectives and requirements of the Food Science internship program.

FSTE 4110. Food Microbiology
4 Credits (3+2P)
Detrimental and beneficial microbiological aspects of food products. Methods of quantification and identification of microorganisms associated with food spoilage and preservation. May be repeated up to 4 credits. Prerequisite(s): (BIOL 2610G and BIOL 2610L), or (BIOL 2110G and BIOL 2110L)

FSTE 4120. Food Chemistry
3 Credits (3)
Comprehensive study of the chemical and physiochemical properties of food constituents. Chemical changes involved in the production, processing, and storage of food products and basic techniques used to evaluate chemical and physiochemical properties of foods.
Prerequisites: CHEM 1215G, CHEM 1225G, and CHEM 2115, or consent of instructor.

FSTE 4130. Food Preservation
3 Credits (2+2P)
Processes used in home and commercial food preservation, including canning, freezing, drying, and irradiation. May be repeated up to 3 credits.
Prerequisite(s): FSTE 2110G.

FSTE 4140. Food Analysis
3 Credits (2+2P)
Basic chemical and physical techniques used in establishing nutritional properties and overall acceptance of food products. May be repeated up to 3 credits.
Prerequisite(s): CHEM 1215G or consent of instructor.

FSTE 4150. Food Safety
3 Credits (3)
Provide students' knowledge on good manufacturing practices and prequisite programs, conduct hazard analysis and determine preventive controls, define process, food allergen, sanitation and supply-chain preventive controls and discuss verification validation, recall and recordkeeping requirements with training and educational opportunities related to current best practices and guidane, and future regulatory requirements by establishing the Produce Safety Alliance. Students participate in a Mock Audit. Participants will receive an official FSPCA Preventive Controls Qualified Individual certificate issues by AFDO after attending this training program.
Prerequisite(s): FSTE 4110 or BIOL 311, or consent of instructor.

FSTE 4210. Cereal Technology
3 Credits (2+2P)
This course provides students with an understanding of chemistry and technology of the cereal grains. The course is structured as a combination of theory, demonstrations, and practical laboratory exercises on the fundamentals of cereal processing. Students will learn about post-harvest processing and utilization of major cereal grains for food and feed, current industrial processes and practices, and the theoretical basis for these operations.
Learning Outcomes
1. Understand principles of cereal chemistry and processing.
2. Understand how cereal grains are produced, stored, marketed, and converted into food products.
3. Describe unit operations and procedures involved in the manufacture of cereal-based food and animal feed products.

FSTE 4220. Dairy Technology
3 Credits (2+2P)
This course provides general knowledge on dairy technology as well as on various processing technologies regarding the science behind a variety of dairy products. It is designed to give a thorough understanding of the composition and properties of milk, and of the physical and chemical changes occurring in milk during processing and storage. These products include fluid milk, fermented dairy products, concentrated and dried dairy products, butter, cream and various frozen dairy desserts. Principles and practices in assembling, receiving, processing, and packaging milk and dairy products, including beverage, frozen, cream, butter, concentrated and fractionated milks, dried milks, casein, and lactose.
Prerequisite: FSTE 2110G.
Learning Outcomes
1. To gain an understanding of dairy processing technologies, unit operation and production of dairy products and ingredients.
2. To understand the principles of processing of dairy products by integrating the concepts of chemistry, biochemistry, microbiology, nutrition, sensory properties, and engineering relevant to dairy processing operations.
3. To gain an ability to think critically on practical problems that occur in the dairy industry and to appreciate the many challenges in dairy research technology and dairy product development.
4. To engage in group discussion on current issues pertinent to culture dairy industry.

FSTE 4230. Food Processing Technologies
4 Credits (3+2P)
Common food processing unit operations such as raw material preparation, separation, concentration, fermentation, pasteurization, sterilization, extrusion, dehydration, baking, frying, chilling, freezing, controlled atmosphere storage, water, waste and energy management, packaging, materials handling and storage and process control. Application of principles to processing food in a laboratory setting.

FSTE 4240. Processed Meats
3 Credits (2+2P)
This course provides students with an understanding of physical, chemical and functional characteristics of meat raw materials. Modern meat processing industry and its use of science and technology. The fabrication, processing, preservation, sanitation, food safety, ethnic evolvement, and utilization of manufactured and processed meat. Regulatory compliance and quality assurance in commercial processed meat operations.
Learning Outcomes
1. The theory and chemistry of meat processing.
2. Processing techniques and basic formulations of different categories of processed meats.
3. The effect of type and composition of raw materials and added ingredients on processed meat quality and safety.
4. To evaluate products for consumer and analytical quality and composition.
5. To evaluate and assess defective products and propose processing/ingredient solutions.

FSTE 4250. Sensory Evaluation of Foods and Product Development
3 Credits (2+2P)
Application of affective sensory tests, chemical, physical, and experimental methods to the development and evaluation of a food product. Sensory test methods and procedures used to evaluate the flavor, color and texture of foods. Relationships between sensory and instrumental measurements quality parameters. The course will present the parametric and non-parametric tests that are used in sensory evaluation. May be repeated up to 3 credits.
Prerequisite: FSTE 2110G and (A ST 311 or MATH 1350G).

Learning Outcomes

1. Describe the chemical senses and the receptors that mediate the basic taste modalities.
2. Match sensory tests to research questions and to use the suitable statistical tests.
3. Design and develop a food product and conduct a basic research project.
4. Communicate research results using written, oral, and visual communication techniques.

FSTE 4310. Brewing Science & Engineering
3 Credits (3)
Details of beer production, fermentation science, brewery operation, and process design & economics. Engineering considerations including process safety, fermentation kinetics, unit operations, and economies of scale. Beer styles, recipe formulation, product quantification for tax purposes, and brew analytical methods will also be discussed. Students must be 21 years old to enroll.

Learning Outcomes

1. To provide the undergraduate student with a broad perspective of beer and the brewing industry as well as technical knowledge about the brewing process.

FSTE 450. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits towards a degree. Consent of instructor required.

FSTE 475. ACES Foods at NMSU-Experiential Learning
1 Credit (2-8P)
Professional work experience for FSTE majors only.
Prerequisite: FSTE 375.

Learning Outcomes

1. Students will collect a minimum of four hundred hours.

FSTE 476. FSTE Internship Seminar
1 Credit (1)
A case based approach to analyzing internship experiences. Students will write case studies about specific business issues they countered during FSTE 475 (Internship) and analyze them. Restricted to Food Science Technology majors.
Prerequisite: FSTE 475.

Learning Outcomes

1. Analyze business practices as experienced during an internship.
2. Deliver a presentation effectively communicating operations of ACES Foods at NMSU.
3. Assess use of state and federal food regulation agencies within ACES Foods at NMSU.
4. Present in written form the history, business operations, job descriptions, organizational structure, and human resource policies of ACES Foods at NMSU.

FSTE 480. Food Safety
3 Credits (3)
Provide students' knowledge on good manufacturing practices and prequisite programs, conduct hazard analysis and determine preventive controls, define process, food allergen, sanitation and supply-chain preventive controls and discuss verification validation, recall and recordkeeping requirements with training and educational opportunities related to current best practices and guidane, and future regulatory requirements by establishing the Produce Safety Alliance. Students participate in a Mock Audit. Participants will receive an official FSPCA Preventive Controls Qualified Individual certificate issues by AFDO after attending this training program.
Prerequisite(s): FSTE 320 or BIOL 311, or consent of instructor.

FSTE 4815. FSTE Internship Seminar
1 Credit (1)
A case based approach to analyzing internship experiences. Students will write case studies about specific business issues they countered during FSTE 4998 (Internship) and analyze them. Restricted to Food Science Technology majors.
Prerequisite: FSTE 4998.

Learning Outcomes

1. Analyze business practices as experienced during an internship.
2. Deliver a presentation effectively communicating operations of ACES Foods at NMSU.
3. Assess use of state and federal food regulation agencies within ACES Foods at NMSU.
4. Present in written form the history, business operations, job descriptions, organizational structure, and human resource policies of ACES Foods at NMSU.

FSTE 490. Processed Meats
3 Credits (2+2P)
This course provides students with an understanding of physical, chemical and functional characteristics of meat raw materials. Modern meat processing industry and its use of science and technology. The fabrication, processing, preservation, sanitation, food safety, ethnic evolvement, and utilization of manufactured and processed meat. Regulatory compliance and quality assurance in commercial processed meat operations.

Learning Outcomes

1. The theory and chemistry of meat processing.
2. Processing techniques and basic formulations of different categories of processed meats.
3. The effect of type and composition of raw materials and added ingredients on processed meat quality and safety.
4. To evaluate products for consumer and analytical quality and composition.
5. To evaluate and assess defective products and propose processing/ingredient solutions.

FSTE 492. Special Problems
1-4 Credits
Individual research study in a selected subject of Family and Consumer Sciences. Maximum of 4 credits per semester and a grand total of 8 credits towards a degree. Consent of instructor required.

FSTE 4996. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits towards a degree. Consent of instructor required.

FSTE 4997. Special Problems
1-4 Credits
Individual research study in a selected subject of Family and Consumer Sciences. Maximum of 4 credits per semester and a grand total of 8 credits towards a degree. Consent of instructor required.

FSTE 4998. ACES Foods at NMSU-Experiential Learning
1 Credit (2-8P)
Professional work experience for FSTE majors only.

Prerequisite: FSTE 3110.

Learning Outcomes

1. Students will collect a minimum of four hundred hours.

FSTE 5110. Food Microbiology
3 Credits (2+3P)
Detrimental and beneficial microbiological aspects of food products. Methods of quantification and identification of microorganisms associated with food spoilage and preservation. Additional work required at the graduate level.

Learning Outcomes

1. Understand the principles behind growth of microorganisms in foods.
2. Identify factors associated with growth, prevalence, and survival of microorganisms.
3. Use proper microbiological techniques for detection, isolation, and enumeration of microbial contaminants.
4. Understand the principles of food preservation.

FSTE 5120. Food Chemistry
3 Credits (3)
Comprehensive study of the chemical and physiochemical properties of food constituents. Chemical changes involved in the production, processing and storage of food products and basic techniques used to evaluate chemical and physiochemical properties of foods. Additional work required at the graduate level.

Learning Outcomes

1. Describe the major components, including water, carbohydrates, lipids, and proteins, of foods (edible plant products, milk, and eggs) in chemical and biochemical terms.
2. Relate the chemical nature of foods to the techniques used in and the changes occurring processing of foods.
3. Describe the chemical and biochemical basis of food quality problems.
4. Select ingredients and processes necessary to the composition of specific foods.
5. Select and apply techniques appropriate for producing specific food characteristics.
6. Evaluate food products to determine their quality and safety.
7. Apply chemical and biochemical principles in the design and creation of various food products.

FSTE 5130. Food Preservation
3 Credits (3)
Processes used in home and commercial food preservation, including canning, freezing, drying, and irradiation. Same as FSTE 4130 with additional work required at the graduate level.

FSTE 5140. Food Analysis
3 Credits (2+3P)
Covers basic chemical and physical techniques used in establishing nutritional properties and overall acceptance of food products. Additional work required at the graduate level.

Learning Outcomes

1. Explain the principles behind the analytical techniques used in the chemical and physical analyses of food.
2. Understand food constituents and functional properties important in quality control and research laboratories.
3. Acquire laboratory skills required for performing a range of chemical analyses of food.
4. Acquire writing skills related to food composition and analyses.

FSTE 5150. Rumen Microbiology (so)
3 Credits (3)
Same as ANSC 560.

FSTE 520. Graduate Study in Food Microbiology
3 Credits (2+3P)
Detrimental and beneficial microbiological aspects of food products. Methods of quantification and identification of microorganisms associated with food spoilage and preservation. Additional work required at the graduate level.
Prerequisites: BIOL 2610G/2610L, or BIOL 2110G/2110L, or consent of instructor.

FSTE 521. Graduate Study in Food Chemistry
3 Credits (3)
Comprehensive study of the chemical and physiochemical properties of food constituents. Chemical changes involved in the production, processing and storage of food products and basic techniques used to evaluate chemical and physiochemical properties of foods. Additional work required at the graduate level.
Prerequisites: CHEM 1215G, CHEM 1225G, and CHEM 2115, or consent of instructor.

FSTE 5210. Cereal Technology
3 Credits (2+2P)
This course provides students with an understanding of chemistry and technology of the cereal grains. The course is structured as a combination of theory, demonstrations, and practical laboratory exercises on the fundamentals of cereal processing. Students will learn about post-harvest processing and utilization of major cereal grains for food and feed, current industrial processes and practices, and the theoretical basis for these operations.

Learning Outcomes

1. Understand principles of cereal chemistry and processing.
2. Understand how cereal grains are produced, stored, marketed, and converted into food products.
3. Describe unit operations and procedures involved in the manufacture of cereal-based food and animal feed products.

FSTE 523. Food Processing Technologies
4 Credits (3+2P)
Common food processing unit operations such as raw material preparation, separation, concentration, fermentation, pasteurization, sterilization, extrusion, dehydration, baking, frying, chilling, freezing, controlled atmosphere storage, water, waste and energy management, packaging, materials handling and storage and process control. Application of principles to processing food in a laboratory setting. Additional work beyond that for FSTE 423 required at the graduate level.
Prerequisite(s): FSTE 528.

FSTE 5230. Food Processing Technologies
4 Credits (3+2P)
Common food processing unit operations such as raw material preparation, separation, concentration, fermentation, pasteurization, sterilization, extrusion, dehydration, baking, frying, chilling, freezing, controlled atmosphere storage, water, waste and energy management, packaging, materials handling and storage and process control. Application of principles to processing food in a laboratory setting. Additional work beyond that for FSTE 4230 required at the graduate level.

Learning Outcomes

1. Manage safety considerations and engineering controls for food processing operations.
2. Describe the effects of heat, cold, and pressure on microorganisms, particularly spoilage microorganisms.

3. Describe the effects of heat, cold, and pressure on foods, specifically on texture, flavor, and nutrition.
4. Choose heat, cold, and/or pressure treatment for foods based on desired characteristics of the product.
5. Evaluate and/or troubleshoot finished food products using sensory evaluation terminology and tools.
6. Create, and subsequently modify, a multi-step food processing regimen based desired outcomes, such as preservation, stylistic guidelines, production costs, and shelf-life.
7. Size and cost food processing operations, processes, ingredients, and utilities.
8. Create a food processing business plan for a food production facility, incorporating regulatory considerations.

FSTE 524. Sensory Evaluation of Foods
3 Credits (2+3P)
Principles and procedures involved in the sensory evaluation of foods. Physiological, psychological and environmental factors affecting the evaluation of sensory properties. Analysis and interpretation of sensory data.
Prerequisite(s): FSTE 2110G and A ST 311 or MATH 1350G.

FSTE 5241. Processed Meats
3 Credits (2+2P)
This course provides students with an understanding of physical, chemical and functional characteristics of meat raw materials. Modern meat processing industry and its use of science and technology. The fabrication, processing, preservation, sanitation, food safety, ethnic involvement, and utilization of manufactured and processed meat. Regulatory compliance and quality assurance in commercial processed meat operations.
Learning Outcomes
1. Upon successful completion of this course, the student will learn the theory and chemistry of meat processing.
2. Upon successful completion of this course, the student will learn processing techniques and basic formulations of different categories of processed meats.
3. Upon successful completion of this course, the student will learn the effect of type and composition of raw materials and added ingredients on processed meat quality and safety.
4. Upon successful completion of this course, the student will learn to evaluate products for consumer and analytical quality and composition.

FSTE 525. Graduate Study in Food Analysis
3 Credits (2+3P)
Covers basic chemical and physical techniques used in establishing nutritional properties and overall acceptance of food products. Additional work required at the graduate level.
Prerequisite(s): CHEM 1215G or consent of instructor.

FSTE 5250. Sensory Evaluation of Foods
3 Credits (2+3P)
Principles and procedures involved in the sensory evaluation of foods. Physiological, psychological and environmental factors affecting the evaluation of sensory properties. Analysis and interpretation of sensory data.
Learning Outcomes
1. Describe the chemical senses and the receptors that mediate the basic taste modalities.
2. Understand the capabilities and limitations of sensory tests.
3. Develop a food-based product.
4. Match sensory tests to research questions and use suitable statistical tests.
5. Design and conduct a basic research project.
6. Communicate research results using written, oral, and visual communication techniques.

FSTE 531. Food Preservation
3 Credits (3)
Processes used in home and commercial food preservation, including canning, freezing, drying, and irradiation. Same as FSTE 331 with additional work required at the graduate level.

FSTE 5310. Designing and Brewing Great Beers of the World
3 Credits (2+2P)
The science and technology of brewing unit operations and the ingredients used in beer brewing. That knowledge is then applied to designing and brewing classic world beer styles. Styles investigated change every semester but typically include India Pale Ale, Pale Ale, Stout, Porter, Hefeweisen, Scottish Ale, and Black IPA. Comprehensive evaluation of the product relative to style guidelines completes the design-brew-evaluate cycle. Students must be at least 21 years of age on the first day of class.

FSTE 532. Designing and Brewing Great Beers of the World
3 Credits (2+2P)
The science and technology of brewing unit operations and the ingredients used in beer brewing. That knowledge is then applied to designing and brewing classic world beer styles. Styles investigated change every semester but typically include India Pale Ale, Pale Ale, Stout, Porter, Hefeweisen, Scottish Ale, and Black IPA. Comprehensive evaluation of the product relative to style guidelines completes the design-brew-evaluate cycle. Students must be at least 21 years of age on the first day of class.

FSTE 540. Cereal Technology
3 Credits (2+2P)
This course provides students with an understanding of chemistry and technology of the cereal grains. The course is structured as a combination of theory, demonstrations, and practical laboratory exercises on the fundamentals of cereal processing. Students will learn about post-harvest processing and utilization of major cereal grains for food and feed, current industrial processes and practices, and the theoretical basis for these operations.
Learning Outcomes
1. Understand principles of cereal chemistry and processing.
2. Understand how cereal grains are produced, stored, marketed, and converted into food products.
3. Describe unit operations and procedures involved in the manufacture of cereal-based food and animal feed products.

FSTE 560. Rumen Microbiology (so)
3 Credits (3)
Same as ANSC 560.

FSTE 598. Special Research Programs
1-4 Credits
Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits towards a degree. Consent of instructor required.

FSTE 5997. Special Research Programs
1-4 Credits

Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits towards a degree. Consent of instructor required.

FSTE 600. Special Research Program
1-6 Credits (1-6)
Special research for doctoral students May be repeated up to 6 credits. Consent of Instructor required.
Prerequisite(s): Consent of instructor.

FSTE 601. Cooperative Extension Service Field Experience
1-3 Credits (1-3)
This course will provide students with knowledge and experience in community outreach through the cooperative extension service. This course is required for students pursuing a Ph.D. in FSHN. Students will work collaboratively with extension faculty on applied projects. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: FSHN majors.

FSTE 605. Doctoral Seminar
1 Credit (1)
Current topics and research in Food Science and Human Nutrition. Course will include experts from the field as guest speakers. Students will have the opportunity to present their doctoral proposals and/or research findings.

FSTE 6910. Doctoral Seminar
1 Credit (1)
Current topics and research in Food Science and Human Nutrition. Course will include experts from the field as guest speakers. Students will have the opportunity to present their doctoral proposals and/or research findings.

FSTE 698. Doctoral Reserach
1-6 Credits (1-6)
Research May be repeated up to 6 credits. Consent of Instructor required.

FSTE 6991. Doctoral Research
1-6 Credits (1-6)
Research May be repeated up to 6 credits. Consent of Instructor required.

FSTE 6997. Special Research Program
1-6 Credits (1-6)
Special research for doctoral students May be repeated up to 6 credits. Consent of Instructor required.
Prerequisite(s): Consent of instructor.

FSTE 6998. Cooperative Extension Service Field Experience
1-3 Credits (1-3)
This course will provide students with knowledge and experience in community outreach through the cooperative extension service. This course is required for students pursuing a Ph.D. in FSHN. Students will work collaboratively with extension faculty on applied projects. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: FSHN majors.

FSTE 700. Doctoral Dissertation
1-12 Credits (1-12)
Dissertation May be repeated up to 18 credits. Consent of Instructor required.
Prerequisite(s): Passed the qualifying exam and comprehensive exam.

FSTE 7000. Doctoral Dissertation
1-12 Credits (1-12)
Dissertation May be repeated up to 18 credits. Consent of Instructor required.
Prerequisite(s): Passed the qualifying exam and comprehensive exam.

FWCE-FISH,WILDLF,CONSERV ECOL

FWCE 1110G. Introduction to Natural Resources Management
4 Credits (3+2P)
This class covers historical and current issues affecting the management of renewable natural resources with an emphasis on water, soil, rangeland, forest, fish, and wildlife resources. An emphasis is placed on the scientific method and critical thinking. In the laboratory students collect and analyze field data on topics covered above and write up each unit as a laboratory report.
Learning Outcomes
1. Students should be able to recall, describe and explain the laws, treaties and acts that have led to our current management of natural resources in the United States.
2. Students should recognize or explain what ecological processes are, the importance of ecological processes in maintaining ecosystem function and how human activities change ecological processes and the ecosystems dependent on those processes.
3. In each of the six course and lab modules (water quality, soils, forestry, rangelands, wildlife and fisheries) students should be able to recall, describe and explain basic terminology, fundamental ecological principles and management techniques and challenges.
4. Students should be able to interpret data presented graphically and in tables from class exercises and lectures.
5. Students should be able to solve problems scientifically through field data collection, laboratory analyses and the use of quantitative methods (basic statistics, tables and graphs).
6. Students should be able to communicate results from laboratory exercises (6 lab modules) orally and in writing.
7. Students will learn to apply scientific thinking to real world problems through in class discussion and short essays based on material from case studies presented in class and guest speakers.

FWCE 1120. Contemporary Issues in Wildlife and Natural Resources Management
3 Credits (3)
Ecological, socioeconomic, and political issues surrounding the management of our natural resources with an emphasis on fish and wildlife resources.

FWCE 2110. Principles of Fish and Wildlife Management
3 Credits (3)
Basic principles of fish and wildlife management including history, ecology, economics, and policy. Emphasis on wildlife and fisheries. Uses an ecosystem approach integrating living and nonliving resources.
Prerequisite(s): FWCE 1110G.
Learning Outcomes
1. The goal of this course is to provide a firm foundation in the principles of wildlife and fisheries management.
2. Material will include a background in biological principles geared towards animal populations, characteristics and management of the habitats utilized by fish and wildlife, techniques used to study and manage animals and their habitats, and aspects of the human dimension involved in wildlife and fisheries issues.
3. This course serves as a core requirement for degrees offered in the Department of Fish, Wildlife and Conservation Ecology and as a required course for degrees in other departments such as Rangeland Resources.

FWCE 301. Wildlife Ecology
3 Credits (3)

General ecological theory with emphasis on concepts including how organisms interact with their abiotic environment and with each other, population dynamics, community and ecosystem ecology, and biogeography. Emphasis on how these concepts relate to the management and conservation of vertebrates.
Prerequisite: BIOL 2610G.
Learning Outcomes

1. Students can describe major concepts and theories in ecology that relate to Fish and Wildlife conservation and management (niche, succession).
2. Students will understand population dynamics.
3. Students will learn concepts related to density dependence, population growth, and carrying capacity.
4. Students will learn concepts related to species interactions (predator prey-dynamics, intra- and inter-specific competition, mutualism, and disease dynamics).
5. Students will understand concepts related to the abiotic component of the ecosystem.
6. Students can articulate principles of fishery and wildlife management and apply ecological principles to conservation.

FWCE 325. Human Dimensions of Fish and Wildlife
3 Credits (3)
This course provides a foundational understanding of multiple perspectives in human dimensions of fish and wildlife. The course provides the information needed to identify stakeholders, engage them, understand their concerns, and communicate management plans effectively. Specific topics include the social, psychological, and economic underpinnings of human interactions with wildlife; qualitative and quantitative methods to gather information from people; and ethical considerations. Students will be challenged to approach human dimensions of wildlife issues from multiple perspectives. While this course is focused on fish and wildlife, the concepts covered about human dimensions will be relevant to a broader audience interested in environmental and natural resource conservation, management, or stewardship.
Learning Outcomes

1. Students will learn about human-wildlife conflicts and strategies to mitigate those conflicts.
2. Students will understand how human values, attitudes, and behaviors influence fish and wildlife management.
3. Students will become familiar with stakeholder engagement and communication techniques able to communicate with non-scientist stakeholders.
4. Students will learn to use logic and reasoning to arrive to reasonable conclusions.

FWCE 330. Natural History of the Vertebrates
4 Credits (3+1P)
This course provides students with a foundation in vertebrate natural history, including the evolution, ecology, behavior, anatomy, and physiology of extant and extinct vertebrates. Field trips may be required.
Prerequisite: BIOL 2610G and BIOL 2610L.
Learning Outcomes

1. Students can identify common vertebrate taxa, arrange them into phylogenetic order, and describe their anatomy and physiology.
2. Students understand the major precepts of evolutionary biology.
3. Students are proficient in the use and application of peer-review literature (access, proper use).
4. Students can communicate effectively via technical writing.
5. Students can disseminate information via oral communication.
6. Students will understand concepts related to the abiotic component of the ecosystem.

FWCE 355. Wildlife Management and Analysis
4 Credits (3+1P)
This course is intended to provide a broad overview of basic skills and statistical interpretation that are commonly used by biologists in performing management, research, and reporting functions in natural resource fields with an emphasis on terrestrial wildlife techniques, study design, and data processing/analysis. Field trips may be required.
Prerequisite: FWCE 301 and A ST 311 or consent of instructor.
Learning Outcomes

1. Students can describe major concepts and theories in ecology that relate to Fish and Wildlife conservation and management (niche, succession).
2. Students will understand population dynamics.
3. Students are familiar with techniques used to study fish and wildlife (common capture marking methods).
4. Students can visualize and summarize ecological data using graphs and descriptive statistics.
5. Students can perform basic data analysis and interpret results to draw meaningful conclusions.
6. Students are familiar with common statistical software (R).
7. Students will develop professional (field skills) and interpersonal skills (working in groups).

FWCE 357. Fisheries Management and Analysis
4 Credits (3+1P)
Lectures and laboratory exercises provide a broad overview of basic skills and techniques used for assessing and managing fish populations.
Prerequisite: FWCE 301 and A ST 311.
Learning Outcomes

1. Students can describe major concepts and theories in ecology that relate to animal conservation and management, especially niche, habitat, succession, etc.
2. Students will understand concepts related to population ecology, especially density dependence, population growth and dynamics, metapopulation dynamics, and carrying capacity.
3. Students have hands-on experience with techniques used to study fish and wildlife (common capture marking methods).
4. Students can understand and apply the methods used to measure abiotic and biotic variables.
5. Students can visualize and summarize ecological data using graphs and descriptive statistics.
6. Students can perform basic data analysis and interpret results to draw meaningful conclusions.
7. Students understand the law and policy underlying fish and wildlife management and conservation (North American Model, Public Trust Doctrine).

FWCE 391. Internship
1-3 Credits (1-3)
Professional work experience under the joint supervision of the employer and a faculty member. No more than 3 credits toward a degree.
Learning Outcomes

1. Students are familiar with techniques used to study fish and wildlife (common capture marking methods).
2. Students are familiar with methods used to measure environmental variables.

3. Student can design basic scientific experiments.
4. Students are familiar with the scientific method and its application.
5. Students will develop professional (field skills) and interpersonal skills (working in groups).
6. Students will become familiar with stakeholder engagement and communication techniques able to communicate with non-scientist stakeholders.

FWCE 393. Professional Experience and Communication
3 Credits (3)
Professional work experience under the supervision of employer and/or a faculty member. Written report and presentation is required. Students will learn oral and written communication, interviewing, and networking skills.
Prerequisite/Corequisite: FWCE 2110.
Learning Outcomes
1. Communicate effectively via technical writing.
2. Disseminate information via oral communication.
3. Learn to use logic and reasoning to arrive to reasonable conclusions.
4. Develop professional (field skills) and interpersonal skills (working in groups).

FWCE 402. Seminar in Natural Resource Management
1 Credit (1)
Review and discussion of current topics in natural resource management.
Prerequisite: Senior standing or above.
Learning Outcomes
1. Students can describe major concepts and theories in ecology that relate to FW conservation and management.
2. Students can articulate principles of fishery and wildlife management and apply ecological principles to conservation.
3. Students can understand concepts related to interconnectedness of habitat, abiotic factors, and Fish and Wildlife species common to the Southwest.
4. Students can disseminate information via oral communication.
5. Students will learn to use logic and reasoning to arrive to reasonable conclusions.
6. Students will understand population dynamics.
7. Students will understand concepts related to the abiotic component of the ecosystem.
8. Students will understand genetic concepts as they relate to FW management and conservation.
9. Students will understand how human values, attitudes, and behaviors influence fish and wildlife management. 1
10. Students will become familiar with stakeholder engagement and communication techniques able to communicate with non-scientist stakeholders. 1
11. Students are familiar with the law and policy underlining fish and wildlife management and conservation.

FWCE 409. Introduction to Population Ecology
3 Credits (3)
This course introduces students to the fundamental concepts and principles of population ecology. It covers topics such as population growth and regulation, life history, species interactions, age-structured population models, and metapopulation dynamics. Students will develop skills in applying basic models and interpreting data, with introductory exposure to relevant software tools such as R and Program MARK. The course also emphasizes the role of population ecology in the management and conservation of animal populations.
Prerequisite: MATH 1430G and FWCE 2110.
Learning Outcomes
1. Describe and compare exponential and logistic models of population growth.
2. Construct and interpret simple life tables and basic matrix population models.
3. Explain factors influencing population regulation and viability.
4. Describe and analyze key species interactions (competition, predation) using graphical models.
5. Apply basic models to analyze population dynamics, including metapopulation dynamics.
6. Communicate core concepts and findings effectively through written assignments.

FWCE 425. Evidence-Based Conservation and Management
3 Credits (3)
This course will explore theories and concepts that are fundamental to applied conservation management and evaluation. There is increasing need to justify and evaluate conservation and management actions, and this course will provide students with the insight and knowledge on how to consult the best evidence in conservation planning and how to set up and evaluate a conservation action plan. This course also provides insight into systems thinking, which is needed to address the complex problems faced by conservation managers. Finally, this course teaches students a specific adaptive management framework that has been adopted by several leading conservation organizations and agencies. While this course is focused on biodiversity conservation, the concepts covered about systems thinking and applied conservation planning and management will be relevant to a broader audience interested in environmental and natural resources management or stewardship.
Learning Outcomes
1. Students will understand how human values, attitudes, and behaviors influence fish and wildlife management.
2. Students will learn to use logic and reasoning to arrive to reasonable conclusions.
3. Students can disseminate information via oral communication.
4. Students are proficient in the use and application of peer-review literature (access, proper use).

FWCE 430. Avian Field Ecology
4 Credits (3+1P)
Principles of avian ecology and management with an emphasis on taxonomy, physiology, behavior and field studies. Includes weekly field trips focusing on identification and behavior of Southwest birds.
Prerequisite: FWCE 2110.
Prerequisite/Corequisite: FWCE 330 or Consent of Instructor.
Learning Outcomes
1. Students can understand concepts related to interconnectedness of habitat, abiotic factors, and Fish and Wildlife species common to the Southwest.
2. Students are proficient in the use and application of peer-review literature (access, proper use).
3. Students are familiar with the scientific method and its application.
4. Students can identify common vertebrate taxa, arrange them into phylogenetic order, and describe their anatomy and physiology.
5. Students can communicate effectively via technical writing.
6. Students will learn to use logic and reasoning to arrive to reasonable conclusions.

7. Students will develop professional (field skills) and interpersonal skills (working in groups).
8. Students can perform basic data analysis and interpret results to draw meaningful conclusions.
9. Students will learn concepts related to species interactions (predator prey-dynamics, intra- and inter-specific competition, mutualism, and disease dynamics). 1
10. Students will understand genetic concepts as they relate to Fish and Wildlife management and conservation (population size, connectivity, inbreeding depression).

FWCE 431. Mammalogy
4 Credits (3+1P)
This course provides an overview of the biology of Class Mammalia, the mammals. We will cover the classification, distribution, anatomy, physiology, life history, and ecology of mammals in lecture and learn to identify mammal orders, families, and species in lab with an emphasis on those found in the Southwest. Field trips may be required.
Prerequisite: FWCE 2110 and FWCE 330 or consent of instructor.
Learning Outcomes
1. Students can understand concepts related to interconnectedness of habitat, abiotic factors, and Fish and Wildlife species common to the Southwest.
2. Students can identify common vertebrate taxa, arrange them into phylogenetic order, and describe their anatomy and physiology.
3. Students are proficient in the use and application of peer-review literature (access, proper use).
4. Students will learn concepts related to species interactions (predator prey-dynamics, intra- and inter-specific competition, mutualism, and disease dynamics).
5. Students can communicate effectively via technical writing.
6. Students can disseminate information via oral communication.

FWCE 432. Environmental Biology of Fishes
4 Credits (3+3P)
What makes a fish, a fish? Mechanisms of circulation, gas exchange, osmotic and ionic regulation, swimming, migration, reproduction, and chemoreception will be covered in this class. Taught with FWCE 532.
Prerequisite(s): CHEM 1215G and senior standing.

FWCE 434. Aquatic Contaminants and Toxicology
4 Credits (3+3P)
Basic principles and methodologies of aquatic toxicity testing; routes of exposure and modes of action; environmental legislation and ecological risk assessment. Taught with FWCE 534. Crosslisted with: ENVS 434.
Prerequisite(s): CHEM 1215G and senior standing.

FWCE 437. Wildlife Damage Management
3 Credits (3)
Introduction to basic need and appropriate methods for resolving human-wildlife conflicts and management of animal damage. Socioeconomic, ecological, and political factors. Field trips required. Taught with FWCE 537.
Prerequisite: BIOL 2610G, FWCE 2110, FWCE 301, FWCE 409.
Learning Outcomes
1. Students can articulate principles of fishery and wildlife management and apply ecological principles to conservation.
2. Students are familiar with the scientific method and its application.
3. Students can disseminate information via oral communication.
4. Students will learn to use logic and reasoning to arrive to reasonable conclusions.
5. Students will learn concepts related to density dependence, population growth, and carrying capacity.
6. Students will learn concepts related to species interactions (predator prey-dynamics, intra- and inter-specific competition, mutualism, and disease dynamics).
7. Students will learn about human-wildlife conflicts and strategies to mitigate those conflicts.
8. Students are proficient in the use and application of peer-review literature (access, proper use).

FWCE 442. Wildlife Disease Ecology and Management
4 Credits (3+1P)
This course will provide students with an understanding of the ecological and evolutionary complexity inherent to host-pathogen interactions in wildlife systems. FWCE 442/542 introduces students to parasite and pathogen diversity, core concepts in disease ecology (e.g., pathogen population dynamics, transmission, disease models, virulence), host-pathogen coevolution, community ecology of host-pathogen interactions, and the importance of pathogens in conservation and management. In the laboratory, students will learn basic techniques to isolate pathogens from living organisms, detect pathogens using molecular tools, and model disease outbreaks using bioinformatics. Field trips are required.
Prerequisite: FWCE 2110, FWCE 330.
Learning Outcomes
1. Students can describe major concepts and theories in ecology that relate to Fish and Wildlife conservation and management (niche, succession).
2. Students can articulate principles of fishery and wildlife management and apply ecological principles to conservation.
3. Students understand the major precepts of evolutionary biology.
4. Students are familiar with techniques used to study fish and wildlife (common capture marking methods).
5. Student can design basic scientific experiments.
6. Students are proficient in the use and application of peer-review literature (access, proper use).
7. Students are familiar with the scientific method and its application.
8. Students can identify common vertebrate taxa, arrange them into phylogenetic order, and describe their anatomy and physiology.
9. Students can communicate effectively via technical writing. 1
10. Students can disseminate information via oral communication. 1
11. Students will develop professional (field skills) and interpersonal skills (working in groups). 1
12. Students can visualize and summarize ecological data using graphs and descriptive statistics. 1
13. Students can perform basic data analysis and interpret results to draw meaningful conclusions. 1
14. Students are familiar with common statistical software (R). 1
15. Students will understand population dynamics. 1
16. Students will learn concepts related to density dependence, population growth, and carrying capacity. 1
17. Students will learn concepts related to species interactions (predator prey-dynamics, intra- and inter-specific competition, mutualism, and disease dynamics).

FWCE 447. Wildlife Law and Policy
3 Credits (3)
Introduction to state and federal laws and policies for wildlife and the historical context for their development. Taught with FWCE 547.
Prerequisite: Junior or Senior level standing.

Learning Outcomes

1. Students will learn about human-wildlife conflicts and strategies to mitigate those conflicts.
2. Students will understand how human values, attitudes, and behaviors influence fish and wildlife management.
3. Students will become familiar with stakeholder engagement and communication techniques able to communicate with non-scientist stakeholders.
4. Students are familiar with the law and policy underlining fish and wildlife management and conservation (NAM, PTD).

FWCE 448. Problems
1-3 Credits (1-3)
Individual investigations in fishery or wildlife science. Maximum 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.
Prerequisite(s): 18 credits in WLSC.

FWCE 450. Special Topics
1-4 Credits (1-4)
Specific subjects and credits as announced in the Schedule of Classes. Maximum of 4 credits per semester. May be repeated up to 9 credits. Consent of Instructor required.

FWCE 457. Ecological Biometry
3 Credits (3)
This course introduces students to basic statistical methods used in ecology. Topics include data visualization, basic probability and probability distributions, estimation, hypothesis testing, and simple and multiple linear regression. Students will develop essential skills in summarizing and analyzing ecological data using R, a widely used open-source statistical software. Emphasis will be placed on practical application in ecological studies.
Prerequisite: MATH 1430G or MATH 1511G, A ST 311, FWCE 301.
Learning Outcomes

1. Demonstrate a solid understanding of basic statistical concepts and their application in ecology.
2. Summarize ecological data and create graphs and charts to effectively visualize it.
3. Apply common statistical methods to address real-world ecological questions.
4. Interpret results from statistical tests and draw inference from ecological data.
5. Develop skills in using R for ecological data analysis and visualization.
6. Communicate core statistical concepts and findings effectively through written assignments.

FWCE 459. Aquatic Ecology
4 Credits (4)
Ecological functions of plant and animal communities in aquatic ecosystems with emphasis on chemical and physical properties, productivity, species interactions, population dynamics, and concepts for diagnosing problems and restoring aquatic ecosystems. Taught with FWCE 559.
Prerequisite(s): FWCE 301 or BIOL 301, CHEM 1225G, MATH 1430G.

FWCE 464. Fish and Wildlife Management, Law, and Policy
3 Credits (3)
The course will focus on the policy and governance surrounding fish and wildlife management with the goal of preparing students for careers in fish and wildlife management.
Learning Outcomes

1. Students can apply the scientific method.
2. Students are proficient the finding, using and applying peer-review literature (access, proper use).
3. Students can communicate effectively via technical writing.
4. Students can disseminate information via oral communication.
5. Students understand the law and policy underlying fish and wildlife management and conservation (North American Model, Public Trust Doctrine).

FWCE 467. Herpetology
4 Credits (4)
Systematics, taxonomy, ecology, behavior, and conservation of amphibians and reptiles. Field trips required. Taught with FWCE 567.
Prerequisite(s): FWCE 330.

FWCE 471. GIS for Natural Resource Scientists
4 Credits (4)
Practical GIS class for students with little or no GIS experience. Class focuses on learning to use industry-standard software and applications in natural resource management. Taught with FWCE 571.
Learning Outcomes

1. Students can articulate principles of fishery and wildlife management and apply ecological principles to conservation.
2. Students can understand concepts related to interconnectedness of habitat, abiotic factors, and FW species common to the Southwest.
3. Students are familiar with methods used to measure environmental variables.
4. Students are familiar with the scientific method and its application.
5. Students will learn to use logic and reasoning to arrive to reasonable conclusions.
6. Students can perform basic data analysis and interpret results to draw meaningful conclusions.

FWCE 472. Wildlife Museum Internship
1-4 Credits (1-4)
Substantial directed work experience in various functions of the wildlife natural history museum developed by the student in consultation with the faculty curator. Internships may involve aspects of collection development and management, public education programs, or other related museum activities. Internship must be approved by the faculty curator. May be repeated up to 9 credits. Consent of Instructor required.
Prerequisite(s): BIOL 2610G and BIOL 2610L.

FWCE 482. Ichthyology
4 Credits (3+1P)
Fishes are an incredibly diverse group and have evolved numerous anatomical, physiological, behavioral, and ecological adaptations. In an effort to better understand how fish function within a broader ecosystem, we will take a holistic view of the group. We will first focus on the phylogeny, physiology, and anatomy of fishes such that we can better understand fishes within an ecological context in the later part of the course. Collectively, our treatment of fish should provide a broad overview that will improve your understanding of the form, function, and ecology of fishes.
Prerequisite: FWCE 330 or consent of instructor.
Learning Outcomes

1. Students will understand concepts related to conservation biology, especially the drivers of biodiversity patterns, biodiversity crisis and its causes, extinction vortex, etc.

2. Students will understand concepts related to the abiotic component of the ecosystem (biomes, lentic zones, nutrient cycling), with an emphasis on global change.
3. Students can identify common vertebrate taxa, arrange them into phylogenetic order, and describe their anatomy, physiology, and natural history.
4. Students can interpret and understand analytical results.

FWCE 509. Population Ecology
3 Credits (3)
This course introduces students to the fundamental theories and quantitative methods of population ecology. It covers topics such as population growth and regulation, demographic analysis, species interactions, and spatial population dynamics. Students will gain hands-on experience in applying these concepts by implementing relevant models and analytical techniques using the open-source statistical software R and Program MARK.
Learning Outcomes
1. Develop and apply deterministic and stochastic population growth models.
2. Construct and interpret life tables and matrix population models.
3. Assess population viability and metapopulation dynamics.
4. Examine species interactions using competition and predation models.
5. Apply quantitative methods to estimate population abundance and survival rates.

FWCE 510. Wildlife Ecology Teaching Practicum
3 Credits (3)
This doctoral-level practicum provides hands-on experience in teaching undergraduate courses in wildlife and fisheries ecology. Students will engage in course planning, instructional delivery, and assessment under faculty supervision. Emphasis is placed on applying evidence-based teaching practices, communicating ecological concepts effectively, and fostering inclusive learning environments. Participants will also reflect on their teaching, receive feedback, and develop a professional teaching portfolio. Designed for future educators and academic professionals, this course prepares students for teaching roles in higher education and science communication. May be repeated once for credit with departmental approval.
Prerequisite: Doctoral standing in the Department of Fish, Wildlife and Conservation Ecology.
Learning Outcomes
1. The students will effectively communicate scientific information verbally and in written format.
2. The students will understand how to conduct scholarly and professional activities in an ethical manner.
3. The students will demonstrate thorough knowledge of their chosen disciplines within fish, wildlife and conservation ecology.

FWCE 512. Scientific Writing
3 Credits (3)
This graduate-level course will guide students through the development of a scientific manuscript suitable for submission to a peer-reviewed journal. We will cover the structure of a scientific paper, how to approach drafting each section, as well as give guidance on the submission and peer-review process, and other ethical considerations such as coauthorship. By the end of this course each student will have produced a manuscript based on their research focus.
Learning Outcomes
1. The students will effectively communicate the importance of their research, research hypotheses, data collection and analytical methods, and study conclusions.
2. The students will effectively communicate their research in writing.

FWCE 515. Graduate Seminar
1 Credit (1)
Current topics.

FWCE 523. Model Selection and Multimodel Inference in Ecology
2 Credits (2)
This course will introduce students to the theory and practice of model selection and multimodel inference in ecology. Both techniques are widely used in ecology, natural resources, and related disciplines and have become essential tools in gaining reliable inference from data. A substantial number of novel model selection techniques have emerged in recent years, and are accompanied by their unique drawbacks and potential pitfalls. The objective of this class if to provide students with background knowledge to select the appropriate model selection and inferential tools and interpret the results with confidence and accuracy. The course will comprise a mixture of short lectures, lab exercises, and discussions of the primary literature. There are no course prerequisites, though students are encouraged to have successfully completed at least one semester of graduate-level statistics.
Learning Outcomes
1. Students will demonstrate theoretical and practical understanding of data analysis methods employed.
2. Students will correctly interpret the results of their data analyses.
3. The students will select and use the most appropriate research methodologies and technologies to address the research questions in their thesis/proposal.

FWCE 524. Structured Decision Making in Fish and Wildlife Management
3 Credits (3)
This course will introduce students to the theory and application of structured decision making (SDM). SDM incorporates human-centered values into the decision making process, identifies a set of actions to achieve those values, and creates models that connect actions to outcomes. Though SDM has long been used in business contexts, SDM has recently been applied to diverse problems in wildlife and fisheries management at local, state, and federal levels. Unlike other decision processes that strive to separate management and scientific endeavors, SDM is a collaborative process that unites managers and scientists, and adds transparency to decision making to promote buy-in and trust. The course will comprise a mixture of lectures, discussions of the primary literature, lab exercises, and mock workshop sessions.
Learning Outcomes
1. Students will demonstrate theoretical and practical understanding of the data analysis methods employed.
2. Students will correctly interpret the results of their analyses.
3. Students will select and use the most appropriate research methodologies and technologies to address the research hypothesis in their thesis/proposal.

FWCE 525. Evidence-Based Conservation and Management
3 Credits (3)
This course will explore theories and concepts that are fundamental to applied conservation management and evaluation. There is increasing need to justify and evaluate conservation and management actions, and this course will provide students with the insight and knowledge on how to consult the best evidence in conservation planning and how to set

up and evaluate a conservation action plan. This course also provides insight into systems thinking, which is needed to address the complex problems faced by conservation managers. Finally, this course teaches students a specific adaptive management framework that has been adopted by several leading conservation organizations and agencies. While this course is focused on biodiversity conservation, the concepts covered about systems thinking and applied conservation planning and management will be relevant to a broader audience interested in environmental and natural resources management or stewardship.

Learning Outcomes

1. The students will effectively communicate the importance of their research, research hypotheses, data collection and analytical methods, and study conclusions.
2. The students will effectively communicate their research orally.
3. The students will develop professional working relationships with colleagues and agency personnel.

FWCE 526. Demographic Modeling and Bayesian Inference in Modern Wildlife Management
3 Credits (3)

This course introduces students to the practical application of demographic models in wildlife management. It explores how wildlife laws and regulations are created in the United States, how science is being formally incorporated into the regulatory process, and how advanced quantitative methods are used to connect wildlife ecology with wildlife law. Students will gain hands-on experience using popular software such as R and JAGS to implement these methods within a Bayesian framework.

Learning Outcomes

1. Explain how wildlife laws and regulations are developed and informed by science.
2. Apply advanced demographic models to analyze real-world wildlife datasets.
3. Demonstrate proficiency in statistical software for Bayesian analysis.
4. Interpret and effectively present quantitative findings for management decisions.

FWCE 530. Large Mammal Ecology, Conservation and Management
3 Credits (3)

This course will cover aspects of large mammal ecology, management and conservation. Will include aspects of foraging ecology, resource and habitat selection, competition and resource partitioning, predation and population dynamics. Taught with FWCE 436.

Learning Outcomes

1. Students possesses the ability to develop and articulate appropriate research hypotheses consistent with the overall goals of the thesis research project.
2. The students will effectively communicate their research in writing.

FWCE 531. Mammalogy
4 Credits (3+1P)

Classification, identification, anatomy, physiology, life history, and ecology of mammals. Field trips required.

Learning Outcomes

1. Students will demonstrate theoretical and practical understanding of the data analysis methods employed.
2. Students will effectively communicate their research in writing.
3. Students will effectively communicate their research orally.

FWCE 532. Environmental Biology of Fishes
4 Credits (3+3P)

What makes a fish, a fish? Mechanisms of circulation, gas exchange, osmotic and ionic regulation, swimming, migration, reproduction, and chemoreception will be covered in this class. Taught with FWCE 432; however, students are responsible for all requirements in FWCE 432, plus additional assignments.

FWCE 535. Special Topics
1-4 Credits (1-4)

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

FWCE 537. Wildlife Damage Management
3 Credits (3)

Introduction to basic need and appropriate methods for resolving human-wildlife conflicts and management of animal damage. Socioeconomic, ecological, and political factors. Field trips required. Taught with FWCE 437. Students are responsible for all requirements for FWCE 437 plus additional work. Prerequisite(s): BIOL 2610G, FWCE 2110, FWCE 301 and FWCE 409

FWCE 540. Wildlife Habitat Relationships
4 Credits (4)

The study of wildlife-habitat relationships primarily seeks to describe how the distribution and abundance of resources used for food, cover and security, and constraints on the use of these resources influence the distribution of animals. This course will cover aspects of animal behavior related to how animals select habitat, theoretical models of habitat selection, the influence of inter- and intra-specific interactions on habitat selection, habitat quality, study designs for wildlife-habitat studies, modeling habitat selection and data analyses.

Learning Outcomes

1. Students can select and use the most appropriate data analysis methodologies given the research design and hypothesis being tested.
2. Students will demonstrate theoretical and practical understanding of the data analysis methods employed.
3. Students will correctly interpret the results of their data analyses.
4. Students will effectively communicate their research in writing.

FWCE 541. Conservation Genetics
3 Credits (3)

This course will provide a broad introduction to the use of molecular markers to address questions in ecology, evolution, behavior, and especially conservation. We will begin by learning about genetic variation and basic population genetic principles, then we will explore the applications of genetic markers for understanding relatedness, population structure, and conservation of biodiversity. Finally, we will discuss how to apply and interpret molecular approaches in conservation.

Learning Outcomes

1. Students will demonstrate theoretical and practical understanding of the data analysis methods employed.
2. Students will correctly interpret the results of their data analyses.
3. The students will effectively communicate the importance of their research, research hypotheses, data collection and analytical methods, and study conclusions.
4. The students will effectively communicate their research in writing.
5. The students will effectively communicate their research orally.

FWCE 542. Wildlife Disease Ecology and Management
4 Credits (3+1P)

This course will provide students with an understanding of the ecological and evolutionary complexity inherent to host-pathogen interactions in

wildlife systems. FWCE 442/542 introduces students to parasite and pathogen diversity, core concepts in disease ecology (e.g., pathogen population dynamics, transmission, disease models, virulence), host-pathogen coevolution, community ecology of host-pathogen interactions, and the importance of pathogens in conservation and management. In the laboratory, students will learn basic techniques to isolate pathogens from living organisms, detect pathogens using molecular tools, and model disease outbreaks using bioinformatics. Field trips are required.
Prerequisite: FWCE 2110, FWCE 330.

Learning Outcomes

1. The students can formulate a scientifically sound study/research design linking the overall goals of the thesis research project with the research hypothesis.
2. Students can select and use the most appropriate data analysis methodologies given the research design and hypothesis tested.
3. The students will select and use the most appropriate research methodologies and technologies to address the research hypothesis in their thesis/proposal.
4. The students will effectively communicate the importance of their research hypothesis, data collection and analytical methods, and study conclusions.
5. The students will effectively communicate their research in writing.
6. The students will effectively communicate their research orally.
7. The students will develop professional working relationships with colleagues and agency personnel.

FWCE 546. Conservation Social Sciences
3 Credits (3)

This course provides an overview of social science concepts and research important to the conservation and management of wildlife and natural resources. The course will introduce students to the social, psychological, and economic underpinnings of human dimensions research, and specific approaches used to change human behaviors to improve conservation outcomes. Some of the approaches covered in the course include economic incentives, behavioral nudges, and community-based conservation. Additionally, the course will provide an overview of the methods used by conservation social scientists including participatory, qualitative, and quantitative methods. Students will be challenged to approach human dimensions issues from multiple perspectives. The concepts covered about human dimensions will be relevant to a broad audience interested in environmental and natural resource conservation, management, and stewardship.

Learning Outcomes

1. The students will select and use the most appropriate research methodologies and technologies to address the research hypotheses in their thesis/proposal.
2. The students will effectively communicate the importance of their research, research hypotheses, data collection and analytical methods, and study conclusions.
3. The students will effectively communicate their research in writing.

FWCE 547. Wildlife Law and Policy
3 Credits (3)

Introduction to state and federal laws and policies for wildlife and the historical context for their development. Taught with FWCE 447.

FWCE 548. Graduate Problems
1-3 Credits (1-3)

Individual studies in fishery and wildlife sciences. Maximum of 3 credits per semester. No more than 6 credits of this course and FWCE 598, combined, toward a degree. May be repeated up to 6 credits.

FWCE 557. Ecological Biometry
3 Credits (3)

This course introduces students to fundamental descriptive and inferential statistical methods commonly used in ecological research. Topics include data visualization, estimation, hypothesis testing, and statistical modeling. Students will develop essential skills in summarizing and analyzing ecological data using R, a powerful open-source statistical software. Emphasis will be placed on practical applications of statistics to real-world problems in ecology.

Learning Outcomes

1. Demonstrate a critical understanding of fundamental statistical concepts in ecological contexts.
2. Summarize and visualize ecological data.
3. Apply a range of statistical methods to address real-world ecological problems.
4. Interpret statistical findings and draw inference from ecological data.
5. Demonstrate proficiency in using R for ecological data analysis and visualization.

FWCE 558. Nonthesis Project
1-6 Credits (1-6)

Independent study to satisfy nonthesis project requirement. Maximum of 6 credits toward degree. Available only to nonthesis students. May be repeated up to 6 credits.

FWCE 559. Aquatic Ecology
4 Credits (3+1P)

Ecological functions of plant and animal communities in aquatic ecosystems with emphasis on chemical and physical properties, productivity, species interactions, population dynamics, and concepts for diagnosing problems and restoring aquatic ecosystems. Taught with FWCE 459.
Prerequisite: FWCE 301 or BIOL 301, CHEM 1225G, MATH 1430G.

Learning Outcomes

1. Students can possesses the ability to develop and articulate appropriate research hypotheses consistent with the overall goals of the thesis research project.
2. Students can select and use the most appropriate data analysis methodologies given the research design and hypothesis being tested.
3. The students will effectively communicate the importance of their research, research hypotheses, data collection and analytical methods, and study conclusions.
4. The students will effectively communicate their research in writing.
5. The students will effectively communicate their research orally.
6. The students will select and use the most appropriate research methodologies and technologies to address the research hypotheses in their thesis/proposal.
7. Students will correctly interpret the results of their data analyses.
8. Students can formulate a scientifically sound study/research design linking the overall goals of the thesis research project with the research hypothesis.

FWCE 567. Herpetology
4 Credits (3+1P)

Systematics, taxonomy, ecology, behavior and conservation of amphibians and reptiles. Field trips required. Taught with FWCE 467.

Learning Outcomes

1. The students can formulate a scientifically sound study/research design linking the overall goals of the thesis research project with the research hypothesis.

2. Students will demonstrate theoretical and practical understanding of the data analysis methods employed.
3. The students will select and use the most appropriate research methodologies and technologies to address the research hypothesis in their thesis/proposal.
4. The students will effectively communicate the importance of their research hypothesis, data collection and analytical methods, and study conclusions.
5. The students will develop professional working relationships with colleagues and agency personnel.

FWCE 571. GIS for Natural Resource Scientists
4 Credits (4)
Practical GIS class for students with little or no GIS experience. Class focuses on learning to use industry-standard software and applications in natural resource management. Taught with FWCE 471.
Learning Outcomes
1. Students can select and use the most appropriate data analysis methodologies given the research design and hypothesis being tested.
2. Students will demonstrate theoretical and practical understanding of the data analysis methods employed.
3. Students will correctly interpret the results of their data analyses.
4. Students will select and use the most appropriate research methodologies and technologies to address the research hypotheses in their proposal.

FWCE 582. Ichthyology
4 Credits (4)
Fishes are an incredibly diverse group and have evolved numerous anatomical, physiological, behavioral, and ecological adaptations. In an effort to better understand how fish function within a broader ecosystem, we will take a holistic view of the group. We will first focus on the phylogeny, physiology, and anatomy of fishes such that we can better understand fishes within an ecological context in the later part of the course. Collectively, our treatment of fish should provide a broad overview that will improve your understanding of the form, function, and ecology of fishes. Taught with FWCE 482.
Learning Outcomes
1. Students understand the major precepts of evolutionary biology.
2. Students can understand concepts related to interconnectedness of habitat, abiotic factors, and FW species common to the Southwest.
3. Students can identify common vertebrate taxa, arrange them into phylogenetic order, and describe their anatomy and physiology.
4. Students can communicate effectively via technical writing.
5. Students will develop professional (field skills) and interpersonal skills (working in groups).

FWCE 598. Special Research Programs
1-3 Credits (1-3)
Individual investigations, either analytical or experimental. Maximum of 3 credits per semester. No more than 6 credits of this course and FWCE 548, combined, toward a degree. Not available to students in the nonthesis program. May be repeated up to 6 credits.

FWCE 599. Master's Thesis
1-9 Credits (1-9)
Thesis. May be repeated up to 30 credits. Thesis/Dissertation Grading.

FWCE 690. Doctoral Seminar
1 Credit (1)
This doctoral-level seminar provides an interdisciplinary forum for engaging with a distinguished seminar series featuring guest speakers from academia, government agencies, national laboratories, non-governmental organizations (NGOs), and industry. Through weekly presentations and discussions, students gain exposure to cutting-edge research, policy-relevant insights, and real-world applications across a range of fields. The course emphasizes critical analysis, cross-sector dialogue, and professional development. Students will prepare for and respond to each seminar through guided readings, written reflections, and facilitated discussions. Designed to foster intellectual breadth and career-relevant perspectives, this seminar supports doctoral students in connecting their research to broader societal challenges and opportunities. May be repeated up to 2 credits.
Learning Outcomes
1. Students will demonstrate theoretical and practical understanding of the data analysis methods employed.
2. Students will correctly interpret the results of their data analyses.
3. The students will select and use the most appropriate research methodologies and technologies to address the research hypotheses in their thesis/proposal.
4. The students will effectively communicate the importance of their research, research hypotheses, data collection and analytical methods, and study conclusions.
5. The students will develop professional working relationships with colleagues and agency personnel.

FWCE 699. Doctoral Research
1-18 Credits (1-18)
Research units that are preformed prior to the students comprehensive exam. May be repeated up to 88 credits.
Learning Outcomes
1. Students will be able to formulate hypotheses and conduct research.
2. Students will demonstrate thorough knowledge of their chosen discipline in Fish, Wildlife and Conservation Ecology.

FYEX-FIRST YEAR EXPERIENCE

FYEX 1110. First-year Seminar
1-3 Credits
This course is designed to help students achieve greater success in college and in life. Students will learn many proven strategies for creating greater academic, professional, and personal success. Topics may include career exploration, time management, study and test-taking strategies to adapt to different learning environments, interpersonal relationships, wellness management, financial literacy, and campus and community resources.
Learning Outcomes
1. Recognize the ways in which s/he is responsible for her/his own experience in education.
2. Identify, locate, and utilize available campus resources essential for academic success.
3. Create long-and short-term goals associated with student success and career planning.
4. Implement time management techniques to organize the semester's workload.
5. Develop strategies to use individual strengths to succeed and reflect upon coursework and course progress in multiple classes to alter academic behaviors and create deeper meaning and learning.

6. Apply the skills essential for analyzing and solving problems in her/his academic, professional, and personal life, which may include financial literacy and wellness management.
7. Develop and apply essential skills such as reading, taking notes, studying,memorizing, taking tests, and self-management skills necessary for college success.
8. Identify and revise self-defeating patterns of behavior, thought, and emotion as well as unconscious limiting beliefs.
9. Develop supportive relationships with members of the campus community. 1
10. Develop essential reading, writing, and critical thinking skills used in study and in research. 1
11. Demonstrate understanding of how to use the computer for academic purposes, including learning management systems, email communications, research databases, degree audit, and other online resources.

FYEX 1112. The Freshman Year Experience
3 Credits (3)
An introduction to the university and its resources; emphasis on development of academic and personal skills that enable freshmen to become successful learners. Restricted to: Main campus only.
Prerequisite(s): Freshman Standing Only.
Learning Outcomes
1. Appreciate the goals, methods, and values of higher education
2. Expand intellectual development and self-direction
3. Establish a faculty mentor relationship
4. Enhance knowledge and practice of collaborative learning principles
5. Establish a familiarity with campus resources and student services
6. Develop public speaking, critical thinking, library research, and study strategies
7. Evaluate talents and interest in relation to selecting a major and career planning
8. Examine and clarify values
9. Acknowledge and enhance respect for diversity

FYEX 1116. Managing Your Money
1 Credit (1)
Principles and strategies for effective money management. Includes financial goal setting, both short and long term. Explores the relationship between career and income earning potential. Explores issues of credit and debt management and prevention of identity theft.
Learning Outcomes
1. Demonstrate understanding of the psychology of money and how it relates to personal financial decisions
2. Create realistic short- and long-term financial goals and a personal budget
3. Comprehend and manage college finances, including types of financial aid
4. Appreciate the importance of the Free Application for Federal Student Aid (FAFSA)
5. Describe the financial aspects of career development and how they apply to their own lives, including resume, taxes, salary, benefits
6. Apply principles of student loan management
7. Demonstrate use of credit reports in the prevention identity theft
8. Identify essential elements of smart spending and borrowing
9. Recognize debt and repayment costs 1
10. Explain the basics of saving and planning for the financial future 1
11. Create focused, developed, clear discussion posts and other written work for this class

FYEX 1117. Financial Literacy Money Matters
2 Credits (2)
This course will cover a variety of financial literacy topics ranging from budgeting to student loan repayment. This course is designed to assist students in becoming more financially literate. Restricted to Las Cruces campus only.
Learning Outcomes
1. Master effective strategies and other skills related to financial literacy
2. Establish a familiarity with campus resources designed to foster financial literacy and wellness
3. Exhibit intellectual development and self-direction in relation to financial literacy and wellness
4. Identify financial literacy skills which best support individual financial well-being
5. Demonstrate skills and knowledge that allows the student to make informed and effective decisions with all of their financial resources

FYEX 1131. Personal Learning Skills I
1-3 Credits
Individualized programs for self-improvement in skill areas necessary for academic success in the university environment. Each course to bear an appropriate subtitle. May be repeated up to 3 credits. Graded S/U.
Learning Outcomes
1. Synthesize the importance of critical thinking through self-reflection and self-exploration
2. Analyze and apply critical thinking skills using the eight intellectual standards
3. Describe the common barriers to critical thinking and construct problem solving strategies
4. Evaluate information and knowledge to determine misinformation and inaccuracies
5. Demonstrate information literacy by recognizing when information is needed and being able to efficiently locate, accurately evaluate, effectively use, and clearly communicate the information in various formats and mediums

FYEX 1132. Academic and Personal Effectiveness
2 Credits (2)
Learn academic self-analysis skills through the application of study and learning techniques to current course demands. Exposure to a variety of topics which enhance university and life-long learning.
Learning Outcomes
1. Students will demonstrate mastery of course objectives in time management, stress management, test taking, and other skills through completion of activities, quizzes, discussions, and more.
2. Students will be able to identify NMSU campus resources, including their services, location, and contact information.
3. Students will exhibit intellectual development and an improved self-direction through participation in the course.
4. Students will be able to identify and adopt those management skills which best support academic and career choices.

FYEX 1133. Academic Reading and Study Skills
1-4 Credits
Introduction to and practice with strategies for effective reading and studying at the college level. Provides laboratory.

Learning Outcomes

1. Use reading strategies to synthesize texts
2. Identify rhetorical elements of texts
3. Identify and apply different study methods
4. Recognize the role of student support services for student success
5. Identify and practice effective time management skills
6. Demonstrate proficient computer skills
7. Write an effective summary

FYEX 1134. Speed Reading
1 Credit (1)
Introduction to strategies and techniques for increasing reading rate and comprehension related to academic areas.
Learning Outcomes

1. Demonstrate an understanding of speed reading strategies and eye movement drills
2. Expand vocabulary and reading comprehension
3. Improve reading rates and develop reading techniques
4. Demonstrate an understanding of skimming techniques and scanning strategies

FYEX 1140. Career Exploration
1 Credit (1)
Survey of careers possible with community college associate degrees. Information on how to make a career choice.
Learning Outcomes

1. Desired career and lifestyle
2. Areas of interest
3. Skills and abilities
4. Personal values
5. DACC programs that match the student's interests, abilities, and values
6. Three careers that match the student's interests, abilities, values, and personality

FYEX 1160. Tutorial
1-3 Credits
Development of specific skills required for college courses, such as note-taking, listening, and test-taking. To be taken in conjunction with a regular designated college course.
Learning Outcomes

1. Demonstrate the ability to organize their time in order to improve study habits.
2. Apply pre-reading strategies to improve reading concentration and comprehension.
3. Demonstrate basic understanding of the systems of the body.
4. Identify techniques to improve personal concentration and comprehension skills.
5. Identify and demonstrate listening skills.
6. Identify effective study and note taking skills.
7. Identify and demonstrate effective test-taking skills.
8. Identify critical thinking skills used in nursing.
9. Demonstrate knowledge of key terms.

FYEX 1170. NMSU Gospel Choir
1 Credit (1)
Students will gain performance experience and exposure to urban contemporary gospel music. Open to all majors. May be taken for unlimited credit. Restricted to: Main campus only.
Learning Outcomes

1. Comprehended the foundation related to singing in a gospel choir setting
2. Demonstrate an understanding of the difference between the musical treble and bass clef
3. Expand vocabulary and reading comprehension of gospel music terminology.
4. Improve the speed and accuracy of music sheet and sight reading

FYEX 1996. Special Topics
1-4 Credits
Covers specific study skills and critical thinking topics. Specific sub-titles to be listed in the Schedule of Classes. May be repeated for a maximum of 8 credits.
Learning Outcomes

1. Varies

FYEX 2994. Prior Learning: Professional Portfolio
1-6 Credits
Creating a portfolio that outlines professional and educational experiences. Life skills and education learned through workplace training and non-traditional education experiences will be evaluated for consideration of awarding college credit. Students will draft a life history paper, prepare a professional resume, assemble supporting documentation and evidence in support of their petition to receive college credit for prior learning. Culminating activities will include an oral presentation of the portfolio contents. Graded S/U.
Prerequisite(s): CCDE 110 N or equivalent.
Learning Outcomes

1. produce writing that is focused on a main point
2. produce writing that is organized
3. produce writing follows task-specific conventions of paragraphing, sentence boundaries, usage, agreement, punctuation and spelling
4. deliver effective speeches
5. organize and present information with a purpose
6. apply effective communication strategies in their personal and professional lives

G S-GRADUATE STUDIES

G S 500. Masters Non-Thesis Final Exam Credit
1 Credit (1)
Course for non-thesis masters students who have completed all program requirements except the final comprehensive exam. A maximum of 12 credits may be earned. Graded S/U.
Prerequisites: advisor signature required.

G S 596. Special Topics
12 Credits (12)
Special Topics course for masters and doctoral students. Max be repeated up to 12 credits. Graded S/U.
Learning Outcomes

1. Varies

G S 600. Doctoral Research
1-15 Credits
Course number is used for assigning credit for research performed prior to successful completion of the doctoral comprehensive examination.

G S 700. Doctoral Dissertation
15 Credits
Dissertation.

GENE-GENETICS

GENE 1110. Experimental Systems in Genetics
1 Credit (1)
Survey of molecular, biochemical, organismal, and computer science based approaches to investigate how genes determine important traits. Historical development and topics of current interest will be discussed.
Learning Outcomes
1. To give the students a historical perspective on the field of genetics.
2. To familiarize the students to introductory concepts and vocabulary to the field of genetics.
3. Introduce experimental systems within the field of genetics and to give perspective to current genetic research.
4. As this course is designed for beginning students as an overview of faculty and research labs on campus. The students majoring in genetics are encouraged to meet with faculty and to explore opportunities available to them on campus

GENE 303V. Genetics and Society
3 Credits (3)
Relates the science of genetics with social ramifications. Ways in which genetics and evolution interact with social, political, and economic issues. Includes genetic engineering, gene therapy, DNA finger-printing, ancient DNA, plant and animal improvement, and future prospects. Students required to formulate value judgments on contemporary biological issues that will impact society. Crosslisted with: AGRO 303V.
Learning Outcomes
1. Explain foundational genetic concepts and modern biotechnological techniques, including whole genome sequencing and genetic variation.
2. Analyze the implications of genetic technologies, such as cloning, gene therapy, genetic testing, and DNA forensics, to society.
3. Evaluate ethical issues surrounding genetic applications, including genetic discrimination, eugenics, and ownership of genetic information.
4. Develop and defend informed arguments about controversial topics in genetics (cloning and stem cells), using scientific evidence and ethical reasoning.
5. Collaborate on a group project (a term paper) to research and present real-world genetics-related issues and their impact on society.

GENE 305. Principles of Genetics
3 Credits (3)
Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.
Prerequisite: (BIOL 2610G and BIOL 2110G, or BIOL 2110G and BCHE 140, and either CHEM 1215G or CHEM 1216).
Learning Outcomes
1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

GENE 305 L. Genetic Techniques
1 Credit (3P)
Experimental procedures used in genetic research including: sexual transmission genetics, eukaryotic DNA isolation, DNA marker development and genotyping, polymerase chain reaction, and cytogenetics.
Prerequisite(s)/Corequisite(s): GENE 315, or AGRO/ANSC/BIOL/HORT 305.

GENE 315. Molecular Genetics
3 Credits (3)
Covers fundamental principles of DNA structure and replication, transcription, translation, gene regulation, recombinant DNA technology, and a survey of genomics and bioinformatics. Recommend CHEM 313.
Prerequisite(s): CHEM 1225G and BIOL 2110G.

GENE 320. Hereditary and Population Genetics
3 Credits (3)
Covers fundamental principles of reproduction, variation, and heredity in plants and animals including: Mendelian inheritance, mitosis, meiosis, genetic linkage, random mating, genetic drift, natural selection, inbreeding, migration, mutation, interrelationships between individuals, populations and communities and the environment.
Prerequisite: CHEM 1215G & BIOL 2110G.
Learning Outcomes
1. Deduce correctly how a trait is being inherited from one generation to another in any species.
2. Explain correctly concepts associated with Mendelian, quantitative, and population genetics.
3. Solve numerical problems correctly associated with Mendelian inheritance of traits, gene linkage and recombination, quantitative inheritance of traits, and population genetics.

GENE 391. Genetics Internship
1-6 Credits (1-6)
Professional work experience in genetics under the joint supervision of an employer and a faculty member. Documentation of proposed internship activities must be submitted prior to the start of the internship. A written report is required after the internship is completed. No more than 6 credits toward a degree. May be repeated up to 6 credits. Graded: S/U Grading (S/U, Audit).

GENE 440. Genetics Seminar
1 Credit (1)
Organization, preparation, and presentation of genetic studies in model microorganism, plant, or animal systems that have been used to solve problems in molecular, cellular, and developmental biology.
Prerequisite: Seniors only; GENE 315 & GENE 320.
Learning Outcomes
1. Evaluate and discuss scientific literature associated with the use of a genetic model (microorganism, plant, or animal).
2. Identify several types of peer-reviewed journal articles.
3. Lead a discussion of a peer-reviewed journal article in genetics.
4. Develop and present a three-minute “lightning talk”.
5. Organize, develop, and deliver a presentation on a topic in genetics.

GENE 449. Special Problems
1-3 Credits (1-3)

Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 3 credits toward a degree. Consent of instructor required.

GENE 450. Special Topics
1-3 Credits (1-3)
Specific subjects to be announced in the schedule of classes. Maximum of 3 credits per semester and a total of 3 credits toward a degree. Consent of instructor required.

GENE 452. Applied Bioinformatics
3 Credits (3)
Survey and application of publicly available bioinformatic tools that treat genomic DNA, cDNA, and protein sequences, RNA abundance, as well as tools that allow inference based on phylogenetic relationships.
Prerequisite: AGRO/ANSC/BIOL/HORT 305 or GENE 315 and GENE 320, and BCHE 341, or BCHE 395.
Learning Outcomes
1. Define bioinformatics and its relevance in different fields or disciplines.
2. Interpret gene sequence and expression information derived from genomic and transcriptomic databases.
3. Identify the importance of sequencing the genomes of organisms and determine the relationships of sequence to the structure, function, and diversity of DNA, RNA, and proteins.
4. Implement information derived from bioinformatics to solve specific biological problems (disease resistance in animals and plants).
5. Organize a round-table discussion of a peer-reviewed journal demonstrating the application of bioinformatics software/program(s) or databases to study (a) gene expression, (b) multiple sequence alignments, or (c) genomics and develop a presentation and research project proposal related to bioinformatics.

GENE 486. Genes and Genomes
3 Credits (3)
Extensive coverage of nuclear and organelle genome structure in plants and animals, genome restructuring including duplication, anueploidy, chromosome translocations and inversions, comparative genomics, and molecular systematics.
Prerequisites: AGRO/ANSC/BIOL/HORT 305 or GENE 315, and GENE 320.

GEOG-GEOGRAPHY

GEOG 1110G. Physical Geography
4 Credits (3+3P)
This course introduces the physical elements of world geography through the study of climate and weather, vegetation, soils, plate tectonics, and the various types of landforms as well as the environmental cycles and the distributions of these components and their significance to humans.
Learning Outcomes
1. Define, describe, illustrate, distinguish among or explain the use of maps, map scale, globes, map projections, and remote sensing.
2. Define, describe, illustrate, distinguish among or explain the various elements of the earth's atmosphere, earth's relation to the sun, incoming solar radiation, the ozone layer, the primary temperature controls, and the unequal heating of land and water.
3. Define, describe, illustrate, distinguish among or explain the weather makers (air temperature, air pressure, humidity, clouds, precipitation, visibility, and wind [including pressure gradient, the Coriolis force, and friction]).
4. Define, describe, illustrate, distinguish among or explain air masses, pressure systems, the various fronts and associated types of storms, weather symbols, monsoons, the various forms of precipitation, along with causes and effects of lightning.
5. Define, describe, illustrate or explain the hydrologic cycle, the characteristics and influences of the oceans and continents on the weather, the Southern Oscillation (i.e., El Nino), the effects of land/water distribution, and climates and their global distribution.
6. Define, describe, illustrate or explain the biosphere, including organisms (flora and fauna), food chains, ecosystems and relationships. Define, describe, illustrate or explain soils in terms of soil-forming processes, components, properties, and classification.
7. Define, describe, illustrate or explain the structure of the earth, the internal processes, weathering and mass wasting, fluvial processes, characteristics and processes of arid regions, processes of coastal and Karst topographical regions, the processes and characteristics of glaciation (mountainous and continental).
8. Define, describe, illustrate, distinguish among or explain specific impacts by humans on weather, climate, and on the ecosystem at large.
9. Perform tests and collect data to analyze and classify weather, climate and landforms characteristics, processes, and impacts both quantitatively and quantitatively. This includes reading and extracting basic information from maps, diagrams, remote sensing devices, graphs, and tables. 1
10. Apply critical thinking skills such as inductive, deductive, and mathematical reasoning to solve problems using the scientific method. This includes interpreting maps, graphs and photos. 1
11. Recognize and discuss the effect of human activity on climate, climate change, the greenhouse effect, and on landforms at large. 1
12. Synthesize information from external, current sources and personal observations and discuss their relationships to class material.

GEOG 1115G. Maps and GIScience
3 Credits (3+3P)
Explore the principles of Geographic Information Science (GIScience) and its applications in solving human, natural, and socio-environmental challenges. Learn to evaluate geospatial data and technologies; analyze their significance, implications, and applications; and communicate insights effectively. Topics include map use, spatial data analysis, Geographic Information Systems (GIS), remote sensing, and Global Navigation Satellite Systems (GNSS).
Corequisite: GEOG 1115L.
Learning Outcomes
1. Explain key concepts and methods of geographic information science (GIScience).
2. Articulate the significance of geographic information in decision-making processes that address human, natural, and socio-environmental challenges.
3. Evaluate the ethical, socio-environmental, and legal implications of geospatial data, technologies, and applications.
4. Evaluate spatial and aspatial data to assess human, natural, and socio-environmental problems, as well as potential solutions.
5. Communicate effectively in written and oral formats.

GEOG 1115L. Maps and GIScience Laboratory
1 Credit (1P)
Gain hands-on field and laboratory experience with geospatial tools, including Geographic Information Systems (GIS), remote sensing, and Global Navigation Satellite Systems (GNSS). Manage, collect, analyze, interpret, and visualize spatial data to solve real-world problem, and develop your own GIScience research report.

Corequisite: GEOG 1115G.

Learning Outcomes

1. Collect spatial and aspatial data using various web and mobile apps.
2. Apply spatial and aspatial quantitative methods for data management, visualization, analysis, interpretation, and spatial problem-solving.
3. Create functional and aesthetically pleasing maps.
4. Develop a GIScience research report.
5. Communicate effectively in written and oral formats.

GEOG 1120G. World Regional Geography
3 Credits (3)

Overview of the physical geography, natural resources, cultural landscapes, and current problems of the world's major regions. Students will also examine current events at a variety of geographic scales.

Learning Outcomes

1. Identify, describe, illustrate, distinguish among or explain the basic concepts of geography, the major world regions, areal differences and similarities, the processes that shape geography natural and human, the use of maps, and the key topics of geographical interpretation (e.g., location, world importance, population, political status, resources, etc.).
2. Identify, describe, illustrate, distinguish among or explain the regional groups of Europe, its historical background, its languages and religions, major features, the diversified economy, political structures, and impact on globalization.
3. Identify, describe, illustrate, distinguish among or explain the regional groups of Russia and its satellite nations, its historical background, their languages and religions, major features, their diversified economies, political structures, current problems, and impact on globalization.
4. Identify, describe, illustrate or explain the regional nations of Middle East, their historical background, their languages and religions, the major features, the diversified economies and political structures, the current problems.
5. Identify, describe, illustrate, distinguish among or explain the regional groups of Asia, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization.
6. Identify, describe, illustrate, distinguish among or explain the regional groups of the Pacific World, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization.
7. Identify, describe, illustrate, distinguish among or explain the regional groups of Africa, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization.
8. Identify, describe, illustrate, distinguish among or explain the regional groups of Latin America, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization.
9. Identify, describe, illustrate, distinguish among or explain the regional groups of Anglo-America, their historical background its languages and religions, major features, the diversified economy and political structures, current problems, and impact on globalization. 1
10. Collect data to analyze or classify the region various historical developments and trends relating to globalization 1
11. Apply critical thinking skills in predicting future developments and impacts in economics, cultural diversity, and political stability globally. 1
12. Recognize and discuss current political “hot-spots,” their causes, and potential results with regards to globalization. 1
13. Synthesize information the data into a comprehensive world-view.

GEOG 1130G. Human Geography
3 Credits (3)

This course serves as an introduction to the study of human geography. Human geography examines the dynamic and often complex relationships that exist between people as members of particular cultural groups and the geographical "spaces" and "places" in which they exist over time and the world today.

Learning Outcomes

1. Locate on maps, globes, and other technologies various geo-political spaces and places around the world, including in the United States.
2. Describe the primary concepts, theories, methods and terms prevalent in the field of human geography.
3. Apply core geographic concepts to the spatial patterns demonstrated in real-world scenarios.
4. Identify the relationships that influence human-environmentinteraction in a specific location at a specific time.
5. Define and utilize key concepts to explain human social and cultural change over time and across geographical space.
6. Explain the geographic context of a current event or conflict.
7. Identify a current event that illustrates a core cultural geographic concept.
8. Think critically, discuss, and write about the relationships of the natural world to human geography.

GEOG 1150G. Introduction to Environmental Studies
3 Credits

This course provides an introduction to core environmental issues and how these have been debated over time. In the process, it is intended to help you read critically, write effectively, and to reflect on your own environmental concerns in relation to the analytical as well as the cultural, social, and political perspectives that have been brought to bear on environmental issues over time. Through extensive exposure to environmental issues, solutions, and institutions, the course will help prepare you for a professional career relating to environmental management and policy.

Learning Outcomes

1. Survey the major environmental issues facing humankind.
2. Assess the conflicts or perceived conflicts between society and the environment.
3. Evaluate the relationships between the environment and the economy.
4. Analyze potential solutions.
5. Develop clear and effective communicators skills.

GEOG 2130. Map Use and Analysis
3 Credits (2+3P)

Exploration of the cartographic medium. Development of critical map analysis and interpretation skills, and map literacy. Comprised of traditional lecture, labs, and map use projects.

GEOG 2996. Special Topics
1-3 Credits

Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

Learning Outcomes

1. Varies

GEOG 315V. World Agriculture and Food Problems
3 Credits (3)

This course examines key concepts and issues relevant to the world's food production systems. Topical highlights include the causes and consequences of hunger, agriculture's economic and environmental significance, sustainable development, biotechnology, and globalization of agricultural markets. As students learn about these issues from both local and global perspectives, they are engaged in the development of both their literacy of economic concepts and their core research and communication skills. We do this through a combination of relevant course readings, in class discussion exercises, and focused writing assignments on current issues of relevance. May be repeated up to 3 credits.

Learning Outcomes

1. Integrate conceptual and systems thinking and design.
2. Assess the nutrition and healthfulness of food choices.
3. Describe structure and function of food and agricultural systems.
4. Analyze roles of and relationships between food producers, consumers, and policy makers.
5. Apply basic economic concepts to describe and interpret food and agricultural issues.

GEOG 325V. New Mexico and the American West
3 Credits (3)

Discover the diverse landscapes, histories, and human-environment interactions that define New Mexico and the American West. In this course, we examine the historical, cultural, political, economic, and environmental forces that have shaped the region, from Indigenous histories and colonial legacies to contemporary land use, sustainability challenges, and climate impacts. Through critical discussions, landscape interpretation, and geographic inquiry, we will explore how people and the environment have co-evolved in the West, how narratives and representations influence conceptions of the region, and how modern challenges continue to shape its present and future. By the end of the course, you will develop a deeper understanding of the complex and contested landscapes of the West and the forces that shape this iconic region.

Learning Outcomes

1. Discuss the human and physical geography of New Mexico and the American West.
2. Critically examine definitions and narratives of the American West.
3. Evaluate contemporary environmental and cultural challenges in the West.
4. Critically interpret the landscapes of the West.

GEOG 326. U.S. National Parks
3 Credits (3)

Explore the U.S. public lands system, where conservation, history, and public access intersect. We will examine the evolution, purpose, and management of national parks, investigating how they preserve geological, ecological, and cultural resources while addressing complex environmental and social challenges. Through discussions and case studies, we will analyze the cultural, social, political, economic, and environmental forces that shape national parks today. The course culminates in an independent research or creative project, allowing you to dive deep into a parks-related topic of your choice and share your findings in a compelling and meaningful way.

Learning Outcomes

1. Discuss the history and current structure of the U.S. public lands system.
2. Describe the diverse physical landscapes represented in U.S. National Parks and their value to human and environmental well-being.
3. Explain the social, cultural, political, and economic role and function of national parks and protected places.
4. Evaluate current challenges related to parks and conservation and how critical spatial and place-based perspectives and methods might help meet those challenges.
5. Communicate an independent research or creative project on a parks-related topic through written, verbal, visual, digital, or multimedia formats.

GEOG 328V. Environment and Society of Latin America
3 Credits (3)

This course takes you on an exciting journey through Latin America, examining how geography shapes the environment, culture, and society of the region. You'll dive into the dynamic interplay between natural landscapes and human development, exploring everything from environmental issues to socioeconomic challenges. Through case studies and real-world examples, we'll tackle pressing topics like urban growth, resource management, climate change, and political conflict. Whether you're interested in sustainability, culture, or global economics, this course will provide a deeper understanding of Latin America's unique challenges and its role in the world today.

Learning Outcomes

1. Analyze how societal and environmental patterns vary across Latin American countries and regions.
2. Evaluate how globalization, development, and other factors shape societies and environments of Latin America.
3. Discuss strategies for addressing contemporary societal and environmental challenges in Latin America.
4. Critically evaluate diverse perspectives on environmental and societal challenges in Latin America using evidence-based reasoning.
5. Communicate challenges and opportunities in human-environment dynamics across Latin America's through clear, structured writing and discussion.

GEOG 331V. Environment and Society of Europe
3 Credits (3)

Join us on an in-depth exploration of Europe as both a physical place and a cultural idea. This course examines the interplay between physical landscapes, environmental dynamics, economic systems, social structures, and political institutions that shape the region. We will critically assess what defines Europe as a region, its historical and contemporary transformations, and the role of the European Union (EU) in addressing key challenges. Through critical discussions, geographic analysis, and hands-on assignments, you will engage with current regional and international issues, including migration, climate change, economic disparities, and political shifts. By the end of the course, you will not only develop a strong understanding of Europe's geography but also gain the skills to analyze its evolving identity and global significance.

Learning Outcomes

1. Critically evaluate conceptions of Europe as both a physical place and a cultural idea.
2. Explain the importance of the major countries, cities, and physical features of Europe.

3. Analyze major regional and international issues facing Europe today.
4. Evaluate the European Union (EU) and current challenges to its stability and influence.
5. Apply knowledge of Europe through a variety of forms, including critical discussions on contemporary issues, a writing assignment, and a plan for a detailed European trip.

GEOG 351. Biogeography
3 Credits (3)
Unravel the mysteries of life's distribution across the planet! In this course, you will explore how species and ecosystems are shaped by time, space, and environmental forces. From deserts to rainforests, you'll investigate the factors driving biodiversity patterns, species dispersal, and ecosystem dynamics. Along the way, you'll examine how evolution, climate, and human influences shape life on Earth. Expect hands-on learning, interactive discussions, and an independent research project culminating in a presentation of your findings. By the end of the course, you'll have a deeper appreciation for the forces that shape life on Earth—and the tools to start exploring them yourself!
Learning Outcomes
1. Analyze how species move, adapt, and survive across diverse environments, from islands to mountaintops.
2. Explain how Earth's history—plate tectonics, climate shifts, and extinctions—has shaped global biodiversity.
3. Evaluate why some places are bursting with life while others have extreme or limited biodiversity, using key biogeographic principles.
4. Apply real-world data and tools, including satellite imagery, geographic information systems, and field data, to study species distributions.
5. Conduct independent research on a biogeographic topic of your choice, culminating in a written and verbal presentation.

GEOG 353. Geomorphology
3 Credits (2+3P)
This course examines the principal theories and concepts of landform creation through an exploration of the roles of structure, processes, climate, and time.
Learning Outcomes
1. Outline the basic history of geomorphic theory and research methods.
2. Describe the trends and probable causes of Cenozoic climate change and its links to basic landform processes.
3. Describe the main landform processes including weathering, soil formation, hillslope evolution and associated natural hazards, fluvial processes, arid land processes, glacial/interglacial climates and processes.
4. Integrate field observations into basic landscape evolution reconstructions.
5. Conduct a fluvial system experiment, incorporating experimental design, implementation, and data analysis.

GEOG 357. Weather & Climate: Earth's Dynamic Atmosphere
3 Credits (3)
From basic atmospheric processes to paleoclimate analysis and modern forecast modeling, from local-to-global, we will investigate climate's influences on natural environments, cultures, economics, politics, the characteristics of regional climates, and issues of global climate change.
Learning Outcomes
1. Explain fundamental atmospheric processes that drive weather patterns and climate systems.
2. Evaluate the evidence for climate change, including historical climate data and modern forecasting models.
3. Integrate perspectives from the natural sciences, social sciences, and humanities to assess the influences of climate on nature and society from local to global scales.
4. Apply knowledge of climate dynamics to current global issues, including environmental policies, sustainability practices, and climate adaptation strategies.

GEOG 361V. Challenges and Opportunities of Globalization
3 Credits (3)
This course takes a deep dive into how globalization shapes our world—creating both exciting opportunities and serious challenges. From booming cities to struggling communities, we'll uncover why some places thrive while others get left behind. But globalization isn't just about uneven development—it's also about innovation, cultural exchange, and creative solutions to pressing global issues. Through engaging discussions, thought-provoking readings, and short writing assignments, we'll connect economic geography to real-world events, giving you new ways to understand and navigate our interconnected world.
Learning Outcomes
1. Analyze the economic, political, and cultural forces driving globalization.
2. Evaluate how globalization contributes to both uneven development and regional disparities.
3. Discuss how globalization fosters regional opportunities, innovation, and cultural exchange in response to global challenges.
4. Assess the impacts of competing economic models and trade approaches on sustainability, equity, and human and environmental well-being.
5. Communicate well-reasoned perspectives on globalization's challenges and opportunities through writing and discussion.

GEOG 363V. Culture, Nature, and the Environment
3 Credits (3)
In this course, we will explore the interactions between geography and culture, and dive into key cultural geographic concepts such as landscape, place, nature, and environment. We will consider multiple ways of doing cultural geography, focusing on cultural geography as both a critical and creative practice. We will especially emphasize the cultural geography tradition, critical cultural geographies, and cultural geography and creativity.
Learning Outcomes
1. Describe critical approaches to the cultural geographic concepts of landscape, place, space, nature, and environment
2. Analyze contemporary cultural geographic approaches to topics such as place and capitalism, place and nature, environmental narratives, and the Anthropocene
3. Articulate the connections between geography and artistic/literary practices.
4. Develop essays, discussions, story maps, and/or visual essays to apply their own practice of cultural geography through multiple forms of output.

GEOG 365V. The City
3 Credits (3)
This course takes you on a fascinating journey through the past, present, and future of urban life, exploring how cities grow, change, and adapt in an increasingly globalized world. We'll uncover the history of urban development and compare cities across North America, South American Europe, Asia, and Africa, highlighting both their unique identities and

shared transformations. You'll discover how cities are shaped—not just in their layout and design, but in how people live, work, and innovate within them. From bustling markets to cutting-edge smart cities, we'll explore the economic, social, and political forces that drive urbanization while also showcasing creative solutions to urban challenges. Whether you're curious about skyscrapers, sustainable city planning, or how neighborhoods evolve, this course will change the way you see the world's cities!

Learning Outcomes

1. Define cities from statistical, historical, cultural, economic, and political perspectives
2. Analyze how historical urban development shapes modern city form and function.
3. Evaluate how globalization, migration, transportation, technology, governance, and environmental change transform urban spaces.
4. Examine how cultural, economic, social, political, and environmental factors influence urban life and well-being.
5. Apply research and critical thinking to propose solutions for contemporary urban challenges.

GEOG 373. Introduction to Remote Sensing
4 Credits (3+3P)

Discover the exciting world of remote sensing! This course introduces the theory, methods, and real-world applications of capturing Earth from above. Explore how energy and light are used to generate stunning images of our planet from aerial and satellite platforms and learn to analyze them to uncover insights about the biosphere, hydrosphere, atmosphere, lithosphere, and cultural landscapes. Hands-on labs and engaging lectures will guide you through the basics of analyzing and interpreting remote sensing products. Dive into the science of seeing our world in a whole new way.

Learning Outcomes

1. Explain basic remote sensing concepts, data, and methods.
2. Evaluate remotely sensed products.
3. Map built and natural environments using remote sensing data and methods.
4. Execute an original remote sensing investigation.
5. Communicate an original remote sensing investigation in written and oral formats.

GEOG 381. Cartography and GIS
4 Credits (3+3P)

Unleash your inner mapmaker! This course introduces the essential concepts and techniques of cartography and geographic information systems (GIS) through dynamic lectures and hands-on labs. Explore topics like map scale, projections, and symbolization in class, and then apply these principles to design maps that are both functional and aesthetically appealing. By the end of the semester, you'll master the science and art of creating and presenting your very own GIS mapping project—a unique blend of data, design, and storytelling that's ready to impress.

Learning Outcomes

1. Explain key cartographic concepts and methods.
2. Evaluate the content, implications, and functionality of maps.
3. Create functional and aesthetically pleasing maps.
4. Execute an original GIS mapping project.
5. Communicate an original GIS mapping project in written and oral formats.

GEOG 401. Internship/Co-op
1-3 Credits

This course provides students with hands-on experience in applied geographic work through an internship or cooperative education placement. Students will work with a local, regional, or federal agency, private-sector firm, or nonprofit organization under the supervision of both an on-site professional and a geography faculty mentor. This course allows students to apply geographic knowledge and skills in professional settings while gaining valuable career experience, networking opportunities, and practical insights into the field of geography. May be repeated up to 3 credits.

Learning Outcomes

1. Apply geographic concepts, skills, and methods to real-world challenges in a professional setting.
2. Develop professional competencies, including communication, problem-solving, and project management, in an applied geographic context.
3. Reflect on internship experiences to evaluate career interests, professional growth, and the role of geography in the workplace.

GEOG 412. Geohumanities
3 Credits (3)

In recent years, artists, writers, and humanities scholars have increasingly engaged with geographic concerns, and geographers have incorporated humanities-based approaches to their work. Broadly known as the geohumanities, these interdisciplinary endeavors offer exciting ways to engage with key geographic concepts such as place, landscape, and nature. This graduate level seminar will examine both critical and creative approaches to the geohumanities.

Learning Outcomes

1. Articulate an understanding of the geohumanities as an interdisciplinary field, including its practices and its histories that draw on geography's intersection with multiple humanities fields.
2. Identify key texts, thinkers, and practices in the geohumanities, as well as spaces (such as both scholarly and public-facing journals and digital spaces) where geohumanities work is currently being advanced and developed.
3. Engage with current debates and directions within the geohumanities.
4. Develop a creative and/or critical project that uses geohumanities approaches and advances your research/scholarly/creative interests.

GEOG 435. Planning a Sustainable World
3 Credits (3)

This course tackles the big challenges we face when imagining and building the places where we live. In addition to exploring today's most pressing issues through engaging readings, we jump into solving real-world problems. You'll explore topics like how to make sustainable development fair for everyone, how to create affordable housing, and how to design land use and transportation systems that actually work together. Plus, we'll examine ways to grow local economies and build cities that are not just livable, but truly sustainable, drawing on ideas like new urbanism and neo-traditional planning.

Learning Outcomes

1. Describe key urban planning principles and how they are applied in practice.
2. Analyze the multiple dimensions of sustainable development and their role in environmental planning.
3. Evaluate strategies for addressing contemporary urban and environmental planning challenges.

4. Critically evaluate scholarly literature on planning themes and a self-selected research topic in written and oral formats.
5. Collaborate on an applied research project to develop solutions for real-world planning scenarios.

GEOG 442. Programming for GIS
3 Credits
Unlock the power of Geographic Information Systems (GIS) with the art of programming! In this dynamic course, you'll dive into the fundamentals of GIS programming through interactive lectures and hands-on lab assignments. Discover the essentials of Python, a versatile and in-demand programming language, as you learn to process, analyze, and develop geospatial applications. Explore key tools and techniques for manipulating and analyzing geographic data while building practical skills. By the end of the semester, you'll confidently harness Python to tackle real-world geospatial challenges and take your GIS expertise to the next level.
Learning Outcomes
1. Explain fundamental rules and syntax in Python including variables, data types, flow of execution, and functions.
2. Articulate key concepts and principles in geospatial data models, processing, and analysis.
3. Use classes, functions, and modules in ArcPy to perform geospatial data processing and analysis.

GEOG 452. Landscape Ecology
3 Credits (3+3P)
This course explores the dynamic patterns and processes that shape landscapes across spatial and temporal scales. Students will investigate how natural forces and human activities interact to influence biodiversity, habitat connectivity, ecosystem services, landscape resilience, and other environmental characteristics. Through the application of geospatial tools—including GIS, remote sensing, and spatial modeling—students will assess landscape change and evaluate conservation strategies. The course culminates in an independent research project, allowing students to apply landscape ecology principles to real-world challenges and communicate their findings in engaging and impactful ways.
Learning Outcomes
1. Analyze spatial patterns and processes in landscapes using core principles of landscape ecology.
2. Evaluate how natural and human-induced processes interact to shape landscape structure and function across space and time.
3. Interpret ecological concepts that influence species distributions, ecosystem processes, and other environmental dynamics across multiple spatial and temporal scales.
4. Apply geospatial tools such as GIS, remote sensing, and spatial modeling to assess rates and patterns of landscape change and evaluate potential conservation strategies.
5. Communicate an independent applied landscape ecology research project in written, verbal, visual, digital, or multimedia formats.

GEOG 453. Geomorphology
3 Credits (2+3P)
Examination of the principal theories and concepts of landform creation; exploration of the roles of structure, processes, climate, and time in the formation of various types of landforms. Cross-listed with GEOG 553 and GEOL 353.
Learning Outcomes
1. Outline the basic history of geomorphic theory and research methods.
2. Describe the trends and probable causes of Cenozoic climate change and its links to basic landform processes.
3. Describe the main landform processes including weathering, soil formation, hillslope evolution and associated natural hazards, fluvial processes, arid land processes, glacial/interglacial climates and processes.
4. Integrate field observations into basic landscape evolution reconstructions.
5. Design and implement a fluvial system experiment and analyze the data.

GEOG 455. Southwest Environments
3 Credits (3)
This course introduces the U.S. Southwest, including its physical and human geography, coupled human-environment interactions, causes and consequences of environmental issues, and implications for sustainable development.
Learning Outcomes
1. Describe physical and human geographic patterns of the U.S. Southwest.
2. Discuss coupled human-environment interactions in the U.S. Southwest.
3. Explain how these interactions have produced a series of societal and/or ecological problems in the U.S. Southwest.
4. Assess critically the challenges and potentials of sustainability in the U.S. Southwest.

GEOG 473. Advanced Remote Sensing
4 Credits (3+3P)
Take your remote sensing skills to the next level! This course explores advanced concepts, methods, and applications in digital image processing, analysis, and visualization. Learn how to acquire, correct, enhance, transform, classify, evaluate, and interpret remotely sensed imagery to reveal insights about Earth's dynamic landscapes. Engaging lectures will introduce cutting-edge techniques, while hands-on labs provide opportunities to apply advanced image processing workflows to real-world data. The course culminates in an independent research project, allowing you to explore a remote sensing topic of your choice and present your findings in a compelling format.
Learning Outcomes
1. Explain advanced remote sensing concepts, data, and methods.
2. Employ several approaches for acquiring and preprocessing remotely sensed data.
3. Apply spectral and spatial analysis techniques to enhance and transform remotely sensed imagery.
4. Implement traditional pixel-based, object-based, spectral unmixing, AI-driven, and hybrid classification and change detection techniques for remote sensing applications.
5. Communicate an independent remote sensing research project in written, verbal, visual, digital, or multimedia formats.

GEOG 481. Fundamentals of GIS
4 Credits (3+3P)
Discover the potential of Geographic Information Systems (GIS) in this dynamic and hands-on introductory course! Whether you're passionate about mapping, solving real-world problems, or analyzing geographic data, this course will teach you how to harness the power of GIS to make an impact. You'll learn to manage, integrate, analyze, and visualize geospatial data to uncover patterns, relationships, and solutions to pressing challenges in fields like urban planning, environmental

management, public health, and beyond. Using the industry-leading ArcGIS Pro software, you'll gain practical experience through engaging activities that blend theory with cutting-edge technology. Whether you're a curious beginner or looking to add GIS skills to your toolkit, this course is your gateway to mastering one of today's most versatile and in-demand technologies. Join us and see the world through a whole new lens.

Learning Outcomes

1. Describe fundamental principles, concepts, and methods underlying geographic information science.
2. Discuss map projections, datums, coordinate systems, and grid systems.
3. Use a geographic information system for management and analysis of spatial data.
4. Utilize GIS concepts, tools, and techniques to answer geographic questions.
5. Communicate the results of spatial data analysis through data visualization.

GEOG 483. Field Explorations in Geography
3 Credits (6P)

This hands-on, field-based course immerses you in the natural and cultural landscapes of the U.S. Southwest. Using geographic field methods and tools, you will document, collect, and analyze data to interpret these diverse environments. Depending on the instructor and schedule, the course may be structured as a two-week immersive field experience with camping or as a series of weekend field excursions. The course culminates in a field research project, allowing you to investigate a topic of your choice and communicate your findings in a compelling and meaningful way. A lab fee is required to cover transportation and field expenses.

Learning Outcomes

1. Apply geographic field methods and tools to document, collect, and analyze human and environmental data.
2. Interpret physical and cultural landscapes using field observations, geospatial technologies, and geographic reasoning.
3. Communicate geographic field research findings in written, verbal, visual, digital, or multimedia formats.

GEOG 484. Qualitative, Critical, and Creative Methodologies
3 Credits (3)

This course explores qualitative, critical, and creative methodologies within human geography and related fields. We will examine epistemology, methodology, ethics, and critical reflexivity in research, as well as particular methods such as interviews, oral histories, questionnaires, participant observation, focus groups, archival research, visual methodologies, textual and discourse analysis, and arts-based approaches.

Learning Outcomes

1. Discuss the relationship between epistemology, methodology, and methods.
2. Develop a nuanced understanding of multiple critical, qualitative, and/or creative methods within human geography and related fields.
3. Demonstrate knowledge of research ethics and the role of NMSU's Institutional Review Board (IRB) in human subjects research, including through the completion of the CITI Human Subjects training.

GEOG 485. Spatial Analysis and Modeling
3 Credits (3)

Leverage the power of spatial data in this hands-on course on spatial analysis and modeling. Building on fundamental statistical concepts, you will explore a range of geospatial techniques to analyze geographic patterns, relationships, and processes. Through lectures and applied labs, you will gain experience with methods such as spatial pattern analysis, spatial interpolation, geographically weighted regression, and ecological niche modeling. Emphasis is placed on critical thinking, real-world applications, and the integration of geospatial approaches to problem-solving. The course culminates in an independent spatial investigation, in which you apply advanced analytical techniques to a topic of your choice and effectively communicate your findings in a compelling format.

Learning Outcomes

1. Explain key concepts and methods in spatial analysis and modeling.
2. Apply diverse techniques to analyze spatial data, model human and environmental processes, and predict spatial distributions.
3. Communicate findings from an original spatial analysis and/or modeling investigation in written, verbal, visual, digital, or multimedia formats.

GEOG 488. GIS for Water Resources
3 Credits (3)

This course explores the application of Geographic Information Systems (GIS) in water resource research and management. Students will work with geospatial data, methods, and technologies to address challenges such as watershed characterization, water quality and availability assessment, flood risk analysis, groundwater-surface water interactions, and hydrological modeling. Through a combination of lectures and hands-on labs, students will gain practical experience applying GIS to real-world water resource issues. The course culminates in an independent or collaborative project tailored to students' interests.

Learning Outcomes

1. Apply GIS techniques to analyze and model water resources and hydrological processes.
2. Evaluate geospatial data and methods for decision-making in water resource planning and management.
3. Communicate an independent or collaborative GIS-based research project on water resources using written, verbal, visual, digital, or multimedia formats.

GEOG 491. Special Topics
1-3 Credits (1-3)

This course provides an in-depth exploration of selected geographic topics that vary by semester and instructor. Course content may include readings, discussions, lectures, hands-on applications, and/or research projects that examine contemporary challenges, emerging trends, and specialized themes in geography. Specific topics will be announced in the Course Schedule.

Learning Outcomes

1. Critically engage with geographic concepts, methods, and applications relevant to the selected topic.
2. Apply geographic reasoning and analytical skills to address topic-related problems.
3. Communicate ideas and findings effectively in written, verbal, visual, digital, or multimedia formats.

GEOG 493. Special Problem Research
1-3 Credits

This course provides advanced undergraduate students with the opportunity to conduct independent research on a specialized geographic topic under the mentorship of a faculty member. Students will formulate a research question, engage in independent inquiry, analyze geographic data, and produce a scholarly paper. Designed for highly motivated students seeking research experience beyond standard coursework,

the course emphasizes original research, critical analysis, and effective communication of findings. May be repeated up to 6 credits.

Learning Outcomes

1. Develop a research approach for investigating a geographic problem.
2. Conduct independent research using appropriate geographic concepts and methods.
3. Communicate research findings in a well-structured scholarly paper.

GEOG 495. Independent Study
1-3 Credits

This independent study course allows undergraduate students to engage in focused learning under the guidance of a faculty mentor. Students will explore specialized topics aligned with their academic and professional interests, developing deeper knowledge through self-directed study. The course fosters critical thinking, independent inquiry, and the application of geographic concepts and methods to real-world questions and challenges. May be repeated up to 6 credits.

Learning Outcomes

1. Develop specialized knowledge and skills in a chosen geographic topic through independent study and faculty mentorship.
2. Apply geographic concepts and methods to a research or applied project.
3. Communicate findings effectively in a format appropriate to the project's scope and objectives.

GEOG 501. Geographic Theory and Application
3 Credits (3)

This graduate seminar provides an overview of geographic philosophies, methodologies, and the relationship between theory and practice. Students will explore key ontological, epistemological, and methodological debates that shape contemporary geographic research across human geography, physical geography, human-environment geography, and GIScience. Through critical discussions, written assignments, and a literature review in their area of interest, students will gain a broad understanding of how geographers approach research and engage with different intellectual traditions. Emphasizing intra- and interdisciplinary synthesis and collaboration, this course prepares students to articulate their research perspectives and work effectively across subfields.

Learning Outcomes

1. Evaluate contemporary philosophies and methodologies in major areas of geographical research.
2. Discuss diverse contemporary applications of geographic research.
3. Communicate effectively in written and oral formats.

GEOG 502. Integrative Research Design
3 Credits (3)

This graduate seminar guides students through the process of designing rigorous and impactful research projects. Students will explore quantitative, qualitative, critical, creative, and mixed-methods approaches, along with research frameworks, ethical considerations, proposal writing, and project management. Designed for students in geography and related fields, this hands-on course fosters critical thinking, collaboration, and effective communication, culminating in the development of a polished research proposal tailored to their goals.

Prerequisite: GEOG 501.

Learning Outcomes

1. Design a significant and feasible research project.
2. Evaluate strategies for successful project management and assessment.
3. Communicate effectively in written and oral formats.

GEOG 505. GIS&T Capstone I - Geospatial Research Design
3 Credits

This course is designed to support the professional development of students with an interest in conducting research using Geographic Information Science and Technology (GIS&T). More specifically, the course asks you to dig into the literature in an area of geospatial research of interest to you and to develop a plan for a research project that aligns with your interests and/or professional work.

Learning Outcomes

1. Conceptualize an independent geospatial research project.
2. Plan an independent geospatial research project.
3. Propose an independent geospatial research project.

GEOG 506. GIS&T Capstone II - Geospatial Research Implementation
3 Credits

This course is designed to support the professional development of students with an interest in conducting research using Geographic Information Science and Technology (GIS&T). The course provides you an opportunity to implement the geospatial work you proposed in Capstone I. You will then then share the results of this research through oral presentations and a written document that supports your professional portfolio and work.

Prerequisite: GEOG 505.

Learning Outcomes

1. Implement an independent geospatial research project.
2. Present orally the rationale, data, methods, results, and implications of this independent geospatial research project.
3. Present in writing the rationale, data, methods, results, and implications of this independent geospatial research project.

GEOG 512. Geohumanities
3 Credits (3)

In recent years, artists, writers, and humanities scholars have increasingly engaged with geographic concerns, and geographers have incorporated humanities-based approaches to their work. Broadly known as the geohumanities, these interdisciplinary endeavors offer exciting ways to engage with key geographic concepts such as place, landscape, and nature. This graduate level seminar will examine both critical and creative approaches to the geohumanities.

Learning Outcomes

1. Articulate an understanding of the geohumanities as an interdisciplinary field, including its practices and its histories that draw on geography's intersection with multiple humanities fields.
2. Identify key texts, thinkers, and practices in the geohumanities, as well as spaces (such as both scholarly and public-facing journals and digital spaces) where geohumanities work is currently being advanced and developed.
3. Engage with current debates and directions within the geohumanities.
4. Develop a creative and/or critical project that uses geohumanities approaches and advances your research/scholarly/creative interests.

GEOG 526. U.S. National Parks
3 Credits (3)

Explore the U.S. public lands system, where conservation, history, and public access intersect. We will examine the evolution, purpose, and management of national parks, investigating how they preserve geological, ecological, and cultural resources while addressing complex environmental and social challenges. Through discussions and case studies, we will analyze the cultural, social, political, economic, and environmental forces that shape national parks today. The course culminates in an independent research or creative project, allowing you to dive deep into a parks-related topic of your choice and share your findings in a compelling and meaningful way.

Learning Outcomes

1. Discuss the history and current structure of the U.S. public lands system.
2. Describe the diverse physical landscapes represented in U.S. National Parks and their value to human and environmental well-being.
3. Explain the social, cultural, political, and economic role and function of national parks and protected places.
4. Evaluate current challenges related to parks and conservation and how critical spatial and place-based perspectives and methods might help meet those challenges.
5. Communicate an independent research or creative project on a parks-related topic through written, verbal, visual, digital, or multimedia formats.

GEOG 535. Planning a Sustainable World
3 Credits (3)

This course tackles the big challenges we face when imagining and building the places where we live. In addition to exploring today's most pressing issues through engaging readings, we jump into solving real-world problems. You'll explore topics like how to make sustainable development fair for everyone, how to create affordable housing, and how to design land use and transportation systems that actually work together. Plus, we'll examine ways to grow local economies and build cities that are not just livable, but truly sustainable, drawing on ideas like new urbanism and neo-traditional planning.

Learning Outcomes

1. Describe key urban planning principles and how they are applied in practice.
2. Analyze the multiple dimensions of sustainable development and their role in environmental planning.
3. Evaluate strategies for addressing contemporary urban and environmental planning challenges.
4. Critically evaluate scholarly literature on planning themes and a self-selected research topic in written and oral formats.
5. Collaborate on an applied research project to develop solutions for real-world planning scenarios.

GEOG 542. Programming for GIS
3 Credits

Unlock the power of Geographic Information Systems (GIS) with the art of programming! In this dynamic course, you'll dive into the fundamentals of GIS programming through interactive lectures and hands-on lab assignments. Discover the essentials of Python, a versatile and in-demand programming language, as you learn to process, analyze, and develop geospatial applications. Explore key tools and techniques for manipulating and analyzing geographic data while building practical skills. By the end of the semester, you'll confidently harness Python to tackle real-world geospatial challenges and take your GIS expertise to the next level.

Learning Outcomes

1. Explain fundamental rules and syntax in Python including variables, data types, flow of execution, and functions.
2. Articulate key concepts and principles in geospatial data models, processing, and analysis.
3. Use classes, functions, and modules in ArcPy to perform geospatial data processing and analysis.

GEOG 544. GIS&T Professional Portfolio
1 Credit

This course provides students with the opportunity to develop their GIS&T professional portfolio and disseminate it via multiple platforms. The portfolio will showcase students' experience, knowledge and skills, and potential for professional development and employment in the geospatial workforce.

Learning Outcomes

1. Identify content for a GIST professional portfolio.
2. Visualize the portfolio content.
3. Describe the portfolio content.
4. Reflect on the portfolio content.
5. Create a compelling static document and interactive web versions of the portfolio.

GEOG 545. Geospatial Professionalism
2 Credits

Geospatial data, technologies, and applications are influenced by and shape our social, political, and legal environments in numerous ways. This course introduces you to these environments and provides opportunities to explore them through a series of readings, writing exercises, and class discussions. We also examine in detail the moral and ethical implications of geospatial data, technologies, and applications. With this grounding in place, we develop skills to communicate the results of our geospatial work in a professional, effective, and morally and ethically responsible manner.

Learning Outcomes

1. Discuss the moral and ethical implications of geospatial data, technologies, and applications.
2. Examine the social, political, and legal implications of geospatial data, technologies, and applications.
3. Communicate geospatial work in a professional, effective, and morally and ethically responsible manner.

GEOG 551. Biogeography
3 Credits (3)

Unravel the mysteries of life's distribution across the planet! In this course, you will explore how species and ecosystems are shaped by time, space, and environmental forces. From deserts to rainforests, you'll investigate the factors driving biodiversity patterns, species dispersal, and ecosystem dynamics. Along the way, you'll examine how evolution, climate, and human influences shape life on Earth. Expect hands-on learning, interactive discussions, and an independent research project culminating in a presentation of your findings. By the end of the course, you'll have a deeper appreciation for the forces that shape life on Earth—and the tools to start exploring them yourself!

Learning Outcomes

1. Analyze how species move, adapt, and survive across diverse environments, from islands to mountaintops.
2. Explain how Earth's history plate tectonics, climate shifts, and extinctions has shaped global biodiversity.

3. Evaluate why some places are bursting with life while others have extreme or limited biodiversity, using key biogeographic principles.
4. Apply real-world data and tools, including satellite imagery, geographic information systems, and field data, to study species distributions.
5. Conduct independent research on a biogeographic topic of your choice, culminating in a written and verbal presentation.

GEOG 552. Landscape Ecology
4 Credits (3+3P)
Analysis of the structure, function, and change of natural and anthropogenic landscapes. Patches, corridors, matrix and network, spatial organization, landscape dynamics, and role of disturbance in overall functioning of landscapes. Role of landscape heterogeneity in landscape management.
Learning Outcomes
1. Apply a vocabulary of terms and phrases employed by landscape ecologists.
2. Demonstrate familiarity with articles and researchers in landscape ecology.
3. Identify influences of scale and spatial configuration on ecosystem processes.
4. Discuss approaches, tools, and techniques to describe, quantify, and analyze landscape characteristics.
5. Demonstrate knowledge of various landscape ecology approaches by accurately applying landscape ecology terms and concepts in answers to a select group of the end-of-chapter questions as well as in discussion posts.

GEOG 553. Geomorphology
3 Credits (2+3P)
This course examines the principal theories and concepts of landform creation through an exploration of the roles of structure, processes, climate, and time.
Learning Outcomes
1. Outline the basic history of geomorphic theory and research methods.
2. Describe the trends and probable causes of Cenozoic climate change and its links to basic landform processes.
3. Describe the main landform processes including weathering, soil formation, hillslope evolution and associated natural hazards, fluvial processes, arid land processes, glacial/interglacial climates and processes.
4. Integrate field observations into basic landscape evolution reconstructions.
5. Conduct a fluvial system experiment, incorporating experimental design, implementation, and data analysis.

GEOG 555. Southwest Environments
3 Credits (3)
This course introduces the U.S. Southwest, including its physical and human geography, coupled human-environment interactions, causes and consequences of environmental issues, and implications for sustainable development. Taught with GEOG 455.
Learning Outcomes
1. Describe physical and human geographic patterns of the U.S. Southwest.
2. Discuss coupled human-environment interactions in the U.S. Southwest.
3. Explain how these interactions have produced a series of societal and/or ecological problems in the U.S. Southwest.
4. Assess critically the challenges and potentials of sustainability in the U.S. Southwest.

GEOG 556. Weather & Climate: Earth's Dynamic Atmosphere
3 Credits (3)
From basic atmospheric processes to paleoclimate analysis and modern forecast modeling, from local-to-global, we will investigate climate's influences on natural environments, cultures, economics, politics, the characteristics of regional climates, and issues of global climate change.
Learning Outcomes
1. Explain the fundamental atmospheric processes that drive weather patterns and create climate systems.
2. Evaluate the evidence for climate change, including historical climate data and modern forecasting models.
3. Integrate perspectives from the natural sciences, social sciences, and humanities to assess the influences of climate on nature and society from local to global scales.
4. Apply knowledge of climate dynamics to current global issues, including environmental policies, sustainability practices, and climate adaptation strategies.

GEOG 571. Cartography and GIS
4 Credits (3+3P)
Unleash your inner mapmaker! This course introduces the essential concepts and techniques of cartography and geographic information systems (GIS) through dynamic lectures and hands-on labs. Explore topics like map scale, projections, and symbolization in class, and then apply these principles to design maps that are both functional and aesthetically appealing. By the end of the semester, you'll master the science and art of creating and presenting your very own GIS mapping project—a unique blend of data, design, and storytelling that's ready to impress.
Learning Outcomes
1. Explain key cartographic concepts and methods.
2. Evaluate the content, implications, and functionality of maps.
3. Create functional and aesthetically pleasing maps.
4. Execute an original GIS mapping project.
5. Communicate an original GIS mapping project in written and oral formats.

GEOG 573. Introduction to Remote Sensing
4 Credits (3+3P)
Discover the exciting world of remote sensing! This course introduces the theory, methods, and real-world applications of capturing Earth from above. Explore how energy and light are used to generate stunning images of our planet from aerial and satellite platforms and learn to analyze them to uncover insights about the biosphere, hydrosphere, atmosphere, lithosphere, and cultural landscapes. Hands-on labs and engaging lectures will guide you through the basics of analyzing and interpreting remote sensing products. Dive into the science of seeing our world in a whole new way.
Learning Outcomes
1. Explain basic remote sensing concepts, data, and methods.
2. Evaluate remotely sensed products.
3. Map built and natural environments using remote sensing data and methods.
4. Execute an original remote sensing investigation.

5. Communicate an original remote sensing investigation in written and oral formats.

GEOG 578. Fundamentals of GIS
4 Credits (3+3P)
Discover the potential of Geographic Information Systems (GIS) in this dynamic and hands-on introductory course! Whether you're passionate about mapping, solving real-world problems, or analyzing geographic data, this course will teach you how to harness the power of GIS to make an impact. You'll learn to manage, integrate, analyze, and visualize geospatial data to uncover patterns, relationships, and solutions to pressing challenges in fields like urban planning, environmental management, public health, and beyond. Using the industry-leading ArcGIS Pro software, you'll gain practical experience through engaging activities that blend theory with cutting-edge technology. Whether you're a curious beginner or looking to add GIS skills to your toolkit, this course is your gateway to mastering one of today's most versatile and in-demand technologies. Join us and see the world through a whole new lens.
Learning Outcomes
1. Describe fundamental principles, concepts, and methods underlying geographic information science.
2. Discuss map projections, datums, coordinate systems, and grid systems.
3. Use a geographic information system for management and analysis of spatial data.
4. Utilize GIS concepts, tools, and techniques to answer geographic questions.
5. Communicate the results of spatial data analysis through data visualization.

GEOG 582. Advanced Remote Sensing
4 Credits (3+3P)
Take your remote sensing skills to the next level! This course explores advanced concepts, methods, and applications in digital image processing, analysis, and visualization. Learn how to acquire, correct, enhance, transform, classify, evaluate, and interpret remotely sensed imagery to reveal insights about Earth's dynamic landscapes. Engaging lectures will introduce cutting-edge techniques, while hands-on labs provide opportunities to apply advanced image processing workflows to real-world data. The course culminates in an independent research project, allowing you to explore a remote sensing topic of your choice and present your findings in a compelling format.
Learning Outcomes
1. Explain advanced remote sensing concepts, data, and methods.
2. Employ several approaches for acquiring and preprocessing remotely sensed data.
3. Apply spectral and spatial analysis techniques to enhance and transform remotely sensed imagery.
4. Implement traditional pixel-based, object-based, spectral unmixing, AI-driven, and hybrid classification and change detection techniques for remote sensing applications.
5. Communicate an independent remote sensing research project in written, verbal, visual, digital, or multimedia formats.

GEOG 583. Field Explorations in Geography
3 Credits (6P)
This hands-on, field-based course immerses you in the natural and cultural landscapes of the U.S. Southwest. Using geographic field methods and tools, you will document, collect, and analyze data to interpret these diverse environments. Depending on the instructor and schedule, the course may be structured as a two-week immersive field experience with camping or as a series of weekend field excursions. The course culminates in a field research project, allowing you to investigate a topic of your choice and communicate your findings in a compelling and meaningful way. A lab fee is required to cover transportation and field expenses.
Learning Outcomes
1. Apply geographic field methods and tools to document, collect, and analyze human and environmental data.
2. Interpret physical and cultural landscapes using field observations, geospatial technologies, and geographic reasoning.
3. Communicate geographic field research findings in written, verbal, visual, digital, or multimedia formats.

GEOG 584. Qualitative, Critical, and Creative Methodologies
3 Credits (3)
This course explores qualitative, critical, and creative methodologies within human geography and related fields. We will examine epistemology, methodology, ethics, and critical reflexivity in research, as well as particular methods such as interviews, oral histories, questionnaires, participant observation, focus groups, archival research, visual methodologies, textual and discourse analysis, and arts-based approaches.
Learning Outcomes
1. Discuss the relationship between epistemology, methodology, and methods.
2. Develop a nuanced understanding of multiple critical, qualitative, and/or creative methods within human geography and related fields.
3. Demonstrate knowledge of research ethics and the role of NMSU's Institutional Review Board (IRB) in human subjects research, including through the completion of the CITI Human Subjects training.

GEOG 585. Spatial Analysis and Modeling
3 Credits (3)
Leverage the power of spatial data in this hands-on course on spatial analysis and modeling. Building on fundamental statistical concepts, you will explore a range of geospatial techniques to analyze geographic patterns, relationships, and processes. Through lectures and applied labs, you will gain experience with methods such as spatial pattern analysis, spatial interpolation, geographically weighted regression, and ecological niche modeling. Emphasis is placed on critical thinking, real-world applications, and the integration of geospatial approaches to problem-solving. The course culminates in an independent spatial investigation, in which you apply advanced analytical techniques to a topic of your choice and effectively communicate your findings in a compelling format.
Learning Outcomes
1. Explain key concepts and methods in spatial analysis and modeling.
2. Apply diverse techniques to analyze spatial data, model human and environmental processes, and predict spatial distributions.
3. Communicate findings from an original spatial analysis and/or modeling investigation in written, verbal, visual, digital, or multimedia formats.

GEOG 588. GIS for Water Resources
3 Credits (3)
This course explores the application of Geographic Information Systems (GIS) in water resource research and management. Students will work with geospatial data, methods, and technologies to address challenges such as watershed characterization, water quality and availability assessment, flood risk analysis, groundwater-surface water interactions, and hydrological modeling. Through a combination of lectures and hands-

on labs, students will gain practical experience applying GIS to real-world water resource issues. The course culminates in an independent or collaborative project tailored to students' interests.

Learning Outcomes

1. Apply GIS techniques to analyze and model water resources and hydrological processes.
2. Evaluate geospatial data and methods for decision-making in water resource planning and management.
3. Communicate an independent or collaborative GIS-based research project on water resources using written, verbal, visual, digital, or multimedia formats.

GEOG 595. Independent Study
1-3 Credits

This independent study course provides master's students with the opportunity to engage in focused learning under the guidance of a faculty mentor. Students will explore specialized topics relevant to their academic and professional interests, gaining deeper expertise through self-directed study. The course fosters critical inquiry, independent scholarship, and the application of geographic concepts, theories, and methods to research and practical applications. May be repeated up to 6 credits.

Learning Outcomes

1. Develop specialized knowledge and skills in a chosen geographic topic through independent study and faculty mentorship.
2. Apply geographic concepts, theories, and methods to an independent research or applied project.
3. Communicate findings effectively in a format appropriate to the project's scope and objectives.

GEOG 596. Residency
1-12 Credits

This course provides graduate students with a structured, contractual learning experience in the public or private sector. Under the supervision of a field supervisor and faculty member, students apply geographic knowledge and skills to real-world projects, gaining professional experience in research, analysis, and decision-making. The residency allows students to integrate academic learning with applied practice, preparing them for careers in government agencies, private industry, nonprofit organizations, and other professional settings. May be repeated up to 12 credits.

Learning Outcomes

1. Apply geographic concepts, methods, and analytical tools in a professional setting.
2. Demonstrate problem-solving and decision-making skills in an applied geographic project.
3. Communicate professional experiences and research findings effectively in written, verbal, or digital formats.
4. Evaluate the role of geographic expertise in public, private, and nonprofit sector work.

GEOG 598. Special Topics
1-3 Credits

This course provides an in-depth exploration of selected geographic topics that vary by semester and instructor. Course content may include readings, discussions, lectures, hands-on applications, and/or research projects that examine contemporary challenges, emerging trends, and specialized themes in geography. Specific topics will be announced in the Course Schedule. May be repeated up to 12 credits.

Learning Outcomes

1. Critically engage with geographic concepts, methods, and applications relevant to the selected topic.
2. Apply geographic reasoning and analytical skills to address topic-related problems.
3. Communicate ideas and findings effectively in written, verbal, visual, digital, or multimedia formats.
4. Conduct independent or collaborative research to develop deeper insights into the selected theme.

GEOG 599. Master's Thesis
1-12 Credits

This course supports master's students in conducting independent research for their thesis under the guidance of a faculty advisor and thesis committee. Students engage in all phases of the research process, including conceptualization, planning, implementation, management, and communication through written and verbal research reports. The course provides a structured framework for developing original geographic research with intellectual merit and broader impacts. May be repeated up to 99 credits.

Learning Outcomes

1. Develop a rigorous and well-structured research design.
2. Accurately implement appropriate methods for data collection and analysis.
3. Correctly evaluate their research findings.
4. Effectively communicate the study's research design, findings, and significance in written and verbal formats.

GEOG 601. Geographic Theory and Application
3 Credits (3)

This graduate seminar provides an overview of geographic philosophies, methodologies, and the relationship between theory and practice. Students will explore key ontological, epistemological, and methodological debates that shape contemporary geographic research across human geography, physical geography, human-environment geography, and GIScience. Through critical discussions, written assignments, and a literature review in their area of interest, students will gain a broad understanding of how geographers approach research and engage with different intellectual traditions. Emphasizing intra- and interdisciplinary synthesis and collaboration, this course prepares students to articulate their research perspectives and work effectively across subfields.

Learning Outcomes

1. Evaluate contemporary philosophies and methodologies in major areas of geographical research.
2. Discuss diverse contemporary applications of geographic research.
3. Communicate effectively in written and oral formats.

GEOG 602. Integrative Research Design
3 Credits (3)

This graduate seminar guides students through the process of designing rigorous and impactful research projects. Students will explore quantitative, qualitative, critical, creative, and mixed-methods approaches, along with research frameworks, ethical considerations, proposal writing, and project management. Designed for students in geography and related fields, this hands-on course fosters critical thinking, collaboration, and effective communication, culminating in the development of a polished research proposal tailored to their goals.

Prerequisite: GEOG 601.

Learning Outcomes

1. Design a significant and feasible research project.
2. Evaluate strategies for successful project management and assessment.
3. Communicate effectively in written and oral formats.

GEOG 603. Professional Geographic Practice
3 Credits (3)

This core course equips students with essential professional skills for careers in academia, government, private industry, and nonprofit organizations. It covers professional communication, ethics, and grant proposal writing while also providing tailored training aligned with students' career goals. Depending on their focus, students may develop expertise in academic teaching, applied policy work, community engagement, or scientific communication. As all students in the doctoral geography program are expected to incorporate applied projects into their research, this course provides a foundation for integrating geographic expertise into real-world problem-solving.

Learning Outcomes

1. Explain the ways in which geographers contribute to research, policy development, and decision-making in professional contexts.
2. Communicate effectively with diverse audiences in academic, government, private sector, and nonprofit settings.
3. Evaluate ethical considerations in geographic research and practice.
4. Develop a competitive grant proposal that aligns with funding priorities and research goals.
5. Apply geographic expertise in a professional setting through a practical exercise in teaching, policy work, community engagement, or scientific communication.

GEOG 695. Independent Study
1-3 Credits (1-3)

This independent study course provides doctoral students with the opportunity to engage in focused learning under the guidance of a faculty mentor. Students will explore specialized topics aligned with their academic and professional interests, deepening their expertise through self-directed study. The course fosters critical inquiry, independent scholarship, and the application of geographic theories and methods to advanced research. May be repeated up to 6 credits.

Learning Outcomes

1. Develop specialized knowledge and skills in a chosen geographic topic through independent study and faculty mentorship.
2. Apply appropriate geographic theories, data, and methods to a self-directed research project.
3. Apply appropriate geographic theories, data, and methods to a self-directed research project.

GEOG 696. Supervised Research
3-9 Credits (3-9)

This supervised research course provides doctoral students with structured guidance as they prepare for key doctoral candidacy requirements, including comprehensive exams, dissertation proposal defenses, and funding applications. Under the mentorship of a faculty advisor, students will engage in independent study and research activities tailored to their dissertation focus. The course emphasizes critical engagement with scholarly literature, research design, and professional communication, equipping students with the skills needed for the next stage of their doctoral journey. May be repeated up to 18 credits.

Learning Outcomes

1. Explain key geographic theories and methodologies in both broad disciplinary contexts and in relation to their specific research focus.
2. Develop a well-structured and persuasive research proposal, including both a written document and an oral presentation.
3. Pursue funding opportunities through grant applications or other funding mechanisms.

GEOG 700. Doctoral Dissertation
1-18 Credits

This highly individualized research course is designed for doctoral students who have completed their comprehensive exams and are actively working on their dissertation. Under the guidance of a faculty advisor and dissertation committee, students refine their research design, conduct independent research, and produce a significant contribution to the field of geography. The course emphasizes advanced research skills, scholarly writing, and professional dissemination of findings. May be repeated up to 99 credits.

Learning Outcomes

1. Expand expertise in a specialized area of geographic research through independent study.
2. Execute a rigorous, original research project that contributes to the field.
3. Apply advanced methods of data collection, analysis, and synthesis in geographic research.
4. Communicate research findings effectively through scholarly writing and presentations.
5. Demonstrate project management skills in organizing, executing, and completing a doctoral dissertation.

GEOL-GEOLOGY

GEOL 1110G. Physical Geology
4 Credits (3+3P)

Physical Geology is an introduction to our dynamic Earth introducing students to the materials that make up Earth (rocks and minerals) and the processes that create and modify the features of our planet. The course will help students learn how mountains are formed, how volcanoes erupt, where earthquakes occur, and how water, wind, and ice can shape landscapes. Students will also develop a basic understanding of the ways humans have altered the planet including our impact on natural resources and global climate change.

Learning Outcomes

1. Recall, describe or explain geologic vocabulary.
2. Identify or explain aspects of the geologic time scale and compare the uses and limitations of relative and absolute dating.
3. Recognize or explain the evidence used to support the theory of plate tectonics. Describe or identify how plate tectonics is related to the structure and features of the Earth.
4. Describe the formation of, and describe, compare, and classify minerals.
5. Identify or describe the three main rock types, how each forms in the context of the rock cycle and what each indicates about its environment of formation.
6. Recognize or explain the fundamentals of surface and groundwater hydrology and discuss the impact of human activities on water quality and quantity.
7. Describe or discuss the processes that are responsible for specific geologic hazards (e.g., earthquakes, volcanic eruptions, mass movement, flooding, etc.).
8. Recognize or describe the geologic processes involved in the formation and concentration of geologic resources.

GEOL 1150. Introduction to Rocks and Minerals
3 Credits (2+3P)
This course is an introduction to the characteristics and the formation of the three main types of rocks, the rock-forming minerals, and important ore minerals. An outline of Plate Tectonics will give students the basis to understand how many of these rocks and minerals form. In laboratory exercises, students will gain practice in describing and identifying hand-specimens of the main types of rocks and minerals.
Prerequisite(s)/Corequisite(s): GEOL 1110G.
Learning Outcomes
1. The student Identify the main rock-forming minerals from each mineral group as demonstrated by scoring a total of 70% or more on the relevant laboratory exercise component. Studying minerals, the student will: Identify the main minerals in hand specimens; Describe the environments in which these minerals form; Identify the rock types in which these minerals are found.
2. The student will understand the structure, composition, and genesis of rocks by identifying the principal igneous, sedimentary, and metamorphic rocks, as demonstrated by scoring a total of 70% or more on the relevant laboratory exercise components.
3. Studying rocks, the student will: Define the principal igneous processes and features, identify the most common igneous rocks and their constituting minerals in hand specimens, and discuss their origin and interpretation; Describe the principles of sedimentary processes and features, identify the most common sedimentary rocks in hand specimens, and discuss their origin and interpretation; Describe the principles of metamorphic processes and features, identify the most common metamorphic rocks and constituting minerals in hand specimens, and discuss their origin and interpretation.

GEOL 2996. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. Community Colleges only. May be repeated for a maximum of 12 credits.
Learning Outcomes
1. Varies

GEOL 305V. Fossils and the Evolution of Life
3 Credits (3)
Examination of the fossil record within the context of geologic time. Special emphasis on critical evaluation of possible terrestrial and extra-terrestrial causes for the evolution of plants and animals and for periods of mass extinction.

GEOL 312. Mineralogy and Optics
3 Credits (2+3P)
Principles of crystallography, optical mineralogy, and mineral chemistry as applied to the identification and characterization of rock-forming minerals. May be repeated up to 3 credits.
Prerequisite(s): GEOL 1110G and GEOL 1150.
Learning Outcomes
1. Students will understand how polarized light interacts with isotropic, uniaxial, and biaxial crystals.
2. Students will be able to recognize optical phenomena resulting from the interaction of polarized light with minerals.
3. Students will become proficient in the recognition of the major rock-forming minerals in thin section.
4. Students will recognize crystal faces according to the Miller Indices.
5. Students will be able to calculate the structural formula of any mineral.

GEOL 320. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

GEOL 335V. Earthquakes, Volcanoes, Hurricanes, and Floods: The Role of Natural Hazards in Civ Past and Present
3 Credits (3)
This class willl provide an introduction to geologic hazards and natural disasters, their effects on society and the attempts at preparation and mitigation for these events. Hazards to be covered include earthquakes, volcanic eruptions, floods, landslides, hurricanes, tsunamis and others.

GEOL 353. Geomorphology
3 Credits (2+3P)
Examination of the principal theories and concepts of landform creation; exploration of the roles of structure, processes, climate, and time in the formation of various types of landforms. Cross-listed with GEOG 553 and GEOL 353.
Learning Outcomes
1. Outline the basic history of geomorphic theory and research methods.
2. Describe the trends and probable causes of Cenozoic climate change and its links to basic landform processes.
3. Describe the main landform processes including weathering, soil formation, hillslope evolution and associated natural hazards, fluvial processes, arid land processes, glacial/interglacial climates and processes.
4. Integrate field observations into basic landscape evolution reconstructions.
5. Design and implement a fluvial system experiment and analyze the data.

GEOL 360. General Geochemistry
3 Credits (3)
The chemistry of the earth and its parts, with emphasis on geochemical systems and cycles, distribution of the elements, and mineral equilibria. Crosslisted with: CHEM 360
Prerequisite(s): CHEM 1215G or CHEM 1120G.

GEOL 399. Igneous and Metamorphic Petrology
3 Credits (2+3P)
Mineralogical composition, classification, and genesis of igneous and metamorphic rocks. May be repeated up to 3 credits.
Prerequisite: GEOL 312 for geology majors, GEOL 1150 for majors other than geology.
Learning Outcomes
1. Students will learn to identify minerals and rocks in hand sample and using the petrographic microscope. Students will be expected to score above 70%on a set of eight laboratory exercises and a laboratory final exam.
2. Students will learn to understand the environments, sources, and processes involved in generating igneous rocks and metamorphic rocks I a range of geologic/tectonic environments.
3. Students will learn to write within the field of geology using Geological Society of America format. A 6-10 page paper will be required and will be graded using the Ramos writing rubric. Revisions will also be required.
4. Students will learn to present in standard GSA format (12 minute oral presentations using Powerpoint). Presentation will be graded using a rubric that evaluates presentation materials, presentation

effectiveness, and presenter skills/behaviors related to their presentations.

GEOL 401. Geology Colloquium
1 Credit (1)
Presentations by visiting speakers and students. May be repeated up to 6 credits.

GEOL 420. Stratigraphy and Sedimentology
3 Credits (2+3P)
Identification and interpretation of sedimentary rocks with emphasis on classification, deposition, and stratal geometry. May be repeated up to 3 credits.
Prerequisite: GEOL 1150.
Learning Outcomes
1. Recognize patterns associated with physical and chemical weathering and erosion.
2. Identify and classify siliciclastic and chemical sedimentary rock and sediment.
3. Compare and contrast sedimentologic processes recorded in depositional, erosional, deformational, and biogenic sedimentary structures (i.e., facies).
4. Identify specific sedimentary facies associated with specific depositional environments.
5. Delineate between nonmarine, marginal marine, and deep marine environments.
6. Correlate stratigraphic successions and environments along strike and place in a tectonic and basin-scale context.

GEOL 424. Soil Chemistry
3 Credits (3)
Same as SOIL 424, CHEM 424.

GEOL 441. Tutorial Geology
2 Credits (1+3P)
Participation in teaching lower-division laboratories and conducting tutorial sessions. May be repeated for a total of 4 credits.
Prerequisite: junior or above standing and nomination by faculty.

GEOL 442. Zuhl Collection Internship
1-3 Credits (3-9P)
Applied experience with the NMSU Zuhl Collection, under supervision of the Zuhl Collection Director. Possible activities include developing displays, giving tours, developing outreach materials, etc. May be repeated up to 6 credits. Consent of Instructor required.

GEOL 444. GIS for Geology
3 Credits (3)
Tools-based introduction to using GIS software for solving problems in geology. Emphasis on effectively portraying and analyzing geologic maps. One required field trip. Crosslisted with: GEOG 544.
Prerequisite(s): GEOL 470.

GEOL 449. The Geological Profession
1 Credit (1)
Outcomes assessment exit exams. For graduating seniors only. May be repeated up to 1 credits.
Prerequisite(s): Graduating seniors only.

GEOL 452. Geohydrology
4 Credits (3+2P)
Origin, occurrence, and movement of fluids in porous media assessment of aquifer characteristics. Development and conservation of ground water resources, design of well fields. May be repeated up to 4 credits. Crosslisted with: ENVS 452 and C E 452.

GEOL 455. Undergraduate Research
1-3 Credits
Geological research and field projects for the advanced student. May be repeated for a total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.
Prerequisite(s): Consent of instructor.

GEOL 465. Isotope Geochemistry
3 Credits (3)
Geochemistry of stable and radiogenic isotopes and its application to a wide range of problems in the earth and planetary sciences.
Prerequisite(s): CHEM 1225G, GEOL 360, GEOL 399.

GEOL 470. Structural Geology
3 Credits (2+3P)
Deformation of rocks of the earth. May be repeated up to 3 credits.
Prerequisite: GEOL 1150.
Learning Outcomes
1. Describe and analyze features in rocks produced by deformation, such as folds and faults.
2. Describe regional phases of structural geology and their relationship to plate tectonic processes.
3. Describe how understanding of deformational features informs plate tectonic models.
4. Describe how practical knowledge of structural geology is related to all fields of geology.

GEOL 471. Volcanology
3 Credits (3)
Identification and interpretation of volcanic deposits (including air fall, ash flow tuffs, surges, lava flows), with focus on how the characteristics of these deposits can reveal eruption styles and eruption dyanmics. Other topics covered include: magma migration and storage, volcanic hazards, volcano monitoring and volcanoes and climate. Crosslisted with: GEOL 571.
Prerequisite(s): GEOL 399.

GEOL 477. Special Problems
1-3 Credits
Selected advanced topics of current interest or importance. May be repeated for a total of 6 credits.
Prerequisite: consent of instructor.

GEOL 478. Petroleum Systems and Stratigraphy
3 Credits (2+3P)
Sedimentation, stratigraphy, depositional environments, and tectonics in relation to the occurrences and exploration of hydrocarbons. Course includes two off-campus field trips. May be repeated up to 3 credits.
Prerequisite(s): GEOL 420.

GEOL 480. Seminar
1-3 Credits
Supervised study of a subject not covered by regular courses. For organized group meetings treating selected advanced topics. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

GEOL 482. Zuhl Collection Internship
1-3 Credits (1-3)
Applied experience working with the Zuhl Collection of rocks, minerals, fossils, and petrified wood, supervised by the Director of the Zuhl Collection. Activities include tours, display development, research on aspects of the collection, and other work in the museum. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: GEOL majors.

GEOL 490. Field Geology
3 Credits (9P)
Mapping, instrumentation, and interpretation of geology in the field.
Prerequisites: either GEOL 420 and GEOL 470.

GEOL 491. Tectonic Evolution of North America
3 Credits (3)
Current ideas regarding the plate-tectonic evolution of North America from Archean through Holocene time, emphasizing the use of regional stratigraphy and structural geology to interpret mountain building, magmatism, and basin development.
Prerequisites: GEOL 1110G, GEOL 399, GEOL 420 and GEOL 470.

GEOL 495. Geology Field Camp
4 Credits (12P)
Three week intensive summer course. Geologic mapping in a site-based setting, emphasizing spatial relations, cross-section construction, and preparation of geologic reports. Prerequisite: GEOL 490

GEOL 499. Senior Thesis
1-3 Credits
Writing a formal paper describing original geologic research conducted under supervision of a faculty advisor. Restricted to majors.
Prerequisite: consent of instructor.

GEOL 501. Geology Colloquium
1 Credit (1)
Presentations by visiting speakers and graduate students.

GEOL 520. Selected Topics
1-3 Credits (1-3)
Selected topics in geology. Students must be in graduate standing to enroll. Consent of instructor requied. May be repeated up to 99 credits.
Learning Outcomes
1. Varies

GEOL 534. Tectonics of Sedimentary Basins
3 Credits (3)
Origin of sedimentary basins with emphasis on subsidence mechanisms, geometry of basin fill, depositional systems and tectonic setting. Course includes two off-campus field trips. Restricted to: GEOL majors May be repeated up to 3 credits. Prerequisite: .
Learning Outcomes
1. To be able to recognize sedimentary basin types in geologic and geomorphic environments.
2. To understand these aspects of sedimentary basins: plate tectonic setting/context, basement to basins (continental vs. oceanic/ transitional lithosphere), structure and structural vergence, sedimentologic and stratigraphic signatures in the rock record, depositional systems, and basin-scale provenance.

GEOL 537. Topics in Volcanology
3 Credits (3)
A seminar-style class exploring volcanic processes. Course topics vary by semester and include: magmatism and volcanism at different tectonic settings (subduction zones, intraplate) and plumbing systems and eruptions of volcanoes (calderas, monogenetic volcanoes).

GEOL 544. GIS for Geology
3 Credits (3)
Tools-based introduction to using GIS software for solving problems in geology. Emphasis on effectively portraying and alayzing geologic maps. One required field trip. Taught with: GEOL 444. May be repeated up to 3 credits.
Learning Outcomes
1. A tools-based introduction to Geographic Information Systems software, specifically the ArcGIS package developed by ESRI.
2. Hands-on use of GIS software to make maps and analyze datasets that are commonly used by geoscientists.
3. Compiling and analyzing geologic mapping datasets collected from the field and from published literature.
4. Development of an awareness of how to find publicly accessible datasets and solutions to problems beyond the sample exercises presented in class.
5. Application of GIS to solve a problem.

GEOL 558. Neotectonics
3 Credits (3)
Recognition, measurement, and dating of deformation related to earthquakes in the Quaternary geologic record.

GEOL 562. Analytical Geochemistry
3 Credits (3)
Techniques used to determine the major element, trace element and isotopic composition of rocks and minerals and the determination of mineral structure.

GEOL 565. Isotope Geochemistry
3 Credits (3)
Trace element partitioning and isotope systematics applied to problems in petrology and ore genesis.

GEOL 571. Volcanology
3 Credits (3)
Identification and interpretation of volcanic deposits (including air fall, ash flow tuffs, surges, lava flows), with focus on how the characteristics of these deposits can reveal eruption styles and eruptions dynamics. Other topics covered include: magma migration and storage, volcanic hazards, volcano monitoring and volcanoes and climate. Crosslisted with: GEOL 471.

GEOL 578. Petroleum Systems and Stratigraphy
3 Credits (2+3P)
Sedimentation, stratigraphy, depositional environments and tectonics in relation to the occurences and exploration of hydrocarbons. Course includes two off-campus field trips.

GEOL 580. Tectonic Evolution of the Southwest USA
3 Credits (3)
Geologic history and tectonic evolution of the Western U.S. Cordillera from the Precambrian assembly of the craton to the recent history of rifting in the Rio Grande valley. Focus on the geology of the Southwest, particularly southern New Mexico, but also topics such as evolution of San Andreas fault system.
Learning Outcomes
1. Learn about the tectonic history of the Southwest United States across the time scale.
2. Learn how to communicate the results of others' work in speaking and writing.
3. Learn how to engage in a discussion of scientific results.
4. Learn details of subdisciplines other than your own interests.
5. Learn about geophysical methods.
6. Learn to improve reading comprehension.
7. Learn about geochronology.
8. Learn how different disciplines in the earth sciences are used to understand tectonics.

GEOL 582. Plate Tectonics
3 Credits (3)
Plate tectonics as a fundamental model for geological activity on a dynamic earth. Focuses on plate tectonic theory development and mechanisms, plus modern analogs of ancient processes.

GEOL 585. Geochronology
3 Credits (3)
The principles, analytical methods, and interpretation of the most common geochronologic methods.

GEOL 598. Special Research Programs
1-3 Credits
Investigations into contemporary geological problems. May be repeated for unlimited credit.
Prerequisites: graduate standing and consent of instructor.

GEOL 599. Master's Thesis
15 Credits
Thesis research. May be repeated up to 88 credits.

GNDR-Gender and Sexuality Studies

GNDR 2110G. Introduction to Women, Gender, and Sexuality Studies
3 Credits (3)
This course introduces students to key concepts, debates, and analytical tools informing Women's, Gender, and Sexuality Studies. As an interdisciplinary field of study, Women's, Gender, and Sexuality Studies employs academic perspectives from a range of disciplines and theoretical approaches. It also incorporates lived experience and social location into its object of analysis. Though content will vary according to the expertise and focus of the instructor, this course will develop tools through readings and assignments that critically analyze how gender and sexuality are shaped by different networks of power and social relations and demonstrate how the intersections of race, class, disability, national status, and other categories identity and difference are central to their understanding and deployment. In addition to feminist thought, areas of focus might include gender and sexuality in relation to social, cultural, political, creative, economic, or scientific discourses. This class is recommended for those with a general interest in the topic area as well as for those seeking a foundational course for further study. May be repeated up to 3 credits.
Learning Outcomes
1. Understand foundational concepts, theories, and approaches to gender and sexuality in conjunction with contemporary social justice movements such as feminism.
2. Describe the range of social and political forces that shape and are shaped by gender, sexuality, race/ethnicity, and other intersecting categories of identity.
3. Demonstrate the ability to conduct intersectional analysis.
4. Develop and improve skills in reading, critical thinking, academic writing, and public speaking.

GNDR 2120G. Representing Women Across Cultures
3 Credits (3)
Historical and critical examination of women's contributions to the humanities, with emphasis on the issues of representation that have contributed to exclusion and marginalization of women and their achievements.
Learning Outcomes
1. To think critically about contemporary discourses on gender, race, sexuality, and class.
2. To understand how forms of identity intersect with one another
3. To explore the ways power and privilege operate in contemporary society
4. To understand some of the ways social inequalities develop, function, and change
5. To further students' interest in developing their own ideas and research in issues of women and gender, sexuality, race, class, and nation

GNDR 350. Special Topics
3 Credits (3)
The topic of course will vary and will be indicated by subtitle. May be cross-listed with relevant courses at the 300-level from any specific department. May be repeated up to 99 credits.
Learning Outcomes
1. Varies

GNDR 352. Women's & Mass Media
3 Credits (3)
Portrayal and participation of women in mass media from colonial to contemporary times. Taught with JOUR 380.

GNDR 357. Gender and Society
3 Credits (3)
Overview of issues related to gender, including how gender is constructed and reproduced in our society. Gender is examined from social psychological and institutional perspectives.
Learning Outcomes
1. To develop a working knowledge of sociological concepts and theoretical approaches common in gender studies, as well as the research methodologies employed to understand gender as an organizing principle in 21st century societies.
2. To develop a solid understanding of how dominant ideologies affect the structures and meanings of gender and gender inequality in the United States and on how gender shapes one's own life chances and choices.
3. To develop a decolonial "sociological imagination" and the analytical tools to understand how gender intersects with other systems of inequality (such as nation, race, ethnicity, sexuality, physical abilities, economic class, and citizenship status).
4. To develop a working knowledge of past and present collective social movements to eradicate gender inequality and gender oppression in all our homes, communities, institutions, and world.

GNDR 359. Psychology of Gender
3 Credits (3)
Examines theories and research on the psychological functioning of women and men in North American society, including influential theories of gender in psychology and current controversies in the psychological literature. Topics include those unique to women and unique to men in development across the lifespan, work, physical and mental health, sexuality, victimization, gender stereotypes, gender comparisons in abilities and personality, and biological, social, and cultural influences on behavior. Crosslisted with: PSYC 359.
Prerequisite: PSYC 1110G.

GNDR 360. Masculinities Studies
3 Credits (3)
Explores how contemporary American culture constructs manhood and masculinity. Interrogates ideas and enactments of masculinity, especially as they intersect with race/ethnicity, class, and sexuality. The class asks how sexuality, gender construction, and sex roles inform our

understanding of masculinity, as well as how masculinity relates to social power.

GNDR 371. Introduction to LGBTQ Studies
3 Credits (3)
Multidisciplinary introduction to Lesbian, Gay, Bisexual, Transgender, and Queer Studies. Students will learn about LGBTQ identities, social movements, civil rights, and media representation.
Learning Outcomes
1. To broaden students' knowledge, cultural competencies, and research skills regarding LGBTQ+ Studies.
2. To develop a critical understanding of LGBTQ+ peoples and communities in relation to issues of power and inequality.
3. To expand understanding and learning approaches involving the study of cultural texts and arts forms created by or about LGBTQ+ experiences.
4. To develop the necessary analytical tools for further and more specialized study in the field of LGBTQ+ Studies.

GNDR 380V. Women Writers
3 Credits (3)
Introduction to multicultural women's traditions through intensive study of works by women writers. Taught with ENGL 380V. May be repeated up to 3 credits.

GNDR 381V. Women's Health Issues
3 Credits (3)
A focus on the unique issues and problems that confront women today and how they affect the health of women. Crosslisted with: PHLS 3120V. May be repeated up to 3 credits.

GNDR 401. Women & Immigration
3 Credits (3)
Explores historical and contemporary immigration processes in/to the U.S. that are shaped by gendered dynamics, societal structures, and the socio-economic conditions that impact immigrant women. Examines how immigrant women use their agency and resistance to overcome exploitative circumstances, and the restraints of immigration laws and policies that impact individual, communal and societal change.

GNDR 402. Transnational Feminisms
3 Credits (3)
Explores dimensions of gender, race, class, and sexuality in conjunction with nationalisms, anti-capitalist struggles, religious fundamentalism, militarism, globalization, eco-critique, and the politics of resistance and social movements.

GNDR 403. Gender & Horror
3 Credits (3)
Explores cultural anxieties and crises through the genre of horror as they relate to issues of gender, sexuality, feminism, and race. Traces ways horror films represent and reconfigure notions of sexuality and gender and ways they reinforce and/or challenge social norms.

GNDR 405. Alternative Genders and Sexualities
3 Credits (3)
Examination of queer, transgender, non-binary, and intersex gender identities and queer/non-heterosexual sexualities through literature, film, and critical theory

GNDR 406. Women and Human Rights
3 Credits (3)
Analysis of human rights violations and injustices as they relate to the lives of girls and women. Examines international political, legal, economic and socio-cultural implications of violence that target women and girls. Focusing on different countries, discusses social, political, economic, and human rights.
Learning Outcomes
1. Students will evaluate socio-culturally sanctioned practices that often lead to widespread victimization of girls/ women/ womxn
2. Students will better understand the application of Human Rights discourse and Human Rights remedies to women's, womxn's, and girls' rights

GNDR 407. Gender and Graphic Narrative
3 Credits (3)
Examines graphic novels that disrupt stereotypical ideas about genre, gender, race, class sexuality, as well as common notions about comics. Considers texts that address underrepresented experiences.

GNDR 408. Feminist Food Studies
3 Credits (3)
Examines contemporary food writing as a way to study identity, social structures, and notions of acceptability. Explores how constructions of food shape bodies, desires, and notions of belonging.
Learning Outcomes
1. Apply critical thinking and critical writing competencies about race ethnicity, gender sexuality, and class, as well as food and culture.
2. Analyze representations of food and culinary practices in literature, film, and other cultural production as a reflection of larger social forces.
3. Develop a scholarly vocabulary for discussing themes of race and ethnicity, gender and sexuality, class, citizenship and belonging, dislocation and exile, labor and consumption.

GNDR 411. Gender and Migration
3 Credits (3)
Explores multiple experiences of forced migration and displacement. Examines violence, structural dislocation, neoliberalism, globalization, economic collapse and civil war. Discusses local, regional and global responses to creating meaningful change in communities most affected by migration.

GNDR 412. Gender and Film Studies
3 Credits (3)
Examines how movies have created, reflected, and shaped ideas about gender, sexuality, race, and other dimensions of identity. This class analyzes these representations, how they create meaning, how they function within the filmic medium, and how some filmmakers create alternative visions.
Learning Outcomes
1. To develop skills to critically analyze films.
2. To gain a grounding in the analysis of social identity categories, with an emphasis on race and gender.
3. To analyze how race and gender are represented in popular culture and why media representation matters.
4. To learn critical tools to think through contemporary discourses on gender, race, and sexuality as well as categories of difference and identity.

GNDR 433V. Sex, Gender and Culture
3 Credits (3)
This seminar course introduces students to the anthropological study of gender. We take an integrated approach to the subject, considering the ways that that different kinds of anthropological research, including archaeology, biological anthropology, ethnography, etc.,expand our understanding of the various ways gender is defined across space and

time, how it is lived, and what it means to us and others. Students will review the historical context and development of this subject within the field, and will explore such topics as sex versus gender, embodiment and gendered performance, gender hierarchies, the politics of reproduction, and globalization. May be repeated up to 3 credits.

Learning Outcomes

1. Identify and evaluate different anthropological approaches to the study of gender
2. Develop and employ analytical and critical thinking skills
3. Demonstrate proficiency in oral and written communication
4. Integrate and synthesize knowledge of gender-related topics in a research paper

GNDR 450. Special Topics
3 Credits (3)

The topic of course will vary and will be indicated by subtitle. May be cross-listed with relevant courses at the 400-level from any specific department. May be repeated up to 99 credits.

Learning Outcomes

1. Varies

GNDR 451. Practicum in Gender and Sexuality Studies
3 Credits (3)

Supervised field work in community setting relating to women. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

GNDR 454. Women Crossing Borders
3 Credits (3)

Experiences of women who cross class, race, cultural, national, or sexual borders including theories regarding women's Interactions across borders. Emphasis will vary with professor and discipline.

GNDR 455. Feminist Research Methodologies
3 Credits (3)

Study of feminist modes of research inquiry, feminist ethics in research, and critiques of traditional disciplinary approaches to research.

Learning Outcomes

1. Students will recognize how theories and research methods influence the subjects and outcomes of studies.
2. Students will understand feminist practices associated with evolving epistemologies, research strategies, and calls for social change.
3. Students will develop and practice skills in designing, conducting, and analyzing narratives in ways that utilize feminist theory and research methods.

GNDR 461. Independent Study in Gender and Sexuality Studies
3 Credits (3)

Individual study of selected topic and writing of research paper. May be repeated up to 6 credits.

Learning Outcomes

1. Varies.

GNDR 465. Sex, Gender and the Body
3 Credits (3)

Examines forces at work in defining and differentiating gender, race, sexuality. How ideas about what is 'natural' and 'normal' for men and women shifted over time. Considers different discourses shaping embodied experiences and categories of identity.

GNDR 471. Seminar in Feminist and Queer Theories
3 Credits (3)

Seminar in contemporary feminist and queer theorizing that explores knowledge production, key debates, and transformation. Course examines interconnectedness of feminist and queer theories as well as critical concepts for social change and worldmaking.

Learning Outcomes

1. Demonstrate through discussion, research, and writing knowledge of shifts, differences, and debates in feminist and queer theoretical discourses.
2. Analyze a range of contemporary feminist and queer critical theories in discussions, essay assignments, and exams.
3. Formulate theories and forge connections between feminist and queer discourses through written and other assignments

GNDR 474. Gender in East Asian History
3 Credits (3)

Examines the position of women and the social roles of both sexes in traditional China and Japan, and traces the changes taking place in those societies in the course of modernization in the last century and a half. Scholarly literature and works of Chinese and Japanese literature in translation and cinema used. Taught with HIST 474.

GNDR 482. Gender and Popular Culture
3 Credits (3)

Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. May be repeated up to 6 credits.

GNDR 501. Advanced Women & Immigration
3 Credits (3)

Advanced exploration of historical and contemporary immigration processes in/to the U.S. that are shaped by gendered dynamics, societal structures, and the socio-economic conditions that impact immigrant women. Examines how immigrant women use their agency and resistance to overcome exploitative circumstances, and the restraints of immigration laws and policies that impact individual, communal and societal change.

GNDR 502. Advanced Transnational Feminisms
3 Credits (3)

Advanced analysis of dimensions of gender, race, class, and sexuality in conjunction with nationalisms, anti-capitalist struggles, religious fundamentalism, militarism, globalization, eco-critique, and the politics of resistance and social movements.

GNDR 505. Advanced Alternative Genders and Sexualities
3 Credits (3)

Intensive exploration of queer, transgender, non-binary, and intersex gender identities and queer/non-heterosexual sexualities through literature, film, and critical theory.

GNDR 506. Advanced Women and Human Rights
3 Credits (3)

Advanced analysis of human rights violations and injustices as they relate to the lives of girls and women. Intensive examination of international political, legal, economic and socio-cultural implications of violence that target women and girls. Focusing on different countries, explores social, political, economic, and human rights.

Learning Outcomes

1. Students will evaluate socio-culturally sanctioned practices that often lead to widespread victimization of girls/ women/womxn

2. Students will better understand the application of Human Rights discourse and Human Rights remedies to women's,womxn's, and girls' rights

GNDR 507. Advanced Gender and Graphic Narrative
3 Credits (3)
Advanced examination of graphic novels that disrupt stereotypical ideas about genre, gender, race, class sexuality, as well as common notions about comics. Considers texts that address underrepresented experiences.

GNDR 508. Advanced Feminist Food Studies
3 Credits (3)
Advanced examination of contemporary food writing as a way to study identity, social structures, and notions of acceptability. Intensive exploration of how constructions of food shape bodies, desires, and notions of belonging.
Learning Outcomes
1. Apply critical thinking and critical writing competencies about race ethnicity, gender sexuality, and class, as well as food and culture.
2. Analyze representations of food and culinary practices in literature, film, and other cultural production as a reflection of larger social forces.
3. Develop a scholarly vocabulary for discussing themes of race and ethnicity, gender and sexuality, class, citizenship and belonging, dislocation and exile, labor and consumption.

GNDR 511. Advanced Gender and Migration
3 Credits (3)
Advanced exploration of multiple experiences of forced migration and displacement. Intensive examination of violence, structural dislocation, neoliberalism, globalization, economic collapse and civil war. Discusses local, regional and global responses to creating meaningful change in communities most affected by migration.

GNDR 512. Advanced Gender and Film Studies
3 Credits (3)
Advanced study of how movies have created, reflected, and shaped ideas about gender, sexuality, race, and other dimensions of identity. This class analyzes these representations, how they create meaning, how they function within the filmic medium, and how some filmmakers create alternative visions.
Learning Outcomes
1. To develop skills to critically analyze films
2. To gain a grounding in the analysis of social identity categories, with an emphasis on race and gender
3. To analyze how race and gender are represented in popular culture and why media representation matters
4. To learn critical tools to think through contemporary discourses on gender, race, and sexuality as well as categories of difference and identity

GNDR 533. Advanced Issues in Sex, Gender, and Culture
3 Credits (3)
Survey of the history of anthropological ideas about gender and women, and a comparison of gender roles, relations, and ideologies across a range of cultures. Same as ANTH 533.
Learning Outcomes
1. Explain to others how you understand the concepts of sex, women, gender, and culture.
2. Critically analyze the uses of these concepts across a range of different contexts including media, politics, cultural performance, and everyday interactions.
3. Apply theoretical concepts introduced in this class to a current anthropological research problem/topic.

GNDR 550. Special Topics
3 Credits (3)
The topic of course will vary and will be indicated by subtitle. May be cross-listed with relevant courses at the 500-level from any specific department. May be repeated up to 99 credits.
Learning Outcomes
1. Varies

GNDR 554. Advanced Issues in Women Crossing Borders
3 Credits (3)
Experiences of women who cross class, race, cultural, national, or sexual borders including theories regarding women's interactions across borders. Consent of Instructor required.

GNDR 555. Advanced Feminist Research Methodologies
3 Credits (3)
Study of feminist modes of research inquiry, feminist ethics in research, and critiques of traditional disciplinary approaches to research.
Learning Outcomes
1. Students will recognize how theories and research methods influence the subjects and outcomes of studies.
2. Students will understand feminist practices associated with evolving epistemologies, research strategies, and calls for social change.
3. Students will develop and practice skills in designing, conducting, and analyzing narratives in ways that utilize feminist theory and research methods.

GNDR 561. Independent Graduate Research in Gender & Sexuality Studies
3 Credits (3)
Individual study of selected topics and writing of a research paper. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

GNDR 565. Advanced Sex, Gender & the Body
3 Credits (3)
Advanced examination of forces at work in defining and differentiating gender, race, sexuality. How ideas about what is 'natural' and 'normal' for men and women shifted over time. Considers different discourses shaping embodied experiences and categories of identity.

GNDR 571. Advanced Seminar in Feminist and Queer Theories
3 Credits (3)
Seminar in contemporary feminist and queer theorizing that explores knowledge production, key debates, and transformation. Course examines interconnectedness of feminist and queer theories as well as critical concepts for social change and worldmaking.
Learning Outcomes
1. Students will be able to demonstrate through discussion, research, and writing knowledge of shifts, differences, and debates in feminist and queer theoretical discourses.
2. Students will be able to analyze a range of contemporary feminist and queer critical theory in discussions, essay assignments, and exams.

3. Students will be able to formulate theories and forge connections between feminist and queer discourses through written and other assignments.

GNDR 582. Gender and Popular Culture
3 Credits (3)
Intensive study of the representations of gender in popular culture. Examines the historical, aesthetic, and cultural contexts of these representation and the various critical and theoretical lenses we use to understand them. Repeatable under different subtitles. May be repeated up to 6 credits.

GPHY-GEOPHYSICS

GPHY 450. Selected Topics
1-3 Credits
Readings, discussions, lectures or laboratory studies of selected areas of geophysics. May be repeated for a maximum of 12 credits.
Prerequisite: consent of instructor.

GPHY 520. Selected Topics
1-3 Credits
Formal treatment of graduate topics not covered in regular courses. May be repeated for unlimited credit.
Prerequisites: graduate standing, consent of instructor, and selection of a specific topic prior to registration.

GPHY 560. Applied Inverse Theory
3 Credits (3)
Inversion of data with an emphasis on geophysical problems. Curve fitting, tomography, earthquake location, over determined and under determined problems, linear and nonlinear problems. Computing experience desirable. Consent of Instructor required.

GPHY 598. Special Research Problems
1-3 Credits
Individual investigations, either analytical or experimental. May be repeated for unlimited credit.

GPHY 599. Master's Thesis
1-15 Credits (1-15)
Thesis.

GPHY 620. Advanced Topics in Geophysics
3 Credits (3)
Advanced formal treatment of a topic or topics not covered in regular courses. May be repeated for unlimited credit.
Prerequisite: consent of instructor.

GPHY 700. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation.

GREX-GRAD CROSS UNIV EXCH

GREX 600. Graduate Cross University Exchange
1-9 Credits

GRMN-GERMAN

GRMN 1110. German I
4 Credits (4)
Intended for students with no previous exposure to German, this course develops basic listening, speaking, reading, and writing skills aiming toward the ACTFL novice-mid level. This is an introductory course designed to teach the student to communicate in German in everyday situations and to develop an understanding of German cultures through the identification of cultural products and practices, of cultural perspectives, and the ability to function at a survival level in an authentic cultural content. This course will also develop the student's sense of personal and social responsibility through the identification of social issues.
Learning Outcomes
1. Students can communicate on very familiar topics using a variety of words and phrases that they have practiced and memorized.
2. Students can write lists and memorized phrases on familiar topics.
3. Students can recognize some familiar words and phrases when they hear them spoken.
4. Students can recognize some letters or characters.
5. Students can understand some learned or memorized words and phrases when they read.
6. Students can identify beliefs, behaviors and cultural artifacts of the German-speaking world.
7. In English, students will engage with social issues confronting the German-speaking world to develop their sense of personal and social responsibility

GRMN 1120. German II
4 Credits (4)
A continuation of German 1, students will develop a broader foundation in skills gained during the first semester, including understanding, speaking, reading and writing German aiming toward the ACTFL novice-high level. This course is designed to increase student fluency in German as applied to everyday situations. Students will also learn to recognize and understand various German products, practices, and perspectives, identifying common cultural patterns, describing basic cultural viewpoints, and further developing their sense of personal and social responsibility through the investigation of cultural issues.
Prerequisite(s): C or better in GRMN 1110.
Learning Outcomes
1. Students can communicate and exchange information about familiar topics using phrases and simple sentences, sometimes supported by memorized language.
2. Students can usually handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can write short messages and notes on familiar topics related to everyday life.
4. Students can often understand words, phrases, and simple sentences related to everyday life.
5. Students can recognize pieces of information and sometimes understand the main topic of what is being said.
6. Students can understand familiar words, phrases, and sentences within short and simple texts related to everyday life.
7. Students can sometimes understand the main idea of what they have read.
8. Students can describe and make comparisons between decisions about beliefs, behaviors and cultural artifacts ofthe German-speaking world.
9. Students will engage with social issues confronting the German-speaking world to continue to develop their sense of personal and social responsibility.

GRMN 2110. German III
3 Credits (3)
In this third semester course, students will continue to develop a broader foundation in skills gained during the first two semesters, including

understanding, speaking, reading and writing German aiming toward the ACTFL intermediate-low level. This course is designed to teach the student to communicate in a more sustained way in areas of personal interest and in everyday situations. Students will engage in and analyze various German products, practices, and perspectives, as well as continue to develop their sense of personal and social responsibility through comparison and contrast of cultural perspectives.
Prerequisite(s): C or better in GRMN 1120.

Learning Outcomes

1. Students can participate in conversations on a number of familiar topics using simple sentences.
2. Students can handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can write briefly about most familiar topics and present information using a series of simple sentences.
4. Students can understand the main idea in short, simple messages and presentations on familiar topics.
5. Students can understand the main idea of simple conversations that they overhear.
6. Students can understand the main idea of short and simple texts when the topic is familiar.
7. Students can analyze beliefs, behaviors and cultural artifacts of the German-speaking world, and discuss the nature and value of German products, practices, and perspectives.
8. Students will engage with social issues confronting the German-speaking world to continue to develop their sense of personal and social responsibility.

GRMN 2120. German IV
3 Credits (3)

In this fourth semester course, students will continue to broaden and refine skills gained during previous semesters, including understanding, speaking, reading and writing German aiming at the ACTFL intermediate-mid level. This course is designed to teach the student to communicate in a more sustained way in situations that go beyond the everyday. Students will evaluate various German products, practices, and create ways to demonstrate their sense of personal and social responsibility through participation in cultural interaction.
Prerequisite(s): C or better in GRMN 2110.

Learning Outcomes

1. Students can participate in conversations on familiar topics using sentences and series of sentences.
2. Students can engage in short social interactions in everyday situations by asking and answering a variety of questions. Students can usually say what they want to say about themselves and their everyday life.
3. Students can write on a wide variety of familiar topics using connected sentences.
4. Students can understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies.
5. Students can understand the main idea of conversations that they overhear.
6. Students can understand the main idea of texts related to everyday life and personal interests or studies.
7. Students can analyze beliefs, behaviors and cultural artifacts of the German-speaking world, and recognize and discuss the representations and controversies of German products, practices, and perspectives.
8. Students will engage with social issues confronting the German-speaking world to create ways to demonstrate their sense of personal and social responsibility.

GRMN 305. Topics in German Culture
3 Credits (3)

Group study of selected topics focusing on German culture and civilization. This course is linked to FLiP courses (Faculty-Led international Programs) when applicable. Topics identified by subtitle in the Schedule of Classes. GRMN 2120 or equivalent is recommended. May be repeated for up to 6 credits with different topics.

Learning Outcomes

1. (Language) Students will show more confidence in their German speaking, listening and writing abilities.
2. (Culture): Students will demonstrate knowledge of the culture of German institutions, of Berlin (through reflection and discussion sessions) after visits to historical, architectural and cultural sites as well as direct interaction with the locals.
3. (Culture): Students will demonstrate competence at navigating a culture different from their own.
4. (Culture): Students will demonstrate (through reflection and discussion sessions) a greater appreciation for the diversity of German identity.

GRMN 313. Intermediate Composition and Grammar
3 Credits (3)

A review of the rules of German grammar. Development of written German skills. GRMN 2120 or equivalent is recommended. May be repeated up to 3 credits.

Learning Outcomes

1. Students will show their improvement in writing skills in German through the application of accurate grammar rules practiced in the course.
2. Students will show their improvement in vocabulary usage in German by using more varied and appropriate vocabulary in their writing.
3. Students will show their improvement in writing organization.

GRMN 326V. Transnational German Film
3 Credits (3)

The film industry has kept abreast of globality, glocality, cultural, and linguistic diversity. In this course we will cover examples of German film from its impressionist beginnings to the current globally influenced, and technologically advancing style and will look at palpable transnational aspects, including Turkish-German cinema and refugees on- and off-screen. We will focus on how the turn towards a transnational understanding of film provides a space for a more globally connected and inclusive cinema and world

Learning Outcomes

1. Students analyze how ideas are represented, interpreted, or valued in various expressions of human culture.
2. Students examine relevant primary source materials as understood by the humanities area under study and interpret the material in writing assignments (or alternatives that require equally coherent and sustained analysis).
3. Students examine the messages embedded in images and relate them to their own culture(s).
4. Students will be conversant in film techniques, film genres, film history, politics, and culture of the time in which the film was made.

5. Students will practice and express aesthetic judgement in the form of analysis and assessment of film as an art form, both through discussion and through writing.
6. Students will be expected to identify and interpret key themes and topics related to Transnational 'German' Cinema.

GRMN 340. Introduction to Translation
3 Credits (3)
General aspects of Translation from German to English and English to German. GRMN 2120 or equivalent is recommended. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate understanding of the concept of translation by reading translation theory.
2. Demonstrate an enhanced knowledge of German as related to translation practices.
3. Demonstrate the ability to use specialized vocabulary and concepts in various professional areas.
4. Demonstrate knowledge of the translator's place as a professional.
5. Develop and enhance their linguistic competence and cultural awareness.

GRMN 341. German Folklore and Culture
3 Credits (3)
Customs, traditions, mythology, folk literature and art. Special focus on Grimms' fairy tales. GRMN 2120 or equivalent is recommended. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate improvement in reading skills in German by one ACTFL level by augmenting vocabulary, grammatical accuracy, and reading comprehension skills.
2. Describe the 5 basic motifs in folktales (FT) and where they supposedly come from.
3. List and define the 9 types of FT (Teverson) according to their functions.
4. Discuss the impact of the enlightenment in the structure of FT, Evaluate the influence of the industrial revolution and the development of a bourgeois society in FT.
5. Critique the position of the present-day, pop-cult media in its recently created versions of FT.

GRMN 350. Introduction to German Literature
3 Credits (3)
Basic literary genres and major figures in German language literature from its beginnings to the 19th century. GRMN 2120 or equivalent is recommended. To be followed by GRMN 471 - Studies in German Literature. May be repeated up to 3 credits. Consent of Instructor required.
Learning Outcomes
1. Demonstrate an improvement on reading skills in German by one ACTFL level by augmenting active vocabulary, grammatical accuracy and reading comprehension skills.
2. Describe the authors, styles and basic discourses of 3 periods of German-language literature (old and middle high German from early the medieval literature, the protestant reformation; High German and literature academies: the fifteenth to seventeenth Centuries; and the Eighteenth Century.

GRMN 399. Intermediate Independent Study in German
1-3 Credits (1-3)
Tutorial in reading, writing and oral expression for intermediate-level students of German. Topics identified in the Schedule of Classes. GRMN 2120 or equivalent is recommended. May be repeated for up to 6 credits with different topics. May be repeated up to 6 credits. Consent of Instructor required.
Learning Outcomes
1. Objectives for independent study courses will depend on the study/research interests of the student; they will always vary.

GRMN 410. Practicum in Conversational German
1-3 Credits
Intensive oral communication practice for students with a strong German language foundation. May be repeated up to 6 credits.
Prerequisite(s): GRMN 325 or consent of instructor.
Learning Outcomes
1. Objectives for independent study courses will depend on the study/research interests of the student; they will always vary.

GRMN 413. Advanced Composition and Grammar
3 Credits (3)
Exercises in written German with emphasis on stylistic features.
Prerequisite: GRMN 313 or consent of instructor.

GRMN 451. Special Topics in German
1-3 Credits
Selected topics to be identified by subtitle in the Schedule of Classes. May be repeated for up to 6 credits with different topic. May be repeated up to 12 credits.
Learning Outcomes
1. Objectives for independent study courses will depend on the study/research interests of the student; they will always vary.

GRMN 453. Independent Studies in German
1-3 Credits (1-3)
Individualized, self-paced research projects for advanced-level students of German. Topics identified by subtitle in the Schedule of Classes. GRMN 2120 or equivalent is recommended. May be repeated up to 12 credits.
Learning Outcomes
1. Objectives for independent study courses will depend on the study/research interests of the student; they will always vary.

HESC - HEALTH EQUITY SCIENCES

HESC 6110. Doctoral Seminar in Health Equity
3 Credits (3)
Course focuses on the nature and origins of health disparities experienced by underserved and marginalized groups. Includes discussion of major health equity theories addressing how historical, social, political, environmental, and economic factors contribute to the creation and maintenance of health inequity in contemporary society.
Learning Outcomes
1. Describe theoretical frameworks that may explain health disparities/inequities
2. Draw upon methods from social epidemiology to describe and analyze the determinants of health disparities for particular groups
3. Generate ideas for programs and policies that promote health equity
4. Identify knowledge gaps, synthesize relevant information, and formulate focused research questions to address these gaps
5. Critically evaluate the social and behavioral science research design and methodology related to public health

6. Design, implement, and evaluate community-based behavior interventions to prevent disease and/or promote health
7. Design and implement community-based research that incorporates knowledge of pertinent cultural, social, behavioral, and biological factors
8. Recognize the unique strengths and integral role of cultural communities and social groups in defining the health problems they experience and directing the solutions

HESC 6120. Quantitative Research Methods in Health Equity Sciences
3 Credits (3)
Course focuses on the principles and application of human health-related research methods. Topics include research problem identification, study planning, data collection, statistical analysis, interpretation of findings, and dissemination of results.
Learning Outcomes
1. Plan, design, and carry out a variety of different research projects, including a dissertation
2. Understand and critique research as described both in technical reports (e.g., professional journals) and in the popular media (e.g., newspapers, magazines, TV)
3. Identify and critically review quantitative study designs in like with various threats to validity
4. Discuss problems associated with methodology and logistics of conducting research
5. Develop the essential elements for a research plan
6. Prepare and present a professional quality research plan

HESC 6130. Seminar in Behavioral and Social Change for the Promotion of Health Equity
3 Credits (3)
This doctoral seminar will cover social and behavioral science theories, research, and interventions aimed at promoting the health of individuals, groups, communities, and populations. Topics include historical and social obstacles to change, health policy and advocacy, and movements to promote change.
Learning Outcomes
1. Describe ways that individual health knowledge and behavior can be reflexive, socially situated, and embedded within larger social, cultural, and historical contexts.
2. Recognize the role of social and behavioral factors in shaping global mortality and morbidity.
3. Be attuned to the social patterning of public health problems and their implications for solutions.
4. Analyze how social structural dimensions of public health problems influence individual and social behavior.
5. Make a case for the importance of focusing on social and behavioral factors as part of a comprehensive public health strategy.
6. Demonstrate how multi-disciplinary efforts can be integrated to suggest a social-structural context for current public health problems.

HESC 6210. Advanced Multiple Regression for Health Equity Sciences
3 Credits (3)
Course focuses on advanced regression-based statistical analyses for health-related research methods. Topics include a deep look into multiple regression, model building, stepwise and hierarchical regression, polynomial and logistic regression.
Learning Outcomes
1. Conduct and interpret a multiple regression analysis containing continuous, as well as categorical variables.
2. Describe the terms used in a linear model.
3. Report and check assumptions for multiple regression.
4. Perform transformations to normalize data.
5. Determine which regression models (e.g., linear, polynomial, exponential) are appropriate for different data set using visualizations, such as scatter plots.
6. Build regression models to predict health outcomes.
7. Conduct and interpret various regression models such as polynomial, exponential, stepwise, and hierarchical in R.

HESC 6220. Regression-Based Structural Equation Modeling for Health Equity Sciences
3 Credits (3)
Course focuses on advanced regression-based statistical analyses for health-related research methods. Topics include an in-depth look into multiple regression, stepwise and hierarchical regression, exploratory and confirmatory factor analysis, plus structural equation modeling.
Learning Outcomes
1. Describe the difference between observed and latent variables.
2. Conduct and interpret exploratory factor analyses in R.
3. Conduct and interpret confirmatory factor analyses in R.
4. Create a model and investigate the application of the model using structural equation modeling in R.
5. Conduct and assess goodness-of-fit for different models.

HESC 6230. Mixed Linear Models for Health Equity Sciences
3 Credits (3)
This course covers the theory and application of mixed linear models, also known as multilevel models for health research. Topics include fixed and random variables, mixed linear models, and mixed effects logistic regression.
Learning Outcomes
1. Identify fixed and random variables.
2. Prepare data for mixed linear model analyses in R.
3. Describe multilevel structures and classifications in a data set and connect these structures to real-world scenarios.
4. Describe mixed linear models and apply mixed linear models to health-related datasets.
5. Apply mixed linear models to scenarios containing binary responses or outcomes (e.g., HIV+ or HIV-).

HESC 6240. Grant Writing in Health Professions
3 Credits (3)
The course addresses all aspects of grant proposal preparation and submission, including locating funding sources, formulating a budget, and developing and writing the proposal.
Learning Outcomes
1. Describe different types of grants
2. Identify sources of funding for health promotion programming and/or research
3. Prepare the narrative portion of a grant proposal
4. Prepare and justify a grant budget
5. Navigate the grant submission and review process

HESC 6250. Design and Evaluation of Programs to Promote Health Equity
3 Credits (3)

Course addresses the processes of successful public health program planning, the application of health education theory and methods, the development and implementation of interventions to address health-related issues, and the use of research methods to examine program formation and impact.

Learning Outcomes

1. Describe the importance of public health programs to promote health equity.
2. Define key components of public health programs that promote health equity.
3. Describe the major stages of evaluation of public health programs to promote health equity, including needs/community assessment, process evaluation, impact evaluation, and outcome evaluation components.
4. Acquire the skills to develop an evaluation plan for public health programs to promote health equity with flow charts and sequential models from start to finish using a theoretical framework, logic model for program development, implementation, and evaluation.
5. Select, choose, and design evaluation tools and measures for public health programs that emphasize underserved and marginalized populations.
6. Understand the challenges and barriers in implementing and evaluating health promotion programs for underserved and marginalized populations and how to navigate such barriers.
7. Critically evaluate public health programs designed to promote the health of vulnerable, marginalized, and underserved populations.

HESC 6991. Doctoral Research
1-15 Credits (1-15)
Preliminary work on the dissertation in collaboration with the instructor before advancing to candidacy. Permission of instructor required. May be repeated up to 15 credits.

Learning Outcomes

1. Varies by student

HESC 6997. Independent Study
1-15 Credits (1-15)
Individual instruction or research. Permission of instructor required. May be repeated up to 15 credits.

Learning Outcomes

1. Varies by student

HESC 7000. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation. Permission of instructor required. May be repeated up to 15 credits.

Learning Outcomes

1. Varies by student

HIST-HISTORY

HIST 1110G. United States History I
3 Credits (3)
The primary objective of this course is to serve as an introduction to the history of the United States from the pre-colonial period to the immediate aftermath of the Civil War. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of the United States within the context of world societies.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of the United States from the pre-colonial period to the immediate aftermath of the Civil War. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply 8
6. Students will APPLY historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze 9

HIST 1120G. United States History II
3 Credits (3)
The primary objective of this course is to serve as an introduction to the history of the United States from reconstruction to the present. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of the United States within the context of world societies.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of the United States from the reconstruction to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distingusih between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appriase different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will apply historical knowledge and historical thinking "inorder to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze 10 11

HIST 1130G. World History I
3 Credits (3)

The primary objective of this course is to serve as an introduction to global history from ancient times to the 16th century. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of world societies. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for global history from ancient times to the 16th century. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze

HIST 1140G. World History II

3 Credits (3)

The primary objective of this course is to serve as an introduction to global history from the 16th century to the present. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of world societies. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of global history from the 16th century to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will Apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze

HIST 1150G. Western Civilization I

3 Credits (3)

This course is a chronological treatment of the history of the western world from ancient times to the early modern era. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of western civilization within the context of world societies. Selective attention will be given to "non-western" civilizations which impact and influence the development of "western" civilization.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of the western world from ancient times to the early modern era. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. BloomTaxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze 14

HIST 1160G. Western Civilization II

3 Credits (3)

This course is a chronological treatment of the history of the western world from the early modern era to the present. The elements of this course are designed to inform students on the major events and trends that are essential in the understanding of the development of western civilization within the context of world societies. Selective attention will be given to "non-western" civilizations which impact and influence the development of "western" civilization.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of the western world from the early modern era to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: Analyze, Remember, Evaluate, Create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: Understand, Evaluate, Apply

4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: Remember, Understand, Evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: Create, Apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: Apply, Analyze

HIST 1170G. Survey of Early Latin America
3 Credits (3)
The primary objective of this course is to serve as a survey of the history of Latin America from pre-Columbian times through independence. This course will explore the contributions of Indigenous peoples, Africans, and Europeans to the creation of Latin America's diverse societies. The elements of this course are designed to inform students on the major events and trends that are essential to the understanding of the history of Latin America within the context of world societies.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of Latin America from independence to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand.
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: analyze, remember, evaluate, create.
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: understand, evaluate, apply.
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: remember, understand, evaluate.
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: create, apply.
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present." Bloom Taxonomy's Cognitive Process: apply, analyze.

HIST 1180. MODERN LATIN AMERICA
3 Credits (3)
The primary objective of this course is to serve as a survey of the history of Latin America from independence to the present. This course will explore the contributions of Indigenous peoples, Africans, and Europeans to the creation of Latin America's diverse societies. The elements of this course are designed to inform students on the major events and trends that are essential to the understanding of the history of Latin America within the context of world societies.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of Latin America from independence to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: analyze, remember, evaluate, create
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: understand, evaluate, apply
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: remember, understand, evaluate
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: create. apply
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present."Bloom Taxonomy's Cognitive Process: apply, analyze

HIST 1180G. Survey of Modern Latin America
3 Credits (3)
The primary objective of this course is to serve as a survey of the history of Latin America from independence to the present. This course will explore the contributions of Indigenous peoples, Africans, and Europeans to the creation of Latin America's diverse societies. The elements of this course are designed to inform students on the major events and trends that are essential to the understanding of the history of Latin America within the context of world societies.

Learning Outcomes

1. Students will be able to explain in their work how humans in the past shaped their own unique historical moments and were shaped by those moments, and how those cultures changed over the course of the centuries for the history of Latin America from independence to the present. Bloom Taxonomy's Cognitive Process: Remember and Understand.
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context. Bloom Taxonomy's Cognitive Process: analyze, remember, evaluate, create.
3. Students will summarize and appraise different historical interpretations and evidence in order to construct past events. Bloom Taxonomy's Cognitive Process: understand, evaluate, apply.
4. Students will identify historical arguments in a variety of sources and explain how they were constructed, evaluating credibility, perspective, and relevance. Bloom Taxonomy's Cognitive Process: remember, understand, evaluate.
5. Students will create well-supported historical arguments and narratives that demonstrate an awareness of audience. Bloom Taxonomy's Cognitive Process: create and apply.
6. Students will apply historical knowledge and historical thinking "in order to infer what drives and motivates human behavior in both past and present."Bloom Taxonomy's Cognitive Process: apply, analyze.

HIST 2245G. Islamic Civilizations to 1800
3 Credits (3)
History of Islamic civilizations to 1800.

Learning Outcomes

1. By the conclusion of the course, the student will be able to demonstrate a knowledge of the history of cultural encounters, exchanges, and conflicts between the Islamic world and the West from the seventh to the sixteenth century;

2. Be able to evaluate the major themes of cultural contact, conflict, and interchange between the Islamic world and the West;
3. Critically read and evaluate historical evidence with the goal of forming an argument about historical evidence
4. Communicate a historical argument logically, clearly, and effectively in writing.

HIST 2250G. East Asia to 1600
3 Credits (3)
History of China, Korea, Vietnam, and Japan from earliest times through the sixteenth century. Emphasis on cultural and political developments and their social and economic contexts, and the interaction between East Asian societies.
Learning Outcomes
1. Students will learn the analytic skills of interpreting historical changes and continuity.
2. They will assess and use historical documents, and learn how to evaluate varying historical interpretations.
3. Students will understand the chronological and geographic context of important historical events,and will understand the social, technological, economic, cultural and political components of the society under study in this course.
4. Students will understand how people shape their culture and its beliefs, and the way in which prevailing cultures and beliefs shape them.
5. They will understand the historical origins of present-day societies, to learn about their own historical roots.
6. They will learn about the development of structures of power, the production of and distribution of goods, and the relationship between science and technology and human values and behavior.

HIST 2251G. East Asia since 1600
3 Credits (3)
History of China, Korea, Vietnam, and Japan from the sixteenth through the twentieth centuries. Emphasis on internal development of each country, as well as the social and political impact of Western Imperialism, and the emergence of each country's unique version of modern society.
Learning Outcomes
1. Students will learn the analytical skills of interpreting historical changes and continuity.
2. They will assess and use historical documents, and learn how to evaluate varying historical interpretations.
3. Students will understand the chronological and geographic context of important historical events, and will understand the social, technological, economic, cultural and political components of the society under study in this course.
4. Students will understand how people shape their culture and its beliefs, and the way in which prevailing cultures and beliefs shape them.
5. They will understand the historical origins of present-day societies, to learn about their own historical roots.
6. They will learn about the development of structures of power, the production of and distribution of goods, and the relationship between science and technology and human values and behavior.

HIST 2996. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. Community Colleges only. May be repeated for a maximum of 12 credits.
Learning Outcomes
1. Varies

HIST 300. Special Topics
1-9 Credits (1-9)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 18 credits.
Learning Outcomes
1. Students will analyze and interpret key themes, events and figures related to the chosen topic of this class, evaluating their historical significance and impact.
2. Students will assess both primary and secondary historical sources related to the chosen topic of this class, developing skills in historical inquiry and evidence-based argumentation in both discussion and written work.
3. Students will construct well-supported historical arguments related to the chosen subject matter of this class in both written and oral formats.

HIST 302V. Science in Modern Society
3 Credits (3)
The social impact of scientific activity and thought from Newton to the present. The growth of modern scientific institutions; the political and social context of modern science. ENGL 1110G recommended.
Learning Outcomes
1. Analyze the historical development of science and scientific ideas since the Scientific Revolution.
2. Evaluate the main factors comprising the institutions of modern science.
3. Assess the development of science and scientific ideas through brief biographies of scientists.
4. Evaluate relevant primary and secondary sources on a selected topic for a research paper related to the course.

HIST 308V. The History of Food
3 Credits (3)
From the earliest uses of fire for cooking up through our modern age of fast food and organic gardening, human culinary traditions have long shaped and been shaped by the forces of history. This course offers a general overview of the history of food production and consumption in the West from prehistoric times through the 21st century, with a special focus on the various ways in which social and political history have impacted dining, taste, and cooking. Among a great variety of topics, we will focus on the origins of cooked food; ancient Hebrew dietary laws; the "spice revolution" and the great influence of Arabic cuisine on the kitchens of medieval Europe; emerging ideas about etiquette and table manners including the use of the fork; the advent of print and the first printed cookbooks; the Columbian Exchange and the arrival of foods from the New World; the rise of French cuisine; food and immigration; the global dominance of fast food; and sustainable food production and consumption in the modern era. We will pay a special emphasis throughout the course to the myriad ways in which food production and consumption in history have always been gendered, as well as influenced by ideas about social class.
Learning Outcomes
1. Master a general master narrative about the history of food in the Western World, including a variety of European countries;
2. Analyze the relationship between food and culture in a variety of countries and traditions;

3. Critically read and learn to evaluate secondary historical literature, grasping the strengths and weaknesses of historical monographs; and
4. Communicate a historical argument logically and effectively in a 20-page original research paper.

HIST 313. Making the American West
3 Credits (3)
Development of the American West from 1803 to 1900 with emphasis on conquest, federal and corporate roles in western development, environmental change, and the Mythic West. Includes meetings outside regular class time to view feature-length films.
Learning Outcomes
1. Students will analyze primary and secondary sources to assess their biases and the quality of their evidence for historical argument.
2. Students will assess different interpretations of the West as described in the historiography of this field.
3. Students will evaluate the processes that created the West as region in both written and oral formats.

HIST 320. American History Through Film
3 Credits (3)
This course uses feature films as texts to examine the depiction of major themes and events in American history and society. It considers both the accuracy of these depictions, and the way in which the historical viewpoint of feature films is influenced by factors including directorial point of view and popular memory. It also examines the influence of feature films on popular understandings of the American past. May be repeated up to 3 credits.
Learning Outcomes
1. Students will critically analyze and evaluate the accuracy and truthfulness of cinematic representations of episodes in U.S. history, and convey these analyses and evaluations orally and in writing.
2. Students will evaluate contemporary claims made concerning the value of films for historical understanding, and convey these analyses and evaluations orally and in writing.
3. Students will assess the ways in which films serve as historical documents that illuminate the cultural, social, and political history of the eras in which they were produced, and convey these analyses and evaluations orally and in writing.

HIST 321V. History of Korea
3 Credits (3)
Social, political, and cultural history of Korea from earliest times through twentieth century. Emphasis on the interaction between Korean traditions and influences from China and the West. May be repeated up to 3 credits.
Learning Outcomes
1. Students will learn the analytical skills of interpreting historical changes and continuity.
2. They will assess and use historical documents, and learn how to evaluate varying historical interpretations.
3. Students will also understand the chronological and geographic context of important historical events, and will understand the social, technological, economic, cultural and political components of the society under study in this course.
4. Students will examine how people shape their culture and beliefs, and the way in which prevailing cultures and beliefs shape them.
5. They will understand the historical origins of present-day societies, to learn about their own historical roots.
6. They will learn about the development of structures of power, the production of and distribution of goods, and the relationships between science and technology and human values and behavior.

HIST 323. Cultural History of Later Imperial China
3 Credits (3)
Covers art and literature of China from the Tang Dynasty (618-907) through the eighteenth century. Developments in cultural theory and practice are traced in the context of the social and economic changes fostering an understanding of Chinese cultural history and its legacy in East Asia today.
Learning Outcomes
1. Analyze and interpret historical changes and continuity.
2. Assess and debate historical documents and practice evaluating varying historical interpretations.
3. Distinguish the chronological and geographic context of important historical events, in order to understand the social, technological, economic, cultural and political components of Chinese society.
4. Examine how people shape their culture and beliefs, and the ways in which prevailing cultures and beliefs shape them.
5. Identify the development of structures of power, the production of and distribution of goods, and the relationships between science and technology and human values and behavior.

HIST 329. History of Egypt
3 Credits (3)
History of Egypt from ancient times to the present.
Learning Outcomes
1. Outline the history of Egypt, from the pharaonic period to the present.
2. Identify key themes in Egyptian history and society and evaluate their significance to the contemporary world.
3. Analyze a variety of primary sources for their biases, as well as the quality of their evidence for historical argument.
4. Create well-supported, well-written historical arguments.

HIST 331. Rebels, Guerrillas, and Terrorists in Modern Latin America
3 Credits (3)
Explores history of rebels in Latin America. Examines guerilla struggles attaining national dimension. Focus on modern events, including Peru's Shining Path, Colombia's FARC, and Mexico's Zapatistas. Taught with POLS 468.
Learning Outcomes
1. Analyze primary sources by placing them into historical context.
2. Relate historical events to current-day issues in Latin America.
3. Improve writing skills using Chicago style of writing.
4. Explain the historical significance of a particular person or set of events.
5. Identify common patterns and differences in the history of Latin American nations.

HIST 333. Renaissance Europe
3 Credits (3)
This course explores the cultural, social, and political developments of early modern Europe between 1350-1650. This period witnessed a dramatic transformation between the medieval and modern worlds: a transition marked by new historical and artistic visions, the invention of the printing press, the discovery of the New World, the permanent fracturing of Christianity during the Protestant Reformation, the scientific revolution, and the rise of capitalism as a world system. We will consider these and other transformations in this time period both as they were

understood by elite society as well as the impact of these innovations upon the daily lives of everyday people and women in particular.

Learning Outcomes

1. Identify the key historical facts, values, and ideas that shaped the history of Europe between 1400--1650;
2. Analyze the causes and effects of the Renaissance, the Age of Encounters, the Reformation, and the Scientific Revolution;
3. Identify the major artistic, literary, and technological contributions of individuals during this time period;
4. Describe how cultural exchanges reveal the global context of events in early modern Europe; and
5. Create well-supported historical arguments based on primary and secondary source evidence.

HIST 334. Art and Life in Renaissance Italy
3 Credits (3)

Examines how Italian Renaissance textual and visual culture offered Europe new ways of seeing and portraying itself, 1350-1550. Topics include: Florence, Venice, Rome, Leonardo, Michelangelo, Titian, humanism, the Medici, and republican and courtly culture. Same as ARTH 444.

HIST 338. World War I
3 Credits (3)

Cultural, social, and intellectual background and impact of World War I. Military and diplomatic events of the war. Consequences of the war.

Learning Outcomes

1. Analyze the events from 1890-1914 that led to the outbreak of WWI.
2. Describe events and factors that led to military stalemates on the western and eastern front from 1914-1916 years.
3. Assess the importance of the southern front in Italy and southeastern Europe, including the Ottoman Empire.
4. Analyze the domestic front in France, Germany, and Russia that led to breakthroughs in the military stalemate.
5. Analyze the collapse of Russia and the renewal of the German offensive on the western front.
6. Explore the long-term impact of the Paris Peace Conference and the Treaty of Versailles.

HIST 339. World War II
3 Credits (3)

Social, cultural and political aspects of World War II, in addition to traditional military events. Emphasis on U.S. involvement.

Learning Outcomes

1. Analyze the situation in Europe from 1919-1939 that led to the outbreak of WWII.
2. Describe the events that led to the triumph of fascism in Italy and Germany.
3. Explore the impact of the Russian Revolution and Soviet Union on eastern European affairs.
4. Describe the impact of the Great Depression on European affairs.
5. Analyze Hitler's political and military strategy during the 1930 year.
6. Explain the events that led to German domination of Europe from 1939 to 1942 years.
7. Understand the connection between WWII and the Holocaust.
8. Analyze the events that led to Hitler's downfall in 1945 year.

HIST 361. African American History to 1877
3 Credits (3)

African background, slave trade, slavery; Civil War and Reconstruction; free blacks in a white society to about 1900. May be repeated up to 3 credits.

Learning Outcomes

1. Students will evaluate and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze and compare political, economic, social and intellectual institutions, structures and processes over the period from the great African Empires (circa 900CE) to the end of the period of Reconstruction (1877), with particular focus on the experiences of African Americans.
3. Students will strengthen their argumentative skills through online class discussions and written assignments.
4. Students will demonstrate an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
5. Students will demonstrate an ability to think about the interaction between present and past issues presented in the class.

HIST 362. African American History, 1865-present
3 Credits (3)

Black Americans in the United States in the twentieth century; segregation; black leaders, organizations, methods and goals; white reaction; the struggle for equality. May be repeated up to 3 credits.

Learning Outcomes

1. Students will evaluate and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze and compare political, economic, social and intellectual institutions, structures and processes over the period of the Civil Rights Movement through readings, interaction with primary source documents, essays, and discussions.
3. Students will strengthen their argumentative skills through online class discussions and written assignments.
4. Students will demonstrate an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
5. Students will demonstrate an ability to think about the interaction between present and past issues presented in the class.

HIST 366V. British Imperialism
3 Credits (3)

Survey of the activities of the British empire from the 16th century through the 20th century, with emphasis on Ireland, North America and India. Assesses the impact of imperial activities on British domestic politics, culture and social history, and the process and impact of decolonization.

Learning Outcomes

1. Students will study the chronologies of colonization and decolonization within the British Empire between 1066 and 1999 years.
2. Students will analyze primary sources to understand their content, context, sourcing, and the degree to which they corroborate a historical interpretation.
3. Students will evaluate narratives from a wide variety of cultural and historical perspectives.

HIST 371. Ancient Greece
3 Credits (3)

This course provides a survey of Greek history from the Trojan War through the conquests of Alexander the Great. Topics include the

formation of the Greek city-states with a focus on Sparta and Athens and the wars between them, the invention of democracy in Athens, the birth of the discipline of history, the development of philosophy, the trial and death of Socrates, and the spread of Greek culture to the borders of India because of the conquests of Alexander the Great. We will explore most aspects of Greek society, using Greek authors and artists to introduce much of the material. Attention is paid to the everyday life of ancient Greeks not just power politics.

Learning Outcomes

1. Students will define, explain, and analyze the major political, social and cultural transformations of Greek history through a variety of primary sources, including works of literature and art.
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context.
3. Students will critically read and evaluate historical evidence with the goal of forming an historical argument.
4. Students will communicate a historical argument logically, clearly, and effectively in writing.

HIST 372. The Roman World
3 Credits (3)

In this course we will explore the growth of Rome from a village in the Italian peninsula to a global empire stretching from Spain to Syria and Britain to the sands of the Sahara. We will focus on the development of political, social, and cultural institutions in the construction of the Roman Republic and the enormous military conquests of that period. We then examine the transformation of the Republic into an empire, governed by an emperor. Finally, we analyze the rise of Christianity in the Roman world and the Roman empire's decline in the 5th century C.E. Attention is paid to the everyday life of ancient Romans not just power politics.

Learning Outcomes

1. Students will define, explain, and analyze the major political, social and cultural transformations of Roman history through a variety of primary sources.
2. Students will distinguish between primary and secondary sources, identify and evaluate evidence and empathize with people in their historical context.
3. Students will critically read and evaluate historical evidence with the goal of forming an historical argument.
4. Students will communicate a historical argument logically, clearly, and effectively in writing.

HIST 379V. The History of Italy from the Etruscans to the Mafia
3 Credits (3)

Italy is beloved by many, for its food, language, and art; however, we often understand it only superficially, and often fail to grasp the darker elements of its history. This class will consider the history of the Italian peninsula from the time of its earliest inhabitants, the Etruscans, up through the twenty-first century. We will consider topics such as the Roman world and its legacy, the rise of Christianity, the growth of medieval towns and their economies, Renaissance, the Risorgimento or the formation of the modern nation of Italy, Italian fascism, the wars of the twentieth century, Italian film, the history of Italian food including pizza and pasta, Italian communism, and the growth of organized crime and the mafia. Special attention will be paid throughout to the relationship between Northern and Southern Italy, as well as the special city of Venice and its relationship to the rest of the peninsula.

Learning Outcomes

1. Master a general master narrative about the history of Italy from its earliest inhabitants through the twenty-first century
2. Identify a variety of developments in the history of Italian culture, including art, literature, food, and film;
3. Critically read and evaluate primary and secondary historical sources and
4. Communicate a historical argument logically and effectively in a 15-page original research paper.

HIST 382V. Modern Russia
3 Credits (3)

Domestic policies and foreign relations from mid-nineteenth century to the present with emphasis on the Soviet period.

Learning Outcomes

1. Evaluate the political, social, and cultural development of Russia/Soviet Union from the 1917 Revolutions to 1953 at Stalin's death.
2. Evaluate the political, social, and cultural developments in the Soviet Union in the post-Stalin Era (1953-91) and the post-Soviet era until the present (1991-2024).
3. Analyze primary source materials relating to the Soviet and post-Soviet periods.
4. Assess differing historical interpretations (historiography) of important periods of the Soviet and post-Soviet eras.

HIST 386. New Mexico History
3 Credits (3)

Economic, political and social development of New Mexico from exploration to modern times.

Learning Outcomes

1. Students will examine the scholarship of New Mexico history since 1,000 ADE.
2. Students will describe New Mexico's place on the edges of empires over its 500-year history and how this shaped a unique identity.
3. Students will create new ways of applying New Mexico history to contemporary issues and debates.
4. Students will analyze New Mexico history through secondary and primary source scholarship.
5. Students will create well-supported, well-written historical arguments about New Mexico history in the twentieth century.

HIST 387. Spain in the New World: Conquest, Conflict, and Cultural Exchange
3 Credits (3)

The history of Spain, with a focus on Spain's interaction with the New World. May be repeated up to 3 credits.

Learning Outcomes

1. The student will be able to demonstrate a knowledge of the history of Spanish contacts, conquests, and influences in the New World from the late fifteenth century until the early twenty first century;
2. Be able to evaluate the major themes of cultural contact, conflict, and interchange between the Spain and the New World; Critically read and evaluate historical evidence in order to construct past events;
3. Communicate a historical argument logically, clearly, and effectively in writing.

HIST 390V. The Holocaust
3 Credits (3)

The attack upon European Jews by Adolf Hitler and the National Socialist Party in Germany and occupied Europe from his accession to chancellor in 1933 until the end of the Third Reich in 1945.

Learning Outcomes

1. Analyze the historical context and events leading up to the Holocaust, including the rise of antisemitism and the Nazi party in Germany.
2. Examine the policies and actions taken by the Nazi regime that led to the systematic extermination of Jewish people and other minority groups.
3. Analyze the experiences of Jews and other victims of the Holocaust, including their persecution, enslavement, and murder by various methods.
4. Evaluate the role of collaborators, bystanders, victims, and resistance fighters during the Holocaust and the impact of their actions on the course of events.

HIST 397. Introduction to Public History
3 Credits (3)
Surveys how historians do history in museums, archives, government agencies, and in communities. Hands-on experience provides students a better understanding of history and how historians work outside of the classroom. Seminar project required.
Learning Outcomes

1. Students will discuss the history and theories of public history in the United States.
2. Students will examine the different debates and methods in the field.
3. Students will analyze a variety of primary and secondary sources and identify how they apply to a general audience.

HIST 398. Historians and History
3 Credits (3)
General historiography and philosophy of history; historical methodology, research, and writing; bibliographical aids and their uses.
Learning Outcomes

1. Understand the philosophy of history and historiographical changes.
2. Demonstrate proper use of historical methodology.
3. Formulate a research plan, conduct independent research, synthesize findings, and construct a historical argument based on the research.
4. Articulate the importance of historical research to the growth of knowledge and understanding of present-day issues and challenges.

HIST 400. Special Topics
1-9 Credits (1-9)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 18 credits.
Learning Outcomes

1. Students will analyze and interpret key themes, events and figures related to the chosen topic of this class, evaluating their historical significance and impact.
2. Students will engage with and critically assess both primary and secondary historical sources related to the chosen topic of this class, developing skills in historical inquiry and evidence-based argumentation in both discussion and written work.
3. Students will construct well-supported historical arguments related to the chosen subject matter of this class in both written and oral formats.

HIST 402. Special Topics in European History
3 Credits (3)
Special topics in European history to be announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes

1. Students will analyze and interpret key themes, events and figures related to a topic in European history, evaluating their historical significance and impact.
2. Students will engage with and critically assess both primary and secondary historical sources related to the chosen topic of this class, developing skills in historical inquiry and evidence-based argumentation in both discussion and written work.
3. Students will construct well-supported historical arguments related to the chosen subject matter of this class in both written and oral formats.

HIST 404. Special Topics in Asian History
3 Credits (3)
Special topics in Asian history to be announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes

1. Students will analyze and interpret key themes, events and figures related to a topic in Asian history, evaluating their historical significance and impact.
2. Students will engage with and critically assess both primary and secondary historical sources related to the chosen topic of this class, developing skills in historical inquiry and evidence-based argumentation in both discussion and written work.
3. Students will construct well-supported historical arguments related to the chosen subject matter of this class in both written and oral formats.

HIST 406. Special Topics in United States History
3 Credits (3)
Special topics in United States history to be announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes

1. Students will analyze and interpret key themes, events and figures related to a topic in US history, evaluating their historical significance and impact.
2. Students will engage with and critically assess both primary and secondary historical sources related to the chosen topic of this class, developing skills in historical inquiry and evidence-based argumentation in both discussion and written work.
3. Students will construct well-supported historical arguments related to the chosen subject matter of this class in both written and oral formats.

HIST 413. Native American History
3 Credits (3)
Seminar explores the history of Native Americans, including tribal conflicts, interactions with Europeans and Euro-Americans, land loss, degradation of natural resources, federal Indian policy, pan-Indian movements, cultural resistance and revitalization, and modern tribal economies.

HIST 414. The Constitution and U.S. History
3 Credits (3)
This seminar examines the history and political context of the ideas that coalesced in the U.S. Constitution, from 1603 to the writing of the Constitution and into the Early Republic.
Learning Outcomes

1. Students will evaluate and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.

2. Students will analyze the relationship between historical events in the Atlantic world and the development of key political concepts including divine right monarchy, constitutional monarchy, individual representation, the social contract theory, checks and balances, and the theoretical and practical processes of constitution-writing and ratification.
3. Students will strengthen their critical thinking argumentative skills through class discussions.
4. Students will demonstrate public speaking and class leadership skills by preparing and leading class discussions.
5. Students will demonstrate an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
6. Students will demonstrate an ability to think about the interaction between present and past issues presented in the class.
7. Students will undertake a major project of historical synthesis at the end of the semester.

HIST 431. History of Race and Ethnicity
3 Credits (3)
Seminar explores the historical social construction of race and ethnicity, and their relationship to other systems of social difference such as class and gender. Course will examine popular and academic theories of race and ethnicity as well as historical concrete effects of racial and ethnic differences in society.
Learning Outcomes
1. Summarize the importance of race, ethnicity, and indigeneity in the history of the United States.
2. Analyze and critique academic sources in groups.
3. Identify the historical precedents for varied rights across racial, ethnic, and indigenous groups.
4. Analyze the ways social, political, and economic systems and ideas in the United States have been impacted by ideas around race, ethnicity, and indigeneity.

HIST 433. United States Labor History Since 1877
3 Credits (3)
Seminar discussions explore United States labor and working-class history since 1877, including such topics as industrial labor, debt peonage, and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state.
Learning Outcomes
1. Students will evaluate, synthesize, and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze and compare the economic structures, workplace experiences, and cultural impacts presented by different types of industries in New Mexico from the late 19th century to the present.
3. Students will apply their argumentative skills through online class discussions and written assignments.
4. Students will express an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
5. Students will demonstrate an ability to think about the interaction between present and past issues presented in the class.

HIST 434. Urban History
3 Credits (3)
Seminar discusses cities as complex catalysts for cultural, political, and scientific development, both within cities themselves and more broadly for their nations and regions. Course deals with such topics as the relationship between social organization and physical space; city development, morphology and dynamics; and the cultural and intellectual history of cities.
Learning Outcomes
1. Students will analyze current debates about city planning and development in a historical context.
2. Students will identify major events that have shaped city planning and urban development since World World I.
3. Students will analyze primary sources and construct short argumentative papers on how gender, race, or class has shaped urban centers in the United States.

HIST 435. History of War and Revolution
3 Credits (3)
Seminar covers historical dynamics of violent social, political, and economic transitions. May focus upon a particular war or upheaval, such as World War II or the French Revolution, or may examine more generic characteristics of conflict and radical change across many historical examples. Extensive readings in scholarly literature. Research projects relating to specific course contents.

HIST 443. The Cold War in Latin America
3 Credits (3)
Seminar discusses Latin American political history during the Cold War. Course focuses on how Latin Americans (individuals, parties, militaries, states) acted in an increasingly politicized arena defined by growing United States concerns over Cuban and Soviet influence in the area.
Learning Outcomes
1. Analyze primary sources by placing them into the historical context of the Cold War.
2. Compare Cold War themes and historical events to current-day issues in Latin America.
3. Acquire writing skills using Chicago style of writing.
4. Explain the historical significance of a particular person or set of events.
5. Analyze the impact of the Cold War in different Latin American countries.

HIST 449. Readings
1-3 Credits
Individual study of selected readings and problems. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

HIST 469. Cultural Resource Management I
3 Credits (3)
This course will introduce students to the field of cultural resource management (CRM) and the federal and state laws and regulations that govern most archaeology and historic preservation projects conducted today. Course lectures, readings, and written assignments will cover major US federal laws (NHPA, NEPA, ARPA, NAGPRA); New Mexico state cultural resource laws, regulations, and permitting practices; and major international heritage laws. Particular emphasis will be placed on the evaluation and nomination processes of cultural resources to the National Register of Historic Places (NRHP). Strong oral and communication skills are key for success in CRM, so you will be given many opportunities to develop these skills in class.

Learning Outcomes

1. Explain the goals of cultural resource management (CRM).
2. Describe the major laws and regulations that govern CRM in the United States, New Mexico, and abroad.
3. Identify common challenges with implementing these laws and regulations.
4. Determine the eligibility of cultural resources for listing on the NRHP and justify that determination.

HIST 471. China through the Ming Dynasty
3 Credits (3)
History of China from origins to Ming dynasty, (1368-1644). Cultural and political development with emphasis on social and economic contexts and long term trends.

HIST 472. China in the Modern World
3 Credits (3)
History of China from seventeenth through twentieth centuries. Rise and fall of the Manchu Qing dynasty, internal dynamics of social and political change in nineteenth and twentieth centuries, impact of Western Imperialism, and development of the Peoples Republic since 1949.

Learning Outcomes

1. Students will learn the basic narrative of modern Chinese history.
2. Students will learn to understand and evaluate historical arguments and interpretations.
3. Students will learn to work with primary sources and to analyze and interpret their contents.
4. Students will complete a research paper combining primary and secondary sources and making a sustained historical argument.

HIST 473. History of Japan
3 Credits (3)
History of Japan through twentieth century. Political and cultural developments and their social and economic contexts. Chinese influence on early Japan, rise of Samurai and Shogunate, impact of Western Imperialism, and emergence of modern Japan.

HIST 474. Gender in East Asian History
3 Credits (3)
Examines the position of women and the social roles of both sexes in traditional China and Japan, and traces the changes taking place in those societies in the course of modernization in the last century and a half. Scholarly literature and works of Chinese and Japanese literature in translation and cinema used. Same as GNDR 474.

Learning Outcomes

1. Students will analyze historical change and continuity, with particular attention to female-centered lenses through time.
2. Students will interpret historical documents, and learn how to evaluate varying historical interpretations.
3. Students will summarize the chronological and geographic context of important historical events and will understand the social, technological, economic, cultural, and political components of Chinese society.
4. Students will describe how people shape their culture and its beliefs, and the way in which prevailing cultures and beliefs shape them.
5. Students will understand the development of structures of power, the production and distribution of goods, and the relationship between science and technology and human values and behavior.

HIST 475. History of the Global Political Economy
3 Credits (3)
Traces development of global systems of economic interaction and the rise of European military and political dominance in the 18th and 19th centuries. Emphasis on East and South Asian roles in early modern history, and on challenges to European dominance in the 20th and 21st centuries.

HIST 478. History of Transportation: Planes, Trains and Automobiles
3 Credits (3)
The course examines the impact of changes in transportation technology on society from the 19th century to the present, with a focus on the Americas, both the United States and Latin America. Revolutionary changes such as the railroad, the steamship, and later the automobile and the airplane changed the way that people lived, worked and interacted with others.

Learning Outcomes

1. Analyze primary sources by placing them into historical context.
2. Improve writing skills using Chicago style of writing.
3. Explain the nature of technological change in history and its impact in society.
4. Relate historical events to current-day debates about transportation.
5. Practice team-work through Team Based Learning method.

HIST 479. Oral History
3 Credits (3)
Oral history through readings, discussions, and interviews. Semester project required that includes an interview and transcript.

Learning Outcomes

1. Demonstrate an understanding of methodology, importance, and challenges for oral history research and scholarship.
2. Attain experience developing materials for and conducting oral history interviews.
3. Apply oral history research to a historical research paper.
4. Construct a historical argument using oral histories in conjunction with other historical sources and secondary materials.

HIST 483. Historic Preservation
3 Credits (3)
Study of community development, the historic preservation movement, and the built environment. Field project.

Learning Outcomes

1. Students will study the fundamental practices of historic preservation.
2. Students will examine the different debates and methods in the field and how they apply to the nomination process.
3. Students will assess the Secretary of Interior's standards of site interpretation.

HIST 486. Interpreting Historic Places for the Public
3 Credits (3)
Explores historic site interpretation, the scholarship and philosophy of historic interpretation, and the nature of heritage interpretation for historic places.

Learning Outcomes

1. Students will interpret primary and secondary sources to understand how they apply to a general audience.
2. Students will examine the different debates and methods in the field and how they apply to the nomination process.
3. Students will assess the basic history and theories of historic site interpretation.

HIST 500. Special Topics
1-9 Credits (1-9)
Specific subjects to be announced in the Schedule of Classes. Graduate research paper required. May be repeated up to 12 credits.
Learning Outcomes
1. Students will analyze and interpret key themes, events and figures related to the chosen topic of this class on an advanced level, evaluating their historical significance and impact.
2. Students will engage with and critically assess both primary and secondary historical sources related to the chosen topic of this class on an advanced level, developing skills in historical inquiry and evidence-based argumentation in both discussion and written work.
3. Students will construct well-supported historical arguments related to the chosen subject matter of this class in both written and oral formats.

HIST 511. Making the American West
3 Credits (3)
Development of the American West from 1803 to 1900, with emphasis on conquest, federal and corporate roles in western development, environmental change, and the mythic West. Includes extra class meetings to view feature-length films. Graduate research paper required.
Learning Outcomes
1. Students will analyze primary and secondary sources about the history of the US West.
2. Students will examine and debate different interpretations of the West and the controversies by writing a short historiographical essay.
3. Students will create their own history assignment.
4. Students will construct arguments in written essays and in class discussions.

HIST 514. The Constitution and U.S. History
3 Credits (3)
This seminar examines the history and political context of the ideas that coalesced in the U.S. Constitution, from 1603 to the writing of the Constitution and into the Early Republic.
Learning Outcomes
1. Students will evaluate and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze the relationship between historical events in the Atlantic world and the development of key political concepts including divine right monarchy, constitutional monarchy, individual representation, the social contract theory, checks and balances, and the theoretical and practical processes of constitution-writing and ratification.
3. Students will strengthen their critical thinking argumentative skills through class discussions.
4. Students will demonstrate public speaking and class leadership skills by preparing and leading class discussions.
5. Students will demonstrate an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
6. Students will demonstrate an ability to think about the interaction between present and past issues presented in the class.
7. Students will undertake a 10-12 page research paper in which they will integrate and extend learned material.

HIST 527. Labor History
3 Credits (3)
Seminar discussions explore labor and working-class history, including such topics as pre-industrial labor, slavery, debt peonage, indentured servitude, and housework. May explore the history of labor organization, working-class culture and leisure activities, and responses to labor issues by the state.
Learning Outcomes
1. Students will evaluate, synthesize, and employ primary and secondary sources in order to understand varying historical interpretations and craft their own interpretations of historical evidence in discussions and essays.
2. Students will analyze and compare the economic structures, workplace experiences, and cultural impacts presented by different types of industries in New Mexico from the late 19th century to the present.
3. Students will apply their argumentative skills through online class discussions and written assignments.
4. Students will express an understanding of academic honesty and the ability to cite, paraphrase, and quote sources.
5. Students will attain an ability to think about the interaction between present and past issues presented in the class.

HIST 535. War and Revolution
3 Credits (3)
Seminar covers historical dynamics of violent social, political and economic transitions. May focus upon a particular war or upheaval, such as World War II or the French Revolution, or may examine more generic characteristics of conflict and radical change across many historical examples. Extensive readings in scholarly literature. Research projects relating to specific course contents.

HIST 538. Special Topics in European History
3 Credits (3)
Advanced special topics in European history to be announced in the schedule of classes. May be repeated up to 12 credits.
Learning Outcomes
1. Students will analyze and interpret key themes, events and figures related to the chosen topic of this class on an advanced level, evaluating their historical significance and impact.
2. Students will engage with and critically assess both primary and secondary historical sources related to the chosen topic of this class on an advanced level, developing skills in historical inquiry and evidence-based argumentation in both discussion and written work.
3. Students will construct well-supported historical arguments related to the chosen subject matter of this class in both written and oral formats.

HIST 543. Special Topics in Asian History
3 Credits (3)
Advanced special topics in Asian history to be announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes
1. Students will analyze and interpret key themes, events and figures related to a topic in Asian history on an advanced level, evaluating their historical significance and impact.
2. Students will engage with and critically assess both primary and secondary historical sources related to the chosen topic of this class on an advanced level, developing skills in historical inquiry and evidence-based argumentation in both discussion and written work.

3. Students will construct well-supported historical arguments related to the chosen subject matter of this class in both written and oral formats.

HIST 545. Special Topics in United States History
3 Credits (3)
Advanced special topics in United States history to be announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes
1. Students will analyze and interpret key themes, events and figures related to a topic in US history on an advanced level, evaluating their historical significance and impact.
2. Students will engage with and critically assess both primary and secondary historical sources related to a topic in US history on an advanced level, developing skills in historical inquiry and evidence-based argumentation in both discussion and written work.
3. Students will construct well-supported historical arguments related to the chosen subject matter of this class in both written and oral formats.

HIST 549. Graduate Readings
1-3 Credits
Individual study of selected readings and problems. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

HIST 568. Urban History
3 Credits (3)
Seminar discusses cities as complex catalysts for cultural, political, and scientific development, both within cities themselves and more broadly for their nations and regions. Course deals with such topics as the relationship between social organization and physical space; city development, morphology and dynamics; and the cultural and intellectual history of cities.
Learning Outcomes
1. Students will examine the best practices of urban planning and development and write short argumentative papers on how these theories have changed over time.
2. Students will create a presentation that examines urban development in the American West since 1880 using primary and secondary sources.
3. Students will identify the major turning points in urban development in the United States in class discussions and short response papers.

HIST 569. Cultural Resource Management I
3 Credits (3)
This course will introduce you to the field of cultural resource management (CRM) and the federal and state laws and regulations that govern most archaeology and historic preservation projects conducted today. Course lectures, readings, and written assignments will cover major US federal laws (NHPA, NEPA, ARPA, NAGPRA); New Mexico state cultural resource laws, regulations, and permitting practices; and major international heritage laws. Particular emphasis will be placed on the evaluation and nomination processes of cultural resources to the National Register of Historic Places (NRHP). Strong oral and communication skills are key for success in CRM, so you will be given many opportunities to develop these skills in class.
Learning Outcomes
1. Explain the goals of cultural resource management (CRM).
2. Describe the major laws and regulations that govern CRM in the United States, New Mexico, and abroad.
3. Identify common challenges with implementing these laws and regulations.
4. Determine the eligibility of cultural resources for listing on the NRHP and justify that determination.

HIST 570. The Cold War in Latin America
3 Credits (3)
Seminar discusses Latin American political history during the Cold War. Course focuses on how Latin Americans (individuals, parties, militaries, states) acted in an increasingly politicized arena defined by growing United States concerns over Cuban and Soviet influence in the area.
Learning Outcomes
1. Analyze primary sources by placing them into the historical context of the Cold War.
2. Compare Cold War themes and historical events to current-day issues in Latin America.
3. Attain writing skills using Chicago style of writing.
4. Explain the historical significance of a particular person or set of events.
5. Analyze the impact of the Cold War in different Latin American countries.

HIST 571. China through the Ming Dynasty
3 Credits (3)
History of China from origins to Ming Dynasty, 1368-1644. Cultural and political development with emphasis on social and economic contexts and long term trends. Research paper required.

HIST 572. China in the Modern World
3 Credits (3)
Covers the history of China from 17th through 20th centuries. Rise and fall of the Manchu Qing dynasty, internal dynamics of social and political change in the 19th and 20th centuries, impact of Western imperialism, and development of the Peoples Republic since 1949. Research paper required. May be repeated up to 3 credits.
Learning Outcomes
1. Students will learn the basic narrative of modern Chinese history.
2. Students will learn to understand and evaluate historical arguments and interpretations
3. Students will learn to work with primary sources and to analyze and interpret their contents.
4. Students will complete a research paper combining primary and secondary sources and making a sustained historical argument.

HIST 573. History of Japan
3 Credits (3)
Covers the history of Japan through the 20th century. Political and cultural developments and their social and economic contexts. Chinese influence on early Japan, rise of Samurai and Shogunate, impact of Western imperialism, and the emergence of modern Japan. Research paper required.

HIST 575. History of the Global Political Economy
3 Credits (3)
Traces development of global systems of economic interaction and the rise of European dominance in the 18th and 19th centuries. Emphasis on East and South Asian roles in early modern history, and on challenges to European dominance in the 20th and 21st centuries.

HIST 577. Cultural Resource Management II
3 Credits (3)
This course will introduce students to the practice of working in cultural resource management (CRM). It includes readings, lectures, field

sessions, and laboratory sessions aimed at providing students with the research design, archaeological survey, site mapping and documentation, and technical writing skills necessary to pursue employment in CRM. Students are strongly encouraged to take CRM I before taking this class.

Learning Outcomes

1. Map and record an archaeological site.
2. Document an archaeological site (using a Laboratory of Anthropology site form).
3. Analyze and present archaeological data using relevant software.
4. Critically evaluate an inventory, testing, or data recovery report.
5. Prepare sections of a technical report—either a research proposal or survey report.
6. Conduct archaeological fieldwork safely and ethically.

HIST 579. Oral History
3 Credits (3)

Oral history through readings, discussion, and interviews. Course project required that includes an interview and transcription.

Learning Outcomes

1. Articulate an understanding of methodology, importance, and challenges for oral history research and scholarship.
2. Practice developing materials for and conducting oral history interviews.
3. Apply oral history research to a historical research paper.
4. Construct a historical argument using oral histories in conjunction with other historical sources and secondary materials.

HIST 583. Advanced Historic Preservation
3 Credits (3)

Covers the community development, the historic preservation movement, and the built environment. Field project and additional graduate work.

Learning Outcomes

1. Students will examine the best practices in the field of historic preservation and construct short response papers based on course readings.
2. Students will examine the different debates and methods in the field and how they apply to the nomination process.
3. Students will prepare a group nomination project and write a paper justifying how their work aligns with the Secretary of Interior's standards as a way of gaining field experience.

HIST 585. Public History Internship
3 Credits (3)

Individual project in an area of public history, including a final written report. Research project required. May be repeated for a maximum of 9 credits.

Prerequisite: consent of instructor.

HIST 586. Interpreting Historic Places for the Public
3 Credits (3)

Advanced study of historic site interpretation, the scholarship and philosophy of historic interpretation, and the nature of heritage interpretation for historic places.

Learning Outcomes

1. Students will complete historical marker nomination forms and align them with the NM SHPO standards as a way of gaining field experience.
2. Students will examine the different debates and methods in the field through short writing assignments and construct historical arguments backed with secondary and primary sources.
3. Students will analyze different theories of interpretation and visit a historic site or museum to see how other professionals apply these concepts.

HIST 590. Reading Seminar: Borders, Boundaries and Frontiers
3 Credits (3)

Explores questions and issues concerning different kinds of borders, boundaries and frontiers. Introduces relevant theoretical literature and considers specific places and times through case studies, including U.S.-Mexico border. Restricted to students in HIST program. May be repeated up to 6 credits.

Learning Outcomes

1. Summarize historiographical debates around borders, boundaries, and frontiers.
2. Analyze academic sources in group discussions.
3. Evaluate the impacts of borders, boundaries, and frontiers on other areas of historical inquiry.
4. Formulate a research plan, conduct independent research, synthesize findings, and construct a historical argument based on the research.

HIST 591. Reading Seminar: Modernity and its Discontents
3 Credits (3)

Examines the problem of modernization and the meaning of becoming and being modern, including positive and negative effects on individuals, cultures, environments and societies.

Learning Outcomes

1. Students will evaluate the complex concept of modernity by engaging in group discussion based on close readings of academic sources on the topic.
2. Students will analyze how different cultures have incorporated the concept of modernity to understand their own historical development.
3. Students will summarize recent historiography that challenges the notion of modernity as a Western-centered historical process.

HIST 592. Reading Seminar: Nature and Society
3 Credits (3)

Considers how humans and nature have reshaped each other, how people have perceived nature, how different cultures have understood their relationships to nature, and how social groups and nations have struggled over natural resources. Takes a comparative, transnational approach.

Learning Outcomes

1. Students will analyze the complex interactions between people and environments across a wide range of geographies and temporalities.
2. Students will compare how different cultures, in different historical moments, have shaped, been shaped by, and thought about the environments around them.
3. Students will summarize the major texts, themes, concepts, and approaches in the field of environmental history.
4. Students will evaluate sources, evidence, historical interpretations, and arguments with a critical eye.
5. Students will craft evidence-based historical arguments that reflect an awareness of audience, purpose, ethics, and historiography.

HIST 594. Public History Seminar
3 Credits (3)

Introduction to the discipline of public history, including its methodology and literature. Fieldwork is required.

Learning Outcomes

1. Students will examine the history and theories of public history in the United States and write short argumentative papers about the field's best practices.
2. Students will compare the different debates and methods in the field and write short response papers that engage a general audience.
3. Students will create an original public history project from one of the subfields and compile a proposal, budget, and CV as a way of gaining grant writing experience.

HIST 596. Research Seminar
3 Credits (3)
Research seminar teaches students the process of conducting original historical research with primary source documents. Students will then use these research skills to produce a polished chapter or article-length manuscript. Restricted to HIST majors.
Learning Outcomes

1. Make an original and substantial historical contribution based on research in primary sources available in an archive or in digital form.
2. Explain how their scholarship makes a contribution to the field by summarizing relevant historiography.
3. Articulate their research findings effectively in written and oral presentations.
4. Demonstrate an understanding of professional and ethical standards in the discipline.

HIST 597. Public History Article
1-9 Credits (1-9)
Researching and writing an article suitable for publication about a student's public history internship or other topic of interest within the field of public history.

HIST 598. Craft of History: Historical Theories, Methods, and Criticism (f)
3 Credits (3)
Introduction to historical theories, methodologies, criticism, and skills essential to graduate study in history. Required for all history graduate students; restricted to history majors.
Learning Outcomes

1. Analyze exemplary historical writing and a variety of methodologies around a single topic.
2. Explain historical epistemic practices.
3. Craft a precis that summarizes and analyzes historical scholarship.
4. Situate new works within a relevant historiographic tradition.
5. Produce an academic book review suitable for publication in a scholarly journal.
6. Devise an engaging class discussion about shared readings.

HIST 599. Master's Thesis
1-15 Credits (1-15)
Thesis.

HLED-HEALTH EDUCATION

HLED 1110. American Heart Association Heartsaver First Aid CPR/AED
1 Credit (1)
A video-based, instructor-led course that teaches students critical skills needed to respond to and manage an emergency until emergency medical services arrives. Skills covered in this course include first aid; choking relief in adults, children, and infants; and what to do for sudden cardiac arrest in adults, children, and infants. Upon successful completion of the course, students will become eligible for AHA Heartsaver® First Aid & CPR/AED certification. May be repeated up to 1 credit.
Learning Outcomes

1. Demonstrate the skills necessary to efficiently perform one (1) and two (2) rescuer CPR for adult, child, and infant victims of cardiac arrest at the Basic Life Support level.
2. Demonstrate the skills necessary to safely and effectively operate an automated external defibrillator (AED).
3. Demonstrate the skills necessary to intervene and care for an adult, child, or infant choking victim and be able to administer first-aid to this population.

HMRT-HUMAN RIGHTS

HMRT 2110G. Introduction to Human Rights
3 Credits (3)
The course provides a basic introduction to international human rights including conceptual foundations and key theoretical debates with attention paid to current events that are shaping justice and human rights. It provides a variety of disciplinary perspectives on human rights including philosophy, socio-legal studies, political science, law, and criminology. The combination of understanding the conceptual foundations, key theoretical debates, and thematic areas in human rights will enable students to understand the evolution of human rights regimes and their influence in society today. The course is broken into four parts. The first part provides an understanding of the historical underpinnings of international human rights and their evolution in society and law. It examines foundational texts on justice and human rights that have shaped our concepts of rights and justice today. The second part focuses on global and regional mechanisms within human rights. Examining these mechanisms helps us understand the legal application and enforcement of human rights globally. The third section focuses on thematic areas in human rights. These thematic areas include: environmental law, international criminal law, refugee, migrants and asylum seekers, international women's rights, economic, social & cultural rights, and transitional justice. The course concludes by focusing on critical perspectives and local issues on human rights.
Learning Outcomes

1. Understand key theoretical debates on human rights.
2. Describe historical underpinnings of international human rights.
3. Identify different foundational texts in the evolution of justice and human rights.
4. Understand how social and historical contexts have impacted beliefs on justice, rights, and human dignity.
5. Explain thematic areas in international human rights.
6. Understand regional and global multilateral mechanisms in human rights law.
7. Critically examine the efficacy of international human rights.
8. Understand the social, political, economic and other factors that have molded human rights.
9. Gain a better understanding of your own worldviews and opinions towards justice and human rights.

HMRT 2125. International Rights of Children
3 Credits (3)
This course examines the history, sources and role of international rights of children in the protection of children worldwide. It provides an understanding of the international legal regulatory framework implemented to address the rights of children. The course is broken into two parts. The first part covers the history and development of

international rights of children and explores key concepts from children's rights theory. This section also covers current international legal mechanisms in place to protect children worldwide. The second section covers issues in the protection of children's rights. Issues covered include (but not limited to): child labor, child trafficking, armed conflict, war, the right to truth. Lastly the course covers the future of international rights of children.

Learning Outcomes

1. Understand the history and origins of child protection in international human rights law.
2. Identify key concepts of children's rights theory in international human rights law.
3. Describe major international human rights law established for the protection of children.
4. Understand how international rights of children addresses issues in child exploitation and abuse related to child labor and child trafficking.
5. Explain the rights of children during armed conflict and war.
6. Identify the rights of children to the right to truth.
7. Critically examine the what the future of international rights of children entails when incorporating an understanding of human rights law.
8. Gain a better understanding of your own worldviews and opinions towards the international rights of children.

HMRT 2175G. Border Justice & Human Rights
3 Credits (3)

This course examines the human rights implications of border practices, migration/refugee patterns, and environmental degradation set amidst increasingly contentious territorial politics, complex population movements, and record-shattering climate change events. Additionally, the course provides context to justice along the U.S/Mexico border as seen through a human rights lens. It examines issues of border conflict around the world. It also explores the history of the U.S.-Mexico border and examines historical and contemporary human rights issues impacting the region. The course is broken into three parts. The first part provides an introduction to the history of the U.S.-Mexico border region. This includes exploring the history of border drawing and its impact on populations living along the border. The second section examines the long history of violence along borders. It examines how border identities develop over time in the midst of violence, community building, and the contested spaces of borders. It also explores how drugs, immigration, and free trade has impacted border regions. Lastly after understanding the history and issues of violence along borders, the last section explores human rights issues of border regions. This section examines how social movements and human rights advocacy have impacted the protection of rights of communities living along borders.

Learning Outcomes

1. Explain the historical evolution of border drawing along the U.S.-Mexico border and throughout the world.
2. Identify how colonization impacted the development of border regions.
3. Understand how identity is informed by migration and belonging in the U.S.-Mexico border region.
4. Describe how increased border enforcement and immigrant criminalization has impacted the U.S.-Mexico border region.
5. Understand how drug wars, human trafficking and gendered violence impacts the U.S.-Mexico border.
6. Describe past and current human rights violations taking place along the U.S.-Mexico border and at other borders throughout the world.
7. Understand how transnational advocacy groups and other social movements advocating for human rights have impacted border regions.
8. Gain a better understanding of your own worldviews and opinions towards the U.S.-Mexico border and human rights.

HMRT 3996. Issues in Human Rights
3 Credits (3)

The course provides an opportunity to discuss contemporary issues in international human rights, including current events that are shaping justice and human rights. It provides a variety of disciplinary perspectives on human rights including philosophy, socio-legal studies, political science, law, and criminology. The combination of understanding the conceptual foundations, key theoretical debates, and thematic areas in human rights will enable students to understand the evolution of human rights regimes and their influence in society today. It will be taught as a Seminar on problems and conflicts encountered in major human rights issues.

Learning Outcomes

1. Understand key theoretical debates on human rights.
2. Describe historical underpinnings of international human rights.
3. Identify different foundational texts in the evolution of justice and human rights.
4. Understand how social and historical contexts have impacted beliefs on justice, rights, and human dignity.
5. Explain thematic areas in international human rights.
6. Understand regional and global multilateral mechanisms in human rights law.
7. Explain issues and approaches in human rights enforcement and policy.
8. Critically examine the efficacy of international human rights.
9. Understand the social, political, economic and other factors that have molded human rights. 1
10. Gain a better understanding of your own worldviews and opinions towards justice and human rights.

HMRT 4550V. Skills & Ethics for Human Rights Work
3 Credits (3)

Course topics will vary, but each will cover a specific skill that is important for doing contemporary human rights work. Topics might include: grant writing and fundraising, specific statistical techniques or research methods, forensics and human rights, interviewing of marginalized communities, creating documentary media, or the optimum use of social media. The course is broken into three parts. The first part provides an introduction to the topic of human rights and examines current issues faced by people working in the human rights field. The second section focuses on development of practical human rights skills. The last section explores ethical dilemmas faced when conducting human rights work

Learning Outcomes

1. Explain the practice of human rights work.
2. Identify differences between human rights activism and advocacy.
3. Explain differences between human right and other rights.
4. Understand the nature and practice of human rights data collection.
5. Describe the different research methods used in human rights work.
6. Understand grant writing and fundraising strategies for human rights work.
7. Identify the impact journalism, documentaries, and social media has on human rights work.

8. Understand how decolonizing human rights practices impact human rights work along the U.S.-Mexico border.
9. Critically examine the role human rights work has globally. 1
10. Gain a better understanding of your own worldviews and opinions towards the skills and ethics of human rights work.

HMRT 4580V. International Environmental Law and Justice
3 Credits (3)
This course will provide a general introduction to the basic concepts and mechanisms of international environmental law. The course is aimed at providing a foundation of the current international legal framework and principles that govern and regulate environmental law. It explores the root causes of environmental problems and investigates the ways society manages environmental issues via the law that transcend international boundaries and resultantly fall beyond the authority of a single nation. The course is broken into four parts. The first part provides an introduction to the topic and examines current issues impacting environmental law and justice. The section also examines the history and evolution of international environmental law. The second section analyzes the causes associated with environmental problems and describes current norms and policies. The third section explores the roles of governmental and intergovernmental actors and actors beyond the state that participate in international environmental law. The course concludes by examining environmental justice and questions whether environmental law is effective and what are the shortcomings and areas needed for improvement to protect the environment. This section also examines how social movements impact the protection and implementation of environmental law.
Learning Outcomes
1. Explain the historical evolution of international environmental law.
2. Identify root causes of environmental problems.
3. Understand the nature and practice of environmental law.
4. Describe the different types of environmental norms.
5. Identify the legal structure of courts and regulators for environmental law.
6. Understand the different jurisdictional spaces and actors for environmental law.
7. Explain the complexities of international environmental governance and regulation.
8. Describe the interconnections of environmental law with other areas of international law, including human rights, humanitarian law, trade and foreign investment.
9. Critically examine the influence of politics on the protection of the environment and establishment of international environmental law. 1
10. Gain a better understanding of your own worldviews and opinions towards the environmental protection and the law.

HMRT 4720V. Space Law & Human Rights
3 Credits (3)
This course examines the history, sources and role of space law shaping contemporary governance of space activities including weapons in space, freedom of exploration, militarization, surveillance, and corporate accountability. It provides an understanding of international resolutions, principles, regulations and private international and national space laws and policies. The course is broken into two parts. The first part provides an introduction the space law and human rights and examines the evolution of space law. This section also provides understanding on current space law treaties and principles. The second section covers substantive legal issues in outer space law and how human rights intersects with these issues. Issues covered include: weapons in space, corporate responsibility, national security, militarization, and environmental issues.
Learning Outcomes
1. Understand the history and development of space law.
2. Identify main tenets of space law.
3. Explain key space law treaties and principles.
4. Describe how space law intersects with human rights law.
5. Understand contemporary legal issues in space law and the protection of human rights and the environment.
6. Critically examine the what the future of space law entails when incorporating an understanding of human rights law.
7. Gain a better understanding of your own worldviews and opinions towards the outer space law and human rights.

HMSV-HUMAN SERVICES

HMSV 2110. Case Management
3 Credits (3)
This course introduces students to the concept of case management, how it is used in human services, and skills necessary to function effectively as case managers. The emphasis is on the client assessment process, service planning and delivery, and client advocacy. Topics introduced include observation, data collection, documentation, and reporting of client behaviors, identification and referral to appropriate services, monitoring, planning, and evaluation. This course provides student with basic knowledge and beginning case management skills. May be repeated up to 3 credits.
Prerequisite: PSYC 1110G and SOWK 2110G.
Learning Outcomes
1. Define the purpose of case management and explain the role of the case manager
2. Explain the process of case management and what it entails
3. Explain the ethical, professional and legal responsibilities of case managers
4. Describe several settings within which case management takes place
5. Apply principles of client record management, and protect client rights to privacy and confidentiality
6. Use data to determine the appropriate referral service to professional, agencies, community programs or other resource, and clearly and specifically explain the referral service's role in treatment and contact information
7. Apply standards of clinical evaluation, including establishing rapport, data gathering and screening, analysis of substance abuse implications, treatment possibilities, initial actions, and documentation of findings and treatment recommendations
8. Incorporate individual and cultural relevance in concert with established situation-specific policies and procedures for crisis management.

HNRS-HONORS

HNRS 1115. Honors First Year Seminar
3 Credits (3)
This course is designed to introduce new first semester students to the life of the mind, the life of the University, and the principles that guide the NMSU University Honors Program. Combining critical thinking and experiential exploration, students will develop a personalized plan for success, both in and out of the classroom, consistent with the values of the Conroy Honors College and the mission of the University.

Learning Outcomes

1. Demonstrate critical thought about the nature of knowledge, learning, and student development in the contemporary University.
2. Explain how key concepts and principles serve as the foundation for the Honors College mission and values.
3. Create a plan for their experiences at NMSU, in and out of the classroom, that will maximize their academic achievement and personal success beyond graduation.

HNRS 1135G. Introduction to Biological Anthropology
3 Credits (3)

This course provides a basic introduction to the broad field of biological anthropology. The research interests of biological anthropologists include the history and development of modern evolutionary biology, molecular and population genetics, modern primates, the primate and human fossil record, and modern human biological diversity. This is an Honors version of ANTH 1135G. It is taught with ANTH 1135G with differentiated assignments.

Prerequisite: High School GPA of 3.75; or a NMSU cumulative GPA of 3.5 or higher.

Corequisite: HNRS 1135L.

Learning Outcomes

1. Summarize the basic principles of evolution and recognize how they apply to the human species.
2. Recognize the biological and behavioral continuity of humans with all life, and especially other modern primate species.
3. Identify ways in which the human species is biologically and behaviorally unique.
4. Summarize fossil evidence for human evolution.
5. Distinguish the major Paleolithic industries and outline the behavioral and cognitive changes indicated by the fossil and archeological evidence.
6. Critically evaluate popular accounts of human variation and human evolution.
7. Interpret modern human dilemmas (e.g., overpopulation, co-evolution of disease, and genetic engineering) from an evolutionary perspective.
8. Discuss in class and analyze in writing scholarly arguments concerning course concepts.

HNRS 1135L. Introduction to Biological Anthropology Lab
1 Credit (1P)

This laboratory course expand on the topics covered in lecture course and uses scientific methods and principles to examine evidence for the process of evolution, the nature of heredity, human evolutionary history and family tree relationships, primate ecology and behavior, and modern human diversity. Hands-on experience with fossil and skeletal material will be an important part of the learning process. This is an Honors version of ANTH 1135L.

Corequisite: HNRS 1135G.

Learning Outcomes

1. Demonstrate an understanding of the scientific method.
2. Employ principles of Mendelian genetics to determine genotype and phenotype probabilities, and calculate gene, genotype, and phenotype frequencies using the Hardy-Weinberg Equilibrium formula.
3. Demonstrate an understanding of cell structure and functions.
4. Use common lab and anthropometric equipment such as a compound microscope and calipers.
5. Discuss primate evolution, and compare and contrast members of the Primate order in terms of structure, behavior, and phylogeny.
6. Classify hominid species based upon selected traits such as anatomical changes associated with bipedalism, changes in the size and structure of the brain, and the development of culture.
7. Locate and describe the major bones of the human skeleton, and identify characteristics of human skeletons or skulls such as gender, age, and ancestry.
8. Discuss current research in genome analysis of various hominid popul ati ons.

HNRS 2111. Successful Fellowship Writing
1 Credit (1)

Provides scholars with hands-on skills to complete proposals for scholarships and fellowships, such as the Truman, Rhodes, Marshall, Goldwater, Udall, and others. Other skills include how to write resumes, develop general research skills, and find grant and foundation sources. For freshmen and sophomores.

Prerequisite(s): High School GPA of 3.75; or a NMSU cumulative GPA of 3.5 or higher.

Learning Outcomes

1. Review of Prestigious International and National scholarships.
2. Best practices in preparing competitive proposals and applications.
3. Effective strategies for writing compelling Executive summaries, Resumes, and Personal Statements.

HNRS 2114G. Music in Time and Space
3 Credits (3)

Introduction to all forms of Music. Through our auditory senses and intellectual faculties music is an ideal means for intelligent and humanistic examination of peoples and cultures, and for the enhancement of life. Types of music covered include classical, jazz, rock and roll, and world music. Music videos, live in-class performances, evening concerts, and lectures will be used as a basis for discussions and research. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

Learning Outcomes

1. Analyze and critically interpret significant primary texts and/or works of art (this includes fine art, literature, music, theatre, and film).
2. Compare art forms, modes of thought and expression, and processes across a range of historical periods and/or structures (such as political, geographic, social, cultural, religious, intellectual).
3. Recognize and articulate the diversity of human experience across a range of historical periods and/or cultural perspectives.
4. Draw on historical and/or cultural perspectives to evaluate all of the following: contemporary problems/issues, contemporary modes of expression, and contemporary thought

HNRS 2115G. Encounters with Art
3 Credits (3)

A multicultural examination of the principles and philosophies of the visual arts and the ideas expressed through them.

Prerequisite: A High School GPA of 3.75; or a NMSU cumulative GPA of 3.5 or higher.

Learning Outcomes

1. Articulate the relationship of art to the human experience.
2. Apply the vocabulary of art to critical writings and discussions.
3. Interpret art works within cultural, social, personal and historical contexts.

HNRS 2116G. Earth, Time and Life
4 Credits (3+3P)

Covers how the earth's materials form, processes involved in changing the earth's configuration, and extent of people's dependence upon the earth's resources. Includes mineral and energy resources, development of landscapes, environmental problems, evolution of the earth and life forms. May be taken in place of GEOL 1110. May be repeated up to 4 credits.
Prerequisite: A High School GPA of 3.75; or a NMSU cummulative GPA of 3.5 or higher.

Learning Outcomes

1. Gain a general understanding of geology and the geological processes that have been occurring throughout Earth's history.
2. Learn about some of the common minerals and rocks that are the building blocks to geology and the rock cycle.
3. Investigate the processes associated with each rock type (e.g., volcanoes, faults, depositional processes, etc.) and as well as potential geologic hazards (e.g., volcanic eruptions, earthquakes, flooding, etc.).
4. Recognize and identify common minerals and rocks and understand the basic processes and conditions responsible for their formation and occurrence.
5. Comprehensively understand how the internal and external parts of the Earth have functioned throughout geologic time.

HNRS 2117G. The World of the Renaissance: Discovering the Modern
3 Credits (3)
An introduction to the literature and thought of Renaissance Europe. Humanism and the Reformation will be approached through the intensive study of major writers such as Petrarch, Machiavelli, Luther, Erasmus, Montaigne, and Shakespeare. Restricted to Las Cruces campus only.
Prerequisite: A High School GPA of 3.75; or a NMSU cumulative GPA of 3.5 or higher.

Learning Outcomes

1. Analyze and critically interpret significant primary texts and/or works of fine art, literature, philosophy, and theatre from the early modem period.
2. Locate art forms, modes of thought and expression, and processes from the early modem period in historical and/or cultural context and compare them to those of other time periods.
3. Demonstrate an understanding of how early modem historical and/or cultural perspectives and key technological developments contributed to the development of contemporary thought and modes of expression.
4. Recognize and articulate the diversity of human experience across historical periods and/or cultural perspectives.
5. Demonstrate skill in working with relevant secondary resources and research tools to develop a class.

HNRS 2130G. Shakespeare on Film
3 Credits (3)
How do Shakespeare's plays continue to speak to us through the medium of film? Written in a time of rapid social change,Shakespeare's plays invited audiences to think critically about the relationship between the self and others and to question conventions. Performances of Shakespeare have long been used to call out social injustice, from western anti-Semitism prior to World War II (The Merchant of Venice), to civil rights-era white supremacy in the US and apartheid in South African (Othello),and authoritarianism in the Arab Spring (Richard III). This course focuses on post-1980 Hollywood film versions of Shakespeare's plays and a few prior landmark adaptations around the world, examining how they use Shakespeare as a medium for debate and even a catalyst for social change.

Learning Outcomes

1. Demonstrate critical thinking by identifying issues and problems in the film adaptation of Shakespeare; 2 .Engage in intercultural reasoning and develop intercultural competence and historical consciousness in analyzing film adaptations from the US, Europe, and Asia;
2. Engage with questions of personal and social responsibility as explored in Shakespeare's plays and modern film adaptations;
3. Conduct effective research on a relevant topic, evaluating the validity and authority of secondary sources, synthesizing ideas, and drawing reasonable conclusions; 5 .Present independent research in collaboration with other student researchers and reflect on this teamwork experience

HNRS 2140G. Plato and the Discovery of Philosophy
3 Credits (3)
Examines arguments and theories found in the Platonic dialogues with a view to determining the nature and value of philosophy both from Plato's point of view and absolutely.
Prerequisite: A High School GPA of 3.75; or a NMSU cumulative GPA of 3.5 or higher.

Learning Outcomes

1. Students will evaluate a number of Plato’s dialogues to understand his doctrines and arguments.
2. Students will use their understanding to further evaluate why his philosophies have remained influential in modern, Western society and beyond.
3. Students will develop well-formulated, compelling arguments from philosophical texts.

HNRS 2141G. Bamboo and Silk: The Fabric of Chinese Literature
3 Credits (3)
Introductory survey of traditional and modern Chinese prose and poetry in translation with emphasis on genre, theme, and social/historical context.
Prerequisite: A High School GPA of 3.75; or a NMSU cumulative GPA of 3.5 or higher.

Learning Outcomes

1. Students will acquire extensive knowledge of one of the world's oldest and richest literary traditions.
2. Not incidentally, students will also gain knowledge of China's history and philosophical traditions.
3. As this class is based on reading, writing, and discussion, students will hone their interpretive and expressive skills.

HNRS 2145G. Celtic Literature
3 Credits (3)
This course provides an overview of the most important early literary works of the so-called Celtic nations, principally Ireland and Wales, from a literary and historical approach. This literature stems from the period 600-1200 and ends with the development of the Romances under influence from the French

Learning Outcomes

1. Students will learn the concept of the international folk tale,
2. Students will learn about the history of the Celts
3. Students will learn about the concept of Celtic nations' formed during the 19th Century.
4. Students will enhance critical thinking skills.
5. Students will enhance written and oral communication.

HNRS 2160G. New Testament as Literature
3 Credits (3)
Literature of the New Testament examined from a literary perspective. Emphasis on translation history of the New Testament, generic features of gospel, epistle and apocalypse, precedent literary models, problems of authorship, classification of New Testament texts.
Prerequisite(s): A High School GPA of 3.75; or a NMSU cumulative GPA of 3.5 or higher.
Learning Outcomes
1. Students will hone critical thinking skills by analyzing arguments and controversies surrounding the roots of Christianity.
2. Students will discern and discuss the viability of both literary and historical sources with debated authorship, dating, and interdependency.
3. Students will practice interpersonal navigation and maintaining an academic environment of respect as they discuss a number of topics that can be considered controversial or subjective.

HNRS 2161G. Window of Humanity
3 Credits (3)
Anthropology is the most humanistic of the sciences, and the most scientific of the humanities. This course will use anthropological perspectives to examine the human experience from our earliest origins, through the experiences of contemporary societies. We will gain insights into the influence of both culture and biology on shaping our shared human universals, and on the many ways in which human groups are diverse.
Prerequisite: A High School GPA of 3.75; or a NMSU cumulative GPA of 3.5 or higher.
Learning Outcomes
1. Explain the concepts that define Anthropology (along with its subfields) as a specific research discipline.
2. Possess a growing vocabulary for anthropology, cultural study, ethnographic research and writing that will empower them as they continue with their degrees and professional careers.
3. Recognize how Anthropological concepts, terms, and methods are valuable for present-day concerns and how these tools can be used to engage life and the world at large.

HNRS 2165G. Introduction to Humanities in the 21st Century
3 Credits (3)
An exploration of the global humanities according to its various manifestations: environmental, public, digital, and applied.
Learning Outcomes
1. Articulate what the humanities are and what role they have played in education throughout the ages
2. Critically analyze and communicate orally and in writing various humanities concepts and global interconnections among peoples and cultures.
3. Describe, through the study of the global humanities, how cultural contexts and human practices influence individuals and societies.
4. Apply the knowledge and skills gained through the study of the global humanities to explore their majors, their career goals, and the responsibilities of individuals in their communities.
5. Demonstrate information literacy and technological skills in researching and presenting themes related to the global humanities.
6. Reflect on the effects of the global humanities on individuals.

HNRS 2170G. The Human Mind
3 Credits (3)
The primary course objective is to develop an appreciation of the variety and complexity of problems that are solved by the human mind. The course explores how problems are solved by a combined computational analysis (computational theory of mind), and evolutionary (evolution by natural selection) perspective. The mind is what the brain does (i.e. information processing) and the brain is a computational device that is a product of evolution by natural selection. Note that this is not a neuroscience course, we will be focusing on the mind (what the brain does) rather than on the brain. Restricted to Las Cruces campus only.
Learning Outcomes
1. Enhance written and oral communication
2. Stimulate critical thinking and learn to weigh scientific evidence
3. Challenge students to make ethical decisions and promote personal and social responsibility

HNRS 2172G. Archaeology: Search for the Past
3 Credits (3)
A critical evaluation of various approaches to understanding prehistory and history. The methods and theories of legitimate archaeology are contrasted with fantastic claims that invoke extraterrestrials, global catastrophes, transoceanic voyages, and extra-sensory perception.
Prerequisite: A High School GPA of 3.75; or a NMSU cumulative GPA of 3.5 or higher.
Learning Outcomes
1. Identify, describe, and explain how human lifeways changed in diverse communities in different parts of the globe.
2. Select and use relevant archaeological evidence to articulate how people's beliefs and values were influenced by politics, geography, economics, culture, biology, history, and social institutions in the past.
3. Analyze the significance of archaeological artifacts in context and explain their relevance to understanding relations among individuals, their society, and the environment.
4. Evaluate how practices in research, conservation, and tourism to archaeological sites promote ethical stewardship of non-renewable archaeological resources.
5. Design a study tour to archaeological sites that will address a key question or argument in prehistory and promote historic/archaeological preservation.

HNRS 2175G. Introduction to Communication Honors
3 Credits (3)
Study and practice of interpersonal, small group, and presentational skills essential to effective social, business, and professional interaction. May be repeated up to 3 credits.
Prerequisite: A High School GPA of 3.75; or a NMSU cumulative GPA of 3.5 or higher.
Learning Outcomes
1. Analyze and evaluate oral and written communication in terms of situation, audience, purpose, aesthetics, and diverse points of view.
2. Express a primary purpose in a compelling statement and order supporting points logically and convincingly.
3. Use effective rhetorical strategies to persuade, inform and engage.
4. Employ writing and/or speaking processes such as planning, collaborating, organizing, composing, revising editing to create presentations using correct diction, syntax, grammar and mechanics.
5. Integrate research correctly and ethically from credible sources to support the primary purpose of a communication.
6. Engage in reasoned civil discourse while recognizing the distinctions among opinions, facts, and inferences.

HNRS 2178G. Theatre: Beginnings to Broadway
3 Credits (3)
Intercultural and historical overview of live theatre production and performance, including history, literature and professionals. Students attend and report on stage productions. May be repeated up to 3 credits.
Prerequisite: A High School GPA of 3.75; or a NMSU cumulative GPA of 3.5 or higher.
Learning Outcomes
1. Distinguish and differentiate the characteristics of theatre from other art forms.
2. Describe the major components of a theatrical event.
3. Describe the functions of various theatre personnel.
4. Define specific terms relating to the study of theatre.
5. List and describe the parts of a play.
6. Define the different parts of plot.
7. Critique plays.
8. Describe the characteristics of theatre in the different periods of history.
9. Develop an appreciation for theatre as an art form and a reflection of society.

HNRS 2180G. Citizen and State Great Political Issues
3 Credits (3)
The fundamental questions of politics: why and how political societies are organized, what values they express, and how well they satisfy those normative goals and the differing conceptions of citizenship, representation, and freedom.
Prerequisite: A High School GPA of 3.75; or a NMSU cumulative GPA of 3.5 or higher.
Learning Outcomes
1. Students will investigate the fluid state of American politics by discerning the decisions and policies of a selection of presidents.
2. Students will investigate the complex operations behind a representative democracy.
3. Students will examine how the sociopolitical environment surrounding a president influences his policies, and how a president's policies affect the broader society.
4. Students will assess and measure how politics can be affected by active and engaged citizens.

HNRS 2190G. Claiming a Multiracial Past
3 Credits (3)
Survey of history of the United States in the nineteenth and twentieth centuries, with an emphasis on multicultural social and cultural history. Focus on understanding American history from the point of view of dispossessed, impoverished, and disenfranchised Americans who have fought to claim both their rights as Americans and American past.
Prerequisite: A High School GPA of 3.75; or a NMSU cumulative GPA of 3.5 or higher.
Learning Outcomes
1. Students will contextualize the current state of American "being" by focusing on the multicultural-social and cultural history of the U.S. in the nineteenth and twentieth centuries.
2. Students will hone public speaking and presentation skills through classroom discussions and activities.
3. Students will practice interpersonal navigation and maintaining an academic environment of respect as they discuss a number of topics that can be considered controversial or subjective.

HNRS 2996. Special Topics
1-3 Credits (1-3)
Special course offerings, with unique titles listed in Schedule of Classes. May be repeated up to 6 credits.
Learning Outcomes
1. Students will experience multiple topics by different professors and departments.

HNRS 303 V. Personal Financial Planning and Investing in a Global Economy
3 Credits (3)
Provides a framework for successful personal financial planning within an individual's career and income. Covers personal money management, federal and state taxation, the mathematics of finance and credit, housing, inflation, insurance, savings, and investments. Majors and minors may not use this course to satisfy their finance requirements.
Learning Outcomes
1. Students will develop an understanding of how globalization and international affairs impact their personal financial planning.
2. Students will develop an understanding of how knowledge from a variety of disciplines, including capital market history, the political environment, government, mathematics, behavioral economics, and statistics, are important to financial planning.
3. Students will develop an understanding of the core areas of a personal financial planning course which include: the financial planning process, time value of money, measuring financial health, tax planning, liquid asset management, the role of credit, consumer loans, home and auto financing, investment basics, domestic and international securities markets, bond investing, equity investing, mutual funds and retirement planning.
4. Students will integrate knowledge of international financial markets into the personal financial planning process by developing and writing their own personal financial plan.

HNRS 304V. Dilemmas of War and Peace
3 Credits (3)
A multi-disciplinary introduction to war, peace, and world order studies. The origins of war and the foundations of peace are explored in the context of a rapidly changing world order.

HNRS 305V. Is Fake News Real: Journalism, Community, and Mass Communications
3 Credits (3)
Overview of how technology, money, politics, and human desire have changed journalism since 1963. Explores role of journalism in news dissemination, influencing opinion, and political behavior. Course includes guest lectures from regional journalists and media experts.

HNRS 306V. Science, Ethics and Society
3 Credits (3)
Investigation of the ethical issues related to scientific investigation and the ethical implications of scientific discoveries for society. Emphasis on discussion of case studies about specific ethical issues in science, and readings by both scientists and non-scientists.

HNRS 308V. Into the Final Frontier
3 Credits (3)
Exploration of space; a brief review of the history of space flight, the Apollo program, joint U.S.-Soviet space missions, and unstaffed exploration of the planets. Emphasis on knowledge gained through these efforts. Includes new space initiatives. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to compare and contrast previous history with current global events.
2. Students will able to use perspectives from history to draw conclusions about the geopolitical, economic, ethnic, and cultural outcomes of current geopolitical policies and events (especially as they relate to expanding the space frontier), and to draw your their conclusions.
3. Students will understand how critical it is to the human conditon that humanity is always breeching a PHYSICAL frontier.

HNRS 309. Honors Global Citizenship
3 Credits (3)

University students live in an age of globalization with daily impacts on every aspect of their lives. Combining explorations of the dimensions of global citizenship with an international abroad experience, this seminar is designed to help students become more internationally informed, interculturally competent, and globally minded as they learn about the experiences of citizens in other parts of the world and reflect about their own place in the world in new ways. May be repeated up to 6 credits.

Learning Outcomes

1. Identify dimensions of globalization and how they impact citizens from the local to the global.
2. Describe and reflect appreciation for unique cultural-historical contexts and how these shape personal judgments and world views.
3. Explain how national identities have significance for global citizenship – including students' identities as Americans abroad.
4. Demonstrate intercultural competence through both travel and engagement with others while abroad.
5. Synthesize lessons from content and experiences to develop a personal statement about global citizenship as a concept and as a personal identity with plans for future action.

HNRS 3110V. Human Sexuality
3 Credits (3)

Examination of human sexuality from a variety of perspectives: cultural, sociological, physiological and psychological. Issues examined from viewpoints such as gender, individual, family, and professional roles.
Prerequisite: 3.5 GPA for continuing student, 3.75 for incoming High School student, and/or Crimson Scholar status.

Learning Outcomes

1. Understand the cultural and historical inputs resulting in our current understanding of the human sexual experience.
2. Examine the early and modern researcher in the field of human sexuality, along with an overview of basic research skills.
3. Study gender roles and similarities and differences between men and women.
4. Examine male and female reproductive anatomy and the physiology of sexual arousal.
5. Identify the factors affecting love and attraction, and the development of relationships.
6. Discuss homophobia and the factors associated with negative attitudes toward homosexuality.
7. Identify and discuss current techniques of contraception along with fertility problems.
8. Discuss the sexual behavior of adults.
9. Examine the medical, relational, and stress factors related to sexual dysfunction. 1
10. Learn the facts and fallacies about sexually transmitted diseases. 1
11. Identify the continuum of behaviors related to paraphililias. 1
12. Examine sexual coercion and violence.

HNRS 3115V. Service Learning through Civic Engagement
3 Credits (3)

This class focuses on academic service learning through Civic Engagement. Academic service learning is a high impact form of pedagogy that integrates community-based service or outreach with classroom instruction to enhance both student learning and promote values of constructive civic engagement. This project-based class is designed to help make linkages between the academic world and the community by providing students with a supervised experience implementing service activities to meet an identified community need. Students learn about the world and the importance of their involvement in working with vulnerable, marginalized populations and the barriers these populations experience. Such barriers are legal, historical, related to discrimination and biases, misinformation, and etc. From explorations of root causes of problems and the development of objectives to the challenges of implementation and assessment, students will be encouraged to think more critically about social problems and the complexity of identifying lasting solutions.
Prerequisite: 3.5 GPA for continuing students, 3.75 for incoming High School students, and/or Crimson Scholar status.

Learning Outcomes

1. Describe the process required to assess real world community problems.
2. Clarify short- and long-term goals and objectives for any project.
3. Synthesize and analyze information to solve a complex problem that have multiple solutions.
4. Apply knowledge and concepts to new situations.
5. Identify, analyze, and reflect on core concepts related to service learning and constructive civic engagement.
6. Reflect on their service to enhance their personal development as active citizens.
7. Successful engagement with a local community organization that serves vulnerable populations.

HNRS 314. Successful Fellowship Writing
1 Credit (1)

Provides scholars with hands-on skills to complete proposals for scholarships and fellowships, such as the Truman, Rhodes, Marshall, Goldwater, Udall, and others. Other skills include how to write resumes, develop general research skills, and find grant and foundation sources.

HNRS 317V. Cultural Lessons on Nazism
3 Credits (3)

Examination of the values and cultural manifestations of fascism in the period 1918-45 with multidisciplinary emphasis on European forms of fascism, particularly German Nazism. Course features a survey of literary, dramatic, poetic, cinematic, and artistic treatments of human behavior leading up to fascism, living under fascist rule, and coming to grips with the consequences of war and genocide.

HNRS 318V. The World of Cinema
3 Credits (3)

Appreciation of the art of motion pictures as world-wide medium specific to national cultures. Refinement of cinematic literacy and critical viewing skills. Historical and thematic overview emphasizes collaborative nature of medium in various genres from 1895 to present. Selected films from different periods and different countries. Substantial library research projects.

HNRS 321V. Agriculture in an Interconnected World
3 Credits (3)
Study of the impact of agriculture on cultural and social systems, with special emphasis on twentieth century urban development.

HNRS 324V. Science and the Arts: Theatre and Story
3 Credits (3)
This course examines present day relations between the sciences and the representation and communication of science, especially in connection with theatre, narrative fiction, and autobiography.

HNRS 325V. Insects, Humans, and the Environment
3 Credits (3)
Overview of the interactions of the world's largest group of organisms with humans. Emphasizing the role of insects in the development of human cultures, including health, food and fiber production, art, music, and environmental issues; with discussions of historic, present-day, and future impacts in underdeveloped, developing, and developed civilizations. Students with an Honors designation will have additional assignments that require them to synthesize information from primary literature sources.

Learning Outcomes

1. Students will gain sufficient knowledge in the prevalence and magnitude of insects in the world and their interactions with humans.
2. Students will learn how insects influence development of human culture, art, music, and environmental issues.
3. Students will conduct assignments and final projects that further enhance their knowledge of insects in the environment and how to collect samples through independent projects.
4. Students with an Honors designation will have additional assignments that require them to synthesize information from primary literature sources.

HNRS 326V. Art and Mythology
3 Credits (3)
Mythological figures, past and present, in the visual arts. Through iconographical studies (attributes and symbols), trace the development of visual traditions that evolved from the literary sources of classical Mediterranean mythology.

HNRS 328V. Rock History: 20th Century Popular Music
3 Credits (3)
Evolution of popular music in the 20th Century. Examines the history of popular music conventions, influences, and breakthroughs through the 20th Century. Topics include the originations of major music styles and their evolution as cultivated by key artists, scientific advancements, and sociopolitical change, contextualized within the contemporaneous history. Of particular concern are the influences of groundbreaking artists; the effect of evolving playback electronics, recording devices, and musical instruments; and the interplay between music and economic depression, war, civil rights, sexual revolution, and other sociopolitical events. May be repeated up to 3 credits.

Learning Outcomes

1. Develop active listening skills by using the various book listening guides and homework assignments/listening projects.
2. Recall the names of major performers and recordings from each style period of popular music, offer specific work examples, and develop a general understanding of the evolutional nature of popular music as it moves through the various large style periods surveyed in the textbook.
3. Apply terminology learned throughout the class to your active listening experiences.
4. Apply the skills you learn from the textbook and through homework assignments to independent listening experiences.
5. While totally subjective, using your learned active listening skills, develop your own aesthetic for what you like and don't care for from the numerous genres found throughout the various periods of popular music. (Don't worry; there's no "wrong" answer here!)
6. Develop a broader worldview of the possible future for popular music and explore a broader range of musical styles beyond the mainstream.

HNRS 335V. Legal Issues in Modern Society
3 Credits (3)
Case study approach to contemporary legal problems involving environment, consumer protection, international law, corporate responsibility.

HNRS 336V. Testimonios from the Borderlands
3 Credits (3)
This course is about the testimonies (testimonios) and autobiographical writings about and by Latinas in the United States. Life stories are told through many forms: "testimonios," memoirs, autobiographies and autobiographical fiction, oral histories and short stories, poetry and poetic prose pieces, essays, and audio-stories. The course focuses on testimonios as method, epistemology, and pedagogy. Among the questions we will examine will be those concerning knowledge production, sexual politics, the mind-body-spirit connection, voice, representation, and truth. May be repeated up to 3 credits.

Learning Outcomes

1. The course focuses on testimonios as method, epistemology, and pedagogy. Among the questions we will examine will be those concerning knowledge production, sexual politics, the mind-body-spirit connection, voice, representation, and truth.

HNRS 341V. The Old Testament as Literature
3 Credits (3)
Old Testament surveys a portion of the thirty-nine canonical books of the Old Testament from a literary approach, centered on the so-called historical-critical method that developed in the 19th C under such figures as Julius Wellhausen. Higher criticism of the texts, their sources, authorship, dating and interdependency has led to deepened insights as well as scholarly conflict. In addition, we will examine several apocryphal books that have continuing importance in our understanding of Old Testament. We will read the Old Testament along with an introduction and some supplementary materials.

HNRS 347V. World Dance
3 Credits (3)
Examination of dance forms from a cross-cultural perspective, focusing on the role of dance in different cultures around the globe. Same as DANC 3510V with differential assignments for Honors students. May be repeated up to 3 credits.

HNRS 348V. Comparative Mythology: Myth, Ritual, and the Life Cycle
3 Credits (3)
Exploration of the central myths of several religious traditions and investigation of how each, through ritual, has given meaning to key moments in the journey of the individual through life.

HNRS 353V. Justice without Prejudice
3 Credits (3)
Exploration of central questions about race, ethnicity, and justice. Students will learn to argue persuasively from different perspectives, both orally and in writing. May be repeated up to 3 credits.

Learning Outcomes

1. Through this course, we will explore the diversity and commonality of Latina/x experiences. We will each write our own scripts, narrate them, scan and apply images to the narration and add music and special effects.

HNRS 370V. Design: The Creative Act
3 Credits (3)
Explores the nature of design and what it means to design in various diverse media. Included are creative efforts in writing, art, music, and technology. Commonalities and differences are considered.

HNRS 374V. The European City: History and Culture
3 Credits (3)
Historical overview of development, growth, and culture of European cities.

HNRS 378V. Technology and Policy
3 Credits (3)
Study of the processes through which society sets goals for science and technology, of the allocation of resources needed to achieve these goals, and of the obligations and conflicts that develop as the goals are realized. International comparisons of public policies.

HNRS 381V. Economic Development of Latin America
3 Credits (3)
Economic analysis of problems related to development in Latin America, including the agrarian problem, debt and austerity programs, industrialization, inflation and unemployment, the drug trade, U.S.-Latin American relations, development strategies. Also individual counties' problems.
Prerequisite(s): 3.75 High School GPA; or NMSU cumulative GPA of 3.50; and/or Crimson Scholar status.
Learning Outcomes

1. Analysis of problems related to economic development in Latin America.

HNRS 387V. Comparative Perspectives on Women
3 Credits (3)
The history, antecedents, and consequences of sex and gender systems around the world from the perspective of sociology, anthropology, and psychology. May be repeated up to 3 credits.
Learning Outcomes

1. Identify and evaluate multiple scholarly approaches to the study of gender and identity.
2. Develop and employ analytical and critical thinking skills.
3. Demonstrate proficiency in oral and written communication.
4. Understand and demonstrate ability in discuss the complicated ways in which political/economic/cultural sites discipline/produce subjects and the ways in which power emerges to create intersectional barriers and concerns (overlaps in institutional sexism/racism, etc).
5. Integrate and synthesize knowledge of gender-related topics in a scholarly research paper.

HNRS 388V. Leadership and Society
3 Credits (3)
Exploration of the multifaceted nature of leadership in modern society through readings and seminar discussion. May be repeated up to 3 credits.
Learning Outcomes

1. Students will gain understanding of ethical principals of leadership.
2. Students will be able to apply ethical principals of leadership.
3. Students will be able to identify differing ways of enacting leadership across different cultures.

HNRS 390V. Worlds of Buddhism
3 Credits (3)
This course is an introduction to Buddhism and its contribution to the formation of (East) Asian cultures. It provides students with Buddhist and (East) Asian "case studies" - i.e., examples of the ways in which Buddhism has influenced, and has been influenced by, the region's various cultural and social milieus over time. The course is designed to offer opportunities to critically reflect on Buddhism as a transformative philosophical, cultural and individual system. May be repeated up to 3 credits.
Learning Outcomes

1. Use analytic skills in interpreting historical changes and continuity.
2. Critically interpret significant primary texts and/or works of art, and learn how to evaluate varying historical interpretations.
3. Evaluate the chronological and geographic context of important historical events.
4. Identify the social, cultural, and political components of the societies under study in this course.
5. Conduct independent research and synthesize your interests with the required material.

HNRS 394V. Southwestern and Border Literature
3 Credits (3)
Introduction to the culturally diverse literature of the American Southwest and borderlands region. Class analyzes evolution of the Southwest concept and considers degree to which the existence of a borderlands culture is manifest in literature.
Prerequisite: honors eligibility.

HNRS 400. Honors Capstone
3 Credits (3)
Independent-study research and writing project to be carried out under the supervision of a faculty member. Consent of instructor required. May be repeated up to 6 credits.
Learning Outcomes

1. Students will apply concepts from their discipline in the development and implementation of a capstone research or creative activity project.

HNRS 410. Honors Internship
3-6 Credits
Assignments in departments to be supervised by faculty in the area. A cumulative 3.5 GPA is required. May be repeated up to 12 credits.
Learning Outcomes

1. Students will experience professional development through participating in an internship with a professional organization.

HNRS 4110. U-RISE Seminar
1,3 Credits
This course is only available to students in the U-RISE program at NMSU. This course is part of that program. It includes a two-year research education program bolstered by this inclusive and affirming honors seminar series which is built into students' curriculum and a summer internship at a research-intensive institution. Complementary activities are focused on the acquisition of knowledge, skills, and confidence building in five major areas that will prepare undergraduate student researchers to fulfill their potential toward achieving their career goals in biomedical sciences. These include: basic research skills, a quantitative-based approach to analyze and solve problems, scientific communication

skills, building professional networks, and development of a science identity. May be repeated up to 12 credits.

Learning Outcomes

1. Students will be able to clarify their scientific values, interests, strengths and skills.
2. Students will be able to discuss and detail the graduate admission process and requirements to obtain an advanced degree.
3. Students will be able to cultivate a professional network among student peers and faculty at NMSU.
4. Students will be able to articulate (communicate) their scientific knowledge and research skills to a wide range of community audiences (through written and oral presentations – "data blitzes", "elevator pitches," email and social media outlets).
5. Students will be able to represent themselves effectively to prospective graduate programs (through written documents, online presence, and skillful oral communication).
6. Students will be able to identify and research a wide variety of summer research internships and graduate programs.
7. Students will be able to navigate and plan for scientific and professional opportunities at a national meeting.

HNRS 411V. Great Theorems in Mathematics

3 Credits (3)

Same as MATH 411V.

Prerequisite: Grade of C- or higher in MATH 1531, or grade of B or higher in any upper-division math course, or consent of instructor.

Learning Outcomes

1. At the end of this course, students will be able to: Describe the history of the development of some key mathematical concepts.
2. Describe the connections between mathematical ideas in different historical periods and places.
3. Recognize the role of abstraction and logic in the progress of mathematics.
4. Describe the contribution of mathematics to culture and science in different historical eras.
5. Determine if a mathematical conjecture is correct and provide rigorous written mathematical justification.
6. Provide sound, complete and clear mathematical arguments involving simple calculations, geometric constructions, and/or written mathematical proofs.
7. Communicate mathematical ideas, both written and orally.

HNRS 412. Medical College Admission Test Preparation

3 Credits (3)

This course prepares students to optimize their performance on the Medical College Admission Test that is required for admission to medical schools throughout North America. This course should be taken only after completing requisite courses in biology, chemistry and biochemistry, physics, health sciences, and appropriate social science electives.

Prerequisite(s): Completion of basic courses in STEM, health sciences and behavioral sciences.

HNRS 413. Medical Shadowing

1-3 Credits (1-3)

For students who are shadowing medical professionals this course will provide academic credit for completion of this experience. May be repeated up to 9 credits.

Learning Outcomes

1. Students will experience the medical profession through shadowing a medical professional.

HNRS 415. Internship: Non-Capstone Practicum

1-6 Credits (1-6)

In this class students will be working to gain professional experiences by extensively immersing yourself in a professional setting. Students will be required to 1) complete all pre and post paperwork and requirements, 2) complete their placement hours, and 3) complete a weekly reflection prompt. May be repeated up to 6 credits.

Learning Outcomes

1. Demonstrating understanding of professional customs and practices.
2. Organizing and maintaining information.
3. Applying knowledge to the task.
4. Serving clients and stakeholders.
5. Negotiating and arriving at a decision.
6. Working with diversity/diverse populations.
7. Identifying, understanding, and working with professional standards.
8. Improving problem-solving and critical thinking skills.
9. Monitoring and correcting performance. 1
10. Exercising leadership. 1
11. Behaving professionally and ethically. 1
12. Listening effectively. 1
13. Dressing appropriately. 1
14. Addressing colleagues and superiors appropriately. 1
15. Allocating time effectively. 1
16. Adapting effectively to changing conditions. 1
17. Participating as a member of a team. 1
18. Developing appropriate workplace attitudes. 1
19. Understanding and managing personal behavior and attitudes. 2
20. Developing individual responsibility.

HNRS 420. Independent Studies

1-3 Credits

Directed, individual studies and projects.

Prerequisites: consent of instructor and honors eligibility.

HNRS 421. Special Topics

1-3 Credits (1-3)

Course will be cross-listed with HNRS 521/HNRS 421 Special Topics.

Learning Outcomes

1. Students will experience different courses with professors or mentors from across NMSU.

HNRS 422. Directed Research

3 Credits (3)

Individual research projects supervised by faculty advisers. Consent of instructor required. May be repeated up to 12 credits.

Learning Outcomes

1. Students will learn how to conduct research or complete a creative activity with a mentor.

HNRS 4222. Research and Writing

3 Credits (3)

Workshop format designed to prepare students for research and writing associated with production of an honors thesis or a major research assignment. Does not count for general education or honors certification credit.

Learning Outcomes

1. Students will conduct research on multiple topics with mentors.
2. Students will learn how to write up results from research they conduct.

HNRS 4230. McNair Engaged Scholar Junior Session I
1 Credit (1)

This is one of a series of courses designed to prepare McNair Scholars for competitive, successful application to graduate/Ph.D. programs in their field of choice. Combining personal exploration and engagement with faculty narratives in a cohort-based learning environment, students will begin the process of exploring pathways and critical steps to their doctoral degree. By the end of the course students will have secured a faculty mentor and developed a final draft of a research proposal in preparation for the McNair Summer Immersive Research Internship.

Learning Outcomes

1. Demonstrate an increased understanding of the meaning, value, and steps to attain a doctoral degree.
2. Demonstrate understanding of key concepts and best practices in the Faculty Mentor relationship.
3. Demonstrate understanding of required elements of the Research Proposal.

HNRS 4231. McNair Engaged Scholar Junior Session II
2 Credits (2)

This is one of a series of courses designed to prepare McNair Scholars for competitive, successful application to graduate/Ph.D. programs in their field of choice. Combining personal exploration and engagement with faculty narratives in a cohort-based learning environment, students will begin the process of exploring pathways and critical steps to their doctoral degree. By the end of the course students will have secured a faculty mentor and developed a final draft of a research proposal in preparation for the McNair Summer Immersive Research Internship.

Learning Outcomes

1. Demonstrate an increased understanding of the meaning, value and steps to attain a doctoral degree.
2. Demonstrate understanding of key concepts and best practices in the Faculty Mentor relationship.
3. Demonstrate understanding of required elements of the Research Proposal.

HNRS 4330. McNair Engaged Scholar Senior Session I
2 Credits (2)

This is one of a series of courses designed to prepare McNair Scholars for competitive, successful application to graduate/Ph.D. programs in their field of choice. Continuing exploration of their research interests and related graduate programs, students will begin the process of applying to graduate programs in their field of interest. By the end of the course students will have identified and completed the application materials and submitted complete applications with attendant materials by each institution's application deadline.

Learning Outcomes

1. Demonstrate an understanding of the meaning, value and opportunities of academic conferences and networking.
2. Demonstrate understanding of key concepts and best practices in the graduate application process.
3. Demonstrate understanding of required elements and key concepts of research presentations and communicating your research.

HNRS 4331. McNair Engaged Scholar Senior Session II
1 Credit (1)

This is one of a series of courses designed to prepare McNair Scholars for competitive, successful application to PhD/ graduate programs in their field of choice. Students will continue exploration of their research interests and communicate their work through presentations. They will explore factors influencing selection of doctoral program offers. Students will also continue exploring differences between undergraduate and graduate education/culture and learn strategies for navigating these differences as they prepare for transition to their own graduate programs.

Learning Outcomes

1. Demonstrate an increased understanding of differences between undergraduate and graduate education settings, and strategies to address inherent challenges in the transition to the graduate education environment.
2. Demonstrate an understanding of required elements and key concepts of research presentations and communicating your research.
3. Demonstrate an understanding of the meaning, value and opportunities of academic conferences and networking.

HNRS 4440. Honors Leadership Ambassador Program
1-3 Credits (1-3)

This course is designed to build leadership and teamwork skills. Students will work together to plan events for other Honors students and our community. Through participation in this course students will learn how to plan and manage events as well as learn how to work better with colleagues in teams, they will also learn the importance of civic engagement in their community. May be repeated up to 9 credits.
Prerequisite: At least 1 HNRS course completed.

Learning Outcomes

1. Develop team-building skills.
2. Plan, organize, and/or manage events.
3. Support other Honors students through community-building events.
4. Support our community through a service event/program.
5. Express persuasive arguments in support of the Honors College and related programs at NMSU.
6. Assess their own leadership abilities and seek to improve leadership skills.

HNRS 450V. The Sundt Honors Seminar
3 Credits (3)

The Sundt Honors Seminar is a unique, experience-based, interdisciplinary seminar developed and taught by the holder of the Sundt Honors Professorship for the year. The subject of the course will vary according to the discipline of the Sundt Professor. The course may include a travel experience related to the seminar topic, hosting of outside specialists, or other unique activity. May be repeated up to 6 credits.

Learning Outcomes

1. The Sundt Honors Seminar is a unique, experience-based, interdisciplinary seminar developed and taught by the holder of the Sundt Honors Professorship for the year.
2. The subject of the course will vary according to the discipline of the Sundt Professor.
3. he course may include a travel experience related to the seminar topic, hosting of outside specialists, or other unique activity.

HNRS 521. Special Topics
1-3 Credits (1-3)

Course will be cross-listed HNRS 521/HNRS 421 Special Topics. May be repeated up to 12 credits.

Learning Outcomes

1. Students will experience different courses with professors or mentors from across NMSU.

HORT-HORTICULTURE

HORT 1115G. Introductory Plant Science
4 Credits (3+2P)
Introduction to the physical, biological, and chemical principles underlying plant growth and development in managed ecosystems. In the laboratory portion of the class, students perform experiments demonstrating the principles covered in lecture. The course uses economic plants and agriculturally relevant ecosystems to demonstrate basic principles. Appropriate for nonscience majors. Same as AGRO 1110G.
Learning Outcomes

1. Describe the role plants play in everyday lives
2. Introduce career opportunities in plant and soil sciences, and related fields
3. Define plants through the concepts of plant structure and anatomy
4. Introduce the wide variety of plants cultivated throughout the world
5. Describe how plants work (growth, reproduction, physiology, and soil)
6. Describe how plants are manipulated to feed, clothe and entertain the world

HORT 2110. Ornamental Plants I
4 Credits (2+3P)
Covers identification, botanical characteristics, culture, and landscape uses of woody plants. Emphasis on deciduous trees, native shrubs, and evergreens.
Learning Outcomes

1. Identify landscape plants by scientific names, including family, genus and specific epithet.
2. Use scientific terminology to accurately describe landscape plant morphology.
3. Illustrate plant family relationships at the family and genus level.
4. Apply landscape design principles and knowledge of plant requirements to arrange plants in a landscape.

HORT 2120. Ornamental Plants II
4 Credits (2+3P)
Identification, botanical characteristics, culture, and landscape uses of woody plants. Emphasis on flowering trees, cacti, and members of the pea and rose families.
Learning Outcomes

1. Identify landscape plants by scientific names, including family, genus and specific epithet.
2. Use scientific terminology to accurately describe landscape plant morphology.
3. Illustrate plant family relationships at the family and genus level.
4. Apply landscape design principles and knowledge of plant requirements to arrange plants in a landscape.

HORT 2130. Floral Quality Evaluation and Design
2 Credits (1+2P)
Critical hands-on evaluation of the quality of cut and potted floral and tropical foliage crops, their specific merits and faults, and fundamentals of floral design.
Learning Outcomes

1. Identify common floriculture crops, or know resourcing to help identify the crop.
2. Evaluate quality (merit and fault) of common floriculture crops, based on industry standards and merit. Pi Alpha Xi and American Floral Endowment standards will be used for the purpose of this class.
3. Have a basic understanding of the floriculture industry, and identify career pathways within the industry.
4. Know, understand, creatively interpret, and execute basic principles of design in regards to floral design.
5. Use interpersonal communication, problem solving, basic math, and marketing during cash and carry "lab" time (flower sales) in developing job ready skills in floristry.
6. Layer principles of design, marketing, sales, and time management to create floral art in real-world scenarios.

HORT 2160. Plant Propagation
3 Credits (2+2P)
Practical methods of propagating horticultural plants by seed, cuttings, layering, grafting, division and tissue culture. Examination of relevant physiological processes involved with successful plant propagation techniques. Same as AGRO 2160.
Learning Outcomes

1. Practical methods of propagating plants by seed, cuttings, layering, grafting, division, and tissue culture through experiential, “hands-on” laboratories.
2. Relevant physiological principles involved in propagating horticultural plants through lecture discussions and readings.

HORT 2990. Floriculture Field Practicum
1 Credit (1)
Participation as team member in the National Intercollegiate Floral Quality Evaluation and Design Competition. Intensive week-long travel for competition, networking with industry, academia, and floriculture tours. May be repeated for a maximum of 3 credits.
Prerequisite(s): HORT 2130 or consent of instructor.
Learning Outcomes

1. Varies

HORT 2996. Special Topics
1-4 Credits
Specific subjects and credits as announced. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required.
Learning Outcomes

1. Varies

HORT 300. Special Topics
1-4 Credits
Specific subjects as announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

HORT 302V. Forestry and Society
3 Credits (3)
Global study of the development and use of forest resources for production of wood, fuel, fiber, and food products. Climatic, edaphic, cultural, and economic influences on forests of the world evaluated. Same as RGSC 302V.

Learning Outcomes

1. Demonstrate comprehension of basic plant physiology.
2. Analyze various inputs and environmental factors that affect trees and forests.
3. Identify forest biomes based on plant morphology and environmental characteristics.
4. Categorize different types of forest products and harvesting methods.
5. Compare and contrast various forest management practices in the US and worldwide.
6. Evaluate climate and ecological issues as they relate to society.
7. Develop an awareness of the interconnection of nature and society.

HORT 304. Hydroponics
4 Credits (4)
This course will introduce students to the basics of the different soil-less growing systems: hydroponics, aeroponics and aquaponics. Topics will include growing systems and environments, crop management, business aspects of hydroponic growing, integrated pest management, commercial and restaurant systems, and plant nutrition. Labs will reinforce lecture topics and give students practical experience growing different types of crops in different types of systems.
Prerequisite: AGRO 1110G or HORT 1115G.
Learning Outcomes

1. Discuss the benefits and constraints of different hydroponic systems.
2. Evaluate different crops for each type of system.
3. Identify the components and calculate costs of different systems.
4. Demonstrate how to build and maintain each type of system.
5. Discuss how soilless growing relates to sustainability and local food production.

HORT 305. Principles of Genetics
3 Credits (3)
Covers fundamental principles of reproduction, variation, and heredity in plants and animals. May be repeated up to 3 credits.
Prerequisite: (BIOL 2610G and BIOL 2110G, or BIOL 2110G and BCHE 140, and either CHEM 1215G or CHEM 1216).
Learning Outcomes

1. To provide an introduction to the basic concepts, methods, and terminology of genetics. Introduction to genomics and bioinformatics.
2. To develop a working understanding of genetics and heredity
3. To understand in some depth, the mechanism of DNA replication, transcription and protein synthesis. To understand the regulation of gene expression.
4. To examine the impact of genetics on both basic and applied aspects of the biological sciences, as well as its effects on our everyday lives.

HORT 307. Landscape Design
4 Credits (3+3P)
Design elements, the design process, and contemporary planting design used in the design of residential and small commercial landscapes. Basic drafting, drawing, and landscape plan presentation techniques.
Prerequisite: HORT 2110 or HORT 2120 or consent of instructor.
Learning Outcomes

1. Access a residential site for landscape design.
2. Create a landscape plan that addresses and solves a client's needs and wishes.
3. Incorporate ideas into the landscape plan that reflects the region.
4. Incorporate sustainable ideas into a landscape plan.
5. Analyze a landscape plan for aesthetics and functionality.
6. Verbally and visually present a landscape plan in a professional manner.

HORT 310. Medicinal Herbs
3 Credits (3)
Introduction to ethnobotany, including plant cultivation, extraction methods, and analysis of active chemistries.
Learning Outcomes

1. Describe relationships between people and plants.
2. Identify cultural uses of plants by peoples across the world.
3. Discuss the westernized use of plants and regulations associated with medicinal plant products.
4. Discuss the scientific methods employed to study medicinal plant compounds.
5. Identify medicinal plant chemical structures.
6. List medicinal plant tincture preparation methods.
7. Discuss analytical chemistry instrumentation used to identify plant compounds.

HORT 318V. Urban Water Issues and Society
3 Credits (3)
Global study of water science, development, law, and use for agriculture, manufacturing, landscaping, home use, and other urban uses. This course allows students to become familiar with important issues concerning the interaction between water use and humans. Topics include the water cycle, water chemistry, human-water relations, plant-water relations, water users, water-dependent population placement and growth, water regulation, and the future of water.
Learning Outcomes

1. Define and describe Earth's water sources and the water cycle.
2. Describe the chemical processes associated with water and analyze the composition of several water sources.
3. Summarize the interactions of water with the human body.
4. Explain the use of water in agricultural and other plants on both a regional scale and cellular level.
5. Identify, explain, and compare all water users and categorize their demand and availability for water.
6. Analyze the interconnection of the human societies and water while discussing locations of civilizations and communities.
7. Analyze, from a historical perspective, the interrelationships of all water users and all water decision makers. Describe the history of US and world water regulation and analyze its success rate.
8. Predict and recommend how water will be used and distributed in the future.

HORT 340. Greenhouse Retailing
2 Credits (1+1P)
A hands-on experience in weekly organizing, management, propagation and sale of greenhouse crops. This course is to learn how to propagate crops to achieve the fastest finished products, maintain the stock plant, and create opportunities for sales. Students will work 2 hours a week in the greenhouse with instructor, and choose one day a week to maintain and check on the greenhouse throughout the semester. May be repeated up to 4 credits.
Learning Outcomes

1. Identification and propagation of common greenhouse plants.
2. Create care sheets and propagation manuals for potential buyers of greenhouse crops.

3. Propagate, maintain, water, schedule and sell greenhouse products.
4. Practice team communication and support to create an equitable division of labor during the semester.
5. Learn to maintain labor and sales records.

HORT 365. Principles of Crop Production
4 Credits (3+3P)
Basic principles of crop production including environmental and physiological factors limiting production, plant nutrition and soil science, soil-water management, cropping systems and management, pest management, and economic factors influencing crop production. Taught with AGRO 365. May be repeated up to 4 credits.
Prerequisite: AGRO 1110G/HORT 1115G, CHEM 1215G or equivalent and MATH 1215 or equivalent.
Learning Outcomes
1. Analyze and apply core principles of crop production, including environmental, physiological, and climatic factors, to optimize plant growth, yield, and overall production efficiency.
2. Demonstrate understanding of plant biology by identifying structures, growth stages, and functions across the plant life cycle.
3. Evaluate plant propagation and reproduction methods by distinguishing between sexual and asexual techniques, explaining pollination and fertilization processes, and discussing their impact on genetic improvement and crop uniformity.
4. Demonstrate proficiency in seed and equipment technologies, including identification and calibration of farm implements, calculation of seed rates, and evaluation of certified seed quality and planting operations.
5. Apply experiential learning methods to design, manage, and assess crop production systems using real-world data and reflection-based decision-making models (Kolb's learning cycle).

HORT 377. Introduction to Turfgrass Management
4 Credits (3+3P)
Establishment and maintenance of turfgrass with emphasis on seeding methods, soil and water management, mowing, disease, insects and turfgrass varieties. Consent of instructor required. Crosslisted with: AGRO 377
Learning Outcomes
1. Identify the general morphology of grass plants and the characteristics of cool- and warm-season grasses.
2. Explain various turf establishment techniques and procedures.
3. Demonstrate understanding of basic soil science, soil testing, amendments, and fertilization regarding cultural and maintenance procedures as well as seasonal projects to maintain healthy turf.
4. Recognize and identify common turf disturbances including weed, pest, and disease identification.
5. Communicate turf conditions and the rationale for different maintenance processes on the course or field.

HORT 378. Turfgrass Science
4 Credits (3+3P)
Introduction to the scientific fundamentals for turfgrass management cultural practices, pest management, rootzone construction and ecology. May be repeated up to 4 credits.
Prerequisite: HORT 377 or consent of instructor.
Learning Outcomes
1. Explain the benefits and history of turfgrass.
2. Apply basic plant physiological knowledge to turfgrass adaptation, growth and function.
3. Demonstrate ability to identify known and unknown turfgrasses and appraise how, when and why specific turfgrasses are used in certain environments.
4. Examine the basic principles of turfgrass soils, turfgrass establishment and major turfgrass management practices (mowing, fertility, irrigation, cultivation, secondary cultural practices).
5. Examine basic turfgrass pest management principles and practices in order to be able to identify, analyze and implement solutions.
6. Calculate common turfgrass math calculations and perform equipment calibrations.
7. Analyze how the environment influences turfgrass growth and management.
8. Prepare a consulting appraisal and specific turfgrass management plan using learned turfgrass knowledge.

HORT 391. Internship
1-6 Credits
Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of instructor required. Graded: S/U. Crosslisted with: AGRO 391 and SOIL 391

HORT 447. Seminar
1 Credit (1)
Organization, preparation, and presentation of current topics in agronomy, environmental sciences, horticulture, and soil science. Crosslisted with: AGRO 447, SOIL 447 and ENVS 447.
Learning Outcomes
1. Develop professional communication skills through teamwork, case study preparation and presentation, data interpretation, and role-playing in mock interviews.
2. Prepare a professional resume, personal statement of goals for graduate school or permanent employment and make a Case Study presentation to faculty and peers.

HORT 449. Special Problems
1-3 Credits
Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

HORT 450. Special Topics
1-4 Credits
Specific subjects as announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required.

HORT 462. Plant Breeding
3 Credits (3)
Principles and practices involved with the genetic improvement of plants.
Prerequisite: ANSC/AGRO/BIOL/HORT/GENE 305 or GENE 320.
Learning Outcomes
1. Learn the principles and practices involved in plant genetic improvement.
2. Be able to apply principles and practices in real life scenarios.

HORT 471. Plant Mineral Nutrition
3 Credits (3)
Basic and applied aspects of plant requirements for soil-derived minerals and the processes whereby minerals are acquired, absorbed, translocated, and utilized throughout the plant. Same as AGRO/EPWS 471.

Prerequisite/Corequisite: EPWS/BIOL 314, or concurrent enrollment, or consent of instructor.

Learning Outcomes

1. Describe how minerals function in plants, including uptake, transport and heritability factors.
2. Explain how plants regulate internal mineral content.
3. Compare different crop nutrient management practices.
4. Identify plant mineral disorders and stressors.
5. Prepare and present information on crop mineral nutrition.

HORT 479. Advanced Turfgrass Science
3 Credits (3)

Extensive reviews of turfgrass sciences including ecology, physiology, entomology, pathology, weed science, and soil science.

Prerequisite: HORT 378 or consent of instructor.

Learning Outcomes

1. Discuss the fundamentals of turfgrass management practices including mowing, fertilization, irrigation, cultural practices and pest management, and use these practices to plan an integrated turfgrass management plan.
2. Identify common and unique turfgrass problems and situations and formulate a solution based on prior knowledge learned.
3. Analyze how stresses, construction and turfgrass management practices affect growth, development, and physiology of turfgrasses.
4. Ascertain how environmentally sound management practices can be modified to promote optimal turfgrass health under stress conditions.
5. Critically evaluate scientifically based literature on turfgrass management.

HORT 483. Advanced Sustainable Crop Production
4 Credits (3+3P)

Characteristics and objectives of sustainable agricultural systems with application to the production, utilization, and improvement of agronomic and vegetable crops.

Prerequisite: AGRO 365 or HORT 365.

Learning Outcomes

1. Design and evaluate sustainable cropping systems by integrating principles of crop diversification, crop rotation, no-till, and organic practices, and assessing their advantages, challenges, and impact on long-term agricultural sustainability.
2. Analyze and apply crop and soil management strategies using holistic and integrated approaches, including mycorrhizal fungi use in arid environments, IPM (Integrated Pest Management), and the "many little hammers" approach to weed control.
3. Select and recommend crop cultivars and management practices for specific agronomic and horticultural crops using tools such as growing degree days, variety test reports, and region-specific criteria (for New Mexico).
4. Critically review and communicate sustainable agricultural research and practices by analyzing case studies, scientific literature, and peer presentations to evaluate the effectiveness of sustainability-focused strategies.
5. Identify and engage with agricultural support systems and sustainability networks, including agencies like Western SARE, to explore resources for funding, research, and application of sustainable agriculture practices.

HORT 488. Greenhouse Management
4 Credits (3+3P)

Principles and practices involved in greenhouse structures and construction, site considerations, heating and cooling systems, greenhouse crop production techniques, sustainability practices. May be repeated up to 4 credits.

Prerequisite: HORT/AGRO 365 or consent of instructor.

Learning Outcomes

1. Establish, operate, and maintain a greenhouse.
2. Demonstrate greenhouse business and marketing skills, horticulture techniques.
3. Practice "hands-on" greenhouse production.
4. Describe greenhouse sustainability issues.
5. Identify emerging trends in the greenhouse industry.

HORT 492. Diagnosing Plant Disorders
3 Credits (2+3P)

Systematic diagnosis of the physiological, pathological, and entomological causes of plant disorders. Same as EPWS 492 and AGRO 492.

Prerequisites: EPWS 303 and EPWS 310.

HORT 500. Special Topics
1-4 Credits

Specific subjects and credits to be announced in the Schedule of Classes . Maximum of 4 credits per semester. No more than 9 credits toward a degree.

HORT 505. Research Orientation
4 Credits (3+2P)

Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: AGRO 505, SOIL 505 and ENVS 505.

Learning Outcomes

1. Gain insight into the nature of scientific research and skills vital for graduate research and future careers in science.
2. Navigate graduate school processes and protocols.
3. Demonstrate critical thinking.
4. Generate a scientific hypothesis.
5. Communicate science effectively in written and oral formats, including drafting a proposal for thesis or dissertation research.

HORT 513. Introduction to Scientific Writing
3 Credits (3)

Students will learn how to communicate, through written format, to both the scientific community and diverse audiences. Students will be introduced to new technologies and new genres of scientific writing. Students will also learn basic reviewing and writing skills that underlie efficient preparation of literature reviews, scientific manuscripts, project reports, blog-posts, opinion or perspective pieces for more popular venues, advocacy articles for legislators, and descriptive pieces for popular venues such as newspapers, magazines, and broadcast media. Emphasis will be on the communication of experimental findings in peer-reviewed scientific journals.

Learning Outcomes

1. Students will review the basics of rhetoric and the technology of language.
2. Students will learn how to overcome writing barriers and gain confidence in their writing skills.
3. Students will improve their writing skills so that manuscript preparation becomes more efficient and productive.
4. Students will learn professional standards for the conduct of ethical reporting of scientific results.

5. Students will learn to recognize structural and stylistic elements in scientific articles that help researchers achieve certain communication goals.
6. Students will learn the basics of table, figure, diagram, and image presentation in manuscripts.
7. Literature reviews, framed so that they answer an important question in the field, and lead to peer-reviewed publication, may also be prepared. (With permission of the instructor.)

HORT 525. Scientific Writing How to be a Productive and Effective Writer
1-3 Credits (1-3)
Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review Crosslisted with: AGRO 525, AGRO 625, EPWS 525, SOIL 625 and SOIL 525.

HORT 590. Graduate Seminar
1 Credit (1)
Current research discussions presented by masters level graduate students. Not more than one credit toward the degree. Same as AGRO/SOIL 590. Crosslisted with: AGRO 590 and SOIL 590.

HORT 595. Internship
1-6 Credits
Supervised professional on-the-job learning experience. Limited to Master of Horticulture or Plant & Environmental Science candidates. Not more than 6 credits toward the degree.

HORT 596. Master's Proposal
1 Credit (1)
Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, ENVS 596, GENE 596 and SOIL 596. Restricted to: Masters HORT; Masters PLEN majors.
Prerequisite: Master level graduate students.
Learning Outcomes
1. Student will review academic literature and draft a research proposal.

HORT 598. Special Research Programs
1-6 Credits
Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits toward a degree.
Prerequisite: consent of instructor.

HORT 599. Master's Thesis
15 Credits
Thesis.

HOST-HOSPITALITY AND TOURISM

HOST 155. Special Topics
1-3 Credits (1-3)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 9 credits.
Learning Outcomes
1. Varies.

HOST 201. Introduction to Hospitality Industry
3 Credits (3)
Overview of hospitality industry; organization and operation of lodging, food and beverage, and travel and tourism segments; focus on career opportunities and future trends of hospitality industry. Restricted to: Community College campuses only.
Learning Outcomes
1. Analyze the interrelationship between lodging, food beverage operations, and the travel and tourism industry.
2. Evaluate the scope of the travel and tourism industry and assess its economic impact at the local, national, and international levels.
3. Investigate and propose opportunities for education, training, and career development in the hospitality industry.
4. Analyze the effects of globalization on the hospitality industry and predict future trends.
5. Critically examine and discuss major factors, developments, and trends that have affected lodging and food service operations in recent years and anticipate their future impact on the industry.
6. Analyze the effects of franchising, management contracts, referral organizations, independent and chain ownership, and condominium growth on the industry, and develop a comparative analysis of their implications.
7. Classify hotels based on their general characteristics and evaluate the distinctive features of each classification.
8. Identify and describe the common divisions or functional areas of hotel organization (rooms, food beverage, engineering, marketing and sales, accounting, human resources, and security), and analyze the interdependence and collaboration among these divisions in achieving organizational goals.

HOST 202. Front Office Operations
3 Credits (3)
Hotel/motel front office procedures detailing flow of business, beginning with reservations and extending to the night audit process. Restricted to: Community College campuses only.
Learning Outcomes
1. Analyze and differentiate the responsibilities for each job description in the front office.
2. Evaluate the significance of important factors in the day-to-day operation of the front office and propose strategies for optimal performance.
3. Explain front office technology and assess its impact on operational efficiency and guest satisfaction.
4. Develop and implement operational procedures/tasks that are critical to the registration process.
5. Demonstrate effective techniques for handling guest complaints and create a set of best practices for complaint resolution.
6. Analyze the key points regarding front office security functions and develop a comprehensive security plan.
7. Define and explain key terms in front office accounting and apply them to real-world scenarios.
8. Analyze the functions and tasks involved in the night audit processes and develop a step-by-step guide for conducting a successful night audit.

HOST 203. Hospitality Operations Cost Control
3 Credits (3)
Management of Food & Beverage facilities using cost control techniques. Functional training in menu analysis and development with all phases of product flow through a Food & Beverage organization explored. Restricted to: Community Colleges only.
Learning Outcomes
1. Explain the concept of "control" and analyze its importance in the management system.

2. Analyze the purposes and applications of standard costs and evaluate the uses of standard cost tools.
3. Evaluate the role of budget standards in planning and control and create cost-volume-profit analysis models for food and beverage operations.
4. Analyze and compare methods for estimating allowable food and beverage costs based on forecasted sales levels.
5. Evaluate subjective and objective menu pricing methods and create menu prices that incorporate profit requirements.
6. Apply principles and procedures important in controlling the purchasing and receiving processes and analyze the need to incorporate quality requirements in purchasing and receiving activities.
7. Analyze sales history records and time series data to create accurate production forecasts.
8. Evaluate the importance of standard recipes (including computerized standard recipes) as production tools and create a plan for incorporating production planning time.
9. Apply the basic formula for calculating cost of sales and analyze sources of information for each component of the formula. 1
10. Analyze the role of analysis, corrective action, and evaluation in the control process, and create a plan for implementing these steps effectively.

HOST 204. Promotion of Hospitality Services
3 Credits (3)
Organization of hotel marketing functions; developing a marketing plan to sell the varied services of the hotel/motel property. Restricted to: Community College campuses only.

Learning Outcomes

1. Analyze the distinctive aspects of marketing within service industries in relation to the intangibility of services, service encounters, service chains, and service quality.
2. Create an appropriate marketing mix to meet guest needs and achieve company goals.
3. Evaluate several methods of segmenting and targeting markets and apply market segmentation criteria effectively.
4. Analyze the kinds of marketing data needed for effective marketing efforts, apply the marketing research process to solve marketing problems, and create marketing information, systems that meet a hospitality company's real marketing needs.
5. Design a product/service mix (or product offer) that meets guest and company needs.
6. Develop and implement a distribution mix of hospitality networks to deliver hospitality products and services effectively and efficiently.
7. Evaluate and apply pricing mix strategies and tactics as an active and critical component of the overall marketing plan.
8. Analyze the components and interrelationships of the communications mix.
9. Evaluate and apply advertising, public relations, personal selling, merchandising, and promotion to better achieve company goals and objectives.

HOST 205. Housekeeping, Maintenance, and Security
3 Credits (3)
Function of housekeeping departments, including personnel, sanitation, maintenance, and materials. A survey of security procedures to include guest protection and internal security of hotel/motel assets. Restricted to: Community College campuses only.

Learning Outcomes

1. Analyze and differentiate various positions and job descriptions within the housekeeping, maintenance, and security departments.
2. Apply and evaluate various scheduling methods to optimize departmental efficiency.
3. Evaluate the role of the Maintenance department in the success of the operation and propose strategies for effective collaboration with other departments.
4. Identify and classify various types of floor, wall, and ceiling coverings and develop a comprehensive care and maintenance plan for each type.
5. Analyze the sanitation responsibilities of the Housekeeping department and develop a detailed sanitation protocol.
6. Evaluate the importance of an effective security program and design a comprehensive security plan for a hospitality establishment.
7. Investigate and recommend innovative technologies and practices that can enhance the efficiency and effectiveness of housekeeping, maintenance, and security operations.
8. Develop and implement training programs for housekeeping, maintenance, and security staff to ensure consistent quality and adherence to industry standards.
9. Analyze the impact of sustainable practices in housekeeping, maintenance, and security operations and develop a sustainability plan for these departments. 1
10. Evaluate the role of effective communication and collaboration among housekeeping, maintenance, security, and other departments in ensuring guest satisfaction and operational success.

HOST 206. Travel and Tourism Operations
3 Credits (3)
Transportation, wholesale and retail operations, attractions, the traveler, tourism development, and operational characteristics of tourism business. Restricted to: Community College campuses only.

Learning Outcomes

1. Analyze the economic importance of travel and its impact on local, national, and global economies.
2. Evaluate the historical evolution of travel and its influence on contemporary tourism practices.
3. Identify and explain the roles of various travel and tourism organizations in promoting and regulating the industry.
4. Compare and contrast various modes of transportation, assessing their strengths, weaknesses, and suitability for different types of travel.
5. Investigate and categorize barriers to tourism, proposing strategies to mitigate their impact on the industry.
6. Develop a comprehensive understanding of the global tourism landscape, including popular destinations, emerging markets, and niche travel segments.
7. Analyze the social, cultural, and environmental impacts of tourism on host communities and propose sustainable tourism practices.
8. Evaluate the role of technology in shaping the travel and tourism industry, including its influence on booking systems, customer experiences, and destination marketing.
9. Create a hypothetical travel itinerary that showcases an understanding of transportation logistics, destination management, and customer preferences. 1

10. Assess the importance of customer service in the travel and tourism industry and develop strategies for delivering exceptional experiences to travelers.

HOST 208. Hospitality Supervision
3 Credits (3)
Strategies for directing, leading, managing change and resolving conflict. Prepares students to meet expectations of management, guests, employees, and governmental agencies. Restricted to: Community College campuses only.
Learning Outcomes
1. Apply the management process to business activities, analyzing its effectiveness in achieving organizational goals.
2. Evaluate the importance of the communication process in relation to productivity and morale and develop strategies for effective communication within the organization.
3. Analyze and select appropriate recruitment channels and apply interviewing and screening skills to identify and hire the most qualified employment candidates.
4. Develop and implement effective orientation and training programs to prepare employees for their roles and responsibilities.
5. Integrate standard operating procedures into performance evaluation processes and utilize coaching and ongoing training techniques to support employee development.
6. Evaluate and apply motivational tools to maximize productivity levels while implementing labor cost reduction strategies.
7. Analyze special management concerns, including EEO policy, sexual harassment, safety and security, ethics, substance abuse, and unions, and develop policies and procedures to address these issues effectively.
8. Apply conflict management, communication, and motivational skills to build and lead effective work teams.
9. Evaluate professional development needs and future trends and create strategies for managing change within the organization. 1
10. Design and implement a performance management system that aligns with organizational objectives, incorporates employee feedback, and supports continuous improvement.

HOST 210. Catering and Banquet Operations
3 Credits (3)
Teaches the basics of catering and banquet operations, including computer coordination, planning, set up, service, and completion.
Learning Outcomes
1. Identify and analyze the types of caterers and customer markets, evaluating their unique characteristics and needs.
2. Evaluate and apply various marketing methods used in catering to effectively reach target audiences and promote catering services.
3. Analyze the process of client negotiation and problem resolution and develop strategies for effective communication and conflict management in catering.
4. Apply knowledge of menu planning, truth-in-menu guidelines, pricing, and types of meal functions to create and execute successful catering events.
5. Evaluate beverage service considerations, including pricing, types of beverage functions, liquor laws, and third-party liability, and develop strategies for responsible and profitable beverage service in catering.
6. Analyze special set up considerations, such as space requirements, cleaning and maintenance, equipment, and client services (audiovisual, entertainment, and lighting), and create comprehensive event plans that address these factors.
7. Evaluate recruitment, orientation, training, and compensation practices in catering, and develop strategies for building and managing effective catering teams.
8. Apply understanding of the banquet event order, contract, change order, and other related reports to effectively manage catering events and maintain accurate documentation.
9. Analyze payroll cost control techniques, credit management, and food and beverage cost control methods, and apply these concepts to optimize profitability in catering operations. 1
10. Develop and implement a comprehensive risk management plan for catering operations, addressing issues such as food safety, liability, and emergency preparedness.

HOST 214. Purchasing and Kitchen Management
3 Credits (3)
Technical purchasing concepts, product selection, and specifications. Safety and sanitation as they relate to food service establishments. Prepares student for work with HACCP programs.
Prerequisite: Grade of C- or better in HOST 203.
Learning Outcomes
1. Analyze and apply government and industry standards and specifications to ensure compliance and maintain quality in food service operations.
2. Create detailed specifications for a product or service, taking into account operational requirements, quality standards, and cost considerations.
3. Evaluate the appropriateness of bid purchasing programs for various operational types, considering factors such as volume, frequency, and supplier relationships.
4. Analyze and select the most cost-effective bids by compiling and calculating relevant data, such as price, quality, and delivery terms.
5. Identify and assess the benefits of labor-saving equipment in kitchen operations, and develop strategies for their effective implementation and use.
6. Design and implement a procedural method for improving kitchen efficiency, considering factors such as workflow, ergonomics, and resource optimization.
7. Analyze the inherent dangers found in kitchens and develop a comprehensive safety plan to mitigate risks and protect staff and customers.
8. Identify the major microbial causes of Food Borne Illnesses (FBI), and evaluate their origins, transmission methods, and potential impacts on public health.
9. Apply food safety principles and develop a comprehensive food safety management system to minimize hazards in kitchen environments. 1
10. Evaluate the role of state and local health departments, CDC, WHO, and the HACCP model in controlling Food Borne Illnesses, and incorporate their guidelines and best practices into kitchen operations.

HOST 216. Event, Conference and Convention Operations
3 Credits (3)
The ability to successfully plan, organize, arrange, and execute special events is critical to the success of many hospitality organizations. This course gives the student a grounding in the skills necessary to achieve success in this area. A variety of events are discussed and the similarities and differences with conferences and conventions are explored. Students

are taught to organize and plan events of varying type and durations. Sales, logistics, and organizing skills are emphasized. Restricted to: Community College campuses only.

Learning Outcomes

1. Identify and analyze the major requirements for successful event production, including organizational, financial, and operational factors.
2. Create a marketing plan for an event, incorporating strategies for target audience segmentation, promotional activities, and ROI measurement.
3. Demonstrate and apply effective customer service techniques and negotiating skills in the context of event planning and implementation.
4. Design and optimize the layout and functional space for an event, considering factors such as guest flow, accessibility, and aesthetic appeal.
5. Analyze the importance of financial contracts and controls in event planning, and develop strategies for budgeting, cost management, and revenue generation.
6. Evaluate the legal responsibilities of event planners and develop a risk management plan to mitigate potential liabilities and ensure compliance with relevant regulations.
7. Assess and select appropriate vendors and suppliers for events, considering factors such as quality, reliability, and cost-effectiveness.
8. Develop and implement a comprehensive project management plan for an event, including timelines, milestones, and contingency plans.
9. Analyze post-event data and feedback to identify areas for improvement and develop strategies for enhancing future event outcomes. 1
10. Evaluate the sustainability and environmental impact of events and develop strategies for incorporating Eco-friendly practices into event planning and execution.

HOST 219. Safety, Security and Sanitation in Hospitality Operations
3 Credits (3)

It is the responsibility of the manager to provide appropriate security, sanitation, and safety precautions in hospitality operations. Preparation for internal and external disasters is an important task for the Hospitality Manager. This course uses the National Restaurant Association ServSafe¬ training material.

Learning Outcomes

1. Analyze the steps of the HACCP process and evaluate the significance of each in ensuring food safety in hospitality operations.
2. Design an effective accident prevention program for a hospitality operation, incorporating strategies for hazard identification, risk assessment, and employee training.
3. Evaluate how equipment and facility design impacts employee and guest safety and propose improvements to enhance safety in hospitality settings.
4. Develop and implement loss control/theft prevention policies, considering factors such as asset protection, inventory management, and employee accountability.
5. Create a comprehensive emergency response procedure for hotels and restaurants, including protocols for evacuation, communication, and coordination with local authorities.
6. Analyze the impact of 9/11 on security in the hospitality industry and evaluate the effectiveness of subsequent security measures and policies.
7. Assess the importance of cyber-security in the hospitality industry, and develop strategies for protecting sensitive data, preventing breaches, and responding to cyber incidents.
8. Apply principles of risk management to identify and mitigate potential safety and security threats in hospitality operations.
9. Evaluate the role of technology in enhancing safety and security in the hospitality industry, and propose the adoption of innovative solutions, such as biometrics and AI-based surveillance. 1
10. Analyze the legal and ethical implications of safety and security practices in the hospitality industry and develop policies that prioritize guest and employee well-being while complying with relevant regulations.

HOST 220. Experiential Travel
1-3 Credits (1-3)

Course provides an opportunity for students to plan, prepare for and experience travel to destinations they might not otherwise have visited. Students experience local culture and peoples. Restricted to Community Colleges campuses only. May be repeated up to 9 credits.

Prerequisite: Grade of C- or better in HOST 201 or consent of instructor.

Learning Outcomes

1. Evaluate the marketing and promotional material used by the destination service providers to determine the target market demographics.
2. Recognize and discuss the cultural variations of the host venue and their impact on tourism.
3. Develop plans for cost effective utilization of the services of transportation, activity and lodging providers.
4. Prepare a detailed itinerary for the planned travel to manage time maximizing traveler's experiences.
5. Discuss the economic, cultural and political issues in the destination country and their impact on the tourism industry.
6. Describe customer service strengths and weaknesses experienced at the destination during the travel event.

HOST 221. Internship I
1,3 Credits (1,3)

Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships may be paid or unpaid. Students are supervised/evaluated by both the employer and the instructor. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate proficiency in performing assigned tasks and responsibilities and contribute meaningfully to the internship host company's operations.
2. Evaluate personal strengths, weaknesses, and areas for improvement based on feedback received during the internship and develop a professional development plan.
3. Create a portfolio showcasing the skills, knowledge, and experiences gained during the internship, and reflect on how these align with career goals and industry expectations.
4. Develop a professional network within the hospitality industry, and leverage internship experiences to explore career opportunities and pathways.
5. Evaluate the internship experience holistically and provide constructive feedback and recommendations to the internship host company and the academic program for continuous improvement.

HOST 222. Cooperative Experience II
3 Credits (3)
Continuation of HOST 221. Restricted to majors. May be repeated up to 3 credits. Restricted to: Community College campuses only. Restricted to HOST majors.
Prerequisite: Grade of C- or better in HOST 221.
Learning Outcomes
1. Student Learning Outcomes vary.

HOST 239. Introduction to Hotel Management
3 Credits (3)
This course covers basic management functions in hotels, resorts, Boutique Hotels, Bed & Breakfast establishments, and other lodging operations. All aspects of the operation are covered including guest management, operations, and sales and marketing. Restricted to: Branch campuses only.
Learning Outcomes
1. Analyze the historical evolution of hotels and evaluate how they have developed into their current form.
2. Describe and explain the basic operational structure of lodging operations.
3. Analyze the different divisions in hotels and evaluate how they interact and contribute to the overall success of the property.
4. Evaluate the functions of the Front Office area and assess its impact on other departments and overall guest experience.
5. Analyze the various functions of the housekeeping department and develop strategies for optimizing its efficiency and effectiveness.
6. Evaluate the role of the sales and marketing department in driving occupancy and revenue.
7. Identify and explain the duties of the Human Resources department in a lodging operation and propose strategies for effective talent management and employee engagement.
8. Analyze the operation of a Food Beverage department in a lodging property, and develop strategies for enhancing its profitability and guest satisfaction.
9. Evaluate the importance of safety and security in a hotel operation and design a comprehensive risk management plan that addresses potential threats and emergencies. 1
10. Compare and contrast the various types of properties in the specialty hotel/lodging market, and analyze their unique characteristics, target markets, and operational requirements.

HOST 255. Special Topics
3 Credits (3)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 9 credits.
Learning Outcomes
1. Course Learning Outcomes are based on the topical outline for the Special Topic.

HOST 298. Independent Study
1-3 Credits (1-3)
Individual studies directed by consenting faculty with prior approval of department chair. May be repeated for a maximum of 3 credits. Restricted to: Community College campuses only.
Prerequisite(s): Minimum 3.0 GPA and sophomore standing.

HRTM-HOTEL/RESTRNT/TOURISM MGT

HRTM 1120G. Introduction to Tourism
3 Credits (3)
Survey of travel and tourism development and operating characteristics.
Learning Outcomes
1. Define tourism and related terms.
2. Identify and explain the role of the elements of the destination mix.
3. Identify the potential socio-cultural, economic and environmental impacts of tourism.
4. Identify and describe the role of key governmental and nongovernmental organizations in tourism.
5. Describe basic tourism planning and development principles.
6. Discuss the unique challenges of tourism marketing and standard marketing methods.
7. Describe the components of the tourism distribution system.
8. Demonstrate a basic understanding of traveler behavior including motivations and barriers to travel.
9. Identify major factors that influence traveler flows. 1
10. Describe the role of major modes of transportation in the tourism system. 1
11. Identify and describe the three pillars of sustainable tourism development. 1
12. Explain personal and social responsibility as it relates to sustainable tourism development. 1
13. Demonstrate effective communication and critical thinking skills.

HRTM 1130. Introduction to Hospitality Management
3 Credits (3)
Overview of the major segments of the hospitality industry, with a focus on basic management principles.
Learning Outcomes
1. Understand the concept of management contracts and franchising.
2. Recognize and understand needed leadership qualities to achieve organizational objectives.
3. Understand the hospitality industry within the global environment.
4. Identify company and industry trends.
5. Understand the functions of all departments in a hospitality organization (restaurant, hotel, club, etc.).
6. Apply the concepts of convention management, meeting and event planning, and casino management.
7. Understand the concepts of quick and institutional/contract foodservice management.
8. Understand the principles of bar management and compare and contrast wines, beers and distilled spirits.
9. Manage the process of service delivery. 1
10. Identify and solve managerial problems 1
11. Manage a diverse workforce and develop positive employee relations to reduce turnover.

HRTM 1310. Safety, Sanitation and Health in the Hospitality Industry
1 Credit (1)
Addresses public health, HACCP, and food safety responsibilities in the hospitality industry. Sanitation certification test allows students to receive national ServSafe Food Protection Manager Certification.

Learning Outcomes

1. Identify the hazards to safe food and the foods at risk in a foodservice operation.
2. Identify and discuss the Hazard Analysis Critical Control Point (HACCP) system and be able to design a HACCP flowchart.
3. Demonstrate knowledge of how to protect food during purchasing, receiving, storing, preparing, holding, and serving.
4. Discuss the procedures for ensuring sanitary equipment, facilities, and food-handling practices.
5. Explain how to set-up cleaning, safety, pest control, crisis management, and training programs.
6. Also meets KRDNs for the Accreditation Council for Education in Nutrition and Dietetics (ACEND).

HRTM 1320. Food Production and Service Fundamentals
3 Credits (1+4P)

Basic overview of food service systems including menu management, purchasing and production. The course includes basic principles of food fabrication and production. Topics include knife skills, culinary terminology, product identification, quality standards, nutritional cooking theory and application of food preparation techniques. The course includes laboratory aspects and demonstration of basic food production techniques, service styles, practices and procedures in food service operations including culinary math. This course provides students with an understanding of food service sanitation and culinary nutrition. Completion of a national certification examination is required. Students who have not completed HRTM 1310 before enrolling in the course must have proof of valid ServSafe Food Protection Manager certificate. May be repeated up to 3 credits.

Prerequisite: HRTM 1130 or FSTE 2110G.
Prerequisite/Corequisite: HRTM 1310.

Learning Outcomes

1. Demonstrate use of standard recipes and how to reduce and increase their yields
2. Demonstrate basic culinary knife cuts, basic fabrication and mise en place
3. Demonstrate basic cookery techniques of dry, moist and a combination of heat
4. Demonstrate the proper plating and garnishing of foods
5. Describe proper personal behaviors required for the safe handling of food
6. Identify and properly operate kitchen equipment.
7. Pass the ServSafe Exam
8. Describe the three forms of food contaminants and preventative measures.
9. Demonstrate how to properly “set” a table for service 1
10. Demonstrate how to provide dining room service with proper etiquette 1
11. Demonstrate safe work habits, identify safety hazards, and employ preventative safety measures. 1
12. Maintain positive relations with fellow students and faculty through teamwork. 1
13. Exhibit appropriate work habits and attitudes; demonstrate a willingness to compromise. 1
14. Demonstrate a positive attitude, conversation skills, personal hygiene and work attire.

HRTM 2130. Hotel Operations I
3 Credits (3)

Analysis of hotel operations to include: guest services, reservations, reception, guest/city ledger and the night audit. May be repeated up to 3 credits. Restricted to Las Cruces campus only.

Prerequisite(s): HRTM 1130.

Learning Outcomes

1. Outline the history, magnitude and culture of the hotel industry
2. Define and identify hotel ownership and operational structures
3. Outline the organization and structure of a hotel and resort.
4. Describe and calculate the components and processes of room reservation forecasting, pricing and revenue management.
5. Outline and explain the flow of the guest from pre-arrival through arrival, room occupancy and departure.
6. Demonstrate the procedures and processes for Guest Accounting, the City Ledger, Guest Credit and the Night Audit.
7. Discuss problem solving and guest service associated with the front office and other departments of the hotel and resort.
8. Forecast impacts of technology to the guest services and hotel operations
9. Describe the day to day activities and responsibilities of a Hotel Front Office Manager or a Hotel Assistant General Manager (AGM).

HRTM 2996. Special Topics
1-4 Credits

Specific subjects and credits to be assigned on a semester basis for both lecture and laboratory assignments. May be repeated for a maximum of 4 credits.

Prerequisite: consent of instructor.

Learning Outcomes

1. Varies

HRTM 3210. Hotel, Restaurant, and Tourism Marketing
3 Credits (3)

The development of effective marketing programs for hospitality service organizations.

Prerequisite: HRTM 1130.

Learning Outcomes

1. Understand the unique challenges involved in marketing and managing services.
2. Describe the hospitality marketing concepts.
3. Define the characteristics of hospitality marketing.
4. Understand management strategies for service businesses.
5. Discuss the role of marketing in strategic planning.
6. Explain how customer behavior influences individual customer buying decisions.
7. Discuss market segmentation, targeting, and positioning.
8. Use the elements of the marketing mix to create a marketing action plan targeting a specific market.

HRTM 3220. Hospitality and Travel Law
3 Credits (3)

Specialized applications of the law to the hospitality and tourism industry.

Prerequisite: HRTM 1130.

Learning Outcomes

1. Describe the history and origins of hospitality law.
2. Identify the differences between the types of laws governing the hospitality industry.
3. Explain how civil and disability rights laws impact hospitality operations and their duties to guests.

4. Determine how contract law applies to the hospitality industry.
5. Describe the concepts of negligence and due diligence and the actions that can be used to minimize potential legal liability.
6. Interpret laws associated to hotel guests' right to privacy, personal safety and safekeeping of personal property.
7. Assess hospitality operators' legal obligations in safely serving food and alcoholic beverages.
8. Analyze hospitality related legal case studies.

HRTM 3230. Hospitality Leadership Management
3 Credits (3)
Examines modern leadership theory in the context of the hospitality industry. Connects contemporary leadership topics to their historical antecedents through focused reading, discussion and assignments.
Prerequisite: HRTM 1130 and HRTM 1120G.
Learning Outcomes
1. Analyze leadership theories and the current research on effective leadership behavior.
2. Apply leadership theories to management practice.
3. Identify relevant characteristics, skills, and situations that contribute to leadership effectiveness.
4. Explain the importance of ethical leadership and how promoting diversity, inclusion, and equity benefits organizations.
5. Discuss what hospitality organizations must do to empower their managers and staff.
6. Explain why conflict occurs in organizations and describe positive and negative aspects of organizational conflict.

HRTM 3310. Quantity Food Production and Service
4 Credits (1+6P)
Covers quantity food production and service including cooking concepts, sanitation and safety, teamwork, dining room service, and management responsibilities. Students will apply this knowledge developing product for sale in a student run restaurant. Proof of current ServSafe Food Protection Manager or NM Food Handler certification required. May be repeated up to 4 credits.
Prerequisite(s): HRTM 1320.
Learning Outcomes
1. Describe and apply the process of planning and producing foods in quantity.
2. Follow, extend, and reduce a recipe.
3. Prepare and plate foods for service to guests.
4. Demonstrate dining room set up skills.
5. Demonstrate food serving skills.
6. Operate a foodservice establishment using proper food safety practices.
7. Work as a team to operate a foodservice establishment.
8. Evaluate the quality and profitability of menu items.
9. Evaluate a budget and interpret financial data. 1
10. Evaluate guests perceptions of food and service.

HRTM 3410. Hospitality Management Accounting
3 Credits (3)
Specialized accounting for hotel revenue and expenses; accounting for inventory, property, and equipment; hospitality payroll accounting; hotel departmental financial statements; income statement, balance sheet, and statement of cash flows; the analysis of financial statements; interim and annual reports; budgeting expenses; forecasting sales; budgetary reporting and analysis; and financial decision making.
Prerequisite: ACCT 2110.
Learning Outcomes
1. Present the terminology and principles required to develop modern Hospitality Management financial statements.
2. Present the primary principles of managerial accounting and applications to modern Hospitality Management cost and profit analysis.
3. Demonstrate the concepts of financial analysis required to evaluate capital investments, analyze business performance, and to develop tools for financial planning and analysis.
4. Develop the analytical concepts required to understand and evaluate money flows over time and apply these concepts to the use of capital and credit.

HRTM 3910. Professional Development
1 Credit (1)
Covers essential elements of career management including preparation for a successful internship. Restricted to majors.
Learning Outcomes
1. Classify your personality type and its relationship to career goals and strategies.
2. Write an effective resume in the appropriate style.
3. Recognize the importance of appropriate and effective communications with potential employers using a various professional behavior methods.
4. Demonstrate effective interview preparation and engagement.
5. Determine appropriate professional dress and etiquette for various business and dining experiences.
6. Select an appropriate internship experience.
7. Transform the base tools of resume writing, interview preparation, and professional development into future adaptations of career progress and network growth and determine what criteria are important when hiring.

HRTM 4110. Meetings, Conventions and Special Events
3 Credits (3)
Examination of the role of the meeting/event planner, including setting objectives, site selection, negotiations, design, budgeting, marketing, registration, on-site logistics, and evaluation.
Learning Outcomes
1. Identify and differentiate between different types of meetings, conventions, and events.
2. Analyze the scope and complexity of meetings, conventions, and special events.
3. Develop realistic goals, strategic plans, action plans, production schedules, budgets, and facilities designs for meetings and special events.
4. Apply group dynamics, management, and leadership skills to accomplish organizational tasks.
5. Implement an effective communication network among different parties involved in meetings and special events.
6. Organize and facilitate contacts with hospitality industry leaders, vendors, and media personnel.
7. Evaluate the outcomes of meetings and events.

HRTM 4115. Entertainment Business and Venue Management
3 Credits (3)
This course will review and examine the principles and practices associated with managing a public assembly venue and the nature of the venue and entertainment business. This is a comprehensive course

designed to cover all aspects of incorporated event practices such as marketing, production, contracts, ticketing, and security.

Learning Outcomes

1. Analyze the origin and history of public assembly venues and the role they play within the community.
2. Analyze different ownership and management structures and how governance relationships impact operational management.
3. Analyze the business and financial operations of a public assembly venue.
4. Describe the booking process, the entities involved, and the importance of relationships.
5. Analyze and create marketing and sales strategies for both a public assembly venue and an event that is booked in the venue.
6. Identify and analyze the ticket system options available to venue managers, as well as their importance in access management, financial accountability, and data collection.
7. Analyze the role and importance of ancillary revenue sources, as well as the need for creativity and entrepreneurship.
8. Describe the operational systems and processes required to maintain a venue and produce events.
9. Analyze the event planning process and how it is used to produce an event experience for guests and clients. 1
10. Analyze management's role in developing and maintaining a safe and secure public assembly venue.

HRTM 4120. An Overview of Italian Tourism focused on Food, Wine, Art and Culture
3 Credits (3)

The course content provides a global perspective and understanding of Italian food, wine, art and culture and their integration into tourism. The content is designed to provide students an appreciation of Italian cultural values and an overview of food, wine and art in the tourism regions of Italy.

Learning Outcomes

1. Describe and explain the basic history of the tourism regions of Italy.
2. Recognize and describe the Italian food and wine industry and its impact on tourism.
3. Detail how the Italian's integrate sustainability into tourism.
4. Recognize the impact of culture and art on tourism.
5. Explain strategies for responsible travel abroad in Italy and the European Union focused on personal and group safety.
6. Analyze and evaluate multicultural differences between Italian and American societies focused on effective personal communication practices.
7. Produce a 20 slide narrated online presentation with pictures that focused on at least two course learning objectives

HRTM 4130. Advanced Hotel Operations
3 Credits (3)

The duties and administration of a hotel front office, including housekeeping. Additional focus on the procedures of reservations and night audit. Students also gain exposure to property management systems.

Prerequisite: HRTM 2130.

Learning Outcomes

1. Describe day-to-day responsibilities for a hotel General Manager.
2. Explain departmental competencies for a hotel (Human Resources, Accounting, Revenue Management, Sales and Marketing, Front Office, Housekeeping, Food and Beverage, and Property Operation and Maintenance).
3. Compare and contrast management roles and responsibilities between limited service and full service hotels.
4. Describe hotel organizational, ownership, and franchising structures and their effect on hotel operations.
5. Explain the role of service throughout hotel operation departments.

HRTM 4135. Hospitality Facilities Management
3 Credits (3)

Exploration of the engineering and maintenance requirements specific to the hospitality industry. Emphasis on environmental issues, renovation and management of the physical plant.

Prerequisite: HRTM 2130, HRTM 4998.

Learning Outcomes

1. Manage property assets using planning and budgeting strategies and the appropriate type of maintenance.
2. Explain how technology is used to make maintenance and operations more efficient and effective.
3. Devise strategies to sustainably manage operational areas and systems in a hospitality business.
4. Manage water, HVAC, electrical, lighting, laundry safety and security, and waste management systems safely and efficiently.
5. Interpret construction drawings and schematics in a basic manner.
6. Describe various kitchen hood systems and individual pieces of kitchen equipment from a mechanical, maintenance and operational perspective.
7. Explain how risk management strategies for a hospitality business relate to facilities management.
8. Describe the importance of building design and engineering to guest experiences, safety, government compliance, and brand identity.
9. Describe real-world facility management activities for hotels and restaurants as described by industry professionals active within their career. 1
10. Apply effective communication and critical thinking skills.

HRTM 4140. Hotel Revenue and Sales Management
3 Credits (3)

Examines methods used for profitably managing capacity, including dynamic pricing and allocation of the rooms inventory across market segments to maximize revenues. Focuses on the integration of revenue management principles with information technology, management, marketing and sales concerns at the property and market level.

Prerequisite: HRTM 2130.

Learning Outcomes

1. Describe and discuss the role and function of revenue management in a hotel organization.
2. Evaluate pricing techniques and effects on demand.
3. Determine market segmentation for a hotel.
4. Demonstrate inventory management strategies.
5. Discuss legal and ethical aspects of revenue management.
6. Perform various analysis for a hotel as a function of revenue management.
7. Evaluate distribution channels for hotels.
8. Evaluate and recommend revenue management techniques.

HRTM 4145. Resort Management
3 Credits (3)

This course introduces students to the operation and management of full service resort properties, including the management of resort recreational amenities.
Prerequisite: HRTM 2130 or consent of instructor.
Learning Outcomes

1. Explain the history and structure of the resort industry, and its various products.
2. Describe the operations and management between resorts and hotels.
3. Identify and explain concepts and terminology for various resort amenities and activities.
4. Evaluate resort amenities and activities for various market segments.
5. Discuss trends in the resort industry.
6. Describe best practices in resort management.

HRTM 4230. Hotel, Restaurant and Tourism Industry Purchasing, Selection, and Procurement
3 Credits (3)
Purchasing methods for the hotel, restaurant and tourism industries based on standards of quality, grade, care, and storage for food and nonfood supplies. Purchasing, installation, operation, and care of large foodservice equipment.
Learning Outcomes

1. Differentiate purchasing functions in different types of hotel, restaurant and tourism operations and determine how internal and external forces impact purchasing decisions.
2. Outline and describe the duties and responsibilities of hotel, restaurant and tourism purchasing managers.
3. Develop product recommendations for hotel, restaurant and tourism food and equipment through the use of various product evaluation methods.
4. Identify examples of unethical purchasing practices throughout history, research present a code of purchasing ethics for a hotel, restaurant or tourism company.
5. Analyze hotel, restaurant and tourism industry supplier selection criteria and recommend a supplier based on those criteria.
6. Apply mathematical models to calculate recipe costs as well as order quantities and times. Determine how to reduce AP prices.
7. Outline and describe each step of the flow of inventory and determine which controls are needed for security of inventory.
8. Explain product grades and explain grading procedures and procurement criteria for meats, poultry, eggs, dairy, produce, marine products, groceries, and nonfood items.

HRTM 4235. Club Management and Marketing
3 Credits (3)
Provides an understanding of the general operational and administrative procedures practiced in private clubs from a marketing perspective with a special emphasis on managing and marketing club food and beverage operations and service. It will provide the professional golf management and hospitality students with the unique sensitivities required in managing and operating in the increasingly lucrative club management market.
Learning Outcomes

1. Describe the different types of private clubs and their specific operations.
2. Describe the different types of membership categories offered by private clubs.
3. Describe the responsibilities of the board of directors of private clubs.
4. Identify the typical organizational structure in private clubs.
5. Distinguish the functions and responsibilities of a club's board of directors from those of the club's general manager and staff.
6. Identify tips for long-term success to become an effective leader and communicator.
7. Explain the importance of a club strategic plan and strategic implementation.
8. Explain the role of marketing in a private club setting.
9. Summarize the importance of training and lifelong learning to the success of private clubs. 1
10. Describe the different types of food and beverage operations found in private clubs. 1
11. Identify the different financial statements used by clubs. 1
12. Describe the functions and ethical interdependencies among the major departments within a club. 1
13. Describe a manager's operational inspection and critique of one of the major departments within a club from an overall department manager's leadership perspective. 1
14. Explain the importance of facility management in clubs, particularly as it relates to members, employees and costs. 1
15. Summarize the duties and responsibilities of golf professionals, greens and grounds departments, and other golf staff members. 1
16. Describe a club fitness operation, and common programs of a club fitness center.

HRTM 4240V. Sustainability in the Hospitality Industry
3 Credits (3)
This course provides a summary and definition of the concept and roots of sustainability and climate change as well as their impact and effect on the hospitality industry while providing the rationale for sustainable development for the industry. A review of environmentally sound management strategies for all operational management areas ranging from eco-design, energy, waste and water management, food security, sourcing of agricultural products leads to a detailed strategy for planning and evaluating the sustainability of a hospitality operation in terms of corporate responsibility and social entrepreneurship. The content is focused on a global perspective of sustainability in the industry.
Learning Outcomes

1. Recognize, interpret and summarize the global challenges facing the hospitality industry caused by climate change driving the need for sustainability in the industry.
2. Explain implementation strategies for responsible environmentally sound hospitality management practices for hotel, food and beverage and tourism businesses.
3. Evaluate sustainable development practices and the importance of personal and corporate social development.
4. Analyze, evaluate and communicate the sustainability practices of a hospitality operation.

HRTM 4310. Beverage Management
3 Credits (3)
Survey of all aspects of beverage management, including wine/beer/distilled spirits origins and trends, cost control, bar management, beverage purchasing, and wine appreciation.
Prerequisite: HRTM 3310.
Learning Outcomes

1. Identify beverage industry career opportunities and trends that impact hospitality beverage operations.

2. Discuss responsible alcohol service principles in compliance with legal and ethical standards.
3. Explain the basic components of bar and beverage operations', design, layout and equipment.
4. Differentiate between the various beverage production processes and service standards.
5. Classify types of alcoholic and non-alcoholic beverages.
6. Develop beverage menus that align with food offerings, customer preferences, and business goals.
7. Describe the key principles of beverage inventory management and control.
8. Illustrate the role of beverage sales in operational profitability including pricing strategies and marketing techniques.

HRTM 4320. Restaurant Operations Management
4 Credits (1+6P)
Provides a detailed understanding of the processes of restaurant operations management. Students are expected to increase kitchen and service technical skills, develop and cook from recipes, develop a personal leadership style, understand food and wine pairing, and supervise front and back of the house operations. Provides the opportunity to perform a detailed analysis of a food and beverage operation. Proof of valid ServSafe Food Protection Manager or NM Food Handler certification and current NM Alcohol Server certification required.
Prerequisite: HRTM 3310.
Learning Outcomes
1. Demonstrate the skill of planning, designing, pricing and evaluating menus.
2. Demonstrate servant leadership skills during fine dining meals.
3. Demonstrate cost control through budget, income and expense reports.
4. Demonstrate how to construct, portion and cost standard recipes.
5. Demonstrate how to inventory, purchase, receive and store foods for production.
6. Demonstrate back of house production, service, and management.
7. Demonstrate how to manage alcoholic beverages with emphasis on wines.
8. Demonstrate front of house service and management.
9. Demonstrate how labor costs effect menu, food production, and desired service. 1
10. Demonstrate application of revenue control in the food service facility. 1
11. Demonstrate ability to implement change within the restaurant setting.

HRTM 4330. Wine Appreciation
3 Credits (3)
An experiential examination of wine through lectures, guest speakers and focused tasting of wine and food. Topics include viticulture, wine making varietals, terroir, wine service, tasting and evaluation techniques, and food pairings. Student must be at least 21 years old. Consent of instructor required.
Learning Outcomes
1. Discuss the historical and cultural significance of wine.
2. Compare and contrast the production processes for wines.
3. Describe and analyze the characteristics of popular wine varietals.
4. Describe how viticultural practices and geography/climate factors relate to the quality and variation in wines.
5. Perform evaluation and appraisal of wines based on quality, value, and intended use.
6. Apply knowledge of terminology related to labeling laws, practices, and geography of the major wine-growing regions of the world to the effective selection of both domestic and imported wines.
7. Pair wine with foods.
8. Examine the distribution and service systems for wine, including current issues affecting them.

HRTM 4410. Hospitality Cost Control
3 Credits (3)
Familiarizes students with all aspects of cost control including financial data entry and hospitality accounting practices, financial report production, analysis and problem solving. Students will learn to understand the roles of the various stakeholders (owners, managers, employees and customers.) Provides tools needed to communicate effectively about global financial issues affecting the hospitality business.
Prerequisite: HRTM 3310, HRTM 3410.
Learning Outcomes
1. Analyze relationships between hospitality business traffic, revenue, expense, and contribution margin as key variables associated with demand and profitability.
2. Explain professional purchasing, storage, and receiving techniques managers use to minimize spoilage and prevent product shortages.
3. Apply standardized recipes and effective menu planning techniques to efficiently manage food and beverage production systems.
4. Outline the steps managers take to control costs and achieve operational profit goals.
5. Categorize types of expenses accurately.
6. Calculate expenses by the cost per guest served and by the percentage of sales revenue.
7. Evaluate operational cost effectiveness through income (PL) statement analysis, including sales volume and all expense categories.
8. Prepare cost-volume-profit analysis(s) to evaluate the contribution of menu items to operational profits, including calculating break-even points.
9. Propose systems to prevent potential internal and external revenue theft threats. 1
10. Solve detailed virtual restaurant simulation exercises, including start-up and turnaround scenarios.

HRTM 4910. HRTM Internship Seminar
1 Credit (1)
A case based approach to analyzing internship experiences. Students will write case studies about specific business issues they encountered during HRTM 4998 and analyze them. Restricted to HRTM majors. May be repeated up to 1 credit.
Prerequisite: HRTM 4998.
Learning Outcomes
1. Explain the strengths and weaknesses of departments and work units from the hospitality operation in which they interned.
2. Compare and contrast management styles, leadership skill, and effectiveness of supervisors and managers.
3. Offer solutions to problems and challenges encountered in the workplace.
4. Write a comprehensive case study about their internship experiences.

HRTM 4991. Special Problems
1-4 Credits (1-4)
Individual research in a selected subject area of hospitality management. Consent of instructor required. Maximum of 4 credits per semester and a total of 6 credits toward a degree. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

HRTM 4996. Special Topics
1-4 Credits (1-4)
Specific subjects to be announced in the Schedule of Classes. Consent of instructor required. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits.
Learning Outcomes
1. Varies.

HRTM 4998. Hospitality Internship
1 Credit (1)
Hospitality and tourism professional work experience for HRTM majors only. Consent of instructor required. May be repeated up to 1 credit.
Prerequisite: HRTM 3910.
Learning Outcomes
1. Secure and maintain an internship opportunity that includes leadership/cross training industry-related experience and work.
2. Recognize current and key concepts and principles related to market trends, teamwork and ethical management and decision-making strategies in the operation of hospitality and tourism organizations.
3. Demonstrate principles of ethical leadership and effective teamwork within diverse hospitality and tourism management contexts, and the ability to apply these principles in real-world scenarios.
4. Apply current and emerging professional operational systems, service management techniques and service quality measurement systems.
5. Create favorable guest experiences in hospitality and tourism settings.
6. Use current and emerging operational methods and relevant technologies.
7. Exercise effective written, oral, visual, and interpersonal communication skills.

HRTM 4999. Senior Capstone Experience
3 Credits (3)
Synthesizes all previous work. Students apply multi-disciplinary principles to the analysis of hospitality business cases and tourism problems.
Prerequisite: HRTM 4998.
Learning Outcomes
1. Apply the ethical lens framework to business decisions.
2. Evaluate the importance of the effects of the Covid-19 pandemic, diversity, equity, and inclusion, the guest service experience, including service failure, and recovery, innovation, technology, corporate social responsibility, business models, and other trends to the hospitality and tourism industry.
3. Use research and the case study method to analyze hospitality business issues and trends.
4. Present case and research findings in a professional manner
5. Write professional reports.

HRTM 5115. Graduate Entertainment Business and Venue Management
3 Credits (3)
This course will review and examine the principles and practices associated with managing a public assembly venue and the nature of the venue and entertainment business. This is a comprehensive course designed to cover all aspects of incorporated event practices such as marketing, production, contracts, ticketing, and security.
Learning Outcomes
1. Analyze the origin and history of public assembly venues and the role they play within the community.
2. Evaluate different ownership and management structures and how governance relationships impact operational management.
3. Analyze the business and financial operations of a public assembly venue.
4. Describe the booking process, the entities involved, and the importance of relationships.
5. Investigate and create marketing and sales strategies for both a public assembly venue and an event that is booked in the venue.
6. Identify and analyze the ticket system options available to venue managers, as well as their importance in access management, financial accountability, and data collection.
7. Analyze the role and importance of ancillary revenue sources, as well as the need for creativity and entrepreneurship.
8. Describe the operational systems and processes required to maintain a venue and produce events.
9. Analyze the event planning process and how it is used to produce an event experience for guests and clients. 1
10. Evaluate management's role in developing and maintaining a safe and secure public assembly venue.

HRTM 5120. Hospitality Services Management
3 Credits (3)
This course explores and applies the design and management of service quality in global hospitality organizations.
Learning Outcomes
1. Investigate the design and management of service quality in global hospitality organizations to create authentic and memorable hospitality experiences.
2. Design and manage service delivery systems to create a culture of service excellence.
3. Define and discuss the relationship between service and financial performance in hospitality organizations.

HRTM 5130. Graduate Advanced Hotel Operations
3 Credits (3)
The duties and administration of a hotel front office, including housekeeping. Additional focus on the procedures of reservations and night audit. Students also gain exposure to property management systems. Same as HRTM 4130 with additional work for graduate credit.
Learning Outcomes
1. Describe day-to-day responsibilities for a hotel General Manager.
2. Explain departmental competencies for a hotel (Human Resources, Accounting, Revenue Management, Sales and Marketing, Front Office, Housekeeping, Food and Beverage, and Property Operation and Maintenance).
3. Compare and contrast management roles and responsibilities between limited service and full service hotels.
4. Describe hotel organizational, ownership, and franchising structures and their effect on hotel operations.
5. Explain the role of service throughout hotel operation departments.

HRTM 5140. Hotel Revenue and Sales Management
3 Credits (3)

Examines methods used for profitably managing capacity, including dynamic pricing and allocation of the rooms inventory across market segments to maximize revenues. Focuses on the integration of revenue management principles with information technology, management, marketing and sales concerns at the property and market level. Same as HRTM 4140 with additional work for graduate credit. Consent of Instructor required.

Learning Outcomes

1. Describe and discuss the role and function of revenue management in a hotel organization.
2. Evaluate pricing techniques and effects on demand.
3. Determine market segmentation for a hotel.
4. Demonstrate inventory management strategies.
5. Discuss legal and ethical aspects of revenue management.
6. Perform various analysis for a hotel as a function of revenue management.
7. Evaluate distribution channels for hotels.
8. Evaluate and recommend revenue management techniques.

HRTM 5145. Resort Management
3 Credits (3)

This course introduces students to the operation and management of full service resort properties, including the management of resort recreational amenities. Consent of instructor required. Must be in Graduate Student standing to enroll. Same as HRTM 4145 with additional work for graduate credit.

Learning Outcomes

1. Explain differences in operations and management between resorts and hotels.
2. Identify and explain concepts and terminology for various resort amenities and activities.
3. Evaluate resort amenities and activities for various market segments.
4. Identify and discuss trends in the resort industry.
5. Describe best practices in resort management.
6. Evaluate resort amenities, activities, markets and products.

HRTM 5210. The Hospitality Industry and Sustainable Competitive Strategy
3 Credits (3)

An examination of the hospitality industry, and its contemporary strategic management principles and practices. Key components, industry organization, and competitive environment of the hospitality industry are analyzed. Strategic decision making principles are examined to create sustainable competitive advantages for hospitality and service industry leaders and organizations.

Learning Outcomes

1. Analyze key components, industry organization, and competitive environment of the hospitality industry.
2. Examine strategic decision making principles to create sustainable competitive advantages for hospitality and service industry leaders and organizations.

HRTM 5220. Contemporary Global Issues in Hospitality
3 Credits (3)

Contemporary issues confronting the global hospitality industry.

Learning Outcomes

1. Discuss contemporary issues confronting the global hospitality industry.
2. Project how contemporary global issues will impact hospitality organizations.
3. Evaluate new developments in hotel and restaurant management.

HRTM 5230. Hotel, Restaurant and Tourism Industry Purchasing, Selection and Procurement
3 Credits (3)

Purchasing methods for the hotel, restaurant and tourism industries based on standards of quality, grade, care, and storage for food and nonfood supplies. Purchasing, installation, operation, and care of large foodservice equipment. Same as HRTM 4230 with additional work for graduate credit.

Learning Outcomes

1. Differentiate purchasing functions in different types of hotel, restaurant and tourism operations and determine how internal and external forces impact purchasing decisions.
2. Outline and describe the duties and responsibilities of hotel, restaurant and tourism purchasing managers.
3. Develop product recommendations for hotel, restaurant and tourism food and equipment through the use of various product evaluation methods.
4. Identify examples of unethical purchasing practices throughout history, research present a code of purchasing ethics for a hotel, restaurant or tourism company.
5. Analyze hotel, restaurant and tourism industry supplier selection criteria and recommend a supplier based on those criteria.
6. Apply mathematical models to calculate recipe costs as well as order quantities and times. Determine how to reduce AP prices.
7. Outline and describe each step of the flow of inventory and determine which controls are needed for security of inventory.
8. Explain product grades and explain grading procedures and procurement criteria for meats, poultry, eggs, dairy, produce, marine products, groceries, and nonfood items.

HRTM 5240. Sustainability in the Hospitality Industry
3 Credits (3)

This course provides a summary and definition of the concept and roots of sustainability and climate change as well as their impact and effect on the hospitality industry while providing the rationale for sustainable development for the industry. A review of environmentally sound management strategies for all operational management areas ranging from eco-design, energy, waste and water management, food security, sourcing of agricultural products leads to a detailed strategy for planning and evaluating the sustainability of a hospitality operation in terms of corporate responsibility and social entrepreneurship. The content is focused on a global perspective of sustainability in the industry. Same as HRTM 4240V with additional work for graduate credit.

Learning Outcomes

1. Recognize, interpret and summarize the global challenges facing the hospitality industry caused by climate change driving the need for sustainability in the industry.
2. Explain implementation strategies for responsible environmentally sound hospitality management practices for hotel, food and beverage and tourism businesses.
3. Evaluate sustainable development practices and the importance of personal and corporate social development.
4. Analyze, evaluate and communicate the sustainability practices of a hospitality operation.

HRTM 5310. Beverage Management
3 Credits (3)
Survey of all aspects of beverage management, including wine/beer/distilled spirits origins and trends, cost control, bar management, beverage purchasing, and wine appreciation. Same as HRTM 4310 with additional work for graduate credit. Consent of Instructor required.
Learning Outcomes
1. Identify beverage industry career opportunities and trends that impact hospitality beverage operations.
2. Discuss responsible alcohol service principles in compliance with legal and ethical standards.
3. Explain the basic components of bar and beverage operations' design, layout, and equipment.
4. Differentiate between the various beverage production processes and service standards.
5. Classify types of alcoholic and non-alcoholic beverages.
6. Develop beverage menus that align with food offerings, customer preferences, and business goals.
7. Describe the key principles of beverage inventory management and control.
8. Illustrate the role of beverage sales in operational profitability, including pricing strategies and marketing techniques.

HRTM 5330. Graduate Wine Appreciation
3 Credits (3)
An experiential examination of wine through lectures, guest speakers and focused tasting of wine and food. Topics include viticulture, wine making varietals, terroir, wine service, tasting and evaluation techniques, and food pairings.
Learning Outcomes
1. Discuss the historical and cultural significance of wine.
2. Compare and contrast the production processes for wines.
3. Describe and analyze the characteristics of popular wine varietals.
4. Describe how viticultural practices and geography/climate factors relate to the quality and variation in wines.
5. Perform evaluation and appraisal of wines based on quality, value, and intended use.
6. Apply knowledge of terminology related to labeling laws, practices, and geography of the major wine-growing regions of the world to the effective selection of both domestic and imported wines.
7. Pair wine with foods.
8. Examine the distribution and service systems for wine.
9. Critically research and evaluate current issues in wine production, marketing, and distribution.

HRTM 5402. AI Applications in Fiber and Food Systems
3 Credits (3)
Focusing on food and fiber systems, the course includes applications of AI to food processing, food safety, nutrition, and sustainability. Students in the course will explore demand forecasting, labor management, consumer behavior, and other economic and sociocultural aspects of food and fiber systems. The course will incorporate concepts of equitable access, job quality, transparency, data privacy and security, and responsible and ethical use of AI in fiber and food systems.
Learning Outcomes
1. Identify application areas in food and fiber systems for AI opportunities.
2. Evaluate AI tools for nutrition, food processing, food safety, supply chain management, and sustainability in food and fiber systems.
3. Assess the impact of AI tools on demand forecasting, labor management and consumer behavior in food and fiber systems.
4. Apply machine learning and AI methods to enhance decision-making across food and fiber value chains.
5. Develop and evaluate predictive and classification models using real-world data from food and fiber systems.
6. Discuss and apply ethical and responsible AI frameworks to food and fiber systems.

HRTM 5404. Emerging Topics in AI for Food and Agriculture
3 Credits (3)
Analyze emerging applications and uses of AI in food systems, agriculture, and the environment. Project impacts of emerging AI topics to agriculture, the environment, and food and fiber industries. Evaluate new developments in AI for application to food, fiber, agriculture, and the environment. Explore ethical dimensions of AI in agriculture.
Learning Outcomes
1. Analyze emerging applications and uses of AI in food systems, agriculture, and the environment.
2. Describe and discuss how emerging developments in AI can impact food, fiber, and agriculture businesses.
3. Describe and discuss impacts of emerging AI technologies to agriculture, the environment, and food and fiber industries.
4. Evaluate new developments in AI for application to food, fiber, agriculture, and the environment.

HRTM 5410. Hospitality Cost Control
3 Credits (3)
Familiarizes students with all aspects of cost control including financial data entry and hospitality accounting practices, financial report production, analysis and problem solving. Students will learn to understand the roles of the various stakeholders (owners, managers, employees and customers). Provides tools needed to communicate effectively about global financial issues affecting the hospitality business. Same as HRTM 4410 with additional work for graduate credit. Consent of Instructor required.
Learning Outcomes
1. Analyze relationships between hospitality business traffic, revenue, expense, and contribution margin as key variables associated with demand and profitability.
2. Explain professional purchasing, storage, and receiving techniques managers use to minimize spoilage and prevent product shortages.
3. Apply standardized recipes and effective menu planning techniques to efficiently manage food and beverage production systems.
4. Outline the steps managers take to control costs and achieve operational profit goals.
5. Categorize types of expenses accurately.
6. Calculate expenses by the cost per guest served and by the percentage of sales revenue.
7. Evaluate operational cost effectiveness through income (PL) statement analysis, including sales volume and all expense categories.
8. Prepare cost-volume-profit analysis(s) to evaluate the contribution of menu items to operational profits, including calculating break-even points.
9. Propose systems to prevent potential internal and external revenue theft threats. 1

10. Solve detailed virtual restaurant simulation exercises, including start-up and turnaround scenarios.

HRTM 5420. Hospitality Research Methods & Analysis
3 Credits (3)
Application of appropriate statistical procedures and research methodologies within the hospitality industry.
Learning Outcomes
1. Analyze hospitality operational data.
2. Develop the framework for researching hospitality operations and organizations.
3. Implement appropriate statistical procedures and research methodologies to hospitality operations.
4. Examine problems in hospitality, formulate and clarify research topics to address these problems.

HRTM 550. The World of Hospitality Higher Education
3 Credits (3)
Survey of the history, organization, and administration of hospitality higher education programs. Explores differences between types of degree programs – associate, bachelor, graduate and sources of funding – public, private, proprietary. Investigates the role of the faculty member in non-instructional activities, such as working with administrative and support departments, accreditation, service, community outreach, fundraising, and industry relations. Restricted to: HRTM Minor or Master of Science in Family and Consumer Sciences majors.
Learning Outcomes
1. Discuss the history of higher education and hospitality management programs.
2. Analyze how general higher education principles, laws, and finance apply to hospitality management programs.
3. Compare the characteristics, administration, and operations of programs based on type of degrees offered.
4. Compare the characteristics, administration, and operations of programs based on sources of funding.
5. Analyze the role of the faculty in hospitality education in collaborating with various educational departments and support services.
6. Analyze the role of the faculty in hospitality education in collaborating with external stakeholders.

HRTM 5510. The World of Hospitality Higher Education
3 Credits (3)
Survey of the history, organization, and administration of hospitality higher education programs. Explores differences between types of degree programs – associate, bachelor, graduate and sources of funding – public, private, proprietary. Investigates the role of the faculty member in non-instructional activities, such as working with administrative and support departments, accreditation, service, community outreach, fundraising, and industry relations. Restricted to: HRTM Minor or Master of Science in Family and Consumer Sciences majors.
Learning Outcomes
1. Discuss the history of higher education and hospitality management programs.
2. Analyze how general higher education principles, laws, and finance apply to hospitality management programs.
3. Compare the characteristics, administration, and operations of programs based on type of degrees offered.
4. Compare the characteristics, administration, and operations of programs based on sources of funding.
5. Analyze the role of the faculty in hospitality education in collaborating with various educational departments and support services.
6. Analyze the role of the faculty in hospitality education in collaborating with external stakeholders.

HRTM 598. Special Research Programs
1-4 Credits
Individual investigations, either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree.
Prerequisite: consent of instructor.

HRTM 5991. Special Research Programs
1-4 Credits (1-4)
Individual investigations, either analytical or experimental. Consent of instructor required. Maximum of 4 credits per semester and no more than 6 credits toward a degree.
Learning Outcomes
1. Explain and deliver a summary and definition for planning research in hospitality and tourism.
2. Demonstrate effective academic reading skills, articulate your research goal, define parameters and organization for your literature search, appropriately document and cite sources from your search.
3. Develop a topic statement and the framework for researching specific hospitality operations and organizations.
4. Design and implement appropriate statistical procedures and research methodologies to hospitality operations.
5. Evaluate problems in hospitality, formulate and clarify research topics to address these problems.

HRTM 5992. Applied Management Project
3 Credits (3)
Students will develop a project scope based on problems presented within the hospitality industry. Projects incorporate concepts and skills developed in previous coursework. Students will take this course in their last semester of the Master of Hospitality Degree.
Learning Outcomes
1. Develop a project scope based on problems presented within the hospitality industry.
2. Use collaborative problem solving to execute the project.
3. Define and identify a business research problem and explain its importance to study.
4. Identify sources and strategies for locating related literature.
5. Plan research regarding the business problem.
6. Write the professional paper.
7. Present the professional paper.

HRTM 5996. Special Topics
1-4 Credits (1-4)
Specific subjects and credits to be announced in the Schedule of Classes. Consent of instructor required. Maximum of 4 credits per semester and a total of 9 credits toward a degree. May be repeated up to 9 credits.
Learning Outcomes
1. Varies

HRTM 5998. Graduate Hospitality Internship
3 Credits (3)
Hospitality and tourism industry professional, structured and supervised work experience for HRTM graduate students only.

Learning Outcomes

1. Develop and apply interviewing and negotiating skills during the process of seeking and being hired into an internship.
2. Recall and explain the strengths and weaknesses of departments and work units from the hospitality operation in which they interned.
3. Describe and explain interactions with the hospitality operation's guests and the development of a positive service oriented attitude as well as be able to describe the service management delivery system.
4. Compare and contrast the management styles, leadership skills, and effectiveness of supervisors and managers. analyze which type of style or skill fits best with their style.
5. Analyze which styles and leadership skills best fit their personal management abilities.
6. Identify new and different experiences encountered during the internship, distinguish the positive and negative aspects of the experience, and appraise these experiences as to their value to their future hospitality management career.
7. Apply coursework related knowledge to demonstrate coursework related knowledge to the internship position.
8. Synthesize the total internship learning experience by completing a comprehensive management report.

HRTM 5999. Master's Thesis
1-6 Credits (1-6)
Thesis. Consent of instructor required. May be repeated up to 6 credits.
Learning Outcomes

1. Varies

HVAC-HEATING/AC/REFRIGERATION

HVAC 1105. Introduction to Fundamentals of Refrigeration
4 Credits (3+2P)
Demonstrate the ability to perform HVAC/R Technician duties in a safe manner. Accurately perform HVAC/R related calculations and interpret results for the purpose of diagnosis, repair, or installation of HVAC/R equipment and systems. Professionally communicate in oral and written forms. Demonstrate the use of current industry techniques including tools, testing equipment, manufacturers' apps. Determine the appropriate ethical action that should occur in a given circumstance. Work effectively in a team-based environment. Possess a mastery of the refrigeration cycle and its components.
Learning Outcomes

1. Demonstrate working knowledge of heat theory, safety, and temperature/pressure/volume gas laws as they relate to the refrigeration cycle.
2. Identify and demonstrate heat transfer by conduction, convection, and radiation and describe their effects on temperature change using latent and sensible heat transfer.
3. Safely demonstrate the refrigeration process using system components such as compressors, condensers, evaporators, metering (expansion) devices and accessories.
4. Demonstrate a knowledge of industry standards for system installation of equipment and tubing and safely demonstrate tubing operations including cutting, reaming, flaring, swaging, and brazing.

HVAC 1110. Introduction to Fundamentals of Electricity
4 Credits (3+2P)
Introduces the student to electrical theory, generation and distribution, OHM's Law, series and parallel circuits, A/C / D/C, practical applications and electrical safety.
Learning Outcomes

1. Demonstrate the use of industry practices: safety, use of lockout/tagout, diagnosing , repairing, and installing electrical components in HVAC/R equipment and systems; use of test instruments both digital and analog, comprehension of wiring diagrams, proper use of tools specific to the industry, mastery of electrical theory and circuits, single-phase and three-phase applications; use of symbols and terminology, and the ability to communicate professionally in oral and written forms.

HVAC 1111. EPA Clean Air Act: Section 608
1 Credit (1)
Refrigerant certification preparation to include basics of refrigerant bearing equipment, ozone depletion and the new legislation, technician categories covered and the certification examination.
Learning Outcomes

1. Use oral communication effectively, use written communication effectively.
2. Accurately perform calculations related to refrigeration.
3. Accurately perform calculations related to refrigeration.
4. Accurately perform calculations related to air conditioning.
5. Accurately perform conversions between various units.

HVAC 1125. Electrical and Mechanical Controls I
4 Credits (3+2P)
Applications of basic electrical and mechanical controls. Reading and drawing diagrams of simple refrigerating equipment. Safe use of testing equipment.
Prerequisite: HVAC 1105 and HVAC 1110, or consent of instructor.
Learning Outcomes

1. Use oral communication and written communication effectively.
2. Determine the appropriate ethical action that should occur in a given circumstance.
3. Perform technician duties safely.
4. Service refrigeration systems, repair refrigeration systems, maintain refrigeration systems.
5. Accurately perform calculations related to refrigeration.
6. Work effectively as a team.
7. Troubleshoot refrigeration systems.
8. Accurately perform conversions between various units.

HVAC 1233. Professional Development and Leadership
1 Credit (1)
As members and/or officers of various student professional organizations, students gain experience in leadership, team building, and community service. Students competing in Skills USA are required to register for the course. May be repeated up to 6 credits.
Learning Outcomes

1. Professionally communicate in oral and written forms.
2. Work effectively in a team-based environment.
3. Demonstrate the ability to perform HVAC/R Technician duties in a safe manner.

HVAC 1238. Introduction to Sheet Metal Fabrication
4 Credits (3+2P)
Introduction to sheet metal fabrication to include hands-on practical laboratory applications, cutting and forming procedures, identifying types and gauges. Design and layout techniques.
Prerequisite: OETS 118 or equivalent math or consent of instructor.

Learning Outcomes

1. Professionally communicate in oral and written forms.
2. Demonstrate the ability to perform HVAC/R Technician duties in a safe manner.
3. Demonstrate sheet metal design and layout techniques to fabricate ducting and associated fittings accurately.
4. Determine the appropriate ethical action that should occur in a given circumstance.
5. Accurately perform HVAC/R related calculations and interpret results for the purpose of diagnosis, repair, or installation of HVAC/R equipment and systems.

HVAC 1243. Residential Air Conditioning Systems
4 Credits (3+2P)
Applications and types of equipment used in comfort cooling. Preventive maintenance, service, and repairs common to evaporative coolers and refrigerated air conditioning systems. Air properties and psychometrics. May be repeated up to 4 credits.
Prerequisite: C- or better in HVAC 1105 and HVAC 1110.
Learning Outcomes

1. Use oral and written communication effectively.
2. Work effectively as a team.
3. Determine the appropriate ethical action that should occur in a given circumstance.
4. Troubleshoot heating systems accurately perform conversions between various units, accurately perform calculations related to heating systems.

HVAC 1245. Gas Heating Furnaces
4 Credits (3+2P)
The study and application of gas furnaces including installation, operation, service, maintenance and controls. The students will learn about natural gas, and electric heating systems used for residential and/or light commercial heating systems including furnace and boiler package systems and alternative heating sources. Highlights electrical and electronic trouble shooting, service, maintenance, repair and replacement of residential and light commercial heating systems. The course will include service, maintenance and troubleshooting.
Prerequisite: C- or better in HVAC 1105 and HVAC 1110.
Learning Outcomes

1. Identify the components and describe the sequence of operation of gas furnaces.
2. Use proper procedures to troubleshoot gas furnaces.
3. Describe and demonstrate proper procedures for conducting service calls and delivering customer service.
4. Demonstrate the use of proper procedures for preventative maintenance of gas furnaces.
5. Describe how gas pressure is measured, what unit of measurement is used and what is the purpose of a water manometer, gas combustion, four means of proof flame, why there is a fan-on and fan-off delay, flue gas venting systems, gas piping adjacent to the gas valve, calculate the correct orifice size, derate sea level input for altitude, calculate the correct gas pipe sizing for a one-story building with several gas appliances.

HVAC 1250. Heat Pump Systems
4 Credits (3+2P)
The student will acquire the knowledge to identify heat pump components, explain the sequence of operation, and develop troubleshooting skills for both mechanical and electrical issues associated with reverse cycle refrigeration systems used in comfort heating and cooling, a while utilizing the proper tools and equipment.
Prerequisite: C- or better in HVAC 1105 and HVAC 1110.
Learning Outcomes

1. Professionally communicate in oral and written forms.
2. Work effectively in a team-based environment.
3. Accurately perform HVAC/R related calculations and interpret results for the purpose of diagnosis, repair, or installation of HVAC/R equipment and systems.
4. Demonstrate the use of current industry techniques and equipment to diagnose HVAC/R systems and perform appropriate repairs.
5. Demonstrate the use of current industry techniques and equipment to perform the service and maintenance of HVAC/R equipment and systems.
6. Demonstrate the use of current industry techniques and equipment in the installation of HVAC/R equipment and systems.
7. Determine the appropriate ethical action that should occur in each circumstance.

HVAC 1410. Commercial Refrigeration Systems
4 Credits (3+2P)
This course covers the installation, service, and maintenance of a wide range of refrigeration equipment, including reach-in and walk-in coolers, ice machines, ice cream machines, as well as mechanical and electrical troubleshooting of refrigeration systems. Encompassing the service and maintenance of commercial refrigeration equipment, which involves procedures for evacuation and charging, understanding electrical diagrams, and handling compressors and related accessories.
Prerequisite: Grade of C- or better in HVAC 1105 and HVAC 1110.
Learning Outcomes

1. Read and interpret model numbers, nomenclature, and component capacities.
2. Use industry techniques and equipment for diagnosing and repairing HVAC/R systems.
3. Perform service and maintenance on HVAC/R equipment and systems.
4. Determine ethical actions in given circumstances.
5. Demonstrate safe HVAC/R Technician duties.
6. Work effectively in a team-based environment.
7. Accurately perform HVAC/R calculations and interpret results.
8. Communicate professionally, both orally and in writing.
9. Perform leak checks, repairs, recovery, evacuation, and recharging of refrigeration systems. 1
10. Identify components and troubleshoot parallel refrigeration systems. 1
11. Start up, troubleshoot, and explain Lab Systems.1
12. Address various refrigeration accessories. 1
13. Assemble, pipe, pressure test, and operate systems. 1
14. Troubleshoot refrigeration defrost timer systems. 1
15. Calculate heat gain and specify refrigeration systems. 1
16. Understand the use of water and brines as secondary refrigerants. 1
17. Diagnose and repair refrigerant side problems. 1
18. Set controls for temperature regulation. 1
19. Locate information in reference sources. 2
20. Evaluate system performance using data. 2
21. Size and assemble refrigeration systems to meet customer needs. 2
22. Handle refrigerant, including recovery, recycling, and reclamation. 2

23. Identify and troubleshoot various safety controls. 2
24. Troubleshoot line voltage thermostats and compressor contactors. 2
25. Diagnose and repair air side problems. 2
26. Troubleshoot electrical problems using schematics. 2
27. Use pressure/enthalpy charts and understand the refrigeration cycle.

HVAC 2098. Heating, Ventilating, Air Conditioning, and Refrigeration Field Experience
1 Credit (1)
The course will provide students with actual hands-on exposure to HVAC/R fieldwork, offering insights into the expectations of field technicians as they shadow experienced HVAC/R professionals. Students will gain practical experience through supervised training at an approved Heating, Ventilation, Air Conditioning, and Refrigeration workplace.
Learning Outcomes
1. Effectively utilize verbal and written communication, collaborate efficiently within a team, diagnose issues in refrigeration systems, precisely execute unit conversions, accurately conduct refrigeration-related calculations, identify the ethical course of action in specific situations, safely execute technician responsibilities, provide maintenance for refrigeration systems, conduct repairs on refrigeration systems, and service refrigeration systems.

HVAC 2210. Commercial Air Conditioning and Heating Systems
4 Credits (3+3P)
Covers troubleshooting mechanical and electrical problems associated with HVAC equipment in commercial buildings. Includes gas, electric, and heat pump systems.
Prerequisite: Grade of C- or better in HVAC 1105 & HVAC 1110.
Learning Outcomes
1. Professionally communicate in oral and written forms.
2. Determine the appropriate ethical action that should occur in a given circumstance.
3. Demonstrate the ability to perform HVAC/R Technician duties in a safe manner.
4. Demonstrate the use of current industry techniques and equipment in the installation of HVAC/R equipment and systems.
5. Demonstrate the use of current industry techniques and equipment to perform the service and maintenance of HVAC/R equipment and systems.
6. Accurately perform HVAC/R related calculations and interpret results for the purpose of diagnosis, repair, or installation of HVAC/R equipment and systems.
7. Demonstrate the use of current industry techniques and equipment to diagnose HVAC/R systems and perform appropriate repairs.
8. Work effectively in a team-based environment.

HVAC 2990. Practicum
3 Credits (3)
Working in the field with journeymen service technicians. Develop and apply job skills.
Prerequisite: HVAC 2098.
Learning Outcomes
1. Varies.

HVAC 2996. Special Topics
1-6 Credits
Topics to be announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes
1. Varies.

I B-INTERNATIONAL BUSINESS

I B 317. International Marketing
3 Credits (3)
Focuses on decisions relating to entering markets, market segmentation, marketing strategies, and tactics in the international arena. Same as MKTG 317.
Learning Outcomes
1. Develop understanding about what is involved in making international marketing decisions, including product, price, promotion, and place decisions to create a marketing mix.
2. Acquire an overview on the contemporary issues in global marketing and the unique challenges faced by marketing managers in the dynamic global environment.
3. Develop insights into how differences in global economic, cultural, social, political, and legal environments can affect marketing decisions.
4. Develop strategic thinking in the context of complex problems and challenges faced by the contemporary global executives and managers.
5. Develop ability to integrate the important global societal dimensions of diversity, environmental concerns, ethics, and technological change into their thinking.
6. Develop knowledge and skills to analyze cross-cultural variables and their impact on international marketing.
7. Discover sources of information for researching and evaluating international markets.
8. Communicate effectively about marketing issues in group discussions, oral presentations and written reports.
9. Work effectively as a team member in analyzing marketing issues. 1
10. Develop leadership skills necessary to deal with the uncertainty and changes faced by today's global marketers.

I B 351. International Business
3 Credits (3)
The various aspects of international business, and identification and analysis of problems encountered by multinational companies.
Prerequisite: Junior standing or consent of instructor.
Learning Outcomes
1. To understand the operations of international business including international trade, finance, marketing, corporate management, political relations, business culture and ethics, and other business topics.

I B 398. International Business and Economic Environments
3 Credits (3)
Description and analysis of various world regions, e.g., Pacific Rim, Eastern Europe, South Asia. Region will vary from semester to semester.

I B 449. Open Economy Macroeconomics
3 Credits (3)
This course studies theoretical and empirical macroeconomics in international dimension. It covers from the fundamental concepts of national income and growth, monetary/fiscal and exchange rate policies, foreign exchange markets, international trade and finance, and regionalization/economic integration to the impact analysis of these macroeconomic fundamentals in the open economy. Crosslisted with: ECON 449.

Prerequisite(s): BFIN 341 OR ECON 311.

I B 450. International Economics
3 Credits (3)
Trade and capital flows between countries, international payments, government policy in balance-of-payments and tariff matters, international organizations. Crosslisted with: ECON 450G
Prerequisite(s): ECON 2110G or ECON 2110H and ECON 2120G or ECON 2120H.

I B 475. International Finance
3 Credits (3)
International aspects of financial transactions, decision-making, banking and financial markets. Crosslisted with: BFIN 475 and BFIN 575.
Prerequisite(s): BFIN 341.

I B 489. Senior Seminar in International Business
3 Credits (3)
Capstone class for I B majors. Integration of previous classwork via the examination of case studies and completion of a major project.
Prerequisite: I B core.

I E-INDUSTRIAL ENGINEERING

I E 151. Computational Methods in Industrial Engineering
3 Credits (3)
History, social implications, and application of computers and an introduction to computer programming, word processing, and database management systems. Satisfies General Education computer science requirement. May be repeated up to 3 credits.
Prerequisite: MATH 1220G.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

I E 200. Special Problems-Sophomore
1-3 Credits
Directed individual projects. May be repeated up to 3 credits.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.

I E 217. Manufacturing Processes
3 Credits (2+3P)
Introduction to manufacturing and processing, including: casting, forming, and machining. Emphasis on creating products with the appropriate techniques. Crosslisted with: E T 217.
Prerequisite(s): A grade of C- or better in either E T 110 or ENGR 110 and C- or better in MATH 1220G.
Learning Outcomes
1. Identify the different manufacturing processes and their applications.
2. Use, set up, and calibrate measuring tools.
3. Apply geometric tolerances to engineering drawings.
4. Demonstrate basic knowledge of materials and material properties.
5. Demonstrate basic knowledge of GM codes and their application.
6. Proficiently use CAM packages such as SolidWorks CAM.
7. Identify different tooling, their use, and manufacturing application.

I E 300. Special Problems-Junior
1-3 Credits
Directed individual projects. May be repeated up to 3 credits.
Prerequisite: consent of faculty member.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.

I E 311. Engineering Data Analysis
3 Credits (3)
Methodology and techniques associated with identifying and analyzing industrial data.
Prerequisite: C- or better in MATH 1521G or MATH 1521H or ENGR 190.
Learning Outcomes
1. Ability to correctly interpret statistical reports
2. Ability to correctly identify and solve problems involving continuous and discrete probability and random variables.
3. Ability to correctly analyze random samples using methods that include: point estimates, confidence intervals, tests of hypothesis, analysis of variance (ANOVA), and linear regression.

I E 316. Methods Engineering
3 Credits (2+3P)
Methods analysis and design. Work measurement techniques. Job evaluation and wage incentive methods. May be repeated up to 3 credits.
Corequisite: I E 311.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
5. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

I E 351. Applied Problem Solving in Industrial Engineering
3 Credits (3)
Application of computational techniques to engineering problems including the use of commercial programs in statistics and applied mathematics. Restricted to majors.
Corequisite: I E 311.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

I E 365. Quality Control
3 Credits (3)
Statistical analysis of quality in manufacturing. Acceptance sampling and control charts.
Prerequisite: I E 311 or equivalent.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.

I E 375. Manufacturing Processes II
3 Credits (3)
Review of basic manufacturing processes. Advanced topics in casting, forming, machining and joining; major process parameters; economics of processes.
Prerequisite: I E 217 or E T 217.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
4. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

I E 400. Undergraduate Research
1-3 Credits
Directed individual projects. May be repeated up to 6 credits.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.

I E 411. Occupational Safety
3 Credits (3)
Practical methods to improve safety in the workplace. Topics include OSHA and other regulations, hazard recognition, assessment and control, industry standards, risk assessment and safety management. Material is applicable to a variety of workplace settings. This course is intended for College of Engineering students who have completed their lower-division requirements in mathematics, engineering, technology, and basic science. Same as I E 561 with differential assignments. May be repeated up to 3 credits.
Prerequisite: Junior standing.
Learning Outcomes
1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

I E 412. Design for Manufacturing and Assembly
3 Credits (3)
Engineering methodology focusing on reducing time-to-market and total production costs by prioritizing both the ease of manufacture for the product's parts and the simplified assembly of those parts into the final product.
Prerequisite: (ENGR 217 or I E 217) and I E 316.
Learning Outcomes
1. The ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. The ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. The ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
4. The ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

I E 413. Engineering Operations Research I
3 Credits (3)
Deterministic operations research modeling including linear and integer programming.
Prerequisite: MATH 1521G or MATH 1521H or ENGR 190.
Corequisite: MATH 480 or MATH 2415.
Learning Outcomes
1. Ability to model optimization problems that can be solved by linear optimization.
2. Ability to solve linear optimization problems
3. Ability to interpret solutions of linear optimization problems in the context of the larger problem.

I E 423. Engineering Operations Research II
3 Credits (3)
Probabilistic operations research modeling, including queuing systems and their optimization; Markov chains.
Prerequisite: I E 311.
Corequisite: MATH 392.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 424. Manufacturing Systems
3 Credits (3)

Organization and functions of manufacturing planning and control systems including forecasting, MRP, capacity planning, JIT systems, scheduling, and inventory control.
Prerequisite: I E 311.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

I E 425. Supply Chain Modeling and Analysis
3 Credits (3)
This course introduces supply chain and logistics concepts integrating theory and its application. The course emphasis is on understanding the role of supply chains for competitive advantage, when and how these concepts are applied to improve the distribution of goods and services, as well as in using mathematical programming and optimization methods for their adequate implementation.
Prerequisite: MATH 1521G or MATH 1521H or ENGR 190.
Corequisite: MATH 2415.
Learning Outcomes
1. Define and understand different structures and the importance of the supply chain.
2. Identify the main drivers of supply chain performance and measure them using precise metrics.
3. Integrate production operations management topics in the context of the supply chain.
4. Develop the ability to formulate quantitative decision models for supply chain and logistics management.
5. Study inventory planning decisions, Economic Order Quantity (EOQ), and its variants.

I E 451. Engineering Economy
3 Credits (3)
Discounted cash flows, economics of project, contract and specifications as related to engineering design.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 456. Large Scale Systems Engineering
3 Credits (3)
Systems engineering approaches to large-scale complex technological and societal problems. Concepts of interaction and structural graphs, matrices, delta, and Gantt charts. The hall matrix approach, structural concepts, reachability matrices, and cross impact-analysis, modeling and decision making. May be repeated up to 3 credits.
Learning Outcomes
1. Ability to describe the systems engineering standards and best practices
2. Ability to characterize the limitations of the way that current systems engineering is practiced in terms of dealing with lifecycle uncertainty.

I E 459. Systems Thinking and Decision Making
3 Credits (3)
A general introduction to systems engineering. Topics include General Systems Theory, Systems Thinking and emerging concepts, Systems Dynamics approaches for modelling and analyzing non-linear feedback mechanisms in complex systems, and Complexity science and complex adaptive systems. May be repeated up to 3 credits.
Learning Outcomes
1. Ability to understand the complexities of engineering systems, and the implications of change on system behavior
2. Ability to understand the nature of complex systems in respect to people, processes, the environment and development organization
3. Ability to understand Systems Thinking's' role and value within organizations
4. Ability to recognize the advantages, as well as the flaws of our present predominant way of thinking (Cartesian), while looking at the changes that would enable us to deal with complex issues in daily practice (Systems Thinking)
5. Ability to recognize the value and limitations of modeling and simulation as well as how to construct and interpret various models to support decision making.

I E 460. Evaluation of Engineering Data
3 Credits (3)
Analysis of engineering systems possessing variability, employing regression, analysis of variance, distribution theory, and experimental design methods.
Prerequisite: I E 311 or equivalent.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

I E 466. Reliability
3 Credits (3)
Application of statistical theory to engineering reliability estimation, reliability improvement, and the analysis of reliability test data.
Prerequisite: I E 311 or equivalent.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.

3. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

I E 467. Discrete-Event Simulation Modeling
3 Credits (3)
Basic modeling concepts, organizations of simulations, input data analysis, random variate generation, simulation design and analysis, model validation, output analysis, and management of simulations. Differentiated graduate assignments.
Prerequisite: I E 311 or equivalent.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
4. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
5. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

I E 468. Advanced Discrete-Event Simulation Applications
3 Credits (3)
Semester long project involving development and application of advanced simulation skills. May be repeated up to 3 credits.
Prerequisite: I E 467.
Learning Outcomes
1. Ability to understand the techniques of computer simulation modeling in the context of hierarchy of knowledge about a system and develop the capability to apply the same to study systems through available computer simulation software

I E 478. Facilities Planning and Design
3 Credits (3)
Plant location methods, total process analysis, process integration, materials handling analysis, and traditional and computerized plant layout methodologies.
Prerequisite: I E 316.
Prerequisite/Corequisite: I E 424.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.

I E 490. Selected Topics
1-3 Credits
This course offers an in-depth exploration of specific topics within a given field or discipline. The content may vary each time the course is offered, allowing for flexibility in addressing emerging trends, current issues, or specialized areas of study. May be repeated up to 9 credits.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 505. Directed Readings
1-3 Credits
The Directed Readings course provides students with the opportunity to pursue an in-depth exploration of a specific topic or area of interest under the guidance of a faculty mentor. Through independent study and directed readings, students will delve into scholarly literature, research articles, and relevant texts to deepen their understanding of the chosen subject matter. The course allows for a flexible learning experience tailored to the student's academic goals and interests. Students will work closely with their mentor to develop a reading list, set learning objectives, and engage in discussions to enhance their comprehension and critical analysis skills. May be repeated up to 6 credits.
Learning Outcomes
1. An ability to demonstrate a comprehensive understanding of the chosen topic or area of interest through in-depth reading and analysis of relevant literature.
2. An ability to develop critical thinking skills by evaluating and synthesizing information from scholarly sources, research articles, and other relevant texts.
3. An ability to effectively communicate their insights, findings, and reflections on the chosen topic through written assignments, discussions, and presentations.
4. An ability to acquire research skills, including the ability to locate, evaluate, and integrate scholarly sources into their analysis and writing.

I E 511. Survey of Industrial Engineering
3 Credits (3)
A project-based course covering methods of engineering, plant layout, production and inventory control, economic analysis, etc. May be repeated up to 3 credits.
Learning Outcomes
1. Ability to apply the various techniques of Industrial Engineering to solve real-life problems

I E 515. Stochastic Processes Modeling
3 Credits (3)
Introduction to the use of stochastic processes in the modeling of physical and natural systems. Use of generating functions, conditional probability and expectation, Poisson processes, random walk models, Markov chains, branching processes, Markov processes, and queuing processes in an applied setting.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.

3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 522. Queuing Systems
3 Credits (3)
Elements and classification of queuing systems, single server models, multi-server models, cost analysis and applications.
Learning Outcomes
1. Ability to model, analyze, and apply solutions to problems involving queueing systems
2. Ability to read and understand literature in the queueing system analysis field.

I E 523. Advanced Engineering Economy
3 Credits (3)
Theoretical basis for engineering economy methods, problems of cost estimation, replacement, nonmonetary factors, and feasibility studies. Same as C E 523.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 524. Advanced Production and Inventory Control
3 Credits (3)
Organization and functions of manufacturing planning and control systems including forecasting, MRP, capacity planning, JIT systems, scheduling and inventory control. Same as I E 424 with differentiated assignments.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

I E 525. Systems Synthesis and Design
3 Credits (3)
Examination of the production management complex in terms of its components and the synthesis of these components into an effective operating unit. Development of input-output models representing the basis structure of all production activities.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 530. Environmental Management Seminar
1 Credit (1)
Survey of practical and new developments in hazardous and radioactive waste management provided through a series of guest lectures and reports of ongoing research. Same as C E 530, E E 530, CHME 530.
Learning Outcomes
1. An ability to demonstrate a comprehensive understanding of key concepts, principles, and theories related to environmental management, including environmental policy, sustainability, resource conservation, and pollution control.
2. An ability to develop critical thinking and analytical skills by evaluating environmental issues, assessing their impact on ecosystems and human populations, and proposing evidence-based solutions to address complex environmental challenges.
3. An ability to gain an interdisciplinary perspective by exploring environmental management topics from multiple viewpoints, integrating knowledge from fields such as ecology, economics, sociology, and public policy.
4. An ability to develop an awareness of ethical considerations and values relevant to environmental management, including principles of environmental justice, equity, and responsibility towards future generations.

I E 533. Linear Programming
3 Credits (3)
Linear programming problem formulation, simplex algorithm, theory of linear programming, duality, revised simplex algorithm, and sensitivity analysis.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 534. Nonlinear Programming
3 Credits (3)

Theoretical and computational methods to solve optimization problems in engineering, statistics, economics, and operations research. Topics include convexity, optimality conditions, Newton's method, Lagrange multipliers, search algorithms for unconstrained and constrained problems, as well as barrier and penalty methods.

Learning Outcomes

1. Ability to model situations which may be solved by nonlinear optimization and to interpret the results in the context of the larger problem
2. Ability to employ several computer tools to correctly solve nonlinear optimization problems.
3. Ability to read and understand literature in the field of nonlinear optimization
4. Ability to select appropriate methods and algorithms from a core representative set of methods and tools to solve nonlinear optimization problems

I E 535. Discrete Optimization
3 Credits (3)

Combinatorial Optimization problems using both integer programming and graph theoretic approaches. Emphasis on modeling and computational algorithms. May be repeated up to 3 credits.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 537. Large Scale Systems Engineering
3 Credits (3)

Systems engineering approaches to large-scale complex technological and societal problems. Concepts of interaction and structural graphs, matrices, delta, and Gantt charts. The hall matrix approach, structural concepts, reachability matrices, and cross impact-analysis, modeling and decision making.

Learning Outcomes

1. Ability to describe the systems engineering standards and best practices.
2. Ability to characterize the limitations of the way that current systems engineering is practiced in terms of dealing with lifecycle uncertainty.

I E 545. Characterizing Time-Dependent Engineering Data
3 Credits (3)

Theory and techniques employed in the characterization of stochastic processes commonly found in engineering applications. Distribution models include exponential, gamma, Weibull, and extreme value. Design and analysis of experiments involving complete and censored data and elevated stress. Analytical techniques include parametric, nonparametric, and graphical approaches with emphasis on modern computer tools. Exact and approximate maximum-likelihood techniques are stressed.

Learning Outcomes

1. Ability to characterize a process, based on data that is time-dependent or sequential in nature.

I E 561. Advanced Safety Engineering
3 Credits (3)

Regulation as well as qualitative, and quantitative methods to achieve and maintain safety in the workplace. Includes liability, worker's compensation, OSHA, hazard control, safety assessment, cost justification, and system analysis.

Learning Outcomes

1. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.

I E 563. Topics in Engineering Administration
3 Credits (3)

Study of qualitative and quantitative aspects. Consideration given to philosophical, psychological, political and social implications of engineering administrative decisions.

Learning Outcomes

1. An ability to demonstrate a comprehensive understanding of key principles, theories, and practices related to engineering administration, including organizational management, leadership, strategic planning, and decision-making processes.
2. An ability to apply management techniques and tools to analyze and solve complex administrative problems commonly encountered in engineering organizations, such as resource allocation, project management, and risk assessment.
3. An ability to develop effective communication skills, including written, oral, and interpersonal communication, to convey technical information, lead teams, and interact with stakeholders in engineering settings.
4. An ability to enhance critical thinking and problem-solving abilities by evaluating case studies, identifying challenges, and proposing innovative solutions to address administrative issues in engineering contexts.
5. An ability to demonstrate an understanding of ethical and professional responsibilities in engineering administration, including considerations of integrity, fairness, and accountability in decision-making and leadership roles.
6. An ability to develop strategic leadership abilities by analyzing case studies, formulating organizational strategies, and articulating visions for future growth and innovation within engineering organizations.

I E 567. Design and Implementation of Discrete-Event Simulation
3 Credits (3)

Basic modeling concepts, organizations of simulations, input data analysis, random variate generation, simulation design and analysis, model validation, output analysis, and management of simulations. Taught with I E 467 with differentiated assignments for graduate students.

Learning Outcomes

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.

3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
4. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
5. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

I E 571. Advanced Quality Control
3 Credits (3)
Advanced topics in quality control and design of experiments for improvement of quality.
Prerequisite: I E 311 or equivalent.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.

I E 575. Advanced Manufacturing Processes
3 Credits (3)
Covers major process parameters in casting, forming, machining, and joining. Process economics and selection of processes design and interactions.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
4. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

I E 590. Selected Topics
1-3 Credits
This course offers an in-depth exploration of specific topics within a given field or discipline. The content may vary each time the course is offered, allowing for flexibility in addressing emerging trends, current issues, or specialized areas of study. May be repeated up to 9 credits.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 598. Special Research Programs
1-3 Credits (1-3)
Individual analytical or experimental investigations. May be repeated up to 6 credits.
Learning Outcomes
1. An ability to demonstrate the ability to develop a well-defined research question, formulate hypotheses or objectives, and design a research plan or methodology appropriate to address the research question or problem.
2. An ability to conduct a comprehensive literature review related to their research topic, critically evaluating existing scholarship, identifying gaps in the literature, and synthesizing relevant theoretical frameworks or conceptual models.
3. An ability to collect, analyze, and interpret data using appropriate qualitative or quantitative research methods, techniques, and tools, demonstrating proficiency in data management, statistical analysis, and data visualization.
4. An ability to apply critical thinking skills to evaluate research findings, draw conclusions, and generate insights that contribute to knowledge advancement or address practical problems in their field of study.
5. An ability to effectively communicate their research findings, methodologies, and interpretations to both specialized and non-specialized audiences through written reports, oral presentations, and visual aids, demonstrating clarity, coherence, and persuasiveness.
6. An ability to demonstrate an understanding of ethical principles and guidelines governing research conduct, including issues related to research integrity, confidentiality, informed consent, and the responsible conduct of research.
7. An ability to manage their research projects effectively, including setting timelines, allocating resources, and adapting to unforeseen challenges or setbacks, demonstrating skills in organization, time management, and project coordination.

I E 599. Master's Thesis
1-15 Credits
Thesis. May be repeated up to 88 credits.
Learning Outcomes
1. An ability to demonstrate the ability to develop a well-defined research question, formulate hypotheses or objectives, and design a research plan or methodology appropriate to address the research question or problem.
2. An ability to conduct a comprehensive literature review related to their research topic, identifying gaps in the literature, and synthesizing relevant theoretical frameworks or conceptual models.
3. An ability to collect, analyze, and interpret data using appropriate qualitative or quantitative research methods, techniques, and tools, demonstrating proficiency in data management, statistical analysis, and data visualization.
4. An ability to apply critical thinking skills to evaluate research findings, draw conclusions, and generate insights that contribute to knowledge advancement or address practical problems in their field of study.
5. An ability to effectively communicate their research findings, methodologies, and interpretations to both specialized and non-specialized audiences through written reports, oral presentations, and visual aids, demonstrating clarity, coherence, and persuasiveness.

6. An ability to demonstrate an understanding of ethical principles and guidelines governing research conduct, including issues related to research integrity, confidentiality, informed consent, and the responsible conduct of research.
7. An ability to manage their research projects effectively, including setting timelines, allocating resources, and adapting to unforeseen challenges or setbacks, demonstrating skills in organization, time management, and project coordination.

I E 610. Topics in Operations Research
3 Credits (3)
Selected topics of current interest, to be designated by subtitle. May be repeated up to 6 credits.
Learning Outcomes
1. An ability to demonstrate a deep understanding of advanced topics in operations research, including but not limited to optimization theory, stochastic processes, queuing theory, decision analysis, and simulation modeling.
2. An ability to apply mathematical modeling techniques to formulate and solve complex optimization problems arising in real-world contexts, such as production planning, logistics, supply chain management, transportation, and resource allocation.
3. An ability to analyze and interpret optimization solutions generated by mathematical models, identifying optimal solutions, sensitivity analysis, trade-offs, and implications for decision-making under uncertainty or constraints.
4. An ability to develop algorithmic problem-solving skills by implementing and applying optimization algorithms, heuristic methods, and computational techniques to solve large-scale optimization problems efficiently and effectively.
5. An ability to demonstrate proficiency in using operations research software tools and programming languages commonly used in the field, such as linear programming solvers, simulation software, mathematical modeling languages (e.g., Xpress, CPLEX, AMPL, GAMS), and general-purpose programming languages (e.g., Python, MATLAB).
6. An ability to critically evaluate the application of operations research techniques in various industries and domains, assessing the strengths, limitations, and practical considerations of OR models and methodologies in addressing complex decision problems.
7. An ability to effectively communicate the results of their operations research analyses and findings to diverse stakeholders, including technical and non-technical audiences, through written reports, presentations, and visualizations.

I E 620. Topics in Computer Modeling
3 Credits (3)
Selected topics of current interest, to be designated by subtitle. May be repeated up to 6 credits.
Learning Outcomes
1. An ability to demonstrate an understanding of fundamental principles and techniques used in computer modeling, including conceptual modeling, mathematical modeling, simulation, and computational algorithms.
2. An ability to apply computer modeling tools and software packages to develop, implement, and validate models for solving real-world problems across various domains, such as engineering, science, economics, and social systems.
3. An ability to develop, analyze, and interpret computer models to simulate complex systems, processes, or phenomena, identifying relevant input parameters, defining system boundaries, and evaluating model outputs to draw meaningful conclusions.
4. An ability to acquire proficiency in programming languages and scripting tools commonly used for computer modeling, such as Python, MATLAB, R, or specialized simulation software, enabling them to implement and customize models to address specific requirements.
5. An ability to employ verification and validation techniques to assess the accuracy, reliability, and credibility of computer models, including sensitivity analysis, calibration, uncertainty quantification, and comparison with empirical data or experimental results.
6. An ability to integrate optimization techniques and decision support tools into computer models to optimize system performance, resource allocation, scheduling, or decision-making processes, considering constraints, objectives, and stakeholder preferences.
7. An ability to utilize visualization techniques and graphical representation methods to visualize model outputs, communicate results effectively, and facilitate stakeholders' understanding and interpretation of complex modeling scenarios.
8. An ability to apply critical thinking and problem-solving skills to analyze real-world problems, formulate hypotheses, design experiments, and iteratively refine models based on feedback and empirical observations.

I E 630. Topics in Engineering Management
3 Credits (3)
Selected topics of current interest, to be designated by subtitle. May be repeated up to 6 credits.
Learning Outcomes
1. An ability to demonstrate an understanding of fundamental concepts, theories, and principles in engineering management, including organizational behavior, project management, strategic planning, leadership, and decision-making processes.
2. An ability to apply engineering management techniques and tools to analyze, plan, and optimize engineering projects, processes, and systems, considering factors such as cost, quality, time, risk, and stakeholder requirements.
3. An ability to develop skills in strategic planning and decision-making, identifying organizational goals, formulating strategies, evaluating alternatives, and making informed decisions to achieve desired outcomes in engineering contexts.
4. An ability to acquire proficiency in project management methodologies, tools, and techniques, including project planning, scheduling, budgeting, resource allocation, risk management, and performance monitoring, to successfully execute engineering projects.
5. An ability to recognize the ethical and social responsibilities of engineering managers, considering the impact of engineering projects on society, environment, and stakeholders, and integrating ethical considerations into decision-making processes.
6. An ability to engage in cross-functional collaboration, interacting with professionals from diverse disciplines such as engineering, business, finance, marketing, and operations to address complex engineering management challenges and opportunities.
7. An ability to evaluate and mitigate risks associated with engineering projects and operations, applying risk assessment techniques, developing risk management plans, and implementing proactive measures to minimize potential negative impacts.

I E 690. Selected Topics
1-15 Credits
This course offers an in-depth exploration of specific topics within a given field or discipline. The content may vary each time the course is offered, allowing for flexibility in addressing emerging trends, current issues, or specialized areas of study. May be repeated up to 99 credits.
Learning Outcomes
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to communicate effectively with a range of audiences.
3. An ability to recognize ethical and professional responsibilities in engineering situations, and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

I E 700. Doctoral Dissertation
15 Credits
Dissertation. May be repeated up to 88 credits.
Learning Outcomes
1. An ability to demonstrate the ability to develop a well-defined research question, formulate hypotheses or objectives, and design a research plan or methodology appropriate to address the research question or problem.
2. An ability to conduct a comprehensive literature review related to their research topic, identifying gaps in the literature, and synthesizing relevant theoretical frameworks or conceptual models.
3. An ability to collect, analyze, and interpret data using appropriate qualitative or quantitative research methods, techniques, and tools, demonstrating proficiency in data management, statistical analysis, and data visualization.
4. An ability to apply critical thinking skills to evaluate research findings, draw conclusions, and generate insights that contribute to knowledge advancement or address practical problems in their field of study.
5. An ability to effectively communicate their research findings, methodologies, and interpretations to both specialized and non-specialized audiences through written reports, oral presentations, and visual aids, demonstrating clarity, coherence, and persuasiveness.
6. An ability to demonstrate an understanding of ethical principles and guidelines governing research conduct, including issues related to research integrity, confidentiality, informed consent, and the responsible conduct of research.
7. An ability to manage their research projects effectively, including setting timelines, allocating resources, and adapting to unforeseen challenges or setbacks, demonstrating skills in organization, time management, and project coordination.

ICT-INFO &COMMUNICATION TECH

ICT 141. IT Essentials I: A+ Certification Training Focused on the Hardware Exam
3 Credits (3)
Installing, configuring, troubleshooting, and maintaining personal computer hardware components and will assist in preparation for the CompTIA A+ Hardware certification.
Learning Outcomes
1. Configure and support PC, mobile, and IoT device hardware.
2. Perform basic computer diagnostic and maintenance operations.
3. Implement basic data backup and recovery methods.
4. Apply basic hardware maintenance best practices.
5. Demonstrate baseline security practices for hardware.

ICT 145. Network Essentials: N+ Certification Training
3 Credits (3)
Focuses on the installation and administration of network communication systems and will assist in preparation for the CompTIA N + Network certification.
Learning Outcomes
1. Explain basic networking concepts including network services, physical connections, topologies, and architecture.
2. Explain security concepts and network attacks in order to harden networks against threats.
3. Explain routing technologies and networking devices; deploy Ethernet solutions and configure wireless technologies.
4. Troubleshoot common cable, connectivity, and software issues related to networking.
5. Monitor and optimize networks to ensure business continuity.

ICT 152. Java Programming
3 Credits (3)
Programming in the Java language.
Learning Outcomes
1. Set up a rich programming environment.
2. Analyze existing code.
3. Create/modify/debug/test programs.
4. Employ software documentation and programming best practices.

ICT 161. IT Essentials II: A+ Certification Training focused on the Software exam
3 Credits (3)
Installing, configuring, troubleshooting, and maintaining personal computer operating systems and will assist in preparation for the CompTIA A+ Software certification.
Prerequisite: A grade of C- or better in ICT 141.
Learning Outcomes
1. Configure device operating systems, including Windows, Mac, Linux, Chrome OS, Android, and iOS.
2. Administer client-based and cloud-based software.
3. Troubleshoot and problem-solve core service and support challenges.
4. Apply best practices for documentation, change management, and scripting.
5. Support basic IT infrastructure and networking.

ICT 220. Discrete Math and Its Relationship to Information Technology
3 Credits (3)
Focuses on developing software coding skills using a programming language and its application to discrete mathematics, the use discrete structures in computer science. Topics included are logic, sets, relations, functions, methods of proof, recursion, combinatorics, graph theory, and algorithms
Prerequisite: A grade of C- or better in MATH 1220G or higher.
Corequisite: ICT 152.

Learning Outcomes

1. Explain the relationship between discrete math sets and coded arrays, finite and infinite, subsets, intersection, unions, and other set operations.
2. Explain binary Trees and know how to use demonstrate them using code.
3. Demonstrate the use of code applied to group and subgroup theory.
4. Demonstrate the use of code to create functions and algorithms.
5. Identify and explain logical operations and their application in coding.
6. Demonstrate the use of Probability Theory in code to predict random outcomes.

ICT 267. Information Security+ Certification Preparation
3 Credits (3)
The course covers the Sec+ exam objectives and detailed preparation for certification in information security.
Prerequisite: A grade of C- or better in both, ICT 141 and ICT 145.
Learning Outcomes

1. The student will select appropriate mitigation and deterrent techniques to address network attacks and vulnerabilities.
2. The student will examine how access control, identity management, and cryptography can secure a network and manage risk.
3. The student will identify privacy and policy issues.
4. The student will apply activities that an Information Systems Security specialist would normally carry out in the performance of his/her duties.

ICT 280. Introduction to Web Development
3 Credits (3)
Introduction to front-end web development including webpage design, structure, layout, positioning, responsiveness, and foundational layers of how the web works.
Learning Outcomes

1. Explain the Document Object Model of HTML5 web pages.
2. Organize web page contents with Lists, figures, and organizational elements.
3. Develop web page layout templates.
4. Implement style application inline, via style blocks, and using external resources.
5. Develop and apply javascript event-driven programming to web pages.
6. Explain the difference between client and server-side scripting and data processing.

ICT 300. Special Topics
3 Credits (3)
Directed study or project. Students must be in Junior standing and have the consent of department head to enroll. May be repeated up to 3 credits.
Learning Outcomes

1. Various.

ICT 320. Introduction to Internet Protocols
3 Credits (3)
Present a overview of Internet Protocols Applications. Students must be in Junior or Senior standing only.
Learning Outcomes

1. Students will apply an understanding of basic Networking.
2. Students will employ effective use of Packet analysis software to troubleshoot network issues.
3. Explain the RFC process for developing network protocols.
4. Explain network protocol security implications.

ICT 339. Introduction to Digital Forensics and Incident Response
3 Credits (3)
Introduction to the skills required to perform digital forensics and incident response on Windows operating systems. Topics include: live response, evidence acquisition, Windows operating system artifacts, documentation and reporting.
Prerequisite: A grade of C- or better in ICT 141 or ICT 161.
Learning Outcomes

1. To understand Digital Forensics terms and definitions and why digital forensics is needed.
2. To study what is required and how to perform digital forensics.
3. To become familiar and aware of the hindrances/obstacles that affects effective digital/computer forensic operations.
4. To learn about the tools and procedures for how deleted data is recovered during digital forensic operations.
5. To use forensic tools and procedures to perform digital forensic operations on Windows operating systems, Emails, Mobile devices, and Communication networks (Computer, wireless, cellular networks).
6. To learn about incident response and procedures.

ICT 350V. Introduction to Personal Computer Security and Privacy
3 Credits (3)
Introduction to Information Security and Privacy – Have you ever wondered what happens to all of your browsing history or data you fill out on websites go? Who has this data? What do they do with this data? How do you stop sharing your private information? This class will answer those questions and provide steps to make your online presence more secure.
Learning Outcomes

1. Classify security issues
2. Classify Privacy protections
3. Evaluate threats and countermeasures based on personal security breaches.
4. Formulate a real-time privacy response
5. Assess international privacy protections through a multicultural focus.

ICT 352. Software Technology I
3 Credits (3)
This course focuses on reading, writing, debugging, testing, and documenting computer programs. May be repeated up to 3 credits.
Learning Outcomes

1. Set up a rich programming environment
2. Analyze existing code
3. Create/modify/debug/test programs
4. Employ software documentation and programming best practices

ICT 355. Linux System Administration
3 Credits (3)
Operating systems applications and interfacing with an introduction to systems administration. Topics include Shell Programming, Programming Tools, Database Management, System Backups, Security, Setup, and Maintenance of Linux Servers.
Learning Outcomes

1. Create a virtual environment on a host system using VirtualBox.
2. Develop single and multiple Linux Operating Systems within The VirtualBox Virtual Environment.

3. Select applications on production Linux Operating systems.
4. Support the operation of the Linux Operating system using System Administration Techniques.

ICT 360. Operating Systems for ICT
3 Credits (3)
Fundamentals of operating systems with Windows and Linux including installation and configuration using the GUI as well as the command line, text editors, file systems, scripting and operating system management.
Learning Outcomes
1. Create a virtual environment on a host system using VirtualBox.
2. Create multiple Operating Systems in a Virtual Environment.
3. Manage error codes in Virtual Machines.
4. Support the operation of the CentOS GUI and Windows Operating Systems.

ICT 362. Software Technology II
3 Credits (3)
Topics include problem analysis, object-oriented programming (OOP), structured logic, and development concepts. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better in ICT 152 or ICT 352 or E T 262 or OECS 195 or C S 152 or C S 172.
Learning Outcomes
1. Set up and use a rich programming environment for programming with Python.
2. Analyze existing code.
3. Employ effective use of basic programming and basic troubleshooting.
4. Employ effective use of Object-Oriented Programming (OOP) and troubleshooting.
5. Apply testing and documentation best practices.

ICT 364. Windows Enterprise Administration
3 Credits (3)
Installation, configuration, and maintenance of Windows Enterprise services which includes Active Directory, distributed file systems, SQL Server, Web Server, Authentication Procedures, and enterprise elasticity. Topics covered include: Server Maintenance and Troubleshooting Methodologies.
Prerequisite: A grade of C- or better in ICT 152.
Learning Outcomes
1. Set up and use a Windows Enterprise environment with Active Directory.
2. Use best practices to design an organizational structure and define AD DS Objects.
3. Deploy an AD DS embedded DHCP server with IPv4, IPv6, and Failover.
4. Analyze and use PowerShell code for process automation.
5. Deploy security and user settings using Group Policy.
6. Apply version updates and establish an intra-forest trust relationship.

ICT 372. Software Engineering and Design
3 Credits (3)
Topics include the software development lifecycle, problem analysis, and implementing software testing routines to improve the quality, integrity, and security of code.
Prerequisite: A grade of C- or better in ICT 362.
Learning Outcomes
1. Identify, explain, and apply the phases of the SDLC.
2. Identify different Agile methodologies and practices for software project management.
3. Use different development tools and apply best practices.
4. Apply best practices in the creation of business objects, data storage and access, testing, and debugging.
5. Configuring, handling, testing, and deploying services.

ICT 377. Computer Networking I
3 Credits (3)
Computer network design and applications for LAN, TCP/IP networks, routing and switching technologies, VLANs, and the OSI layers from physical to transport.
Prerequisite/Corequisite: A grade of C- or better MATH 1220G or higher.
Learning Outcomes
1. Define and distinguish the role of a network administrator (from other roles in the IT world).
2. Identify the OSI model, its layers, and the relationship to the TCP/IP model.
3. Identify different cable media and networking devices and their use.
4. Design, configure and troubleshoot basic networks.
5. Identify MAC, IPvfour, and IPvsix addressing.
6. Apply different techniques for IP allocation and subnet design (IPvfour).
7. Use the Cisco IOS software for basic switch and router configurations.
8. Configure and troubleshoot basic setup for static and dynamic routing protocols.

ICT 380. Web Design and Multimedia
3 Credits (3)
Introduction to front-end web development including webpage design, structure, layout, positioning, responsiveness, and foundational layers of how the web works. Video, audio, and other digital presentation tools are covered.
Learning Outcomes
1. Create multiple front-end development micro-components.
2. Create single and multi-page websites.
3. Use flexbox, grid, and media queries and different design patterns.
4. Employ effective use of web development and basic troubleshooting.
5. Build small web site projects.

ICT 400. Special Topics
1-3 Credits (1-3)
Directed study or project. Students must be in Senior standing and have the consent of department head to enroll. May be repeated up to 6 credits.
Learning Outcomes
1. Various.

ICT 435. Senior Project
3 Credits (3)
Capstone course. Practical application of student's cumulative knowledge to an assigned design project. Design principles, teamwork, and project management skills are stressed. Demonstration of written and oral communication skills via project documentation and presentation of results. Must be graduating senior. Consent of Instructor required. Restricted to ICT Majors.

Prerequisite: A grade of C- or better in the following: ICT 364 and ICT 377 and (ICT 462 or ICT 355).

Learning Outcomes

1. Demonstrate ability to manage a complex technical project.
2. Demonstrate the ability to create an engineering project timeline.
3. Demonstrate the ability to self-motivate and organize project.
4. Demonstrate the ability to work in teams and execute project.
5. Goal setting, skills assessment and portfolio development included.

ICT 439. Advanced Digital Forensics and Incident Response
3 Credits (3)

Advanced topics in digital forensics and incident response. Topics include network analysis and advanced cybersecurity concepts.

Prerequisite: A grade of C- or better in both, (E T 339 or ICT 339 or ICT 450) and (E T 377 or ICT 377).

Learning Outcomes

1. Demonstrate the use of forensic tools and procedures to perform digital forensic operations on Windows operating systems, Emails, Mobile devices, and Communication networks (Computer, wireless, cellular networks).
2. Demonstrate proper incident response procedures and proper chain of custody when handling digital evidence.
3. Students will become familiar with tools and processes to analyze and detect memory resident processes that include malware, rootkits, and user recoverable data.
4. Students will also have exposure to methods and processes used by hackers to penetrate and compromise targets.

ICT 450. Ethical Hacking
3 Credits (3)

Ethical Hacking and Penetration testing techniques. Students must be in senior standing to enroll.

Prerequisite: A grade of C- or better in ICT 350V.

Learning Outcomes

1. Analyze networking concepts as they relate to hacking vulnerabilities.
2. Define contract requirements necessary to avoid legal liability during Ethical Hacking.
3. Employ tools and techniques to scan and do reconnaissance on potential targets.
4. Demonstrate use of vulnerability testing tools to identify vulnerabilities and exploits.
5. Identify the role of sniffers and session Hijacking in Ethical Hacking.
6. Demonstrate the use of Social Engineering tools and techniques used in Ethical Hacking.

ICT 457. Information Security Principles
3 Credits (3)

This course provides an overview of security challenges and strategies of countermeasure in the information systems environment. Topics include definition of terms, concepts, elements, and goals incorporating industry standards and practices with a focus on availability, vulnerability, integrity and confidentiality aspects of information systems.

Prerequisite: A grade of C- or better in ICT 350V.

Learning Outcomes

1. Demonstrate an understanding of the information security concepts.
2. Demonstrate an understanding of the diversity of potential attacks against an organization.
3. Demonstrate an understanding of cryptographic techniques.
4. Demonstrate an understanding of authentication methods.
5. Demonstrate an understanding of access control systems.
6. Demonstrate an understanding of various network security controls.
7. Demonstrate an understanding of the legal, ethical, and professional issues in information security.

ICT 458. Web Development and Database Applications
3 Credits (3)

Design, plan, and build interactive and dynamic web applications. Topics include relational databases, object-oriented programming, and the application of backend frameworks.

Prerequisite/Corequisite: A grade of C- or better in ICT 362.

Learning Outcomes

1. Build knowledge of Web Servers.
2. Plan, design, and create code for backend web development.
3. Design, create, and access databases that support web applications.
4. Implement adequate security and authentication for the deployment of Web applications.

ICT 460. Advanced Software Development Concepts
3 Credits (3)

This course focuses on advanced software development concepts to help embed security into code, protecting software applications.

Prerequisite: A grade of C- or better in ICT 362.

Learning Outcomes

1. Application of best practices against software vulnerabilities.
2. Identification of code defects, bugs, and logic flaws.
3. Assessment and testing of code.
4. Utilization of secure code alternatives.
5. Code refactoring to improve design and structure and prevent vulnerabilities.

ICT 462. Linux System Administration
3 Credits (3)

Operating system applications and interfacing with an introduction to systems administration. Topics include Shell Programming, Programming Tools, Database Management, System Backups, Security, Setup and Maintenance of Linux Servers.

Learning Outcomes

1. Create a virtual environment on a host system using VirtualBox.
2. Develop single and multiple Linux Operating Systems within The VirtualBox Virtual Environment.
3. Select applications on production Linux Operating systems.
4. Support the operation of the Linux Operating system using System Administration Techniques.

ICT 463. Enterprise Linux Network Administration Tools
3 Credits (3)

Advanced methods and tools used to deploy, manage, and administer networked devices.

Prerequisite: A grade of C- or better in ICT 377.

Learning Outcomes

1. Demonstrate the ability to use Software Versioning systems using Windows and Linux.
2. Apply best practices with versioning repositories when creating software.
3. Deploy single and clustered microservice containers to support a web application.
4. Use script-based code to deploy and configure a full stack web server.

5. Use infrastructure management software to deploy defined roles in multiple environments.

ICT 467. Communication Network Security
3 Credits (3)
The course provides a technical perspective on maintaining the security of communication network systems. It covers a wide range of technical issues, including wired, wireless and Internet communication fundamentals, communication network security mechanisms and configuration, standards and protocols, vulnerabilities, attacks and countermeasures.
Prerequisite: A grade of C- or better in both, ICT 320 and ICT 377.
Learning Outcomes
1. Demonstrate an understanding of key and basic communication network security concepts, terminologies, standards, issues, and policies.
2. Apply the principles of network security techniques such as Cryptography, Cryptanalysis, Biometrics, Watermarking, and Stenography.
3. Implement security techniques with commonly available network security software.
4. Examine the fundamentals of Wired and Wireless communication network systems including Cellular, Bluetooth, Wi-Fi, Internet, Cloud Networking, and the Internet of Things.
5. Explain the TCP/IP security protocols that pertain to communication network systems.
6. Explain the security attacks, threats, risks, mechanisms, and tools associated with and used for securing network devices especially mobile devices.
7. Demonstrate an understanding of the operation and countermeasures against Malwares in network systems and the implementation of intrusion detection and prevention, and firewall technologies.

ICT 477. Computer Networking II
3 Credits (3)
Advanced concepts in computer network design and applications including managing the campus network infrastructure (LANs and virtual LANs), network services (DNS and DHCP), network security as well as network monitoring.
Prerequisite: A grade of C- or better in either ICT 377 or E T 377 or CTEC 285.
Learning Outcomes
1. VLSM, Summarization, and the TCP/IP model.
2. Understanding of IPvsix basics
3. Configuration of routing protocols using IPvsix
4. Configuration of advanced router configurations
5. Configuration of route redistribution, DHCP, DNS, NAT and PAT
6. Configure network security and Access Control Lists (ACLs)
7. Perform basic analysis of network data traffic
8. Create, test and troubleshoot software simulations (Cisco Packet Tracer)

ICT 487. Data Security
3 Credits (3)
Delving into the realm of advanced data security is the essence of this senior-level undergraduate course. Students will immerse themselves in the intricacies of safeguarding digital information by covering an array of topics, from encryption to secure data transmission, and extending to secure data storage and data security in use. The course takes a comprehensive approach, encompassing three key domains of data security: data in motion, data at rest, and data in use. Throughout the journey, students will grasp the technical and theoretical underpinnings of data security and cultivate practical, hands-on expertise in fortifying data against vulnerabilities.
Prerequisite: A grade of C- or better in both, ICT 320 and ICT 360.
Learning Outcomes
1. Understand the fundamental concepts of data security, including data in motion, data at rest, and data in use.
2. Explore encryption algorithms and their applications in data security.
3. Evaluate the importance of secure communication protocols in data transmission.
4. Develop skills in secure data storage and backup techniques.
5. Analyze various security architectures, such as network security, cloud security, and mobile security.

INST-INSTRUMENT & CONT TECH

INST 133. Process Technology and Systems
4 Credits (4)
Provides instruction in the use of common process equipment. Students will use appropriate terminology and identify process equipment components such as piping and tubing, valves, pumps, compressors, turbines, motors, engines, heat exchangers, heaters, furnaces, boilers, filters dryers and other miscellaneous vessels. Included are the basic functions, scientific principles and symbols. Students will identify components on typical Process Flow Diagrams and Process and Instrument Diagrams. Restricted to: Instrumentation and Control Technology majors. Restricted to Carlsbad campus only.
Learning Outcomes
1. Explain the different pieces of equipment used in moving fluids through a process plant such as piping, valves, pumps, compressors, motors, engines, turbines, and power transmission devices. Explain the purpose of each component. Understand the applications for the different types of equipment in each classification and their operating principles.
2. Explain the different types of heat exchangers and cooling towers used in the Process Industry as well as their components. Describe their operating principles and the operator's role in their operation.
3. Explain the different types of boilers and furnaces as well as their components. Describe their operating principles and the operator's role in their operation.
4. Explain the function of filters and dryers along with their principles of operation and the operator's role in their operation.
5. Explain the different types of vessels used in the process industry and well as their components and auxiliary systems. Define what happens internally in the different vessels.
6. Demonstrate reading Process Flow Diagrams and Piping and Instrumentation Diagrams.
7. Apply terms used when describing the various pieces of equipment

INST 165. Equipment Processes
4 Credits (4)
This course introduces Thermal Energy and Mechanical alignment in equipment and machinery components. Students will learn the operation, maintenance, and troubleshooting of these types of equipment. Consent of Instructor required. Restricted to: Instrumentation and Control majors. Restricted to Carlsbad campus only.

Learning Outcomes

1. Explain how Thermal Process System works.
2. Identify parts of Thermal System and Steam machines.
3. Identify troubleshooting of thermal machine.
4. Explain the steps of how to operate the Thermal Systems

INST 205. Programmable Logic Controllers and Applications
4 Credits (4)
This learning system is set up in a self-directed format where students can proceed forward at their own pace. The directions are provided in a series of Learning Activity Packets (LAPs), which include text and lab activity directions. LAPs book will be handed out at the start of every class day and must be returned before the class day begins. This learning system can be used as a stand-alone teaching learning system within any class to give hands-on experience in electrical systems. Computer Literacy and internet literacy is required to enroll in this course. Restricted to: Instrumentation and Control Technology majors. Restricted to Carlsbad campus only.
Learning Outcomes

1. Explain the basics of PLCs.
2. Describe how PLCs are used in industrial environments.
3. Demonstrate ability to program a PLC unit to solve a problem

INST 251. Instrumentation and Measurement
5 Credits (5)
The overall aim of this course is to present the students with the basic principles and techniques required for the design and analysis of measurement systems. The course introduces the theory of measurement as well as the sensors and instruments typically used for measuring various physical quantities. Restricted to: Instrumentation and Control Technology majors. Restricted to Carlsbad campus only.
Learning Outcomes

1. Understand measurement principles and apply them within measurement systems
2. Select and specify suitable instrumentation for measurement of physical quantities
3. Analyze and interpret experimental data
4. Perform analog and digital signal processing
5. Identify various sensor technologies and their use in measurement systems

INTR-INTERDISCIPLINARY STUDIES

INTR 300. Foundations of Interdisciplinary Studies
3 Credits (3)
Introduction to Bachelor of Individualized Studies (BIS) and Bachelor of Applied Studies (BAS) degree programs. Explores roles of interdisciplinary studies in contemporary world and how emerging and perennial problems and issues can be comprehended utilizing multiple theoretical and analytic methods. Students design or update their course of study for earning the BIS or BAS degree. Consent of Instructor required. Restricted to Las Cruces campus only.

INTR 301. Interdisciplinary Research: Theory & Practice
3 Credits (3)
Focuses on knowledge gained through interdisciplinary research. Students develop comprehensive understanding of steps of systematic inquiry into interdisciplinary research questions. Includes active learning through design and implementation of an interdisciplinary research project. For BIS and BAS majors only. Consent of Instructor required.

JAPN-JAPANESE

JAPN 1110. Japanese I
4 Credits (4)
This course focuses on the basics of the Japanese language with a balanced approach to the development of four skills: listening, speaking, reading and writing. The course is designed to teach students to communicate with Japanese socially and to utilize culturally appropriate manners to engage in Japanese daily life. While conversational skills are emphasized, the student will also be introduced to the various Japanese scripts.
Learning Outcomes

1. Become introduced to the sound system of the Japanese language.
2. Gain a basic understanding of Japanese scripts.
3. Learn and utilize vocabulary needed for basic conversation.
4. Converse and write on topics related to immediate personal needs, greetings, introductions, personal data, daily routines and school.
5. Comprehend both artificial and authentic written and aural texts of short length on familiar topics.
6. Comprehend and use essential grammar concepts.
7. Identify patterns of cultural behavior or customs in Japan, including gestures, greetings, and body language.
8. Gain the ability to converse using Japanese idiomatic expressions.

JAPN 1120. Japanese II
4 Credits (4)
This course focuses on building upon the basics of the Japanese language with a balanced approach to the development of four skills: listening, speaking, reading and writing. The course is designed to teach students to communicate with Japanese socially and to utilize culturally appropriate manners to engage in Japanese daily life. Along with further developing conversational skills, the student will also continue to learn about and utilize various Japanese scripts.
Prerequisite: grade of C or better in JPNS 1110 or consent of instructor.
Learning Outcomes

1. Understand and utilize in more depth the sound system of the Japanese language.
2. Gain a greater understanding of Japanese scripts.
3. Utilize expanded vocabulary in conversation.
4. Converse and write on topics related to personal, social, geographical, and political life.
5. Comprehend both artificial and authentic written and aural texts of longer, but still brief length, such as personal letters, messages, journals, and narrative accounts.
6. Comprehend and use essential and more complex grammatical concepts.
7. Continue to develop a sense of culturally appropriate conduct.
8. Build upon the ability to converse using Japanese idiomatic expressions.

JAPN 2110. Japanese III
3 Credits (3)
This course is designed for students who have completed 12 credit hours or the equivalent of Japanese study. This course continues to expand vocabulary, grammar and 209 Kanji to deal with daily activities. Its objective is to teach students to communicate in a meaningful way using all four language skills: speaking, listening comprehension, reading and writing. Students will be able to manage not-complicated daily situation. Students will attain ACTFL intermediate-low level in four skills.

Prerequisite: grade of C or better in JPNS 1120 or consent of instructor.

Learning Outcomes

1. Participate in conversations on familiar topics, such as applying part-time job, gift giving/receiving,planning a trip, lost and found, using sentences and short series of sentences.
2. Handle short social interactions in everyday situations by asking and answering a variety of questions.
3. Usually say what they want to say about themselves and their everyday life.
4. Write on a variety of familiar topics in Japanese characters using connected sentences.
5. Understand the main idea in messages and presentations in Japanese on a variety of topics related to everyday life and personal interests and studies.
6. Sometimes understand the main idea of conversations that they overhear.
7. Understand the main idea of texts in Japanese characters related to everyday life and personal interests or studies.
8. Describe and make comparisons between cultures about beliefs, behaviors and cultural artifacts in Japan.

JAPN 2120. Japanese IV

3 Credits (3)

This course is designed for students who have completed 15 credit hours or the equivalent of Japanese study. This course continues to expand vocabulary, grammar and 271 Kanji to deal with not-complicated daily situation with ease. Also students acquire a competence for Japanese pragmatic usage. This course follows ACTFL language guidelines, integrating the five C's: communication, cultures, connections, comparisons and communities, to offer the student a well- rounded classroom experience. Students will attain ACTFL intermediate-mid level in four skills.

Prerequisite: grade of C or better in JPNS 2110 or consent of instructor.

Learning Outcomes

1. Participate with ease and confidence in conversations on familiar topics, such as relationships, par-time job, shopping with a variety of request, meeting socially superiors.
2. Usually describe people, places,and things, and talk about events and experiences in various time frames.
3. Handle social interactions in everyday situations, sometimes even when there is an unexpected complication.
4. Write about topics related to school, work, and community in a generally organized way in Japanese characters.
5. Write some simple paragraphs in Japanese characters about events and experiences in various time frames.
6. Easily understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies.
7. Usually understand a few details of what they overhear in conversations, even when something unexpected is expressed.
8. Sometimes follow what they hear about events and experiences in various time frames.
9. Understand the main idea of texts in Japanese characters with topics related to everyday life, personal interests, and studies, as well as sometimes follow stories and descriptions about events and experiences in various time frames. 1
10. Describe and make comparisons between cultures about beliefs, behaviors and cultural artifact in Japan. 1
11. Start using languages in a culturally appropriate way based on the understanding of cultural similarities and differences, including the use of "honorific" and "humble" expression.

JAPN 320. Oral Practicum in Japanese

1-3 Credits

Service training for facilitators leading informal conversation groups in Japanese. May be repeated up to 4 credits.

Prerequisite: fluency in Japanese and consent of instructor.

JAPN 453. Independent Studies in Japanese

1-3 Credits (1-3)

Individualized, self-paced projects for advanced students. May be repeated up to 6 credits.

JOUR-JOURNALISM

JOUR 105G. Media and Society

3 Credits (3)

Functions and organization of the mass media system in the United States; power of the mass media to affect knowledge, opinions, and social values; and the impact of new technologies.

Learning Outcomes

1. Describe the structure and functions of major US media institutions and their roles in shaping public knowledge and opinion.
2. Analyze the social, political, and cultural impacts of mass media on audiences and communities, with attention to issues of power and representation.
3. Evaluate the influence of emerging technologies on media practices, audience behavior, and the future of journalism.

JOUR 110. Media Writing I

3 Credits (2+2P)

Introduction to media writing basics including news writing for print and web, feature writing, sports writing and writing for public relations. Course emphasizes fundamental news values, journalism ethics and Associated Press style. Restricted to all Campuses. May be repeated up to 3 credits.

Learning Outcomes

1. Know and put into practice news writing basics including the five W's, inverted pyramid, basic news leads, quotations, interviews, attributions and cutlines.
2. Know how to cover scheduled and breaking news events, and put knowledge into practice.
3. Know how to write for different media, including print, web and broadcast, and put knowledge into practice.
4. Know fundamentals of writing news stories, features, editorials, obituaries, and press releases, and put knowledge of each into practice.
5. Develop and practice basic copy editing skills.

JOUR 201. Introduction to Multimedia Journalism

3 Credits (2+2P)

Introduction to journalistic storytelling using text, photos, audio, video and infographics. Students produce their own multimedia stories in intensive, hands-on environment using digital cameras and audio recorders, mobile phones, external microphones and digital editing software applications including Adobe Premiere Pro, Audition and Photoshop. May be repeated up to 3 credits.

Learning Outcomes

1. Learn how to recognize and accurately define multimedia journalism.
2. Improve visual literacy by viewing and analyzing a variety of work produced by professional multimedia journalists.
3. Know the basic requirements and parts of a story, and know how to map and structure a story.
4. Know and put into practice news writing basics including the five W's.
5. Know what makes a good image, and put into practice composing and framing photographs and videos.
6. Understand and put into practice still photography, video and audio capture and editing fundamentals using a variety of tools.
7. Know how to combine different media to create a logical and effective story.

JOUR 210. Copyediting
3 Credits (2+2P)

Introduction to various aspects of copyediting with an emphasis on accuracy and style. Includes hands-on, directed practice in editing for Associated Press style, punctuation and grammar. Includes headline and cutline writing. May be repeated up to 3 credits.
Prerequisite: JOUR 110.
Learning Outcomes

1. Know and put into practice news writing basics including the five W's, inverted pyramid, basic news leads, quotations, interviews and attributions.
2. Know fundamentals of writing news stories, sports stories, features and editorials, and put knowledge of each into practice.
3. Know how to write for different media, including print, web and social media, and put knowledge into practice.
4. Develop and practice basic copy editing skills.
5. Understand fundamentals of media law and ethics, and know basic press rights.
6. Understand basic math principles used by reporters.
7. Practice and understand the importance of meeting deadlines.
8. Develop a habit of consuming news and monitoring daily headlines.

JOUR 300. Introduction to Advertising
3 Credits (3)

This course introduces students to the principles and practices of integrated marketing communications (IMC) and their role in promoting goods, services, and organizations. Students explore the creative and strategic processes behind advertising campaigns, including media planning, message design, and consumer behavior analysis. The course also addresses social and ethical issues in advertising, providing a foundation for further study in media strategy, creative development, and campaign evaluation.
Learning Outcomes

1. Explain the role of integrated marketing communications in the promotion of goods, services, and organizations within the broader marketing landscape.
2. Analyze consumer behavior and media trends to inform strategic planning and message development for advertising campaigns.
3. Apply creative and ethical principles to design basic advertising concepts or campaign strategies that address specific communication objectives.

JOUR 302. Television Videography & Editing
3 Credits (3)

Classroom instruction on basic studio and single camera video productions. The focus is placed on introductory practical aspects of news and videography, reporting and storytelling. Lab experience in camera basics, studio functions and digital video editing. Includes practical experience through crew assignments on the live student - produced newscast, News22, which airs on KRWG-TV, a PBS affiliate station. May be repeated up to 3 credits.
Learning Outcomes

1. The students will be able to have a broader introductory understanding of video production for broadcasting media
2. The students will be able to edit video and digital production
3. The students will be able to create media reporting for News and Sports

JOUR 305. Visual Communication in Media
3 Credits (3)

How one sees, perceives, interprets, creates and applies visual language. Explores the history, techniques, application and practice of the various visual media. May be repeated up to 3 credits.
Learning Outcomes

1. Give students an understanding of the historical, critical, theoretical and practical aspects of visual culture in digital media era.
2. Sharpen students' visual acuity
3. Enhance students' understanding of point of view
4. Help students to broaden their perspective of visual communication from the storytelling perspective in social and digital media
5. Enlarge students appreciation of visual culture

JOUR 306. Sports Writing and Reporting
3 Credits (3)

Fundamental principles of sports writing and reporting with an emphasis on accuracy and style. Includes a mix of classroom instruction and hands-on, directed practice in game coverage sports feature writing, sports commentary and sports statistics. Students have the opportunity to produce sports content for Kokopelli online news outlet. May be repeated up to 6 credits.
Prerequisite: JOUR 210 or consent of instructor.
Learning Outcomes

1. Know how to recognize and accurately define sports journalism and different sports story types
2. Improve sports journalism literacy by reading, viewing and analyzing a variety of work produced by professional sports writers and reporters
3. Know the basic parts of a sports story, and know how to structure and package various types of sports stories
4. Know and put into practice sports writing basics including the five W's, leads, interviews, quotations and attributions
5. Know how to write sports stories for different media, including print, web and social media, and put knowledge into practice
6. Know basic sports terminology, and know how to compile, compute and interpret a wide variety of sports statistics

JOUR 310. Media Writing II
3 Credits (3)

Field reporting and writing for web and print publication. Includes a mix of classroom instruction and hands-on, directed practice in local news and sports reporting, feature writing, opinion writing and social media content creation. Students produce written and visual content for Kokopelli online news outlet. Course emphasizes accuracy, news values and ethics in fast-paced, deadline-oriented environment. May be repeated up to 3 credits. May be repeated up to 3 credits.
Prerequisite: JOUR 210.

Learning Outcomes

1. Write an inverted pyramid on deadline.
2. Use AP style in all written assignments.
3. Incorporate news writing conventions in all stories.
4. Identify the differences between hard news stories and features.
5. Conduct interviews using best journalistic practices and professionalism.
6. Demonstrate news judgment in pitching, reporting, and writing stories.
7. Build a personal website and use digital media to report, publish and promote stories.
8. Understand basic libel law and journalistic ethics.

JOUR 312. Advertising/Copywriting
3 Credits (3)

This course explores the creative and strategic processes involved in developing effective advertising messages. Students will learn the principles of persuasive copywriting, visual storytelling, and layout design, applying these skills to create integrated advertising materials for clients. Emphasis is placed on aligning creative executions with brand strategy and audience insights while adhering to ethical and professional standards.

Prerequisite: JOUR 110 or consent.

Learning Outcomes

1. Apply principles of persuasive writing and strategic thinking to develop advertising copy that aligns with client objectives and target audiences.
2. Design storyboards and layouts that integrate copy and visuals to communicate cohesive advertising messages across multiple media platforms.
3. Evaluate advertising concepts for effectiveness, creativity, and alignment with ethical and professional standards in the industry.

JOUR 314. Broadcast Reporting
3 Credits (3)

Students learn the techniques of reporting and writing news stories for broadcast, including how to incorporate video and natural sound so all elements work together for good storytelling. May be repeated up to 3 credits.

Prerequisite: JOUR 302.

Learning Outcomes

1. Students will learn the basics of television reporting.
2. Students will learn and practice the skills of broadcast news reporting, especially, broadcast writing, reporting, interviewing, videography and audio recording, editing, and how to tell stories with video and audio.

JOUR 315. News 22
1-3 Credits (1-3)

Students will report news stories for live, student-produced television newscast that airs on KRWG-TV, public television for Southern New Mexico. May be repeated up to 3 credits.

Prerequisite: JOUR 314 or JOUR 330.

Learning Outcomes

1. Students will learn to report professional news stories for News twenty-two
2. Students will learn the fundamentals of live broadcast news production.

JOUR 319. Intro Photography
3 Credits (3)

Introduction to photography emphasizing composition, camera techniques, post-production skills in Photoshop, Lightroom, and InDesign and storytelling skills. History of photography overview. This class is the starting point for students interested in a photojournalism emphasis. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to use "visual language" for use across multiple platforms including print, video and web.
2. Students will acquire post-production skills used in various industries.
3. Students will be able to produce powerful and effective communication through image-making.

JOUR 320. Photojournalism
3 Credits (3)

Communication photography on multiple platforms for sports, news, advertising/public relations and other editorial and commercial needs. Photography lighting techniques, photo-editing software, and website skills will be expanded and further developed. May be repeated up to 3 credits.

Prerequisite: JOUR 319 or Consent of instructor.

Learning Outcomes

1. Students will be able to use specialty techniques, especially sports photography and studio/portraiture/product photography.
2. Students will expand skills needed in editorial, advertising and other communication industries.

JOUR 321. Media Graphic Design
3 Credits (3)

Introduction to graphic design fundamentals for print and web publication including page layout, typography, color theory and photo editing. Students produce their own print and web-based design pieces using Adobe InDesign and Photoshop. May be repeated up to 3 credits.

Learning Outcomes

1. Know and put into practice fundamental design principles including proximity, alignment, repetition and contrast.
2. Know fundamentals of color theory and typography, and apply this knowledge to a variety of media design projects.
3. Know fundamental rules of photography composition and cropping.
4. Know fundamental rules and principles of printed newspaper and magazine design and put knowledge into practice.
5. Know fundamental rules and principles of printed newsletter and brochure design and put knowledge into practice.

JOUR 330. TV News Shooting & Editing
3 Credits (2+4P)

Advanced technical and aesthetic skills and journalism basics needed for videography and editing on-location news stories. Single camera videography and nonlinear/digital editing. May be repeated up to 3 credits.

Prerequisite: JOUR 314 or permission of instructor.

Learning Outcomes

1. Learn or continue exploring and mastering the concept of video sequencing in the field, gathering great natural sound, opening and closing shots and improve your overall storytelling process in the field and during the edit process.
2. Learn or continue exploring the fundamentals of non-linear digital editing, using Adobe Premier.
3. Expand knowledge of field sound recording.

4. Learn and distinguish the difference between uncontrolled action and controlled action.

JOUR 350V. Media History
3 Credits (3)
Historical overview of media including newspapers, magazines, radio, television, photography, entertainment media, advertising, public relations, and digital media. The history of American media development is directly intertwined with American history. Newspapers, magazines, television, and radio have not just reported on news and events; by virtue of what facts and sources editors and reporters have chosen to use, journalists have framed how the public should think about events. Editorials also provided further framing guidance on issues to readers and viewers. Students will study media history from social, intellectual, and cultural history perspectives. Students will examine the historical relationship of the media to American social, political, economic, and cultural patterns and developments. And, conversely, students will examine how these same forces impacted and changed all forms of media through a multi-cultural approach. May be repeated up to 3 credits.
Learning Outcomes
1. Survey the development of various forms of media and the changes in the media as they relate to the larger social, economic, and political sphere
2. Learn the methods and processes of historical research and engage in historical research.
3. Learn that the development of all fields of communication are interrelated
4. Discover how American media have attempted to influence how Americans perceive the world around them (including perceptions of other nations) via their coverage and portrayal of global events.
5. Learn that America's historical events played out through the media. As such, students will gain a deeper understanding of how media personnel helped "frame" the discussion and debate about news and information from the 1600s to present day
6. Discover that the ethical and professional foundations of media industries have adjusted and changed over time due to external and internal forces, including the rise of the professionalism movement across the nation in the late nineteenth century, the internal response to public demands for licensing of news media following World War I, and modern pressures caused by digitization of the industry and the parallel fragmentation of audiences
7. Learn how to determine how various groups outside the mainstream contributed to overall press development. This includes an examination of how women and ethnic minorities influenced how and why the press became a force for social, cultural, political, and economic change in society.
8. Discover and appreciate that history is NOT just the study of names, dates, and places, but of people
9. Discover that the history of media is not the province of any one individual, corporation, or entity. Instead, a variety of factors: social, economic, political, legal, ethical, and cultural, helped shape the media's development

JOUR 360. Media Literacy
3 Credits (3)
This course is designed to help students develop an informed, critical, and practical understanding of media including analysis of online and social media and to help students develop their media literacy and analytical skills.
Learning Outcomes
1. Write clearly, precisely, and in a well-organized manner.
2. Demonstrate critical thinking, reading, and viewing skills.
3. Research, develop, evaluate, and present arguments grounded in research-based knowledge.
4. Apply analytical, precise, and elaborated terms and concepts for talking and writing about media and the ways in which they communicate meaning.
5. Demonstrate how images are constructed via specific formal and technical elements and how those images construct meaning about national and global communities.
6. Interpret media texts (film, television, etc.) to expand experience and understanding of the self and society.

JOUR 374. Introduction to Public Relations
3 Credits (3)
This course is designed to familiarize students with the basic concepts, principles, practices, and professions of public relations (PR). It is the foundation course for other PR courses in Journalism and a supplemental course for students majoring in other fields.
Learning Outcomes
1. The role and functions of public relations in contemporary society.
2. The contingency views of public relations practice in the worlds of managing competition and conflict.
3. The historical evolution of public relations, career opportunities in the field, and professional/ethical/legal responsibilities.
4. The basic process of public relations—research, planning, communication, evaluation—and the use of communications strategies and tactics to achieve organizational goals and objectives.
5. The persuasion of public opinion and audience analyses and how to reach diverse audiences.
6. Practical guidelines for utilizing written, spoken, and visual techniques to reach selected audiences.
7. An understanding of how public relations is a global phenomenon.
8. How the Internet and social media are changing the way public relations professionals build and sustain relationships between an organization and its constituents.
9. An understanding of public relations activities in business, sports, tourism, entertainment, nonprofit, education, and government organizations.

JOUR 377V. Mass Media Ethics
3 Credits (3)
Philosophical and moral examination of problems relating to mass media. Use of case study method to analyze media situations; development of framework for media professionalism.
Learning Outcomes
1. Analyze ethical dilemmas in mass media using established philosophical theories and ethical frameworks.
2. Evaluate media case studies to determine the ethical responsibilities and professional standards applicable to journalists and media practitioners.
3. Construct a personal code of media ethics informed by moral reasoning, professional guidelines, and critical reflection on case studies.

JOUR 380. Women and the Media
3 Credits (3)
Portrayal and participation of women in mass media from colonial to contemporary times. Same as GNDR 450.

Learning Outcomes

1. Examine the historical evolution of women's roles and representations in mass media from colonial America to the present.
2. Critique media portrayals of women across different time periods and platforms, using feminist theory and media analysis frameworks.
3. Develop original media content, presentations, or arguments that reflect an informed understanding of gender dynamics in media industries.

JOUR 384. Public Relations Storytelling
3 Credits (3)
This course will help students understand the concept of using storytelling as a tool for public relations, branding, and social change. Students will learn how to use storytelling on traditional and social media platforms. Upon completion of this course, students should have attained knowledge of essential elements of storytelling, audience-led narratives, transmedia storytelling, etc.
Learning Outcomes

1. Students will attain knowledge and understanding of the essential elements of branding through storytelling.
2. Students will attain knowledge and understanding of the assessment of brand stories and customer-led narratives.
3. Students will attain knowledge and understanding of integrating brand storytelling into the marketing mix.
4. Students will attain knowledge and understanding of data-driven storytelling.
5. Students will attain knowledge and understanding of personal branding of leaders and brand storytelling success.
6. Students will attain knowledge and understanding of research skills for brand storytelling.
7. Students will attain knowledge and understanding of the future of brand storytelling.

JOUR 407. Media Internship
1-3 Credits (1-3)
Supervised work with a media organization. 1-3 credits. May be repeated up to 3 credits. Restricted to: JOUR majors.
Prerequisite: Consent of internship coordinator.
Learning Outcomes

1. Varies.

JOUR 408. Media Practicum
1-3 Credits
Advanced supervised work with a media organization. May be repeated up to 3 credits.
Prerequisite: Consent of internship coordinator.
Learning Outcomes

1. Varies.

JOUR 412. Documentary Photojournalism
3 Credits (3)
Production of documentary photography for web, print, broadcasting and exhibition emphasizing deep visual storytelling. Multimedia, social media distribution and website techniques including WordPress website design and maintenance. Discussion of notable photographers. Multiple Field Trips to produce material for the Small Village New Mexico term project (SVNM). Students produce an individual Term Project book and multimedia show. May be repeated up to 3 credits.
Prerequisite: JOUR 319.
Learning Outcomes

1. Students will learn "slow photojournalism," and be able to produce visual stories done with deep immersion in whatever community or subject they work in.
2. Students will be able to use photography for communication, giving deeper meaning to subjects than transitory "news" type photography allows.

JOUR 414. Broadcast Reporting Portfolio
3 Credits (3)
This is course is designed to help students who are preparing for a career in broadcasting. Students will refine reporting, shooting and editing skills and build a professional website containing a reporter reel, resume and proof of other skills needed for success in broadcasting. The class also features guest speakers throughout the semester who work in the broadcast and digital world of media. May be repeated up to 3 credits.
Prerequisite: JOUR 314.
Learning Outcomes

1. To practice, hone, and improve scriptwriting skills, especially news writing.
2. To practice and improve audio announcing skills and on-camera announcing skills.
3. To practice and improve overall videography and digital editing skills.
4. To learn more and prepare for related careers.

JOUR 425. Media Planning and Buying
3 Credits (3)
Covers the principles of media planning for an IMC campaign and procedures for purchasing ad time or space.
Prerequisite: JOUR 300 or consent of instructor.
Learning Outcomes

1. Analyze audience demographics, psychographics, and media consumption data to determine optimal media channels for journalistic content placement.
2. Design comprehensive media plans that align with campaign objectives, budget constraints, and ethical journalism practices.
3. Evaluate the effectiveness of media buys using key performance indicators (KPIs) and adjust strategies based on data-driven insights.

JOUR 427. Media Writing III
3 Credits (3)
Advanced field reporting and writing for web and print publication. Includes hands-on, directed practice in local news and sports reporting, feature writing, opinion writing, social media content creation and web publishing. Students produce written and visual content for Kokopelli online news outlet, and prepare final portfolio. Course emphasizes accuracy news values and ethics in fast-paced, deadline-oriented environment. May be repeated up to 3 credits.
Prerequisite: JOUR 310.
Learning Outcomes

1. Sharpen and expand advanced reporting, interviewing, writing, and editing skills for print and online publication.
2. Sharpen multimedia reporting and storytelling skills including photography skills.
3. Improve and expand professional portfolio through online publication of original work.
4. Demonstrate effective use of social media platforms.
5. Demonstrate understanding of fundamentals of journalism ethics.

6. Learn to work effectively under deadline pressure.
7. Produce a final portfolio or "string book" of published work.

JOUR 457. Social Media Management and Analytics
3 Credits (3)
This course is designed to help students to understand how marketing has (and has not) changed due to the rise of social media and changes in various underlying contextual factors, such as dramatically increased speed of information dissemination across consumers and brands. The overarching goal is to obtain a clear perspective on what's really going on in digital/social/mobile marketing so that you can begin to appreciate its true value to consumers, to managers, and to other corporate stakeholders. It will equip students with the relevant knowledge, perspectives, and practical skills required to develop marketing strategies that leverage the opportunities inherent in social media and consumer-to-consumer social interactions for achieving business and marketing goals.
Prerequisite: JOUR 374.
Learning Outcomes
1. Understand what social media is and how this new type of media and communications technology influences how business and marketing is done
2. Develop skill in using the predominant social media tools currently available for business/marketing communication
3. Understand how to use various social media channels to publish and disseminate relevant branded content in order to engage consumers and to increase social impact, influence, and value
4. Develop a strategic plan for identifying opportunities for using social media in a company

JOUR 460V. Sports & Entertainment P.R.
3 Credits (3)
This course aims to provide a basic understanding of sports and entertainment PR and its industry trends, theories, techniques, case studies, global trends, and future directions. Upon completion of this course, students will be able to use the theories and techniques to plan, implement, and evaluate sports and entertainment PR campaigns and activities. May be repeated up to 3 credits.
Learning Outcomes
1. Describe the nature of public relations practice in sports
2. Practice the primary research methods employed in sports public relations.
3. Recognize the major steps involved in planning a public relations campaign and the key considerations at each step in the process.
4. Identify the various types of paid/earned/shared/owned media commonly utilized in the profession
5. Comprehend the different tactics used to generate publicity.
6. Become proficient in writing news releases.
7. Distinguish among the various response strategies sports managers may employ in a crisis.
8. Describe unique aspects of social responsibility in the sports and entertainment industry
9. Identify legal issues in sports PR, anticipate emerging ethical issues, evaluate ethical dilemmas present in sports PR, and recognize the need for ethical decision-making in sports PR. 1
10. Describe current global trends and multicultural issues, which have impacted the global sports and entertainment industry.

JOUR 463. Public Relations for Social Impact
3 Credits (3)
This course aims to provide a basic understanding of the role of PR in influencing public behavior and creating positive social impact. This course offers different approaches to solving a range of social problems in the areas of health, safety, environmental protection, and community involvement.
Learning Outcomes
1. Apply social marketing theories for developing, implementing, and evaluating social marketing campaigns
2. Utilize nudge techniques to improve decisions about health, wealth, and happiness in both personal and societal levels
3. Prepare a prosocial campaign plan using social media and public relations strategies
4. Identify examples of successful social marketing campaigns

JOUR 470. Environmental, Social, & Governance Public Relations
3 Credits (3)
This course will explore how organizations create values by investigating the concept of environmental, social, and governance (ESG) and social responsibility campaigns in the light of public relations. Students will learn about philanthropy, sustainability, reputation building, and ESG for the media and entertainment industry.
Learning Outcomes
1. Understand the basic concepts and elements of Strategic Corporate Social Responsibility (Strategic CSR).
2. Understand company's value-creating activities through strategic CSR.
3. Understand company's CSR strategy under the context of economical and social exchanges
4. Understand the process of creating comprehensive strategic CSR communications plan

JOUR 476. Advertising & Public Relations Campaigns
3 Credits (3)
In this capstone course, students will utilize the principles and techniques of advertising and public relations to research and develop a comprehensive campaign plan. Students will develop a portfolio to demonstrate their skills to prospective employers. Restricted to Journalism and Media Studies Majors. May be repeated up to 3 credits.
Prerequisite: JOUR 374.
Learning Outcomes
1. Students will independently work on two projects to practice how to promote themselves and develop a professional point of view.
2. Students will create a portfolio at the end of the course that can be used to help demonstrate their skills to prospective employers.
3. Students' projects will demonstrate that they understand how to utilize the principles and techniques of advertising and PR to research and develop a comprehensive campaign plan.

JOUR 489. Media Research
3 Credits (3)
This course introduces students to the methods and applications of empirical research in mass communication. Students explore survey design, field studies, content analysis, and basic data analysis to address real-world media problems. Emphasis is placed on understanding research ethics, interpreting quantitative and qualitative data, and applying research findings to inform media strategies and evaluate communication effectiveness.
Learning Outcomes
1. Explain key research methodologies used in mass communication, including surveys, content analysis, and field studies.

2. Conduct basic empirical research by designing instruments, collecting data, and applying appropriate analytical techniques.
3. Interpret and evaluate research findings to address communication problems and inform media strategies or journalistic practices.

JOUR 490. IMC Campaign
3 Credits (3)
Capstone course utilizing all previous instruction to create and develop plans for a long-term national or local IMC (Integrated Marketing Communications) campaign. May be repeated up to 3 credits. Consent of Instructor required.
Prerequisite(s): JOUR 300 and 312 or consent of instructor.
Learning Outcomes
1. Students will learn how to create IMC campaign for client or for brands, and will be able to apply this for the real world when they apply for job.

JOUR 493. Media Law
3 Credits (3)
Examination of legal issues relating to mass media in the United States. Invasion of privacy, libel, sedition, copyright, and advertising regulation. Same as COMM 493, POLS 493.
Learning Outcomes
1. Identify and explain major legal principles, statutes, and court decisions governing mass media in the United States.
2. Analyze legal issues such as privacy, libel, copyright, and advertising regulation in the context of real or hypothetical media scenarios.
3. Evaluate the legal and ethical implications of media practices to ensure compliance with professional and constitutional standards.

JOUR 494. Special Topics
3 Credits (3)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 9 credits.
Learning Outcomes
1. Varies.

JOUR 495. Media Theory
3 Credits (3)
Theoretical approaches to media communications. Examination of media effects, audiences, and media socialization. May be repeated up to 3 credits.
Learning Outcomes
1. Trace the historical development of major media theories and explain their relevance to contemporary media landscapes.
2. Apply theoretical frameworks to analyze media content, audience behavior, and the role of media institutions in society.
3. Evaluate scholarly research and communication practices using media theory to support critical thinking and effective written communication.

JOUR 499. Independent Study in Media
1-3 Credits
Individual study directed by consenting instructor with prior approval of department head. May be repeated up to 6 credits.
Prerequisite: 2.5 GPA and consent of instructor.
Learning Outcomes
1. Varies.

JOUR 501. Global Strategic Communications: Cultural Perspective
3 Credits (3)
This course is set up to combine both theory and practice, regarding global communications, especially from cultural perspectives. Also, this course is designed for students to understand persuasive strategic communications in different nations. Markets are no longer bound with their physical locations because of the communication technologies. To successfully address the strategic communications in global market, marketers and advertisers need to fully understand “local” challenges coming “deep” from cultural, economic, regulatory and competitive differences. Based on theoretical and practical understanding of the dynamic interplay between global and local forces, students will acquire theoretical as well as practical understandings of how to accomplish the goals of strategic communications in global markets. Thus, the core objective of this class is to develop an ability to analyze and map out persuasive communication strategies that are effective in global markets.
Learning Outcomes
1. Know how to analyze cultural norms and recognize strategic communications practices that are congruent to such cultural norms.
2. Identify similarities and differences in different consumer segments according to dimensions of culture.
3. Develop a deeper understanding of cultural dimensions.
4. Implement effective market research applications in different regions of the world.
5. Conceptualize and operationalize theoretical frameworks.

L SC-LIBRARY SCIENCE

L SC 110. Reference and Information Resources I
3 Credits (3)
Overview of reference services. Introduction to, and evaluation of, basic types of information resources (both print and electronic) and their application in libraries.

L SC 111. Introduction to Information Literacy in an Electronic Environment
3 Credits (3)
Introduction to the basics of the research process; the organization, location and evaluation of information using print, non-print and electronic resources. Restricted to: Community Colleges only.

L SC 130. Introduction to Technical Services in Libraries
3 Credits (3)
Introduction to technical services in libraries, including acquisitions, bindery, cataloging, gifts, and serials. Restricted to Dona Ana campus only.

L SC 200. Collection Management and Development in Libraries
3 Credits (3)
Principles of identifying, selecting, acquiring, managing, and evaluating resources for libraries. Restricted to Dona Ana campus only.

L SC 210. Technology Planning in Libraries
3 Credits (3)
Overview of computer applications in libraries. Topics may include automated systems and electronic resources, introduction to evaluation of technology, and writing a technology plan. Restricted to Dona Ana campus only.

L SC 221. Experiential Learning I
1-3 Credits
Student is employed (paid or non-paid) in an approved work site and evaluated by their supervisor. Each credit requires a specified number of hours of on-the job work experience. Consent of Instructor required. Graded: S/U Grading (S/U, Audit). Restricted to Dona Ana campus only.
Prerequisite(s): Consent of instructor.

L SC 240. Internet Resources and Research Strategies
3 Credits (3)
Introduction to retrieving and evaluating information found on the Internet and in selected Internet-accessible databases. Restricted to: Dona Ana campus only.

L SC 255. Special Topics
1-3 Credits
Special topics to be announced in Schedule of Classes. May be repeated for a maximum of 12 credits. Restricted to: Dona Ana campus only.

L SC 298. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with prior approval of department chair. May be repeated for a maximum of 12 credits. Restricted to: Dona Ana campus only.

LANG-LANGUAGE

LANG 111. Beginning Language I
4 Credits (4)
Developing language skills through study abroad for languages not offered at NMSU main campus. Specific languages to be identified with course subtitles. Main campus only.
Prerequisite: Language placement exam or consent of the instructor.

LANG 451. Special Topics
1-3 Credits
Selected topics relating to cultures or literatures of a specific country. Credit can be applied only towards fulfilling second language requirement. Credit is not accepted towards any graduate level major or minor. May be repeated for a maximum of 12 credits. Consent of instructor required.

LANG 453. Independent Studies
1-3 Credits
Individualized, self-paced projects for advanced students. May be repeated under different subtitles for a maximum of 6 credits.
Prerequisite: consent of instructor.

LAWE-LAW ENFORCEMENT

LAWE 180. Public Safety First Line Supervisor
3-6 Credits (3-6)
This course is designed to enhance public safety personnel's human resource management and reduce organizational liability. Consent of Instructor required. Restricted to Community Colleges campuses
Learning Outcomes
1. Describe and explain police administration.
2. Explain and discuss the various leadership and management theories.
3. Define and discuss the various types of leadership skills and management styles.
4. Express and discuss the role of the police administrator and police administration.
5. Explain the leadership required of police administrators for an effective Law Enforcement administration.
6. Describe and interpret the "quality approach to managing community relations"
7. Explain and discuss the necessities of introducing organizational change.
8. Explain and discuss the planning, programming and budgetary process including: variables that affect the decision-making process.
9. Analyze and discuss the role of effective communications in a police organization including negotiations and conflict resolution. 1
10. Explain and analyze the role of human resources in the organization including: their role in the recruitment and selection process; training; performance evaluations; promotions; and assessment centers. K) Discuss the role of police unions and explain their significance in labor relations.

LAWE 201. Introduction to Juvenile Delinquency
3 Credits (3)
An introductory overview of the juvenile justice system of due process, custody, detention and release. Note: course does not meet upper division requirements towards completion of Bachelor of Science in Criminal Justice. Restricted to: Community Colleges Only.
Learning Outcomes
1. Explain the foundations of today's juvenile justice system - including the history and philosophy behind contemporary practices.
2. Identify and explain theories of juvenile offending and victimization.
3. Communicate what risk and protective factors contribute to juvenile victimization and offending.
4. Describe juvenile involvement with police, courts, and corrections.
5. Compare and contrast the effectiveness of interventions that can prevent delinquency or decrease recidivism rates.
6. Articulate and analyze potential avenues for reforming the juvenile justice system.
7. Exhibit familiarity and comfort with original source materials in the field of juvenile delinquency.
8. Demonstrate competency in writing about juvenile delinquency, utilizing original source materials.

LAWE 202. Police Patrol Procedures
3 Credits (3)
A critical review of police procedures and the influences on police behavior; policy development, including the police role; discretion; police community interaction and arrest, search and seizure. Restricted to: Community Colleges only.
Learning Outcomes
1. Define and discuss the definition of police patrol and operations including their significance within the criminal justice system.
2. Identify and discuss the special proceedings in the criminal law process including detention, arrest, as well as search and seizure.
3. Explain and discuss the exceptions to search warrant requirements including stop and frisk, search incident to arrest, consent searches, plain view doctrine, search and seizure of vehicles, and containers, as well as abandoned property.
4. Identify and explain the police patrol functions and responsibilities and the need for building credibility by maintaining ethics and integrity in the application of law.
5. Identify and discuss the most frequent incidents encountered by the law enforcement officer and the suggested method for handling.
6. List and discuss the methods, modes and techniques of conducting police patrol including goals of crime detection, keeping the peace, maintenance of equipment, and their impact on the community.
7. Review and discuss the New Mexico Uniform Traffic Laws including apprehension methods of citation, and traffic investigations.

LAWE 203. Introduction to Police Supervision
3 Credits (3)
An introductory overview of police supervision and concerns as it applies to law enforcement. (Note: Course does not meet upper division

requirements toward completion of Bachelor of Science in Criminal Justice.) Restricted to: Community Colleges only.

Learning Outcomes

1. Describe and explain police administration.
2. Explain and discuss the various leadership and management theories.
3. Define and discuss the various types of leadership skills and management styles.
4. Express and discuss the role of the police administrator and police administration.
5. Explain the leadership required of police administrators for an effective law enforcement administration.
6. Describe and interpret the "quality approach to managing community relations".
7. Explain and discuss the necessities of introducing organizational change.
8. Explain and discuss the planning, programming and budgetary process including variables affecting the decision-making process.
9. Analyze and discuss the role of effective communications in a police organization including negotiations and conflict resolution. 1
10. Explain and analyze the role of Human Resources in the organization including their role in the recruitment and selection process, training, performance and evaluations, promotions, and assessment centers. 1
11. Discuss the role of police unions and explain their significance in labor relations.

LAWE 204. Introduction to Homeland Security
3 Credits (3)

A historical perspective of international and domestic terrorist threats and the need to develop cohesive response policies and practices in the interest of National Security. Course does not meet requirements towards completion of Bachelor of Science in Criminal Justice. Restricted to: Community Colleges only.

Learning Outcomes

1. Describe the rationale for the creation of the Department of Homeland Security.
2. Analyze the purpose of the DHS, its component agencies, and their specific function and role.
3. Understand and discuss the politico-social ramifications of DHS, including legal complications and issues.
4. Discuss terrorist organizations - their rationale, motivation, methodology, and its impact on DHS.
5. Discuss intelligence efforts, to include counter-intelligence, both within the United States and internationally.
6. Describe and analyze the creation of the United States Department of Homeland Security in its proper historical context.
7. Describe and analyze methodologies utilized by DHS to achieve its goals.
8. Describe and analyze the impact of security measures on American politics, culture, and international relations.

LAWE 206. Traffic Enforcement and Crash Investigations
3 Credits (3)

History and development of traffic laws and regulations, including basic elements of traffic violations, detection, apprehension, impaired drivers and guidelines and procedures for effective crash investigations and reporting. Restricted to: Community Colleges only.

Learning Outcomes

1. Students will analyze the application of the constitutional case studies and their relationships to due process.
2. Students will analyze the relationship between ethics and morality in relation to Criminal Justice and Law Enforcement practices.
3. Students will demonstrate how to conduct a traffic stop and felony stop.
4. Students will be able to perform a standardized field sobriety test.
5. Students will demonstrate how to take measurements at a crash scene and draw a field sketch.
6. Students will research online for medi and department of motor vehicle documents and present to the class.
7. Students will complete a FEMA online class.

LAWE 207. Legal Aspects of Law Enforcement
3 Credits (3)

An evaluation of police authority including responsibilities, civil liability, liability implications, legal obligations, legal restraints, laws of arrest, and search and seizure. Restricted to: Community Colleges only.

Learning Outcomes

1. Explain what constitutes evidence, including rules of evidence and role of the prosecution and defense.
2. Analyze the sequence of events in a typical criminal trial, from arrest through pretrial including the use of witnesses and types of questioning allowed during trial.
3. Identify and explain the basic concepts of evidence used in the American legal system.
4. Explain the general concepts involving witnesses' competency and privileged communications.
5. Analyze the basic elements including credibility and impeachment as it relates to serving as both a lay and expert witness.
6. Explain the rules and exceptions to hearsay testimony.
7. Discuss and explain the law of evidence as it relates to statements including admissions and confessions made by the accused in a criminal case.
8. Analyze the Fourth Amendment as it relates to the law of search and seizure, and the exclusionary rule as it relates to lineups and other identification procedures.
9. Discuss and explain the rules surrounding circumstantial evidence and admissibility of other crimes, acts, or wrongs.

LAWE 221. Law Enforcement Internship
3 Credits (3)

Application of knowledge, skills and abilities, in an agency as an intern and integrated member of a law enforcement affiliated agency.
Prerequisite: consent of instructor.

LAWE 233. Practical Approach to Terrorism
3 Credits (3)

Gives responders an overall safety approach in recognizing and responding to incidents involving terrorism. Presents an overview in types of harm, explosive weapons, chemical weapons, biological weapons and radiological weapons. Restricted to: Community Colleges only.

Learning Outcomes

1. Define Terrorism.
2. Explain the various harm threats that pose a significant risk to response personnel.
3. Define the response challenges terrorism acts pose to response personnel.
4. Explain the management of terrorism incidents.

5. Describe the various materials used in criminal/terrorist acts.
6. Explain the importance of developing in-depth response plans.
7. Explain the importance of preparing for terrorist acts.
8. Describe the various locations that may be subject to terrorist acts.
9. Describe the warning signs that may indicate a terrorist attack. 1
10. Explain the consideration that responders face during crime scene management. 1
11. Discuss the self-protective measures used by response personnel. 1
12. Explain the decontamination process involving weapons of mass destruction.

LAWE 255. Special Topics
1-3 Credits (1-3)
Introductory special topics of lower division level work that provides a variety of timely subjects and content material. Specific subjects to be announced in the Schedule of Classes. A passing grade of C- or better is required. May be repeated up to 6 credits. Consent of Instructor required. Restricted to Community Colleges campuses
Learning Outcomes
1. Obtaining foundational skills in the administration of justice by differentiating the role of police and corrections in contemporary America.
2. Competence in the legal elements of constitutional, criminal, and substantive law, rules of evidence, search and seizure, and the role of the courts in the adjudication of the law in America.
3. Ability to identify, analyze, and synthesize knowledge from discipline-specific courses in criminalistics, legal aspects, homeland security, terrorism, and patrol operations to effectively conduct a practical field investigation and traffic crash investigation.
4. Ability to develop a criminal justice ethical perspective consistent with 21st century America to, effectively and ethically, perform a criminal justice role in law enforcement or corrections.
5. Basic crime scene management, crime scene note-taking techniques, collection of evidence, and case presentations.
6. An application of knowledge, skills, and abilities, as an intern or integrated member of a criminal justice affiliated agency.

LAWE 298. Independent Study
3 Credits (3)
Individual studies directed by the consenting faculty with prior approval of the department chair. A passing grade of C- or better is required. May be repeated up to 6 credits. Consent of Instructor required. Restricted to Community Colleges campuses
Prerequisite(s): Sophomore standing with a 3.0 or better GPA.
Learning Outcomes
1. Obtaining foundational skills in the administration of justice by differentiating the role of police and corrections in contemporary America.
2. Competence in the legal elements of constitutional, criminal, and substantive law, rules of evidence, search and seizure, and the role of the courts in the adjudication of the law in America.
3. Ability to identify, analyze, and synthesize knowledge from discipline-specific courses in criminalistics, legal aspects, homeland security, terrorism, and patrol operations to effectively conduct a practical fietd investigation and traffic crash investigation.
4. Ability to develop a criminal justice ethical perspective consistent with 21 st century America to, effectively and ethically, perform a criminal justice role in law enforcement or corrections.
5. Basic crime scene management, crime scene note-taking techniques, collection of evidence, and case presentations.
6. An application of knowledge, skills, and abilities, as an intern or integrated member of a criminal justice affiliated agency.
7. Effective communication, orally and in writing, using appropriate references and technologies.
8. Analytical and critical thinking skills when solving complex issues in criminology and the criminal justice system.
9. Competence using and applying appropriate criminological theories on crime causation. 1
10. Competence in understanding and describing how gender, race, ethnicity, age, social class, and sexuality contribute to differing experiences in the criminal justice system. 1
11. Competence in understanding how the inter-dependence of the major components of the criminal justice system (i.e., police, courts, correctional agencies) affect victims, offenders, justice professionals, and society. 1
12. Competence in understanding and applying the fundamental elements of both criminal and constitutional law. 1
13. Competence in the legal foundation of criminal justice and the importance of due process.

LIBR-LIBRARY SCIENCE

LIBR 1110. Introduction to Research
1 Credit (1)
The goal of this course is to provide students with techniques and tools to become better researchers. This course introduces students to the research process, and the organization, location, and evaluation of information.
Learning Outcomes
1. Develop a research plan based on an information need.
2. Find information efficiently and effectively using a variety of search tools.
3. Evaluate the reliability of an information resource.
4. Practice ethical behavior in using information.

LIBR 311V. Information Literacy
3 Credits (3)
Lecture, hands-on assignments, and written research projects to give students the technological skills and critical thinking abilities needed to use the printed and electronic information resources found on the Information Highway. Includes how to locate, critically evaluate, and apply information for academic, professional, and personal purposes.
Prerequisite: ENGL 1110G or equivalent; and consent of instructor.

LIBR 3996. Topics in Information Skills, Research and Scholarship
3 Credits (3)
Offered under various subtitles in the Schedule of Classes. May be taken for a maximum of 3 credits per semester and a total of 6 credits overall. May be repeated up to 6 credits.
Learning Outcomes
1. Learning outcomes will vary by subtitle.

LING-LINGUISTICS

LING 2110G. Introduction to the Study of Language and Linguistics
3 Credits (3)
This course presents an introduction to the study of language through the basic aspects of linguistic analysis: the sound system (phonetics

and phonology), the structure of words and sentences (morphology and syntax), and the ways in which language is used to convey meaning (semantics and pragmatics). In addition, the course will investigate how language is acquired and stored in the brain, and how differences in speech styles and dialects reflect different social and cultural backgrounds of individual speakers.

Learning Outcomes

1. Understand the basic concepts and terminology associated with phonetics, phonology, morphology, syntax, semantics, and pragmatics.
2. Comprehend how language evolves over history and over an individual's lifespan.
3. Describe some common, but mistaken, beliefs about language and to distinguish between descriptive and prescriptive approaches to language.
4. Describe the social, psychological, geographic and historical influences that lead to language dominance or language endangerment.
5. Be aware of the relations among various languages in the world, between dialects and slang, and between human and non-human languages.
6. Apply methods of linguistic analysis as introduced in the course.
7. Critically engage with the works of linguistic researchers.
8. Stimulate curiosity about language and what it reveals about the human mind.

LING 302V. Language and Society
3 Credits (3)
Study of how social identity including such factors as ethnicity, age, sex, education, power and socio-economic class is expressed in language systems and how misunderstandings arise between groups. Research skills are emphasized.

LING 303. Exploring Language Systems
3 Credits (3)
Forms of linguistic semantic, syntactic and phonological organization.
Prerequisite(s): LING 2110G.

LING 405. Topics in Linguistics
3 Credits (3)
Selected linguistics topics subtitled in the Schedule of Classes. May be repeated for a maximum of 6 credits under different subtitles.
Prerequisite: consent of instructor.

LING 425. Language and the Mind: Introduction to Psycholinguistics
3 Credits (3)
This course is an introduction to psycholinguistics; the study of how humans learn, represent, comprehend and produce language. Throughout this course, we address a variety of questions on the psychology of language most of which are still being answered. These include: What does it mean to know a language? What are the cognitive processes involved in language use? How do we produce and recognize speech? How can we improve texts and make them easier to read? How can we control speech in special situations to avoid errors?
Prerequisite(s): LING 2110G or consent of instructor.

LING 451. Independent Studies in Linguistics
1-3 Credits
Individual or group study of selected topics to be identified by subtitle. May be repeated for a maximum of 6 credits.
Prerequisites: LING 2110G and prior arrangement with faculty supervisor.

LING 455. Research in Linguistics
3 Credits (3)
This course will provide a capstone experience for students who have progressed through the program in linguistics and provide the foundation for further study at the post-graduate level in a linguistics-related field. Students will apply their foundation of knowledge and skills in linguistics through the realization of an individualized, inquiry-based project. Consent of instructor may enroll student only in case of elective credit shortfall with concurrent enrollment.
Prerequisite(s): LING 2110G, LING 301, LING 302V, LING 303, plus 9 credit hours of related electives.

LING 500. Introduction to Linguistics
3 Credits (3)
Survey of the main branches of linguistics: phonology, morphology, syntax, semantics, language acquisition, sociolinguistics, historical linguistics and some of the theoretical issues in the field.

LING 502. Graduate Study in Sociolinguistics
3 Credits (3)
Study of how social identity including factors such as ethnicity, age, gender education and socio-economic class is expressed in language systems.
Prerequisites: LING 2110G or LING 500 recommended.

LING 503. Exploring Language Systems- Grad
3 Credits (3)
Students will be responsible for all requirements of LING 303 and will undertake independent,directed research.
Prerequisite(s): LING 2110G or LING 500.

LING 505. Selected Topics
3 Credits (3)
Studies, varying from year to year, in linguistics.

M E-MECHANICAL ENGINEERING

M E 228. Engineering Analysis I
3 Credits (3)
Introduction to engineering analysis with emphasis on engineering applications. Topics include ordinary differential equations, linear algebra, and vector calculus with focus on analytical methods. May be repeated up to 3 credits.
Prerequisite: C- or better grades in MATH 2530G.

Learning Outcomes

1. An ability to derive differential equation models of phenomena relevant to mechanical and aerospace engineering.
2. An ability to use basic methods for solution of these ordinary and partial differential equations.
3. An ability to apply the solutions to simple analysis and design situations.

M E 234. Mechanics-Dynamics
3 Credits (3)
Kinematics and dynamic behavior of solid bodies utilizing vector methods. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better grade in the following: C E 233 and PHYS 1310G and MATH 1521G or MATH 1521H.

Learning Outcomes

1. Student will be able to apply concepts of kinematics and accelerated motion.

M E 240. Thermodynamics
3 Credits (3)
First and second laws of thermodynamics, irreversibility and availability, applications to pure substances and ideal gases.

Prerequisite: C- or better grades in PHYS 1310G.

Learning Outcomes

1. An ability to apply the first law of thermodynamics to energy systems.
2. Understanding and application of thermodynamic concepts and properties to analyze systems with pure substances and ideal gases.

M E 261. Numerical Methods

3 Credits (2+3P)

Introduction to programming syntax, logic, and structure. Numerical techniques for root finding, solution of linear and nonlinear systems of equations, integration, differentiation, and solution of ordinary differential equations will be covered. Multi function computer algorithms will be developed to solve engineering problems. May be repeated up to 3 credits.

Prerequisite: C- or better grades in MATH 1521G or MATH 1521H or ENGR 190.

Learning Outcomes

1. Ability to use a variety of numerical methods in both basic and advanced engineering calculations.
2. Ability to formulate algorithms and write programs to solve engineering problems.
3. Ability to develop an appreciation for the hazards and limitations of numerical solutions, including accuracy, stability, and computer limitations of memory and speed.

M E 326. Mechanical Design

3 Credits (3)

Kinematics and dynamics of machinery, analytical and computer-aided design of kinematics, mechanism synthesis involving linkages, cam and gear design, and motion analysis and balancing of forces. Project-based learning of multi-mechanism system design, analysis, fabrication, and evaluation. May be repeated up to 3 credits.

Prerequisite: C- or better in ENGR 234 and C E 301.

Learning Outcomes

1. An ability to perform motion analysis of mechanisms involving various mechanical components such as linkages, cams, and gears.
2. An ability to analyze and balance dynamic forces in machines.
3. Knowledge of how to design mechanism synthesis that can function as required in machines.
4. Understanding of ethics and professional responsibilities in engineering design.

M E 328. Engineering Analysis II

3 Credits (3)

Advanced engineering analysis with emphasis on engineering applications. Topics include systems of ordinary differential equations, Fourier analysis, partial differential equations, and functions of complex variable with focus on analytical methods.

Prerequisite: C- or better grades in M E 228.

Learning Outcomes

1. An ability to use basic properties of Laplace Transforms and apply to initial value problems.
2. Understanding of basics of phase space analysis for ordinary differential equations.
3. An ability to obtain Fourier Series representations of functions.
4. An ability to apply the method of separation of variables to solve linear homogeneous partial differential equations.
5. An ability to perform basic operations involving complex numbers.

M E 331. Intermediate Strength of Materials

3 Credits (3)

Covers stress and strain, theories of failure, curved flexural members, flat plates, pressure vessels, buckling, and composites. May be repeated up to 3 credits.

Prerequisite: C E 301 and M E 328.

Learning Outcomes

1. An ability to perform stress and strain analysis for bending of straight and curved beams, torsion of prismatic bars, and complex loading cases.
2. Application of governing equations of elasticity.
3. Use of common failure theories for failure prediction of ductile metals.

M E 332. Vibrations

3 Credits (3)

Vibration of single and n-degree of freedom systems considering free, forced, and damped motion. Lagrange s equations. Dynamic stability. Controls. Matrix iteration. May be repeated up to 3 credits.

Prerequisite: M E 328, ENGR 234, and M E 261.

Learning Outcomes

1. Ability to analyze free and forced vibrations of a single degree-of-freedom (DOF).
2. Ability to analyze free and forced vibrations of multi-DOF systems.
3. Ability to perform modal analysis for engineering structures to understand mechanical vibrations in terms of normal modes.

M E 333. Intermediate Dynamics

3 Credits (3)

Three dimensional kinematics and kinetics, orbal motion, Lagrange s equations, dynamic stability, and controls. May be repeated up to 3 credits.

Prerequisite: M E 328 and ENGR 234.

Learning Outcomes

1. An ability to derive the equations of motion for particles and rigid bodies based on analytical dynamics theories.
2. Analysis of linear / nonlinear dynamical systems with their equations of motion by finding the associated solutions and by performing simulations.
3. Application of dynamics theory to engineering applications in vehicle dynamics, gyroscopes, aircraft / spacecraft dynamics, and celestial mechanics.

M E 338. Fluid Mechanics

3 Credits (3)

Properties of fluids. Fluid statics and fluid dynamics. Applications of the conservation equations continuity, energy, and momentum to fluid systems.

Prerequisite: C- or better grade in ENGR 234 and in (M E 228 or MATH 3160).

Learning Outcomes

1. Ability to apply knowledge of mathematics, science, and engineering.
2. Ability to design and conduct experiments, as well as to analyze and interpret data.
3. Ability to design a system, component or process to meet desired needs within realistic constraints.
4. Ability to identify, formulate, and solve engineering problems.

M E 340. Applied Thermodynamics

3 Credits (3)

Thermodynamic cycles, availability, Maxwell relations, Gibbs and Helmholtz functions, mixtures, psychrometrics, implications for engineering materials.

Prerequisite: C- or better grades in M E 240.

Learning Outcomes

1. A thorough understanding of the transfer of work, heat, and energy by various thermodynamic processes in open and closed systems, and which processes and allowed and not allowed, and spontaneous and non-spontaneous.
2. An applied knowledge predicated on the four laws of thermodynamics and application to work producing and consuming devices where efficiency must optimized by selection of appropriate fuels, energy sources, working fluids, and design considerations for engineering devices such as nozzles, turbines, condensers, diffusers, regenerators, intercoolers, and feedwater systems.
3. The skills necessary to be successful in their professional duties in employment or further educational pursuits related to the automotive, commercial aviation, space, and energy sectors, and to be able to clearly identify, communicate, formulate, analyze, and deduce solutions to technical problems in the field of thermodynamics with peers in engineering and allied fields.

M E 341. Heat Transfer

3 Credits (3)

Heat balance equation. Fundamentals of conduction, convection, and radiation. Design of heat transfer systems.

Prerequisite: C- or better grades in M E 240 and in (M E 338 or A E 339).

Learning Outcomes

1. A thorough understanding of the three modes of heat transfer (conduction, convection, and radiation).
2. Basic knowledge required to apply heat transfer principles to practical and contemporary engineering problems (primarily in thermal management of electronics such as in data centers and smart phones, buildings, automobiles, and energy and power generation systems).
3. The skills necessary to be successful in their professional duties in employment or further educational pursuits and be able to clearly identify, communicate, formulate, analyze, and deduce solutions to technical problems in the field of heat transfer.

M E 345. Experimental Methods I

3 Credits (2+3P)

Emphasis on experimental techniques, basic instrumentation, data acquisition and analysis, and written presentation of results. Includes experiments in dynamics and deformable body mechanics. May be repeated up to 3 credits.

Prerequisite: C- or better grades in (M E 228 or MATH 3160), in (ENGR 140 or PHYS 2140), and in ENGR 234.

Prerequisite/Corequisite: C E 301.

Learning Outcomes

1. A thorough understanding of how to work in a laboratory with a focus on safety (use of PPE, waste disposal, and knowledge of common laboratory hazards and their mitigation).
2. An ability to implement good laboratory practice (GLP) to ensure proper documentation of results, accuracy of results, and adherence to written procedures to allow replication of results.
3. Hands-on laboratory skills using lab equipment (sensors, data-recording software, scales, calipers, micrometers, strain gages, tensile testing machines/load cells, vibration generators, oscilloscopes, function generators, power supplies, Wheatstone bridges, physical reference standards, and specimen preparation equipment) along with various tools and equipment accessories.
4. An ability to corroborate experimental findings with theoretical predictions.
5. An ability to apply the scientific method to experiments, including hypothesis, deduction, extrapolation (trend analysis), and inference.
6. Experience reducing data including error analysis, basic statistics, basic plotting and graphing, outlier identification, propagation of errors, SI/English units, and appropriate use of implied precision and significant figures.
7. Technical writing skills as a team and individual, effective team presentation skills, and delivering peer review.

M E 349. MAE Career Seminar

1 Credit (1)

Seminar course covering topics relevant to mechanical and aerospace engineering juniors (job placement, interviewing techniques, resume preparation, etc.). May be repeated up to 3 credits. Restricted to: M E and A E majors.

Prerequisite: Sophomore Standing.

Learning Outcomes

1. Students will learn how to prepare for their future career by learning job placement, resume preparation, interview skills, and others.

M E 400. Undergraduate Research

1-3 Credits

Performed with the direction of a department faculty member. May be repeated for a maximum of 6 credits.

Prerequisite: consent of faculty member.

M E 401. Building Energy and Environment

3 Credits (3)

Building energy and greenhouse gas emissions; energy usage distribution in residential and commercial buildings, HVAC, other end use entities (lighting, water heating, refrigeration, and computers and electronics), energy efficiency in buildings, indoor air quality, air filtration and purification, economics.

Prerequisite: C- or better grades in M E 340 and M E 341.

Learning Outcomes

1. Understanding of the energy usage in buildings and their impact on the environment.
2. Calculation of the energy loads for various end use entities and understand their role in building energy.
3. Analysis of HVAC systems and heat transfer and apply the knowledge for realizing energy efficiency in buildings.
4. An ability to write a technical term paper discussing the current and future trends on the topics of building energy and environmental impact and indoor air quality.

M E 405. Special Topics

3 Credits (3)

Topics of modern interest to be offered by the departmental staff. May be repeated up to 12 credits.

Prerequisite(s): Senior standing.

M E 425. Design of Machine Elements

3 Credits (3)

Design and analysis of machinery for load-bearing and power transmission by considering material failure modes such as yielding, fracture, and fatigue. Design and selection of machine elements including threaded fasteners, springs, rolling-element bearings, cams, gears and friction drives.

Prerequisite: C- or better grades in M E 326.

Learning Outcomes

1. An ability to incorporate analysis and design methods for designing and prototyping machine elements.

2. An ability to recognize the design process, to breakdown this complex process into a series of simple tasks, and to carry out those tasks to achieve the desired design.
3. Knowledges of how to apply the industrial specifications and requirements regarding the design of machine elements.
4. Implementation of these knowledge and experiences to real-world engineering projects with finite element method.

M E 445. Experimental Methods II
3 Credits (2+3P)
Emphasis on experimental techniques, instrumentation and data acquisition in fluid mechanics, heat transfer, and thermodynamics. Laboratory results will be presented in written and verbal formats. May be repeated up to 3 credits.
Prerequisite: C- or better grades in (M E 338 or A E 339), M E 340, M E 341, and M E 345.
Learning Outcomes
1. A thorough understanding of how to work in a laboratory with a focus on safety (use of PPE, waste disposal, and knowledge of common laboratory hazards and their mitigation).
2. An ability to implement good laboratory practice (GLP) to ensure proper documentation of results, accuracy of results, and adherence to written procedures to allow replication of results.
3. Hands-on laboratory skills using lab equipment (sensors, data-recording software, scales, calipers, micrometers, straingages, tensile testing machines/load cells, vibration generators, oscilloscopes, function generators, power supplies, Wheatstone bridges, physical reference standards, and specimen preparation equipment) along with various tools and equipment accessories.
4. An ability to corroborate experimental findings with theoretical predictions.
5. An ability to apply the scientific method to experiments, including hypothesis, deduction, extrapolation (trend analysis),and inference.
6. Experience reducing data including error analysis, basic statistics, basic plotting and graphing, outlier identification, propagation of errors, SI/English units, and appropriate use of implied precision and significant figures.
7. Technical writing skills as a team and individual, effective team presentation skills, and delivering peer review.

M E 452. Control System Design
3 Credits (3)
Introduction to the control of dynamical systems, with a focus on mechanical and aerospace systems, including basic systems theory, controllability / observability, feedback and stabilization, PID controls, root-locus plot, and Bode diagram. May be repeated up to 3 credits.
Prerequisite: M E 261, M E 328 and ENGR 234.
Learning Outcomes
1. Construction of a block diagram of control systems to find a transfer function for a dynamical system.
2. Analysis of control systems by utilizing various linear control theories such as root-locus design method, bode, and lead / lag compensation techniques.
3. Design and simulation of PID control systems for mechanical / aerospace engineering applications.
4. Derivation of state space representation of a dynamical systems.

M E 456. Experimental Modal Analysis
3 Credits (3)
Emphasis on hands-on techniques for structural vibration tests for practical applications. Interpretation of experimental results by means of advanced signal processing tools, basic system identification methodology, and reduced-order modeling procedures.
Prerequisite: M E 328 and M E 261 or consent of instructor.
Learning Outcomes
1. An ability to understand fundamentals of linear vibrations theory for discrete and continuous systems.
2. An ability to perform basic numerical and experimental modal analysis of structures.
3. An ability to utilize basic and advanced signal processing tools.
4. An ability to extract system parameters for a mathematical model from a physical model.

M E 457. Engineering Failure Analysis
3 Credits (3)
Introduction to failure theories and causes. Topics include general procedures for failure analysis, ductile and brittle modes of failure, elements of fracture mechanics, fractography, and failures in various engineering applications due to fatigue, wear, corrosion, design or processing defects.
Prerequisite: Grade of C- or better in C E 301 and CHME 361 or consent of instructor.
Learning Outcomes
1. An ability to systematically conduct failure analysis, identify cause(s) of failure, suggest remedial steps to prevent failures and/or improve performance for a variety of engineering applications involving metals, polymers, ceramics and composites.
2. Use of skills and knowledges in any industry and engineering applications such as in aerospace, mechanical, microelectronics, construction, chemical, automotive, energy, and medical areas.

M E 458. Properties and Mechanical Behavior of Materials
3 Credits (3)
Understanding the microstructure of engineering materials and their influence on mechanical behavior. Topics include Material Structure and Physical Properties, Thermodynamics and Kinetics of Materials, Mechanical Properties, Strengthening Mechanisms, Time and Temperature Dependent Behavior, Degradation, Fatigue, and Fracture.
Prerequisite: (Grade of C- or better in C E 301 and CHME 361) or consent of instructor.
Learning Outcomes
1. An ability to correlate mechanical behavior of materials with their microstructure, processing history and composition.
2. An ability to recognize impact of operating conditions, predict life span, and design materials to improve reliability and efficiency.
3. An ability to select appropriate materials for a given application from class of materials such as metals, polymers, ceramics and composites.

M E 460. Applied Finite Elements
3 Credits (3)
Introduction to the practical aspects of structural finite element modeling. Course focuses on providing a working knowledge of how to effectively incorporate finite element techniques into the design process.
Corequisite: M E 425 or consent of instructor.
Learning Outcomes
1. Use of direct stiffness and potential energy approaches to assemble global system of linear equations for static elastic and steady state heat transfer problems (bar, beam, plane stress / strain elements).

2. An ability to solve the global system of linear equations for unknown degrees of freedom (displacements or temperatures).
3. An ability to postprocess the solution to find stresses, strains, or temperature gradients.
4. An ability to solve two-dimensional and three-dimensional problems of elasticity and heat transfer using commercial general purpose finite element analysis software.

M E 481. Alternative and Renewable Energy
3 Credits (3)
Current and future energy needs of the United States and the world will be considered primarily from the standpoint of renewable energy sources such as solar, wind, ocean, and biomass. Technical, economic, and environmental aspects of each technology will be addressed.
Prerequisite: (M E 338 or A E 339) and M E 340 or consent of instructor.
Prerequisite/Corequisite: M E 341.
Learning Outcomes
1. Understanding of current and future energy needs of the United States and the whole world.
2. Understanding of the role of renewable and alternative energy sources such as solar, wind, ocean, and biomass.
3. An ability to conduct basic techno-economic analysis of various renewable and alternative energy technologies.

M E 483. Introduction to Combustion
3 Credits (3)
Introduction to combustion kinetics, combustion thermochemistry, flame dynamics, flame stability, and pollutant formation. Course coverage includes laminar and turbulent flames, premixed and diffusion flames, and detonations. Emphasis is placed on the role of chemical kinetics, heat transfer, mass transfer, and fluid dynamics on flame structure and flame stability. May be repeated up to 3 credits.
Prerequisite: M E 228 and M E 340 or consent of instructor.
Learning Outcomes
1. Understanding of reaction rates of chemical processes.
2. Derivation of simplified reactor models based on coupled chemical and thermal analysis.
3. Knowledge of conservation / transport equations for reacting flows.
4. Calculation of structure and propagation limits of laminar premixed combustion waves.
5. Analysis of structure and controlling processes in laminar diffusion flames, time and spatial scales in turbulent flames, and basic issues in turbulent combustion.

M E 486. Introduction to Robotics
3 Credits (3)
This course provides students with an introduction to the theories and methods for analysis, design, and control of robotic manipulators. This course is devoted to understanding the spatial descriptions and transformations, kinematics, and dynamics of these mechanisms and how to practically implement these concepts into actual robotic manipulators.
Prerequisite: M E 328 and ENGR 234.
Learning Outcomes
1. An ability to develop spatial description and transformations of rigid body motion and coordinate frames.
2. An ability to derive the kinematics and dynamics of robotic manipulators in forward and inverse forms.
3. An ability to plan motion and trajectories, program, and control these robotic platforms.
4. Application of the theoretical methods into industrial robots, and implementation of the knowledge and experiences to real-world engineering projects.

M E 487. Mechatronics
3 Credits (2+3P)
Introduction to the analysis and design of computer-controlled electromechanical systems, including data acquisition and conversion, force and motion sensors, actuators, mechanisms, feedback control, and robotic devices. Students required to work in teams to construct and test simple robotic systems.
Prerequisite: M E 345.
Learning Outcomes
1. An ability to define a mechatronic system and its primary elements.
2. An ability to exercise a computational model of the mechatronic system and evaluate the system response.
3. An ability to design, formulate and implement an appropriate closed-loop controller.
4. An ability to design and demonstrate a functional physical device that solve a practical problem while meets system requirements.
5. Knowledge of contemporary issues.

M E 502. Elasticity I
3 Credits (3)
Introduction to the theory of elastic media with emphasis on understanding the fundamental principles and solution methods used in the analysis of elastic solids and structures. Cartesian tensors are introduced for formulations of general deformations and states of stress. May be repeated up to 3 credits.
Learning Outcomes
1. An ability to understand the fundamental principles and solution methods used in the analysis of elastic solids and structures.
2. Use of cartesian tensors for formulations of general deformations and states of stress.

M E 503. Thermodynamics
3 Credits (3)
A comprehensive study of the first and second laws of thermodynamics, nonequilibrium processes, equations of state, and statistical thermodynamics.
Prerequisite: C- or better grade in M E 340 or consent of instructor.
Prerequisite/Corequisite: M E 570.
Learning Outcomes
1. Application of 1st law and 2nd law of thermodynamics to closed and open systems for analysis of thermodynamic cycles with and without phase change and for pure substances and mixtures as the working fluids.
2. Understanding of thermodynamic properties and their relationships, thermodynamics equilibrium and stability.
3. Understanding of the basics of statistical thermodynamics and its differences from classical thermodynamics.

M E 504. Continuum Mechanics
3 Credits (3)
Introduction to the fundamentals of the mechanics for continuous media. This covers the concepts and general principles common to all branches of mechanics to facilitate further study in various fields such as elasticity, plasticity, fluid, and continuum damage mechanics. Computational aspects of the theory are also discussed. May be repeated up to 3 credits.

Learning Outcomes

1. An ability to understand the fundamentals of the continuum mechanics, which covers the concepts and general principles common to all branches of mechanics to facilitate further study in various fields such as elasticity, plasticity, fluid, and continuum damage mechanics.

M E 509. Individualized Study
3 Credits (3)
Individualized study covering specialized topics in mechanical and aerospace engineering. Consent of instructor required.

M E 510. Special Topics
1-6 Credits
Topics in mechanical engineering. May be repeated for a maximum of 6 credits.
Prerequisite: consent of the department head.

M E 511. Dynamics
3 Credits (3)
An advanced study of the dynamical behavior of systems of particles and rigid bodies, with emphasis on the theoretical background of dynamics.
Prerequisite: ENGR 234 and M E 328.
Learning Outcomes

1. Knowledge of the techniques to describe the motion of mechanical systems.
2. Ability to derive the equations of motion of dynamical systems.
3. Understanding of the difference between several methodologies used to derive the governing equations of systems.
4. Ability to find and classify the dynamical responses of systems.

M E 512. Vibrations
3 Credits (3)
Free and forced vibrations for discrete and continuous systems with single or multiple degrees of freedom. Introduction to nonlinear and random vibration and solution techniques for such systems.
Prerequisite: M E 511 or consent of instructor.
Learning Outcomes

1. Ability to derive equations of motion of single- and multi-degree-of-freedom (DOF) systems.
2. Ability to analyze free and forced vibrations of single- and multi-DOF systems.
3. Ability to perform modal analysis of single- and multi-DOF systems.
4. Ability to derive equations of motion of continuous systems including beams, strings, and rods.
5. Ability to solve the governing equations of motion for several dynamical systems.

M E 517. Nonlinear Dynamics and Chaos
3 Credits (3)
Singular points, periodic solutions, stability, and local bifurcations for ODEs and maps; phase space methods, invariant manifolds, and Poincare maps; nonsmooth, periodic, time-delay, and Hamiltonian systems; perturbation, averaging, and harmonic balance methods; center manifold reduction and normal forms; strange attractors, Liapunov exponents, attractor dimension; dissipative and Hamiltonian chaos. May be repeated up to 3 credits.
Learning Outcomes

1. Ability to qualitatively and quantitatively understand and determine the dynamical response of nonlinear systems.
2. Understanding of various nonlinear behaviors and concepts.
3. Ability to use several perturbation techniques to solve the governing equations of motion.
4. Ability to characterize the response of a nonlinear dynamical system.

M E 518. Finite Element Analysis
3 Credits (3)
Introduction to finite element method. Topics include mathematical modeling, variational formulation, shape functions, truss, beam, solid, and shell elements. Includes static, dynamic, and nonlinear analysis.

M E 527. Linear Systems Theory
3 Credits (3)
Introduction to control of linear multi-input-multi-output (MIMO) systems. Topics include representation of system dynamics using the state-space model, linearization, internal and input-to-output stability, controllability, observability, optimal control, linear quadratic regulator, and observer.
Prerequisite: M E 452 or A E 452 or consent of instructor.
Learning Outcomes

1. Modeling of linear dynamical systems using state space methods.
2. Analysis of stability, controllability, and observability of linear systems.
3. Design of controllers and observers for linear systems using pole placement methods.

M E 530. Intermediate Fluid Mechanics
3 Credits (3)
Application of exact and empirical solutions to fundamental flow problems, including viscous and inviscid behavior. These applications establish a theoretical basis for the origin and physical role of common terms in the governing equations.
Prerequisite: M E 338 or A E 339 or consent of instructor.
Learning Outcomes

1. A basic knowledge of incompressible, viscous flows of Newtonian fluids, boundary layers and boundary layer behavior, vortex dynamics and 1D isentropic compressible flows, shocks and expansion waves.

M E 533. Numerical Methods for Fluid Mechanics and Heat Transfer
3 Credits (3)
Development of numerical techniques for the solution of ordinary and partial differential equations that arise in heat transfer and fluid mechanics; classification of equations, methods of solutions, examples.
Prerequisite: M E 530 or consent of instructor.
Learning Outcomes

1. An ability to understand fundamental aspects of solving differential equations using finite difference methods.
2. An ability to understand fundamental concepts such as stability, accuracy, consistency, systematic errors (phase/amplitude errors), artificial diffusion, etc.
3. An ability to implement and test algorithms for the solution of ordinary and partial differential equations.
4. An ability to develop ability to analyze numerical results and report results in a meaningful way.

M E 536. Hydrodynamic Stability and Turbulence
3 Credits (3)
Introduction to fundamentals of hydrodynamic stability, classical linear stability analysis of parallel shear flows and rotating flows, nonlinear stability, basic concepts in turbulence theory.
Prerequisite/Corequisite: M E 530.

Learning Outcomes

1. An ability to understand fundamentals of hydrodynamic stability.
2. An ability to apply classical linear / nonlinear stability analysis of parallel shear flows and rotating flows.
3. Understanding of basic concepts in turbulence theory.

M E 540. Intermediate Heat Transfer
3 Credits (3)

Fundamentals of conduction, convection, and radiation heat transfer. Emphasis on the application of combined heat transfer to the solution of problems not accessible at the undergraduate level.

Prerequisite: M E 341.

Prerequisite/Corequisite: M E 570.

Learning Outcomes

1. An ability to solve heat transfer problems involving conduction, convection, and radiation.
2. Use of algebra and differential and integral calculus to obtain solutions to heat transfer problems.
3. Understanding of the final solution for a heat transfer problem and predict its correctness using fundamental heat transfer principles.

M E 557. Engineering Failure Analysis
3 Credits (3)

Introduction to failure theories and causes. Topics include general procedures for failure analysis, ductile and brittle modes of failure, elements of fracture mechanics, fractography, and failures in various engineering applications due to fatigue, wear, corrosion, design or processing defects. May be repeated up to 3 credits.

M E 558. Properties and Mechanical Behavior of Materials
3 Credits (3)

Understanding the microstructure of engineering materials and their influence on mechanical behavior. Topics include Material Structure and Physical Properties, Thermodynamics and Kinetics of Materials, Mechanical Properties, Strengthening Mechanisms, Time and Temperature Dependent Behavior, Degradation, Fatigue, and Fracture. May be repeated up to 3 credits.

Prerequisite: CHME 361.

M E 570. Engineering Analysis I
3 Credits (3)

Introduction to engineering analysis with emphasis on engineering applications. Topics include linear algebra, linear ordinary differential equations, and linear partial differential equations with focus on analytical methods.

Prerequisite: M E 328 or PHYS 395 or equivalent.

Learning Outcomes

1. Proficient knowledge of Laplace Transforms and application to initial value problems.
2. Basic knowledge of phase space analysis for ODEs.
3. Proficient knowledge of Fourier Series representations of functions, and basic knowledge of Fourier Transforms.
4. Proficient knowledge of linear, homogeneous boundary value PDEs; basic knowledge of nonhomogeneous BVP, Poisson's equation and Green's Functions.
5. Proficient knowledge of elementary complex functions, basic knowledge of theory of analytic functions, contour integral theorems, Laurent Series and Residue Theorem.

M E 583. Introduction to Combustion
3 Credits (3)

Introduction to combustion kinetics, combustion thermochemistry, flame dynamics, flame stability, and pollutant formation. Course coverage includes laminar and turbulent flames, premixed and diffusion flames, and detonations. Emphasis is placed on the role of chemical kinetics, heat transfer, mass transfer, and fluid dynamics on flame structure and flame stability. May be repeated up to 3 credits.

Prerequisite: (M E 228 and M E 340) or consent of instructor.

Learning Outcomes

1. Understanding of reaction rates of chemical processes.
2. Derivation of simplified reactor models based on coupled chemical and thermal analysis.
3. Knowledge of conservation / transport equations for reacting flows.
4. Calculation of structure and propagation limits of laminar premixed combustion waves.
5. Analysis of structure and controlling processes in laminar diffusion flames, time and spatial scales in turbulent flames, and basic issues in turbulent combustion.

M E 586. Introduction to Robotics
3 Credits (3)

This course provides students with an introduction to the theories and methods for analysis, design, and control of robotic manipulators. This course is devoted to understanding the spatial descriptions and transformations, kinematics, and dynamics of these mechanisms and how to practically implement these concepts into actual robotic manipulators.

Prerequisite: M E 328 and ENGR 234 or consent of instructor.

Learning Outcomes

1. An ability to develop spatial description and transformations of rigid body motion and coordinate frames.
2. An ability to derive the kinematics and dynamics of robotic manipulators in forward and inverse forms.
3. An ability to plan motion and trajectories, program, and control these robotic platforms.
4. Application of the theoretical methods into industrial robots, and implementation of the knowledge and experiences to real-world engineering projects.

M E 587. Mechatronics
3 Credits (2+3P)

Introduction to the analysis and design of computer-controlled electromechanical systems, including data acquisition and conversion, force and motion sensors, actuators, mechanisms, feedback control, and robotic devices. Students required to work in teams to construct and test simple robotic systems. Crosslisted with: M E 487.

Prerequisite: M E 345.

Learning Outcomes

1. An ability to define a mechatronic system and its primary elements.
2. An ability to exercise a computational model of the mechatronic system and evaluate the system response.
3. An ability to design, formulate and implement an appropriate closed-loop controller.
4. An ability to design and demonstrate a functional physical device that solve a practical problem while meets system requirements.
5. Knowledge of contemporary issues.

M E 598. Special Research Programs
1-3 Credits

Individual investigations, either analytical or experimental. May be repeated for a maximum of 6 credits.

M E 599. Master's Thesis
15 Credits
Thesis.

M E 600. Doctoral Research
1-15 Credits
This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination.

M E 698. Special Research Programs
1-3 Credits
May be repeated for a maximum of 6 credits.

M E 700. Doctoral Dissertation
15 Credits
Dissertation.

MAT-AUTOMATION & MANUFACTURING

MAT 101. General Industry Safety
1 Credit (1)
Overview of general industry safety for entry-level individuals. Students will have the opportunity to earn a 10-hour general industry OSHA card. Restricted to Community Colleges campuses only.
Learning Outcomes
1. Discuss the general history of OSHA.
2. Discuss the general history of the U.S. safety movement.
3. Utilize the OSHA web site as a basic safety resource.
4. Recognize industry-related hazards.
5. Identify industry-related hazards.
6. Avoid industry-related hazards.
7. Follow proper basic first aid procedures in an emergency.
8. Avoid exposure to blood-borne pathogens in an emergency situation.
9. Interpret hazard communication. 1
10. Recognize proper lifting techniques. 1
11. Recognize personal protective equipment.

MAT 102. Print Reading for Industry
3 Credits (2+2P)
Reading, interpretation, and revisions of industrial technical drawings common to manufacturing, Aerospace, machine parts, electrical, hydraulic, and pneumatic drawings. Interpretation of engineering drawings and related shop calculations.
Learning Outcomes
1. Recognize fundamentals of shape descriptions.
2. Recognize fundamentals of size description and annotations.
3. Recognize industrial drawing types.
4. Recognize Industrial drawing types.
5. Understand basic geometric dimensioning and tolerances practices that applied to working drawings.
6. Identify standard threads and fasteners callouts and specifications.

MAT 105. Introduction to Manufacturing
3 Credits (2+2P)
Introduction to manufacturing evolution from basic assembly process to modern automated processes. Covers history, employability, soft skills, quality measurements, teamwork concept, production requirements, and considerations in plan layout and design. Minimum math proficiency of CCDM 114 required or math placement into MATH 1215 or higher. Restricted to: Community Colleges only.
Learning Outcomes
1. Classify Hazardous Materials.
2. Perform an Electrical Lockout/Tagout.
3. Locate and Interpret a Safety Data Sheet.
4. Interpret a Hazardous Material Identification Label.

MAT 106. Applied 3D Manufacturing Practices
3 Credits (2+2P)
Introduction to part production and manufacturing utilizing 3D printing processes. Introduction to creating 3D solid models utilizing CAD software and the creation of 3d printed parts utilizing filament or resin style 3D printers. Students will learn how to make selected parts starting from drawings/prints to completed projects. Basic elements of quality control will be introduced.
Learning Outcomes
1. Produce 3D solid models in CAD Software.
2. Read basic 2D technical drawings.
3. Manage Electronic files.
4. Utilize slicing software to prepare 3D solid models for 3d printing.
5. Apply industry standard design practices to produce desired 3D printed parts.
6. Produce 3D printed parts.
7. Apply elements of quality control in the 3D printing process.

MAT 110. Machine Operation and Safety
3 Credits (2+2P)
Introduction to the operation and safety aspects of various types of machinery and equipment, including both mechanical and electrical machines, Rigid Tubing, and Flexible Lines. Maintenance and safety operation of industrial equipment will also be covered. Restricted to: Community Colleges only. Crosslisted with: AERT 115
Learning Outcomes
1. Identify and analyze potential hazards associated with the operation of machinery and equipment, and apply appropriate safety measures to mitigate risks.
2. Demonstrate proficiency in implementing safety protocols and procedures when operating machinery and equipment, adhering to industry standards and regulations.
3. Apply critical thinking and problem-solving skills to troubleshoot issues related to the operation and safety of machinery and equipment, fostering a proactive approach to maintenance and risk management.
4. Gain practical skills in the maintenance and upkeep of industrial equipment, ensuring optimal performance, reliability, and safety.
5. Foster a safety-oriented mindset by recognizing the importance of personal protective equipment (PPE), safe work practices, and the responsibility to create a secure working environment for oneself and others.
6. Gain a deep understanding of file management principles, including folder structures, naming conventions, and version control, to ensure easy accessibility and retrieval of files.

MAT 130. Applied Industrial Electricity I
4 Credits (3+2P)
Electrical safety, AC and DC circuits, use and care of common measuring instrumentation, schematic and wiring diagrams, electromagnetism, National Electric Code branch circuits. Restricted to: Community Colleges only.
Prerequisite(s): MATH 1215 or ELT 120 or OETS 118.

MAT 135. Applied Industrial Electricity II
4 Credits (3+2P)
Relationship between motor power, speed, and torque, basic application of relay circuits, motor control circuits, inductance and capacitance factors, transformers, solid state devices circuits and applications. Restricted to: Community Colleges only.
Prerequisite(s): MAT 130.

MAT 221. Cooperative Experience I
1-6 Credits
Supervised cooperative work program. Student is employed in an approved occupation and rated by employer and instructor. Student meets in a weekly class. Graded S/U.
Prerequisite: consent of instructor.

MAT 234. Industrial Electricity Maintenance
3 Credits (2+2P)
Introduction into electrical systems, theory and uses for the different types of motors used in the industry and related industrial safety practices. DC, AC stepper and servo motors, motor speed and torque, motor performance, and efficiency, motor control fundamentals using variable frequency drives, vector controls, servo and stepper drives. Restricted to: Community Colleges only.

MAT 265. Special Topics
1-6 Credits
Course subtitled in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes
1. Learning goals will vary with the special topic selected for the course.

MATH-MATHEMATICS

A student may not receive credit for a lower-division mathematics course if it serves as a prerequisite to a lower-division math course that the student had previously passed with a grade of C- or better.

Students without adequate placement to enroll in MATH 1134, MATH 1215 or MATH 1130G can gain admission to the course by earning a C- or better in CCDM 114 N at an NMSU Community College campus, or in ARSC 1120.

Students wishing to enroll in MATH 1220G, MATH 1430G, MATH 1511G, MATH 1521G, or MATH 1350G must satisfy one of the following:

1. have passed the stated prerequisite course or an equivalent transfer course with a C- or better
2. have placed into the course with an adequate ACT Math score or through the Mathematics Placement Examination (MPE), the results of which will be made available to the student's advisor. The MPE is given daily in Walden Hall when school is in session and during new student orientation programs.

MATH 1130G. Survey of Mathematics
3 Credits (3)
This course will develop students' ability to work with and interpret numerical data, to apply logical and symbolic analysis to a variety of problems, and/or to model phenomena with mathematical or logical reasoning. Topics include financial mathematics used in everyday life situations, statistics, and optional topics from a wide array of authentic contexts.
Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in CCDM 113 N or CCDM 114 N.
Learning Outcomes
1. Construct and analyze graphs and/or data sets: Gather and organize information; Understand the purpose and use of various graphical representations such as tables, line graphs, tilings, networks, bar graphs, etc.; Interpret results through graphs, lists, tables, sequences, etc.; Draw conclusions from data or various graphical representations.
2. Use and solve various kinds of equations: Understand the purpose of and use appropriate formulas within a mathematical application; Solve equations within a mathematical application; Check answers to problems and determine the reasonableness of results.
3. Understand and write mathematical explanations using appropriate definitions and symbols: Translate mathematical information into symbolic form; Define mathematical concepts in the student's own words; Use basic mathematical skills to solve problems.
4. Demonstrate problem solving skills within the context of mathematical applications; Show an understanding of a mathematical application both orally and in writing; Choose an effective strategy to solve a problem; Gather and organize relevant information for a given application.

MATH 1134. Fundamentals of Elementary Mathematics I
3 Credits (3)
Numbers and the four operations of arithmetic. Understanding and comparing multiple representations of numbers and operations, in particular how these representations build from whole numbers to integers to fractions and decimals. Applying properties of numbers and operations in contextual situations. Reasoning, communicating, and problem solving with numbers and operations. Applications to ratio, and connections with algebra. Taught primarily through student activities and investigations. Restricted to: EDUC,EPAR,E ED,ECED majors.
Prerequisite: C- or better in ENGL 1110G; adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1215.
Learning Outcomes
1. As future elementary teachers you will be teaching mathematics to children.
2. In order to teach a subject well you need not only to know the material that you will teach, but you need to know more than what you will teach, and know it well,in order to be able to answer questions, understand student reasoning, give alternate explanations when your students do not understand something, and be able to adjust to changes in the mathematical curriculum.
3. Furthermore, even if you hope to teach a given grade, you should be prepared to teach a variety of grades since what a person ends up teaching is often not what they planned to do.
4. We will explore ideas of arithmetic in a way to help you improve your mathematical ability, gain confidence in your ability, introduce to you different ideas and models, and to see a variety of mathematical activities that are appropriate for people of all ages.
5. Everything we study will be done with the aim of developing your ability to relate to the mathematics of elementary school and to help children develop mathematical understanding.

MATH 1215. Intermediate Algebra
3 Credits (3)
A study of linear and quadratic functions, and an introduction to polynomial, absolute value, rational, radical, exponential, and logarithmic functions. A development of strategies for solving single-variable equations and contextual problems.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in CCDM 113 N or CCDM 114 N.

Learning Outcomes

1. Students will build on their knowledge of linear and quadratic functions and will begin to build an understanding of absolute value, polynomial, rational, power, radical, exponential and logarithmic functions in the following contexts: Demonstrate appropriate use of basic function language and notation; Convert between equivalent forms of algebraic expressions; Solve single-variable equations of the types listed above; Interpret and communicate algebraic solutions graphically and numerically; Demonstrate contextual problem-solving skills that include setting up and solving problems, and interpreting solutions in context; Apply appropriate problem solving methods from among algebraic, graphical, and numerical.

MATH 1217. General Supplemental Instruction I

1 Credit (2P)

Collaborative workshop for students enrolled in Intermediate Algebra.

Corequisite: MATH 1215.

Learning Outcomes

1. Intermediate Algebra Workshop provides time for students to work on problems from Intermediate Algebra under the guidance of their instructor.

MATH 1220G. College Algebra

3 Credits (3)

The study of equations, functions and graphs, reviewing linear and quadratic functions, and concentrating on polynomial, rational, exponential and logarithmic functions. Emphasizes algebraic problem solving skills and graphical representation of functions.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1215.

Learning Outcomes

1. Use function notation; perform function arithmetic, including composition; find inverse functions.
2. Identify functions and their transformations given in algebraic, graphical, numerical, and verbal representations, and explain the connections between these representations.
3. Graph and interpret key feature of functions, e.g., intercepts, leading term, end behavior, asymptotes.
4. Solve equations algebraically to answer questions about graphs, and use graphs to estimate solutions to equations.
5. Solve contextual problems by identifying the appropriate type of function given the context and creating a formula based on the information given.
6. Communicate mathematical information using proper notation and verbal explanations.

MATH 1221. General Supplemental Instruction II

1 Credit (1+2P)

Collaborative workshop for students enrolled in College Algebra.

Corequisite: MATH 1220G.

Learning Outcomes

1. College Algebra Workshop provides time for students to work on problems from College Algebra under the guidance of their instructor.

MATH 1250G. Trigonometry & Pre-Calculus

4 Credits (3+2P)

Trigonometry & Pre-Calculus includes the study of functions in general with emphasis on the elementary functions: algebraic, exponential, logarithmic, trigonometric and inverse trigonometric functions. Topics include rates of change, limits, systems of equations, conic sections, sequences and series, trigonometric equations and identities, complex number, vectors, and applications.

Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1220G.

Learning Outcomes

1. (Trigonometry) Students will be able to define and evaluate the trigonometric functions as functions of angle in both degree and radian measure using the definitions in terms of x, y, and r; as the ratio of sides of a right triangle; using the unit circle; using reference angles, commonly used (0 o, 30 o, 45 o, 60 o, 90o) angles and using a calculator.
2. (Trigonometry) Students will be able to solve right triangles. They will be able to draw a sketch in an applied problem when necessary.
3. (Trigonometry) Students will be able to solve non-right triangles using the law of sines and the law of cosines.
4. (Trigonometry) Students will be able to prove trigonometric identities and apply addition and subtraction, doubleangle, half-angle and power reduction formulas.
5. (Trigonometry) Students will be able to graph the six trigonometric functions, their transformations and their inverses.
6. (Trigonometry) Students will be able to use algebraic methods, including the use of identities and inverses, to solve trigonometric equations and demonstrate connections to graphical and numerical representations of the solutions.
7. (Trigonometry) Students will be able to add and subtract vectors in two dimensions. They will be able to use the dot product to project one vector onto another and to determine the angle between two vectors. They will be able to solve a variety of word problems using vectors.
8. (Trigonometry) Students will be able to work with polar coordinates; this includes graphing in polar coordinates and transforming an equation with polar coordinates into one with rectangular coordinates, and vice versa.
9. (Trigonometry) Students will be to work with the trigonometric form of complex numbers, including using De Moivre's formula. 1
10. (Pre-Calculus) Functions: Reinforce recognizing a function from its graph and from its algebraic expression; Reinforce identification of a one-to-one function graphically and from its algebraic expression; Reinforce identification of inverse functions graphically and algebraically; Reinforce combining functions arithmetically and compositionally; Be able to calculate the average rate of change of a function using the difference quotient and depict it graphically; Be able to find a limiting value of a function and be able to identify and use the notation that describes this. 1
11. (Pre-Calculus) Graphing: Reinforce using key characteristics of functions to graph them; Be able to graph conic sections from their key characteristics such as foci, eccentricity and asymptotes; Be able to identify all functions mentioned from their graphs, describing their key aspects. 1
12. (Pre-Calculus) Solving: Exponential/Logarithmic equations using the rules of exponents and logarithms; Systems of linear equations by elimination; Non-linear systems algebraically and graphically. 1
13. (Pre-Calculus) Applications: Modeling with functions with an emphasis on exponential and logarithmic functions, growth and decay. 1

14. (Pre-Calculus) Sequences and series: Understand the concept and notation of a sequence; Understand the concept and notation of a series; Be able to find limits of basic sequences; Be able to find sums of basic series.

MATH 1350G. Introduction to Statistics
3 Credits (3)
This course discusses the fundamentals of descriptive and inferential statistics. Students will gain introductions to topics such as descriptive statistics, probability and basic probability models used in statistics, sampling and statistical inference, and techniques for the visual presentation of numerical data. These concepts will be illustrated by examples from a variety of fields.
Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1215 or higher.
Learning Outcomes

1. Explain the general concepts of statistics: Explain and evaluate statistics used in the real world (from a news article, research project, etc.); Use statistical vocabulary appropriately; Distinguish between descriptive and inferential statistics; Distinguish between qualitative and quantitative data; Distinguish between populations and samples, and parameters and statistics; Give examples of independent and dependent variables.
2. Presentation and description of data: Present data graphically using histograms, frequency curves and other statistical graphs; Interpret graphs of data, including histograms and shapes of distributions.
3. Summarize data using measures of central tendency and variation: Calculate and interpret the mean, median, and mode to describe data; Calculate and interpret range, variance, and standard deviation to describe data.
4. Present the concepts of probability: Interpret basic probabilities; Calculate probabilities using compound probability rules and the binomial distribution; Calculate probabilities using the standard normal distribution and relate them to areas under the curve; Determine if the binomial distribution can be approximated with the normal distribution; Describe the relationship between the sampling distribution and the population distribution; Use the central limit theorem to approximate the probability distribution and calculate probabilities.
5. Compute point and interval estimates: Determine the confidence interval for a parameter; Interpret the confidence level and margin of error; Determine whether a statistical technique is appropriate under stated conditions.
6. Perform hypothesis tests: Determine whether a statistical test is appropriate under stated conditions; Identify null and alternative hypothesis; Perform and interpret statistical tests (e.g. z-test, t-test, one-tailed and two-tailed, one-sample, two-sample) and determine whether data is statistically significant; State the conclusion of a hypothesis test; Interpret a p-value as compared to a significance level; Explain why a test can lead us to reject a null hypothesis, not accept one; Distinguish between Type I and Type II errors.
7. Analyze data using regression and correlation: Explain the difference between correlation and causation; Construct and interpret scatter plots; Calculate and interpret the linear correlation coefficient; Determine and use the equation of a least-squares regression line between two variables to make predictions; Interpret the meaning of the coefficient of determination.
8. Optional topics: Inter-quartile range, box-plots, stem-and-leaf plots; Combinations and permutations; The Poisson distribution; Statistical power; Chi-square; Analysis of variance.

MATH 1430G. Applications of Calculus I
3 Credits (2+2P)
An algebraic and graphical study of derivatives and integrals, with an emphasis on applications to business, social science, economics and the sciences.
Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1220G or higher.
Learning Outcomes

1. Find limits algebraically and graphically, and use limits to analyze continuity.
2. Find the derivative of a function by applying appropriate techniques (limit of the difference quotient, general derivative rules, product rule, quotient rule, chain rule, and higher order derivatives).
3. Perform implicit differentiation. Use implicit differentiation to solve related rate application problems.
4. Use the derivative to describe the rate of change and slope of a curve in general and at particular points. Compare and contrast average rates of change to instantaneous rates of change.
5. Find the maxima, minima, points of inflections, and determine concavity of a function by applying the first and second derivatives. Use these results to sketch graphs of functions and to solve optimization problems in context.
6. Find the antiderivative and indefinite integral functions to include integration by substitution. Apply the Fundamental Theorem of Calculus in computing definite integrals of functions.
7. Approximate the area under the curve using Riemann sums.
8. Use the integral to determine the area under a curve and to find the accumulated value of a function in context.
9. Solve contextual problems by identifying the appropriate type of function given the context, creating a formula based on the information given, applying knowledge of algebra and calculus, and interpreting the results in context. 1
10. Communicate mathematical information using proper notation and verbal explanations.

MATH 1435. Applications of Calculus I
3 Credits (3)
Intuitive differential calculus with applications to engineering.
Prerequisite(s): C- or better in MATH 1250G.
Learning Outcomes

1. Find limits algebraically and graphically, and use limits to analyze continuity.
2. Find the derivative of a function by applying appropriate techniques (limit of the difference quotient, general derivative rules, product rule, quotient rule, chain rule, and higher order derivatives).
3. Learn derivative rules for polynomial, exponential, logarithmic, trigonometric and inverse trigonometric functions.
4. Perform implicit differentiation. Use implicit differentiation to solve related rate application problems.
5. Find the maxima, minima, points of inflections, and determine concavity of a function by applying the first and second derivatives. Use these results to sketch graphs of functions and to solve optimization problems in context.
6. Find partial derivatives and find maxima, minima in three dimensions.

7. Find the linear approximation of a function.
8. Find Maclaurin and Taylor series.
9. Find limits via L'Hospital's rule. 1
10. Communicate mathematical information using proper notation and verbal explanations.

MATH 1440. Applications of Calculus II
3 Credits (3)
Topics in this second course of Applications of Calculus include functions of several variables, techniques of integration, an introduction to basic differential equations, and other applications.
Prerequisites: C or better in MATH 1435 or in MATH 1521G, or in MATH 1521H.
Learning Outcomes
1. Find definite and indefinite integrals using integration by parts, integral tables, and numerical integration.
2. Analyze multivariable functions using partial derivatives and double integrals, and apply these techniques to applications such as optimization, least squares, and volumes.
3. Solve differential equations graphically, numerically, and algebraically using separation of variables, and apply differential equations in context.
4. Apply differentiation and integration to other areas, for example to Taylor polynomials and Taylor series, probability, trigonometric functions, etc.

MATH 1511G. Calculus and Analytic Geometry I
4 Credits (4)
Limits and continuity, theory and computation of derivatives, applications of derivatives, extreme values, critical points, derivative tests, L'Hopital's Rule.
Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1250G.
Learning Outcomes
1. The goals are to present the concepts of calculus, stressing techniques, applications, and problem solving, and emphasizing numerical aspects such as approximations and order of magnitude.
2. Overall, the goals are to illustrate the power of calculus as a tool for modeling situations arising in physics, science, engineering and other fields.
3. In fulfillment of these goals, this and later courses will stress topics such as polynomial approximation, setting up integrals, as well as the use of appropriate technology.

MATH 1521G. Calculus and Analytic Geometry II
4 Credits (4)
Riemann sums, the definite integral, antiderivatives, fundamental theorems, techniques of integration, applications of integrals, improper integrals, Taylor polynomials, sequences and series, power series and Taylor series.
Prerequisite: C- or better in MATH 1511G.
Learning Outcomes
1. Recognize the interplay between Riemann sums and definite integrals.
2. Use the Fundamental Theorem of Calculus to compute definite and indefinite integrals.
3. Demonstrate an understand of the relationship between the derivative and the definite integral.
4. Evaluate integrals numerically using standard rules (midpoint, trapezoid, Simpson's).
5. Evaluate integrals analytically using standard methods (substitution, integration by parts, trigonometric substitution and identities, inverse functions and partial fractions.
6. Use integration to solve problems in geometry, physics, science, engineering and other fields.
7. Use appropriate methods such as L'Hopital's Rule to evaluate improper integrals.
8. Approximate functions using Taylor polynomials.
9. Apply standard tests to determine convergence or divergence of sequences and series. 1
10. Find a power series representation for a function and determine where it converges. 1
11. Identify and evaluate first order differential equations.

MATH 1511H. Calculus and Analytic Geometry I Honors
4 Credits (4)
Limits and continuity, theory and computation of derivatives, applications of derivatives, extreme values, critical points, derivative tests, L'Hopital's Rule. This is an Honors version of MATH 1511G. It is taught with MATH 1511G with differentiated assignments.
Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1250G or higher.
Learning Outcomes
1. The goals are to present the concepts of calculus, stressing techniques, applications, and problem solving, and emphasizing numerical aspects such as approximations and order of magnitude.
2. Overall, the goals are to illustrate the power of calculus as a tool for modeling situations arising in physics, science, engineering and other fields.
3. In fulfillment of these goals, this and later courses will stress topics such as polynomial approximation, setting up integrals, as well as the use of appropriate technology.
4. Gain a deeper understanding of the mathematics behind Limits and Derivatives and be able to use mathematical ideas (such as the Intermediate Value Theorem, the Mean Value Theorem, and the Extreme Value Theorem) in applied contexts.

MATH 1521H. Calculus and Analytic Geometry II Honors
4 Credits (4)
A more advanced treatment of the material of MATH 1521G with additional topics. Consent of Instructor required. Restricted to Las Cruces campus only.
Learning Outcomes
1. Recognize the interplay between Riemann sums and definite integrals.
2. Use the Fundamental Theorem of Calculus to compute definite and indefinite integrals.
3. Demonstrate an understand of the relationship between the derivative and the definite integral.
4. Evaluate integrals numerically using standard rules (midpoint, trapezoid, Simpson's).
5. Evaluate integrals analytically using standard methods (substitution, integration by parts, trigonometric substitution and identities, inverse functions and partial fractions.
6. Use integration to solve problems in geometry, physics, science, engineering and other fields.

7. Use appropriate methods such as L'Hopital's Rule to evaluate improper integrals.
8. Approximate functions using Taylor polynomials.
9. Apply standard tests to determine convergence or divergence of sequences and series. 1
10. Find a power series representation for a function and determine where it converges. 1
11. Identify and evaluate first order differential equations.

MATH 1531. Introduction to Higher Mathematics
3 Credits (3)
Logic; sets, relations, and functions; introduction to mathematical proofs.
Prerequisite(s): C- or better in MATH 1521G or MATH 1521H.
Learning Outcomes
1. The primary objective of this course is to serve as a bridge between the calculus courses you have taken, where the focus is on computations and solving problems, to more abstract mathematics courses.
2. In particular, we will discuss logical reasoning, definitions, proofs, and certain basic building blocks such as sets, functions, and relations.
3. By the end of the course, you should be able to understand and construct well-written proofs of basic mathematical arguments involving simple properties of the real numbers, integers, sets, functions, and relations using universal and existential quantifiers, absolute values and inequalities, modular arithmetic, and proof by induction.

MATH 1531H. Introduction to Higher Mathematics Honors
3 Credits (3)
Logic; sets, relations, and functions; introduction to mathematical proofs. A more advanced treatment of the material of MATH 1531 with additional topics and/or assignments. Consent of Instructor required. Restricted to Las Cruces campus only.
Prerequisite: C- or better in MATH 1521G or MATH 1521H.
Learning Outcomes
1. The primary objective of this course is to serve as a bridge between the calculus courses you have taken, where the focus is on computations and solving problems, to more abstract mathematics courses.
2. In particular, we will discuss logical reasoning, definitions, proofs, and certain basic building blocks such as sets, functions, and relations.
3. By the end of the course, you should be able to understand and construct well-written proofs of basic mathematical arguments involving simple properties of the real numbers, integers, sets, functions, and relations using universal and existential quantifiers, absolute values and inequalities, modular arithmetic, and proof by induction.
4. Since this is an honors course, you should be able to understand higher-level properties of the mathematical objects and ideas arising in the class. You should also be able to write, edit, revise, and ultimately construct well-written proofs and mathematical arguments.

MATH 1996. Topics in Mathematics
1-3 Credits
Topics to be announced in the Schedule of Classes. Maximum of 3 credits per semester. Total credit not to exceed 6 credits. Community Colleges only.
Prerequisite: consent of instructor.
Learning Outcomes
1. Varies

MATH 2134G. Fundamentals of Elementary Math II
3 Credits (3)
Geometry and measurement. Multiple approaches to solving problems and understanding concepts in geometry. Analyzing and constructing two- and three-dimensional shapes. Measurable attributes, including angle, length, area, and volume. Understanding and applying units and unit conversions. Transformations, congruence, and symmetry. Scale factor and similarity. Coordinate geometry and connections with algebra. Reasoning and communicating about geometric concepts. Taught primarily through student activities and investigations.
Prerequisite: C- or better in MATH 1134.
Learning Outcomes
1. The primary objectives are mathematical: to understand some of the basic concepts of geometry, and measurement with an appropriate level of rigor; to appreciate the historical, cultural and educational contributions and potential applications in real life situations; and to gain problem solving skills using these concepts.
2. The secondary goal is to appreciate the importance of this material in the elementary school curriculum.

MATH 2350G. Statistical Methods
3 Credits (3)
Exploratory data analysis. Introduction to probability, random variables and probability distributions. Concepts of Central Limit Theorem and Sampling Distributions such as sample mean and sample proportion. Estimation and hypothesis testing single population parameter for means and proportions and difference of two population parameters for means and proportions. Analysis categorical data for goodness of fit. Fitting simple linear regression model and inference for regression parameters. Analysis of variance for several population means. Techniques in data analysis using statistical packages.
Prerequisite: Adequate scoring on the Mathematics Placement Exam, or any ACT/SAT and GPA combination that is considered equivalent, or a C- or better in MATH 1215 or higher.
Learning Outcomes
1. Summarize Data through graphs and Descriptive statistics: Define qualitative and quantitative data; Provide examples of a population, a sample, independent and dependent variables, parameters and statistics; Construct and interpret histograms, stem plots, bar charts, and boxplot; Summarize distributions with numerical measures such as mean, median, standard deviation, percentiles, interquartile range.
2. Present the concepts of probability: Explain related to probability axioms (e.g. mutually exclusive events and independent events); Apply applications of probability rules; Apply Conditional probability and Bayes Rule.
3. Distinguish between discrete and continuous random variables: Calculate probabilities using Binomial and Poisson distributions; Calculate probabilities using the standard normal distribution by finding the area underneath the curve.
4. Explain the Central Limit Theorem: Introduce the concept of a sampling distribution; Discuss the distribution of the sample mean and sample proportion under repeated sampling; Generate and interpret a sampling distribution using repeated sampling; Determine if the Binomial and Poisson distribution can be approximated with the normal distribution.
5. Estimate a population parameter: Determine confidence interval for population mean, proportion, difference of means, and difference of proportions; Interpret the confidence interval and margin of error;

Explain the dependence of margin of error on sample size and confidence level.

6. Perform hypothesis tests for population parameters (population mean, proportion, difference of means, and difference of proportions); Describe the logic and framework of the inference of hypothesis testing; Make a decision using a p-value and draw an appropriate conclusion; Distinguish between Type I and Type II errors; Explain power of the test.
7. Perform Hypothesis Tests for Categorical data: Determine and analyze Chi-square test for Independence; Determine and analyze Chi-square test for Goodness of fit.
8. Analyze data using regression and correlation: Construct scatterplots and analyze the scatter plots; Calculate the linear correlation coefficient and determine whether a linear relationship exists between two variables; Fit the least-squares regression line between two variables; Predict the response variable from the regression line; Apply statistical inference to regression parameters.
9. Perform analysis of variance: State hypotheses for the test of several population means; Construct the AVOVA Table; Explain the significance of multiple comparisons. 1
10. Demonstrate the appropriate use of technology (e.g., Excel, an appropriate graphing calculator or other software (Minitab, SAS)

MATH 2415. Introduction to Linear Algebra
3 Credits (3)
Systems of equations, matrices, vector spaces and linear transformations. Applications to computer science.
Prerequisite(s): Grade of C- or better in MATH 1521G or MATH 1521H.
Learning Outcomes

1. Use row reduction and echelon forms of a matrix to solve linear systems of equations.
2. Use matrix operations, inverse matrices, and matrix factorizations to solve matrix equations.
3. Study the properties of vector spaces and subspaces (e.g., the null and column spaces of a matrix); linear transformations, isomorphisms and kernels; linear independence, bases, and dimension.
4. Apply appropriate matrix manipulations to perform a change of basis.
5. Understand determinants and their properties.
6. Find eigenvalues and eigenvectors and use them to diagonalize matrices.
7. Understand inner product spaces and apply them to real-world problems.

MATH 2530G. Calculus III
3 Credits (3)
Continuation of Calculus II including multivariate and vector calculus, level curves and surfaces, partial derivatives, gradient, directional derivatives, tangent planes, optimization, multiple integrals in Cartesian, cylindrical and spherical coordinate systems.
Prerequisite: Grade of C- or better in MATH 1521G or MATH 1521H.
Learning Outcomes

1. Use vector notation correctly.
2. Perform vector operations, including dot product, cross product, differentiation and integration, and demonstrate their geometric interpretations.
3. Perform operations on vector valued functions and functions of a parameter.
4. Identify and graph the equations of cylinders and quadratic surfaces in 3-dimensional space.
5. Determine the domain of continuity of a vector valued function and of a function of multiple variables.
6. Compute partial derivatives, generally and at a point, and sketch their graphical representation on a surface in space.
7. Recognize when the chain rule is needed when differentiating functions of multiple variables, parametric equations and vector valued functions, and be able to use the chain rule in these situations.
8. Compute curvature of a parameterized vector representation of a curve in 2- and 3-dimensional space and be able to explain its meaning.
9. Compute the unit tangent and unit normal vectors to a curve and be able to sketch them with the curve. 1
10. Computationally move among position vector, velocity vector, speed, and acceleration vectors; recognize and demonstrate their use as applied to motion in space. 1
11. Determine the equation of the tangent plane to a surface at a point. 1
12. Use the tangent plane to a surface to approximate values on the surface and estimate error in approximation using differentials 1
13. Compute directional derivatives and represent them graphically relative to the inherent surface. 1
14. Compute the gradient vector; represent it graphically relative to the inherent surface and use it to maximize or minimize rate of change of the function. 1
15. Locate local and global maxima and minima of a function. 1
16. Use Lagrange multipliers to maximize output with one or two constraints. 1
17. Compute arc length and be able to explain its derivation as a limit. 1
18. Calculate double and triple integrals independently and with their geometric representations as surfaces, areas and volumes. 1
19. Calculate iterated integrals in polar, cylindrical and spherical coordinate systems.

MATH 2992. Directed Study
1-3 Credits
May be repeated for a maximum of 6 credits. Graded S/U.
Prerequisite: consent of the instructor.
Learning Outcomes

1. Varies

MATH 3110. Introduction to Modern Algebra
3 Credits (3)
Elements of abstract algebra, including groups, rings and fields.
Prerequisite: C or better in MATH 1531 and MATH 2415.
Learning Outcomes

1. Varies.

MATH 3120. Introduction to Analysis
3 Credits (3)
Development of the real numbers, a rigorous treatment of sequences, limits, continuity, differentiation, and integration.
Prerequisite: C- or better in MATH 1531 or MATH 1531H.
Learning Outcomes

1. Understand the Axiom of Completeness and be able to work with suprema and infima.
2. Know the basic definitions of sequences and be able to understand and construct rigorous epsilon-N proofs.

3. Understand the properties of convergent sequences and be able to construct related proofs.
4. Know the basic definitions of limits and be able to understand and construct epsilon-delta proofs.
5. Be familiar with the basic properties and topology of the reals.

MATH 3130. Introduction to Geometry
3 Credits (3)
Building on ideas from high school geometry, an introduction to the axiomatic method, transformation groups, and non-Euclidean geometry.
Prerequisite: C- or better in MATH 1531 (or MATH 1531H) and MATH 2415.
Learning Outcomes
1. Demonstrate the ability to make conjectures in geometry, refine conjectures, and prove or refute conjectures.
2. Understand how transformations of the plane can be used to define and apply the concepts of congruence and similarity in Euclidean geometry.
3. Solve problems in geometry using different approaches (axioms, coordinates, transformations), and explain how the different approaches are related.
4. Compare the definitions and theorems of Euclidean geometry with the corresponding definitions and theorems in non-Euclidean geometry.

MATH 3140. Introduction to Numerical Methods
3 Credits (3)
Basic numerical methods for interpolation, approximation, locating zeros of functions and integration; numerical linear algebra. Computer-oriented methods will be emphasized. Student must also have some programming experience in order to enroll.
Prerequisite: C- or better in one of MATH 2415, M E 228, or E E 200.
Learning Outcomes
1. Understand the limitations, advantages, and disadvantages of common numerical methods and how they are used to obtain approximate solutions.
2. Apply numerical methods to obtain approximate solutions to mathematical problems.
3. Analyze and evaluate the accuracy of common numerical methods.
4. Write efficient, well-documented code to implement numerical methods.

MATH 3160. Introduction to Ordinary Differential Equations
3 Credits (3)
Introduction to differential equations and dynamical systems with emphasis on modeling and applications. Basic analytic, qualitative and numerical methods. Equilibria and bifurcations. Linear systems with matrix methods, real and complex solutions.
Prerequisite: C or better in MATH 1521G or MATH 1521H or B or better in MATH 1440.
Learning Outcomes
1. Solve basic linear and nonlinear linear first order equations using appropriate methods (both explicit and qualitative).
2. Model both linear and nonlinear physical entities such as population, income growth, mixing and cooling, as well as systems of physical entities such as predator/prey models and electric circuits.
3. Classify higher order equations as homogeneous/nonhomogeneous and linear/nonlinear.
4. Solve second order homogeneous and nonhomogeneous linear equations using appropriate techniques.
5. Solve differential equations using Laplace Transforms.
6. Solve systems of linear equations using basic matrix methods.

MATH 3997. Directed Readings
1-3 Credits
A selection of readings and reports in the mathematical sciences, the breadth and depth of which is deemed to fit the needs of the student. May be repeated up to 3 credits.
Prerequisite: consent of instructor.

MATH 4110V. Great Theorems in Mathematics
3 Credits (3)
This course examines some significant mathematical achievements from antiquity to the modern era. Evolution of notions and methods in geometry, number theory, algebra, and calculus will be supplemented by cultural and biographical history, placing mathematics in a broad human context.
Prerequisite: Grade of C- or higher in MATH 1531, or grade of B or higher in any upper-division math or stat course, or consent of instructor.
Learning Outcomes
1. At the end of this course, students will be able to: Describe the history of the development of some key mathematical concepts.
2. Describe the connections between mathematical ideas in different historical periods and places.
3. Recognize the role of abstraction and logic in the progress of mathematics.
4. Describe the contribution of mathematics to culture and science in different historical eras.
5. Determine if a mathematical conjecture is correct and provide rigorous written mathematical justification.
6. Provide sound, complete and clear mathematical arguments involving simple calculations, geometric constructions, and/or written mathematical proofs.
7. Communicate mathematical ideas, both written and orally.

MATH 4210. Complex Variables
3 Credits (3)
A first course in complex function theory, with emphasis on applications.
Prerequisite: C- or better in both MATH 3160 and MATH 2530G.
Learning Outcomes
1. Define analytic function, the Cauchy-Riemann equations, and harmonic functions.
2. Recognize elementary analytic functions such as the exponential function, trigonometric functions, and branches of the logarithmic function and their properties.
3. Understand mapping by elementary functions, linear fractional transformations, and powers.
4. Compute line integrals, making appropriate use of the Cauchy-Goursat Theorem, the Cauchy Integral Formula, and Morera's Theorem.
5. Relate complex power series (including Laurent series) to their singularities (removable singularities, poles, and essential singularities).
6. Evaluate improper integrals using the Residue Theorem.

MATH 4220. Fourier Series and Boundary Value Problems
3 Credits (3)
Fourier series and methods of solution of the boundary value problems of applied mathematics.
Prerequisite: C- or better in MATH 3160.

Learning Outcomes

1. Learn the standard boundary/initial value problems for the partial differential equations of mathematical physics: wave equation, heat equation, Laplace's equation and Poisson's equation.
2. Be able to use the method of separation of variables to solve the boundary/initial value problems.
3. In learning the method, understand orthogonal sets of functions, eigenvalues, eigenfunctions, Fourier series, generalized Fourier series.
4. Understand Fourier integrals, Fourier transforms and their applications.

MATH 4230. Applied Linear Algebra
3 Credits (3)
An application-driven course, whose topics may include the four fundamental subspaces, inner products, orthogonality, diagonalization, and complex matrices. Applications may include factorization, least squares, data compression, singular value decomposition, and discrete Fourier transform.
Prerequisite: C- or better in one of MATH 2415, E E 200, or M E 228.
Learning Outcomes

1. Understand higher-level linear algebra concepts for which matrix linear algebra is the basic tool.
2. Understand how to apply higher-level linear algebra concepts to problems that arise in real-world applications.

MATH 4310. Introduction to Topology
3 Credits (3)
Topological spaces: general spaces and specific examples such as metric spaces, Hausdorff spaces and/or normed vector spaces; separation axioms; continuity, compactness, connectedness; related theorems. Crosslisted with: MATH 5310.
Prerequisite: MATH 3120.

MATH 4320. Logic and Set Theory
3 Credits (3)
Propositional and first order logic; axioms, proofs, models. Semantic and syntactic consequence. Soundness, completeness, compactness, and Loewenheim –Skolem theorems. The Zermelo-Fraenkel axioms for set theory. Well orderings, ordinals, cardinals, the axiom of choice, and the von Neumann hierarchy.
Learning Outcomes

1. Define the fundamental notions of set theory (ordinals, cardinals) and apply transfinite induction/recursion to construct proofs.
2. Explain the Axiom of Choice and relate set-theoretic and logical techniques to topics in algebra and analysis.
3. Construct formal proofs in first-order logic and distinguish between semantic and syntactic consequence.
4. Prove the Completeness and Compactness theorems of first-order logic and apply metatheorems (Löwenheim–Skolem) to analyze formal theories and their models.

MATH 4330. Elementary Number Theory
3 Credits (3)
Covers primes, congruences and related topics.
Prerequisite: Grade of C or better in MATH 3110 or consent of instructor.

MATH 4340. Abstract Algebra I: Groups and Rings
3 Credits (3)
Group theory, including cyclic groups, homomorphisms, cosets, quotient groups and Lagrange's theorem. Introduction to rings: ring homomorphisms, ideals, quotient rings, polynomial rings, and principal ideal domains. Taught with MATH 5340.
Prerequisite(s): MATH 3110 or consent of instructor.

MATH 4350. Advanced Linear Algebra
3 Credits (3)
Rigorous treatment of vector spaces and linear transformations including canonical forms, spectral theory, inner product spaces and related topics.
Prerequisite: Grade of C or better in MATH 3110.
Learning Outcomes

1. Apply the fundamental properties of abstract vector spaces to solve algebraic problems.
2. Define and evaluate linear independence, bases, and dimension within abstract vector spaces.
3. Construct matrix representations for linear transformations between vector spaces.
4. Compute determinants, eigenvalues, and eigenvectors of linear operators.
5. Prove theorems regarding direct sums, kernels (null spaces), and ranges of linear transformations.
6. Apply the properties of adjoint operators to solve problems in inner product spaces.

MATH 4360. Introduction to Real Analysis I
3 Credits (3)
Rigorous discussion of the real numbers for topics introduced in calculus: limits and continuity, followed by differentiation, integration, and series of functions.
Prerequisite: Grade of C- or better in MATH 3120 or consent of instructor.
Learning Outcomes

1. Understand two-sided limits, one-sided limits, limits at infinity, continuity and uniform continuity for functions on the real line.
2. Understand derivatives, differentiability theorems, the Mean Value Theorem, Taylor's Theorem, L'hospital's Rule and the Inverse Function Theorem for functions on the real line.
3. Understand integration on the real line: the Riemann integral, Riemann sums, the Fundamental Theorem of Calculus and improper Riemann integrals.
4. Understand sequences and infinite series of functions, including uniform convergence, limit supremum, limit infimum, power series and analytic functions.

MATH 4365. Introduction to Real Analysis II
3 Credits (3)
Extension of the ideas of Math 4360 to higher dimensions and more general contexts (metric spaces, differentiability on higher dimensional Euclidean space, integration on higher dimensional Euclidean space).
Prerequisite: C- or better in MATH 4360 or consent of instructor.
Learning Outcomes

1. Understand the algebraic structure, including planes and linear transformations, of Euclidean spaces.
2. Understand the fundamental notions of metric spaces: limits of functions, interior/closure/boundary of sets, compact sets, connected sets, continuous functions and the Stone-Weierstrass Theorem.
3. Understand derivatives, differentials, tangent planes, the Chain Rule, the Mean Value Theorem, Taylor's Formula and the Inverse Function Theorem for functions on n-dimensional Euclidean space.
4. Apply the Ascoli Theorem for relative compactness of sets of continuous functions on a compact metric space.

MATH 4991. Undergraduate Research
1-3 Credits

May be repeated for a maximum of 6 credits. Graded S/U.

MATH 4996. Special Topics
1-3 Credits (1-3)
Specific subjects to be announced in the Schedule of Classes. May be used to fulfill a course requirement for the mathematics major. May be repeated up to 99 credits.

Learning Outcomes

1. Analyze concepts in the selected topic area.
2. Apply mathematical methods to solve complex problems within the topic area.
3. Communicate findings from the topic area in written and oral formats.

MATH 4997. Directed Reading
1-6 Credits
May be repeated for a maximum of 6 credits. Graded S/U.

MATH 5110. Fundamentals of Elementary Mathematics I
3 Credits (3+1P)
Topics from real numbers, geometry, measurement, and algorithms, incorporating calculator technology. Intended for K-8 teachers. As part of course students mentor MATH 1134 undergraduates. Does not fulfill degree requirements for M.S. in mathematics.

MATH 5120. History and Theories of Mathematics Education
3 Credits (3)
A study of the history of the mathematics taught in American schools, including an examination of authentic original textbooks and the changes in their content and the approach to the subject over time, together with writings of people who have influenced the development and changes of mathematics education. Theories of learning mathematics, and current issues in mathematics education.
Prerequisite(s): Restricted to graduate students.

MATH 5130. Algebra with Connections
3 Credits (3)
Connections between Algebra and other K-12 curriculum strands, especially Geometry and Probability / Data Analysis. Apply algebraic modeling and reasoning to a variety of mathematical problem solving situations. Does not fulfill requirements for degrees in mathematics.
Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 5140. From Number to Algebra
3 Credits (3)
The progression from Number to Algebra in the K-12 curriculum as a concrete-to-abstract progression. Key concepts considered across the grade levels include the different uses of variables, equivalence in different contexts, patterns, and ratios. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.
Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 5150. Data Analysis with Applications
3 Credits (3)
Statistical concepts and terminology in professional uses of data by teachers, such as standardized test score reports and educational research; visual displays of data; measures of variation and central tendency; consideration of how K-12 topics in Data Analysis are developed from one grade level to the next. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.
Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 5160. From Measurement to Geometry
3 Credits (3)
The progression from Measurement to Geometry in the K-12 curriculum as a concrete-to abstract progression. Important concepts such as angle, length, and area progress from concrete, measurable situations to more abstract problems which require reasoning and proof. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.
Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 5170. Using Number Throughout the Curriculum
3 Credits (3)
Understand number concepts more deeply by seeing many examples of those concepts applied in other content strands. Develop mathematical knowledge and understanding to build a repertoire of ways for students to practice and review basic number skills and concepts as part of later, more advanced courses. Does not fulfill requirements for degrees in mathematics. Consent of instructor required.
Prerequisite(s): Admittance into the MC2-LIFT program.

MATH 5180. Geometry with Connections
3 Credits (3)
Connections between Geometry and other K-12 curriculum strands, especially Algebra and Probability / Data Analysis. Address key attributes of geometric concepts by considering their connections within and across grade levels. Does not fulfill requirements for degrees in mathematics.
Prerequisite: Admittance into the MC2-LIFT program.

MATH 5210. Complex Variables
3 Credits (3)
Same as MATH 4210 with additional work for graduate students.

Learning Outcomes

1. Define analytic function, the Cauchy-Riemann equations, and harmonic functions.
2. Recognize elementary analytic functions such as the exponential function, trigonometric functions, and branches of the logarithmic function and their properties.
3. Understand mapping by elementary functions, linear fractional transformations, and powers.
4. Compute line integrals, making appropriate use of the Cauchy-Goursat Theorem, the Cauchy Integral Formula, and Morera's Theorem.
5. Relate complex power series (including Laurent series) to their singularities (removable singularities, poles, and essential singularities).
6. Evaluate improper integrals using the Residue Theorem.

MATH 5220. Fourier Series and Boundary Value Problems
3 Credits (3)
Same as MATH 4220 with additional work for graduate students.

Learning Outcomes

1. Derive the partial differential equations of physics: wave equation, heat equation, Laplace's equation, and Poisson's equation, including boundary/initial values.
2. Use the method of separation of variables to solve the boundary/initial value problems.
3. Recognize the role of orthogonal sets of functions, eigenvalues, eigenfunctions, Fourier series, generalized Fourier series in the method of separation of variables.
4. Compute Fourier integrals and Fourier transforms, and apply them to physical problems.

MATH 5310. Introduction to Topology
3 Credits (3)
Topological spaces: general spaces and specific examples such as metric spaces, Hausdorff spaces and/or normed vector spaces; separation axioms; continuity, compactness, connectedness; related theorems. Crosslisted with: MATH 4310.

Learning Outcomes

1. Define the topology induced from a total ordering or metric.
2. Construct new topological spaces by taking subspaces, products, and quotients.
3. Compare different topologies on the same set to determine which is finer.
4. Determine whether a function is continuous with respect to a particular topology.
5. Classify topological spaces based on fundamental properties (connectedness, compactness, Hausdorff).
6. Construct examples and counter-examples of topological spaces satisfying a given set of properties.

MATH 5320. Logic and Set Theory
3 Credits (3)
Same as MATH 4320 with additional assignments for graduate students.

MATH 5330. Elementary Number Theory
3 Credits (3)
Same as MATH 4330 with additional assignments for graduate students.
Learning Outcomes

1. Apply various properties of the integers to solve number theory problems.
2. Analyze the properties of number theoretic functions.
3. Construct proofs using the concept of a congruence.
4. Solve certain types of Diophantine equations using number theoretic methods.
5. Explain how number theory is related to and used in modern cryptography.

MATH 5340. Abstract Algebra I: Groups and Rings
3 Credits (3)
Same as MATH 4340 with additional work for graduate students. Taught with MATH 4340.
Prerequisite: MATH 5350 or consent of instructor.
Learning Outcomes

1. Apply the fundamental properties of groups to solve abstract algebra problems and analyze the structure of rings.
2. Construct subgroups and factor groups of given groups.
3. Prove key theorems related to cyclic groups, Sylow groups, and permutation groups.
4. Prove that certain algebraic structures are isomorphic using homomorphism properties.
5. Determine group structures based on analyzing information about their subgroups.

MATH 5350. Advanced Linear Algebra
3 Credits (3)
Same as MATH 4350 with additional work for graduate students.
Learning Outcomes

1. Apply the fundamental properties of abstract vector spaces to solve algebraic problems.
2. Define and evaluate linear independence, bases, and dimension within abstract vector spaces.
3. Construct matrix representations for linear transformations between vector spaces.
4. Compute determinants, eigenvalues, and eigenvectors of linear operators.
5. Prove theorems regarding direct sums, kernels (null spaces), and ranges of linear transformations.
6. Apply the properties of adjoint operators to solve problems in inner product spaces.

MATH 5360. Introduction to Real Analysis I
3 Credits (3)
Same as MATH 4360 with additional work for graduate students.
Learning Outcomes

1. Understand two-sided limits, one-sided limits, limits at infinity, continuity and uniform continuity for functions on the real line.
2. Understand derivatives, differentiability theorems, the Mean Value Theorem, Taylor's Theorem, L'hospital's Rule and the Inverse Function Theorem for functions on the real line.
3. Understand integration on the real line: the Riemann integral, Riemann sums, the Fundamental Theorem of Calculus and improper Riemann integrals.
4. Understand sequences and infinite series of functions, including uniform convergence, limit supremum, limit infimum, power series and analytic functions.

MATH 5365. Introduction to Real Analysis II
3 Credits (3)
Same as MATH 4365 with additional work for graduate students.
Learning Outcomes

1. Understand the algebraic structure, including planes and linear transformations, of Euclidean spaces.
2. Understand the fundamental notions of metric spaces: limits of functions, interior/closure/boundary of sets, compact sets, connected sets, continuous functions and the Stone-Weierstrass Theorem.
3. Understand derivatives, differentials, tangent planes, the Chain Rule, the Mean Value Theorem, Taylor's Formula and the Inverse Function Theorem for functions on n-dimensional Euclidean space.
4. Apply the Ascoli Theorem for relative compactness of sets of continuous functions on a compact metric space.

MATH 5410. Complex Analysis
3 Credits (3)
Rigorous treatment of complex differentiation and integration, properties of analytic functions, series and Cauchy's integral representations.
Prerequisite: MATH 3120.
Learning Outcomes

1. Analyze the definitions and properties of analytic functions (the Cauchy-Riemann equations, harmonic functions).
2. Explain and apply Cauchy's Integral Theorem/Formula, primitive functions, Liouville's Theorem and the Maximum Modulus Principle.
3. Construct Taylor/Laurent series, analyze their convergence, and (where applicable) classify isolated singularities (poles, essential).
4. Prove the Residue Theorem and use it to compute line integrals and improper real integrals.
5. Analyze such concepts as the Argument Principle, Rouche's Theorem, Jordan's Lemma, the Schwarz Lemma, and Montel's Theorem.

MATH 5420. Topology I
3 Credits (3)
Connectedness and compactness of topological spaces, introduction to the quotient topology, elementary homotopy theory, the fundamental group, the Seifert-van Kampen theorem.
Prerequisite(s): MATH 5350 and MATH 5365, or consent of instructor.

Learning Outcomes

1. Formulate explicit homotopies between functions and construct homotopy equivalences between topological spaces.
2. Construct standard examples of manifolds and CW-complexes.
3. Prove basic properties of the fundamental groups of topological spaces.
4. Calculate fundamental groups of topological spaces using the Van Kampen Theorem.
5. Construct the covering space corresponding to a particular subgroup.
6. Determine when a group action on a space is a deck transformation action and compute the corresponding base space.

MATH 5425. Topology II
3 Credits (3)
Covering spaces and their classification, singular homology, degree theory, Brouwer's fixed point theorem, CW-complexes and cellular homology, and other applications.
Prerequisite(s): MATH 5420 or consent of instructor.
Learning Outcomes

1. Define singular chain complexes and singular homology.
2. Prove basic properties such as functoriality and homotopy invariance of singular homology groups.
3. Define and calculate cellular homology groups of CW-complexes using degree theory.
4. Prove geometric theorems (Brouwer's Fixed-point Theorem) using properties of homology groups.
5. Calculate singular homology groups of CW-Complexes using the singular/cellular equivalence.

MATH 5428. Topics in Topology
3 Credits
Topics in modern topology. The material covered will reflect current research topics in the field and may vary each time the course is offered. To be taken up to 3 times. May be repeated up to 9 credits.
Learning Outcomes

1. Gain knowledge of advanced methods in the area of topology.
2. Develop potential to explore literature in the area of topology.
3. Develop potential to conduct supervised research in the area of topology.

MATH 5430. Mathematical Structures in Logic
3 Credits (3)
Lattices, distributive lattices, Boolean algebras, Heyting algebras. Lindenbaum-Tarski algebras of classical and intuitionistic logics. Representation theorems. Modal logics and their algebraic counterparts. Kripke semantics. Goedel translation.
Prerequisite: MATH 5320.
Learning Outcomes

1. Explain the basic theory of posets and lattices and apply closure operators, ideals, and completions to solve related problems.
2. Analyze the basic theory of distributive lattices, Boolean algebras, and Heyting algebras, and construct related algebraic structures (homomorphisms, subalgebras).
3. Illustrate the connections between various algebraic systems and the propositional logics they model, and translate statements between an algebraic structure and its dual space.
4. Explain the theoretical motivation for various modal logics and relate properties of modal algebras with their corresponding dual frames.

MATH 5435. Universal Algebra and Model Theory
3 Credits (3)
Universal algebra, homomorphisms, subalgebras, products, congruences. Varieties and class operators. Free algebras and Birkhoff's theorem. Ultraproducts and Los's theorem. Congruence distributive varieties and Jonsson's theorem. Universal classes and quasi-varieties.
Prerequisite: MATH 5320.
Learning Outcomes

1. Analyze standard examples of universal algebras arising from logic, algebra, and linear algebra.
2. Construct and manipulate homomorphisms, subalgebras, products, and congruences within universal algebraic systems.
3. Apply the relationships between equations, free algebras, and varieties to characterize algebraic classes.
4. Classify subdirectly irreducible algebras within various varieties.
5. Apply Jonsson's lemma and Los's theorem to solve complex problems related to varieties.
6. Relate the theory of varieties to broader concepts and special cases within model theory.

MATH 5438. Topics in Foundations
3 Credits
Topics in modern foundations. The material covered will reflect current research topics in the field and may vary each time the course is offered. To be taken up to 3 times. May be repeated up to 9 credits.
Learning Outcomes

1. Gain knowledge of advanced methods in the area of foundations.
2. Develop potential to explore literature in the area of foundations.
3. Develop potential to conduct supervised research in the area of foundations.

MATH 5440. Partial Differential Equations I
3 Credits (3)
The basic equations of mathematical physics. Laplace, Heat and Wave Equations. The method of characteristics, introduction to conservation laws, special solutions.
Prerequisite(s): MATH 5220 and MATH 5365 or consent of instructor.
Learning Outcomes

1. Formulate the basic equations of mathematical physics from physical principles and classify them (elliptic, parabolic, hyperbolic).
2. Apply analytical techniques (separation of variables, Fourier series) to solve the Heat and Wave equations.
3. Solve boundary and initial value problems for classical Partial Differential Equations (PDEs).
4. Interpret special solutions of PDEs in applied contexts.
5. Evaluate the stability and uniqueness of solutions to PDEs.

MATH 5445. Partial Differential Equations II
3 Credits (3)
Sobolev spaces theory: basic definitions and properties, embedding theorems, weak solutions of boundary value problems and variational methods for partial differential equations.
Prerequisite(s): MATH 5460 or consent of instructor.
Learning Outcomes

1. Define and apply key concepts in Sobolev space theory.
2. Apply embedding theorems to analyze function spaces.
3. Formulate and solve boundary value problems for PDEs using weak solutions.

4. Apply variational methods to analyze solutions of partial differential equations.

MATH 5450. Abstract Algebra II: Fields, Rings and Modules
3 Credits (3)
Topics covered include field extensions; algebraic closure; polynomials rings; irreducibility criteria; Noetherian rings; algebraic sets; Nullstellensatz; modules; applications to linear algebra.
Prerequisite(s): MATH 5340 or consent of instructor.
Learning Outcomes
1. Apply factorization properties of rings (UFD, PID, ED) to solve algebraic problems.
2. Apply irreducibility criteria to univariate polynomials over various fields.
3. Construct field extensions and determine their key properties.
4. Analyze the structure and basic properties of modules.
5. Apply the structure theorem for modules over a PID to classify modules.
6. Compute the rational canonical form of a matrix.

MATH 5453. Module Theory and Homological Algebra
3 Credits (3)
Introductory concepts of homological algebra, including projective, injective and flat modules; projective and injective resolutions; exactness of functors; homology of chain complexes; derived functors.
Prerequisite(s): MATH 5450 or consent of instructor.

MATH 5455. Introduction to Commutative Algebra and Algebraic Geometry
3 Credits (3)
Introduction to the basic notions and techniques of modern algebraic geometry, including the necessary commutative algebra foundation. Topics likely to include algebraic and projective varieties, Nullstellensatz, morphisms, rational and regular functions, local properties. Other topics may include Noether normalization, dimension theory, singularities, sheaves, schemes, Grobner bases.
Prerequisite(s): MATH 5450 or consent of instructor.

MATH 5458. Topics in Algebra
3 Credits
Topics in modern algebra. The material covered will reflect current research topics in the field and may vary each time the course is offered. To be taken up to 3 times. May be repeated up to 9 credits.
Learning Outcomes
1. Gain knowledge of advanced methods in the area of algebra.
2. Develop potential to explore literature in the area of algebra.
3. Develop potential to conduct supervised research in the area of algebra.

MATH 5460. Measure and Integration
3 Credits (3)
Measure spaces, measurable functions, extension and decomposition theorems for measures, integration on measure spaces, absolute continuity, iterated integrals.
Prerequisite: MATH 5365 or consent of instructor.
Learning Outcomes
1. Define key concepts in measure theory and distinguish between them.
2. Apply extension and decomposition theorems to determine the structure of measures.
3. Construct the Lebesgue integral on general measure spaces.
4. Compare the Lebesgue integral to the Riemann integral using concrete examples.
5. Evaluate and manipulate iterated integrals using absolute continuity and Fubini's theorem.

MATH 5463. Real Analysis
3 Credits (3)
Differentiation, Lp spaces, Banach spaces, measure and topology, other selected topics.
Prerequisite: MATH 5460.
Learning Outcomes
1. Analyze the topological structure, duality properties, and important inequalities of Lp spaces.
2. Apply concepts from measure theory and topology to analyze the behavior of functions and sets in real analysis.
3. Evaluate differentiability and integrability using advanced real analysis techniques.
4. Distinguish between pointwise and norm-based convergence of function sequences.
5. Solve problems involving the completeness, continuity, and compactness of Banach spaces.

MATH 5465. Introduction to Functional Analysis
3 Credits (3)
Banach spaces. The three basic principles: uniform boundedness principle, closed graph/open mapping theorems, Hahn-Banach theorem.
Prerequisite: MATH 5463, or consent of instructor.
Learning Outcomes
1. Define and analyze the structure of normed and Banach spaces.
2. Apply the Hahn-Banach Theorem to investigate the properties of dual spaces.
3. Apply the Uniform Boundedness Principle, the Open Mapping Theorem, and the Closed Graph Theorem to solve problems in functional analysis.
4. Define the properties of compact and self-adjoint operators.
5. Apply spectral theory to analyze self-adjoint operators.

MATH 5468. Topics in Analysis
3 Credits
Topics in modern analysis. The material covered will reflect current research topics in the field and may vary each time the course is offered. To be taken up to 3 times. May be repeated up to 9 credits.
Learning Outcomes
1. Gain knowledge of advanced methods in the area of analysis.
2. Develop potential to explore literature in the area of analysis.
3. Develop potential to conduct supervised research in the area of analysis.

MATH 5996. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. May be for unlimited credit with approval of the department.
Learning Outcomes
1. Analyze advanced concepts in the selected topic area.
2. Apply specialized mathematical methods to solve complex problems within the topic area.
3. Critique current research and developments in the topic area.
4. Communicate findings from the topic area in professional written and oral formats.

MATH 5997. Directed Reading
1-6 Credits
Readings. May be repeated for a maximum of 6 credits. Consent of instructor required. Graded: S/U.
Learning Outcomes
1. Summarize key concepts from assigned mathematical literature in a written report.
2. Critique mathematical arguments presented in advanced texts.
3. Synthesize information from multiple mathematical sources to form a coherent overview.
4. Communicate understanding of the assigned readings through a written report or oral presentation.

MATH 5999. Master's Thesis
1-15 Credits
Thesis. May be repeated up to 99 credits.
Learning Outcomes
1. Formulate a significant mathematical research problem suitable for a Master's thesis.
2. Apply appropriate mathematical methods to investigate the research problem.
3. Interpret research results in the context of existing mathematical literature.
4. Produce a Master's thesis meeting scholarly standards.
5. Defend the Master's thesis in an oral examination.

MATH 6991. Doctoral Research
1-15 Credits
Research. May be repeated up to 88 credits.
Learning Outcomes
1. Identify and refine an original doctoral research problem into a testable hypothesis or clear objectives.
2. Design a rigorous research plan for the doctoral research.
3. Implement the initial stages of the rigorous research plan.
4. Evaluate initial research findings within the academic context.
5. Communicate research progress and results through appropriate scholarly formats (written paper, oral presentation).

MATH 6996. Special Topics
1-15 Credits
Selected topics. May be repeated up to 88 credits.
Learning Outcomes
1. Integrate advanced mathematical theories to solve problems related to the selected topic.
2. Solve complex problems requiring specialized mathematical tools.
3. Critique research trends and debates in the topic area.
4. Present an advanced analysis of the topic area through written and oral communication.

MATH 7000. Doctoral Dissertation
1-15 Credits
Dissertation. May be repeated up to 88 credits.
Learning Outcomes
1. Conduct original research advancing knowledge in mathematics.
2. Apply rigorous methodologies to address complex research questions.
3. Integrate research findings into the scholarly literature through a publishable paper.
4. Produce a doctoral dissertation meeting professional standards.
5. Defend the doctoral dissertation in an oral examination.

MGMT-MANAGEMENT

MGMT 2110. Principles of Management
3 Credits (3)
An introduction to the basic theory of management including the functions of planning, organizing, staffing, leading, and controlling; while considering management's ethical and social responsibilities.
Learning Outcomes
1. Explain the major functions of management including planning, organizing, communications, controlling, motivating, leading, and staffing.
2. Recognize major developments in the history of management thought.
3. Describe the basic managerial processes including decision-making and other key skills necessary for managers to perform their roles.
4. Identify an organization's stakeholders and the importance of social and ethical responsibility of managers.
5. Explain the formulation and implementation of strategic planning, including the relationship between goals, plans, vision statements, and mission statements.
6. Describe the strategies managers use to help organizations adapt to changing internal and external environments.
7. Explain organizational change, forces for change, sources of resistance to change, and the techniques managers can use to implement and facilitate change.

MGMT 309. Human Behavior in Organizations
3 Credits (3)
Interpersonal and organizational behavior, motivation, communication, team building, leadership, diversity management, legal and ethical issues, and politics in organizations.
Learning Outcomes
1. Analyze behavior of people at work in all types of organizations.
2. Understand what influences human motivation, communication, team relationships.
3. Understand how human interactions in an organization influence employee and organizational performance.

MGMT 310V. Entrepreneurial Mindset
3 Credits (3)
This course provides the opportunity to learn to think like an entrepreneur in the broader context of social entrepreneurship, intrapreneurship, creative problem solving, opportunity recognition, and innovation.
Learning Outcomes
1. Define and explain entrepreneurial skills, behaviors, and attributes.
2. Describe and assess your own entrepreneurial skills, behaviors, and attributes and evaluate your potential for an entrepreneurial career.
3. Describe and assess the entrepreneurial process by identifying and employing various strategies for business idea generation, assessing business opportunities, and identifying the key steps in the start-up process.

MGMT 332. Human Resources Management
3 Credits (3)
Introductory course in human resources management. Includes recruitment, selection, legal and ethical implications, performance

appraisal, training, compensation, safety, and union-management relations.

Learning Outcomes

1. Provides basic understanding of the functional areas in Human Resource Management (HRM), including recruitment, selection, performance management, compensation, employee development, legal compliance, and union-management relations.
2. Understand the concerns and functions of the principal actors in employment systems: employees, management, and government.
3. Enable an understanding of how to strategically align HR practices with organizational goals and achieve effective workforce management and performance.

MGMT 333. Training and Development
3 Credits (3)

Training and development of human capital, including training needs assessment, training approaches and techniques, and evaluation of training effectiveness.

Learning Outcomes

1. Research and practice various methods of delivering management training and development programs, including, lectures, experiential exercises, simulations, self-assessment tools and questionnaires to stimulate self-reflection.
2. Analyze one's own skills as a trainer and areas needing improvement.
3. Conduct training needs assessments via questionnaires and interviews.
4. Evaluate the success of a training program by collecting and interpreting feedback from training session participants and the course instructor.

MGMT 335V. Business and Government
3 Credits (3)

Crosslisted with: ECON 335G

MGMT 344. Production and Operations Management
3 Credits (3)

Management of physical and human resources; management of information systems and decision-making in operations; applications in various organizations.

Prerequisite: MATH 1350G or A ST 311; and BCIS 338 or BCIS 350.

Learning Outcomes

1. Develop an understanding of the challenges and solutions in operations, production, and delivery of goods and services in manufacturing and service organizations.
2. Employ quantitative and analytical techniques in industrial and service settings to enhance decision-making in operations management.
3. Evaluate the use of sustainable practices in operations and their influence on the environment and business efficiency, encouraging the development of responsible management decisions.
4. Cultivate critical thinking skills and apply operations management concepts and methodologies to address and solve specific operational problems.

MGMT 345V. Quality and Competitiveness: An International Perspective
3 Credits (3)

Quality management and competitiveness are studied in manufacturing, services, and the public sector with an international perspective. Topics include: global history of quality, foreign competition and its impact on quality and productivity, quality management and continuous improvement, international operations management, quality assessment, and a review of the emergence of quality and competitiveness in government, education and health care. May be repeated up to 3 credits.

Learning Outcomes

1. Developing critical thinking skills through challenging material and assignments.
2. Foster intelligent inquiry through assignments, participative lectures, team projects.
3. Develop an integration and synthesis of knowledge through applications to case studies and individual assignments.
4. Promote a breadth of knowledge on international developments in quality and competitiveness with a holistic view of quality and its impact on businesses, organizations, nations and individuals.

MGMT 347. Management Functions and Processes
3 Credits (3)

Planning, organizing, directing, and controlling operating units in an organization. Applications to a variety of types of organizations.

Learning Outcomes

1. Understand and explain the theory and role of planning and organizing in today's organizations or operating units.
2. Understand and explain the theory and role of leading and directing today's organizations or operating units.
3. Understand and explain the concept and role of control in today's organizations.

MGMT 351. Supply Chain Management
3 Credits (3)

Acquisition and control and delivery of materials, parts, equipment, and services for end use in the organization. Applications to service and manufacturing industries, nonprofit, and governmental institutions.

Learning Outcomes

1. Acquire an understanding of supply chain management (SCM) topics, including integration and management of supply chain processes, strategic purchasing management, accurate demand forecasting, customer relationship management, and supply chain performance measurement.
2. Recognize the strategic significance of effective supply chain design, planning, and operations for business success.
3. Learn to leverage key supply chain performance drivers at conceptual and practical levels to enhance supply chain efficiency, employing analytical methodologies for in-depth supply chain analysis.
4. Explore using digital technologies to enhance supply chain transparency, visibility, and efficiency, including implementing IoT, blockchain, and AI solutions to streamline operations and improve supply chain resilience.

MGMT 361. Small Business Management
3 Credits (3)

Principles and practice of managing a small enterprise with emphasis on growth and performance.

Learning Outcomes

1. Understand the small business environment and operations.
2. Understand various strategies and processes unique to small business, including forms of ownership, sustainability issues, strategic planning, alternative forms of business, and succession issues.
3. Analyze the financial reporting, financial performance, and risks associated with small businesses.

MGMT 388V. Leadership and Ethics
3 Credits (3)

Exploration of the multifaceted nature of leadership and principal-based ethics in modern society through readings, cases, and seminar discussion.

Learning Outcomes

1. Provide students with a critical and multi-perspectival and leadership understanding of business ethics and the social responsibilities of businesses today.
2. Understand how to apply this knowledge to actual cases and especially to students' own experiences and understandings of ethics in organizations.
3. Develop more complex moral reasoning and understand important principles of ethics (integrity, trust, accountability, transparency, fairness, respect, rule of law and viability) and how to apply and practice them.

MGMT 391. Management Internship and Cooperative Education I
1,3 Credits

Application of management skills to the work environment. Open only to students majoring or minoring in management. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not by the work experience. May be repeated up to 3 credits.

Prerequisite: MGMT 309.

Learning Outcomes

1. Student learning outcomes will vary for each student.

MGMT 449. Strategic Management
3 Credits (3)

Integrative approach to envisioning the future and shaping strategies for business success.

Prerequisite: BCIS 338 or BCIS 350; BLAW 316; BFIN 341; MGMT 309; MKTG 303; and one of the following: MGMT 344 or MGMT 470 or BCIS 485.

Learning Outcomes

1. Apply strategic management ideas, frameworks, and concepts to analyze situations and identify strategic management issues.
2. Create and evaluate alternative courses of action.
3. Communicate and support conclusions to others using strategic analysis tools, and in writing and speech.
4. Think in a critical, analytic, integrative, and ultimately strategic manner.

MGMT 450. Business Process Improvement
3 Credits (3)

Identify, design, and implement process change techniques to create efficient and effective processes in various business context. Student must be in final academic year before graduation or have consent of instructor.

Learning Outcomes

1. Describe the benefits and steps of process improvement.
2. Provide examples of resources and tools to support process improvement.
3. Demonstrate an ability to utilize practice improvement tools such as process mapping and PDSA (Plan-Do-Study-Act) cycles.

MGMT 451. Strategic Talent Management
3 Credits (3)

Staffing and talent management processes for organizational selection, promotion, and retention. Use of selection methods and measurement of work behavior for the evaluation of employee performance.

Prerequisite: MGMT 332 or instructor permission.

Learning Outcomes

1. Understand the legal and regulatory environment surrounding the human resources functions of selection, placement, and evaluation.
2. Understand how to select, develop and implement reliable, valid, and cost-effective employee selection and evaluation procedures, specific to job analysis, job application and resume screening, various employment tests, role of virtual mediums, and structured interviews.

MGMT 458. International Business Management
3 Credits (3)

Cultural influences on management are examined in a global business environment with a particular emphasis on human behavior and people management in multinational organizations. Same as I B 458.

Learning Outcomes

1. Understand the global business environment as it relates to HR and people management, including the economic, social, political, cultural, and legal environments of different countries.
2. Develop a capacity to think about business and human behavior in a global context, and how to adapt to cultural differences.
3. Assess the risks and opportunities of doing business in different countries.
4. Understand the ethical considerations and decision-making differences of doing business in a global context.

MGMT 459. Transportation Optimization
3 Credits (3)

Equip students with a deep understanding of logistics network design, transportation planning, and cost optimization strategies while exploring emerging technologies such as AI, IoT, and blockchain. This course will develop the analytical and strategic skills needed to enhance efficiency, resilience, and sustainability in modern global supply chains.

Prerequisite: MGMT 344, MGMT 351.

Learning Outcomes

1. Develop an ability to critically analyze transportation data and logistics to make informed decisions that optimize operational efficiency and reduce costs.
2. Learn how to strategize and plan transportation routes and schedules that meet business objectives while considering budget, time, and environmental impact constraints.
3. Develop and apply optimization models to solve real-world transportation problems, utilizing linear programming, network design, and routing algorithms.
4. Gain experiential learning with advanced transportation technologies and software, including GIS (Geographic Information Systems), GPS (Global Positioning System), and real-time data analytics platforms and leverage these technologies to enhance route planning, fleet management, and overall transportation system performance.

MGMT 460. Compensation Management
3 Credits (3)

An overview of wage and salary administration, including job evaluation, wage and salary surveys, program administration, legal aspects of pay systems, and benefits administration.

Prerequisite: MGMT 332 or consent of instructor.

Learning Outcomes

1. Understand and design effective compensation systems within an organization that seek to define and measure employee work performance.
2. Understand foundational concepts such as the different compensation philosophies, components of a total compensation package, and market competitiveness analysis.

3. Understand relevant employment laws and ethical principles that impact compensation.

MGMT 461. Entrepreneurial Decision Making
3 Credits (3)
Explore the fundamentals of lean startup methodologies and customer discovery in this hands-on course. Students will learn to develop and test business ideas using the Lean Canvas, conduct effective customer interviews, and apply continuous feedback to iterate on their concepts. By the end of the course, students will be equipped to make strategic decisions and validate their business models with real-world insights. Crosslisted with: MKTG 461.
Prerequisite: Students in final year or consent of instructor.
Learning Outcomes
1. Explore the fundamentals of lean startup methodologies.
2. Develop skills to conduct effective customer interviews and apply continuous feedback in concept development.
3. Possess competency to make strategic decisions and validate business models with real-world insight.
4. Learn to develop and test business ideas through customer discovery.

MGMT 465. Contemporary Issues in Human Resources Management
3 Credits (3)
Integrative course in human resources management, emphasizing the application of advanced contemporary concepts to complex personnel cases and strategic human resource initiatives.
Prerequisite: MGMT 332.
Learning Outcomes
1. Develop increased understanding of current trends in Human Resource Management.
2. Understand how HR trends can be used to optimize HR strategy in the 21st century.
3. Develop critical thinking skills and communication skills.

MGMT 470. Project Management in Organizations
3 Credits (3)
Roles, responsibilities, and techniques of project managers in managing projects effectively. Preparation for professional certification.
Learning Outcomes
1. Develop an understanding of a project manager's roles and responsibilities.
2. Develop knowledge of the skills and abilities needed to manage a project effectively, to include effective communication, leadership, time management, problem-solving, adaptability, and decision-making.
3. Gain an ability to develop the foundations of a project plan, implement and control the project, and terminate a project effectively.
4. Provide a foundation for preparation for project management certification.

MGMT 490. Selected Topics
1-18 Credits (1-18)
Seminars in selected current topics in the various areas of management and administration. Prerequisites vary according to the seminar being offered.

MGMT 491. Management Internship and Cooperative Education II
1-3 Credits
Covers the application of management skills to the work environment. The amount of academic credit (1-3 cr.) will be determined by the academic experience and not be the work experience. May be repeated for a maximum of 3 credits. Restricted to majors and minors.
Prerequisite: MGMT 309 and consent of instructor.

MGMT 498. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.
Prerequisites: junior or above standing and consent of instructor.

MGMT 502. Operations Management
3 Credits (3)
Systems and specialized models applied to the management of production facilities and service operations, including physical and human resources.
Learning Outcomes
1. Explain the elements of design, operation and improvement of productive systems that creates the firm's products and services.
2. Develop working knowledge of operations principles and techniques that will increase customer satisfaction and value to the firm.

MGMT 503. Organizational Behavior and Management Processes
3 Credits (3)
Covers the theory and practice related to the successful management of human capital in organizations operating within a dynamic global environment. Course goals include developing alternative frameworks for analyzing issues related to human behavior, management science, and organizational structure and theory.
Learning Outcomes
1. Discern, analyze, and evaluate issues at the individual, group, and organizational levels of analysis, understanding these levels are both separate and interrelated forces in need of alignment.
2. Understand how effective leaders communicate, influence, motivate, negotiate, and build and manage teams.
3. Apply problem solving methods and develop action plans and recommendations to optimize, resolve, or mitigate complex problems or opportunities.
4. Recognize, describe, compare, and contrast the central concepts and theories of organizational behavior, including organizational culture, change, and social and political processes, team dynamics, individual and team decision making, and leadership.

MGMT 510. AI and Machine Learning for Supply Chain Decision-Making
3 Credits (3)
This course provides an understanding of the use of artificial intelligence (AI) and machine learning (ML) in supply chain operations, focusing on data-driven decision-making. Students will apply predictive and prescriptive models to address challenges in forecasting, inventory management, customer segmentation, and sourcing, among others.
Prerequisite: Programming Foundations (either CSCI 4525 or CSCI 4520), AI Foundations (CSCI 5405, CSCI 5420 or EE 565).
Learning Outcomes
1. Understand the most common supply chain management challenges and the potential for AI to address them.
2. Apply traditional AI and ML techniques such as regression and clustering to solve supply chain problems.
3. Assess model performance in the context of the supply chain.
4. Compare customer and supplier segmentation models.
5. Develop basic AI-driven supply chain decision support tools.
6. Reflect on the ethical implications of AI/ML applications in the supply chain.

7. Understand the implications of data management on developing AI decision support tools.

MGMT 520. Advanced Supply Chain Intelligence: Optimization and Generative AI
3 Credits (3)
This advanced course is complementary to MGMT/BCIS 510. It equips students to design and optimize emerging intelligent supply chain systems using mathematical optimization, simulation, and generative AI technologies, including large language models (LLMs) and generative adversarial networks (GANs). Students will develop planning, risk management, and automation models using system development platforms such as Nvidia Developer or Llama through hands-on projects like digital twinning or agentic decision tools, while critically evaluating their strategic and ethical implications in supply chain operations. Students will collaborate to bridge technical and business knowledge.
Prerequisite: MGMT 510 or BCIS 510.
Learning Outcomes
1. Formulate and solve supply chain optimization problems using Nvidia Developer or Llama.
2. Design and evaluate simulation models for decision-making under uncertainty.
3. Utilize large language models (LLMs) for supply chain documentation and automation.
4. Generate synthetic data for risk analysis and what-if scenarios using generative AI.
5. Design basic AI-driven agents for supply chain automation.
6. Critically assess generative AI's operational, strategic, and ethical implications in supply chains.
7. Integrate technical and strategic perspectives to develop AI-driven supply chain solutions.
8. Develop vector databases for customer sentiment analysis and update LLMs with current supply chain information.

MGMT 548. Small Business Consulting
3 Credits (3)
Study, analysis, and presentation of recommendations for solving significant problems confronting small businesses. Same as MGMT 448 with differentiated assignments for graduate students.
Prerequisite(s): Graduate standing.

MGMT 550. Small Business Consulting
3 Credits (3)
Study, analysis, and presentation of recommendations for solving significant problems confronting small businesses. Same as MGMT 450 with differentiated assignments for graduate students.
Learning Outcomes
1. Understand financials and other indicators of firm health.
2. Understand how to analyze a firm's market and competitive environment.
3. Identify warning signs that a business turnaround may be needed.
4. Formulate a recovery plan for a troubled company.

MGMT 590. Strategic Management
3 Credits (3)
Covers the integration of functional, human, technological, and environmental aspects of business within the framework of management policy and strategy formulation. Formulate, implement, evaluate and control the various functions of the organization from a systems perspective. Understand the external environment and its impact on the organization. Restricted to majors.
Prerequisite: M.B.A. student in his or her final semester.

MGMT 591. Seminar in Entrepreneurship
3 Credits (3)
For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Same as MGT 461 with differentiated assignments for graduate students. Crosslisted with: MKTG 591.
Prerequisite(s): Graduate standing.

MGMT 598. Special Research Programs
1-3 Credits
Individual investigations either analytical or experimental. A maximum of 6 credits may be earned.
Prerequisite: consent of instructor.

MGMT 600. Doctoral Research
1-15 Credits (1-15)
This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination. Restricted to management majors. May be repeated up to 88 credits.

MGMT 601. Research in Management
1 Credit (1)
Ph.D. course provides opportunities for significant interaction between Management faculty and Management Ph.D. students. The course also provides opportunities for development of professional scholarly standards, ethics, and critiques, as well as insight into current research areas and topics supported by the Management Department and other relevant disciplinary areas. May be repeated for a maximum of 6 credits. Restricted to Ph.D. students. Graded S/U.

MGMT 645. Seminar in Human Resources Management
3 Credits (3)
Seminar will address current issues in human resources management. Focus on research related to the selection, development, and effective use of human resources. Restricted to doctoral students. May be repeated up to 3 credits.

MGMT 650. Seminar in Organizational Behavior
3 Credits (3)
Seminar will include specific organizational behavior topics; motivation, leadership, group and inter-group relations, and attitude theory. Focus on current research and theory. Restricted to doctoral students. May be repeated up to 3 credits.
Learning Outcomes
1. Varies

MGMT 655. Seminar in Organizational Systems and Theory
3 Credits (3)
Analysis of organizations from a macro perspective. Topics include organizational theory, organizational design, organizational environment, and sociotechnical systems. Restricted to doctoral students. May be repeated up to 3 credits.

MGMT 660. Research Design and Methodology
3 Credits (3)
Topics will include philosophy of science, theory building, and research methods applicable to the study of organizational behavior. Restricted to doctoral students. May be repeated up to 3 credits.
Learning Outcomes
1. Varies

MGMT 661. Qualitative Research Methods
3 Credits (3)
In-depth coverage of selected topics in research methodology, including theory and logic of scientific investigation, grounded theory, action

research, and ethnomethodology. Restricted to doctoral students. May be repeated up to 3 credits.

MGMT 670. Seminar in Operations Management
3 Credits (3)
Seminar examines the major problem areas, research findings, and research methodologies of operations management. Focus on the critical evaluation of current theory and methodology. Restricted to Doctoral students. May be repeated up to 3 credits.

MGMT 675. Seminar in Strategic Management
3 Credits (3)
Survey of current and classical readings in strategy. Introduces the doctoral level student to strategic issues, strategic topics for research, and publication venues. Restricted to doctoral students. May be repeated up to 3 credits.

MGMT 685. Story Consulting to Organizations
3 Credits (3)
Apply various qualitative story and narrative research methods (plot analysis, script analysis, life history, and restoring) to action research consulting project. Students will conduct story assessment and (propose or enact)intervention with a local consenting organization. Restricted to doctoral students.

MGMT 690. Special Topics
3 Credits (3)
Seminars in selected current topics in the various areas of management. May be repeated for unlimited credit. Restricted to doctoral students.
Prerequisite(s): Vary according to seminar being offered.

MGMT 698. Special Topics
1-3 Credits
Prerequisite: consent of instructor.

MGMT 700. Doctoral Dissertation
1-15 Credits (1-15)
May be repeated up to 88 credits.
Prerequisite: advancement to candidacy.

MKTG-MARKETING

MKTG 1111. Level 1, PGA's PGM Education Program (Part 1)
3 Credits (3)
Level 1 Part 1 of the PGA PGM Education Program. Introduction to the Policies and Procedures of the PGA Golf Mgt. Program and the PGA of America. Students will complete the PGA Qualifying Level, Facility Management 1A (Tournament Ops A, Rules of Golf B, and Career Enhancement B), and the corresponding Work Experience Activities. Additional course fee required.
Learning Outcomes

1. Knows the career opportunities, challenges, and benefits of PGA.
2. Can distinguish significant differences between Teaching and Player Development and the Facility Operations Management pathways to PGA membership.
3. Understands the structure and requirements of the PGM Program.
4. Knows how to maintain acceptable progress.
5. Knows the courses at each level of the PGM Program.
6. Knows how to access resources that facilitate progress through the PGM Program.
7. Discuss how the PGA of America began and evolved and be familiar with key milestones in PGA history.
8. State the mission of the PGA of America and the structure of the PGA Constitution, Bylaws and Regulation.
9. Describe how the PGA of America is organized, including its Officers, Board of Directors, The Chief Executive Officer and headquarters staff. 1
10. Describe the role of Sections and Districts, the PGA Officers and Board of Directors, The Chief Executive Officer and headquarters staff. 1
11. Recognize the requirements for PGA Recognized Golf Facilities and employment definitions. 1
12. Describe the importance of the PGA of America's dedication to professionalism and ethical practices, what constitutes a Code of Ethics violation, and the procedures for processing Code of Ethics violations. 1
13. Identify eligibility requirements for apprentices and members, the rights of membership, the different membership classifications, how to maintain active status, and the process for appealing to the Board of Control on membership issues. 1
14. Review the organization of The Rules of Golf. 1
15. Understand proper etiquette of the game of golf. 1
16. Review the history and development of the Rules. 1
17. Understand how the Rules are maintained and changed. 1
18. Prepare a professional resume and cover letter for an employment interview.

MKTG 1112. Level 1, PGA's PGM Education Program (Part 2)
3 Credits (3)
Level 1 Part 2 of the PGA PGM Education Program. This class will focus on Teaching and Coaching 1, the corresponding PGA Work Experience Activities, and PGA Teaching Seminars. Additional course fee required.
Learning Outcomes

1. Know how students learn and process golf knowledge and skills, and identify the implications for teaching.
2. Know how to define and distinguish between learning and performance.
3. Understand how juniors learn golf knowledge and skills, and identify implications for teaching.
4. Conduct a physical evaluation of a junior golfer and create developmentally appropriate exercise and training programs.
5. Establish student/teacher relationships that promote greater student learning and enjoyment.
6. Develop a communication style that fits the student and increases instructional effectiveness.
7. Analyze student's instructional needs and set clear, purposeful learning and practice goals.
8. Know the format for an effective golf lesson.
9. Deliver effective explanations and demonstrations during a golf lesson. 1
10. Engage in self-assessment of teaching skills and competencies. 1
11. Recognize the appropriate clubhead path and clubface position information to improve a golfer's performance. 1
12. Conduct appropriate assessments to determine the short game skill level of the golfer. 1
13. Gain understanding of the short game elements to help lower scores and improve the player. 1
14. Define club performance terms and specifications, including lie angle and clubface angle or position, and describe their effect on ball flight and player performance: Define what information is require to properly assess a player's golf equipment. 1

15. Define club performance terms and specifications, including lie angle and clubface angle or position, and describe their effect on ball flight and player performance: Observe a player's swinging motion, ball flight, and equipment to evaluate the effectiveness of their equipment.

MKTG 1210. Advertising
3 Credits (3)
A survey of currently available advertising media. A psychological approach to consumer persuasion; applied techniques in media selection, layout mechanics, production methods, and campaign structures.
Prerequisite: MKTG 2110.
Learning Outcomes
1. Define advertising and the relevant application of psychology in delivering the message.
2. Explain the importance of various advertising media in the marketing mix.
3. Identify and explain the social, ethical and legal issues advertisers must consider.
4. Describe the significance of the marketing function in business.
5. Explain the importance of advertising and other marketing communication tools.
6. Demonstrate application of the planning process as it applies to marketing and advertising.
7. Describe the factors that are weighted when considering the use of radio and television in the creative advertising mix.
8. Describe the relationship between market segment, consumer behavior and selection of advertising campaign types.
9. List the alternative means of reaching a target market and the technical challenges of each.

MKTG 1220. Small Business Marketing
3 Credits (3)
An overview of public relations principles, practices and purposes as applied to small business. Topics include basics of news release writing, media awareness, development and maintenance of a positive public image, branding, ethical marketing, and the relationships of public relations with advertising and marketing. Methods and practices used in small business are explored.
Prerequisite/Corequisite: MKTG 2110.
Learning Outcomes
1. Explain the importance of creating and sustaining a positive public awareness and image.
2. Identify public relations practices as they relate to the management and marketing processes.
3. Define branding and discuss its importance for small business.
4. Describe the value of business event management and promotion for small business.
5. Discuss how media relations, public relations, advertising and marketing efforts are interrelated and the importance of each.

MKTG 180. Level 1, PGA's PGM Education Program (Part 1)
3 Credits (3)
Level 1 Part 1 of the PGA PGM Education Program. Introduction to the Policies and Procedures of the PGA Golf Mgt. Program and the PGA of America. Students will complete the PGA Qualifying Level,Facility Management 1A (Tournament Ops A, Rules of Golf B, and Career Enhancement B), and the corresponding Work Experience Activities. Additional course fee required. Consent of Instructor required. Restricted to: MKTG majors.

MKTG 181. Level 1, PGA's PGM Education Program (Part 2)
3 Credits (3)
Level 1 Part 2 of the PGA PGM Education Program. This class will focus on Teaching and Coaching 1, the corresponding PGA Work Experience Activities, and PGA Teaching Seminars. Additional course fee required. Consent of Instructor required. Restricted to: MKTG majors.
Learning Outcomes
1. Know how students learn and process golf knowledge and skills, and identify the implications for teaching
2. Know how to define and distinguish between learning and performance
3. Understand how juniors learn golf knowledge and skills, and identify implications for teaching
4. Conduct a physical evaluation of a junior golfer and create developmentally appropriate exercise and training programs
5. Establish student/teacher relationships that promote greater student learning and enjoyment
6. Develop a communication style that fits the student and increases instructional effectiveness
7. Analyze student's instructional needs and set clear, purposeful learning and practice goals
8. Know the format for an effective golf lesson
9. Deliver effective explanations and demonstrations during a golf lesson 1
10. Engage in self-assessment of teaching skills and competencies 1
11. Recognize the appropriate clubhead path and clubface position information to improve a golfer's performance 1
12. Conduct appropriate assessments to determine the short game skill level of the golfer 1
13. Gain understanding of the short game elements to help lower scores and improve the player 1
14. Define club performance terms and specifications, including lie angle and clubface angle or position, and describe their effect on ball flight and player performance: Define what information is require to properly assess a player's golf equipment 1
15. Define club performance terms and specifications, including lie angle and clubface angle or position, and describe their effect on ball flight and player performance: Observe a player's swinging motion, ball flight, and equipment to evaluate the effectiveness of their equipment

MKTG 2110. Principles of Marketing
3 Credits (3)
Survey of modern marketing concepts and practices focusing on the marketing mix: product, pricing, promotion, and distribution strategies. Topics include: the marketing environment, consumer behavior, marketing research, target marketing, and the ethical and social responsibilities of marketers. May be repeated up to 6 credits.
Prerequisite: BUSA 1110.
Learning Outcomes
1. Describe the professional, ethical, and social responsibilities of marketers.
2. Explain the role of the product in the marketing mix, including the product life cycle, the relevance of product innovation, and product classifications.
3. Illustrate the role of promotion in the marketing mix, including the communication process and the promotional mix.
4. Explain the role of price in the marketing mix, including pricing objectives, pricing policies, and pricing methods.

5. Describe the operation of channels of distribution and supply chains, including functions of intermediaries and degrees of coverage.
6. Define the concepts of target markets and market segmentation with respect to elements of the marketing mix.
7. Explain the importance of market research and information systems in supporting marketing decision making.
8. Describe the dynamic environment(s) in which marketing decisions must be made.

MKTG 2111. Level 1, PGA's PGM Education Program (Part 3)
3 Credits (3)
Level 1 Part 3 of the PGA PGM Education Program. This class will focus on Facility Management 1B (Business Planning A, Customer Relations A, Golf Car A, Merchandising A, Turfgrass A), Level 1 Checkpoint Exams, and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required.

Learning Outcomes

1. Understand the PGA Business Planning Model.
2. Use case studies to apply business planning concepts.
3. Define the business at the facility in terms of vision, core values, facility characteristics, and mission.
4. Assess the current state of the business by conducting a SWOT analysis.
5. Develop appropriate business goals and objectives.
6. Develop strategies to achieve goals and objectives.
7. Analyze financial history to create a financial forecast and operating budget.
8. Monitor performance and make necessary modifications to the plan.
9. Utilize the PGA PGM Work Experience Portfolio to display relevant training and experience. 1
10. Describe the golf industry job market and the knowledge and skills required to succeed. 1
11. Access PGA employment resources and participate in professional growth and development. 1
12. Utilize negotiation strategies for a compensation package. 1
13. Understand the major components of an employment agreement or contract. 1
14. Understand the business value of customer relations. 1
15. Describe the components of the PGA Customer Relations Model. 1
16. Utilize the four Interaction Strategies in a variety of routine and challenging customer situations. 1
17. Utilize the seven Interpersonal Skills in a variety of routine and challenging customer situations. 1
18. Initiate the PGA Experience using a systematic engagement routine. 1
19. Understand the importance of the golf car to the customer, the golf professional, and the facility. 2
20. Know the characteristics of a well-managed golf car fleet. 2
21. Utilize policies and procedures necessary for the operation of a safe and efficient golf car program. 2
22. Evaluate the components and potential benefits of an effective maintenance program and a proper storage facility. 2
23. Determine golf car needs in order to acquire a fleet that supports the facility's mission, customers, and physical characteristics. 2
24. Project fleet revenue, costs, and profit, and identify how budgeting changes impact the bottom line. 2
25. Evaluate the advantages and disadvantages of lease-purchase options. 2
26. Determine optimal rental fees. 2
27. Define key terms used in the Rules of Golf. 2
28. Locate and apply Rules to frequently encountered situations. 2
29. Encourage the use of the Rules and etiquette at your facility. 3
30. Understand how to define, assess, and develop tournament business at a facility. 3
31. Identify and define a tournament's purpose to develop an event that meets the needs of the customer and the facility. 3
32. Know how golf courses and facilities prepare for an event. 3
33. Define staff requirements for tournament operations. 3
34. Understand and communicate tasks required for tournament execution. 3
35. Manage situations and make rulings during events. 3
36. Review tournaments and suggest improvements for future events.

MKTG 2112. Level 2, PGA's PGM Education Program (Part 1)
3 Credits (3)
Level 2 Part 1 of the PGA PGM Education Program. This class will focus on Teaching and Coaching 2, Teaching and Coaching Seminars, and the corresponding PGA Work Experience Activities. Additional course fee required.

Learning Outcomes

1. Explain how students learn golf knowledge and skills, and identify the implications for teaching.
2. Explain how students process information when learning golf skills.
3. Identify and explain the principles of effective practice.
4. Explain how juniors learn golf knowledge and skills, and identify the implications for teaching.
5. Structure an effective golf lesson.
6. Analyze student's instructional needs and set clear, purposeful learning and practice goals.
7. Deliver effective explanations and demonstrations during a golf lesson.
8. Engage in self-assessment of teaching skills and competencies.
9. Recognize and apply the appropriate clubhead path and clubface position information to improve a golfer's performance. 1
10. Conduct appropriate assessments to determine the skill level of the golfer. 1
11. Demonstrate basic knowledge of anatomy and physiology, and conduct a physical observation to identify movement capabilities and limitations that may affect a golfer's performance. 1
12. Define club performance terms and specifications, and describe their effect on ball flight and player performance.

MKTG 2220. Digital Marketing
3 Credits (3)
This course focuses on planning to create and market a website. Internal marketing topics such as registering with search engines, increasing traffic, segmenting and targeting markets, establishing an online presence, developing a marketing plan and reshaping business for the Web market are covered.
Prerequisite: MKTG 2110.

Learning Outcomes

1. Describe how search engines work. (Use knowledge to make recommendations to a website on how it can improve its organic search rankings - perform search engine optimization).

2. Describe the various methods of online display advertising.
3. Determine the appropriate key performance indicators (KPIs) for any type of website.
4. Describe and implement best practices in marketing to a database of current and potential customers via email.
5. Utilize knowledge of social media tactics to design an effective social media campaign.
6. Implement online reputation management tactics to improve the online reputation of a brand.
7. Develop and present a digital marketing plan for a small, local business.

MKTG 280. Level 1, PGA's PGM Education Program (Part 3)
3 Credits (3)
Level 1 Part 3 of the PGA PGM Education Program. This class will focus on Facility Management 1B (Business Planning A, Customer Relations A, Golf Car A, Merchandising A, Turfgrass A), Level 1 Checkpoint Exams, and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required. Consent of Instructor required. Restricted to: MKTG majors.

MKTG 281. Level 2, PGA's PGM Education Program (Part 1)
3 Credits (3)
Level 2 Part 1 of the PGA PGM Education Program. This class will focus on Teaching and Coaching 2, Teaching and Coaching Seminars, and the corresponding PGA Work Experience Activities. Additional course fee required. Consent of Instructor required. Restricted to: MKTG majors.
Learning Outcomes
1. Explain how students learn golf knowledge and skills, and identify the implications for teaching
2. Explain how students process information when learning golf skills
3. Identify and explain the principles of effective practice
4. Explain how juniors learn golf knowledge and skills, and identify the implications for teaching
5. Structure an effective golf lesson
6. Analyze student's instructional needs and set clear, purposeful learning and practice goals
7. Deliver effective explanations and demonstrations during a golf lesson
8. Engage in self-assessment of teaching skills and competencies
9. Recognize and apply the appropriate clubhead path and clubface position information to improve a golfer's performance 1
10. Conduct appropriate assessments to determine the skill level of the golfer 1
11. Demonstrate basic knowledge of anatomy and physiology, and conduct a physical observation to identify movement capabilities and limitations that may affect a golfer's performance 1
12. Define club performance terms and specifications, and describe their effect on ball flight and player performance

MKTG 303. Principles of Marketing
3 Credits (3)
Process, functions, and principles in the current marketing system.
Learning Outcomes
1. Understand primary and changing perspectives on marketing and strategic management.
2. Understand the fundamental principles and theories of marketing.
3. Develop the capacity to obtain and process relevant information and analytical skills.
4. Evaluate the impact of interactive media on marketing management.
5. Apply relevant marketing concepts and analytical tools, identify viable alternatives, make informed choices, and recommend marketing implementation plans.
6. Develop skills in organizing more effective strategic marketing and in implementing the market planning process.
7. Develop, evaluate, and implement marketing management strategies in complex environments through recent, popular case study analyses.
8. Formulate marketing management strategies on critical issues, problems, and business opportunities.
9. Broaden perspectives of ethics and social responsibility, keep abreast of global developments, and adapt to changing environments.

MKTG 305. Marketing and Food Agricultural Products
3 Credits (3)
This course provides a review of marketing principles and techniques used throughout the food and fiber supply chain. The course introduces a broad variety of marketing topics including marketing strategy, consumer behavior, market segmentation, market research, competitive analysis, and the marketing mix. The course serves as a foundation for advanced courses in agricultural marketing. May be repeated up to 3 credits.
Prerequisite: ECON 1110G or ECON 2120G.
Learning Outcomes
1. Articulate how agricultural commodities move through the food and fiber supply chain.
2. Understand the importance of strategic marketing and how organizations within the food and fiber supply chain identify consumers and their preferences
3. Understand key marketing concepts used by agribusiness marketers, including SWOT analysis, the marketing mix, advertising and public relations
4. Know the basic outline and components of a marketing plan

MKTG 310. Marketing Research
3 Credits (3)
Design, collection analysis, and presentation of research data.
Prerequisite: MATH 1350G or A ST 311 and C- or better in MKTG 303, or consent of instructor.
Learning Outcomes
1. Translate a marketing problem into a feasible research question.
2. Recognize marketing research as a process that involves a sequence of activities, each compatible with the preceding activities.
3. Compare and contrast alternative research designs.
4. Identify the sources of marketing information and the various means for gathering such information.
5. Recognize the biases and limitations of marketing data and basic data analysis.
6. Interpret univariate and basic bivariate data analysis techniques (i.e., should be able to decide when a technique is appropriate and recognize the managerial implications of analytical results).
7. Design and execute a basic survey research project.
8. Assess ethical issues associated with various research approaches.

MKTG 311V. Consumer Behavior
3 Credits (3)
The different aspects of consumer behavior and the variables affecting consumer decisions. Analysis of current concepts and models.

Learning Outcomes

1. Know the consumer behavior concepts by integrating and adapting theories developed in disciplines such as psychology, sociology, anthropology, and economics.
2. Use specific tools to tackle and analyze customer issues.
3. Develop the ability to apply consumer behavior concepts from the perspective of marketing managers and public policy makers.
4. Increase the awareness of and enhance the ability to make ethical decisions in consumer-related issues.

MKTG 312. Personal Selling
3 Credits (3)
Implementation of the promotion process through interpersonal communications between salesperson and prospects. Serving customers by sales representatives.

Learning Outcomes

1. Demonstrate how personal selling can strategically enhance interpersonal communication skills, career management, personal productivity.
2. Identify key issues and trends such as opportunities or threats, for evolving emerging sales approaches platforms.

MKTG 313. Retail Management
3 Credits (3)
Investigates retail business operations and focuses on the strategic profit model, store location, layout, display, merchandising, operations, and personnel.

Learning Outcomes

1. Analyze the role of retailing in society and basic retailing principles, ideas, and concepts as they relate to an understanding of our market-driven system
2. Compare and contrast segmentation and target market selection relative to a specific population product/service for different markets and retailing opportunities
3. Apply the concepts of the marketing mix to the formulation and evaluation of retailing strategies relative to particular target markets, environments (economic, technological and competitive), and desired positions in market places (both local and global)
4. Areas to be addressed include communication strategy, branding, packaging, pricing, product/service design, methods of delivery and the product life cycle
5. Relate the concepts of marketing and retailing research, consumer behavior and strategy and their interrelationships
6. Compare and contrast analysis techniques and judgment that are useful to managers in acting with integrity to make decisions and taking action

MKTG 314. Advertising Strategy
3 Credits (3)
Utilization of advertising as a business administration function; communication with consumers as a means of attaining marketing goals.

Learning Outcomes

1. Analyze advertising from a consumer perspective
2. Compare advertising strategy theories and concepts
3. Evaluate advertising critically and creatively

MKTG 317. International Marketing
3 Credits (3)
Focuses on decisions relating to entering markets, market segmentation, marketing strategies, and tactics in the international arena. Same as I B 317.

Learning Outcomes

1. Develop understanding about what is involved in making international marketing decisions, including product, price, promotion, and place decisions to create a marketing mix.
2. Acquire an overview on the contemporary issues in global marketing and the unique challenges faced by marketing managers in the dynamic global environment.
3. Develop insights into how differences in global economic, cultural, social, political, and legal environments can affect marketing decisions.
4. Develop strategic thinking in the context of complex problems and challenges faced by the contemporary global executives and managers.
5. Develop ability to integrate the important global societal dimensions of diversity, environmental concerns, ethics, and technological change into their thinking.
6. Develop knowledge and skills to analyze cross-cultural variables and their impact on international marketing.
7. Discover sources of information for researching and evaluating international markets.
8. Communicate effectively about marketing issues in group discussions, oral presentations and written reports.
9. Work effectively as a team member in analyzing marketing issues. 1
10. Develop leadership skills necessary to deal with the uncertainty and changes faced by today's global marketers.

MKTG 324. Product/Service Development
3 Credits (3)
Covers product innovation, development, commercialization and resource recovery, price determination and administration strategies, and complementing planning processes.

Learning Outcomes

1. Understand the product/service development process.
2. Identify market opportunities for new products.
3. Use structured methods to evaluate and test product concepts.
4. Apply tools learned in class to develop new products/services.
5. Plan the launch of a product and evaluate its impact on the market.
6. Efficiently work with and communicate ideas to team members.

MKTG 354. Sports Marketing
3 Credits (3)
The application of marketing concepts to the sports industry. Topics include fans/customers, products, and promotions across a range of sports.

Learning Outcomes

1. Discuss the domain of sports marketing
2. Apply basic marketing tools (e.g., research, segmentation) to sports marketing contexts
3. Recognize, evaluate, and accommodate the perspectives of participants and spectators as sports consumers
4. Identify appropriate marketing mix options for sports products
5. Appraise recent sports marketing trends
6. Plan a career in sports marketing

MKTG 357. Digital Marketing Strategy
3 Credits (3)

This course explores how organizations plan, execute, and evaluate marketing strategies in digital environments. Emphasis is placed on strategic frameworks and decision-making approaches that adapt to evolving technologies and market conditions.

Learning Outcomes

1. Apply the concepts of the marketing mix to the formulation/ evaluation of marketing strategies relative to Social Media policies that combine business objectives with appropriate use of Social Media channels and content.
2. Compare and contrast the history of Social Media and recognize the various platforms of Social Media.
3. Select/defend segmentation and target market selection relative to a specific population product/service that engages target audiences with a marketing message.
4. Analyze business objectives and connect to appropriate Social Media tactics.
5. Evaluate Social Media marketing content to shape the way we connect to and build relationships with users, consumers and businesses.
6. Relate the concepts of marketing research to establish metrics for measuring Social Media marketing success.

MKTG 380. Level 2, PGA's PGM Education Program (Part 2)
3 Credits (3)

Level 2 Part 2 of the PGA PGM Education Program. This class will focus on Facility Managment 2 and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGA Golf Management majors.

Learning Outcomes

1. Define the business at the facility level in terms of vision, core values, facility characteristics and mission.
2. Utilize the four Interaction Strategies in a variety of routine and challenging customer situations.
3. Identify core business areas that support a customer-focused environment
4. Know the characteristics of a merchandising operation that align with a facility's business plan
5. Understand how to define, assess, and develop tournament business at a facility.

MKTG 381. Level 3, PGA's PGM Education Program (Part 1)
3 Credits (3)

Level 3 Part 1 of the PGA's PGM Education Program. This class will focus on Teaching and Coaching 3, Teaching and Coaching Seminars, and the corresponding PGA Work Experience Activities. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGA Golf Management

Learning Outcomes

1. Explain how various types of feedback function to influence learning
2. Define the major variables that influence learning and explain how they operate with implications for practice, learning, and teaching
3. Provide effective instructional feedback after students' practice and performance
4. Explain how the form, precision, timing, frequency, and regulation of augmented feedback influence learning with implications for teaching and practice conditions
5. Explain how the key practice factors influence learning with implication for designing practice conditions
6. Establish relationships that promote greater student learning and enjoyment
7. Plan long-term developmental programs for beginning and intermediate players
8. Communicate effectively with students
9. Develop a communication style that increases instructional effectiveness 1
10. Effectively determine and design an appropriate practice routine to the benefit of the golfer 1
11. Effectively determine and assign the appropriate drill or drill with an aid to improve the swing shape of the golfer 1
12. Use relevant technology to promote student learning 1
13. Effectively demonstrate and apply the appropriate specialty shot information to the benefit of the golfer 1
14. Demonstrate basic knowledge of current swing methodologies of noted instructors 1
15. Physical development of junior golfers 1
16. Assess the physical capabilities of adult golfer, describe implications for performance, and provide potential physical adjustments 1
17. Describe how to use bench skills, tools, and technologies for measuring and altering club performance 1
18. Perform analyses and make appropriate alterations to change ball flight, players performance, and teacher effectiveness

MKTG 400. Marketing Internship/Field Experience
3 Credits (3)

Internship of field experience in application of marketing principles. The student must accept an internship before being allowed to enroll in the course. Consent of instructor required. Restricted to MKTG majors.

MKTG 440. Sales, Negotiations, and Customer Relationship Management
3 Credits (3)

This course focuses on addressing the issues, processes and strategies related to professional selling and sales management. This is a comprehensive course in the art of selling, focusing on relationship building, negotiating, and sales management. Various techniques will be explored, including prospecting, lead management, product introduction, negotiation, closing strategies, and relationship management.

Learning Outcomes

1. Understand concepts and frameworks that help you analyze each negotiation situation.
2. Develop a strategic plan and preparation documents in advance of each negotiation.
3. Master a toolkit of useful negotiation skills, strategies and tactics.
4. Improve your ability to predict and understand the other party's behavior during negotiations
5. Gain valuable experience and confidence in your own negotiating skills.
6. Improve future outcomes whenever you enter into a negotiation or are engaged in a dispute.

MKTG 449. Promotion Management
3 Credits (3)

Covers concepts and problems in the use of advertising, internet marketing, social media marketing, personal selling, publicity, and other forms of promotion; planning, coordination, control, and evaluation of effectiveness.

Learning Outcomes

1. Analyze the role of advertising and promotion in society and basic marketing principles, ideas, and concepts as they relate to an understanding of our market-driven system
2. Compare and contrast segmentation and target market selection relative to a specific population product/service for different markets and promotional opportunities
3. Apply the concepts of the marketing mix to the formulation and evaluation of promotional strategies relative to particular target markets, environments (economic, technological and competitive), and desired positions in market places (both local and global)
4. Areas to be addressed include communication strategy, branding, pricing, product/service design, and e-commerce
5. Relate the concepts of marketing and advertising research, consumer behavior and strategy and their interrelationships
6. Compare and contrast analysis techniques and judgment that are useful to managers in acting with integrity to make decisions and taking action in the promotional environment

MKTG 450. Sales, Negotiations, and Customer Relationship Management
3 Credits (3)

This course focuses on addressing negotiations and strategies related to professional selling and sales management. This is a comprehensive course in the art of selling, focusing on relationship building, negotiating, and sales management. Various techniques will be explored, including prospecting, lead management, product introduction, negotiation, closing strategies, and relationship management.

Learning Outcomes

1. Understand concepts and frameworks that help you analyze each negotiation situation.
2. Develop a strategic plan and preparation documents in advance of each negotiation.
3. Master a toolkit of useful negotiation skills, strategies and tactics.
4. Improve your ability to predict and understand the other party's behavior during negotiations.
5. Gain valuable experience and confidence in your own negotiating skills.
6. Improve future outcomes whenever you enter into a negotiation or are engaged in a dispute.

MKTG 451. Food and Agribusiness Market Assessment
3 Credits (3)

This course is an application course in which self-managed teams develop and present marketing plans for agribusiness firms. Emphasis on integrating the marketing mix, particularly promotional elements. May be repeated up to 3 credits. Crosslisted with: AEEC 4510.

Prerequisite(s): AEEC 3210 or MKTG 305 or consent of instructor.

Learning Outcomes

1. Identify, organize ad conduct market research specific to the project.
2. Develop an understanding of primary and secondary research collection and analysis.
3. Exhibit enhanced relationship management, communication skills, and team building.
4. Develop written communication with final deliverable for implementation into the business world.

MKTG 453. Sales Management
3 Credits (3)

The nature of the sales management function in industry. Focuses on intra and interdepartmental sales management activities.

Prerequisite: MKTG 312.

Learning Outcomes

1. Examined the linkage between personal selling, as a basket of activities, and the management of those marketing personnel who do selling (i.e., salespeople).
2. Examined the role of the sales force in the achievement of a firm's marketing objectives.
3. Undertaken numerous case-based analyses of typical sales management issues, including the hiring, firing, training, motivation, compensation, deployment, and evaluation of the firm's sales personnel.
4. Developed decision-making skills and analytic capabilities in the development and management of both sales programs and salespeople.

MKTG 461. Entrepreneurial Decision Making
3 Credits (3)

Explore the fundamentals of lean startup methodologies and customer discovery in this hands-on course. Students will learn to develop and test business ideas using the Lean Canvas, conduct effective customer interviews, and apply continuous feedback to iterate on their concepts. By the end of the course, students will be equipped to make strategic decisions and validate their business models with real-world insights. Crosslisted with: MGMT 461.

Prerequisite: Students in final year or consent of instructor.

Learning Outcomes

1. Explore the fundamentals of lean startup methodologies.
2. Develop skills to conduct effective customer interviews and apply continuous feedback in concept development.
3. Possess competency to make strategic decisions and validate business models with real-world insight.
4. Learn to develop and test business ideas through customer discovery.

MKTG 462. Advanced Sales
3 Credits (3)

Advanced instruction and skill development in interpersonal communication skills to broaden understanding of the professional sales role (especially in team selling situation), career management, personal productivity, negotiation, and coordination with other functional areas.

Prerequisite: MKTG 312.

Learning Outcomes

1. Students will learn "how" to sell (i.e., the behaviors and planning associated with selling today).
2. Analyze the concept of what/how is perhaps equally important but not nearly as obvious, how and why buyers "buy".
3. The course focus will be particularly on so-called "business-to-business" (B2B) sales jobs, as that is where many of the most interesting – and lucrative – sales positions reside.

MKTG 480. Level 3, PGA's PGM Education Program (Part 2)
3 Credits (3)

Level 3 Part 2 of the PGA's PGM Education Program. This class will focus on Facility Management 3, the Business Simulation Seminars, and the corresponding PGA Work Experience Activities. Students will also be required to provide an internship evaluation report. Additional course fee required. Consent of Instructor required. Restricted to: MKTG/PGA Golf Management Majors

Learning Outcomes

1. Assess the current state of the business by conducting a SWOT Analysis

2. Describe the golf industry job market and the knowledge and skills required to succeed
3. Identify areas where food services and golf operations should coordinate efforts
4. Determine golf car needs in order to acquire a fleet that supports the facility's mission, customers, and physical characteristics
5. Describe the organizational structure, key departments, reporting relationships, and job descriptions of a facility
6. Utilize industry-proven pricing strategies to meet business objectives
7. Describe the Performance System for supervising and delegating
8. Describe practices that improve the golf course and protect the environment

MKTG 481. PGA Golf Management Final Experience
1 Credit (1)
The following are requirements for successful completion of this senior level PGA Golf Management capstone course: 16 months of internship, completion of the Qualifying Level, Level 1, Level 2, and Level 3 of the PGA's PGM Education Program and successful completion of the PGA's Playing Ability Test. Consent of Instructor required. Restricted to: MKTG/PGA Golf Management majors.
Learning Outcomes
1. Describe the golf industry job market and the knowledge and skills required to succeed
2. Access PGA employment resources and participate in professional growth and development

MKTG 489. Strategy and Policy
3 Credits (3)
Techniques and analysis of marketing strategy and policy planning and formulation. Restricted registration to senior standing or by consent of instructor.
Prerequisite: C- or better in MKTG 310.
Learning Outcomes
1. Relate marketing strategy to the environmental constraints and opportunities with which managers must deal.
2. Compare marketing strategy theories and concepts.
3. Evaluate appropriate strategic marketing decisions in various situations.

MKTG 490. Selected Topics
1-18 Credits (1-18)
Covers materials and subjects not offered in regular Marketing courses. Students can take 18 credit hours of MKTG 490 if each class is a different subtitle. A maximum of 18 credit hours can be earned through MKTG 490.

MKTG 498. Independent Study
1-3 Credits
Individual studies directed by consenting faculty with the prior approval of the department head. A maximum of 3 credits may be earned.
Prerequisites: junior or above standing and consent of instructor.

MKTG 503. Marketing Management
3 Credits (3)
Analysis of marketing problems and the integration of organizational resources as well as behavioral and quantitative techniques into the development and implementation of solutions.
Learning Outcomes
1. Identify the fundamental principles and theories of marketing
2. Outline primary and changing perspectives on marketing and strategic management
3. Apply relevant marketing concepts and analytical tools
4. Develop capacity to obtain and process relevant information with enhanced analytical skills
5. Identify viable alternative to make informed choices and recommend marketing implementation plans
6. Evaluate the impact of interactive media on marketing management
7. Develop skills in organizing more effective strategic marketing and implementing the market planning process
8. Practice implementing marketing management strategies in complex environments through case study analyses
9. Formulate marketing management strategies on critical issues, problems, and business opportunities 1
10. Synthesize perspectives of ethics and social responsibility in adapting to changing environments

MKTG 591. Seminar in Entrepreneurship
3 Credits (3)
For students interested in owning and operating their own business; students desiring hands-on, real-time experience in helping start up a business. Same as MKTG 461 with differentiated assignments for graduate students. Crosslisted with: MGMT 591.
Prerequisite(s): Graduate standing.

MKTG 601. Marketing Management
3 Credits (3)
Covers the conceptual foundations of contemporary marketing management research, concepts, and literature. Fundamental to the understanding of contemporary marketing and the breadth of the field of marketing study.
Learning Outcomes
1. Identify the contemporary principles and theories of marketing strategy research
2. Outline primary guidelines and trendy directions of marketing strategic research
3. Improve theoretical foundation for research development in marketing strategy
4. Develop capacity of analytical and quantitative skills required for empirics
5. Apply relevant marketing theories, concepts and analytical methodology in research development
6. Formulate research ideas pertinent to marketing strategies on critical issues, problems, and phenomena
7. Practice complex research design, theoretical development and empirical operationalization
8. Synthesize perspectives of ethics and social responsibility in scholarly research

MKTG 620. Contemporary Marketing Readings
3 Credits (3)
Theoretical and methodological issues involved in translating a theory into a research study. Prepares Ph.D. students to undertake dissertation research. Consent of instructor required. May be repeated up to 3 credits.
Learning Outcomes
1. Students will be able to apply theory that they have learned to the process of doing research.

MKTG 625. Consumer Behavior
3 Credits (3)
Extensive reading of seminal and contemporary articles on consumer behavior and developing original research to explore cross-disciplinary

issues relevant to the study of marketing. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to develop theories and frameworks.
2. Students will be able to discuss the latest research topics related to consumer behavior.
3. Students will be able to generate research ideas (interesting questions about consumer behavior and research hypotheses).
4. Students will be able to design experiments to test their research ideas and hypotheses.

MKTG 640. Measurement and Structural Equation Modeling
3 Credits (3)

Explores theories of measurement that underlie all quantitative analysis, including the use of structural equation models. Contrasts classical test theory with item response theory and generalizability theory. Covers PRELIS and LISREL, and critiquing structural equation models by other researchers. May be repeated up to 3 credits.

Prerequisite(s): A ST 505.

MKTG 670. Marketing Theory
3 Credits (3)

The evolution, development, construction, and evaluation of the major theoretical perspectives of marketing. Fundamental to the understanding of contemporary marketing and preparation for investigations into the nature and role of theory in marketing. May be repeated up to 3 credits.

Learning Outcomes

1. Students will be able to identify the contemporary principles and theories of marketing strategy research.
2. Students will be able to outline primary guidelines and trendy directions of marketing strategic research.
3. Students will be able to improve theoretical foundation for research development in marketing strategy.
4. Students will be able to develop capacity of analytical and quantitative skills required for empirics.
5. Students will be able to apply relevant marketing theories, concepts and analytical methodology in research development.
6. Students will be able to formulate research ideas pertinent to marketing strategies on critical issues, problems, and phenomena.
7. Students will be able to immplement complex research design, theoretical development, and empirical operationalization.
8. Students will be able to synthesize perspectives of ethics and social responsibility in scholarly research.

MKTG 690. Special Topics in Marketing
3 Credits (3)

A seminar on special topics in marketing. The topic of the course will vary according to the needs of the students in the program and the instructor. Ph.D. students may repeat this course up to three times for a maximum total of 9 credits.

MKTG 698. Selected Topics
1-9 Credits (1-9)

Materials and subjects not offered in regular marketing courses. May be repeated for a maximum of 18 credits under different subtitles.

MKTG 700. Doctoral Dissertation
1-15 Credits (1-15)

May be repeated up to 88 credits.

Prerequisite: advancement to candidacy.

MLSL-MILITARY SCIENCE

MLSL 1110. Introduction to Army Leadership
2 Credits (1+1,2P)

This course provides an introduction to the Army and basic Soldier skills. Students receive an introduction to the Army Profession and examine what it means to be a professional in the U.S. Army. The overall focus is on developing fundamental knowledge and comprehension of the Army Leadership Requirements Model (ALRM) while understanding the Reserve Officers' Training Corps (ROTC) program, its purpose in the Army, and its advantages for the student. Students also begin learning map reading and land navigation.

Learning Outcomes

1. Identify and describe the Army leader attribute and competency categories described in the Army Leadership Requirements Model.
2. Analyze and demonstrate methods for creating and sustaining an organizational climate of trust, ensuring all individuals are treated with dignity and respect.
3. Develop and implement plans for prioritizing, planning, preparing, executing, evaluating, and assessing training within a military context.
4. Apply critical and creative thinking to solve problems and make decisions in Army scenarios.

MLSL 1110L. Introduction to Army Leadership I Laboratory
1-3 Credits (1-3)

In this weekly lab, students will apply initial instruction from MLSL 1110 on fieldcraft, first aid, and team building. The lab will be facilitated by MS III Cadets and supervised by MS IV's and cadre.

Learning Outcomes

1. Demonstrate proficiency in individual Soldier skills such as fieldcraft and first aid through practical exercises and assessments.
2. Explain and practice Army customs and courtesies in various scenarios, demonstrating appropriate behavior and respect.
3. Execute team, squad, and platoon movements, showcasing knowledge of tactical formations and commands.

MLSL 1120. Introduction to Army Leadership II
2 Credits (1+1,2P)

This course introduces students to the personal challenges and competencies that are critical for effective leadership. Students learn how to develop personal life skills such as critical thinking, time management, goal setting, and communication. Students learn the basics of the communication process and the importance for leaders to develop the essential skills to effectively communicate in the Army.

Learning Outcomes

1. Identify and describe the Army leader attribute and competency categories as outlined in the Army Leadership Requirements Model.
2. Demonstrate methods for creating and sustaining an organizational climate of trust in which all individuals are treated with dignity and respect.
3. Develop plans for prioritizing, planning, preparing, executing, evaluating, and assessing training within a military context.
4. Apply critical and creative thinking skills to solve problems and make decisions in Army scenarios.

MLSL 1120L. Introduction to Leadership Lab
1 Credit (1P)

Planning, coordination, execution and evaluation of training and activities in a collaborative training environment with both basic and advanced course students from within the ROTC program. Students develop and

refine leadership skills in positions of responsibility. Restricted to Las Cruces campus only.
Prerequisite: MLSL 1110.
Learning Outcomes
1. Leadership Development: Demonstrate an understanding of leadership theories and principles, Apply leadership skills in a real-world context Reflect on personal leadership strengths and areas for growth.
2. Effective Communication: Develop effective communication skills to peers, cadre, and instructors, Foster positive and open communication, Demonstrate the ability to adapt to constructive feedback and guidance.
3. Reflective Practice: Engage in reflective practice to assess personal growth and learning throughout the course, Identify strategies for continuous improvement in leadership skills.
4. Teamwork and Collaboration: Collaborate effectively within the ROTC cadet cohort, Work as a team to address challenges and enhance the ROTC program.
5. Time Management and Goal Setting: Learn time management techniques, Learn and apply study skills, Learn to develop SMART goals and implement plans to achieve them.

MLSL 1129. Introduction to Military Fitness I
2 Credits (2)
This course provides a hands-on overview of the fitness requirements needed to serve in the U.S. Army. Students are introduced to, and expected to complete exercises and routines to build their individual strength, endurance, and speed to meet the demands of training and Soldier tasks.
Learning Outcomes
1. Identify and describe the key physical requirements for successful service in the U.S. Army.
2. Complete the Army Combat Fitness Test (ACFT) and achieve a passing score.
3. Complete the Combat Water Survival Test (CWST) and achieve a passing score.

MLSL 1130. Introduction to Military Fitness II
2 Credits (2P)
This course provides a hands-on overview of the fitness requirements needed to serve in the U.S. Army. Students are introduced to and expected to complete exercises and routines to build their individual strength, endurance, and speed to meet the demands of training and Soldier tasks.
Learning Outcomes
1. Describe the physical requirements for service in the U.S. Army.
2. Pass the Army Combat Fitness Test (ACFT).
3. Pass the Combat Water Survival Test (CWST).

MLSL 2110. Foundations of Army Leadership I
3 Credits (2+1,2P)
This course focuses on leadership and ethics. The course adds depth to the Cadets knowledge of the different leadership styles. Cadets will conduct a leadership analysis of famous leaders and self-assessment of their leadership style. The Army Profession is presented through understanding Culture Awareness, Values, Ethics, and how to apply both to different situations they may encounter as a leader. Army Values and Ethics and their relationship to the Law of Armed Conflict (LOAC) and philosophy of military service are presented through video clips and historical vignettes followed small group discussions with cadets.
Learning Outcomes
1. Apply the Army leader attributes and competency categories described in the Army Leadership Requirements Model.
2. Design and implement strategies for creating and sustaining an organizational climate of trust in which all individuals are treated with dignity and respect.
3. Develop a systematic approach to prioritizing, planning, preparing, executing, evaluating, and assessing training exercises and demonstrate their execution.
4. Use critical and creative thinking skills to analyze historical leaders and develop a personal leadership philosophy.

MLSL 2110L. Foundations of Army Leadership I Laboratory
1,3 Credits (1,3P)
Planning, coordination, execution and evaluation of training and activities in a collaborative training environment with both basic and advanced course students from within the ROTC program. Students develop and refine leadership skills in positions of responsibility. Restricted to Las Cruces campus only.
Learning Outcomes
1. Demonstrate proficiency in individual Soldier skills.
2. Apply Army customs and courtesies.
3. Demonstrate effective team, squad, and platoon movement drills by conducting exercises and adhering to tactical procedures.

MLSL 2120. Foundations of Army Leadership II
3 Credits (2+1,2P)
This course focuses on Army doctrine and decision-making. The course begins with analytical techniques, creative thinking skills, and the Army problem-solving process related to situations faced by leaders when making decisions. Troop Leading Procedures (TLPs) and Operations Orders (OPORDs) will lead Cadets to understand Army Doctrine and Symbology. Squad tactics will be covered in classes on Offensive Operations and Defensive Operations inside of the Army's operating environmental concept of Multidomain Operations.
Learning Outcomes
1. Apply the Army leader attribute and competency categories from the Army Leadership Requirements Model by demonstrating their integration into various leadership plans.
2. Implement strategies to create and sustain an organizational climate of trust by developing plans that promote dignity and respect for all individuals.
3. Develop and apply an approach to prioritizing, planning, preparing, executing, evaluating, and assessing training by creating and demonstrating successful exercise plans in a practical setting.
4. Demonstrate critical and creative thinking to analyze complex decision-making scenarios related to Army doctrine and tactics, develop solutions, and present a decision-making strategy that addresses the challenges of Multidomain Operations, Offensive Operations, and Defensive Operations.

MLSL 2120L. Foundations of Army Leadership II Lab
1 Credit (1,3P)
Cadets apply their knowledge outside the classroom in hands-on performance-oriented environments during the weekly lab, which is facilitated by MS III Cadets and supervised by MSIVs and cadre.
Prerequisite: MLSL 2120.
Learning Outcomes
1. Demonstrate proficiency in individual Soldier skills by successfully executing practical exercises as assessed by MS IVs and cadre.

2. Apply Army customs and courtesies in various lab scenarios and perform protocols correctly.
3. Coordinate team, squad, and platoon exercises by leading these exercises in a lab setting and adhering to tactical procedures.

MLSL 2129. Foundations of Military Fitness I
2 Credits
This course provides a hands-on overview of the fitness requirements needed to serve in the U.S. Army. Students are introduced to, and expected to complete exercises and routines to build their individual strength, endurance, and speed to meet the demands of training and Soldier tasks.
Learning Outcomes
1. Summarize the physical requirements for service in the US Army.
2. Pass the Army Combat Fitness Test (ACFT).
3. Pass the Combat Water Survival Test (CWST).

MLSL 2130. Foundations of Military Fitness II
2 Credits (2P)
This course provides a hands-on overview of the fitness requirements needed to serve in the U.S. Army. Students are introduced to and expected to complete exercises and routines to build their individual strength, endurance, and speed to meet the demands of training and Soldier tasks.
Learning Outcomes
1. Summarize the physical requirements for service in the United States Army.
2. Pass the Army Combat Fitness Test (ACFT).
3. Pass the Combat Water Survival Test (CWST).

MLSL 2992. Directed Studies in Military Science
1-3 Credits
Independent projects conducted under the direction of designated faculty.
Learning Outcomes
1. Identify and articulate key concepts and theories relevant to the specific topic of study by preparing a comprehensive research paper, report, portfolio, or presentation that synthesizes current knowledge and insights.

MLSL 3103. Recent American Military History
3 Credits (3)
History explains the present and informs the future. We will cover America's major military engagements from the Colonial Period to today's headlines. Whatever challenges you encounter as a leader – conflict resolution, resource limitations, teamwork deficiencies – leaders who served before you confronted many of the same issues. You can draw from their experiences to create your own solution. History teaches that while we may learn from our mistakes, it is generally much less painful to learn from the mistakes of others.
Learning Outcomes
1. Describe the military's role in society.
2. Examine the evolution of war and the progression of military professionalism.
3. Analyze the major wars fought by the US Army, using the Principles of War.
4. Discuss the role of the US military in joint operations.
5. Discuss the role of the US Army in humanitarian operations and nation-building at home and abroad.
6. Analyze lessons learned from military history to the Contemporary Operating Environment.

MLSL 3110. Leading Small Organizations I
3 Credits (3)
Part of the Senior ROTC Advanced Course, this course provides a Focus on training management and the warfighting functions. It is an academically challenging course were Cadets study, practice, and apply the fundamentals of Training Management and how the Army operates through the Warfighting functions. At the conclusion of this course, Cadets will be capable of planning, preparing, and executing training for a squad conducting small unit tactics. Includes one lab meeting per week using peer facilitation overseen by MSL IV, supervised by ROTC Cadre and three physical fitness sessions per week. Students must meet Basic Course of Military Science requirements to enroll in this course.
Corequisite: MLSL 3110L.
Learning Outcomes
1. Demonstrate an understanding of leadership theories and principles.
2. Foster positive and open communication.
3. Engage in reflective practice to assess personal growth and learning throughout the course.
4. Collaborate effectively within the ROTC cadet cohort.
5. Develop effective communication skills to peers, cadre, and instructors.
6. Apply leadership skills in a real-world context Reflect on personal leadership strengths and areas for growth.
7. Demonstrate the ability to adapt to constructive feedback and guidance.
8. Identify strategies for continuous improvement in leadership skills.
9. Work as a team to address challenges and enhance the ROTC program.

MLSL 3110L. Leading Small Organizations I Lab
1 Credit (1,3P)
Planning, coordination, execution and evaluation of training and activities with advance course students and ROTC program. Students develop and refine leadership skills in positions of responsibility. Open only to students taking MLSL 3110.
Corequisite(s): MLSL 3110.
Learning Outcomes
1. Collaborate effectively within the ROTC cadet cohort.
2. Demonstrate an understanding of leadership theories and principles.
3. Apply leadership skills in a real-world context Reflect on personal leadership strengths and areas for growth.
4. Develop effective communication skills to peers, cadre, and instructors.
5. Foster positive and open communication.
6. Demonstrate the ability to adapt to constructive feedback and guidance.
7. Engage in reflective practice to assess personal growth and learning throughout the course.
8. Identify strategies for continuous improvement in leadership skills.
9. Work as a team to address challenges and enhance the ROTC program.

MLSL 3120. Leading Small Organizations II
3 Credits (3)
Part of the Senior ROTC Advanced Course, this course provides a focus on applied leadership in small unit operations. Cadets will be capable of

planning, coordinating, navigating, motivating and leading a platoon in the execution of a mission. This includes one lab meeting per week using peer facilitation overseen by MSL IVs, supervised by ROTC Cadre and three physical fitness sessions per week. Successful completion of this course is a requirement to Cadet Summer Training Advance Camp during the summer, at Fort Knox, KY. Successful in completion of this course is a requirement to attend Summer Camp or Advanced Camp during the summer.
Prerequisite: MLSL 3110.
Corequisite: MLSL 3120L.
Learning Outcomes

1. Focus on applied leadership in small unit operations.
2. Cadets study, practice, and apply the fundamentals of direct level leadership and small unit tactics at the platoon level.
3. Cadets will be capable of planning, coordinating, navigating, motivating and leading a platoon in the execution of a mission.

MLSL 3120L. Leading Small Organizations II Lab
1 Credit (1,3P)
Practice and refinement of leadership skills. Different roles assigned for students at different levels in the program. Planning, coordination, execution and evaluation of training and activities with advance course students and ROTC program. Open to students taking MLSL 3120.
Corequisite: MLSL 3120.
Learning Outcomes

1. Leadership Development: Demonstrate an understanding of leadership theories and principles, Apply leadership skills in a real-world context Reflect on personal leadership strengths and areas for growth.
2. Effective Communication: Develop effective communication skills to peers, cadre, and instructors, Foster positive and open communication, Demonstrate the ability to adapt to constructive feedback and guidance.
3. Reflective Practice: Engage in reflective practice to assess personal growth and learning throughout the course, Identify strategies for continuous improvement in leadership skills.
4. Teamwork and Collaboration: Collaborate effectively within the ROTC cadet cohort, work as a team to address challenges and enhance the ROTC program.
5. Time Management and Goal Setting: Learn time management techniques, Learn and apply study skills, Learn to develop SMART goals and implement plans to achieve them.

MLSL 3129. Military Fitness III
2 Credits (2)
A general program that focuses on activities and principles that promote physical fitness, achieve and maintain athletic prowess, and accomplish related research and service goals. Includes instruction in human movement studies, motivation studies, rules and practice of specific sports, exercise and fitness principles and techniques, basic athletic injury prevention and treatment, and organizing and leading fitness and sports programs.
Prerequisite: MLSL 2229.
Learning Outcomes

1. Demonstrate an understanding of leadership theories and principles.
2. Work as a team to address challenges and enhance the ROTC program.
3. Collaborate effectively within the ROTC cadet cohort.
4. Identify strategies for continuous improvement in leadership skills.
5. Engage in reflective practice to assess personal growth and learning throughout the course.
6. Demonstrate the ability to adapt to constructive feedback and guidance.
7. Foster positive and open communication.
8. Develop effective communication skills to peers, cadre, and instructors.
9. Apply leadership skills in a real-world context Reflect on personal leadership strengths and areas for growth.

MLSL 3130. Remember Bataan
2 Credits (2)
This will be a history course that explores the impacts of WWII on the state of New Mexico, with a particular emphasis on the Battle of Bataan. This course will incorporate a few different approaches to achieve the desired learning objectives listed below. 1) Historical Approach: The traditional lecture-based approach to history will be utilized to cover some of the course content. Two texts will largely inform the discussion: Dorothy Cave's Beyond Courage and It Tolled for New Mexico by Eva Matson. 2) Living History: Examining living history artifacts that exist throughout the state; discussions with families of survivors; discussions about what the legacy of Bataan means to today's society. 3) Service-based learning: This is an educational approach that integrates meaningful community service with academic learning. In a service-based learning course, students engage in hands-on experiences that address real community needs while reflecting on and applying academic concepts. The goal is to enhance students' understanding of course content, develop their civic responsibility, and foster a sense of social awareness. Only one module of the course will be devoted to this style of learning. Instructors will steer students towards volunteering with the Remember Bataan Foundation, volunteering at White Sands Missile Range to support the Bataan Memorial Death March, or designed and implementing their own community service initiative in close coordination with and incorporating guidance from the instructors if they decide to go this third route. May be repeated up to 8 credits.
Learning Outcomes

1. Understanding the Context of World War II: Define the key events and factors that led to the outbreak of World War II, explain the geopolitical and economic situation of New Mexico before the war.
2. Analyzing New Mexico's Role in the War Effort: Assess the contributions of New Mexico to the war effort, including the development of the Manhattan Project and the establishment of military bases.
3. Examining Social Changes on the Home Front: Describe the social and economic changes that occurred in New Mexico during World War II, analyze the impact of wartime policies on women, minorities, and everyday life in the state.
4. Exploring the Battle of Bataan: Summarize the key events and significance of the Battle of Bataan, evaluate the role of New Mexican units and individuals in the battle.
5. Examining the Experiences of POWs and Veterans: Explore the experiences of New Mexican soldiers as prisoners of war in Bataan, analyze the challenges faced by veterans upon their return to New Mexico and their integration into post-war society.
6. Assessing Economic and Technological Changes: Evaluate the economic boom in New Mexico after World War II, examine the technological advancements that occurred and their long-term effects on the state.

7. Analyzing the Legacy and Commemoration: Assess how the Battle of Bataan is memorialized in New Mexico, analyze the lasting impact of World War II on the state and its modern perspectives.
8. Research and Communication Skills: Conduct independent research on specific aspects of New Mexico's history during World War II, communicate findings effectively through written assignments and discussions.
9. Critical Thinking and Synthesis: Apply critical thinking skills to analyze historical sources and perspectives, synthesize information to form well-reasoned arguments about the impact of World War II on New Mexico. 1
10. Cultural Competency: Recognize and appreciate the diverse contributions of individuals from different backgrounds in New Mexico during World War II, understand the cultural implications of wartime experiences on various communities within the state.

MLSL 3992. Advanced Directed Studies
1,3 Credits (1,3)
Directed individual study of advanced subjects under the guidance of ROTC Instructors.
Learning Outcomes
1. Demonstrate an understanding of leadership theories and principles.
2. Demonstrate the ability to adapt to constructive feedback and guidance.
3. Engage in reflective practice to assess personal growth and learning throughout the course.
4. Identify strategies for continuous improvement in leadership skills.
5. Collaborate effectively within the ROTC cadet cohort.
6. Work as a team to address challenges and enhance the ROTC program.
7. Foster positive and open communication.
8. Develop effective communication skills to peers, cadre, and instructors.
9. Apply leadership skills in a real-world context Reflect on personal leadership strengths and areas for growth.

MLSL 3999. Cadet Summer Training Advanced Course
3 Credits (3)
Advanced Camp is a 31-day training event which takes place at Fort Knox, KY. Cadets are mentally and physically tested during a 12-day consequence driven field training exercise that replicates a combat training center rotation. Successful completion of the Advanced Camp is a requirement for commissioning. Each cadet will be evaluated during the time they are at Advanced Camp.
Prerequisite: MLSL 3110, MLSL 3110L, MLSL 3120, MLSL 3120L.
Learning Outcomes
1. Designed for the cadet to demonstrate proficiency to the Advanced Camp Instructor.
2. Cadets are evaluated on their ability to lead at the Squad and Platoon levels, both in garrison and tactical environments.
3. Assess a Cadet's ability to demonstrate proficiency in basic officer leadership tasks.

MLSL 4110. Leadership Challenges and Goal Setting
3 Credits (3)
Part of the Senior ROTC Advanced Course, this course provides a focus on development of the Army Officer. It is an academically challenging course were Cadets develop knowledge, skills, and abilities to plan, resource, and assess training at the small unit level. Cadets also learn about Army programs that support counseling subordinates and evaluating performance, values and ethics, career planning, and legal responsibilities. At the conclusion of this course, Cadets will be familiar with how to plan, prepare, execute, and continuously assess the conduct of training at the company or field grade officer level. Includes a lab per week overseeing MSL IV lesson facilitation and supervised by ROTC Cadre and three physical fitness sessions per week.
Prerequisite: MLSL 3120.
Corequisite: MLSL 4110L.
Learning Outcomes
1. Leadership and the Army Profession: Proficiency in creating and sustaining an organizational climate of trust in which all individuals are treated with dignity and respect, Proficiency in the Army leader attribute and competency categories described in the Leadership Requirements Model, Proficiency in developing others (i.e. setting conditions, creating opportunity, providing feedback, and enhancing learning) across the institutional, operational, and self-development domains, Proficiency as an Army professional who embraces the Army's culture of service, instills discipline, and lives the Army Values.
2. Mission Command: Proficiency in the principles of mission command, Proficiency in the elements of command and the elements of control, Proficiency in C2 Warfighting Function tasks and employment of the C2 system to generate and apply combat power, Proficiency in the fundamentals of the operations process to enable leaders to understand, visualize, describe, direct, lead, and assess operations, Proficiency in critical creative thinking.
3. Operations: Proficiency in synchronizing all Warfighting Functions in Multi-Domain Operations in support of Joint Operations, Proficiency in understanding the Operational Environment across all domains, Proficiency in sustainment functions supporting Army Operations.
4. Training: Proficiency in prioritizing, planning and preparing, executing, evaluating and assessing training.

MLSL 4110L. Leadership Challenges and Goal Setting Lab
1,3 Credits (1,3P)
Different roles assigned for students at different levels in the program. Practice and refinement of leadership skills. Planning coordination, execution and evaluation of training and activities with basic course students and ROTC program. This course is a leadership lab and its for all MLSL levels of the program as they all work together in getting all of the drills and trainings done with one another.
Corequisite: MLSL 4110.
Learning Outcomes
1. Leadership and the Army Profession: Proficiency in creating and sustaining an organizational climate of trust in which all individuals are treated with dignity and respect, Proficiency in the Army leader attribute and competency categories described in the Leadership Requirements Model, Proficiency in developing others (i.e. setting conditions, creating opportunity, providing feedback, and enhancing learning) across the institutional, operational, and self-development domains, Proficiency as an Army professional who embraces the Army's culture of service, instills discipline, and lives the Army Values.
2. Mission Command: Proficiency in the principles of mission command, Proficiency in the elements of command and the elements of control, Proficiency in C2 Warfighting Function tasks and employment of the C2 system to generate and apply combat power, Proficiency in the fundamentals of the operations process to enable leaders to understand, visualize, describe, direct, lead, and assess operations, Proficiency in critical creative thinking.
3. Operations: Proficiency in synchronizing all Warfighting Functions in Multi-Domain Operations in support of Joint Operations, Proficiency

in understanding the Operational Environment across all domains, Proficiency in sustainment functions supporting Army Operations.
4. Training: Proficiency in prioritizing, planning and preparing, executing, evaluating and assessing training.

MLSL 4120. Transition to Lieutenant
3 Credits (3)
The final course within the Senior ROTC Advanced Course, this course is an academically challenging course were Cadets further develop knowledge, skills, and abilities required of junior officers pertaining to the Army in Unified Land Operations and Company Grade Officer roles and responsibilities. This course includes reading assignments, homework assignments, small group assignments, briefings, case studies, practical exercises, a mid-term exam, and an Oral Practicum as the final exam. The Oral Practicum explores the Cadet's knowledge of how they will be prepared for the 20 Army Warfighting Challenges (AWFC) covered throughout the ROTC Advanced Course. Successful completion of this course will assist in preparing Cadets for their BOLC B course following graduation and commissioning. It is a mandatory requirement for commissioning. Includes a lab per week overseeing MSL III lesson facilitation and supervised by ROTC Cadre and three physical fitness sessions per week.
Prerequisite: MLSL 4110.
Corequisite: MLSL 4120L.
Learning Outcomes
1. Leadership and the Army Profession: Proficiency in creating and sustaining an organizational climate of trust in which all individuals are treated with dignity and respect, Proficiency in the Army leader attribute and competency categories described in the Leadership Requirements Model, Proficiency in developing others (i.e. setting conditions, creating opportunity, providing feedback, and enhancing learning) across the institutional, operational, and self-development domains, Proficiency as an Army professional who embraces the Army's culture of service, instills discipline, and lives the Army Values.
2. Mission Command: Proficiency in the principles of mission command, Proficiency in the elements of command and the elements of control, Proficiency in C2 Warfighting Function tasks and employment of the C2 system to generate and apply combat power, Proficiency in the fundamentals of the operations process to enable leaders to understand, visualize, describe, direct, lead, and assess operations, Proficiency in critical creative thinking.
3. Operations: Proficiency in synchronizing all Warfighting Functions in Multi-Domain Operations in support of Joint Operations, Proficiency in understanding the Operational Environment across all domains, Proficiency in sustainment functions supporting Army Operations.
4. Training: Proficiency in prioritizing, planning and preparing, executing, evaluating and assessing training.

MLSL 4120L. Transition to Lieutenant Lab
1,3 Credits (1,3P)
Different roles assigned for students at different levels in the program. Practice and refinement of leadership skills. Planning, coordination, execution, and evaluation of training and activities with basic course students and ROTC program.
Corequisite: MLSL 4120.
Learning Outcomes
1. Leadership and the Army Profession: Proficiency in creating and sustaining an organizational climate of trust in which all individuals are treated with dignity and respect, Proficiency in the Army leader attribute and competency categories described in the Leadership Requirements Model, Proficiency in developing others (i.e. setting conditions, creating opportunity, providing feedback, and enhancing learning) across the institutional, operational, and self-development domains, Proficiency as an Army professional who embraces the Army's culture of service, instills discipline, and lives the Army Values.
2. Mission Command: Proficiency in the principles of mission command, Proficiency in the elements of command and the elements of control, Proficiency in C2 Warfighting Function tasks and employment of the C2 system to generate and apply combat power, Proficiency in the fundamentals of the operations process to enable leaders to understand, visualize, describe, direct, lead, and assess operations, Proficiency in critical creative thinking.
3. Operations: Proficiency in synchronizing all Warfighting Functions in Multi-Domain Operations in support of Joint Operations, Proficiency in understanding the Operational Environment across all domains, Proficiency in sustainment functions supporting Army Operations.
4. Training: Proficiency in prioritizing, planning and preparing, executing, evaluating and assessing training.

MLSL 4129. Military Fitness IV
2 Credits (2)
A general program that focuses on activities and principles that promote physical fitness, achieve and maintain athletic prowess, and accomplish related research and service goals. Includes instruction in human movement studies, motivation studies, rules and practice of specific sports, exercise and fitness principles and techniques, basic athletic injury prevention and treatment, and organizing and leading fitness and sports programs. May be repeated up to 6 credits.
Prerequisite: MLSL 3329.
Learning Outcomes
1. Proficiency in developing others (i.e. setting conditions, creating opportunity, providing feedback, and enhancing learning) across the institutional, operational, and self-development domains.
2. Proficiency in creating and sustaining an organizational climate of trust in which all individuals are treated with dignity and respect.
3. Proficiency as an Army professional who embraces the Army's culture of service, instills discipline, and lives the Army Values.
4. Proficiency in the Army leader attribute and competency categories described in the Leadership Requirements Model.

MLSL 4992. Practicum
1,3 Credits (1,3+1,3P)
Independent projects conducted under the direction of the Professor of Military Science, and concerned with analysis of selected leadership or management problems. Course not eligible for S/U grade.
Learning Outcomes
1. Leadership and the Army Profession.
2. Proficiency in creating and sustaining an organizational climate of trust in which all individuals are treated with dignity and respect.
3. Proficiency as an Army professional who embraces the Army's culture of service, instills discipline, and lives the Army Values.
4. Proficiency in developing others (setting conditions, creating opportunity, providing feedback, and enhancing learning) across the institutional, operational, and self-development domains.
5. Proficiency in the Army leader attribute and competency categories described in the Leadership Requirements Model.

MOLB-MOLECULAR BIOLOGY

MOLB 448. Special Research Problems
1-3 Credits

Individual investigation, theoretical or experimental, under the supervision of a molecular biology faculty member. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

MOLB 520. Molecular Cell Biology
3 Credits (3)
Same as BIOL 520.

MOLB 542. Biochemistry I
3 Credits (3)
Same as BCHE 542. B or better required.

MOLB 545. Molecular and Biochemical Genetics
3 Credits (3)
Same as BCHE 545 and BIOL 545.

MOLB 546. Biochemistry II
3 Credits (3)
Same as BCHE 546.

MOLB 550. Topics in Molecular Biology
1-3 Credits
Selected topics of current interest in field of molecular biology for master's level students. May be repeated up to 12 credits.
Learning Outcomes
1. Learning goals are dependent upon topic and instructor.

MOLB 590. Discussions in Molecular Biology
1 Credit (1)
Oral presentations of ongoing research and/or research proposal for the masters thesis. Must be repeated twice for masters and a minimum of three times for doctoral students. May be repeated up to 4 credits.
Learning Outcomes
1. To expose students to the fundamentals of speaking, including organization, and listening.
2. To understand and gain practice oral presentations.
3. Encourage critical thinking and discussion of scientific material during presentations.

MOLB 597. Laboratory Rotations/Research Discussions
1-3 Credits
All entering students are required to take at least one credit, during their first semester, in which they will circulate through at least three different labs working on assigned problems and discussing research programs. May be repeated for a maximum of 4 credits. Graded S/U.

MOLB 598. Special Research Programs
1-3 Credits
Individual investigation, experimental or theoretical, under the supervision of a molecular biology faculty member. Course may be repeated up to a total of 6 credits with committee approval.

MOLB 599. Master's Thesis
1-15 Credits (1-15)
Experimental and scholarly research leading to the preparation of a master's thesis.

MOLB 600. Molecular Biology Research
1-15 Credits
Laboratory research efforts prior to successful completion of doctoral comprehensive exam.

MOLB 650. Advanced Topics in Molecular Biology
1-3 Credits
Discussions and lectures on topics of current interest in molecular biology for doctoral students.

MOLB 698. Advanced Research Projects
1-9 Credits
Individualized special research assignments for doctoral-level students. Up to 9 credits, with approval of committee. Graded S/U.

MOLB 700. Doctoral Dissertation Research
1-15 Credits
Research for doctoral students after completing comprehensive exams.

MUSC-MUSIC

MUSC 1110G. Music Appreciation: Jazz
3 Credits (3)
This course explores the ideas of music in society and its cultural relevance and is designed to increase the students' appreciation of music as well as to enhance their listening skills. Students are introduced to various periods, styles, and composers of music and become acquainted with knowledge and appreciation of Jazz from various cultures and times.
Learning Outcomes
1. Develop a vocabulary of musical terms, and be able to describe music using those terms
2. Demonstrate knowledge of composers, their music and their relationship to historical periods
3. Recognize how music played and plays a political, social, and cultural function
4. Identify well-known pieces and the historical and social context in which they were composed
5. Demonstrate basic understanding of music notation and musical communication

MUSC 1130G. Music Appreciation: Western Music
3 Credits (3)
This course explores the ideas of music in society and its cultural relevance and is designed to increase the students' appreciation of music as well as to enhance their listening skills. Students are introduced to various periods, styles, and composers of music and become acquainted with knowledge and appreciation of Western music from various cultures and times.
Learning Outcomes
1. Develop a vocabulary of musical terms, and be able to describe music using those terms
2. Demonstrate knowledge of composers, their music and their relationship to historical periods
3. Recognize how music played and plays a political, social, and cultural function
4. Identify well-known pieces and the historical and social context in which they were composed
5. Demonstrate basic understanding of music notation and musical communication

MUSC 1210. Fundamentals of Music for Non-majors
3 Credits (3)
A beginning course in the fundamentals of music, this course includes notation, scales, key signatures and intervals. Aural comprehension is introduced through singing intervals, scales and triads and dictating simple rhythmic and melodic patterns and students explore the basic components of music. Traditional Grading with RR.

Learning Outcomes

1. Demonstrate and apply standard notation of pitch, rhythm, scales, intervals, key signatures, triads, and simple melodic and harmonic composition
2. Develop and improve basic aural skills
3. Read musical notation
4. Improve and expand understanding of fundamental musical techniques and concepts

MUSC 1310. Recital Attendance
0.5 Credits (.5+1P)
This course is for music students to attend and participate in a good number of convocation, concert, and recital performances, creating a wider appreciation for the performing arts. May be repeated up to 4 credits. Restricted to: Music and Music Education majors. S/U Grading with RR. Restricted to Las Cruces campus only.

Learning Outcomes

1. Encourage student observation of serious music
2. Provide opportunities for public performances
3. To create a greater sense of community within the student body

MUSC 1410. Introduction to Music Education
2 Credits (2)
This course is an overview of teaching in the music classroom through readings and observations. Students will be introduced to the skills needed to become a reflective educator, develop observation techniques, and demonstrate knowledge of the current state of the profession. Restricted to Las Cruces campus only.

Learning Outcomes

1. Make observations and analyze the current state of musical education in public schools
2. Describe characteristics of good teaching in music
3. Articulate a personal philosophy of music education
4. Reflect on personal strengths and weaknesses as a teacher of music

MUSC 1440. Class Voice I
1 Credit (1)
Group instruction in voice and vocal pedagogy for instrumental Music Education majors, offering basic principles of healthy vocal production with particular attention to diction, development of vocal range, and the ability to impart that knowledge to elementary, junior and/or high school age students. Restricted to: Music Education majors. Traditional Grading with RR. Restricted to Las Cruces campus only.

Learning Outcomes

1. Provide the basic understanding of healthy vocal production. Including, but is not limited to, the following topics: Expanding vocal range; Learning how to practice and learn songs effectively and efficiently; Provide basic understanding of vocal pedagogy; Introduction to diction
2. Aims to equip students with the ability to impart that knowledge to elementary, junior and/or high school age students.

MUSC 1450. Ear Training I
1 Credit (1)
To develop the ability to accurately hear, identify, sing and notate musical elements including rhythm, melody, intervals and harmony Traditional Grading with RR. Restricted to Las Cruces campus only. May be repeated up to 1 credit.

Learning Outcomes

1. Counting rhythms at sight using the Eastman Counting System.
2. Singing melodies at sight using solfege syllables.
3. Writing out rhythmic patterns.
4. Writing out melodic patterns.
5. Identifying and singing intervals.
6. Identifying and singing chord / triad qualities.

MUSC 1451. Ear Training II
1 Credit (1)
To develop the ability to accurately hear, identify, sing and notate musical elements including rhythm, melody, intervals and harmony Restricted to Las Cruces campus only.
Prerequisite(s): Grade of C- or better in MUSC 1450.

Learning Outcomes

1. Counting rhythms at sight using the Eastman Counting System
2. Singing melodies at sight using solfege syllables
3. Writing out rhythmic patterns
4. Writing out melodic patterns
5. Identifying and singing intervals
6. Identifying and singing chord / triad qualities

MUSC 1460. Music Theory I
3 Credits (3)
Introduction to vocabulary and syntax of 4-voice 18th c. chorale music through study and harmonic analysis. May be repeated up to 3 credits.

Learning Outcomes

1. To learn the vocabulary and syntax of 4-voice 18th c. chorale music through study and harmonic analysis.

MUSC 1461. Music Theory II
3 Credits (3)
Expansion of vocabulary and syntax of 4-voice 18th c. chorale music through study, harmonic analysis, and part writing.
Prerequisite(s): Grade of C or better in MUSC 1460.

Learning Outcomes

1. To expand and apply the vocabulary and syntax of 4-voice, 18th c. chorale music through study, harmonic analysis, and part writing.

MUSC 1470. Functional Piano I
2 Credits (2)
Scales, chords, memorization. Harmonization of simple melodies with the ability to play simple melodies and rhythms. May be taken for unlimited credit. Restricted to music majors. No S/U option.

Learning Outcomes

1. 5 finger hand position in all keys
2. I-IV-I-V7-I cadences in all keys
3. One octave scales with hands together in C, G, D and F (major and minor)
4. Root position cross–over triads, solid and broken (major and minor)
5. Simple sight reading, harmonizing and transposition
6. Prepared pieces from the textbook
7. Simple improvisation
8. Play 2 simple vocal exercises
9. Identify intervals, key signatures and chords 1
10. Correct posture and hand position 1
11. Musical issues such as phrasing, slurs and dynamics 1
12. Good practice habits and techniques

MUSC 1471. Functional Piano II
2 Credits (2)

Scales, chords, memorization. Harmonization of simple melodies with the ability to play simple melodies and rhythms. May be taken for unlimited credit. Restricted to music majors. No S/U option.
Prerequisite: MUSC 1470 or consent of instructor.
Learning Outcomes
1. Two octave scales with hands separate in C, G, D, A, E, B and F (major and minor)
2. I-IV-I-V-V7-I cadences in above mentioned keys in root position and 1st inversion
3. Simple sight reading, harmonization and transposition
4. Prepared pieces from the book
5. Simple improvisation
6. Identify intervals, key signatures and chords
7. Correct posture and hand position
8. Musical issues such as phrasing, slurs and dynamics
9. Good practice habits and techniques

MUSC 1472. Functional Piano III
2 Credits (2)
For music majors preparing for the Piano Proficiency Examination. May be taken for unlimited credit. Restricted to music majors. No S/U option.
Prerequisite: MUSC 1471 or consent of instructor.
Learning Outcomes
1. Keys learned in previous semesters, adding F# and C# (D flat)
2. Secondary dominant chords added to cadence patterns
3. Two-octave, , root position arpeggios, major and minor
4. Intro to chord charts, harmonization
5. More difficult sight--reading and transpositions
6. More difficult prepared pieces
7. Accompany a piece for any instrument on the Mid-Term Recital (required)

MUSC 1992. Applied Music
1-2 Credits (1-2)
Private or group instruction for non-music majors, secondary instruments, and music majors preparing for 2000-level applied music. May be taken for unlimited credit. May be repeated up to 99 credits.
Learning Outcomes
1. Development of Musical Abilities.
2. Development of Technical Abilities.

MUSC 2110. Chamber Ensemble
1 Credit (1)
This course is an exploration of chamber ensembles, allowing students to develop their abilities with their instruments in a group setting. Students will gain a broader understanding of chamber ensemble through study of musical history, as well as various practice exercises and performances. May be repeated up to 16 credits. Restricted to Las Cruces campus only.
Prerequisite(s): by audition only.
Learning Outcomes
1. Improve performance skills
2. Develop and improve performance skills in a group setting
3. Develop understanding and interpretation within the context of music history
4. Refine and improve technical ability
5. Demonstrate proper technique and usage

MUSC 2120. Major Ensemble
1 Credit (1)
This course is an exploration of major ensembles, allowing students to develop their abilities with their instruments in a group setting. Students will gain a broader understanding of major ensemble through study of musical history, as well as various practice exercises and performances. May be repeated up to 24 credits.
Prerequisite: by audition only.
Learning Outcomes
1. Improve performance skills
2. Develop and improve performance skills in a group setting
3. Develop understanding and interpretation within the context of music history
4. Refine and improve technical ability
5. Demonstrate proper technique and usage

MUSC 2130. Jazz Ensemble
1 Credit (1)
This course is an exploration of jazz ensembles, allowing students to develop their abilities with their instruments in a group setting. Students will gain a broader understanding of jazz ensemble through study of musical history, as well as various practice exercises and performances. May be repeated up to 10 credits. Restricted to Las Cruces campus only.
Prerequisite(s): By audition only.
Learning Outcomes
1. Improve performance skills
2. Develop and improve performance skills in a group setting
3. Develop understanding and interpretation within the context of music history
4. Refine and improve technical ability
5. Demonstrate proper technique and usage
6. Develop and improve improvisation skills

MUSC 2132. Percussion Ensemble
1 Credit (1)
Study and performance of contemporary percussion ensemble literature. May be repeated up to 5 credits. Restricted to Las Cruces campus only.
Prerequisite(s): by audition only.
Learning Outcomes
1. Improve performance skills
2. Develop and improve performance skills in a group setting
3. Develop understanding and interpretation within the context of music history
4. Refine and improve technical ability
5. Demonstrate proper technique and usage

MUSC 2151. An Introduction to World Music, Jazz and Music Research
3 Credits (3)
Introduces world music and jazz within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works. A major component will be the development of effective research and scholarly writing skills for the music major or minor. May be repeated up to 3 credits. Restricted to: Music majors and minors. Restricted to Las Cruces campus only.
Learning Outcomes
1. This course will cover fundamental concepts and styles associated with world music (ethnomusicology), jazz and popular music, an overview of the Western European tradition, and an intense focus on research and writing about music.
2. Emphasis will be placed on writing skills as they apply to the college experience in general and the world of music education and performance in particular.

3. Students will become acquainted with the diverse ways cultures create and are affected by their respective musical arts.
4. Focus will be on style evolution, forms, genres, composers, literature, and, where appropriate, performers

MUSC 2210. Diction I
2 Credits (2)
This course is designed to prepare students for singing in multiple languages using concepts of the International Phonetic Alphabet. Students will work to master the basics of phonetic singing to improve their overall musical abilities. Restricted to Las Cruces campus only.
Learning Outcomes
1. Correctly and consistently form vowel and consonant sounds when speaking and singing in multiple languages
2. Correctly and consistently transcribe texts in multiple languages using the International Phonetic Alphabet
3. Understand and explain the International Phonetic Alphabet's usage and symbols
4. Develop and apply the concept of lyric diction to singing
5. Gain fluency, accuracy, and confidence in pronunciation of sung text

MUSC 2220. Diction II
2 Credits (2)
This course serves as a continuing study in the concepts of the International Phonetic Alphabet. Students will continue to improve and practice their diction to develop their singing and musical abilities in order to begin the mastery of lyric diction. Restricted to music majors. Restricted to Las Cruces campus only.
Prerequisite: MUSC 2210 or consent of instructor.
Learning Outcomes
1. Correctly and consistently form vowel and consonant sounds when speaking and singing in multiple languages
2. Correctly and consistently transcribe texts in multiple languages using the International Phonetic Alphabet
3. Understand and explain the International Phonetic Alphabet's usage and symbols
4. Develop and apply the concept of lyric diction to singing.
5. Gain fluency, accuracy, and confidence in pronunciation of sung text.
6. Demonstrate ability to notate song texts according to IPA standards

MUSC 2240. Music History and Literature: Antiquity through Baroque
3 Credits (3)
Surveys Western art music within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works from antiquity through the end of the Baroque era. An additional emphasis will be given to effective research and scholarly writing skills. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better in MUSC 1450 and 1460.
Learning Outcomes
1. The purpose of the course is to survey the beginning history of music from the earliest ancient times through the Baroque period, ca.

MUSC 2310. Sound and Music Technology
1 Credit (1)
This course serves as an overview of current technologies and principles for the recording and production of sound, and the use of computer-based technologies for the production of music. Restricted to: MUSC,MED majors. Traditional Grading with RR. Restricted to Las Cruces campus only.
Prerequisite(s): MUSC 1460.
Learning Outcomes
1. Demonstrate fundamental knowledge of techniques and practices of music recording and production
2. Demonstrate ability to properly use computer-based technologies to produce and record music
3. Demonstrate ability to create music recordings
4. Work with a variety of recording, production, and sound reinforcement tools
5. Apply basic and mixed editing techniques
6. Use audio editing and file management techniques
7. Demonstrate knowledge of music technology vocabulary
8. Explain and understand the development of various music technologies

MUSC 2451. Ear Training III
1 Credit (1)
Continuation of MUSC 1451, advanced sight singing, dictation. Restricted to Las Cruces campus only.
Prerequisite(s): Grade of C- or better in MUSC 1451.
Learning Outcomes
1. Count rhythms at sight using the Eastman Counting System
2. Sing melodies at sight and prepared using Solfege syllables
3. Write out rhythmic patterns
4. Write out melodic patterns
5. Identify and singing intervals
6. Identify and sing chord / triad qualities
7. Write out harmonic dictation

MUSC 2452. Ear Training IV
1 Credit (1)
Continuation of MUS 2451, advanced sight singing, dictation. Restricted to Las Cruces campus only.
Prerequisite(s): Grade of C or better in MUSC 2451 and MUSC 2460.
Learning Outcomes
1. Count rhythms at sight using the Eastman Counting System
2. Sing scales and sequences as assigned for the level
3. Sing melodies at sight using solfege syllables
4. Write out rhythmic patterns in both simple and compound meters
5. Write out melodic patterns in both major and minor tonalities
6. Identify, label and sing intervals
7. Identify, label and sing chords and extended harmonic qualities, i.e. V7 and inversions
8. Write out harmonic progressions in both two and four part forms including secondary dominants and modulations.
9. Accurately detect melodic and rhythmic errors in dictation examples.

MUSC 2460. Music Theory III
3 Credits (3)
Analysis of Baroque and Classical Music. Vocabulary and syntax of 18th and 19th c. Western art music through study, chordal/formal analysis, and composition. Restricted to Las Cruces campus only.
Prerequisite(s): Grade of C or better in MUSC 1461.
Learning Outcomes
1. To learn and apply the vocabulary and syntax of 18th and 19th c. Western art music through study, chordal/formal analysis, and composition.

2. Topics covered include: Two-Voice Eighteenth Century Counterpoint; Fugue; Borrowed Chords; Neapolitan 6th Chords; Augmented 6th Chords; Sonata Form; Rondo Form.

MUSC 2461. Music Theory IV
3 Credits (3)
Analysis of Romantic, Post-Romantic, Impressionist, and Twelve-Tone Music. Vocabulary and syntax of late 19th and early 20th c. Western art music through study, micro/macro analysis, and composition. Restricted to Las Cruces campus only.
Prerequisite(s): Grade of C or better in MUSC 2460.
Learning Outcomes
1. To learn and apply the vocabulary and syntax of late 19th and early 20th c. music through study, micro/macro analysis, and composition.

MUSC 2470. Functional Piano IV
2 Credits (2)
For music majors preparing for Piano Proficiency Examination. May be taken for unlimited credit. Restricted to music majors. No S/U option. May be repeated up to 99 credits.
Prerequisite: MUSC 1472 or consent of instructor.
Learning Outcomes
1. Keys learned in previous semesters, adding A flat, E flat, and B flat
2. Secondary dominant chords added to cadence patterns, all inversions
3. Arpeggios, all inversions
4. More difficult sight--reading and transpositions
5. More difficult prepared pieces
6. Four part pieces (hymns)
7. Accompany a piece for any instrument onthe Mid-Term Recital (required) Score reading and transposition

MUSC 2510. Applied Music I
1-4 Credits
Individual instruction to develop technique, musicianship, performance and improvisational skills, as well as knowledge of significant repertoire. Prerequisite of an audition to register for course. May be repeated up to 16 credits.
Learning Outcomes
1. Individual instruction to develop technique, musicianship, performance and improvisational skills.

MUSC 2740. Pride Marching Band
1 Credit (1)
The Pride Marching Band performs at all NMSU home football games and select away games. The marching band is open to all students at NMSU and supports both instrumental and visual units. May be repeated up to 8 credits.
Learning Outcomes
1. To cultivate within the student a value system that encourages community service.
2. To provide the performer with experiences that will enable them to communicate thoughts/ideas/emotions in a unique and personal manner using his/her instrument, body, and physical motion.
3. To instill in students a commitment to life-long learning.
4. To promote personal growth through the rehearsal and performance of music, choreography, and drill of high quality.
5. To encourage students to continuously participate in and support artistic performances following graduation.

MUSC 2993. Opera Workshop
1 Credit (1)
Study, translation, analysis, rehearsal and performance of opera. Entry into course by audition. May be repeated up to 10 credits.
Learning Outcomes
1. Students will learn fundamentals of acting for singers, stage technique, movement, role preparation, character development, and audition techniques.
2. Students will prepare and perform Opera/Musical Theatre Scenes.

MUSC 2996. Special Topics I
1-3 Credits
Emphasis on special areas of music; designed for highly motivated students. May be repeated up to 99 credits.
Learning Outcomes
1. Varies.

MUSC 301. Marching Band Techniques
2 Credits (2)
This course will help students develop the techniques needed to administer and teach all aspects of a contemporary high school marching band. This includes drill conception and design, instruction, organization, and administration. Stylistic varieties of marching fundamentals, show conception, fundamentals of charting and teaching drill, computer-aided drill design, traditional show design, contemporary show design, rehearsal techniques, and organizational concepts. Restricted to: Music, Music Education majors. Traditional Grading with RR.
Learning Outcomes
1. Develop the techniques needed to administer and teach all aspects of a contemporary high school marching band.

MUSC 302. Music History and Literature: Classic through Romantic
3 Credits (3)
Surveys Western art music within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works from the beginnings of the Classic era through the end of the Romantic era. An additional emphasis will be given to effective research and scholarly writing skills. Restricted to: Music Majors and Minors majors.
Prerequisite: A grade of C- or better in MUSC 2240.
Learning Outcomes
1. A study of Western Culture music from the beginnings of the Classic Era through the end of the Romantic Era.

MUSC 303. Music History and Literature: 20th Century Through the Present
3 Credits (3)
Surveys Western art music within a historical and cultural context, considering significant musical figures, forms, genres, styles, and representative works from the beginning of the 20th Century through the Present. An additional emphasis will be given to effective research and scholarly writing skills. Restricted to: MUS minors and majors.
Prerequisite: A grade of C- or better in MUSC 302.
Learning Outcomes
1. To develop an understanding Western Art Music within a historical and cultural context, focusing on representative works from the beginning of the 20th Century through the Present.

MUSC 315. Brass Techniques I
1 Credit (1)
Methods and techniques of teaching high brass instruments, for music education majors. Main campus only.

Learning Outcomes

1. To learn the fundamentals of playing the trumpet and horn.
2. To learn basic maintenance of the instrument and common problems that may arise.
3. Learn instrument assembly, embouchure formation, tone production, hand position and fingerings.

MUSC 316. Brass Techniques II

1 Credit (1)

Methods and techniques of teaching low brass instruments, for music education majors. Las Cruces campus student only.

Learning Outcomes

1. To learn the fundamentals of playing brass instruments.
2. To learn basic maintenance of the instrument and common problems that may arise.

MUSC 317. Woodwind Techniques I

1 Credit (1)

Methods and techniques of teaching woodwind instruments (clarinet and Basson), for music education majors. Las Cruces campus only.

Learning Outcomes

1. To prepare students to teach clarinet and bassoon at the beginning and intermediate levels in a public school environment.

MUSC 318. Woodwind Techniques II

1 Credit (1)

Methods and techniques of saxophone and oboe, for music education majors.

Learning Outcomes

1. To learn the fundamentals of playing the flute, saxophone, and oboe.
2. To learn basic maintenance of the instrument and common problems that may arise.
3. Learn instrument assembly, embouchure formation, hand position and fingerings.

MUSC 319. String Techniques I

1 Credit (1)

Methods and techniques of teaching low string instruments, for music education majors. Las Cruces Campus Only.

Learning Outcomes

1. Knowledge of pedagogy required to answer questions about posture, position, and technique for cello and bass in addition to history and evolution of the instruments.
2. Play Major scales in keys up to two sharps and two flats on both the cello and bass.

MUSC 321. Instrumental Techniques for Vocal Music Education Majors

2 Credits (2)

Methods of teaching brass, woodwind, percussion, stringed and fretted instruments for vocal music education majors. Restricted to: Music and Music Education majors. Traditional Grading with RR.

Learning Outcomes

1. Demonstrate an understanding of various approaches and teaching techniques that may be utilized in the instruction of beginning-level instrumental music students.
2. Develop knowledge of selection, purchase, and maintenance of equipment.

MUSC 322. Guitar Methods

1 Credit (1)

Methods and techniques of teaching guitar, for Music Education majors.

Learning Outcomes

1. Demonstrate appropriate strategies for teaching guitar in individual and class settings.
2. Diagnose and guide correct guitar performance techniques.
3. Have a working knowledge of guitar specific topics, including correct left- hand and right-hand position and technique, classical and American sitting position, finger style and flat pick technique, multi-part solo playing, chord strumming, reading standard notation, reading tablature.

MUSC 323. Percussion Technique I

1 Credit (1)

Methods and techniques of teaching fundamental percussion instruments (snare drum, timpani, keyboards and essential accessories).

Learning Outcomes

1. Demonstrate appropriate strategies for teaching percussion in individual and class settings.
2. Diagnose and guide correct percussion performance techniques.

MUSC 324. Percussion Technique II

1 Credit (1)

Methods and techniques of teaching marching percussion, drum set, and a continuation of techniques discussed in MUS 323. Restricted to: MUS,M ED majors. Traditional Grading with RR.

Prerequisite: A grade of C- or better in MUS 323.

Learning Outcomes

1. Demonstrate advanced strategies for teaching percussion in individual and class settings.

MUSC 325. Beginning Conducting

1 Credit (1)

A study of the fundamentals of conducting and rehearsal strategies with an emphasis on beginning technique applicable to all ensembles. Reading of musical scores with application via laboratory ensemble experience is included. Restricted to: Music and Music Education majors. May be repeated up to 1 credit.

Prerequisite: A grade of C or better in MUSC 2451 and MUSC 2460.

Learning Outcomes

1. Develop the musicianship of the student.
2. Development of basic conducting techniques.
3. Develop a knowledge of appropriate terminology, tempi, and transpositions.
4. Establishment of a gestural (nonverbal) vocabulary.
5. Cultivation of self-awareness and effective interaction through nonverbal communication.

MUSC 326. Instrumental Conducting

3 Credits (3)

Will continue from MUSC 325 in the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques as it relates to the instrumental ensemble. The class will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS,M ED majors. Traditional Grading with RR.

Prerequisite: A grade of C- or better in MUSC 325.

Learning Outcomes

1. Establishment of a gestural (nonverbal) vocabulary as it relates to the instrumental ensemble.

MUSC 327. Choral Conducting
3 Credits (3)
Continuation of conducting study with emphasis on choral rehearsal techniques, ensemble management, and literature. Restricted to: Music and Music Education majors. Traditional Grading with RR.
Prerequisite: A grade of C or better in MUSC 325.
Learning Outcomes
1. Establishment of a gestural (nonverbal) vocabulary as it relates to choral ensembles.

MUSC 330. Applied Music II
1-4 Credits
Continuation from MUS 2510. Individual instruction to develop technique, musicianship, performance and improvisational skills, as well as knowledge of significant repertoire. May be repeated up to 16 credits. Restricted to: Music and Music Education majors. Traditional Grading with RR.
Prerequisite: A grade of C or better in MUSC 2992 plus a juried audition.
Learning Outcomes
1. Individual instruction to develop technique, musicianship, performance and improvisational skills.

MUSC 340. Junior Recital
1 Credit (1)
Public solo performance under the supervision of the appropriate applied instructor. 30 minutes of musical performance is required. Consent of Instructor required.
Corequisite: MUSC 330.
Learning Outcomes
1. Development of the ability to Perform publicly in a solo capacity.
2. Development of practice skills and time management.

MUSC 341. BA Capstone
1-2 Credits (1-2)
The objective of the Capstone course for the BA degree in Music is to demonstrate the accumulation, understanding and knowledge of the student's course of study. This will take the form of an analytical paper, recital, research paper, composition or other equally encompassing project approved by the Instructor of Record. This may involve coursework from the student's minor area of study and be a multi-disciplinary collaborative effort. Restricted to: Music majors.
Prerequisite: A B- or better in MUSC 2460 and MUSC 302.
Learning Outcomes
1. Each project results in a scholarly and creative product that serves as a tangible and measurable indication of the extent to which students have mastered the critical thinking, reading, writing, and oral communication skills that are part of the learning objectives of the program.

MUSC 346. Elementary Music Methods
2 Credits (2)
Lesson planning, curriculum, teaching methodology, materials, and procedures for teaching music in an elementary school. Emphasis on methodology of Koday and Orff, teaching in a multicultural setting, and developing reflective practitioners. This course requires field experience in the public schools. May be repeated up to 2 credits.
Prerequisite: A grade of C or better in MUSC 1410.
Learning Outcomes
1. Students will identify and apply ideas from various music education pedagogical approaches including Orff and Kodaly.
2. The ability to develop lesson plans for primary school teaching.

MUSC 349. Secondary Music Methods
2 Credits (2)
Lesson planning, curriculum, teaching methodology, materials, and procedures for teaching music in the middle school and high school. Emphasis on teaching in a multicultural setting and developing reflective practitioners. Restricted to: Music Education majors.
Prerequisite(s): A grade of C or better in MUSC 346.

MUSC 350. Chamber Music
1 Credit (1)
Small performing ensembles that may include strings, woodwinds, brass, pianos, percussion, and voices. Prerequisite of an audition for this course. May be repeated up to 16 credits.
Learning Outcomes
1. Gain practical experience in the art of collaborative performance.
2. Prepare and perform chamber works.
3. Learn to express musical opinions, and to respect those of others.

MUSC 351. Opera Workshop
1 Credit (1)
Study, translation analysis, rehearsal and performance of opera or musical theater. Prerequisite of an audition. May be repeated up to 10 credits.
Learning Outcomes
1. Gain practical experience in the art of collaborative performance.
2. Learn to express musical opinions, and to respect those of others.
3. Prepare and perform a large work.

MUSC 360. Special Topics II
1-3 Credits
Emphasis on special areas of music; designed for highly motivated students. May be repeated up to 99 credits.
Learning Outcomes
1. Varies.

MUSC 361. Concert Choir II
1 Credit (1)
Composed of both music and nonmusic majors. Emphasis on vocal techniques, sight-singing, and basics of choral musicianship. Students must assume leadership role. Registration into course based on audition. May be repeated up to 88 credits.
Learning Outcomes
1. Demonstrate a thorough knowledge of the ensemble's repertoire.
2. Articulate an understanding of the fundamental practical and musical elements necessary to the development of a successful choral ensemble.
3. Possess an expanded knowledge of vocal technique, vocal health, choral techniques, choral repertoire, expressive diction, and the relationship between text and music.

MUSC 362. Philharmonic Orchestra II
1 Credit (1)
The University Philharmonic Orchestra is open to all students and performs a wide variety of standard orchestral literature. The orchestra performs each semester and the objectives include refining technique, stylistic characteristics, intonation, balance, bowings, color, rhythmic integrity and dynamics. Prerequisite of an audition. May be repeated up to 10 credits.
Learning Outcomes
1. Participants will improve the way they listen to themselves, to each other into the composers work.

2. Participants will also learn to perform with an adequate level of proficiency.
3. Identify how their individual parts relate to the rest of the orchestra.

MUSC 363. Jazz Ensembles II
1 Credit (1)
Performance ensemble that explore repertoire written for big band, including (but not limited to) dance band, swing, and contemporary compositions. May be repeated up to 10 credits.
Prerequisite: By audition only.
Learning Outcomes
1. Improve Performance Skills.
2. Improve Group Performance Skills.
3. Gain Improvisations Skills.
4. Develop knowledge of Repertoire.
5. Refine and improve technical ability.

MUSC 365. Composition I
2 Credits (2)
Significant forms for various media. Emphasis on structural aspects of original composition. May be repeated up to 2 credits.
Prerequisite: A grade of B or better in MUSC 1460.
Learning Outcomes
1. Demonstrate the ability to analyze a variety of musical compositions
2. Demonstrate the ability to develop musical compositions from basic melodic, harmonic, rhythmic, and formal structures
3. Create new musical compositions from variety of perspectives for smaller chamber ensembles

MUSC 368. University Singers II
1 Credit (1)
Select concert and touring choir of undergraduate and graduate students performing a cappella and accompanied choral literature. May be repeated up to 10 credits.
Prerequisite: By audition only.
Learning Outcomes
1. Develop Performance Skills.
2. Develop ensemble performance skills.
3. Refine and improve technical ability.
4. Demonstrate proper technique and usage.

MUSC 370. Wind Symphony II
1 Credit (1)
This elite ensemble of 50 highly qualified graduate and undergraduate students performs a varied repertoire of the highest quality literature for winds. Members will also perform concerts of chamber winds literature each semester. This ensemble is dedicated to professional level performance while fostering the musical growth of its members. Conducted by the Director of Bands, this group serves as the flagship for the entire university bands program. May be repeated up to 10 credits.
Prerequisite: by audition only.
Learning Outcomes
1. Develop Performance Skills.
2. Develop Ensemble Performance Skills.
3. Demonstrate proper technique and usage.
4. Develop understanding and interpretation within the context of music history.
5. Refine and improve technical ability.

MUSC 372. Marching Band II
1 Credit (1)
Composed of both majors and nonmajors. Opportunity to perform all varieties of music in a contemporary style marching unit. May be repeated up to 5 credits.
Learning Outcomes
1. Develop and improve performance skills in a group setting.
2. Demonstrate proper technique and usage.
3. Refine and improve technical ability.
4. Develop understanding and interpretation within the context of music history.

MUSC 374. Percussion Ensembles II
1 Credit (1)
Study and performance of contemporary percussion ensemble literature. Students must assume a leadership role. May be repeated up to 5 credits.
Prerequisite: By audition only.
Learning Outcomes
1. Improve performance skills.
2. Develop and improve performance skills in a group setting.
3. Develop understanding and interpretation within the context of music history.
4. Refine and improve technical ability.
5. Demonstrate proper technique and usage.

MUSC 380. Symphonic Band II
1 Credit (1)
This is a select large ensemble, chosen by audition. It provides a challenging musical environment for skilled performers by programming repertoire that ranges from works for chamber winds, to standards of the wind band literature, to cutting edge literature. Conducted by the Associate Director of Bands, this ensemble is comprised of music majors and non-music majors alike and provides the less experienced student an opportunity to hone and refine performance skills. May be repeated up to 10 credits.
Prerequisite: By audition only.
Learning Outcomes
1. Improve Performance Skills.
2. Develop and improve performance skills in a group setting.
3. Develop understanding and interpretation within the context of music history.
4. Refine and improve technical ability.
5. Demonstrate proper technique and usage.

MUSC 386. Applied Music Pedagogy and Literature I
2 Credits (2)
Methods, materials, problems, literature, and techniques in teaching individual lessons. Consent of Instructor required.
Learning Outcomes
1. Development of appropriate pedagogical skills.
2. Development of ability to write program notes.

MUSC 390. Survey of Wind Literature
2 Credits (2)
An examination of beginning to advanced literature for wind bands with an emphasis on the needs of middle and high school ensembles. It will include a means to determine the quality of a piece as well as the standardized level of difficulty (grading).
Prerequisite: A grade of C- or better in MUSC 2452 and MUSC 2461.

Learning Outcomes

1. Understanding of wind band literature with an emphasis on the needs of middle and high school ensembles.
2. Understanding a means to determine the quality of a piece as well as the standardized level of difficulty.

MUSC 391. Survey of Orchestral Literature
2 Credits (2)
An examination of beginning to advanced literature for both string orchestra and symphony orchestra with an emphasis on the needs of middle and high school ensembles. A means to determine the quality of a piece as well as the standardized level of difficulty (grading) will be included. May be repeated up to 2 credits.
Prerequisite: A grade of C- or better in MUSC 2452 and MUSC 2461.
Learning Outcomes

1. Identify significant composers and compositions that are appropriate for all grade levels and applicable to teaching music through a performance-based environment in an orchestral setting
2. Determine the quality of a work based on aesthetic ideals
3. Determine appropriate programming strategies and repertoire selection dependent upon level of difficulty and/or varying ability levels.

MUSC 392. Survey of Choral Literature
2 Credits (2)
An examination of beginning to advanced literature for choir with an emphasis on the needs of middle and high school ensembles. A means to determine the quality of a piece as well as the standardized level of difficulty (grading) will be included. Restricted to: Music and Music Education majors.
Prerequisite: A grade of C- or better in MUSC 2452 and MUSC 2461.
Learning Outcomes

1. Identify significant composers and compositions that are appropriate for all grade levels and applicable to teaching music through a performance-based environment in a choral setting.

MUSC 393. Instructional Strategies I for Instrumentalists
2 Credits (2)
An examination of beginning to advanced literature for instrumentalists with an emphasis on the needs of middle and high school ensembles. The course includes a means to determine the quality of a piece as well as the standardized level of difficulty (grading). It also allows for full ensemble instrumentation to experience both playing the repertoire and peer teaching to better rehearsal skills.
Prerequisite: A grade of C- or better in MUSC 1410.
Learning Outcomes

1. The ability to assess the graded needs of middle and high school ensembles.
2. The development of rehearsal skills.

MUSC 394. Instructional Strategies II for Instrumentalists
2 Credits (2)
The course focuses on rehearsal techniques for middle and high school ensembles. It includes a means to determine the quality of a piece of music as well as the standardized level of difficulty (grading). Students must also passing the TEP exam in order to enroll in this course.
Prerequisite: A grade of C- or better in MUSC 1410.
Learning Outcomes

1. The development of rehearsal techniques for middle and high school ensembles

MUSC 395. Instructional Strategies I for Vocalists
2 Credits (2)
An examination of beginning to advanced literature for vocalists with an emphasis on the needs of middle and high school ensembles. The course includes a means to determine the quality of a piece as well as the standardized level of difficulty (grading). It also allows for full ensemble instrumentation to experience both playing the repertoire and peer teaching to better rehearsal skills. Students must also pass the TEP exam to enroll in this course.
Prerequisite: A grade of C- or better in MUSC 1410.
Learning Outcomes

1. The ability to assess the graded needs of middle and high school ensembles.
2. The development of rehearsal skills.

MUSC 396. Instructional Strategies II for Vocalists
2 Credits (2)
The course focuses on rehearsal techniques for middle and high school ensembles. It includes a means to determine the quality of a piece of music as well as the standardized level of difficulty (grading). Students will also need to pass the TEP exam in order to enroll in the course.
Prerequisite: A grade of C- or better in MUSC 1410.
Learning Outcomes

1. The development of rehearsal techniques for middle and high school ensembles.

MUSC 397. Administrative Music Methods
1 Credit (1)
Lesson planning, curriculum, teaching methodology, materials, and procedures for teaching music in the middle school and high school. Emphasis on administration. Students must also pass the TEP exam to enroll in this course.
Prerequisite: A grade of C- or better in MUSC 1410.
Learning Outcomes

1. Gain insight and experience with administrative strategies and procedures in secondary classroom
2. Work on interview skills as well as resume and cover letter composition
3. Collect a set of usable tools that a student can carry with them into their first job.
4. Gain familiarity with laws and regulations regarding programs and money spent

MUSC 413. Form and Analysis
3 Credits (3)
Forms in tonal music and basic analytic techniques including music from diverse cultures and media. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better in MUSC 2452 and MUSC 2461.
Learning Outcomes

1. Gain a fuller knowledge of musical patterns of organization, and use that knowledge in learning repertoire.
2. Communicate the essence of a work in performance more effectively by making interpretive decisions that are in alignment with the work's formal processes and the composer's intent.
3. Listen to performances and recordings with a deeper, quicker understanding of the web of structure that gives coherence to a work.

MUSC 415. Orchestration
3 Credits (3)
Scoring for full orchestra and various instrumental combinations with consideration of instrument timbres, strengths, weaknesses and

ranges. May be repeated up to 3 credits. Restricted to: Music and Music Education majors.
Prerequisite: A grade of C- or better in MUSC 2452,MUSC 2461 and MUSC 2310.
Learning Outcomes
1. Write effectively and idiomatically for voice, orchestra, and Band.

MUSC 417. Studio Accompanying
2 Credits (2)
Practical application of collaborative piano skills in a studio setting for Piano Performance majors. May be repeated up to 12 credits.
Learning Outcomes
1. Benefit from the teaching of other faculty, and learn more about the specific challenges of playing each instrument.
2. Explore how to adapt factors such as dynamics and pacing when accompanying different instruments and voices.
3. Discover the balance between musical leading and following.

MUSC 421. Music of the Baroque Era
3 Credits (3)
An overview of the music of the Baroque era with an emphasis on history and literature. May be repeated up to 3 credits.
Prerequisite: MUSC 303.
Learning Outcomes
1. Discuss the historical and social context from which Baroque music developed.
2. Summarize the career of several well-known Baroque composers.
3. Outline the musical traits common and unique to different regions in the Baroque period and name the most important Baroque genres.
4. Describe the musical style of several well-known and lesser-known Baroque composers, citing examples from specific works.
5. Examine thirty-three Baroque musical works.
6. Write a term paper based on an analysis of a Baroque musical work.
7. Interpret and perform Baroque works with an understanding of historically-informed performance.
8. Describe Baroque string, wind, brass, keyboard, and percussion instruments: their appearance, construction, and manner of playing.

MUSC 422. Music of the Classic Era
3 Credits (3)
An overview of the music of the Classic era with an emphasis on history and literature.
Prerequisite: MUSC 303.
Learning Outcomes
1. Discuss the historical and social context from which Classical music developed.
2. Outline the musical traits common and unique to different regions in the Classical period.
3. Summarize the development of the symphony, opera and other main genres in the eighteenth century.
4. Write scholarly papers on music.

MUSC 424. Music of the Twentieth Century
3 Credits (3)
An overview of the music of the Twentieth Century with an emphasis on history and literature. Consent of Instructor required.
Prerequisite: MUSC 303.
Learning Outcomes
1. Discuss the historical and social context from which Twentieth Century music developed.

MUSC 429. Opera: History and Literature
3 Credits (3)
An overview of the operatic art form from the Florentine Camerata and Baroque opera through current 21st-century works, with an emphasis on historical context, composers, and significant works. Restricted to: Music, Music Education majors.
Prerequisite(s): MUSC 303 or consent of instructor.
Learning Outcomes
1. The student will be able to effectively identify and discuss operatic developments and traditions in historical context as well as demonstrate a knowledge of operatic composers and significant operatic works.

MUSC 430. Applied Music III
1-4 Credits
Continuation from MUS 330. Individual instruction to develop technique, musicianship, performance and improvisational skills, as well as knowledge of significant repertoire. May be repeated up to 16 credits. Consent of Instructor required. Restricted to: Music and Music Education majors. Traditional Grading with RR.
Prerequisite(s): A grade of C or better in MUSC 330 plus a juried audition.

MUSC 432. 21st Century Piano Skills
1 Credit (1)
To guide students' keyboard versatility, particularly the skills practical and meaningful in various roles as a professional pianist in the 21st century music. The course explores performance in a variety of settings including sight-reading, efficient music learning, jazz, lead sheet harmonization, improvisation and arranging, alto and tenor clef reading, transposition, and quickly grasping the musical styles of the given new repertoire. May be repeated up to 6 credits.
Learning Outcomes
1. Sight-read and learn new music efficiently across a range of genres and ensemble settings.
2. Harmonize melodies using lead sheets and chord symbols in jazz, folk, hymn, and popular music stylistic appropriateness.
3. Arrange and improvise music in various musical contexts, including classical, jazz, and contemporary idioms.
4. Transpose short passages and chord progressions into different keys at sight.
5. Read and play treble, bass, alto, and tenor clefts with functional fluency (such as reading the B-flat clarinet part in duo music and SATB choir repertoire, with selected parts).
6. Identify and apply appropriate stylistic features when performing new repertoire.
7. Demonstrate professional preparation and keyboard versatility in mock performance scenarios reflective of real-world gigs (for example: church, musical theater, cocktail hour, large ensemble, etc).

MUSC 440. Senior Recital
1-2 Credits (1-2)
Public solo performance under the supervision of the appropriate applied instructor. 60 minutes of musical performance is required for enrollment of 2 hours credit. 30 minutes of musical performance is required for enrollment of 1 hour credit. May be repeated up to 2 credits. Traditional Grading with RR.
Corequisite: MUSC 430.

Learning Outcomes

1. Cumulation of public performance skills.
2. The ability to write program notes.

MUSC 441. Supervised Studio Teaching
2 Credits (2)
Teaching of private lessons under supervision. May be repeated up to 6 credits.
Learning Outcomes

1. Development of applied teaching skills.

MUSC 450. Research Methods
3 Credits (3)
Introduction to methodology of music research. Emphasis on important scholarly resources and academic writing. Restricted to Music majors. No S/U grading option.
Learning Outcomes

1. Develop an understanding methodology of music research.

MUSC 470. Special Topics III
1-3 Credits
Designed for highly motivated students. Independent study and individual guidance. May be taken for unlimited credit. May be repeated up to 99 credits.
Learning Outcomes

1. Varies.

MUSC 471. Graduate Theory Review
3 Credits (3)
Comprehensive and accelerated study of modes, diatonic harmony, and classical form of the common practice period. Restricted to: Music majors. Traditional Grading with RR.
Learning Outcomes

1. Develop an understanding of modes, diatonic harmony, and classical form of the common practice period.

MUSC 475. Intermediate Conducting
3 Credits (3)
Serves as a bridge from undergraduate conducting study to the graduate level. Advanced undergraduate students may enroll to learn how the graduate program in conducting functions. The course also serves as the introductory experience for newly admitted graduate conducting majors. After successful completion of this course, students will be able to: Study musical scores from a conducting perspective; Demonstrate effective predetermined gestures and movements; Lead an ensemble; Research and give presentations related to composers and their music; Demonstrate advanced knowledge of conducting practices.
Prerequisite: A grade of C- or better in MUSC 326 or MUSC 327.
Learning Outcomes

1. Develop the musicianship of the student.
2. Development of basic to advanced conducting techniques.
3. Gain a knowledge of appropriate terminology, tempi, and transpositions.
4. Cultivation of self-awareness and effective interaction through nonverbal communication.

MUSC 476. Diction Review
2 Credits (2)
Review of the International Phonetic Alphabet (IPA) and pronunciation rules for singing in English, Latin, Italian, German and French. For graduate choral conducting and vocal performance (students who did not pass the diction proficiency exam).

Learning Outcomes

1. Refamiliarize their knowledge of the IPA and its uses in singing including its symbols and connection to vocal anatomy and physiology.
2. Apply knowledge of IPA to pronunciation and enunciation of English, Latin, Italian, German and French.
3. Continue to refine awareness of the movements of the vocal articulators and their effect on speech sounds and singing tone.
4. Gain further exposure to role models for lyric diction in all languages studied.
5. Reinforce fluency, accuracy, and confidence in pronunciation, enunciation, and expression of sung text.
6. Apply the concept of lyric diction to both solo and ensemble singing at a graduate level as well as applying pedagogical concepts into professional contexts.

MUSC 477. Graduate Music History Review
3 Credits (3)
Comprehensive and accelerated study of music history from antiquity to the present Restricted to: Music majors. Traditional Grading with RR.
Learning Outcomes

1. Develop an understanding of music history from antiquity to the present.

MUSC 481. The Collaborative Musician
1-15 Credits (1-15)
This course integrates one-on-one meeting and group performance. The goal is to guide the students' topic interests, expand their knowledge of musical repertoire, styles, composers, and/or interpretation. May be repeated up to 15 credits.
Learning Outcomes

1. Prepare and perform a mixture of vocal one instrumental collaborative work.
2. Learn the skills necessary to collaborate successfully with other musicians, including listening, having an open and constructive communication, and developing stronger keyboard skills as applicable to ensemble settings.
3. Prepare a professional comprehensive Repertoire List with all categories (solo piano, collaborative music, chamber music, large ensemble).
4. Learning diversity of teaching styles.
5. Learn more about the specific challenges of playing each instrument and instrumental family.
6. Adapt factors such as dynamics and pacing when collaborating with different instruments and voices.
7. Discover and apply the balance between musical leading and following.
8. Learn to express musical opinions and respect those of others.

MUSC 486. Applied Music Pedagogy and Literature II
2 Credits (2)
Methods, materials, problems, literature, and techniques in teaching individual lessons. Consent of Instructor required. Restricted to: Music majors. Traditional Grading with RR.
Learning Outcomes

1. Development of appropriate pedagogical skills.

MUSC 498. Independent Study
1-3 Credits

For students with a strong musical background wishing to explore content beyond the traditional curriculum. May be repeated up to 6 credits. Restricted to majors.
Prerequisite: consent of instructor.
Learning Outcomes
1. Varies.

MUSC 511. Survey of Traditional Harmony
3 Credits (3)
Tonal harmony in common practice and theory of the late 17th, 18th, and early 19th centuries. Restricted to: Music majors. Traditional Grading with RR.
Prerequisite(s): A grade of B or better in MUSC 471.

MUSC 513. Twentieth Century Art Music
3 Credits (3)
Analytical techniques, structural design and compositional materials from Debussy to the Minimalist school in historical context. Restricted to: Music majors.
Prerequisite(s): A grade of B or better in MUSC 471.

MUSC 518. Seminar in Music Theory
3 Credits (3)
Varying topics in Music Theory, providing a more specific and in-depth study of the particular topic. Restricted to: Music majors. Traditional Grading with RR. May be repeated up to 6 credits.
Prerequisite: A grade of B or better in MUSC 471.
Learning Outcomes
1. Varies.

MUSC 519. Seminar in Music History
3 Credits (3)
Varying topics in Music History, providing a more specific and in-depth study of the particular topic. May be repeated up to 6 credits. Restricted to: MUS majors.
Prerequisite: A grade of B or better in MUSC 477.
Learning Outcomes
1. Varies.

MUSC 521. Music of the Baroque Era: History and Literature
3 Credits (3)
An overview of the music of the Baroque Era with an emphasis on history and literature. May be repeated up to 3 credits.
Prerequisite: A grade of B or better in MUSC 477.
Learning Outcomes
1. Discuss the historical and social context from which Baroque music developed.
2. Summarize the career of several well-known Baroque composers.
3. Outline the musical traits common and unique to different regions in the Baroque period and name the most important Baroque genres.
4. Describe the musical style of several well-known and lesser-known Baroque composers, citing examples from specific works.
5. Examine thirty-three Baroque musical works.
6. Write a term paper based on an analysis of a Baroque musical work.
7. Interpret and perform Baroque works with an understanding of historically-informed performance.
8. Describe Baroque string, wind, brass, keyboard, and percussion instruments: their appearance, construction, and manner of playing.

MUSC 522. Music of the Classical Era: History and Literature
3 Credits (3)
An overview of the music of the Classical era with an emphasis on history and literature. Restricted to: MUS majors.
Prerequisite(s): A grade of B or better in MUSC 477.

MUSC 523. Music of the Romantic Era: History and Literature
3 Credits (3)
An overview of Romantic era music, with an emphasis on history and literature. Restricted to MUS Majors. May be repeated up to 3 credits.
Prerequisite: A grade of B or better in MUSC 477.
Learning Outcomes
1. Develop an in depth knowledge of composers of the Romantic era
2. Develop the ability to Recognize Major compositions of the Romantic Era
3. Develop the ability to analyze works from the Romantic Era.

MUSC 529. Opera History and Literature
3 Credits (3)
An overview of the operatic art form from the Florentine Camerata and Baroque opera through current 21st-century works, with an emphasis on historical context, composers, and significant works. Restricted to: M ED,MUS majors.
Prerequisite(s): A grade of B or better in MUSC 477.
Learning Outcomes
1. The student will be able to effectively identify and discuss operatic developments and traditions in historical context as well as demonstrate a knowledge of operatic composers and significant operatic works.

MUSC 530. Seminar in Music Education
3 Credits (3)
Varying topics in Music Education, providing a more specific and in-depth study of the particular topic. Restricted to: MUS majors. May be repeated up to 3 credits.
Learning Outcomes
1. Varies.

MUSC 531. Music Education in the Diverse Classroom
3 Credits (3)
This course is designed to provide an introduction to diverse and at-risk student groups in educational settings in the music classroom. It will help the course participants explore strategies and gain skills to enhance the musical growth of marginalized groups of students. There is an emphasis on identification, behavioral patterns, building interpersonal relationships, and will include a critical review of selected current research studies in music education. Armed with this knowledge, course participants will be better prepared to understand at-risk students and how best to implement strategies in the classroom. May be repeated up to 3 credits. Restricted to: MUS majors.
Learning Outcomes
1. Students will access and utilize the basic research journals and other sources of research reports and summaries, including those identified using computer technology in the field of music education.
2. Students will describe the structure of most qualitative research studies and their aide in identifying student traits.
3. Students will understand and use most of the language, terms and vocabulary found in qualitative research reports in discussing and identifying behavioral patterns of at-risk students.
4. Students will appraise qualitative research in a systematic way; analyze and review what the research produced in order to isolate the strategies available to incorporate in classroom teaching scenarios.

5. Students will independently retrieve, critique and summarize research related to at-risk students in music education.

MUSC 532. 21st Century Piano Skills
1 Credit (1)
To guide students' keyboard versatility, particularly the skills practical and meaningful in various roles as a professional pianist in the 21st century music—The course explores performance in a variety of settings including sight-reading, efficient music learning, jazz, lead sheet harmonization, improvisation and arranging, alto and tenor clef reading, transposition, and quickly grasping the musical styles of the given new repertoire. May be repeated up to 15 credits.
Learning Outcomes
1. Sight-read and learn new music efficiently across a range of genres and ensemble settings.
2. Harmonize melodies using lead sheets and chord symbols in jazz, folk, hymn, and popular music stylistic appropriateness.
3. Arrange and improvise music in various musical contexts, including classical, jazz, and contemporary idioms.
4. Transpose short passages and chord progressions into different keys at sight.
5. Read and play treble, bass, alto, and tenor clefts with functional fluency (such as reading the B-flat clarinet part in duo music and SATB choir repertoire, with selected parts).
6. Identify and apply appropriate stylistic features when performing new repertoire.
7. Demonstrate professional preparation and keyboard versatility in mock performance scenarios reflective of real-world gigs (for example: church, musical theater, cocktail hour, large ensemble, etc).

MUSC 533. Vocal Literature for Piano
2 Credits (2)
This course provides pianists with an in-depth exploration of voice literature from the Baroque and Classical periods to contemporary repertoire, with a focus on art song traditions across languages and cultures. Emphasis is placed on the stylistic, historical, and linguistic aspects of major song literature, including German Lieder, French mélodie, English and American art song, and other significant repertoires beyond canon. Through listening, score study, and performance, students will develop the collaborative skills necessary for effective partnership with vocalists, including issues of interpretation, diction, phrasing, and stylistic nuance. Special attention will be given to repertoire selection, transposition, and the pianist's role in rehearsal and performance. This course is designed to build both knowledge and practical tools for pianists. Basic knowledge of vocal diction is needed to take this course.
Learning Outcomes
1. Identify and describe key composers, styles, and historical contexts of major vocal literature from Baroque period through the 21st century.
2. Analyze and interpret art song and operatic Aria repertoire across multiple languages and traditions, including German Lieder, French mélodie, Italian, English, American, Spanish, and Russian songs.
3. Explore and contextualize art song from Japanese, Korean, Chinese, and Indigenous traditions, and demonstrate familiarity through listening, discussion, and performance.
4. Demonstrate effective collaborative skills with vocalists, including score preparation, phrasing, and stylistic sensitivity.
5. Apply knowledge of IPA and diction principles to support accurate pronunciation and interpretation in German, French, English, Spanish, and other languages commonly found in vocal repertoire.
6. Evaluate, translate, and discuss song texts, musical settings, and performance practices.
7. Perform representative works from multiple stylistic periods in a collaborative setting, exhibiting both technical proficiency and interpretive insight.

MUSC 534. Instrumental Sonatas and Duo Repertoire for Piano
2 Credits (2)
This course provides pianists with an in-depth study of major sonatas and duo repertoire for piano and instruments—including strings, woodwinds, brass, and selected percussion. Emphasis is placed on historical style, interpretive collaboration, rehearsal strategies, and performance practice. In addition, skills for quickly learning new pieces, reducing orchestral reduction effectively, and developing technical and musical refinement skills will be covered. Students will explore key repertoire from the Baroque through Contemporary eras, developing the musical, technical, and interpersonal skills needed to perform as equal partners in recital settings. The course includes score study, listening, class coaching, and ensemble work. Pianists will gain practical experience performing with a variety of instrumentalists and develop fluency in stylistic nuance, balance, articulation, and cueing.
Learning Outcomes
1. Analyze and interpret instrumental duo repertoire from the Baroque through Contemporary periods, with attention to historical style, performance practice, and techniques.
2. Demonstrate collaborative rehearsal techniques, including cueing, balance, articulation, and phrasing appropriate to various instrumental partners.
3. Apply practical strategies for quickly learning new repertoire, including major Sonatas, complex stand-alone pieces, and orchestral reductions with skills to adjust the orchestral reduction as needed.
4. Perform collaboratively with a range of instrumentalists (strings, woodwinds, brass, and percussion), showing stylistic fluency, musicality, and technical confidence.
5. Identify and discuss defining characteristics of major composers and stylistic schools represented in the duo repertoire.
6. Exhibit professional rehearsal and communication etiquette, score preparation, and adaptability across diverse collaborative settings.

MUSC 535. Current Issues in Music Education
3 Credits (3)
This course examines the rich and challenging complexities of music teaching and learning from a variety of perspectives. Educational theory to pedagogical inquiry of current educational practice will be examined, calling students to critically reflect on such professional activities as lesson planning, curriculum design, repertoire choice, program assessment, advocacy in the arts, and student evaluation. Restricted to: MUS (Music Ed track only) majors.
Learning Outcomes
1. An understanding of the complexities of music teaching and learning from a variety of perspectives.

MUSC 540. Graduate Recital/Analytical Paper
4 Credits (4)
This course is for students completing a Master of Music with a Performance emphasis. A public recital will be given and an accompanying research paper will be submitted. Restricted to: MUS majors.

Learning Outcomes

1. Development of performance skills.
2. Development of research ability.
3. Development of writing skills.

MUSC 574. Advanced Choral Conducting I
3 Credits (3)
This course will continue the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.
Prerequisite(s): A grade of B or better in MUSC 475.

MUSC 575. Advanced Choral Conducting II
3 Credits (3)
This is the final course in preparation for the student's graduate conducting concert. It will continue the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.
Prerequisite(s): A grade of B or better in MUSC 574.

MUSC 576. Advanced Instrumental Conducting I
3 Credits (3)
The role of the conductor is to lead, react to, alter, and reinforce the performance of the ensemble. This course will continue in the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.
Prerequisite(s): A grade of B or better in MUSC 475.

MUSC 577. Advanced Instrumental Conducting II
3 Credits (3)
The role of the conductor is to lead, react to, alter, and reinforce the performance of the ensemble. This course will continue in the training for competent musicianship with a focus on conducting gestures and movements, score study, and rehearsal techniques. Lessons will focus primarily on the development of a non-verbal vocabulary that will allow each student to clearly and artistically communicate with the members of an ensemble to solicit a predetermined musical result. Restricted to: MUS majors.
Prerequisite(s): A grade of B or better in MUSC 576.

MUSC 578. Advanced Choral Literature
2-3 Credits (2-3)
An examination of significant choral works from 1200 to the present, including composers, genres, and historical context May be repeated up to 3 credits. Restricted to: MUS majors.
Prerequisite(s): A grade of B or better in MUSC 475.

MUSC 579. Advanced Instrumental Literature
2-3 Credits (2-3)
An examination of significant instrumental works from the Baroque period to the present, including composers, genres, and historical context May be repeated up to 3 credits. Restricted to: MUS majors.
Prerequisite(s): A grade of B or better in MUSC 475.

MUSC 580. Ensemble Performance
1 Credit (1)
Performance in university ensembles. May be repeated up to 99 credits.
Prerequisite: By audition only.
Learning Outcomes

1. Improve performance skills.
2. Develop and improve performance skills in a group setting.
3. Develop understanding and interpretation within the context of music history.
4. Refine and improve technical ability.
5. Demonstrate proper technique and usage.

MUSC 581. The Collaborative Pianist
1 Credit (1)
This course integrates one-on-one meeting and group performance. The goal is to guide the students' topic interests, expand their knowledge of musical repertoire, styles, composers, and/or interpretation. May be repeated up to 15 credits.
Learning Outcomes

1. Prepare and perform a mixture of vocal one instrumental collaborative work.
2. Learn the skills necessary to collaborate successfully with other musicians, including listening, having an open and constructive communication, and developing stronger keyboard skills as applicable to ensemble settings.
3. Prepare a professional comprehensive Repertoire List with all categories (solo piano, collaborative music, chamber music, large ensemble).
4. Learning diversity of teaching styles.
5. Learn about the specific challenges of playing each instrument and instrumental family.
6. Adapt factors such as dynamics and pacing when collaborating with different instruments and voices.
7. Discover and apply the balance between musical leading and following.
8. Learn to express musical opinions and respect those of others.

MUSC 582. Applied Music
2-4 Credits (2-4)
For music majors, individual instruction, including improvisation skills and techniques. Students may enroll for 2 or 4 credits. Students must audition in order to enroll. Consent of instructor required. May be repeated up to 24 credits.
Learning Outcomes

1. Develop of Musical Performance Attributes.
2. Development of technical Skills.
3. Development of Aural Skills.
4. Development of Musical Analytical Skills.
5. Development of Improvisatory Skills.

MUSC 586. Applied Music Pedagogy and Literature III
2 Credits (2)
Methods, materials, problems, literature, and techniques in teaching individual lessons. Restricted to: Music majors.
Prerequisite: A grade of B or better in MUSC 486.
Learning Outcomes

1. Development of appropriate pedagogical skills.

MUSC 598. Special Research Programs
1-4 Credits

May be taken for unlimited credit. May be repeated up to 99 credits.

Learning Outcomes

1. Varies.

MUSC 599. Master's Thesis

15 Credits

Thesis. May be repeated up to 88 credits.

Learning Outcomes

1. Varies.

NATV-NATIVE AMERICAN STUDIES

NATV 1150G. Introduction to Native American Studies

3 Credits

This course surveys the significance of Native American Studies through an inter-disciplinary approach to two areas of academic concentration: Indigenous Learning Communities, and Leadership and Building Native Nations.

Learning Outcomes

1. Students will develop a general understanding of the various concentration areas in Native American Studies throughout the United States.
2. Students will identify the contributions of various academic disciplines to Native American Studies.
3. Students will understand the intricacies and intersections of Indigenous scholarship in Native American Studies.
4. Students will articulate the importance of Native American Studies as a stand-alone discipline in academia.
5. Students will be able to connect community issues in both Native and Non-Native America to concepts taught in Native American Studies.

NATV 2120. Native American Experience

3 Credits (3)

Introductory survey of Native American History, culture an contemporary issues. Students read literature by and about Native Americans covering a variety of topics including tribal sovereignty, federal policy, activism, economic development, education and community life.

Learning Outcomes

1. Apply cultural and historical context to text about Native Americans (by Natives and non-Natives).
2. Analyze texts about Native Americans in relation to tribal sovereignty, federal policy, activism, economic development, education and community life.
3. Evaluate texts by and about Native Americans from an NAS perspective.

NATV 3120. An Indigenous Peoples History of the United States

3 Credits (3)

This course is a history of United States as experienced by the Indigenous people. It delineates the Indigenous experience as reflected in Native American scholarship and research. The Indigenized and decolonized Native perspective provides an educative authenticity of Indigenous knowledge comprehensible to all, particularly the non-Indian.

Learning Outcomes

1. The student can identify and describe significant historic periods as experienced by the Indigenous inhabitants in United States.
2. The student is able to identify and differentiate aspects of the Native American historic experience in relationship to the standard linear chronicle timeline as reflected in U.S. history.
3. The student it able to compose a brief summary review of the Native American historic periods as evidenced in scholarship and research.

NATV 4110. Native American Women

3 Credits (3)

Students investigate the status, experience, and contributions of Native American women from pre-contact to contemporary times. Identifying the contribution of Native American women to societies, communities, and Nations as keepers of knowledge, teachings, and traditions. Crosslisted with: ANTH 553.

Learning Outcomes

1. Explore and examine the roles of American Indian women within a tribal society and analyze the impact of colonization and decolonization upon their place / roles over time.
2. Evaluate historical and contemporary issues of importance to American Indian women and their communities.
3. Assess a topic, book or issue of importance to Native women through a research paper, case study, or exam demonstrating in-depth knowledge and understanding.
4. Demonstrate in-depth knowledge and understanding of Native American women histories and contemporary issues.
5. Formulate a paper on Native woman/tribal women from historical or contemporary sources and share with class (undergraduates).
6. Demonstrate in-depth knowledge and understanding of Native American women through an exam/final (undergraduates).

NATV 4120V. Native American Visual Culture

3 Credits (3)

This course examines the various theoretical and methodological challenges inherent to the study of indigenous art, including the issues of identity, sovereignty, gender, cultural critique, and the role of the artist.

Learning Outcomes

1. Identify NA / Indigenous, film/video writers and directors.
2. Locate NA / Indigenous nations with their geo-physical location.
3. Consider issues of identity concerning Indigenous population.
4. Apply “colonizing” / “decolonizing” methodologies.
5. To practice writing short analytical journal entries.
6. To learn effective group discussion techniques

NATV 4130. Indigenous Ways of Knowing

3 Credits (3)

This course examines Indigenous knowledge and ways of knowing to gain an appreciation of an epistemology and ontology that may be outside the boundaries of Eurocentric theory, concepts, and principles. The course explores and analyzes the nature and ways that Native Americans’ develop knowledge as well as the concepts and composition of metaphysics and cosmology. Students analyze knowledge development through mythology and storytelling by emphasizing the nature of difference rather than comparative analysis.

Learning Outcomes

1. By the end of the semester, through dialogue and interaction, reading, writing, exercises, out of classroom experiences, auto/visual aids and computer technologies, the student is able to describe and explain characters and ways that Native Americans’ develop knowledge (epistemology); as measured by reports, critiques, reflective summaries, learning logs, analysis techniques and assessments.
2. By the end of the semester, through dialogue and interaction, reading, writing, exercises, out of classroom experiences, auto/visual aids and computer technologies, the student is able to describe and explain concepts and composition of the metaphysics and cosmology

(ontology) of Native American knowledge; as measured by reports, critiques, reflective summaries, learning logs, analysis techniques, and assessments.

NATV 4210. Native American Education
3 Credits (3)
This is a survey course that explores the education of Natives from multiple perspectives; the perspectives of Native theories and practices, the colonizers'-imposed education theories and practices, U.S. federal educational policies and practices, tribal systems of education, and responses from those experiencing the education. Starting with traditional education, the course will examine colonial education, federal and tribal efforts, contemporary models of Indian education including issues and challenges, and the educational sovereignty of tribes.
Learning Outcomes
1. Describe (verbally and written) traditional methods of education used by Native Americans.
2. Discuss and interpret (verbally and written) the theories and practices of educating Natives in different eras.
3. Compare (verbally and written) the different systems of education for Native Americans.
4. Articulate (verbally and written) contemporary Native American educational issues and challenges.
5. Be able to articulate (verbally and written) support for educational sovereignty of tribes.
6. Research, analyze and orally present a written a paper about an American Indian boarding school and its legacy.

NATV 4210V. Native American Education
3 Credits (3)
Native American education will be examined by investigating historical and contemporary perspectives of Native Peoples' and settlers' ideas of education and the latter's development of educational systems. Students will survey various types of schools (missionary, boarding, public, etc.), read Native student accounts of westernized schooling, and examine key historical and contemporary policies, laws, and reports, as well as curricular and pedagogical literature. Native perspectives will become central to understanding present and future trends in education to transform educational futures while centering and supporting sovereignty, self-determination, and cultural continuance.
Learning Outcomes
1. Describe (verbally and/or written) traditional methods of education used by Native Americans.
2. Discuss and interpret (verbally and/or written) the theories and practices of educating Natives in different eras.
3. Compare (verbally and/or written) the different systems of education for Native Americans.
4. Articulate (verbally and/or written) contemporary Native American educational issues and challenges.
5. Be able to articulate (verbally and/or written) support for educational sovereignty of tribes.

NATV 4220. Federal Indian Policy
3 Credits (3)
This course provides a basic historic overview of federal Indian policy. As preexisting sovereign nations, the U. S. Constitution acknowledges only states, foreign nations, and Indian tribes as sovereign governments. The purpose is to provide a fundamental understanding of the unique position Indian tribes occupy in this country. It examines impacts and effects on culture and contemporary livelihood.
Learning Outcomes
1. The student can recall and identity fundamental laws, policies, and court actions affecting Indian tribes.
2. The student can describe and explain the effects of federal Indian policy on activities and interactions between Native American and the overall society.
3. The student can analyze and interpret the impacts and effects of federal Indian policy on culture and contemporary lives of Native Americans

NATV 4310. Indigenizing Methodologies in Native American Studies
3 Credits (3)
This course utilizes decolonizing (indigenizing) methodologies and praxis to gain insight into the complex effects of oppression and colonization. The course uses critical and indigenous concepts to identify and analyze hegemonic, ethnocentric, historic and contemporary human rights and social justice issues of indigenous people. Emphasis includes research theory and methodology, such as community participatory action research, that is collaborative, inclusive, and pragmatic to ethics, intellectual property, and cultural boundaries of indigenous people. Crosslisted with: ANTH 541.
Learning Outcomes
1. The student is able to describe and explain some of the complex effects of oppression and colonization on indigenous peoples.
2. The student is able to identify historic and contemporary issues that have influenced and affected the study and research of indigenous peoples.
3. The student is able to convey particular research theory and methodology that is collaborative, inclusive, and pragmatic to ethics and cultural boundaries of indigenous people.

NATV 5110. Advanced Indigenizing Methodologies in Native American Studies
3 Credits (3)
This course utilizes indigenizing methodologies and praxis to gain insight into the complex effects of oppression and colonization. Critical and indigenous concepts are used to identify and analyze hegemonic, ethnocentric, historic and contemporary human rights and social justice issues of indigenous people. Research theory and methodology such as community participatory action research that is collaborative, inclusive, and pragmatic to ethics, intellectual property, and cultural boundaries of indigenous people is emphasized.
Learning Outcomes
1. Explain how producing research is connected to producing knowledge.
2. Identify and describe the impact of colonialism and imperialism on disrupting ways of knowing.
3. Recognize political and cultural implications of the world seen as a colonial, constructed narrative.
4. Describe how a social reality can have set political and ideological conditions.
5. Distinguish how indigenous methodologies relate to decolonizing methods.
6. Describe how decolonizing methods are a different approach to research.
7. Identify decolonizing methods that have been used in research.
8. Critically engage with research lenses stemming from a decolonizing standpoint.

NATV 5120. Advanced Indigenous Peoples History of the United States
3 Credits (3)
This course is a history of United States as experienced by the Indigenous people. It delineates the Indigenous experience as reflected in Native American scholarship and research. The Indigenized and decolonized Native perspective provides an educative authenticity of Indigenous knowledge comprehensible to all, particularly the non-Indian.
Learning Outcomes
1. The student can identify and describe significant historic periods as experienced by the Indigenous inhabitants in United States
2. The student is able to identify and differentiate aspects of the Native American historic experience in relationship to the standard linear chronicle timeline as reflected in U.S. history.
3. The student it able to compose a brief summary review of the Native American historic periods as evidenced in scholarship and research.

NATV 5210. Advanced Native American Education
3 Credits (3)
This is a survey course that explores the education of Natives from multiple perspectives; the perspectives of Native theories and practices, the colonizers'-imposed education theories and practices, U.S. federal educational policies and practices, tribal systems of education, and responses from those experiencing the education. Starting with traditional education, the course will examine colonial education, federal and tribal efforts, contemporary models of Indian education including issues and challenges, and the educational sovereignty of tribes.
Learning Outcomes
1. Describe (verbally and written) traditional methods of education used by Native Americans.
2. Discuss and interpret (verbally and written) the theories and practices of educating Natives in different eras.
3. Compare (verbally and written) the different systems of education for Native Americans.
4. Articulate (verbally and written) contemporary Native American educational issues and challenges.
5. Be able to articulate (verbally and written) support for educational sovereignty of tribes.
6. Research, analyze and orally present a written a paper about an American Indian boarding school and its legacy.

NATV 5220. Advanced Native American Visual Cultures
3 Credits (3)
This course examines the various theoretical and methodological challenges inherent to the study of indigenous art, including the issues of identity, sovereignty, gender, cultural critique, and the role of the artist.
Learning Outcomes
1. Identify NA/Indigenous, film/video writers and directors.
2. Locate NA/Indigenous nations with their geo-physical locations.
3. Consider issues of identity concerning Indigenous populations.
4. Apply "colonizing"/ "decolonizing" methodologies.
5. To Practice writing short analytical journal entries.
6. To learn effective group discussion techniques.

NATV 5520. Advanced Native American Women
3 Credits (3)
Students investigate the status, experience, and contributions of Native American women from pre-contact to contemporary times. Identifying the contribution of Native American women to societies, communities, and Nations as keepers of knowledge, teachings, and traditions.
Learning Outcomes
1. Explore and examine the roles of American Indian women within a tribal society and analyze the impact of colonization and decolonization upon their place / roles over time.
2. Evaluate historical and contemporary issues of importance to American Indian women and their communities.
3. Assess a topic, book or issue of importance to Native women through a research paper, case study, or exam demonstrating in-depth knowledge and understanding.
4. Demonstrate in-depth knowledge and understanding of Native American women histories and contemporary issues.
5. Formulate a paper on Native woman/tribal women from historical or contemporary sources and share with class (undergraduates).
6. Demonstrate in-depth knowledge and understanding of Native American women through an exam/final (undergraduates).

NAV-NAVAJO

NAV 101. Introduction to Navajo Studies
3 Credits (3)
Covers geography, demography, institutions of modern Navajo society with historical overview. Restricted to: Community Colleges only.

NAV 111. Elementary Navajo I
4 Credits (4)
Navajo for beginners with emphasis on speaking skills.
Prerequisite: not open to Navajo-speaking students except by consent of instructor.

NGEC-NATURAL GAS ENGINE COMP

NGEC 133. Natural Gas Engine Repair Technology
5 Credits (5)
This course will cover the engine fundamentals, cylinder head and valve trains, engine block, engine servicing, lubrication and cooling Systems. Restricted to: Natural Gas Engine Compression majors. Restricted to Carlsbad campus only.
Learning Outcomes
1. A basic knowledge about engine operation.
2. Practice shop safety, ability to identify potential hazards, tool identification, proper rigging and crane operation.
3. Ability to identify specific components of a natural gas engine and their function.
4. Locate and identify various components on and off an engine.
5. Safely start large stationary industrial natural gas engines.
6. List the steps of preventive maintenance on natural gas engines.
7. Completely disassemble a natural gas engine, clean and organize parts, and measure critical clearances using appropriate precision measuring tools.
8. Replace or repair any defects that are found on assigned engine, compile a list of parts needed to make repairs, assemble engine correctly, and start and run the engine.

NGEC 175. Natural Gas Compression Technology I
4 Credits (4)
This course delivers an introduction to the theory, application, rotary, and centrifugal natural gas compressor including operating principles, maintenance, and repair of the reciprocating, identification of the component parts and their functions, methods of balancing, and lubrication systems, and design characteristics. This course will

also include calculations of gas flow, compressor sizing, rod loads, compressor analysis charts and horsepower ratings. In addition, this course will cover safety, precision measurement, use of the manuals, use of tools, and proper adjustments will be included with overhaul exercises. Restricted to: Natural Gas Engine Compression majors. Restricted to Carlsbad campus only.

Learning Outcomes

1. Identify and analyze the re-usability of basic compressor parts.
2. Accurately diagnose failure of key core components of basic compressors.
3. Identify basic preventive maintenance tasks on natural gas compressors.
4. Identify the key concept of troubleshooting of natural gas compressors by applying failure analysis techniques to arrive at the root cause of the failure.
5. Demonstrate safety procedures in the workshop and follow appropriate steps to work with the compressor.

NGEC 246. Fuel and Emissions Technology
5 Credits (5)

This course delivers operational and application studies of fuel components and emissions control system. Restricted to: Natural Gas Engine Compression majors. Restricted to Carlsbad campus only.

Learning Outcomes

1. Identify specific components of a natural gas engine and their function.
2. List the steps of preventive maintenance on natural gas engines.
3. Know the fuel components and operation
4. Locate and identify various components on and off an engine.
5. Safely start stationary industrial natural gas engines.

NGEC 295. Special Topics
2 Credits (2)

Topics are to be announced in the Schedule of Classes. The topic and project are to be discussed and implemented between faculty member and student. Student gives presentation to class at the end of the term of study. All-Natural Gas Compression Technology classes in the NGEC Program must be completed or in progress before enrolling in this course. Restricted to: Natural Gas Engine Compression majors. Restricted to Carlsbad campus only.

Learning Outcomes

1. The student should provide an overall meaning during the individual time in the NGEC Program for this final project.

NMNC-NEW MEXICO NURSING EDUCATION CONSORTIUM

NMNC 3110. Introduction to Nursing Concepts
3 Credits (3)

This course introduces the nursing student to the concepts of nursing practice and conceptual learning. Same as NMNC course number: NMNC 1110. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.

Corequisite: NMNC 3120, NMNC 3135.

Learning Outcomes

1. Integrate knowledge from nursing pre- and co-requisites into a conceptual learning model.
2. Apply conceptual learning to select nursing concepts.
3. Define personal values, beliefs, and attitudes about health and wellness.
4. Describe importance of identifying patient safety issues.
5. Describe roles and values of nursing and members of the health care team.
6. Describe standards and regulations that apply to nursing practice.

NMNC 3120. Evidence-Based Practice
3 Credits (3)

The focus of this course is the principles of evidence-based nursing practice. It includes the identification of clinical practice problems, the evaluation of available evidence, and the integration of evidence with clinical expertise and patient preferences in application to practice. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.

Corequisite: NMNC 3110, NMNC 3135.

Learning Outcomes

1. Examine integrating evidence-based practice with diverse patients' values.
2. Identify clinical practice problems and issues.
3. Explain the research process.
4. Describe how evidence is generated through the research process.
5. Appraise evidence and standards of care that support best clinical outcomes and patient safety.
6. Utilize informatics to access evidence-based practice guidelines.

NMNC 3135. Principles of Nursing Practice
4 Credits (4)

This course introduces the nursing student to the application of concepts through clinical skills in seminar, laboratory, and/or clinical settings. Principles of communication, assessments, safety, and interventions including accurate calculation, measurement, and administration of medications will be included. Same as NMNC course number: NMNC 1135. Restricted to: BSN, BSNP, and BSNR Majors. May be repeated up to 4 credits.

Corequisite: NMNC 3110, NMNC 3120.

Learning Outcomes

1. Describe the different types and characteristics of communication in professional nursing practice.
2. Utilize the concepts presented in Level One nursing courses in the application to the care of the patient.
3. Demonstrate the principles of safety during the implementation of nursing skills.
4. Demonstrate the learned skills in patient based scenarios.
5. Utilize the nursing process to provide safe and effective care.

NMNC 3210. Health and Illness Concepts I
3 Credits (3)

This course will focus on health and illness concepts across the lifespan. Concepts covered are related to homeostasis/regulation, sexuality/reproductive, protection/movement, and emotional processes. Same as NMNC course number: NMNC 1210. May be repeated up to 3 credits.

Prerequisite: NMNC 3110, NMNC 3120, NMNC 3135.

Corequisite: NMNC 3220, NMNC 3230, NMNC 3235.

Learning Outcomes

1. Describe the scope, risk factors, physiologic processes, attributes, and clinical management of selected concepts and exemplars across the lifespan.
2. Discuss evidence-based practices and health care standards of care related to the concepts/exemplars of the course.

3. Explain the collaboration necessary related to the concepts/ exemplars of the course.
4. Utilize informatics and resources related to the concepts/exemplars of the course.
5. Integrate considerations of normal physiology and healthy adaptations into nursing practice of patients across the lifespan.

NMNC 3220. Health Care Participant
3 Credits (3)
This course introduces the nursing student to the attributes of the health care participant as an individual, a family, or a community. Same as NMNC course number: NMNC 1220. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.
Prerequisite: NMNC 3110, NMNC 3120, NMNC 3135.
Corequisite: NMNC 3210, NMNC 3230, NMNC 3235.
Learning Outcomes
1. Identify values, beliefs and attitudes toward health and illness of the health care recipient.
2. Articulate the role of nursing in relation to the health of vulnerable populations and elimination of health disparities.
3. Describe the protective and predictive factors which influence the health of families, groups, communities, and populations.
4. Describe the use of evidence-based practices to guide health teaching, health counseling, screening, outreach, disease and outbreak investigation, referral, and follow-up throughout the lifespan.
5. Describe the use of information and communication technologies in preventive care.
6. Examine the health care and emergence preparedness needs of the local community and in the state of New Mexico.
7. Identify clinical prevention and population-focused interventions with attention to effectiveness, efficiency, cost-effectiveness, and equity.

NMNC 3230. Nursing Pharmacology
3 Credits (3)
This course introduces the nursing student to pharmacologic nursing practice from a conceptual approach. Same as NMNC course number: NMNC 1230. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.
Prerequisite: NMNC 3110, NMNC 3120, NMNC 3135.
Corequisite: NMNC 3210, NMNC 3220, NMNC 3235.
Learning Outcomes
1. Identify the nurse's professional role related to pharmacotherapeutics in diverse populations across the lifespan.
2. Identify safety issues and minimize risk potential associated with pharmacotherapeutics and complementary and alternative medicine.
3. Utilize evidence-based information integrating pharmacologic and pathophysiologic concepts to guide medication therapeutics.
4. Describe health care system protocols related to pharmacotherapeutics.
5. Identify methods of communication with the health care team related to pharmacotherapeutics.
6. Utilize informatics systems related pharmacotherapeutics.
7. Describe common classes of drugs that are used in health care, including pharamacokinetics, pharmacodynamics, and pharmacotherapeutics.

NMNC 3235. Assessment and Health Promotion
4 Credits (4)
This course introduces the nursing student to the assessment of and the health promotion for the health care participant as an individual, a family, or a community. This course uses seminar, laboratory and/or clinical settings. Same as NMNC course number: NMNC 1235. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.
Prerequisite: NMNC 3110, NMNC 3120, NMNC 3135.
Corequisite: NMNC 3210, NMNC 3220, NMNC 3230.
Learning Outcomes
1. Assess physical health including a focus on the health/illness beliefs, values, attitudes, developmental level, functional ability, culture, and spirituality of the participant.
2. Assess family health including a focus on family health history, environmental exposures, and family genetic history to identify current and future health problems.
3. Collaborate with a community to assess their health needs
4. Utilize community assessment data and evidence-based practice as basis for identifying community health needs.
5. Document health assessments in electronic health record or written formats.
6. Share community assessment data with other health care professionals to identify needed interventions.
7. Explain the role of the nurse in relation to advocacy for the health care recipient.
8. Analyze education materials for health literacy concerns.

NMNC 4310. Health & Illness Concepts II
3 Credits (3)
This course covers health and illness concepts across the lifespan with the focus on chronic conditions. Concepts covered are related to oxygenation and hemostasis, homeostasis and regulation, protection and movement, and cognition and behavior processes. Same as NMNC course number: NMNC 2310. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.
Prerequisite: NURS 328, NMNC 3210, NMNC 3220, NMNC 3230, NMNC 3235.
Corequisite: NMNC 4320, NMNC 4335.
Learning Outcomes
1. Relate the scope, risk factors, physiologic processes, attributes, and clinical management of selected concepts and exemplars across the lifespan.
2. Investigate evidenced-based practice, standards of nursing care, and factors to improve safety related to selected concepts and exemplars.
3. Examine how members of the health care team collaborate in the delivery of care related to selected concepts and exemplars.
4. Discuss available technology for the delivery of nursing care related to selected concepts and exemplars.
5. Apply selected health and illness concepts to the nursing care of patents across the lifespan.

NMNC 4320. Professional Nursing Concepts I
3 Credits (3)
This course covers foundational concepts for professional development, including selected professional attributes and care competencies. Same as NMNC course number: NMNC 2320. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.
Prerequisite: NURS 328, NMNC 3210, NMNC 3220, NMNC 3230, NMNC 3235.
Corequisite: NMNC 4310, NMNC 4335.
Learning Outcomes
1. Examine the ethical values, virtues, principles, and policies that guide the moral delivery of health care.

2. Relate the nurse's interpretation of patient needs, concerns, and health problems with nursing decisions.
3. Discuss the factors which motivate individuals, groups, and organization to deliver quality nursing care.
4. Determine how interactions of health care team members provide quality patient care.

NMNC 4335. Care of Patients with Chronic Cndtns
4 Credits (8P)
The focus of this course is to provide safe, evidence-based nursing care for patients with chronic conditions, across the lifespan in a variety of settings. This course builds upon curricular concepts. This course is a combination of lab and clinical. Same as NMNC course number: NMNC 2335. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.
Prerequisite: NURS 328, NMNC 3210, NMNC 3220, NMNC 3230, NMNC 3235.
Corequisite: NMNC 4310, NMNC 4320.
Learning Outcomes
1. Demonstrate ethical practice in the delivery of nursing care to patients with chronic conditions.
2. Apply understanding of the principles of safe nursing care for patients with chronic conditions.
3. Demonstrate knowledge of appropriate evidence-based protocols when providing nursing care to patients with chronic conditions.
4. Apply understanding of appropriate health care policy, finance, and regulatory environments in the care of patients with chronic conditions.
5. Communicate effectively with patients with chronic conditions and health care team members.
6. Demonstrate an understanding of the technology used in the care of patients with chronic conditions.
7. Utilize the nursing process to deliver nursing care to patients with chronic conditions.

NMNC 4410. Health & Illness Concepts III
4 Credits (4)
This course will cover health and illness concepts, with the focus on acute conditions across the lifespan. Concepts covered are related to homeostasis/ regulation, oxygenation/ hemostasis, protection/ movement, and emotional processes. Same as NMNC course number: NMNC 2410. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.
Prerequisite: NMNC 4310, NMNC 4320, NMNC 4335.
Corequisite: NMNC 4435, NMNC 4445.
Learning Outcomes
1. Anticipate health care participant's risk for potentially harmful situations related to the concepts/exemplars of the course.
2. Integrate evidence-based practices and health care standards of care related to the concepts/exemplars of the course.
3. Differentiate the multiple roles of the health care team related to the concepts/exemplars of the course.
4. Integrate use of appropriate technology related to the concepts/ exemplars of the course.
5. Interrelate risk factors, concepts, physiologic processes, patient attributes, and clinical management of the exemplars covered in this course.

NMNC 4435. Clinical Intensive I
4 Credits (4)
This is the first of two Level Four clinical courses in which the student will apply the curricular concepts in the management of care participants with acute conditions across the lifespan. Same as NMNC course number: NMNC 2435. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.
Prerequisite: NMNC 4310, NMNC 4320, NMNC 4335.
Corequisite: NMNC 4410, NMNC 4445.
Learning Outcomes
1. Integrate nursing practice concepts into their professional nursing practice.
2. Integrate diverse patient values into plan of care for patients with acute illness.
3. Interpret and analyze factors and system contributions that impact the quality and safety of nursing practice.
4. Integrate an evidence-based approach in the delivery and evaluation of nursing care to acutely ill patients across the lifespan.
5. Evaluate the use of policies and procedures within the acute care settings.
6. Effectively collaborate with the health care team in the delivery of patient care.
7. Integrate use of appropriate technology for the delivery of nursing care to acutely ill patients.

NMNC 4445. Clinical Intensive II
4 Credits (4)
This is the second of two Level Four clinical courses in which the student will apply the curricular concepts in the management of care participants with acute conditions across the lifespan. Same as NMNEC course number: NMNC 404. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.
Prerequisite: NMNC 4310, NMNC 4320, NMNC 4335.
Corequisite: NMNC 4410, NMNC 4435.
Learning Outcomes
1. Integrate nursing practice concepts into their professional nursing practice.
2. Integrate diverse patient values into pan of care for patients with acute illness.
3. Interpret and analyze factors and system contributions that impact the quality and safety of nursing practice.
4. Integrate an evidence-based approach in the delivery and evaluation of nursing care to acutely ill patients across the lifespan.
5. Evaluate the use of policies and procedures within the acute care setting.
6. Effectively collaborate with the health care team in the delivery of patient care.
7. Integrate use of appropriate technology for the delivery of nursing care to acutely ill patients.

NMNC 4510. Concept Synthesis
3 Credits (3)
This course focuses on the synthesis of curricular concepts in the care of complex patients. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.
Prerequisite: NMNC 4410, NMNC 4435, NMNC 4445.
Corequisite: NMNC 4520, NMNC 4535, NMNC 4545.
Learning Outcomes
1. Synthesize curricular concepts into patient-centered nursing practice that is appropriate for diverse individuals, families, and communities.
2. Synthesize the evidence base into nursing care of patients across the lifespan.

3. Evaluate leadership principles that integrate the application of health care policies and standards.
4. Evaluate effectiveness of interprofessional collaboration in the delivery of health care for quality patient outcomes.
5. Evaluate technologies for the management of information and in the delivery of patient care.

NMNC 4520. Professional Nursing Concepts II
3 Credits (3)
This course covers policy concepts for professional nursing. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 3 credits.
Prerequisite: NMNC 4410, NMNC 4435, NMNC 4445.
Corequisite: NMNC 4510, NMNC 4535, NMNC 4545.
Learning Outcomes
1. Integrate principles of quality improvement and safety into nursing practice within health care organizations and systems.
2. Demonstrate leadership behaviors through the application of policies that apply to health care delivery.
3. Synthesize care delivery concepts to improve quality patient outcomes and professional nursing practice.
4. Analyze impact of health care delivery systems on patient care outcomes.
5. Compare and contrast health care policies and evidence-based practice.

NMNC 4535. Clinical Intensive III
4 Credits (4)
The focus of this clinical course is application of the curricular concepts in the management of care participants with complex conditions across the lifespan. Same as NMNEC course no.: NMNEC503. Restricted to: BSN,BSNP,BSNR,NURS majors. May be repeated up to 4 credits.
Prerequisite: NMNC 4410, NMNC 4435, NMNC 4445.
Corequisite: NMNC 4510, NMNC 4520, NMNC 4545.
Learning Outcomes
1. Engage in professional nursing practice that is patient--centered and appropriate for diverse individuals, families, and communities.
2. Integrate principles of quality improvement and safety into nursing practice within health care organizations and systems.
3. Deliver nursing care that is evidence-based across the lifespan.
4. Demonstrates leadership behaviors through the application of policies that apply to health care delivery.
5. Engage in effective interprofessional collaboration in the delivery of health care for quality patient outcomes.
6. Utilize technologies for the management of information and in the delivery of patient care.

NMNC 4545. BSN Capstone
4 Credits (4)
The synthesis, integration, and application of concepts to professional nursing practice will be applied in the final clinical course to ensure readiness to enter practice. Restricted to: BSN, BSNP, and BSNR majors. May be repeated up to 4 credits.
Prerequisite: Successful completion of all previous nursing courses.
Corequisite: NMNC 4510, NMNC 4520, NMNC 4535.
Learning Outcomes
1. Synthesize and integrate nursing practice concepts into their professional nursing practice.
2. Engage in professional nursing practice that is patient-centered and appropriate for diverse individual, families, and communities.
3. Integrate principles of quality improvement and safety into nursing practice within health care organizations and systems.
4. Deliver nursing care that is evidence-based.
5. Demonstrate leadership behaviors through the application of policies that apply to health care delivery.
6. Engage in effective interprofessional collaboration in the delivery of health care for quality patient outcomes.
7. Utilize technologies for the management of information and in the delivery of patient care.

NURS-NURSING

NURS 1110. Pre-Nursing Freshman Seminar
1 Credit (1)
This Freshman seminar provides an introduction to the university and its resources, an orientation to the pre-nursing curriculum, and overview of concepts for professional nursing practice. Emphasis is placed on exploring the nurse's role as an integral member of the healthcare team across multiple contexts and settings, and developing a professional identity. Consent of Instructor required.
Learning Outcomes
1. Develop strategies for transitioning to university life and a pathway to the nursing program, through evaluating knowledge, skill, and experience strengths and deficits.
2. Understand the role nurses and other interprofessional partners play in addressing issues regarding the patient experience across multiple healthcare settings.
3. Identify and examine cultural, professional and personal beliefs and values of nurses as they relate to patient care and working in multidisciplinary teams.
4. Begin to explore nursing careers in a variety of healthcare settings, across the nation.

NURS 1120. Fundamentals of Nursing Lecture and Laboratory
6 Credits (4+6P)
This course will introduce the nursing student to foundational theoretical concepts of professional nursing practice, the nursing process, and fundamental nursing skills. It includes developmental concepts related to clients across the lifespan. Clinical experiences in various healthcare settings will provide the student with the opportunity to apply learned skills to provide total care to meet client needs and to develop care planning skills related to actual problems. May be repeated up to 6 credits.
Corequisite: NURS 1154.
Learning Outcomes
1. Describe personally held values, attitudes, and beliefs related to health and wellness.
2. Describe scopes of practice, roles and values of health care team members.
3. Describe an evidence-based practice approach to provision of patient care and professional nursing practice across the lifespan.
4. Identify policies, procedures, standards of care and nursing leadership and management skills related to the provision of professional nursing care.
5. Describe strategies that reduce the risk of harm to self and others.
6. Identify essential information that must be available in a common database to support patient care across the lifespan.

NURS 1121. Foundations of Nursing Practice
4 Credits (4)

This course will introduce the nursing student to foundational theoretical concepts of professional nursing practice, the nursing process, and fundamental nursing skills. It includes developmental concepts related to clients across the lifespan. Clinical experiences in various healthcare settings will provide the student with the opportunity to apply learned skills to provide total care to meet client needs and to develop care planning skills related to actual problems.
Prerequisite/Corequisite: NURS 1134, NURS 1134L, NURS 1121L.
Learning Outcomes

1. Describe personally held values, attitudes, and beliefs related to health and wellness.
2. Describe scopes of practice, roles and values of health care team members.
3. Describe an evidence-based practice approach to provision of patient care and professional nursing practice across the lifespan.
4. Identify policies, procedures, and standards of care related to the provision of professional nursing care.
5. Describe strategies that reduce the risk of harm to self and others.
6. Identify essential information that must be available in a common database to support patient care across the lifespan.

NURS 1121L. Foundations of Nursing Lab
2 Credits (6P)
This course will introduce the nursing student to foundational theoretical concepts of professional nursing practice, the nursing process, and fundamental nursing skills. It includes developmental concepts related to clients across the lifespan. Clinical experiences in various healthcare settings will provide the student with the opportunity to apply learned skills to provide total care to meet client needs and to develop care planning skills related to actual problems.
Prerequisite/Corequisite: NURS 134, NURS 134L, NURS 136.
Learning Outcomes

1. Describe personally held values, attitudes, and beliefs related to health and wellness.
2. Describe scopes of practice, roles and values of health care team members.
3. Describe an evidence-based practice approach to provision of patient care and professional nursing practice across the lifespan.
4. Identify policies, procedures, standards of care and nursing leadership and management skills related to the provision of professional nursing care.
5. Describe strategies that reduce the risk of harm to self and others.
6. Identify essential information that must be available in a common database to support patient care across the lifespan.

NURS 1125. Medical Surgical Nursing I
4 Credits (4)
This course introduces nursing care and management of the adult client with common medical-surgical conditions.
Prerequisite: NURS 1134, NURS 1134L, NURS 1121, NURS 1121L.
Prerequisite/Corequisite: NURS 1130, NURS 1125L.
Learning Outcomes

1. Recognize personally held values and demonstrate assessment of the values held by diverse patients, as well as their preferences and expressed needs related to health and wellness.
2. Communicate with other members of the healthcare team to establish a plan to meet the needs of individuals, including commonly occurring chronic and acute health care problems throughout the lifespan.
3. Compare an individualized patient care plan utilizing an evidence-based approach for patient(s) across the lifespan to outcomes for the patient(s).
4. Demonstrate adherence to policies, procedures, and standards of care for the provision of care in healthcare delivery systems.
5. Apply strategies to reduce the risk of harm to self or others while providing professional nursing care.
6. Utilize varied communication technologies, electronic healthcare databases, and electronic health records to plan nursing care for patients with chronic illnesses across the lifespan.

NURS 1125L. Medical/Surgical Nursing I Clinical
2 Credits (6P)
Clinical experiences provide the student an opportunity to apply theoretical concepts and implement safe patient care to adults in a variety of settings.
Prerequisite: NURS 1134, NURS 1134L, NURS 1121, NURS 1121L.
Prerequisite/Corequisite: NURS 1130, NURS 1125L.
Learning Outcomes

1. Patient Centered Care: Recognize personally held values and demonstrate assessment of the values held by diverse patients, as well as their preferences and expressed needs related to health and wellness.
2. Teamwork and Collaboration: Communicate with other members of the healthcare team to establish a plan to meet the needs of individuals, including commonly occurring chronic and acute health care problems throughout the lifespan.
3. Evidenced Based Practice: Prepare an individualized patient care plan utilizing an evidence- based approach for patient(s) across the lifespan to outcomes for the patient(s).
4. Quality Improvement: Demonstrate adherence to policies, procedures, and standards of care for the provision of care in healthcare delivery systems.
5. Safety: Apply strategies to reduce the risk of harm to self or others while providing professional nursing care.
6. Informatics: Utilize varied communication technologies, electronic healthcare databases, and electronic health records to plan nursing care for patients with chronic illnesses across the lifespan.

NURS 1131. Foundations of Pharmacology
5 Credits (5)
This course provides the nursing student with an introduction to the foundations of pharmacology including: science of drug action, principles of medication administration, accurate calculation of drug doses, medication therapy across the lifespan, application of medications to treat health alterations, normal and adverse responses by the client to medication therapy, medication safety, medication regulation, national patient safety goals, and appropriate nursing interventions to achieve the desired goals of medication therapy.
Learning Outcomes

1. Recognize personally held values and demonstrate assessment of the values held by diverse patients, as well as their preferences and expressed needs related to pharmacological therapy.
2. Communicate with other members of the healthcare team to establish a plan to meet the needs of individuals, including commonly related to adverse or side effects of pharmacological therapy throughout the lifespan.
3. Compare an individualized patient care plan utilizing an evidence-based approach for patient(s) across the lifespan to outcomes related to the administration of pharmacological therapy.

4. Demonstrate adherence to policies, procedures, and standards of care for the administration of pharmacological therapy in healthcare delivery systems.
5. Apply strategies to reduce the risk of harm to self or others while providing professional nursing care.
6. Utilize varied communication technologies, electronic healthcare databases, and electronic health records to plan nursing care for the administration of pharmacological therapy across the lifespan.

NURS 1134. Foundation of Nursing Skills and Assessment
1 Credit (1)
This course provides nursing students with introductory nursing knowledge related to performance of nursing skills and assessment including: techniques of fundamental nursing care, basic and intermediate nursing skills, and foundational physical assessment techniques associated with care across the lifespan.
Corequisite: NURS 1134L, NURS 1121, NURS 1121L.
Learning Outcomes
1. Describe personally held values, attitudes, and beliefs related to health and wellness as measured by: Describe modifications to nursing care based on client cultural and religious influences; Demonstrate physical assessment skills for clients across the lifespan utilizing appropriate equipment and techniques.
2. Describe scopes of practice, roles and values of health care team members as measured by: Identify independent and collaborative nursing interventions.
3. Describe an evidence-based practice approach to provision of patient care and professional nursing practice across the lifespan as measured by: Demonstrate safe performance of basic nursing procedures; Identify quality sources of information to verify skills and interventions are based on evidence.
4. Identify policies, procedures, and standards of care related to the provision of professional nursing care as measured by: Identify need/situation where reporting of incident/event/irregular occurrence/variance is appropriate.
5. Describe strategies that reduce the risk of harm to self and others as measured by: Identify methods utilized to provide safe and effective care; Identify and document changes in patient status.
6. Identify essential information that must be available in a common database to support patient care across the lifespan as measured by: Select standard technology utilized to provide basic care to clients across the lifespan; Identify approved abbreviations and standard terminology for documenting care.

NURS 1134L. Foundation of Nursing Skills and Assessment Laboratory
2 Credits (6P)
This course provides nursing students with introductory nursing knowledge related to performance of nursing skills and assessment including: techniques of fundamental nursing care, basic and intermediate nursing skills, and foundational physical assessment techniques associated with care across the lifespan.
Corequisite: NURS 1134, NURS 1121, NURS 1121L.
Learning Outcomes
1. Describe personally held values, attitudes, and beliefs related to health and wellness.
2. Describe scopes of practice, roles and values of health care team members.
3. Describe an evidence-based practice approach to provision of patient care and professional nursing practice across the lifespan.
4. Identify policies, procedures, and standards of care related to the provision of professional nursing care.
5. Describe strategies that reduce the risk of harm to self and others.
6. Identify essential information that must be available in a common database to support patient care across the lifespan.

NURS 1150. Medical Terminology
3 Credits (3)
Study and understanding of medical terminology. Emphasis will be placed on learning the basic elements of medical words, appropriate spelling and use of the terms, and abbreviations.
Learning Outcomes
1. Demonstrate proficient interpretation of medical abbreviations.
2. Explain the importance of utilizing medical terms/abbreviations in the medical field.
3. Define medical terms correctly.
4. Interpret medical language including roots, prefixes and suffixes.
5. Pronounce medical terms correctly.
6. Spell medical terms correctly.

NURS 1153. Medication & Dosage Calculation
2 Credits (2)
Techniques of dosage calculation for medication and fluid administration. May be repeated up to 2 credits.
Learning Outcomes
1. Utilize the nursing process, clinical judgment, evidenced based information and knowledge from the arts and sciences to provide safe client centered care.
2. Coordinate and collaborate effectively through verbal, nonverbal, and technological means with individuals, families and the interdisciplinary team.
3. Integrate accountability and responsibility for practice within the legal and ethical standards of the nursing profession.
4. Apply the principles of delegation, management and leadership in providing client centered care.
5. Participate in activities that promote professional development and personal growth.

NURS 1154. Physical Assessment
2 Credits (2)
Beginning techniques of physical assessment by systems will be presented using the nursing process as a guide for providing safe client centered care throughout the life span. Laboratory experiences provide an opportunity to practice assessment skills on patients across the lifespan in a variety of settings.
Prerequisite: BIOL 1130 or BIOL 2210.
Corequisite: NURS 1153, NURS 1120.
Learning Outcomes
1. Discuss the purpose, guidelines, safety factors, and equipment necessary for performing a physical exam.
2. Discuss and demonstrate techniques necessary to facilitate communication to obtain a health history.
3. Identify and demonstrate correct documentation of each body system.
4. Define ethical/legal implications as they relate to documentation and the physical assessment exam.
5. Identify and discuss the nutritional implications as they relate to the physical assessment exam.

6. Recognize key terms, exam techniques, and the anatomy and physiology on the assessment of each body system.
7. Discuss developmental and cultural differences in performing a physical assessment.
8. Identify and discuss components of the nursing process focusing on assessment and beginning to recognize self-care deficits.
9. Identify opportunities to promote self-care assessment within the physical exam. 1
10. Identify methods by which airing behaviors facilitate the nurse-patient relationship in the performance of a physical assessment.

NURS 1157. Maternal/Child Health Deviations Lecture
5 Credits (5)
This course provides the intermediate nursing student with an in-depth review of care of the childbearing woman, family structures and roles, and nursing care of the child from birth through adolescence. Emphasis includes the care of pre-partum, intra-partum and postpartum clients, the neonate and health deviations in pediatric clients. Clinical experiences in the simulation laboratory, the community, and acute care settings will provide the student with the opportunity to apply learned skills to provide total care to meet needs of up to two adult, neonatal, or pediatric clients and to apply care planning skills related to actual, psychosocial and potential problems. Students must be concurrently enrolled in both the lecture and laboratory sections of the course. Students must be admitted into the Nursing Program to enroll in this course.
Prerequisite: NURS 1130, NURS 1134, NURS 1134L, NURS 1121, NURS 1121L, NURS 1125, NURS 1125L, NURS 2214, NURS 2214L.
Prerequisite/Corequisite: NURS 1157L.
Learning Outcomes
1. Utilize diverse patients' values, preferences, and expressed needs to drive development of the plan of care for the child bearing woman (19-65 years) and pediatric client (newborn-18).
2. Evaluate ability to function within own scope of practice as a member of the healthcare team to deliver care to individuals and families across the lifespan with complex health alterations as it relates to the child bearing woman (19-65 years) and pediatrics.
3. Demonstrate the use of evidence-based approaches for the delivery and evaluation of care to patients across the lifespan as it relates to the child bearing woman (19-65 years) and pediatric client (newborn-18).
4. Formulate a plan of care for the provision of care in healthcare delivery systems using policies, procedures and standards of care as it relates to the child bearing woman (19-65 years) and pediatric client (newborn-18).
5. Interpret effective use of strategies to reduce risk of harm to self or others while providing professional nursing care including evidence-based practice, national patient safety goals, and core measures as it relates to the child bearing woman (19-65 years) and pediatric client (newborn-18).
6. Utilize information management tools to monitor outcomes of care processes and deliver nursing care to patients with chronic or acute illness across the lifespan as it relates to the child bearing woman (19-65 years) and pediatric client (newborn-18).

NURS 1157L. Maternal/Child Health Deviations Laboratory
2 Credits (6P)
This course provides the intermediate nursing student with an in-depth review of care of the childbearing woman, family structures and roles, and nursing care of the child from birth through adolescence. Emphasis includes the care of pre-partum, intra-partum and postpartum clients, the neonate and health deviations in pediatric clients. Clinical experiences in the simulation laboratory, the community, and acute care settings will provide the student with the opportunity to apply learned skills to provide total care to meet needs of up to two adult, neonatal, or pediatric clients and to apply care planning skills related to actual, psychosocial and potential problems.
Prerequisite: NURS 1130, NURS 1134, NURS 1134L, NURS 1121, NURS 1121L, NURS 1125, NURS 1125L, NURS 2214, NURS 2214L.
Prerequisite/Corequisite: NURS 1157.
Learning Outcomes
1. Utilize diverse patients' values, preferences, and expressed needs to drive development of the plan of care for the childbearing woman (19-65 years) and pediatric client (newborn-18).
2. Evaluate ability to function within own scope of practice as a member of the healthcare team to deliver care to individuals and families across the lifespan with complex health alterations as it relates to the childbearing woman (19-65 years) and pediatric client (newborn-18).
3. Demonstrate the use of evidence-based approaches for the delivery and evaluation of care to patients across the lifespan as it relates to the childbearing woman (19-65 years) and pediatric client (newborn-18).
4. Formulate a plan of care for the provision of care in healthcare delivery systems using policies, procedures, and standards of care as it relates to the childbearing woman (19-65 years) and pediatric client (newborn-18).
5. Interpret effective use of strategies to reduce risk of harm to self or others while providing professional nursing care including evidence-based practice, national patient safety goals, and core measures as it relates to the childbearing woman (19-65 years) and pediatric client (newborn-18).
6. Utilize information management tools to monitor outcomes of care processes and deliver nursing care to patients with chronic or acute illness across the lifespan as it relates to the childbearing woman (19-65 years) and pediatric client (newborn-18).

NURS 2210. Pharmacological Requisites of the Childbearing Family
1 Credit (1)
Basic concepts of pharmacology including pharmacokinetics, pharmacodynamics, and pharmacotherapeutics, and their relationship to nursing care will be discussed focusing on medications commonly utilized with the childbearing family. Medication classes to be discussed include labor and delivery, analgesic, vitamins, respiratory, gynecological, endocrine, and anti-microbial/anti-infective drugs. May be repeated up to 1 credit.
Prerequisite: NURS 1154 and NURS 1120.
Learning Outcomes
1. Incorporate the values, preferences and expressed needs of maternal/child and pediatric clients in the administration of pharmacotherapeutics to these clients.
2. Apply principles of teaching/learning in education maternal/child and pediatric clients on the use, adverse effects and interactions of pharmacotherapeutic agents.
3. Explain how members of the health care team collaborate in the delivery of pharmacotherapeutics to maternal/child and pediatric clients.
4. Discuss pharmacokinetics and pharmacodynamics of drugs specific to the maternal/child and pediatric client.
5. Apply evidenced based information to the administration of pharmacotherapeutics to maternal/child and pediatric clients.

6. Give examples of policies, procedures and standards of care related to pharmacotherapeutics utilized in the care of maternal/child and pediatric clients.

NURS 2214. Psychiatric Mental Health Nursing Theory
3 Credits (3)
This course will allow the nursing student to develop skills necessary to provide nursing care for clients with mental health problems in various health care settings including: common mental health disorders, psychosocial dysfunction, psychosocial safety/substance abuse issues, violence, suicide, restraints, developmental age related pathophysiology, psychopharmacology, cultural/religious considerations, grief/loss, promotion of mental health, and therapeutic communication.
Prerequisite: NURS 1134, NURS 1134L, NURS 1121, NURS 1121L.
Prerequisite/Corequisite: NURS 1130, NURS 2214L.
Learning Outcomes
1. Recognize personally held values and demonstrate assessment of the values held by diverse patients, as well as their preferences and expressed needs related to health and wellness. wellness.
2. Communicate with other members of the healthcare team to establish a plan to meet the needs of individuals, including commonly occurring chronic and acute health care problems throughout the lifespan.
3. Compare an individualized patient care plan utilizing an evidence-based approach for patient(s) across the lifespan to outcomes for the patient(s).
4. Demonstrate adherence to policies, procedures, and standards of care for the provision of care in healthcare delivery systems.
5. Apply strategies to reduce the risk of harm to self or others while providing professional nursing care.
6. Utilize varied communication technologies, electronic healthcare databases, and electronic health records to plan nursing care for patients with chronic illnesses across the lifespan.

NURS 2214L. Psychiatric Mental Health Nursing Clinical
1 Credit (3P)
This course will allow the nursing student to develop skills necessary to provide nursing care for clients with mental health problems in various health care settings including: common mental health disorders, psychosocial dysfunction, psychosocial safety/substance abuse issues, violence, suicide, restraints, developmental age related pathophysiology, psychopharmacology, cultural/religious considerations, grief/loss, promotion of mental health, and therapeutic communication. Selected clinical learning experiences in the simulation Laboratory, acute care, and community settings will allow the student to develop ability to develop: proficiency in performance of nursing skills, collaborative skills with clients, families, peers and health care team members, care planning skills related to patient actual, psychosocial, and potential problems in the delivery of total nursing care to meet needs of one client across the life span with acute/chronic mental health needs.
Prerequisite: NURS 1134, NURS 1134L, NURS 1121, NURS 1121L.
Prerequisite/Corequisite: NURS 1134, NURS 2214.
Learning Outcomes
1. Recognize personally held values and demonstrate assessment of the values held by diverse patients, as well as their preferences and expressed needs related to health and wellness.
2. Communicate with other members of the healthcare team to establish a plan to meet the needs of individuals, including commonly occurring chronic and acute health care problems throughout the lifespan.
3. Compare an individualized patient care plan utilizing an evidence-based approach for patient(s) across the lifespan to outcomes for the patient(s).
4. Demonstrate adherence to policies, procedures, and standards of care for the provision of care in healthcare delivery systems.
5. Apply strategies to reduce the risk of harm to self or others while providing professional nursing care.
6. Utilize varied communication technologies, electronic healthcare databases, and electronic health records to plan nursing care for patients with chronic illnesses across the lifespan.

NURS 2225. Medical Surgical Nursing II
4 Credits (4)
This course focuses on the care of adult clients with complex medical/surgical health problems. Emphasis is placed on helping clients and their families cope with alterations in body functions. Concepts of pharmacology, health promotion and education, evidence-based practice, and interdisciplinary collaboration will be integrated throughout the course.
Learning Outcomes
1. Utilize diverse patients' values, preferences, and expressed needs to drive development of the plan of care for the adult client with acute illness.
2. Evaluate ability to function within own scope of practice as a member of the healthcare team to adult clients with acute illness.
3. Demonstrate the use of evidence-based approaches for the delivery and evaluation of care to patients across the lifespan as it relates to adult clients with acute illness.
4. Formulate a plan of care for the provision of care in healthcare delivery systems using policies, procedures and standards of care as it relates to adult clients with acute illness.
5. Interpret effective use of strategies to reduce risk of harm to self or others while providing professional nursing care including evidence-based practice, national patient safety goals, and core measures as it relates to adult clients with acute illness.
6. Utilize information management tools to monitor outcomes of care processes and deliver nursing care to adult clients with acute illness.

NURS 2225L. Medical Surgical Nursing Clinical II
2 Credits (6P)
Clinical experiences provide the student an opportunity to apply theoretical concepts and implement safe care to clients and selected groups in a variety of settings.
Prerequisite: NURS 1130, NURS 1134, NURS 1134L, NURS 1121, NURS 1121L, NURS 1125, NURS 1125L, NURS 2214, NURS 2214L.
Corequisite: NURS 2225, NURS 1157, NURS 1157L.
Learning Outcomes
1. Utilize diverse patients' values, preferences, and expressed needs to drive development of the plan of care for the adult client with acute illness.
2. Evaluate ability to function within own scope of practice as a member of the healthcare team to adult clients with acute illness.
3. Demonstrate the use of evidence-based approaches for the delivery and evaluation of care to patients across the lifespan as it relates to adult clients with acute illness.
4. Formulate a plan of care for the provision of care in healthcare delivery systems using policies, procedures and standards of care as it relates to adult clients with acute illness.
5. Interpret effective use of strategies to reduce risk of harm to self or others while providing professional nursing care including evidence-

based practice, national patient safety goals, and core measures as it relates to adult clients with acute illness.

6. Utilize information management tools to monitor outcomes of care processes and deliver nursing care to adult clients with acute illness.

NURS 2235. Medical Surgical Nursing III
3 Credits (3)
This course focuses on advanced concepts of nursing care as they relate to patients across the lifespan with complex, multisystem alterations in health. Emphasis is placed on implementing time management and organizational skills while managing the care of patients with multiple needs and collaborating with the interdisciplinary team. Complex clinical skills, as well as priority setting, clinical judgment, and tenets of legal and ethical practice, are integrated throughout the course.
Prerequisite: NURS 1130, NURS 1134, NURS 1134L, NURS 1121, NURS 1121L, NURS 1125, NURS 1125L, NURS 2214, NURS 2214L, NURS 1157, NURS 1157L, NURS 2225, NURS 2225L.
Prerequisite/Corequisite: NURS 2996, NURS 2235L.
Learning Outcomes

1. Integrate the values, preferences, attitudes, and expressed needs of the acutely ill patient into the plan of care related to the care of the adult client with complex health deviations.
2. Integrate the contributions of other members of the healthcare team into the delivery of nursing care for individuals across the lifespan with complex or multi-system health alterations related to the care of the adult client with complex health deviations.
3. Discriminate between valid and invalid reasons for modifying evidence-based clinical practice based on clinical expertise or patient/family preferences in the creation of a plan of care for delivery and evaluation of care for patients across the lifespan related to the care of the adult client with complex health deviations.
4. Evaluate the use of policies, procedures and standards of care in healthcare delivery systems and adapt the care as appropriate related to the care of the adult client with complex health deviations.
5. Interpret and analyze effective use of strategies to reduce risk of harm to self or others while providing professional nursing care, creating a structure for implementation of evidence- based practice, national patient safety goals, and core measures in the care of the adult client with complex health deviations.
6. Integrate use of appropriate technology and information management tools to support safe delivery of care to the adult client with complex health deviations.

NURS 2235L. Medical Surgical Nursing III Clinical
4 Credits (12P)
Clinical experiences provide the student an opportunity to apply theoretical concepts and implement safe care to clients and selected groups in a variety of settings. Experiences that facilitate entry into practice are included in this practicum.
Prerequisite: NURS 1130, NURS 1134, NURS 1134L, NURS 1121, NURS 1121L, NURS 1125, NURS 1125L, NURS 2214, NURS 2214L, NURS 1157, NURS 1157L, NURS 2225, NURS 2225L.
Prerequisite/Corequisite: NURS 2996, NURS 2235.
Learning Outcomes

1. Integrate the values, preferences, attitudes, and expressed needs of the acutely ill patient into the plan of care related to the care of the adult client with acute, chronic, or complex health deviations.
2. Integrate the contributions of other members of the healthcare team into the delivery of nursing care for individuals across the lifespan with complex or multi-system health alterations related to the care of the adult client with acute, chronic, or complex health deviations.
3. Discriminate between valid and invalid reasons for modifying evidence-based clinical practice based on clinical expertise or patient/family preferences in the creation of a plan of care for delivery and evaluation of care for patients across the lifespan related to the care of the adult client with acute, chronic, or complex health deviations.
4. Evaluate the use of policies, procedures, and standards of care in healthcare delivery systems and adapt the care as appropriate related to the care of the adult client with acute, chronic, or complex health deviations.
5. Interpret and analyze effective use of strategies to reduce risk of harm to self or others while providing professional nursing care, creating a structure for implementation of evidence- based practice, national patient safety goals, and core measures in the care of the adult client with acute, chronic, or complex health deviations.
6. Integrate use of appropriate technology and information management tools to support safe delivery of care to the adult client with acute, chronic, or complex health deviations.

NURS 2996. Nursing Topics
3 Credits (3)
Varies.
Prerequisite: NURS 1130, NURS 1134, NURS 1134L, NURS 1121, NURS 1121L, NURS 1125, NURS 1125L, NURS 2214, NURS 2214L, NURS 1157, NURS 1157L, NURS 2225, NURS 2225L.
Corequisite: NURS 2235, NURS 2235L.
Learning Outcomes

1. Varies.

NURS 3110. Human Pathophysiology Foundation for Nursing
4 Credits (4)
Human pathophysiology concepts of adaptation and alteration in function and structure across the life span and their implications for nursing practice. Restricted to: BSNR,BSN,BSNP or consent of instructor majors. May be repeated up to 4 credits.
Prerequisite: Grade of C- or better in both (BIOL 353 & BIOL 2221/ BIOL 354), or (BIOL 2210 & BIOL 2225), or (SPMD 2210 & SPMD 3210).
Corequisite: NMNC 3110, NMNC 3135.
Learning Outcomes

1. Identify the functional and structural (pathophysiology) alterations that occur in the human body.
2. Relate the impact of functional and structural alterations on human health.
3. Recognize the relationships of pathophysiology to the practice of professional nursing.
4. Discuss the basic concepts of patterns of genetic inheritance of disease with related nursing implications and ethical considerations.
5. Use medical terminology appropriately.
6. Relate the impact of socio-cultural, legal-ethical factors, and scientific advances on pathophysiology.

NURS 3115. Care of the Veteran Population
3 Credits (3)
This course prepares healthcare and other professionals to care for the Veteran population. Specific topics and health issues explored include military and veteran culture, women in the military, post-traumatic stress disorder, traumatic brain injury, military sexual trauma, and chemical exposures. An overview of the Veterans Health Administration, the largest healthcare system in the USA, will be provided. May be repeated up to 3 credits.

Learning Outcomes

1. Examine Veterans' demographics and the impact of political, social, cultural, and environmental factors.
2. Analyze the mission of the Veterans Health Administration with a focus on healthcare system and services.
3. Evaluate health concerns, issues, and health seeking behaviors within the diverse Veteran population.
4. Appraise available evidence on delivering culturally sensitive care that addresses the needs of the Veteran patient and their family.

NURS 3996. Special Topics
1-9 Credits (1-9)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 21 credits.
Learning Outcomes

1. Varies

NURS 4110. Strategies for Student Success
3 Credits (3)
This course is designed to assist and support students as they identify learning needs and develop a plan for successfully mastering nursing knowledge. Course activities and assignments will be designed to address student's self-identified learning goals to enhance their opportunity for success. Restricted to NURS, BSN, BSNP, BSNR majors. May be repeated up to 3 credits.

NURS 4997. Independent Study
1-3 Credits (1-3)
Individual studies with prior approval of department head. May be repeated up to 3 credits.
Learning Outcomes

1. Varies

NURS 5105. Scholarly Preparation for the Doctor of Nursing Practice
1 Credit (1)
This course is designed to enhance students' scholarly writing skills while fostering an effective school and study mindset. Students will explore current research on the science of learning, delving into evidence-based practices that improve student learning outcomes. Students will also identify techniques and habits that support an effective school/study mindset, essential for academic success. By the end of the course, students will be equipped with practical skills to enhance their academic performance and produce high-quality scholarly writing.
Learning Outcomes

1. Explore strategies to improve memory and make learning easier.
2. Compare and contrast the common myths with scientifically-backed facts about learning.
3. Utilize APA formatting guidelines to properly format a given writing assignment, including citations and references.
4. Identify key characteristics of professional writing, such as clarity, conciseness, proper grammar, and appropriate tone.

NURS 5110. Evidence-Based Practice for Healthcare Leaders
3 Credits (3)
This course is designed to prepare nurse administrators and other healthcare leaders with the skills and knowledge needed to critically analyze and synthesize scholarly evidence to promote high quality evidence-based practice.
Learning Outcomes

1. Utilize information sources, such as bibliographic databases and electronic resources and experts, to locate existing knowledge relevant to healthcare and nursing practice.
2. Critically appraise selected research designs, methods of data collection (quantitative and qualitative), and data analytic methods in relation to selected clinical practice and healthcare systems problems.
3. Discuss the relevance of theory and conceptual frameworks to health care research and practice.
4. Evaluate the use of evidence-based practice models to investigate clinical practice and healthcare systems problems.
5. Discuss the ethical, cultural, and professional concerns with human subjects in nursing research and considerations for evidence-based practice.
6. Propose a clinical practice change utilizing evidence-based practice guidelines.

NURS 5115. Quality Improvement for Healthcare Leaders
3 Credits (3)
This course prepares nurse administrators and healthcare leaders to be engaged in the process of continuous quality improvement on interprofessional healthcare teams. Healthcare improvement principles and practice will focus on improving patient care and outcomes, lowering costs, reducing healthcare disparities, and increasing access to healthcare. Restricted to: exclude Online MSN in Nursing Administration majors.
Learning Outcomes

1. Explain the value of improvement science in healthcare and its impact on healthcare quality.
2. Articulate the role of administrators in leading and facilitating change in healthcare systems through quality improvement processes.
3. Compare and contrast conceptual models and frameworks that guide quality improvement work in healthcare systems.
4. Articulate the principles for selecting a systems-level problem for continuous quality improvement action.
5. Demonstrate the use of quality improvement methods, tools and clinical data to address a systems-level problem in the clinical setting.
6. Examine the role of health policy and national standards in guiding quality improvement initiatives.

NURS 5120. Nursing Informatics
3 Credits (3)
This course is designed to meet the needs of the doctoral nurse of practice and master's prepared nurse in acquiring informatics knowledge for the use of information technology in meeting today's health care challenges. Areas of concentration examine the implications of informatics for practice, including nursing, public health, and healthcare in general, electronic health record issues, related ethical, legislative, standardization and political issues in health informatics and explore global and future informatics issues. Restricted to: NURS, NUSC, NURP majors.
Learning Outcomes

1. Analyze the rationale for the development of informatics competencies at all levels of nursing practice.
2. Synthesize knowledge management principles with the advanced practice and nurse leadership role.
3. Use the knowledge of information technology to inform and guide the design of databases that generate meaningful evidence for nursing practice.
4. Analyze critical elements necessary for the selection, use, and evaluation of healthcare information systems and patient care technology.

5. Appraise the impact of the legal, ethical and policy issues surrounding technological advances in health care systems to include the use of information, information technology, communication networks and patient care technology.
6. Evaluate programs that monitor outcomes of care, care systems and quality improvement including consumer use of healthcare information systems.

NURS 5125. Health Policy for Advanced Nursing Practice
3 Credits (3)
Course provides a conceptual approach to understanding and analyzing the environment of professional nursing practice. Focus on the impact of health care economics, financing, law and regulation, ethics and health policy on individual and collaborative nursing practice. Restricted to: NURS, NUSC, NURP majors.
Learning Outcomes
1. Demonstrates an understanding of the interdependence of policy and practice.
2. Advocate for ethical policies that promote access, equity, quality, and cost.
3. Analyze ethical, legal, and social factors influencing policy development.
4. Demonstrate ability to contribute to the development of health policy.
5. Analyze the implications of health policy in the development of collaboration, interdisciplinary, and inter-organizational practices.
6. Evaluate the impact of globalization on health care policy development.
7. Advocate for policies for safe and healthy practice environments.

NURS 5130. Promoting Health Behavior
3 Credits (3)
This course provides an overview of the advance practice nurse's role in affecting health behavior change. Relationships among health behaviors and health status are examined to include education and structural approaches to the modification of those behaviors, ethics of health promotion, sites for health promotion activities, and evaluation of health promotion. Theoretical models of behavior change, and primary, secondary, and tertiary prevention concepts serve as a basis for developing nursing interventions that promote behavior change.
Learning Outcomes
1. Identify determinants of health-related behavior, behavior change, and relevant outcomes.
2. Describe the relationships between health promotion intervention activities, expected changed in behavior, and expected outcomes.
3. Apply theories of health behavior, learning, and changes as a basis for planning health promotion programs.
4. Conduct a needs assessment that includes the use of epidemiological methods to determine learning needs of a specific community, group of individuals, or health-related organization.
5. Evaluate the effectiveness of educational methods and materials in achieving behavior changes using appropriate measures of health-related behavior change.
6. Develop a nursing intervention with an evaluation plan to promote behavior change in a given population.
7. Explore the use/integration of an array of interdisciplinary paraprofessionals and professional health providers along with that of the advance education nurse in efforts to promote behavior change.

NURS 5210. Advanced Leadership in Healthcare
3-5 Credits (3+1-2P)
Analysis of leadership theories as they pertain to the nurse executive and the advanced practice nurse in complex health care organizations. Emphasis will be placed on organizational change and conflict management in working with interdisciplinary health care teams. Clinical component included for DNP students only. Restricted to: NURS,NUSC,NURP majors. May be repeated up to 5 credits.
Learning Outcomes
1. Develop strategies for managing the ethical concerns inherent to in-patient care, the health care organization, and research.
2. Demonstrate knowledge required to initiate and guide change, work collaboratively with other professionals for the improvement of healthcare practices and outcomes.
3. Apply leadership, change, and management theories to practice at the organizational and individual levels.
4. Develop written and verbal communication skills necessary to advance innovations in health care systems and health care practice.
5. Develop strategies that promote/improve access to quality, cost-effective health care.
6. Apply the principles of persuasion, influence, negotiation, and consensus-building to lead high-reliability teams.

NURS 5220. Management of Human and Fiscal Resources in Nursing
4 Credits (3+3P)
This graduate level course examines and applies contemporary concepts of human and fiscal resource management for the nurse administrator. Focus is placed on achieving quality outcomes through effective management of human assets and organizational resources in health care settings. The course includes a clinical component. May be repeated up to 4 credits.
Learning Outcomes
1. Demonstrate an understanding of the economic and market factors that affect health care organizations.
2. Demonstrate understanding of financial reports common to health care organizations.
3. Utilize common strategies and techniques for fiscal planning and management in health organizations.
4. Demonstrate understanding of the legal and regulatory environment of health care organizations that influence fiscal planning and management.
5. Address current issues facing Human Resource managers and organizational leaders, from a nursing perspective.
6. Determine how organizational vision sets the context for strategic objectives and action plans.
7. Demonstrate application of human resources management through case analysis.
8. Enhance leadership skills in performance evaluation, motivation and professional development.
9. Evaluate how an organization improves administrative effectiveness, productivity, and systems.1
10. Analyze ethical, legal, and regulatory issues in Human Resource Management and organizational leadership.

NURS 5230. Seminar in Nursing Administration- Roles
3 Credits (3)
This course is designed for role preparation for the nurse administrator as manager, leader, collaborator and change agent. It involves synthesis of concepts from management and nursing as a basis for role effectiveness in nursing administration.

Corequisite: NURS 5240.

Learning Outcomes

1. Differentiate between levels of preparation for nursing practice at the graduate level.
2. Differentiate the nature and scope of the role of the nurse administrator among the roles of various healthcare team members.
3. Analyze role expectations of selected career options for the graduate prepared nurse administrator.
4. Articulate the role of the nurse administrator in relation to the health of vulnerable populations and elimination of health disparities.
5. Synthesize theories from the disciplines of nursing, business, organizational, fiscal, and human resource management for the application to the role of the nurse administrator.
6. Evaluate leadership responsibilities of the nurse administrator in health care organizations in relation to the accepted scope and standards for that role.
7. Analyze and evaluate evidence-based practice for effective administration in health care organizations.

NURS 5240. Advanced Field Work in Nursing
1-3 Credits (1P)

A practicum in Nursing Administration. Application of concepts from management and nursing to the clinical, educational, or community setting. Restricted to: MSN, DNP, PHD majors. May be repeated up to 12 credits.

Prerequisite: NURS 5210.

Corequisite: NURS 5230.

Learning Outcomes

1. Analyze organizational processes observed/experienced in the clinical setting and the roles of nursing administrators in these processes.
2. Utilize research findings as a basis for nursing administration practice.
3. Establish networking relationships with colleagues in nursing administration and related areas.

NURS 5996. Special Topics
1-3 Credits (1-3)

Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits.

NURS 5997. Independent Study
1-10 Credits (1-10)

Individual studies and directed research with prior approval of department head. May be repeated up to 20 credits.

NURS 6110. Introduction to Population Health
1 Credit (1)

This interprofessional survey course will provide the student with a theoretical foundation in population health approaches to improving systems of care and health outcomes. The student will analyze empirical evidence in population health and appraise interprofessional population health strategies from a local, national, and international perspective. Students will identify and demonstrate methods for completing a community or health systems assessment and apply the assessment to the conceptualization of interprofessional strategies for improving population health systems of care.

Learning Outcomes

1. Analyze key concepts in population health.
2. Examine population-based services from a local, national and international perspective with an emphasis on opportunities for interprofessional collaborations and contributions.
3. Appraise the population health evidence-based literature on a topic of interest.
4. Develop a community health or health systems assessment within an interprofessional student team and propose strategies for improving the delivery of population health services within a community of interest.

NURS 6112. Population Health Leadership and Epidemiologic Decision-Making
3 Credits (3)

This course prepares advanced nursing students to integrate epidemiologic principles with population health strategies to improve outcomes across diverse populations. The course emphasizes data-driven decision-making, evidence-based interventions, interprofessional collaboration, and advocacy for health equity. Students will analyze disease patterns, assess community health needs, and design interventions to address social determinants of health, health disparities, and system-level barriers to care.

Learning Outcomes

1. Use epidemiologic methods to evaluate health disparities and needs in populations.
2. Evaluate the impact of social determinants of health on population health outcomes.
3. Synthesize evidence-based practices to inform equitable and culturally competent population health programs.
4. Develop a comprehensive program management plan, including budget analysis and evaluation strategies, to address a population health priority.

NURS 6115. Advanced Nursing Knowledge and the DNP Role
3 Credits (3)

This course provides an exploration of advanced nursing knowledge and the pivotal role of the Doctor of Nursing Practice (DNP) in healthcare. Students will examine the theoretical foundations and advanced practices that underpin the DNP role and review nursing's scientific and disciplinary knowledge.

Learning Outcomes

1. Analyze theoretical concepts, principles and processes to create a framework for advanced nursing practice.
2. Discuss the history and structure of nursing knowledge.
3. Assess the roles of the DNP from a nursing theory lens.
4. Conceptualize the role and function of the DNP within healthcare systems.

NURS 6120. Quality Improvement in Healthcare
3 Credits (3)

This course prepares advanced practice nurses to be leaders of inter-professional teams engaged in the process of continuous quality improvement in healthcare settings. Healthcare quality improvement principles and practice will focus on improving patient care and outcomes, lowering costs, reducing health disparities, and increasing access to healthcare. May be repeated up to 3 credits.

Learning Outcomes

1. Explain the value of improvement science in healthcare and its impact on healthcare quality.
2. Articulate the role of the doctorally-prepared nurse in leading and facilitating change in healthcare systems through quality improvement processes.
3. Compare and contrast conceptual models and frameworks that guide quality improvement work in healthcare systems.

4. Articulate the principles for selecting a systems-level problem for continuous quality improvement action.
5. Demonstrate the use of quality improvement methods, tools and clinical data to address a systems-level problem in the clinical setting.
6. Understand the role of health policy and national standards in guiding quality improvement initiatives.

NURS 6125. Evidence-Based Practice in Healthcare
3 Credits (3)
This course is designed to prepare nurse practitioners and other advanced practice nurses with the skills and knowledge needed to critically analyze and synthesize scholarly evidence to promote high quality evidence-based practice. Restricted to: Family Nurse Practitioner; Psych/Mental Health Nursing; Nursing Practice; Family Nurse Practitioner Certificate; and Psych/Mental Health Nursing Certificate majors.
Prerequisite: NURS 6120.
Learning Outcomes
1. Utilize information sources, such as bibliographic databases and electronic resources and experts, to locate existing knowledge relevant to healthcare and nursing practice.
2. Critically appraise selected research designs, methods of data collection (quantitative and qualitative), and data analytic methods in relation to selected clinical practice and healthcare systems problems.
3. Discuss the relevance of theory and conceptual frameworks to health care research and practice.
4. Evaluate the use of evidence-based practice models to investigate clinical practice and healthcare systems problems.
5. Discuss the ethical, cultural, and professional concerns with human subjects in nursing research and considerations for evidence-based practice.
6. Propose a clinical practice change utilizing evidence-based practice guidelines.

NURS 6130. Epidemiology for Advanced Nursing Practice
2 Credits (2)
Emphasis is on the practical application of the principles of epidemiology in the measurement and evaluation of population health. Epidemiological literature will be critiqued and synthesized to evaluate population-based public health nursing problems. Issues related to disease surveillance, causation, genetic patterns, screening and social trends in population health will be examined. Use of existing data bases and technology programs are covered. Restricted to: NURP, NURS, NUSC majors.
Learning Outcomes
1. Analyze epidemiological evidence for rigor and application in designing population- based intervention strategies for selected health issues.
2. Evaluate current legislative and regulatory policies that have influenced the impact of the epidemiological factors on health and disease in human populations.
3. Integrate knowledge of epidemiological concepts when evaluating population based public health nursing problems within diverse/ undeserved populations.
4. Synthesize data from existing sources to assess, plan, implement and evaluate population-based interventions.

NURS 6135. Interdisciplinary Leadership and Role Development for Practice Excellence
3 Credits (3)
This required course prepares students for organizational and systems leadership and knowledge and skills critical to role development in independent and inter and intra-disciplinary practice. Content includes communication, conflict resolution, collaboration and negotiation, leadership, and team functioning to maximize success in the establishment of safe, effective patient-centered care in complex environments.
Learning Outcomes
1. Evaluate interdisciplinary care delivery models from a systems perspective using evidence-based findings.
2. Incorporate principles of specialty practice management, quality improvement, and interdisciplinary teamwork in order to meet the health needs of the specialty population served.
3. Analyze effective strategies for the management of ethical dilemmas, incorporation of sensitivity to diverse cultures, and elimination of health disparities.
4. Differentiate among the multiple roles in advanced nursing practice.
5. Evaluate leadership styles in a team environment in the analysis of complex practice and organizational issues.
6. Incorporate consultative and leadership skills with inter and intra-disciplinary teams to facilitate change.

NURS 6150. Advanced Anatomy
3 Credits (2+1P)
This course presents an extensive exploration of human anatomy from a topographical and regional perspective. The knowledge gained in this course serves as a foundation for advanced clinical assessment for anesthesia practice, clinical decision-making, and patient management.
Learning Outcomes
1. Survey the regional organization and topography of anatomical structures within the key clinical regions of the human body with a focus on neurovascular anatomy and internal organs.
2. Discover the structure and function of the central nervous system and the distribution of all of the major peripheral nerves in the body.
3. Classify the relationship between palpable anatomical landmarks and the deep anatomy of the head, neck, thorax, abdomen, pelvis and limbs.
4. Evaluate major anatomical structures in the human body using radiographs, ultrasound, CT, MRI images.

NURS 6155. Advanced Physiology
3 Credits (3)
This course presents an extensive and detailed exploration of human physiology from a molecular, cellular, tissue, organ, and system perspective. The course will cover individual differences in physiology and how they relate to culture, gender, race, age, and genetics. The knowledge gained in this course serves as a foundation for advanced nursing clinical assessment, pharmacology, clinical decision-making, and patient management. This course provides an in-depth exploration of human physiology with a focus on the principles and mechanisms relevant to advanced nurse practice. Students will study advanced concepts in cardiovascular, respiratory, renal, endocrine, and neurological systems. Emphasis is placed on understanding the physiological responses to critical care scenarios and how to manage patient homeostasis throughout. The course aims to enhance the student's ability to assess, analyze, and intervene in complex clinical situations, ensuring safe and effective advanced nursing care.

Learning Outcomes

1. Identify structures and normal physiologic physiological functions of the human body organs and Systems.
2. Demonstrate knowledge of the concept of homeostasis and be able to Analyze the physiological impact on different organ systems and apply this knowledge to clinical practice.
3. Summarize the complexities of normal human physiologic physiological multi-system interactions.
4. Discuss how principles of normal physiology impact advance practice nursing care of individuals and develop critical thinking skills to identify and manage complex physiological changes, complications, and emergencies related to anesthesia, using evidence-based practices to guide clinical decision-making.
5. Understand advanced physiological mechanisms within the cardiovascular, respiratory, renal, endocrine, and nervous systems, and how these systems are affected by disease processes and medications.

NURS 6160. Chemistry and Physics for Anesthesia
3 Credits (3)

This course synthesizes the principles of math, inorganic chemistry, organic chemistry, biochemistry, and physics to advanced nursing practice, specifically nurse anesthesiology. Topics are covered from a molecular, cellular, tissue, organ, and system perspective. The knowledge gained in this course serves as a foundation for advanced clinical assessment, pharmacology, clinical decision-making, and patient management.

Learning Outcomes

1. Demonstrate proficiency in medical mathematics: algebraic equations, math conversions, and medical word problems.
2. Interpret physical and chemical principles related to concentration gradients, thermodynamics, the gas laws, solutions, fluids, volume and flow.
3. Evaluate and analyze basic and advanced bio-scientific concepts to normal and abnormal human physiologic states and critically assess the effectiveness and limitations of various types of clinical monitoring equipment in patient care.
4. Interpret basic and advanced bioscience concepts to assess hazards and implement electrical, fire, and radiation safety in the clinical anesthesia setting.
5. Formulate solutions to patient and equipment clinical dilemmas using the scientific underpinnings of bio-scientific principles.

NURS 6210. Professional Roles for Advanced Practice Clinical Nursing
3 Credits (3)

This course will focus on providing an in depth understanding of the legal, historical, political, social, and ethical aspects of advanced practice nursing. Traditional and emerging roles for advanced practice nursing are examined. Students must be Admitted to the DNP program. Restricted to DNP majors. May be repeated up to 3 credits.

Prerequisite: NURS 6430 OR NURS 6520.

Learning Outcomes

1. Analyze the development, functions and roles of advance practice nurse in multidisciplinary and collaborative settings.
2. Use conceptual and analytical skills to evaluate the links among practice, organizational, population, fiscal, and policy issues related to advance practice nurses.
3. Create a practice framework for entry into advanced practice with a complex, multicultural health care system.
4. Articulate the role of the advance practice nurse in resolution of ethical and legal, and policy issues within a complex health care system.
5. Analyze the role of the Advance Practice Nurse in promoting positive changes in the health status of individuals, families, groups, communities and populations.
6. Describe the role of the Advance Practice Nurse in dissemination of nursing knowledge.

NURS 6215. Professional Aspects of Nurse Anesthesiology Practice
3 Credits (3)

This course examines professional role development of the nurse anesthetist with an emphasis on the history and evolution of nurse anesthesiology practice, as well as scope, standards, legal aspects, ethics, quality, and regulations. Professional advocacy topics and the business of anesthesiology practice will be appraised. This course also addresses the risks of the role related to wellness and substance use disorder. Cultural competence modules for healthcare workers will be completed during this course.

Learning Outcomes

1. Discuss the history and evolution of nurse anesthesiology practice.
2. Analyze the professional components of nurse anesthesiology practice, emphasizing scope, standards, legal aspects, ethics, and regulation.
3. Differentiate between state, national, and international anesthesia organization roles and functions.
4. Identify quality assessment tools in anesthesiology practice.
5. Compare various business models of anesthesia, reimbursement methods, payment policies, reimbursement, and nurse anesthesiology practice patterns.
6. Examine the impact of wellness and substance use disorder on anesthesia providers.
7. Demonstrate cultural awareness and sensitivity of patient background characteristics including, but not limited to race, ethnicity, socioeconomic status, age, gender and sexuality.
8. Examine professional advocacy and other selected current issues affecting nurse anesthesiology practice.

NURS 6220. Advanced Pathophysiology for Clinical Nursing
3 Credits (3)

In-depth study of the physiological and pathological bases of altered health states of patients across the life span. Case studies facilitate application of complex concepts to clinical nursing practice. Restricted to: NURS, NUSC, NURP majors.

Learning Outcomes

1. Identify the functional alterations that occur as a result of illness in individuals across the life span.
2. Recognize risk factors, signs, and symptoms produced by the physiological changes to frequently occurring illnesses as a basis for health care, evidence-based practice, and therapeutic nursing interventions.
3. Analyze the concepts of altered molecular and cellular function related to selected disease processes.
4. Critically analyze the impact of alterations in structure and function including the relationship of genetics and environment on the individual as a system.
5. Discuss effective and ineffective adaptations to stressors by the human body across the lifespan.

NURS 6224. Diagnostic Reasoning and Advanced Health Assessment
3 Credits (3)
This course is designed to assist students to refine history taking, psychosocial assessment and physical assessment skills. Content focuses on assessment of individuals throughout the lifespan. Emphasis is placed on detailed health history taking, differentiation, interpretation and documentation of normal and abnormal findings. Diagnostic reasoning skills are emphasized as students develop processes to formulate differential diagnoses for acute and chronic physical and mental illnesses in the primary care setting across the lifespan.
Prerequisite: NURS 6235.
Learning Outcomes
1. Analyze and use the most effective communication methods to obtain a health history and to develop a therapeutic relationship.
2. Differentiate variations in normal and abnormal health and physical data.
3. Explore processes of diagnostic reasoning and potential cognitive biases.
4. Using data from the health and physical assessment, formulate differential diagnoses for given physical and mental illnesses across the lifespan.
5. Demonstrate advanced clinical judgment by using data from the health and physical assessment to design and implement clinically safe and patient-focused interventions.

NURS 6226. Advanced Health Assessment Practicum
1 Credit (1P)
Assessment skills for advanced clinical practice. Emphasis on assessment of patients across the life span. May be repeated up to 2 credits.
Corequisite: NURS 6225.
Learning Outcomes
1. Conduct a comprehensive and systematic assessment of health and illness in complex situations.
2. Collect and interpret health data related to the health history, chief complaint, and history of the present illness.
3. Use effective communication methods to obtain a health history and to develop a therapeutic relationship
4. Assess variations in normal and abnormal health and physical data.
5. Document advanced clinical judgment by using data from the health and physical assessment to determine a health status.

NURS 6230. Advanced Clinical Pharmacology
3 Credits (3)
Principles of clinical pharmacology and the related human physiology and pharmacology for advanced clinical practice.
Learning Outcomes
1. Relate associated physiology.
2. Classify drugs based on their mechanism of action.
3. Examine and discuss the pharmacokinetics, pharmadynamics, contraindications, and anesthesia implication for the following drug categories: Sympathomimetic and Sympatholytic, Respiratory pharmacology, Vasodilators, Antiarrhythmic, Neurologically active drugs, Diuretics, Lipid-lowering drug, Antacids, gastrointestinal motility, and antiemetics, Hypothyroidism and hyperthyroidism, Glucose regulation, Other endocrine drugs, Antimicrobials, antiseptics, and disinfectants, Chemotherapeutic, Psychopharmacologic.
4. Articulate and correlate drug characteristics and rationale for use in a professional manner.
5. Apply, appraise, and evaluate pharmaceutical characteristics when applied to a clinical scenario.
6. This course covers the following NCE content: Pharmacokinetics, Pharmadynamics, Sympathomimetic and Sympatholytic, Respiratory pharmacology, Vasodilators, Antiarrhythmic, Neurologically active drugs, Diuretics, Lipid-lowering drugs, Antacids, gastrointestinal motility, and antiemetics, Hypothyroidism and hyperthyroidism, Glucose regulation, Other endocrine drugs, Antimicrobials, antiseptics, and disinfectants, Chemotherapeutic, Psychopharmacologic.

NURS 6235. Advanced Pathophysiology for Nurse Anesthesiology Practice
4 Credits (4)
This course focuses on pathophysiology of diseases relevant to nurse anesthesiology practice. Evidence-based practice resulting from relevant research will be incorporated in discussions related to anesthesia management of patients with health status alterations. Students will utilize this information to build a foundation for anesthesia clinical reasoning and principles of nurse anesthesiology practice.
Learning Outcomes
1. Analyze the relationship between normal physiology and pathologic consequences produced by selected disease states.
2. Demonstrate understanding of selected biochemical, genetic, and cellular mechanisms that lead to common health alterations that occur in individuals across the lifespan.
3. Identify various pathologic alterations relevant to anesthesia practice.
4. Integrate the clinical application of pathophysiology into the practice of nurse anesthesiology.
5. Discuss the relationship between pathophysiology of various systems and anesthesia planning and management.

NURS 6240. Advanced Health Assessment for Nurse Anesthesiology Practice
4 Credits (3+1P)
This course focuses on development of knowledge and skills necessary to conduct comprehensive and focused health assessments for patients across the lifespan with special attention given to nurse anesthesiology practice. Principles of conducting detailed health histories, physical examinations, and diagnostic study interpretations will be featured. Students will obtain and document detailed culturally sensitive health histories and physical examinations. They will use critical thinking to identify and/or interpret pertinent diagnostic studies related to alterations in health patterns. Emphasis is placed on differentiation between normal and abnormal health history, physical assessment, and diagnostic findings.
Learning Outcomes
1. Demonstrate a systematic approach to the collection and documentation of data for health history and physical assessment while maintaining confidentiality and respecting privacy.
2. Collect and interpret health data related to the health history, history of the present illness, laboratory and other diagnostic findings.
3. Document relevant findings for both comprehensive and focused health histories and physical assessments.
4. Identify potential anesthesia risks based on patient health history, physical exam findings, and current literature.
5. Conduct and document a comprehensive preanesthesia evaluation to include health and surgical history, physical examination, and

interpretation of diagnostic data using effective communication while maintaining confidentiality and respecting privacy.

NURS 6245. Advanced Pharmacology for Nurse Anesthesiology Practice
3 Credits (3)
This course builds upon the advanced clinical pharmacology course and is designed to provide an evidence-based in-depth foundation of pharmacology and its application to anesthesiology practice across the lifespan. The primary focus will be on topics such as pharmacodynamics, pharmacokinetics, pharmacotherapeutics, pharmacy, and toxicology of currently used anesthetic agents

Learning Outcomes

1. Identify general pharmacokinetic, pharmacodynamic, pharmacogenetic, and pharmacotherapeutic principles related to anesthetic agents and adjunct drugs
2. Discuss the uptake and distribution of primary anesthetic agents and adjunct drugs.
3. Summarize indications/contraindications for selected anesthetic agents and adjunct drugs.
4. Calculate accurate doses of selected anesthetic agents and adjunct drugs.
5. Review potential adverse effects and drug interactions of selected anesthetic agents and adjunct drugs.
6. Describe evidence-based anesthetic considerations of anesthetic agents and adjunct drugs used for various procedures and various patients across the lifespan with diverse comorbidities and demographics.

NURS 6250. Healthcare Policy and Ethics
3 Credits (3)
This course examines complex challenges faced in the US healthcare system for nurses in advanced practice roles within an ethical framework. Ethical, social, and political issues that affect the provision of health care, communities, and society are critically analyzed with an emphasis on interprofessional roles in health care. Concepts that support advocating for social justice, reducing healthcare disparities. improving quality, promoting ethical aspects of care, and cost containment are overarching themes in the course discussions and assignments. Students use self-reflection, case studies and presentations to apply ethical principles, develop healthcare policy recommendations to improve care access, and reduce disparities in professional practice and population health.

Learning Outcomes

1. Analyze the historical evolution of health care systems and their influence on the development of institutional, local, state, federal and international health policy.
2. Critique socioeconomic, legal, ethical, and political issues relevant to policymaking and provision of equitable, safe, and quality health care at the local, state, and national levels.
3. Assess health policies, infrastructure, financing, and complex systems in the US in contrast to other nations.
4. Critically analyze bioethical issues in clinical practice settings as they impact policy, disparities, advocacy, ethics, improved patient outcomes and reduced costs.
5. Synthesize the principle of human rights and ethics in conduct of health care research and policy design.
6. Interpret the value and importance of advanced practice nursing role(s) to policy makers, health care professionals, and consumers.

NURS 6255. Innovations and Health Care Organizations
3 Credits (3)
Examines complexity and innovation within health care systems, health care delivery, and population health. Areas of focus are systems, organizations, health disparities, and ethical decision making. Emphasis is on improvement in services and outcomes. Restricted to: NURS, NUSC, NURP majors.

Learning Outcomes

1. Apply knowledge of organizational practices and complex systems to improve health care delivery.
2. Facilitate the development of health care systems that address the needs of culturally diverse populations, providers, and other stakeholders.
3. Evaluate the impact of health care delivery on patients, providers, other stakeholders, and the environment.
4. Analyze organizational structure, functions, and resources to improve the delivery of care.
5. Evaluate the relationships among access, cost, quality, and safety and their influence on health care.
6. Evaluate how organizational structure, care processes, financing, marketing, and policy decisions impact the quality of health care.

NURS 6260. Population Health and the Environment
3 Credits (3)
This course provides an overview of the core principles in environmental health. Emphasis is on the integration of key concepts of environmental health into nursing education, practice, research, and policy/advocacy efforts. Students will apply the key concepts to address specific environmental hazards that affect the health of individuals and populations.
Prerequisite: NURS 6110.

Learning Outcomes

1. Describe the scope and nature of environmental health sciences and relevance to population health, nursing research and practice, and theory.
2. Analyze the impact of environmental health hazards including mechanisms of exposure, health effects of exposure, and populations more vulnerable to exposure.
3. Apply risk management and risk communication strategies for environmental health exposures.
4. Appraise the impact of climate change on population health and its implications for nursing practice.
5. Describe the effect of regional, national, and international legislation on environmental health.
6. Discuss the role of advocacy and justice in environmental health in achieving equity and countering injustice in the form of systemic and structural conditions such as racism and privilege.

NURS 6265. Strategic and Financial Planning for Population Health Programs
3 Credits (3)
This course explores the role of nurses in advanced nursing practice within a rapidly changing healthcare system. Theories of leadership, quality, risk outcomes, and financial structures for healthcare organizations are discussed providing a framework for change within advanced nursing practice specialties. Accounting, finance, and marketing principles are presented enabling students to complete a financial plan for an evidence based practice change.
Prerequisite: NURS 6270.

Learning Outcomes

1. Use the principles of population focused program planning, development, implementation, and evaluation to develop an evidence-based population focused strategy to address a health priority issue.
2. Analyze the potential influence of cultural, ethical, and public health policy issues when working with diverse populations.
3. Analyze aspects of organizational culture and planned change that may influence success of planned interventions.
4. Evaluate feasibility issues related to implementing planned interventions such as cost, time, and available resources.
5. Integrate principles of program evaluation to determine impact and sustainability of evidence-based interventions.
6. Analyze the impact of financial models on costs, quality and health outcomes.

NURS 6266. Strategic and Financial Decision-Making in Healthcare Systems
3 Credits (3)
This course prepares graduate nursing students to lead within complex healthcare organizations. The course emphasizes the clinical leader's role in understanding the structure, function, and financing of healthcare systems and organizations. Students will develop systems-based practice competencies, financial literacy, and strategic planning skills necessary to guide evidence-based organizational change.
Learning Outcomes

1. Evaluate healthcare systems as complex adaptive environments, integrating organizational learning and interconnected subsystems to inform strategic decision-making.
2. Apply financial literacy and financial stewardship principles to assess revenue streams, cost structures, and ethical resource management in healthcare organizations.
3. Analyze healthcare financing models, reimbursement structures, and economic influences to support ethical financial decision-making and long-term sustainability.
4. Develop a comprehensive strategic plan that incorporates budgeting methodologies, technology-driven decision-making, and community relations to advance healthcare innovation.

NURS 6270. Clinical Data Management and Analysis
2 Credits (2)
This required course provides students with the knowledge base to understand, collect, manage, and measure clinical data. Students will explore data collection and management processes, levels of measurement, basic statistics, and measurement for improvement in order to effectively use clinical data. Data entry exercises employed through analytical tools and statistical software packages will allow the students practice and apply the basic data management and analysis skills needed for the evaluation of clinical data and evidence-based practice.
Learning Outcomes

1. Apply principles of sound data collection and management.
2. Create a database to collect and aggregate data.
3. Promote internal and external validity by identifying appropriate levels of measurement.
4. Organize data through use of Microsoft Excel and/or IBM SPSS Statistics Software.
5. Perform basic statistical analysis using descriptive, parametric, and non-parametric statistics appropriately.
6. Construct statistical analyses while preventing the introduction of errors.

NURS 6305. Introduction to the DNP Project
1 Credit (1)
This course is designed to assist the student in exploring a clinical problem and selecting an area of interest within a practice specialization, and in demonstrating professional competencies related to an area of interest to begin foundational development of the scholarly project. The student will document previously acquired abilities and competencies while developing an understanding of the scholarly project process. Students will work towards selection of a setting (hospital, long-term, primary care or community health agency) where concepts, theories, and principles of leadership, administration, and management can be applied.
Learning Outcomes

1. Examine the role of the DNP in the development and implementation of evidence based change of practice projects.
2. Identify a DNP Project practice site and clinical advisor.
3. Develop a portfolio demonstrating expertise in the specialty area of interest and understanding of a clinical problem.

NURS 6307. DNP Project Practicum
1-3 Credits (1-3P)
This leadership practicum courses provide for the development of a population health leader as demonstrated through the DNP project. The student will conduct an assessment of a population, community and/or organization where evidenc- based leadership activities may be employed. Once a problem or issue is identified in the practice setting, the student will develop an evidence-based project designed to positively impact population- specific and/or patient care outcomes. After approval of the DNP project proposal, the student will implement an evidence-based project designed to positively impact population health and/or patient/client care outcomes. The culmination of the DNP project is evaluation and dissemination of the evidence-based changes. May be repeated up to 9 credits.
Learning Outcomes

1. Demonstrate competence in the role of population health leader who delivers advanced practice nursing, including educators, clinicians, administrators, and translators of research.
2. Execute the DNP Project that meets the needs of diverse populations
3. Collaborate with DNP committee and the organization to establish an intra- and inter-professional continuous quality improvement process for achievement of the desired outcomes
4. Exhibit consistent professional behavior, performance, accountability, and responsibility within a population health leadership role

NURS 6310. DNP Project I
1 Credit (1)
This is the first in a three-course series that culminates in the implementation, evaluation and dissemination of scholarly work that demonstrates the student's synthesis of the Essentials of Doctoral Education for Advanced Practice Nursing (i.e., the DNP Essentials). The project must use evidence to improve clinical practice, healthcare delivery and/or patient outcomes. Upon completion of this course, students will identify a problem in healthcare, explore the existing evidence and develop a preliminary proposal for a project that demonstrates synthesis of DNP coursework and lays the groundwork for future scholarship.
Prerequisite: NURS 6120 and NURS 6125.
Learning Outcomes

1. Systematically review the existing evidence pertaining to selected clinical problem, generating a written review of the existing evidence.

2. Identify a theoretical framework or model that will guide the development of a solution or intervention and/or the execution of the DNP project.
3. Identify a theoretical framework or model that will guide the development of a solution or intervention and/or the execution of the DNP project.
4. Defend the DNP project proposal in front of the student's project committee and submit to IRB

NURS 6340. Clinical Scholarly Project
1-4 Credits (1-4)
Building on the practice expertise of the DNP student, this series of credits is to provide the student with the opportunity to design an innovative clinical practice improvement project/program addressing an actual health care concern. Through mentored activities, the DNP student will identify, develop, implement, evaluate, and disseminate an independent analytic. Graded: S/U Grading (S/U, Audit). Students must be Admitted to the DNP program.Restricted to: NURP majors. May be repeated up to 4 credits.
Learning Outcomes
1. Within the context of the chosen clinical problem, identify an evidence-based, system-level change or intervention that has the potential to address the problem.
2. Develop a detailed implementation plan to guide the execution of the proposed DNP project.
3. Develop a detailed evaluation plan that includes the identification of outcome measures that will allow the student to determine whether the project objectives were met.
4. Identify the DNP Essentials that are represented in the project and describe how the project addresses the requirement.
5. Defend the DNP project proposal in front of the student's project committee.
6. After successfully defending the DNP project proposal, submit an Institutional Review Board (IRB) application for the proposed project.
7. Initiate the approved DNP project implementation and evaluation plan.

NURS 6352. Integrated Care for Diverse Populations
2 Credits (2)
This course examines integrated health care as an approach to health care delivery characterized by a high degree of collaboration and communication among health professionals. Students expand their knowledge of interprofessional competencies and learn the concepts of the development of comprehensive treatment plans to address the biological, psychological and social needs of the patient in diverse patients across care settings. The focus is on delivering behavioral or biomedical health interventions relevant to everyday clinical practice across disciplines and practice settings. There is a strong emphasis on feasible brief interventions in a fast-paced clinical context and on adapting interventions to each patient's unique biopsychosocial, socioeconomic, and cultural context.
Prerequisite: NURS 6410 or NURS 6510.
Learning Outcomes
1. Analyze the relationship between behavioral and biomedical health and cultural contexts, including an understanding of the common health/illness presentations.
2. Compare and contrast models of integrated health.
3. Develop a treatment plan for a given patient addressing the investigation and management of the patient's illness, and the personal and social issues to which the illness may give rise.
4. Identify strategies for communicating clearly and sensitively with patients and their families and with other health professionals.
5. Analyze inter-professional team members roles in collaboration and cooperation with other team members as an integral component of team function.

NURS 6404. Neurobiology of Mental Disorders
2 Credits (2)
This course advances foundational knowledge of anatomy, physiology, and pathophysiology, focusing on the neurobiological mechanisms that sustain homeostasis within the brain and body. It explores the multifactorial etiology of mental disorders, including genetic, developmental, traumatic, infectious, and degenerative influences. The curriculum focuses on important biological theories, exploring how psychiatric disorders interact with brain structures, chemical pathways, and the related behaviors and symptoms. Mental disorders across the lifespan, including autism spectrum disorder, obsessive-compulsive disorder, attention deficit hyperactivity disorder, and substance use disorders, are critically analyzed.
Learning Outcomes
1. Synthesize foundational concepts of anatomy, physiology, and pathophysiology to understand the neurobiological mechanisms that maintain homeostasis within the brain and body.
2. Evaluate the multifactorial causes of major mental disorders, including genetic, developmental, traumatic, infectious, and degenerative factors.
3. Investigate the relationship between psychiatric disorders and their associated neuroanatomical structures and neurochemical pathways.
4. Identify the genetic etiology and neuropathological alterations associated with major mental disorders and substance use disorders.
5. Incorporate current research findings to inform evidence-based approaches to the care of individuals with mental health disorders.

NURS 6405. Psychopharmacology for Advanced Practice
3 Credits (3)
Principles of clinical psychopharmacology with emphasis on clinical application of major drug classifications including decision making, prescribing, drug monitoring and patient education.
Learning Outcomes
1. Utilize scientific and evidence-based findings to understand the molecular-physiological bases and chemical action of psychopharmacological agents.
2. Evaluate the clinical pharmacotherapeutics of broad categories of drugs along with alternative therapies needed for the therapeutic interventions.
3. Evaluate the legal, financial, policy and ethical issues with administering psychopharmacological agents.
4. Implement and analyze the role of the advanced practice nurse in delivering safe and effective psych pharmacotherapeutic agents for patient-centered care.
5. Serve as a role model for advanced practice nursing when administering psychopharmacological agents in collaborative settings.
6. Apply evidence-based findings to develop and improve practice.

NURS 6408. PMHNP Role in Diagnostics and Screening
3 Credits (3)
This course explores the diagnostics and screening of mental health disorders across the lifespan, focusing on advanced assessment techniques, diagnoses, and care strategies. Students will engage in

risk assessment and develop individualized treatment plans based on relevant theoretical frameworks.

Learning Outcomes

1. Apply advanced assessment techniques to effectively evaluate mental health conditions across the lifespan.
2. Formulate individualized care strategies informed by relevant theoretical frameworks and best practices.
3. Utilize appropriate assessment tools to facilitate accurate diagnoses based on the DSM-5-TR.
4. Analyze cultural aspects of clinical practice to provide effective care for diverse populations and promote optimal outcomes.
5. Identify risk assessment strategies and tools to identify potential challenges and needs of individuals with mental health disorders.
6. Apply ethical considerations and legal requirements relevant to mental health practice.

NURS 6410. PMHNP Across the Lifespan I
3 Credits (3)

This is the first in a series of three didactic for the psychiatric mental health nurse practitioner (PMHNP) student. This course introduces the PMHNP student to the scope and standards of practice; legal and ethical issues; comprehensive psychiatric assessment and evaluation; developmental theories; and the theory and practice of psychotherapy. Emphasis is placed on individuals across the lifespan from diverse populations. May be repeated up to 6 credits.

Prerequisite: NURS 6220, NURS 6230.

Corequisite: NURS 6411.

Learning Outcomes

1. Synthesize the current scientific evidence along with theoretical models for personality development into therapeutic interventions within a healthy environment.
2. Promote and evaluate the role of the Advanced Practice Nurse in the management of evidence-based interventions with individuals experiencing psychosocial and neurobiological disorders.
3. Apply theoretical concepts and psychotherapeutic modalities to develop age appropriate therapeutic alliances with mental health individuals during developmental transitions and life-style adjustments across the lifespan, including focus on vulnerable populations at risk for mental health problems, based on current evidence and clinical practice guidelines.
4. Evaluate strategies to promote the negotiation of mutually acceptable and collaborative treatment plans.
5. Apply evidence-based findings to develop and improve practice.

NURS 6411. PMHNP Across the Lifespan I Practicum
2-4 Credits (2-4P)

This is the first in a series of three clinical practicum courses for the psychiatric mental health nurse practitioner (PMHNP) student. This course provides the family psychiatric nurse practitioner student opportunities to work with a preceptor to gain advanced practice skills in individual therapies, comprehensive psychiatric evaluation, personality development concepts, dual diagnoses and psychotherapy principles; including management of health promotion, health maintenance and disease prevention activities. Students will work in practice settings that see patients across the lifespan to include: children, adolescents, women, men and older adults. Multiple clinical settings may be required; however, students must spend a minimum of 64 clock hours in each clinical setting and should have no more than two clinical settings per semester. 1 P = 64 clock hours of practicum. May be repeated up to 6 credits.

Prerequisite: NURS 6220, NURS 6230.

Corequisite: NURS 6410.

Learning Outcomes

1. Utilize communication skills and ethical strategies to develop and terminate therapeutic relationships.
2. Promote and evaluate the role of the Advanced Practice Nurse in the management of evidence-based interventions with individuals experiencing psychosocial and neurobiological disorders.
3. Demonstrate knowledge of psychotherapeutic theories and concepts by independently conducting psychotherapy with individuals with mental illness or at risk for mental health problems, under the supervision of a preceptor.
4. Apply theoretical concepts and psychotherapeutic modalities to develop age appropriate therapeutic alliances with mental health individuals during developmental transitions and life-style adjustments across the lifespan, including focus on vulnerable populations at risk for mental health problems.
5. Use current evidence and clinical practice guidelines in the assessment and management of patients across the lifespan.

NURS 6420. PMHNP Across the Lifespan II
3 Credits (3)

This is the second in a series of three didactic courses for the psychiatric mental health nurse practitioner (PMHNP) student. This course provides further theoretical foundations, knowledge and evidence-based practice experiences in differential diagnosis for mental health conditions; family and group therapy; and integrated management of mental health conditions. Emphasis is placed on working with families from diverse populations. May be repeated up to 6 credits.

Prerequisite: NURS 6410.

Corequisite: NURS 6421.

Learning Outcomes

1. Evaluate core professional values and ethical/legal standards in the implementation of the nurse practitioner role, identifying and maintaining professional boundaries to preserve the integrity of the therapeutic process.
2. Integrate history, laboratory and physical exam data with the knowledge of pathophysiology and psychopathology of acute and chronic diseases across the life span, to construct comprehensive and concise biopsychosocial assessments and diagnosis of individuals with common psychiatric disorders.
3. Identify age appropriate theoretical concepts and psychotherapeutic modalities to develop age-appropriate therapeutic alliances with individuals and families during developmental transitions and life-style adjustments across the lifespan.

NURS 6421. PMHNP Across the Lifespan II Practicum
3-4 Credits (3-4P)

This is the second in a series of three clinical practicum courses for the psychiatric mental health nurse practitioner (PMHNP) student. The student gains knowledge and evidence-based practice experiences in differential diagnosis for mental health conditions; family and group therapy; and integrated management of mental health conditions. The course involves working with a preceptor to develop and implement comprehensive treatment plans that include psychotherapy and psychopharmacology in inpatient and/or outpatient settings. May be repeated up to 8 credits.

Prerequisite: NURS 6411.

Corequisite: NURS 6420.

Learning Outcomes

1. Demonstrate self-awareness of core professional values and ethical/legal standards in the implementation of the nurse practitioner role.
2. Integrate history, laboratory and physical exam data with the knowledge of pathophysiology and psychopathology of acute and chronic diseases across the life span, to construct comprehensive and concise biopsychosocial assessments and diagnosis of individuals with common psychiatric disorders.
3. Demonstrate interdisciplinary communication and care coordination by seeking consultation with colleagues to improve clinical outcomes for individuals with mental health problems and psychiatric disorders.
4. Recognize cultural diversity, spiritual preferences, values, and beliefs to create a climate of patient-centered care demonstrating confidentiality, privacy, comfort, emotional support, mutual trust, and respect.
5. Apply theoretical concepts and psychotherapeutic modalities to develop age-appropriate therapeutic alliances with individuals and families during developmental transitions and life-style adjustments across the lifespan based on current evidence and clinical practice guidelines.
6. Demonstrate increasing independence in the application of supportive, psychodynamic principles, cognitive-behavioral and other evidence- based psychotherapy/-ies to both brief and long-term individual encounters, family therapy and group therapy.

NURS 6430. PMHNP Across the Lifespan III
1 Credit (1)

This is the third in a series of three didactic/clinical courses for the psychiatric mental health nurse practitioner (PMHNP) student. This course provides further knowledge and skills for the family psychiatric nurse practitioner student to refine competencies in neuropsychology, assessment, diagnosis and treatment. Emphasis will be placed on individuals, families and groups across the lifespan in a multicultural environment. May be repeated up to 5 credits.

Prerequisite: NURS 6420.

Corequisite: NURS 6431.

Learning Outcomes

1. Synthesize and use current scientific evidence, differential and diagnostic reasoning along with theoretical models for group dynamics into therapeutic interventions.
2. Utilize communication skills, self-reflection, and ethical strategies to develop and terminate therapeutic relationships.
3. Promote and evaluate the role of the advanced practice nurse in the management of evidence-based interventions with groups experiencing psychosocial and neurobiological disorders.
4. Evaluate strategies to promote the negotiation of mutually acceptable and collaborative treatment plans.
5. Apply evidence-based findings to develop and improve practice.

NURS 6431. PMHNP Across the Lifespan III Practicum
3,4 Credits (3,4P)

This third course in the series of PMHNP clinical courses provides further knowledge and skills for the psychiatric nurse practitioner student to refine competencies in neuropsychology, assessment, diagnosis and treatment of patients with mental health illness. Emphasis will be placed on psychotherapeutic and psychopharmacologic treatment of individuals, families and groups across the lifespan in a multicultural environment. May be repeated up to 6 credits.

Prerequisite: NURS 6421.

Corequisite: NURS 6430.

Learning Outcomes

1. Demonstrate self-awareness of core professional values and ethical/legal standards in the implementation of the nurse practitioner role, identifying and maintaining professional boundaries to preserve the integrity of the therapeutic process.
2. Independently integrate history, laboratory and physical exam data with the knowledge of pathophysiology and psychopathology of acute and chronic diseases across the life span, to construct comprehensive and concise biopsychosocial assessments and diagnosis of individuals with common psychiatric disorders.
3. Demonstrate interdisciplinary communication and care coordination by seeking consultation with colleagues to improve clinical outcomes for individuals with mental health problems and psychiatric disorders.
4. Apply theoretical concepts and psychotherapeutic modalities to develop age-appropriate therapeutic alliances with individuals and/or families during developmental transitions and life-style adjustments across the lifespan based on current evidence and clinical practice guidelines.
5. Demonstrate theoretical concepts, evidence-based psychotherapeutic modalities, and knowledge of psychopharmacology to independently develop, implement and document comprehensive treatment plans.

NURS 6432. PMHNP Across the Lifespan Residency
2 Credits (2P)

The nurse practitioner student will be expected to fully immerse in the role of the Psychiatric Mental Health Nurse Practitioner (PMHNP) with increasing levels of autonomy, under the supervision of qualified preceptors. Students will demonstrate efficacy in practice, management, and treatment of broad types of mental health issues that present in children, adolescents, adults and/or geriatric individuals and families in a variety of settings. The student will demonstrate the ability to utilize psychopharmacological and psychotherapeutic (individual, family and group) interventions in specialty or subspeciality clinical settings, particularly those that are of clinical relevance to the student's area of intended practice. In this course, the student will demonstrate proficiency in the PMHNP role in integrated healthcare settings. Students must complete psychiatric mental health clinical rotation hours treating patients across the lifespan while offering opportunities for board certification exam preparation. Restricted to Nursing majors. May be repeated up to 4 credits.

Prerequisite: NURS 6421.

Corequisite: NURS 6431.

Learning Outcomes

1. Fully integrate the mental health nurse practitioner role in the implementation of practice in diverse practice settings.
2. Provide high quality, safe, cost-effective, patient centered care recognizing cultural diversity and the patient or designee as a full partner in decision-making.
3. Appropriately diagnose, manage, and develop treatment plans for patients experiencing mental health care problems, to maximize the patient's health potential using psychosocial, psychopharmacologic and psychotherapeutic interventions.
4. Demonstrate the highest level of accountability for ethical professional practice.
5. Evaluate patient outcomes and responses, and modify the patient plan of care accordingly.
6. Participate in opportunities for board certification exam preparation

NURS 6450. Advanced Concepts in the Treatment of Substance Use Disorders
1 Credit (1)
This course examines scope of practice, epidemiology, cultural issues, and common co-occurring psychiatric, medical and legal problems related to substance use disorders, including opioid use disorder. Students will review theories and research as the basis for psychometric screening and evidence-based interventions, including medication-assisted treatment for substance use disorders. Emphasis is placed on individuals across the lifespan from diverse populations. Consent of Instructor required.
Learning Outcomes
1. Demonstrate the significance of professionalism and self-awareness by maintaining professional, ethical and legal standards, preserving the integrity of the therapeutic process, demonstrating commitment to the health and well-being of individuals and society ethical practice, and upholding high personal standards of behavior.
2. Recognize addictive disorders as developmental biopsychosocial disorders using a model of interconnection encompassing neurobiology, genetic, medical and mental health co-morbidities, familial, social, environmental, cultural, spiritual influences as contributors of substance use disorders.
3. Apply an evidence-based approach to detecting substance use disorders by recognizing medical, psychological, social, and functional indicators of subclinical addiction disorders through use of validated standardized substance use disorder screening instruments, and accurately interpret screening results indicative of hazardous and harmful substance use. Integrate positive substance use screening results with therapeutic and counseling strategies appropriate to the patient's readiness to change, by assessing the patient's background, ethnicity, and belief system to accommodate and respect the values and attitudes of various cultures.
4. Recognize the indications, contraindications, duration and utilization of evidence-based medication-assisted treatment and pharmacotherapy for substance use disorders including medications for acute withdrawal and relapse prevention.
5. Diagnose substance use disorders and existing co-occurring mental health and/or medical disorders, and match appropriate level or care, secure consultation and referrals for specialty treatment of addiction and other medical and psychiatric conditions.

NURS 6506. Health Needs of Women and Children
3 Credits (3)
The course will examine patient and family perspectives as well as health care system variables and societal issues affecting the organization and delivery of primary care for women, adolescent, and pediatric populations. Emphasis includes a focus on ways in which poverty, politics, racial and ethnic disparities affect the health of families, women, children, and adolescents. Content addresses comprehensive diagnosis and management of common health problems, including appropriate diagnostic procedures, laboratory tests, and follow-up care for patients with both acute and chronic conditions. There is a strong focus on health promotion, disease prevention, the care of underserved populations, and culturally competent care.
Prerequisite: NURS 6220, NURS 6225, NURS 6230.
Learning Outcomes
1. Analyze the etiology, pathophysiology, presentation, and prognosis of women and children's conditions as they present in clinical settings.
2. Assess the public health impact of clinical problems for both women and children in the community, including the epidemiology of common risk factors and early intervention strategies.
3. Synthesize scientific and evidence-based knowledge along with theory to promote health, prevent illness and treat common acute and chronic conditions of women and children.
4. Apply the principles of health care ethics to the care of women and children with an understanding of legal implications within the sociopolitical environment.
5. Formulate a plan to investigate and manage the health state of women and children taking into account the values and preferences of the patient and addressing the personal and social issues to which the health status may give rise.

NURS 6507. Pediatric Primary Care
3 Credits (3)
This didactic course provides foundational knowledge and clinical decision-making skills necessary for Family Nurse Practitioner (FNP) students to provide safe, developmentally appropriate, and evidence-based care to pediatric patients from infancy through adolescence. The course addresses common acute and chronic pediatric conditions, growth and development milestones, anticipatory guidance, and preventive care, including immunizations, screenings, and nutritional counseling.
Learning Outcomes
1. Provide evidence based assessments and screenings using age appropriate frameworks.
2. Develop differential diagnoses and evidence-based treatment plans for common pediatric conditions.
3. Identify developmental, behavioral, and family-centered care needs in pediatric populations.
4. Apply principles of health promotion, immunization, and disease prevention in managing care across pediatric age groups.
5. Analyze how social, cultural, and environmental determinants influence child health outcomes.

NURS 6510. FNP Across the Lifespan I
3 Credits (3)
The course provides the Family Nurse Practitioner student with advanced theoretical knowledge and practice in the assessment and management of health promotion, health maintenance and disease prevention activities across the lifespan; including the assessment and management of common acute and chronic health concerns. Emphasis will be placed on primary health care of individuals and their families in a multicultural environment. May be repeated up to 6 credits.
Prerequisite: NURS 6220, NURS 6230.
Corequisite: NURS 6511.
Learning Outcomes
1. Apply evidence-based knowledge and theory related to the prevention, diagnosis and management of selected common acute health problems in clients across the lifespan.
2. Plan collaborative case to assist clients and their families from diverse backgrounds to maximize functional health status
3. Formulate patient centered therapeutic plans based on holistic health assessment, risk reduction and safety for the treatment and prevention of select, uncomplicated and common, acute illnesses.

NURS 6511. FNP Across the Lifespan Practicum I
2-4 Credits (2-4P)
This is the first in a series of three clinical courses for the family nurse practitioner (FNP) student. Working with a preceptor students will use advance skills in patient history taking, performing physical assessments, and interpreting laboratory and other test results. Development of a plan of care with health promotion components is also expected. Students will

work in practice settings that see patients across the lifespan to include: children, adolescents, women, men and older adults. Multiple clinical settings may be required; however, students must spend a minimum of 64 clock hours in each clinical setting and should have no more than two clinical settings per semester. 1 P = 64 clock hours of practicum. May be repeated up to 8 credits.
Prerequisite: NURS 6220, NURS 6230.
Corequisite: NURS 6510.

Learning Outcomes

1. Develop physical exam competency.
2. Integrate, implement and evaluate evidence-based therapeutic interventions in complex acute care practice situations.
3. Develop and sustain therapeutic relationships with patients across the life span (child, adolescents, young adult, adult, older adult, seniors) and other professional to optimize patient-centered outcomes.
4. Demonstrate advanced clinical judgment based on current standards of practice.
5. Synthesize clinical judgment, systems thinking, and accountability to provide evidenced based care.

NURS 6520. FNP Across the Lifespan II
3 Credits (3)
This is the second in a series of three didactic courses for the family nurse practitioner (FNP) student. This course provides further theoretical foundations, knowledge and evidence-based practice experiences in the differential diagnosis and management of acute and chronic diseases. Emphasis is placed on individuals across the lifespan from diverse populations. Building on knowledge and skills from the previous course, students will be expected to manage patients with an increasing complexity of health issues and multiple co-morbidities. May be repeated up to 6 credits. NURS 6511.
Prerequisite: NURS 6510.
Corequisite: NURS 6521.

Learning Outcomes

1. Integrate knowledge of pathophysiologic and psychosocial changes associated with common chronic health problems into immersion in practice decision-making.
2. Demonstrate an advanced knowledge base of normal changes and common patterns across the life span, including the physiologic, psychological, social, and spiritual domains.
3. Demonstrate an advanced knowledge base of common pathologies across the life span, and the diagnosis and treatment of common chronic health problems, including referral and follow-up.
4. Evaluate the relationships between access, cost, quality, and safety and their influence on health care.

NURS 6521. FNP Across the Lifespan II Practicum
3,5 Credits (3,5P)
This is the second in a series of three clinical courses for the family nurse practitioner (FNP) student. This course builds on knowledge and skills from the previous course, students will be expected to manage patients with an increasing complexity of health issues and multiple co-morbidities. This course involves working with a preceptor to refine skills in assessment and differential diagnosis as well as the development and implementation of comprehensive treatment plans, that include referrals to other specialties and services. Students are expected to work within Integrated Health Care settings for a minimum of 64 hours of practicum. May be repeated up to 10 credits.
Prerequisite: NURS 6510, NURS 6511.
Corequisite: NURS 6520.

Learning Outcomes

1. Apply conceptual frameworks to and compare strategies for risk analysis and reduction, screening, disease and injury prevention, and health promotion across the life span.
2. Integrate relevant research findings in management of selected health care conditions across the life span.
3. Use the principles of case management process to coordinate effective therapeutic interventions, referrals, and collaboration with other health care providers for clients/patients with chronic illness across the life span.
4. Demonstrate cultural competence related to the individual's ethnicity, culture and lifestyle when considering prevention strategies or developing the health promotion and disease management plan for chronic conditions across the life span.
5. Analyze client and patient outcomes to identify the effectiveness of treatment, the need for change, and the health status of client/patient across the life span in an integrated care setting.
6. Apply inter-professional competencies in addressing integrated health needs of patients across the lifespan.

NURS 6530. FNP Across the Lifespan III
1 Credit (1)
This is the final didactic course for the family nurse practitioner (FNP) student. The course continues the development of knowledge and skills for the nurse practitioner student for the assessment and management of selected common acute and chronic health conditions across the lifespan. Emphasis will be placed on primary health care of individuals and their families in a multicultural environment. This course includes preparation for the FNP board certification exam. May be repeated up to 5 credits.
Prerequisite: NURS 6520, NURS 6521.
Corequisite: NURS 6531.

Learning Outcomes

1. Integrate knowledge of pathophysiologic and psychosocial changes associated with common chronic health problems into clinical decision-making.
2. Demonstrate an advanced knowledge base of normal changes and common patterns across the life span, including the physiologic, psychological, social, and spiritual domains.
3. Demonstrate an advanced knowledge base of common pathologies across the life span, and the diagnosis and treatment of common chronic health problems, including referral and follow-up.
4. Translate knowledge of acute and chronic illness to the development, implementation and documentation of appropriate comprehensive treatment plans, including referrals to other specialties and services.
5. Use self-reflection to evaluate progress in professional development as an integral member of the interprofessional team.
6. Integrate ethical principles in decision-making and demonstrate core professional values in the implementation of the nurse practitioner role.

NURS 6531. FNP Across the Lifespan III Practicum
3-4 Credits (3-4P)
This is the final clinical course for the family nurse practitioner (FNP) student. In this course, the student works with a preceptor to develop mastery of skills required to assess, diagnose and manage acute and chronic conditions in primary care settings. Advancement of knowledge and skills attained through previous practicum experiences, as well as this final course, produces a capable, qualified provider, who will

transition into a safe, novice, primary care nurse practitioner. May be repeated up to 8 credits.
Prerequisite: NURS 6521.
Corequisite: NURS 6530.
Learning Outcomes

1. Apply theoretical concepts of patient-centered care with emphasis on health promotion, disease prevention, guidance/counseling, disease management, and palliative care during developmental transitions and life-style adjustments.
2. Incorporate primary/secondary prevention guidance into comprehensive treatment plans for patients across the lifespan.
3. Integrate history, physical examination laboratory and other test data with knowledge of pathophysiology of acute and chronic diseases/conditions to develop appropriate differential diagnoses.
4. Identify pharmacological interventions in the treatment and management of illness for diverse populations.
5. Integrate evidence-based clinical guidelines into the diagnosis and management of illness in patients across the lifespan.
6. Translate knowledge of acute and chronic illness to the development, implementation and documentation of appropriate comprehensive treatment plans, including referrals to other specialties and services.

NURS 6610. Nurse Anesthesiology Principles I
2 Credits (2)
This is the first of four sequential nurse anesthesiology principles courses. The course introduces the student to advanced nursing practice in anesthesia and focuses heavily on anesthetic delivery systems. The course design integrates theoretical perspectives from anatomy, physiology, physics, and chemistry. The lab will emphasize perioperative preparation, management, and evaluation of the patient, anesthetizing area, and equipment.
Learning Outcomes

1. Review fundamentals of safe evidence-based anesthesia practice related to anesthesia techniques, airway management techniques, perioperative patient/anesthetizing area preparation, anesthesia planning, safety measures, appropriate use of equipment and monitoring devices, and anesthesia complications.
2. Demonstrate a comprehensive equipment check and proper utilization and/or interpretation of anesthesia delivery systems, airway equipment, monitoring devices, communication techniques, documentation, and patient positioning.
3. Assess patient fluid status and calculate, initiate, and manage fluid/blood component therapy.
4. Examine chemistry, physics, biochemistry, and imaging principles and their relationship to anesthesia.
5. Differentiate between acute and chronic pain management based on the neuroscience of pain.
6. Integrate anesthesia research and best practices related to basic anesthesia care, anesthesia equipment, technology, and pain management into anesthesia planning and delivery.

NURS 6620. Nurse Anesthesiology Principles II
5 Credits (4+1P)
This is the second of four sequential nurse anesthesiology principles courses and expands the knowledge gained from the previous course to include advanced airway management, advanced and invasive monitoring, preoperative assessment and anesthesia plan of care development. This course emphasizes evidence-based anesthesia techniques for fluid volume assessment, fluid/blood component therapy replacement, total intravenous anesthesia (TIVA), monitored anesthesia care (MAC), hypotensive techniques, intraoperative fire safety, and basic regional anesthesia knowledge and skills. Students will also learn anesthesia considerations and complications for a variety of patients undergoing selected procedures. The simulation lab focuses on the application of knowledge and skills from the didactic course.
Learning Outcomes

1. Discuss the integration of anesthesia principles, pathophysiology, physiology, and pharmacology for the planning of safe evidence-based anesthesia care for diverse patients undergoing a variety of surgical procedures.
2. Describe the indications and benefits of neuraxial and peripheral nerve blockade for diverse populations, as well as management of associated complications.
3. Identify via ultrasound key anatomy relevant to the brachial plexus and femoral (adductor canal) peripheral nerve blockade.
4. Demonstrate proper#approach and peripheral nerve block technique for the brachial plexus and femoral nerve(s).
5. Analyze the key anatomical structures when demonstrating correct techniques for a subarachnoid and epidural block.
6. Discover anesthesia techniques, considerations, and complications (and their management) related to intra-abdominal, extra thoracic, extracranial, orthopedic, perineal, pelvic, non-operating room, robotic, pediatric, obstetrics, and geriatric procedures.
7. Integrate anesthesia research and best practice guidelines into anesthesia planning and delivery for patients undergoing intra-abdominal, extra thoracic, extracranial, orthopedic, perineal, pelvic, non-operating room, robotic, pediatric, obstetrics, and geriatric procedures and/or regional anesthesia techniques.

NURS 6630. Nurse Anesthesiology Principles III
4 Credits (4)
This is the third of four sequential nurse anesthesiology principles courses and builds upon knowledge gained from previous courses. This course emphasizes evidence-based anesthesia techniques and complications in special populations across the lifespan, as well as selected surgical procedures. The course also addresses scope of practice, standards of practice, central nervous system monitoring devices, massive transfusion protocols, thromboelastography, enhanced recovery after surgery (ERAS), postanesthesia care and respiratory therapy.
Corequisite: NURS 6700.
Learning Outcomes

1. Discuss the integration of anesthesia principles, pathophysiology, physiology, and pharmacology for the planning of safe evidence-based anesthesia care#for#special populations across the lifespan undergoing#intracranial, cardiac, non-cardiac intrathoracic, neck, spine, and vascular surgical procedures.
2. Identify#modifications required for anesthesia planning and management for obese patients across the lifespan related to their physiology, comorbidities, and congenital anomalies as applicable.
3. Individualize common anesthesia techniques across the patients' lifespan undergoing intracranial, cardiac, non-cardiac intrathoracic, neck, spine, and vascular surgical procedures.
4. Identify common comorbid conditions of patients undergoing complex procedures.
5. Integrate anesthesia research and best practice guidelines into anesthesia planning and delivery for patients' undergoing intracranial, cardiac, non-cardiac intrathoracic, neck, spine, and vascular surgical procedures.

6. Examine anesthesia techniques, considerations, and complications (and their management) of diverse patients undergoing a variety of complex procedures.

NURS 6640. Nurse Anesthesiology Principles IV
3 Credits (3)
This is the final of four sequential nurse anesthesiology principles courses and builds upon knowledge gained from previous courses. This course emphasizes evidence-based anesthesia techniques and strategies to mitigate risk from anesthesia complications, as well as considerations for the following special populations: substance use disorder, immunocompromised and oncology populations and selected procedures. A major focus of this course is on pain theory, pain management, imaging, imaging safety and wellness.
Corequisite: NURS 6710.
Learning Outcomes
1. Discuss the integration of anesthesia principles, pathophysiology, physiology, and pharmacology for the planning of safe evidence-based anesthesia care#for#diverse patients undergoing#non-operating room anesthesia (NORA), trauma, burns, organ transplants, organ procurement, and laser procedures.
2. Discuss management of anesthesia complications related to special populations across the lifespan.
3. Examine anesthesia techniques, considerations, and complications (and their management) of diverse patients undergoing a variety of complex procedures.
4. Integrate anesthesia research and best practice guidelines into anesthesia planning and delivery for diverse patients undergoing a variety of complex procedures.

NURS 6650. Nurse Anesthesiology Principles V
4 Credits (3+1P)
This is the final of five sequential nurse anesthesiology principles courses and builds upon knowledge gained from previous courses. This course emphasizes evidence-based anesthesia techniques, complications, and considerations for administering regional anesthesia including spinal, epidural and nerve block procedures and management protocols.
Learning Outcomes
1. Discuss the integration of anesthesia principles, pathophysiology, physiology, and pharmacology for the planning of safe evidence-based anesthesia care for diverse patients undergoing regional anesthesia.
2. Examine regional anesthesia techniques, considerations, and complications (and their management) of diverse patients undergoing a variety of complex procedures.
3. Integrate anesthesia research and best practice guidelines into anesthesia planning and delivery for diverse patients undergoing procedures for regional anesthesia.

NURS 6700. Introduction to the Clinical Residency
3 Credits (3P)
This introductory clinical course provides students extensive simulation in preparation for the clinical environment and the clinical role of advanced nursing practice in anesthesiology. The student will apply concepts in a simulated perioperative environment and begin to learn communication and documentation skills. The student will analyze data from monitors and other equipment to ensure safe delivery of anesthesia care
Learning Outcomes
1. Integrate knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe simulated anesthesia care.
2. Formulate a comprehensive history and physical assessment and begin to formulate an evidence-based anesthesia plan of care based on the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Demonstrate basic anesthesia skills/techniques and incorporate new skills with guidance.
4. Demonstrate safe use of anesthesia monitors and equipment operation, calibration, and interpretation of data.
5. Demonstrate selection of drugs according to surgical patients across the lifespan.
6. In a simulated environment, develop#effective communication strategies and documentation skills in the perioperative environment to facilitate safe patient care.
7. Demonstrate patient positioning requirements for a given surgical procedure and implement appropriate safeguards to protect patients from physiologic compromise or injury.
8. Model integrity, ethics, honesty, and accountability in professional interactions in accordance with the AANA professional practice standards and code of ethics.

NURS 6710. Nurse Anesthesiology Clinical Residency I
3 Credits (3P)
This is the first of six clinical residency courses and provides students with the opportunity to begin developing the advanced nursing practice role in anesthesiology. Students are expected to integrate didactic knowledge learned in previous courses and co-requisite courses into perianesthesia care of the patient. Students begin to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider.
Learning Outcomes
1. Summarize knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into the planning and delivery of an evidence-based safe anesthetic.
2. Translate a comprehensive history and physical assessment into an evidence-based anesthesia plan of care based on the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Develop new anesthesia skills/techniques with guidance while maintaining basic/foundational anesthesia skills/techniques.
4. Make use of safe use of data from anesthesia monitors, equipment operation, and calibration.
5. Choose a selection of drugs according to surgical patients across the lifespan.
6. Compare and use#effective communication and documentation skills with diverse patients, families, other healthcare workers, and ancillary personnel to facilitate safe patient care.
7. Implement appropriate safeguards to protect patients from physiologic compromise or injury due to patient positioning requirements for a given surgical procedure.
8. Build integrity, ethics, honesty, and accountability in professional interactions in accordance with the AANA professional practice standards and code of ethics.

NURS 6720. Nurse Anesthesiology Clinical Residency II
4 Credits (4P)
This is the second of six clinical residency courses and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in Clinical Residency I and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. Students progressively assume more responsibility for patients as they gain skills and knowledge.
Learning Outcomes
1. Organize knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Utilize an evidence-based anesthesia plan of care based on a comprehensive history and physical assessment that takes into account the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Utilize basic anesthesia skills/techniques and discover new skills with guidance.
4. Analyze data from the anesthesia monitors, equipment operation, and calibration to increase patient safety.
5. Dissect selection of drugs according to surgical patients across the lifespan.
6. Construct effective communication and documentation skills with diverse patients, families, other healthcare workers, and ancillary personnel to facilitate safe patient care.
7. Utilize patient positioning requirements for a given surgical procedure and implement.
8. Dissect integrity, ethics, honesty, and accountability in professional interactions in accordance with the AANA professional practice standards and code of ethics.

NURS 6730. Nurse Anesthesiology Clinical Residency III
4 Credits (4P)
This is the third of six clinical residency courses and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in previous clinical residency courses and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. As students complete clinical experiences in various specialties, they will provide anesthesia services to patients with more complex alterations in health patterns requiring more expertise in anesthesia management.
Learning Outcomes
1. Categorize knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Infer an evidence-based anesthesia plan of care based on a comprehensive history and physical assessment taking into account the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Utilize new skills with guidance while maintaining basic anesthesia skills/techniques.
4. Interpret data for safe use of anesthesia monitors, equipment operation, and calibration.
5. Discover selection of drugs according to surgical patients across the lifespan.
6. Discover and simplify effective communication and documentation skills with diverse patients, families, other healthcare workers, and ancillary personnel to facilitate safe patient care.
7. Survey appropriate safeguards to protect patients from physiologic compromise due to patient positioning requirements for a given surgical procedure.
8. Judge integrity, ethics, honesty, and accountability in professional interactions in accordance with the AANA professional practice standards and code of ethics.

NURS 6740. Nurse Anesthesiology Clinical Residency IV
4 Credits (4P)
This is the fourth of six clinical residency courses and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in previous clinical residency courses and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. As students complete clinical experiences in various specialties, they will provide anesthesia services autonomously to patients with more complex alterations in health patterns requiring more expertise in anesthesia management.
Learning Outcomes
1. Appraise knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Design an evidence-based anesthesia plan of care based on a comprehensive history and physical assessment taking into account the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Adapt new skills with guidance while maintaining basic anesthesia skills/techniques.
4. Deduct data from the use of anesthesia monitors, equipment operation, and calibration to increase patient safety.
5. Determine #effective communication and documentation skills with diverse patients, families, other healthcare workers, and ancillary personnel to facilitate safe patient care.
6. Evaluate patient positioning requirements for a given surgical procedure and implement appropriate safeguards to protect patients from physiologic compromise or injury.
7. Develop integrity, ethics, honesty, and accountability in professional interactions in accordance with the AANA professional practice standards and code of ethics.

NURS 6750. Nurse Anesthesiology Clinical Residency V
5 Credits (5P)
This is the last of five clinical residency courses and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in previous clinical residency courses and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. Students are expected to provide anesthesia services independently to patients with more complex alterations in health patterns requiring more expertise in anesthesia management.

Learning Outcomes

1. Maximize knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Design an evidence-based anesthesia plan of care based on a comprehensive history and physical assessment taking into account the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Identify new skills with guidance while mastering basic anesthesia skills/techniques.
4. Analyze data with the use of anesthesia monitors, equipment operation, and calibration to increase patient safety.
5. Modify selection of drugs according to surgical patients across the lifespan.
6. Adapt#effective communication and documentation skills with diverse patients, families, other healthcare workers, and ancillary personnel to facilitate safe patient care.
7. Improve patient positioning requirements for a given surgical procedure and implement appropriate safeguards to protect patients from physiologic compromise or injury.
8. Maximize integrity, ethics, honesty, and accountability in professional interactions in accordance with the AANA professional practice standards and code of ethics.

NURS 6760. Nurse Anesthesiology Clinical Residency VI
5 Credits (5P)

This is the final clinical residency course and builds upon the didactic knowledge, clinical knowledge, and foundational concepts developed in previous clinical residency courses and in-hospital experiences. Students continue to incorporate evidence-based research practices with an emphasis on patient safety and vigilance, culturally competent care of the patient throughout the peri-anesthesia continuum, interpersonal communication, and integration of critical and reflective thinking of an anesthesia provider. Students are expected to provide anesthesia services independently to patients with more complex alterations in health patterns requiring more expertise in anesthesia management.

Learning Outcomes

1. Adapt knowledge of anesthesiology principles, anatomy, physiology, pathophysiology, and pharmacology into evidence-based anesthesia planning and delivery of safe anesthesia care.
2. Improve an evidence-based anesthesia plan of care based on a comprehensive history and physical assessment attacking into account the patient's underlying health status, culturally relevant information, and the surgical or medical procedure.
3. Maximize new skills with guidance while solidifying mastery of basic anesthesia skills.
4. Interpret data with the use of anesthesia monitors, equipment operation and calibration to increase patient safety.
5. Invent selection of drugs according to surgical patients across the lifespan.
6. Imagine and originate effective communication and documentation skills with diverse patients, families, other healthcare workers, and ancillary personnel to facilitate safe patient care.
7. Construct appropriate safeguards to protect patients from physiologic compromise or injury given patient positioning requirements for a given surgical procedure and implement.
8. Internalize integrity, ethics, honesty, and accountability in professional interactions in accordance with the AANA professional practice standards and code of ethics.

NURS 6770. Rural Health Anesthesiology Seminar
3 Credits (3)

This course focuses on unique issues and challenges surrounding the provision of nurse anesthesiology services in rural communities. Topics covered include working with scarce resources, needs of individuals/populations living in rural communities, regulatory issues, health policy, reimbursement practices, cultural issues, technology, and local/state/federal aspects that impact rural nurse anesthesiology practice.

Learning Outcomes

1. Define unique needs of individuals and/or populations living in rural communities.
2. Identify challenges of working with scarce resources.
3. Discuss regulatory, policy, reimbursement, and cultural issues unique to rural nurse anesthesiology practice.
4. Illustrate local, state, and/or federal issues that impact rural nurse anesthesiology practice.

NURS 6771. Anesthesiology Integration/Clinical Correlation I
4 Credits (4)

This course highlights the culmination of reflective learning that the nurse anesthesiology resident has accomplished over the three years of the program.

Learning Outcomes

1. Actively engage in professional advocacy by effectively representing the interests of the nurse anesthesiology profession, contributing to policy development, participating in the state and national organizations, and promoting ethical standards and social responsibility within anesthesia.
2. Prioritize sustainable personal and professional wellness practices by integrating strategies for physical, emotional, and mental well-being, maintaining work-life balance, managing stress effectively, and fostering resilience to support long-term career success and personal fulfillment.
3. Improve leadership and interpersonal effectiveness by applying emotional intelligence, communication, teamwork, adaptability, conflict resolution, and problem-solving skills to lead and collaborate within diverse professional settings.
4. Examine foundational financial literacy principles in both personal and business contexts, including budgeting, debt management, investment planning, financial decision-making, and understanding basic accounting and entrepreneurship practices.
5. Produce educational content using evidence-based teaching strategies, communication techniques, and presentation skills to facilitate learning in academic, clinical, or public settings.
6. Demonstrate readiness for professional practice and certification through active participation in simulation-based assessments, development and execution of a personalized study plan, and successful completion of comprehensive final evaluations that integrate theoretical knowledge with practical application.

NURS 6772. Anesthesiology Integration/Clinical Correlation II
2 Credits (2)

This course is the second of a two-course sequence and continues to further develop critical thinking skills and foster continued integration of theoretical knowledge into clinical practice. Clinically relevant evidence-based research and anesthesia topics will be presented by students and faculty. This course also includes student participation in discussion of clinical experiences and case presentations. Students will continue to critically analyze, synthesize, and evaluate the knowledge gained in all previous nurse anesthesiology courses in preparation for the national certification examination and clinical practice.

Learning Outcomes

1. Demonstrate the ability to critically review pertinent literature and its application to clinical practice.
2. Deliver case-based presentations that incorporate current evidence-based best practices and culturally relevant information.
3. Demonstrate consistent professional growth and development through discussion, presentation, interaction, and individual and/or group participation.
4. Complete the student self-evaluation of graduate standards form.
5. Implement the previously created action plan to pass the NBCRNA NCE and revise it as needed.

NURS 6990. Advanced Practice Nursing Immersion
1-4 Credits (1-4)
Practicum experience for advanced practice students. Focus will be on a practice issue chosen by the student for further development as an evidence-based doctoral project. Clinical practice hours as needed to meet DNP requirements. Up to 24 credits may be completed by student. Restricted to: NURP majors. May be repeated up to 24 credits.
Prerequisite: NURS 6220, NURS 6530 or enrollment in post-masters track.

NURS 6991. DNP Project Development
1,2 Credits (1,2+1,2P)
The DNP Project course is repeated for a minimum of three (3) semesters and is the culmination of the DNP coursework. The three semesters of coursework include development, implementation, evaluation and dissemination of scholarly work that demonstrates the student's synthesis of the Essentials of Nursing Education, Advanced Level. The project must use evidence to improve clinical practice, healthcare delivery and/or patient outcomes. Students will actively participate with their DNP project chair each semester to develop a learning contract with individualized learning objectives based on the student's progression in the DNP project process. The student will register for a minimum of 2 credits which will include 1 hour of didactic and 1 hour of practicum credit (for leading the DNP Project) each semester following NURS 6305 (Intro to the DNP Project) until project completion and a minimum of six (6) credit hours during the course of the program of study. Students who have not completed the DNP Project will repeat the course until the student has met all DNP project requirements for graduation. S/U PR grading. May be repeated up to 8 credits.
Prerequisite: NURS 6305.
Learning Outcomes

1. Synthesize knowledge from experience and specialty literature for application to the project area of interest.
2. Demonstrate the ability to complete a organizational needs assessment, literature review, executive summary, IRB application and write a scholarly manuscript for public dissemination.
3. Identify a theoretical framework or model that will guide the development of a solution or intervention and/or the execution of the DNP project.
4. Incorporate elements of scientific inquiry into a defined project in the specialty practice area or area of clinical interest.
5. Demonstrate the ability to present in a scholarly fashion for the DNP project proposal comprehensive examination and the DNP project final defense.
6. Develop a portfolio demonstrating expertise in the specialty practice area.

NURS 6993. Doctoral Nursing APRN Seminar
1 Credit (1P)
Seminar to build APRN clinical skills, consisting of a 32-40 hour on-site immersion with skills labs and Objective Structured Clinical Evaluation using standardized patients that are used as formative and summative evaluation. May be repeated up to 6 credits.
Prerequisite: NURS 6220, NURS 6224.
Learning Outcomes

1. Apply clinical decision making skills to diagnose and treat given patient cases in area of specialty.
2. Integrate screening and diagnostic tools into diagnosis and treatment of given patient cases in area of specialty.
3. Use advanced health assessment skills to differentiate between normal, variations of normal and abnormal findings.
4. Develop skills in the interpretation of commonly used diagnostic tests in management of patient conditions in area of specialty.
5. Perform procedures commonly used in the treatment of patients in area of specialty.

NURS 6997. Independent Study
1-6 Credits (1-6)
Individual studies and directed research with prior approval of department head. May be repeated up to 12 credits.

NURS 7000. Doctoral Dissertation
1-9 Credits (1-9)
Dissertation may be repeated to maximum of 30 credits. Minimum requirements are 21 credit hours. Comprehensive examine is included within these 21 credits. May be repeated up to 30 credits.
Learning Outcomes

1. Varies.

NURS 999. Practical Nursing Requirements Completed
99 Credits
A phantom course created to indicate a student has met Practical Nursing requirements. Used to indicate this in academic history to replace an administrative message not converted from SOLAR to VISTAS. 01/97 May be repeated up to 99 credits.
Learning Outcomes

1. N/A

NUTR-NUTRITION

NUTR 1120. Dietary Guidelines
4 Credits (4)
A presentation and explanation in detail of the Dietary Guidelines for Americans developed by the U.S. Department of Agriculture (U.S.D.A.) and the U.S. Department of Health and Human Services.
Learning Outcomes

1. Recall, interpret and explain each of the Dietary Guidelines and U.S.D.A. nutrition education tools.
2. Translate the Dietary Guidelines into a diet and exercise program.
3. List and describe methods to select and prepare food which are consistent with the Dietary Guidelines for Americans.
4. Identify risk factors related to disease prevention.

NUTR 2110. Human Nutrition
3 Credits (3)
This course provides an overview of nutrients, including requirements, digestion, absorption, transport, function in the body and food sources. Dietary guidelines intended to promote long-term health are stressed.

Learning Outcomes

1. Evaluate sources of nutrition information for reliability
2. Identify elements of a nutritious diet
3. Describe the digestion, transport, and absorption of nutrients
4. Describe the importance of nutrition in weight control and health
5. Identify nutritional needs as they relate to the life cycle and performance
6. Describe behavior modification techniques that promote good health
7. Evaluate popular nutrition trends for scientific accuracy and effectiveness
8. Develop skills in the planning and assessing of healthy meal plans
9. Describe the role of food choices in the development of chronic disease 1
10. Describe the role of food in the promotion of a healthful lifestyle

NUTR 2120. Seminar I - Becoming a Nutrition Professional
1 Credit (1)
This course will introduce students to the field experience, careers, and professions in nutrition. This course is required for students pursuing a Didactic Program in Dietetics verification statement.
Learning Outcomes

1. Describe career options within the fields of Nutrition Dietetics.
2. Outline the HNDS field experience process.
3. Explain the educational pathways in HNDS.
4. List requirements for admission into the HNDS Dietetics pathway.
5. Begin an HNDS student portfolio.
6. Discuss the importance of personal responsibility accountability.

NUTR 3110. Nutrition Throughout the Lifecycle
3 Credits (3)
Relationship of the stages of the human life cycle to changes in nutrient need. Consent of Instructor required.
Prerequisite(s): NUTR 2110, BIOL 354 and BIOL 354L OR SPMD 2210 and SPMD 2210L.
Learning Outcomes

1. Understand the value of collaborative work in nutrition care of individuals.
2. Compare and contrast the physiological, behavioral, and psychosocial factors associated with each life stage that affect nutritional status.
3. For each life cycle stage, create a nutritionally adequate menu that meets key nutrient needs.
4. Culturally appropriate evidence-based interventions to address common nutrition-related conditions experienced in each lifecycle stage.
5. Utilize the Nutrition Care Process to complete a nutrition assessment.

NUTR 3710. Food Systems & Policy in Dietetics
3 Credits (3)
This course introduces students to food and nutrition policy issues, institutions, and stakeholders and their impacts on public health, sustainability, and the practice of dietetics in the US. The course will examine policy development and the roles of federal agencies, private firms, non-governmental organizations, and the media in food and nutrition policy. It will also examine international perspectives on food and nutrition policies and programs used to support global nutrition, health promotion, and wellness.
Prerequisite(s): Junior standing, NUTR 2120 (for HNDS majors), ENGL 2130G (or ENGL 2210G, 2215G, or 2221G).

Learning Outcomes

1. Discuss the economic, political, social, and cultural factors that influence US food and nutrition policies and impact national food systems and population health.
2. Identify the psychological, social, cultural, and environmental factors that influence food choices, eating behaviors, and nutrition-related practices.
3. Describe the processes and major players involved in US food and nutrition policy development, implementation, monitoring/evaluation, and regulation.
4. Recognize the influence of food and nutrition policy on the practice of dietetics.

NUTR 3750. Applied Nutrition Research
3 Credits (3)
This course will introduce students to various types of nutrition research and equip them to locate and critique nutrition and dietetics research articles. Research analysis skills will then be applied to a review of the current literature on a nutrition topic and applied to dietetics practice.
Prerequisite: MATH 1350G (OR A ST 311); NUTR 3110.
Learning Outcomes

1. Recall the various research methods, study designs, and statistical analyses used in nutrition research.
2. Compare and contrast research methods and analyses in nutrition research.
3. Analyze nutrition research for appropriateness of the methods and analyses.
4. Evaluate nutrition research to form sound, ethical conclusions and practice recommendations.

NUTR 3996. Special Topics
1-4 Credits (1-4)
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits. Consent of Instructor required.
Prerequisite(s): Junior or Senior standing, consent of instructor.
Learning Outcomes

1. Develop foundational knowledge in a specialized area of dietetics practice.

NUTR 4110. Advanced Nutrition
3 Credits (3)
Application of biochemistry and physiology to nutrition.
Prerequisite(s): SPMD 1120 or NURS 150; CHEM 2120; NUTR 3110.
Learning Outcomes

1. Describe the processes of digestion and absorption within the human body.
2. Compare and contrast the structure and function of key nutrients.
3. Describe the metabolism of key nutrients under various conditions.
4. Apply concepts of energy and nutrient metabolism to common medical conditions and other relevant situations such as exercising or fasting.

NUTR 4205. Nutrition Communication and Education
3 Credits (3)
In this course, HNDS students learn about the foundation, design, and delivery of nutrition communication and nutrition education. Students will learn ways to develop audience-focused communication and learning assessment. This course will cover the communication methods used in all facets of the nutrition and dietetics field including oral presentations, writing, video, food photography, and food demonstrations. Students will

utilize a large variety of channels to communicate and educate different target audiences.
Prerequisite: NUTR 3750 and NUTR 4210.
Learning Outcomes
1. Identify a minimum of four reliable sources of nutrition information.
2. Interpret and clearly communicate evidence-based nutrition information.
3. Evaluate the application of behavior change theories and models to nutrition communications.
4. Adapt nutrition communication and education to target specific cultural and age groups.
5. Develop a nutrition education lesson plan with SMART learning objectives, learning activities, and learning assessments.

NUTR 4207. Nutrition Services
3 Credits (3)
In this course, HNDS Dietetic students will learn about the promotion and payment of nutrition services along with aspects related to reimbursement and partnering with allied professionals. The HNDS Dietetics students will also engage in clinical and community nutrition field experiences. This course will provide HNDS Dietetic students with the opportunity to assess their knowledge of professional competencies within the field of dietetics. Restricted to students with senior standing within the Dietetics Option of the HNDS major. Must be in final spring semester.
Prerequisite(s): NUTR 4210 and NUTR 4230 and 4230L.
Corequisite(s): NUTR 4240 and 4240L.
Learning Outcomes
1. Compare best practice guidelines to actual practice in the provision of nutrition services within community settings.
2. Explain at least two processes in delivering quality food and nutrition services.
3. Identify private and public healthcare funding sources.
4. Explain Medicare, Medicaid, and private payer coverage for medical nutrition therapy.
5. Discuss referrals, primary care partnership and promoting nutrition services.
6. Describe best practices, resources and guidelines related to the reimbursement for nutrition services.
7. Compare best practice guidelines to actual practice in the provision of nutrition services within clinical nutrition settings.
8. Evaluate the content of the Commission on Dietetic Registration RDN credentialing exam.

NUTR 4210. Community Nutrition
3 Credits (3)
Overview of the practice of community nutrition. Includes program planning, needs assessment, program implementation and program evaluation. Role of public and private agencies in nutrition programs that impact on nutrition of individuals and groups in the community. Same as NUTR 5210.
Prerequisite: NUTR 3710 and NUTR 3750.
Learning Outcomes
1. Summarize the components of current national and local community nutrition programs.
2. Explain how national or state level policy influences a community nutrition issue.
3. Write a needs assessment for a community nutrition issue using reliable sources of community nutrition information and data and relevant research.
4. Develop goals and objectives of a nutrition program that address a community nutrition issue.
5. Develop a culturally appropriate nutrition education lesson plan that addresses a specific nutrition program objective.

NUTR 4220. Food Service Organization and Management
3 Credits (3)
Personnel, financial and general management in institutional and commercial food service operations.
Prerequisite: HRTM 3310 or 363.
Learning Outcomes
1. Evaluate food products and menu plans through the application of food service management theories and principles.
2. Describe the process of and ethical considerations surrounding purchasing, receiving, storing and controlling inventory of a given food item.
3. Evaluate food system, food safety practices, and scenarios.
4. Evaluate a nutrition and foodservice budget and interpret financial data.

NUTR 4230. Medical Nutrition Therapy I
3 Credits (3)
Special diets and physiological basis for their use. Laws and regulations concerning the practice of dietetics.
Prerequisite(s): NUTR 4110, BCHE 341.Corequisite(s): NUTR 4230, NUTR 4233.
Learning Outcomes
1. Examine the role of medical nutritional therapy in disease processes.
2. Apply nutritional assessment techniques utilizing the Nutrition Care Process.
3. Compose nutrition care plans and utilize various styles of medical charting.
4. Describe the interdisciplinary nature of working with a health care team in the delivery of medical nutritional therapy.

NUTR 4230L. Medical Nutrition Therapy I Lab
1 Credit (1P)
Supplements NUTR 4230. Students will perform nutrition assessments, nutrition focused physical exams, apply medical nutrition therapy-based interventions and practice patient discharge education for specific disease states. Elements of pathology and biochemistry of nutrition-related conditions are integrated into course topics. Restricted to: HNDS majors.
Corequisite: NUTR 4230.
Learning Outcomes
1. Examine the role of medical nutrition therapy in disease processes.
2. Conduct nutrition assessments.
3. Apply the Nutrition Care Process Model.
4. Apply medical terminology to nutrition interventions.
5. Apply therapeutic approaches to treating medical conditions and their associated symptoms via the use of specifically tailored diets.

NUTR 4233. Nutrition Counseling
3 Credits (3)
This course is designed to meet the needs of individuals entering the healthcare/dietetics field who have little counseling experience, but have a strong foundational knowledge in the field of dietetics. It includes counseling techniques and strategies, behavior change, interviewing, cultural competence, mass media, and nutrition education.
Prerequisite: NUTR 3750,NUTR 4110.

Learning Outcomes

1. Evaluate nutrition counseling strategies tools in promoting behavior change and self-management.
2. Apply behavior change theories and models to nutrition counseling sessions.
3. Develop nutrition care plans for nutrition counseling clients.
4. Analyze professionalism and ethics within nutrition counseling and education.

NUTR 4235. Entering the Field of Dietetics
1 Credit (1)
Students will develop professional materials that will be used in their future careers including a personal statement, resume, and interview dialogues. Students will become familiar with career options in the field of dietetics and learn to navigate the processes of becoming a registered dietitian or dietetic technician, registered. Restricted to: HNDS majors. Students must be a Senior to enroll. Final fall semester of dietetics program.
Learning Outcomes

1. Develop professional materials to use when applying to dietetic careers, including a personal statement, resume, and interview dialogue.
2. Become familiar with with career options in the field of dietetics by reviewing current job postings.
3. Navigate the process of becoming a registered dietitian or dietetic technician, registered.
4. Prepare a dietetic internship application using DICAS and DD Digital Matching Service.
5. Create both primary and alternative career plans within the field of dietetics.
6. Learn how to apply professional resources to aid in career development and continuing education.

NUTR 4240. Medical Nutrition Therapy II
3 Credits (3)
Continuation of NUTR 4230.
Prerequisite: NUTR 4230 and 4230L.
Corequisite: NUTR 4240L.
Learning Outcomes

1. Select appropriate medical nutrition therapy interventions for various disease processes.
2. Master nutrition assessment of patients/clients utilizing the Nutrition Care Process Model.
3. Interpret medical terminology in patient chart notes and medical history records.
4. Evaluate laws regulations concerning dietetics.

NUTR 4240L. Medical Nutrition Therapy II Laboratory
1 Credit (1P)
Supplements NUTR 4240. Students will apply medical nutrition therapy to specific disease states with special emphasis on writing nutrition support orders and learning to utilize nutrition support equipment. Students will learn and apply advanced nutritional therapies and patient management strategies. Restricted to: HNDS majors.
Prerequisite(s): NUTR 4230.
Corequisite(s): NUTR 4240.
Learning Outcomes

1. Calculate nutrition support recommendations and document orders in the patient's medical chart.
2. Demonstrate safe use of nutritional support equipment.
3. Master use of the Nutrition Care Process in case-based and simulated patient scenarios to conduct nutrition assessments and implement evidence-based interventions.
4. Critically evaluate lab values and client anthropometric data.
5. Select therapeutic diets for the treatment of medical conditions and their symptoms.

NUTR 4565. Field Experience Community Nutrition
1-8 Credits (1-8)
Experience working with nutritional problems of individual families of all socioeconomic and age levels and with agencies concerned with community nutrition. Practical experience with supervision by resident faculty as well as supervisor at the work site. Performance at work site graded in accordance with university standards. May be repeated up to 8 credits. Consent of Instructor required.
Prerequisite(s): Senior standing, NUTR 4210, consent of instructor.
Learning Outcomes

1. Apply dietetics knowledge to practice in various community settings.
2. Develop a field experience portfolio highlighting the development of community nutrition knowledge and skills.
3. Compare and contrast the responsibilities of Registered Dietitians in various community practice organizations.

NUTR 4991. Special Problems
1-4 Credits (1-4)
Individual research study in a selected subject area of family and consumer sciences. Maximum of 4 credits per semester and a total of 8 credits. May be repeated up to 8 credits. Consent of Instructor required.
Prerequisite(s): Junior or Senior standing.
Learning Outcomes

1. Develop specialized knowledge and competencies in a selected nutrition and dietetics subject area.

NUTR 5110. Graduate Studies in Advanced Nutrition
3 Credits (3)
Covers biochemistry and physiology applied to nutrition. Students enrolled in the 5000-level class will be required to complete additional assignments beyond what is required for NUTR 4110. Crosslisted with: NUTR 4110.
Prerequisite(s)/Corequisite(s): NUTR 3110. Student must be classified as a Graduate student to enroll in this course, BIOL 2221, BCHE 341, and NUTR 2110, or consent of instructor.
Learning Outcomes

1. Describe the processes of digestion and absorption within the human body.
2. Compare and contrast the structure and function of key nutrients.
3. Describe the metabolism of key nutrients under various conditions.
4. Apply concepts of energy and nutrient metabolism to common medical conditions and other relevant situations such as exercise or fasting.

NUTR 5150. Orientation to Dietetic Internship
3 Credits (3)
Dietetic interns prepare for supervised practice rotations. Topics include professionalism, Code of Ethics, and dietetic internship portfolios. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: HNDS majors.
Prerequisite(s): Acceptance into Dietetic Internship.
Learning Outcomes

1. Assembly of dietetic intern portfolio that will be kept throughout dietetic internship.

2. Readiness to begin supervised practice rotations.
3. Understanding of steps and processes to successfully complete requirements of dietetic internship and Masters of Science in Family Consumer Sciences.
4. Upon completion of the course, students will be able to understand the importance of evidence-based information, research ethics, the Code of Ethics of the Profession of Dietetics, and the basic structure of an IRB proposal.

NUTR 5210. Graduate Study in Community Nutrition
3 Credits (3)
Overview on the practice of community nutrition to include program planning, needs assessment, program implementation and program evaluation. Role of public and private agencies in nutrition programs that impact on nutrition of individuals and groups in the community. Students enrolled in the 5000-level class will be required to complete additional assignments beyond what is required for NUTR 4110. May be repeated up to 3 credits. Crosslisted with: NUTR 4210.
Prerequisite(s): Graduate student, NUTR 3110, NUTR 3710, NUTR 3750, or consent of the instructor.
Learning Outcomes
1. Summarize the components of current national and local community nutrition programs.
2. Explain how national or state-level policy influences a community nutrition issue.
3. Write a needs assessment for a community nutrition issue using reliable sources of community nutrition information and data, and relevant research.
4. Develop goals and objectives of a nutrition program that address a community nutrition issue.
5. Develop a culturally appropriate nutrition education lesson plan that addresses a specific nutrition program objective.

NUTR 5220. Graduate Studies in Food Service Organization and Management
3 Credits (3)
Personnel, financial and general management in institutional and commercial food service operations. Students enrolled in the5000-level class will be required to complete additional assignments beyond what is required for NUTR 4220. May be repeated up to 3 credits.
Prerequisite(s): Graduate Students; HRTM 2120, NUTR 3120, or consent of instructor.
Learning Outcomes
1. Evaluate food products and menu plans through the application of food service management theories and principles.
2. Describe the process of and ethical considerations surrounding purchasing, receiving, storing, and controlling inventory of a given food item.
3. Evaluate food system, food safety practices, and management practices of a specific food service establishment.
4. Apply management theories and principles to quality assurance and human resource case scenarios.
5. Evaluate a nutrition and food service budget and interpret financial data.

NUTR 5230. Graduate Studies in Medical Nutrition I
3 Credits (3)
Special diets and physiological basis for their use. Laws and regulations concerning the practice of dietetics. Additional assignments beyond NUTR 4230 required. May be repeated up to 3 credits. Crosslisted with: NUTR 4230.
Prerequisite(s): Graduate student, NUTR 3110, NUTR 4110, BIOL 2225 or BIOL 2221, or consent of instructor.
Learning Outcomes
1. Examine the role of medical nutritional therapy in disease processes.
2. Apply nutritional assessment techniques utilizing the Nutrition Care Process.
3. Compose nutrition care plans and utilize various styles of medical charting.
4. Describe the interdisciplinary nature of working with a health care team in the delivery of medical nutritional therapy.

NUTR 5233. Graduate Studies in Nutrition Counseling & Education
3 Credits (3)
This course is designed to meet the needs of individuals entering the healthcare/dietetics field who have little counseling experience, but have a strong foundational knowledge in the field of dietetics. It includes counseling techniques and strategies, behavior change, interviewing, cultural competence, mass media, and nutrition education. Additional assignments beyond NUTR 4233 required. May be repeated up to 3 credits. Crosslisted with: HNDS 4233.
Prerequisite(s)/Corequisite(s): NUTR 5230. Students must be classified as a Graduate student to enroll in this course, NUTR 2110, NUTR 3110, FCSC 348.
Learning Outcomes
1. Evaluate nutrition counseling strategies and tools in promoting behavior change and self-management.
2. Apply behavior change theories and models to nutrition counseling sessions.
3. Develop nutrition care plans for nutrition counseling clients.
4. Analyze professionalism and ethics within nutrition counseling and education.
5. Develop and present a nutrition education lesson based on current nutrition research.

NUTR 5240. Graduate Studies in Medical Nutrition Therapy II
3 Credits (3)
Continuation of HNDS 546. May be repeated up to 3 credits. Crosslisted with: NUTR 4240.
Prerequisite(s): Graduate student, NUTR 5230 and NUTR 4230L or consent of instructor.
Learning Outcomes
1. Select appropriate medical nutrition therapy interventions for various disease processes.
2. Master nutrition assessment of patients/clients utilizing the Nutrition Care Process model.
3. Interpret medical terminology in patient chart notes and medical history records.
4. Evaluate laws regulations concerning dietetics.

NUTR 5610. Dietetic Intern Seminar
1 Credit (1)
Portfolio development for dietetic interns during supervised practice rotations. May be repeated up to 3 credits. Consent of Instructor required.
Prerequisite(s): Acceptance into Dietetic Internship.
Learning Outcomes
1. CRDN
2. 2: Apply evidence-based guidelines, systematic reviews and scientific literature.

3. CRDN
4. 3: Justify programs, products, services and care using appropriate evidence or data.
5. CRDN
6. 4: Evaluate emerging research for application in nutrition and dietetics practice.
7. CRDN
8. 6: Incorporate critical-thinking skills in overall practice.
9. CRDN
10. 1: Practice in compliance with current federal regulations and state statutes and rules, as applicable and in accordance with accreditation standards and the Scope of Nutrition and Dietetics Practice and Code of Ethics for the Profession of Nutrition and Dietetics.
11. CRDN
12. 2: Demonstrate professional writing skills in preparing professional communications.

NUTR 5620. Dietetic Internship: Supervised Practice in Community Nutrition
1-8 Credits (2-6P)
Provides dietetic interns with a minimum of 500 clock hours of supervised practice in community nutrition to include an emphasis in Cooperative Extension Service. Dietetic interns work under the the guidance of faculty and community nutrition professionals. May be repeated up to 8 credits. Consent of Instructor required. Restricted to: HNDS majors.
Prerequisite(s): Acceptance into Dietetic Internship.
Learning Outcomes
1. CRDN
2. 1 Select indicators of program quality and/or customer service and measure achievement of objectives.
3. CRDN
4. 2 Apply evidence-based guidelines, systematic reviews and scientific literature.
5. CRDN
6. 4 Evaluate emerging research for application in nutrition and dietetics practice.
7. CRDN
8. 5 Conduct projects using appropriate research methods, ethical procedures and data analysis.
9. CRDN
10. 14 Demonstrate advocacy on local, state or national legislative and regulatory issues or policies impacting the nutrition and dietetics profession.
11. CRDN
12. 1 Perform the Nutrition Care Process and use standardized nutrition language for individuals, groups and populations of differing ages and health status, in a variety of settings.
13. CRDN
14. 5 Develop nutrition education materials that are culturally and age appropriate and designed for the literacy level of the audience.
15. CES
16. Consult with organizations regarding food access for target populations.
17. CES
18. Evaluate the operation of Cooperative Extension Service nutrition programs in the areas of policies and procedures. 1
19. CES
20. Develop and deliver nutrition presentations to client/consumer audiences on various topics related to client/consumer needs. 1
21. CES
22. Ensure cultural relevancy and appropriateness of nutrition education. 1
23. CES
24. Assess educational needs and provide nutrition counseling based on individual needs, knowledge, medical needs, and socioeconomic status.

NUTR 5630. Community Nutrition for Dietetic Interns
3 Credits (3)
Advanced topics in community nutrition to include conducting community nutrition needs assessments, program planning and grant writing. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: HNDS majors.
Prerequisite(s): Acceptance into Dietetic Internship.
Learning Outcomes
1. CRDN
2. 1 Select indicators of program quality and/or customer service and measure achievement of objectives.
3. CRDN
4. 2 Apply evidence-based guidelines, systematic reviews and scientific literature.
5. CRDN
6. 4 Evaluate emerging research for application in nutrition and dietetics practice.
7. CRDN
8. 5 Conduct projects using appropriate research methods, ethical procedures and data analysis.
9. CRDN
10. 14 Demonstrate advocacy on local, state or national legislative and regulatory issues or policies impacting the nutrition and dietetics profession.
11. CRDN
12. 1 Perform the Nutrition Care Process and use standardized nutrition language for individuals, groups and populations of differing ages and health status, in a variety of settings.
13. CRDN
14. 5 Develop nutrition education materials that are culturally and age appropriate and designed for the literacy level of the audience.
15. CES
16. Consult with organizations regarding food access for target populations.
17. CES
18. Ensure cultural relevancy and appropriateness of nutrition education.

NUTR 5640. DI SUP PRACT FS MGT
1-5 Credits (2-10P)
Provides dietetic interns with a minimum of 300 clock hours of supervised practice in foodservice management. Dietetic interns work under the guidance of faculty and foodservice management professionals. Students must complete a total of 4 credit hours of NUTR 5640. May be repeated up to 5 credits. Consent of Instructor required. Restricted to: HNDS majors.
Prerequisite(s): Acceptance into Dietetic Internship.

NUTR 5650. Foodservice Management for Dietetic Interns
3 Credits (3)
Advanced topics in foodservice systems management to include business planning and marketing. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: HNDS majors.
Prerequisite(s): Acceptance into Dietetic Internship.
Learning Outcomes
1. CRDN
2. 2: Demonstrate professional writing skills in preparing professional communications.
3. CRDN
4. 15: Practice and/or role play mentoring and precepting others.
5. CRDN
6. 4: Design, implement and evaluate presentations to target audiences.
7. CRDN
8. 3: Demonstrate active participation, teamwork and contributions in group setting.
9. CRDN
10. 7: Apply leadership skills to achieve desired outcomes.
11. CRDN
12. 8: Demonstrate negotiation skills.
13. CRDN
14. 4: Apply current informatics technology to develop, store, retrieve and disseminate information and data.
15. CRDN
16. 6: Analyze quality, financial and productivity data for use in planning.
17. CRDN
18. 7: Conduct feasibility studies for products, programs, or services with consideration of costs and benefits.1
19. CRDN
20. 8: Develop a plan to provide or develop a product, program, or service that includes a budget, staffing needs, equipment and supplies.

NUTR 5660. Dietetic Internship: Supervised Practice in Clinical Dietetics
1-8 Credits (2-16P)
Provides dietetic interns with a minimum of 500 clock hours of supervised practice in clinical dietetics. Dietetic interns work under the guidance of faculty and dietetics professionals. May be repeated up to 8 credits. Consent of Instructor required. Restricted to: HNDS majors.
Prerequisite(s): Acceptance into Dietetic Internship.
Learning Outcomes
1. CRDN
2. 1 Select indicators of program quality and/or customer service and measure achievement of objectives.
3. CRDN
4. 4 Function as a member of interprofessional teams.
5. CRDN
6. 11 Show cultural competence/sensitivity in interactions with clients, colleagues and staff.
7. CRDN
8. 1 Perform the Nutrition Care Process and use standardized nutrition language for individuals, groups and populations of differing ages and health status, in a variety of settings.
9. CRDN
10. 2 Conduct nutrition focused physical exams.
11. CRDN
12. 3 Demonstrate effective communication skills for clinical and customer services in a variety of formats

NUTR 5670. Nutrition Care Process for Dietetic Interns
3 Credits (3)
Advanced topics in nutrition care process and model to include medical nutrition therapy and evidence-based research and outcomes assessment in clinical dietetics. Consent of Instructor required.
Prerequisite(s): Acceptance into Dietetic Internship.Restricted to: HNDS majors.
Learning Outcomes
1. CRDN
2. 2: Apply evidence-based guidelines, systematic reviews and scientific literature.
3. CRDN
4. 3: Justify programs, products, services and care using appropriate evidence or data.
5. CRDN
6. 4: Evaluate emerging research for application in nutrition and diet.
7. CRDN
8. 4 Evaluate emerging research for application in dietetics practice.
9. CRDN
10. 2 Demonstrate professional writing skills in preparing professional communication. Perform the nutrition care process and use standardized nutrition language for individuals, groups, and populations of differing ages and health status, in a variety of settings.
11. CRND
12. 2 Conduct nutrition focused physical exams.

NUTR 5680. Review Course for National RD Exam
3 Credits (3)
Completion of dietetic internship portfolio and preparation for the national registration examination for dietitians. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: exclude HNDS majors.
Prerequisite(s): Acceptance into Dietetic Internship.
Learning Outcomes
1. Demonstrate readiness to take the National Registration Examination for Dietitians.
2. Completion of all requirements of the NMSU Dietetic Internship.
3. Completion of all requirements to receive a Master of Science in Family Consumer Sciences from New Mexico State University

NUTR 5991. Special Research Programs
1-4 Credits (1-4)
Individual investigations either analytical or experimental. Maximum of 4 credits per semester and no more than 6 credits toward a degree. May be repeated up to 6 credits.
Prerequisite(s): Graduate Student.
Learning Outcomes
1. Develop analytical or experimental research skills in the areas of human nutrition and dietetics.

NUTR 5996. Special Topics
1-4 Credits (1-4)
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.
Prerequisite(s): Graduate student.

Learning Outcomes

1. Evaluate issues surrounding advanced nutrition and dietetics topics.

OECS-COMPUTER TECHNOLOGY

OECS 105. Introduction to Information Technology
3 Credits (3)
Examination of information systems and their impact on commerce, education, and personal activities. Utilization of productivity tools for communication, data analysis, information management and decision-making.

Learning Outcomes

1. Describe the social impact of information literacy and systems in relation to commerce, education, and personal activities.
2. Explain how to use the information resources legally, safely, and responsibly in relation to ethical, security, and privacy issues.
3. Evaluate bias, accuracy and relevance of information and its sources.
4. Use productivity tools for communications, data analysis, information management and decision-making.
5. Describe and use current information systems and technologies.

OECS 110. Introduction to Power Point
1-3 Credits (1-3)
An introduction to Power Point software to develop business presentations. Includes concepts of basic presentation methods and graphic design principles. Students will create and deliver presentations using text, charts, digitized images, and sound. Restricted to Community Colleges campuses only.

OECS 128. Operating Systems Linux/Unix
3 Credits (3)
Installation, configuration, and use of Linux/Unix operating system software and utilities including hardware management, file management, use of command line, and scripting. Restricted to: Community Colleges only.

OECS 145. Mobile Application Development
1-3 Credits (1-3)
Introduction to elements of mobile application coding including concepts, design strategies, tools needed to create, test and deploy applications for mobile devices. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

OECS 155. Special Topics - Introductory Computer Technology
0.5-4 Credits (.5-4)
Topics to be announced in the Schedule of Classes. May be repeated up to 8 credits.

OECS 192. C++ Programming I
3 Credits (3)
Development of skills in programming using the C++ programming language. Restricted to: Community Colleges only.

OECS 204. Linux Operating System
1-3 Credits
Install and configure the Linux operating system on X86 systems. Covers issues involved in maintaining operating system, networking, creating and managing users, and installing and updating software. General procedures for working with operating system includes maintaining disk space, preserving system security, and other related topics. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.

OECS 208. Internet Applications
1-3 Credits
Survey of the Internet to include e-mail, file transfer, current search techniques, the World Wide Web and basic Web page development. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.

OECS 209. Computer Graphic Arts
1-3 Credits
Basic graphics composition using computer programs to include editing and manipulating graphic images, clip-art, and printing of pictures. May be repeated for a maximum of 6 credits under different subtitles listed in the Schedule of Classes.
Prerequisite: OECS 105, BCIS 1110, or OECS 101.

OECS 211. Word Processing Applications
1-3 Credits
Basic word processing to include composing, editing, formatting, and printing of documents. May be repeated under different subtitles listed in the Schedule of Classes for a maximum of 6 credits.
Prerequisites: BCIS 1110 or OECS 105.

OECS 215. Spreadsheet Applications
1-3 Credits
Use of spreadsheets to include graphics and business applications. May be repeated for a maximum of 6 credits.
Prerequisites: BCIS 1110 or OECS 105.

OECS 220. Database Application and Design
1-3 Credits
Creating, sorting, and searching of single and multifile databases to include report generation and programming database commands. May be repeated for a maximum of 6 credits under different subtitles listed in the Schedule of Classes. Restricted to: Community Colleges only.
Prerequisite(s): BCIS 1110 OR E T 120 OR E T 122 OR OECS 105.

OECS 221. Internship I
1-3 Credits
Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships may be paid or unpaid. Students are supervised/evaluated by both the employer and the instructor. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OECS majors. Graded: S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.
Prerequisite(s): Consent of instructor.

OECS 222. Internship II
1-3 Credits
Continuation of OECS 221. Each credit requires specified number of hours of on-the-job work experience. May be repeated up to 3 credits. Consent of Instructor required. Restricted to: OECS majors. Graded: S/U Grading (S/U, Audit). Restricted to Community Colleges campuses only.
Prerequisite(s): OECS 221 and consent of instructor.

OECS 230. Data Communications and Networks I
1-3 Credits
Definition of data communication; survey of hardware applications and teleprocessor software; examination and design of networks. May be repeated for a maximum of 6 credits.
Prerequisite: OECS 185.

OECS 234. Linux Server
3-4 Credits (3-4)
This course addresses the implementation and support needs of IT professionals that are planning to deploy and support Linux Server(s). It provides in-depth, hands-on training for planning, implementation, management and support of Linux networking services. May be repeated up to 8 credits.

Prerequisite(s)/Corequisite(s): OECS 204. Restricted to: OECS majors. Restricted to Community Colleges campuses only.

OECS 235. Structured Query Language (SQL)
1-3 Credits
Installation, configuration, administration, and troubleshooting of SQL client/server database management system. May be repeated up to 3 credits.
Prerequisite(s)/Corequisite(s): OECS 220. Restricted to Community Colleges campuses only.

OECS 237. Windows Server
3-4 Credits (3-4)
This course addresses the implementation and support needs of IT professionals that are planning to deploy and support Microsoft Windows Server Active Directory Domain Services in medium to large businesses. It provides in-depth, hands-on training for Information Technology (IT) professionals responsible for the planning, implementation, management, and support of Windows Active Directory services. May be repeated up to 4 credits.
Prerequisite(s)/Corequisite(s): OECS 207. Restricted to Community Colleges campuses only.

OECS 253. Applied Data Analysis and Management
3 Credits (3)
Applied use of advanced spreadsheet tools for data analysis and database tools for data and information management. Connect emerging topics in business to tools used in analyzing data and making raw data useful for business decision making.
Prerequisite: BCIS 1110.
Learning Outcomes
1. Manage, integrate, and analyze data with data tools.
2. Generate and summarize data.
3. Use tools for business projections, comparisons, trends, and informed decisions.
4. Create advanced queries and enhance table design.
5. Use form tools and create custom forms.
6. Use automation tools for efficiency.
7. Secure and maintain data.
8. Plan, research, create, and revise spreadsheets and databases for a specific business application.
9. Discuss emerging topics in business related to data analysis and mangement.

OECS 255. Special Topics
1-4 Credits
Topics to be announced in the Schedule of Classes.

OECS 261. Introduction to Networks
3-4 Credits (3-4)
Introduction to networking principles including the practical and conceptual skills for understanding basic networking, planning and designing networks, implementing IP addressing schemes, examining the OSI and TCP/IP layers, and performing basic configurations for routers and switches. Aligns to the first course of the Cisco Networking Academy CCNA curriculum. Restricted to Community Colleges campuses only.

OECS 262. Essentials of Routing and Switching
3-4 Credits (3-4)
Examination of the architecture, components, and operations of routers and switches in a small network. Student will learn how to configure, verify and troubleshoot: routers and switches, static routing, default routing, VLANs, and ACLs. Aligns to the second course of the Cisco Networking Academy CCNA curriculum. May be repeated up to 4 credits.
Prerequisite(s)/Corequisite(s): OECS 261. Restricted to Community Colleges campuses only.

OECS 263. Network Fundamentals
3-4 Credits (3-4)
Fundamentals of networking architecture, components, and operations including practical and conceptual skills using routers and switches. Student will learn how to configure, verify and troubleshoot static routing, default routing, VLANs, and ACLs. This course aligns to the third course of the Cisco Networking Academy CCNA curriculum. May be repeated up to 4 credits.
Prerequisite(s)/Corequisite(s): OECS 262. Restricted to Community Colleges campuses only.

OECS 264. Network Routing Protocols
3-4 Credits (3-4)
Fundamentals of routing protocols for troubleshooting advanced network operations. Covers common networking issues such as RIP, OSPF, and EIGRP for IPv4 and IPv6 networks. This course aligns to the fourth course of the Cisco Networking Academy CCNA curriculum. May be repeated up to 4 credits.
Prerequisite(s)/Corequisite(s): OECS 263. Restricted to Community Colleges campuses only.

OECS 269. Network Security
3-4 Credits (3-4)
Fundamentals of design and implementation of network security solutions that will reduce the risk of system vulnerability. May be repeated up to 8 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): OECS 204 or OECS 207 or OECS 261 or consent of instructor.

OECS 275. PC Maintenance and Repair II
1-3 Credits
Continuation of OECS 185. May be repeated up to 6 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): OECS 185.

OECS 290. Computer Technology Capstone
1-3 Credits
Refines skills learned in the OECS program. Culminates in a review and practice of advanced software applications. May be repeated up to 3 credits. Restricted to: OECS & OECT majors. Restricted to Community Colleges campuses only.
Prerequisite(s): (OECS 125, OECS 128, OECS 207, OR OECS 203) AND (OECS 185 OR E T 283).

OECS 299. Independent Study
1-3 Credits
Specific subjects to be determined based on need. Restricted to: Community Colleges only.

OETS-TECHNICAL STUDIES

OETS 100. Industrial/Construction Safety
2 Credits (2)
Covers safety issues such as PPE, BBP, ladder safety,, RTK, HazCom, MSDS and information about safety organizations such as OSHA, NIOSH, NFPA, National Safety Council. Community Colleges only. Restricted to Dona Ana and Carlsbad campuses.

OETS 102. Career Readiness Certification Preparation
1 Credit (1)
This course is designed to prepare students to successfully obtain Career Readiness Certifications in all areas and at the appropriate levels for their

program of study. Graded: S/U Grading (S/U, Audit). May be repeated up to 3 credits. S/U Grading (S/U, Audit).

OETS 103. Technical Career Skills
4 Credits (4)
This course will be project-based and will encompass writing, presentation, math, reading, and critical thinking skills applied in a technical environment. Restricted to: Community Colleges only.

OETS 104. Basic Mathematics for Technicians
4 Credits (4)
Fundamental mathematical concepts and computations including measurement, ratio and proportions, and pre-algebra as it relates to technical programs.
Prerequisite: appropriate placement test score.

OETS 117. Writing for Technicians
3 Credits (3)
Instruction in the skills for developing clear, written descriptions of processes and procedures used by technicians in various fields. Emphasis on correct grammar, logical organization, and receiving audience. Focuses on clarity, structure, and concise writing methods. Does not substitute for ENGL 111G. Restricted to: Community Colleges only.

OETS 118. Mathematics for Technicians
3 Credits (2+2P)
Analysis and problem solving of technical problems using measuring instruments and techniques of arithmetic, algebra, geometry, and trigonometry. Restricted to Community Colleges campuses only.
Prerequisite: Grade of "C-" or better in OETS 104 or CCDM 103 N, or appropriate placement test score.
Learning Outcomes
1. Use mathematics and problem solving techniques to analyze and find answers to money and financial problems.
2. Use estimations to solve problems and check answers to make sure they are reasonable.
3. Analyze and solve problems using the tools and techniques of algebra.
4. Use geometry to find circumference, perimeters, areas and volumes of various plane and solid materials and spaces.
5. Use trigonometry to solve problems involving triangular shapes.
6. Use systems of equations and quadratic equations to solve technical problems.

OETS 120. Business Fundamentals
3 Credits (3)
Instruction in the skills for basic business concepts used by technicians in various fields. Emphasis placed on basic business concepts; business ownership including marketing, management, accounting, and customer services; interpersonal communication; and basic computer concepts including word processing, spreadsheets, and presentation software. Restricted to Community Colleges campuses only.

OETS 255. Special Topics Technical Studies
1-6 Credits
Topics to be announced in the Schedule of Classes. Restricted to: Community Colleges only.
Prerequisite(s): Consent of instructor.

PHED-PHYSICAL EDUCATION

PHED 1110. Dance:
1 Credit (1)
Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

PHED 1230. Individual Sport:
1 Credit (1)
Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

PHED 1290. Team Sport:
1 Credit (1)
Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

PHED 1310. Swim I:
1 Credit (1)
Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

PHED 1320. Aqua Fit:
1 Credit (1)
Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

PHED 1330. Lifeguarding
2 Credits (2)
Skills training for a nonsurf lifeguard. Course will include Standard First Aid and CPR certification. May be repeated up to 2 credits.
Learning Outcomes
1. To help the student become aware of the common hazards associated with various types of aquatic facilities and to develop the knowledge and skills to eliminate or minimize such hazards.
2. To help the student develop the skills necessary to recognize a person in distress or in a drowning situation and to effectively rescue that person.
3. To help the student understand their responsibility to their employer, fellow employees and especially to the patrons of their facility.
4. To provide explanations, demonstrations, practice and review of the rescue skills essential for lifeguarding.
5. To instill in the students an understanding and appreciation for the responsibilities, swimming skills and additional duties of lifeguarding.
6. To develop more advance swimming skills to assist in a water rescue.

PHED 1410. Yoga:
1 Credit (1)
Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

PHED 1430. Pilates:
1 Credit (1)

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1510. Training:
1 Credit (1)

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1620. Fitness:
1 Credit (1)

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1630. Career Fitness:
1 Credit (1)

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 10 credits.

Learning Outcomes

1. Varies

PHED 1670. Aerobics:
1 Credit (1)

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 1830. Running:
1 Credit (1)

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 4 credits.

Learning Outcomes

1. Varies

PHED 1910. Outdoor Experience
1 Credit (1)

Individual sections vary based on topic content; "audience"; type or level of participation. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHED 2120. Healthy Life Skills and Personal Wellness
3 Credits (3)

This course has been designed to provide students with the knowledge and skills necessary to cultivate a holistic approach to well-being by giving students effective strategies for achieving and maintaining a balanced and fulfilling life, including coping skills to navigate the challenges of college life. Through a combination of lectures, discussions, activities, and self-reflection, students will explore various dimensions of wellness and develop practical strategies to enhance their overall health and vitality.

Learning Outcomes

1. Explain the principles of wellness, emphasizing the significance of exercise, nutrition, and wellbeing for sustaining health throughout life.
2. Describe effective strategies and methodologies to enhance wellness.
3. Develop individualized goals pertaining to various facets of wellness to promote personal growth and fulfillment.
4. Evaluate personal wellness levels to establish baseline and monitor progress towards specific goals across diverse dimensions of well-being.
5. Participate in a self-tailored wellness regimen, integrating introspective assessments to monitor personal progress effectively.
6. Critically assess and refine wellness plans based on alterations in wellness evaluations and personal reflections, ensuring continuous alignment with evolving health and fitness aspirations.

PHED 2996. Special Topics
1-3 Credits (1-3)

Specific subjects to be announced in the Schedule of Classes. Each offering will carry appropriate subtitle. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHIL-PHILOSOPHY

PHIL 1115G. Introduction to Philosophy
3 Credits (3)

In this course, students will be introduced to some of the key questions of philosophy through the study of classical and contemporary thinkers. Some of the questions students might consider are: Do we have free will? What is knowledge? What is the mind? What are our moral obligations to others? Students will engage with and learn to critically assess various philosophical approaches to such questions.

Learning Outcomes

1. Comprehend and differentiate between various philosophical approaches to questions within fields such as metaphysics, epistemology, ethics, and aesthetics.
2. Critically evaluate various philosophical arguments and positions.

PHIL 1120G. Logic, Reasoning, & Critical Thinking
3 Credits (3)

The purpose of this course is to teach students how to analyze, critique, and construct arguments.The course includes an introductory survey of important logical concepts and tools needed for argument analysis. These concepts and tools will be use to examine select philosophical and scholarly texts.

Learning Outcomes

1. Comprehend components of arguments.
2. Acquire a general understanding of the essential logical concepts needed for argument analysis, such as validity, soundness, deduction, and induction.
3. Critically assess arguments with an aim toward identifying what constitutes effective and reasonable argument strategies.
4. Learn to identify common logical fallacies.
5. Apply knowledge of argumentation principles to philosophical and scholarly texts

PHIL 1140G. Philosophy and World Religions
3 Credits (3)

A philosophical enquiry into the religious life; an introduction to philosophical questions about religions focused on consideration of some of the traditional approaches to God and what it means to be religious. May be repeated up to 3 credits.

Learning Outcomes

1. Identify and describe philosophical theories regarding religion.
2. Develop and enhance your critical thinking skills, particularly in the evaluation of arguments about the truth or applicability of particular religious or secular viewpoints.
3. Analyze the teachings of world religions by describing their similarities and differences.
4. Explain the philosophical beliefs, practices, and ethical standards of the major world religions as well as emerging religious movements.
5. Explain how each religion evolved historically, philosophically, and spiritually as well as the contemporary ideas and practices each religion.

PHIL 1145G. Philosophy, Law, and Ethics
3 Credits (3)
An introduction to practical problems in moral, social, political, and legal philosophy. Topics to be discussed may include ecology, animal rights, pornography, hate speech on campus, same-sex marriage, justice, abortion, terrorism, treatment of illegal immigrants, and New Mexican Aboriginal Peoples' land claims.

Learning Outcomes

1. The aim of this course is to familiarize students with some of the ethical and philosophical issues that arise in connection with laws/legality in general and criminal and constitutional law in the U.S. in particular.
2. It examines issues in moral philosophy, political philosophy, and philosophy of law.
3. A question to which we repeatedly return is whether the law does and/or ought to have some necessary relation to the demands of justice and morality. Among the topics we'll cover are: What is a law? Natural law vs. positive law and legal positivism vs. natural law theory; Utilitarian, divine command, Kantian, and natural law theories of moral rightness/wrongness; The distinction between the normative and the non-normative; Is there a moral duty to obey the law? Plato's Crito and R.P. Wolff's "philosophical anarchism."; J.S. Mill and classical liberalism; Mill's "harm principle" ("the state should restrict the liberty of competent adults via the criminal law only to prevent them from wrongfully harming other persons"); Legal paternalism. Should the state make it harder for citizens to smoke tobacco and/or marijuana, for their own good?; Should voluntary euthanasia be legal? Is there a constitutional "right to die"?; How should judges determine the meaning of vaguely worded constitutional requirements (e.g. "free exercise of religion," no "unreasonable search and seizure," no "cruel and unusual punishment," etc.)? Originalist vs. nonoriginalist approaches; The First Amendment, free speech, and freedom of religion; The death penalty and "cruel and unusual punishment"; The insanity defense in criminal law; Does the 14th Amendment's requirement of "equal protection" under the law compel states to recognize same sex marriage?; The Fourth Amendment and its prohibition of "unreasonable search and seizure."

PHIL 2110G. Introduction to Ethics
3 Credits (3)
This course introduces students to the philosophical study of morality and will explore questions concerning our human obligations to others and related issues. Students may be asked to relate various approaches to ethics to present-day ethical debates and their own lives.

Learning Outcomes

1. Differential between various ethical theories, which may include virtue ethics, deontology, and consequentialism.
2. Critically evaluate various ethical theories and positions.

PHIL 2230G. Philosophical Thought
3 Credits (3)
In this course, students will grapple with some of the key questions of philosophy through the study of classical and contemporary thinkers. Students will become familiar with the perennial problems in subfields of philosophy such as metaphysics, epistemology, ethics, and aesthetics. They will learn to approach these problems both critically and sympathetically.

Learning Outcomes

1. Comprehend and differentiate between various philosophical approaches to questions within fields such as metaphysics, epistemology, ethics, and aesthetics.
2. Critically evaluate various philosophical arguments and positions.
3. Identify the differences that characterize the major subfields of philosophy.

PHIL 305. Philosophy and Literature
3 Credits (3)
Examination of philosophical ideas as presented in selected literary works and literary criticism.

PHIL 306. Philosophy Through Film
3 Credits (3)
An exploration of a range of philosophical issues through the use of film. Topics include personal identity and memory, faith and the problem of evil, free will and moral responsibility, and the meaning of life. Films may include The Prestige, Memento, The Third Man, A Clockwork Orange, Fight Club, and Synecdoche, New York.

PHIL 312. Formal Logic
3 Credits (3)
Introduction to symbolic logic and its application in the analysis of arguments in scientific and ordinary discourse.

PHIL 315. Philosophy of Language
3 Credits (3)
A critical examination of philosophical inquiries into the syntactic, semantic, and pragmatic dimensions of language.

PHIL 316. Philosophy of Mathematics
3 Credits (3)
Survey of traditional philosophical problems and views concerning the nature of mathematics including such questions as: What is the nature of mathematical knowledge? What is mathematical truth? What is a number? What is proof? What is the relationship between logic and mathematics?

PHIL 320. Social and Political Philosophy
3 Credits (3)
This course critically examines such fundamental concepts as liberty, equality and human rights.

PHIL 322. Environmental Ethics
3 Credits (3)
Explores the ethical and topical issues raised by mining and grazing, air and water pollution, factory farming, global warming, and treatment of animals. It also studies some recent ecological movements such as ecofeminism, social ecology, and deep ecology.

PHIL 328. Applied Ethics
3 Credits (3)

Examines the implications of utilitarianism, Kantian ethics, natural law theory, and other moral theories for controversial moral issues such as the death penalty, euthanasia, abortion, genetic engineering, gay marriage, affirmative action, and pornography.

PHIL 331. Philosophy of Religion
3 Credits (3)
The nature, fundamental concepts, and problems of religion. Emphasis on the significance of religion for creative and practical value.

PHIL 332. Ethics and Global Poverty
3 Credits (3)
Philosophical scrutiny of and moral reflection on various aspects of global poverty and foreign aid. For example: Is poverty fundamentally a lack of income, or can it be understood as a failure to meet basic needs, or as a lack of valuable freedom? Do human rights exist? What, if any, are the moral obligations of rich countries to poor countries? Can foreign aid be immoral? How should the answers to these questions influence public policy? Restricted to: Main campus only.

PHIL 341. Ancient Philosophy
3 Credits (3)
Introduction to the philosophies of the pre-Socratics, Socrates, Plato, Aristotle, with brief discussion of the Epicureans and Stoics.

PHIL 344. Modern Philosophy
3 Credits (3)
Foundations of contemporary thought: introduction to the philosophies of Descartes, Bacon, Spinoza, Leibniz, Locke, Berkeley, Hume, Kant, and Hegel.

PHIL 346. Philosophy of Mind
3 Credits (3)
Examination of some of the most influential accounts of the mind, focusing on such issues as the relation between the mind and the body, mental causation and consciousness.

PHIL 350. Epistemology
3 Credits (3)
Introduction to epistemology. The philosophical critique of alleged ways of knowing. An examination of the nature of truth.

PHIL 351. Philosophy of Science
3 Credits (3)
Philosophical examination of the methodology of science. The logical, metaphysical, epistemological, and ethical critique of science and its impact on human affairs.

PHIL 361. Special Topics
3 Credits (3)
Specific subjects announced in the Schedule of Classes. May be repeated for a maximum of 9 credits.

PHIL 363. Independent Studies
1-3 Credits
For students with some background in philosophy. Independent work in a specific area. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

PHIL 373. Ethical Theory
3 Credits (3)
The critical examination of the justification of ethical theories with particular attention to the language of moral discourse.

PHIL 376. Philosophy of Law
3 Credits (3)
Ethical, logical, and epistemological implications of law, together with an analysis of the rhetoric of legal practice.

PHIL 380. Metaphysics
3 Credits (3)
Introduction to metaphysics: a treatment of such issues as the meaning of existence, the mind-body problem, the problem of universals, and free will versus determinism.

PHIL 385. Human Nature and the Good Life
3 Credits (3)
An examination of some of the most historically and philosophically influential conceptions of human nature and corresponding accounts of the good life.

PHIL 397. Existentialism
3 Credits (3)
The origins of existentialist thought in philosophy and literature, including the thought of Nietzsche, Kierkegaard, Dostoyevsky, Camus, and Sartre. The course covers topics in ethics and political philosophy, metaphysics, philosophical psychology, philosophy of religion, and other sub-disciplines of philosophy.

PHIL 435. Internship in Philosophy and Law
3 Credits (3)
Supervised hands-on experience for Justice, Political Philosophy, and Law majors to gain professional expertise of the law working with lawyers or judges in law offices, court rooms, and other professional legal settings. Student must be in junior and above standing to enroll. May be repeated up to 6 credits.
Prerequisite: Completion of 12 Philosophy credits; 2.5 GPA;.
Learning Outcomes
1. Demonstrate practical knowledge, analytical ability and critical thinking of professional legal work by becoming familiar with such legal tasks as: preparing pleadings; preparing discovery, responding to discovery; controlling and organizing documents, information; preparing trial notebooks; preparing motions; contacting and responding to clients, witnesses, courts.

PHIL 448. Writing Philosophy
3 Credits (3)
A workshop on writing philosophy papers. Includes how to read and understand philosophical writing, organize a paper effectively, present a clear and forceful argument, and avoid common mistakes.
Prerequisite(s): completed 18 hours of philosophy credit.

PHIL 451. AI, Ethics, and Society
3 Credits (3)
This course explores the ethical dimensions of current and emerging applications of artificial intelligence. Students will engage with key philosophical questions, including the definition of AI and the moral status of advanced AI agents. The course examines pressing societal issues, such as labor automation and technological unemployment, ownership and distributive justice in AI development, the influence of AI on media disinformation, and concerns surrounding plagiarism. Future-oriented topics will address the possibility of AI exceeding human cognitive abilities and the implications of the Technological Singularity hypothesis. Through critical readings, discussion, and analytical writing, students will develop a robust framework for evaluating the ethical challenges posed by AI technologies.
Learning Outcomes
1. Engage philosophical theories and methods to critically analyze AI-related issues.
2. Evaluate competing moral and political arguments about the development and use of AI.
3. Formulate arguments in valid form about responsibility, fairness, and power in algorithmic systems.

4. Critically interpret contemporary academic literature on ethics and technology.
5. Produce philosophical essays that integrate normative theory and applied analysis.

PHIL 463. Independent Studies
1-3 Credits
For students with a strong background in philosophy. Independent work in a specific area. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

PHIL 532. Advance Studies in Ethics and Global Poverty
3 Credits (3)
Advanced philosophical scrutiny of and moral reflection on various aspects of global poverty and foreign aid. For example: Is poverty fundamentally a lack of income, or can it be understood as a failure to meet basic needs, or as a lack of valuable freedom? Do human rights exist? What, if any, are the moral obligations of rich countries to poor countries? Can foreign aid be immoral? How should the answers to these questions influence public policy? Restricted to: Main campus only.

PHLS-PUBLIC HEALTH SCIENCES

PHLS 1110G. Personal Health & Wellness
3 Credits (3)
A holistic and multi-disciplinary approach towards promoting positive lifestyles. Special emphasis is placed on major problems that have greatest significance to personal and community health. Topics to include nutrition, stress management, fitness, aging, sexuality, drug education, and others.
Learning Outcomes
1. Students will identify, describe and explain human health behaviors and how they are influenced by social structures, institutions, and processes within the contexts of complex and diverse communities. Students should: Develop an understanding of self and the world by examining content and processes used by social and behavioral sciences to discover, describe, explain, and predict human behaviors and social systems.
2. Students will articulate how beliefs, assumptions, and values are influenced by factors such as politics, geography, economics, culture, biology, history, and social institutions. Students should: Enhance knowledge of social and cultural institutions and the values of their society and other societies and cultures in the world.
3. Students will describe ongoing reciprocal interactions among self, society, and the environment. Students should: Understand the interdependent nature of the individual, family/social group, and society in shaping human behavior and determining quality of life.
4. Students will apply the knowledge base of the social and behavioral sciences to identify, describe, explain, and critically evaluate relevant issues, ethical dilemmas, and arguments. Students should: Articulate their role in a global context and develop an awareness and appreciation for diverse value systems in order to understand how to be good citizens who can critically examine and work toward quality of life within a framework of understanding and justice.

PHLS 1110H. Personal Health and Wellness Honors
3 Credits (3)
A holistic and multi-disciplinary approach towards promoting positive lifestyles. Special emphasis is placed on major problems that have greatest significance to personal and community health. Topics to include nutrition, stress management, fitness, aging, sexuality, drug education, and others. In addition students will complete an experiential learning component or project.
Learning Outcomes
1. Students will identify, describe and explain human health behaviors and how they are influenced by social structures, institutions, and processes within the contexts of complex and diverse communities. Students should: Develop an understanding of self and the world by examining content and processes used by social and behavioral sciences to discover, describe, explain, and predict human behaviors and social systems.
2. Students will articulate how beliefs, assumptions, and values are influenced by factors such as politics, geography, economics, culture, biology, history, and social institutions. Students should: Enhance knowledge of social and cultural institutions and the values of their society and other societies and cultures in the world.
3. Students will describe ongoing reciprocal interactions among self, society, and the environment. Students should: Understand the interdependent nature of the individual, family/social group, and society in shaping human behavior and determining quality of life.
4. Students will apply the knowledge base of the social and behavioral sciences to identify, describe, explain, and critically evaluate relevant issues, ethical dilemmas, and arguments. Students should: Articulate their role in a global context and develop an awareness and appreciation for diverse value systems in order to understand how to be good citizens who can critically examine and work toward quality of life within a framework of understanding and justice.

PHLS 2110. Foundations of Health Education
3 Credits (3)
Role and responsibility of the health educator with emphasis on small group dynamics, oral and written communication skills, building community coalitions and introduction to grant writing. Taught with PHLS 3210. Cannot receive credit for both PHLS 2110 and PHLS 3210.
Prerequisite: PHLS 1110G or consent of instructor.
Learning Outcomes
1. Define health, three levels of prevention, health education and health promotion, and describe the major determinants of health.
2. Describe the 7 major areas of responsibility, major competencies and sub-competencies of a professional health educator and the CHES's possible roles in various community health settings.
3. Describe and examine the historical context and development of the profession of health education.
4. Identify and critique major processes and practices of health education programming.
5. Describe the steps involved in conducting needs assessments, program and intervention planning, implementation, and program evaluation.
6. Identify, examine and describe elected health behavior change theories and models and explore possible applications in health education practice.
7. Describe and discuss the process of community mobilization and building of a community coalition.
8. Identify health issues and describe effective methods/strategies in health education advocacy.
9. Describe and discuss the future trends and issues in the professional preparation and practice of professional health educators. 1
10. Demonstrate effective and appropriate oral and written communication skills for health education professionals.

PHLS 2120. Essentials of Public Health
3 Credits (3)
The course will focus on principles and major areas if public health, including ecological and total personal concept of health care system, epidemiological approaches to disease prevention and control . Consent of Instructor required.
Learning Outcomes
1. Understand the sources of public health data, and how to interpret that information.
2. Access existing health related data.
3. Analyze health related data.
4. Identify populations for health education programs.
5. Incorporate data analysis and principles of community organization.
6. Interpret results from evaluation and research.
7. Infer implications from findings for future health–related activities.
8. Have a basic understanding of health topics faced by various populations.

PHLS 3110V. Human Sexuality
3 Credits (3)
Examination of human sexuality from a variety of perspectives: cultural, sociological, physiological and psychological. Issues examined from viewpoints such as gender, individual, family, and professional roles.
Learning Outcomes
1. Understand the cultural and historical inputs resulting in our current understanding of the human sexual experience.
2. Examine the early and modern researcher in the field of human sexuality, along with an overview of basic research skills.
3. Study gender roles and similarities and differences between men and women.
4. Examine male and female reproductive anatomy and the physiology of sexual arousal.
5. Identify the factors affecting love and attraction, and the development of relationships.
6. Discuss homophobia and the factors associated with negative attitudes toward homosexuality.
7. Identify and discuss current techniques of contraception along with fertility problems.
8. Discuss the sexual behavior of adults.
9. Examine the medical, relational, and stress factors related to sexual dysfunction. 1
10. Learn the facts and fallacies about sexually transmitted diseases. 1
11. Identify the continuum of behaviors related to paraphililias. 1
12. Examine sexual coercion and violence.

PHLS 3120V. Women's Health Issues
3 Credits (3)
A focus on the unique issues and problems that confront women today and how they affect the health of women. Crosslisted with: GNDR 381V. May be repeated up to 3 credits.

PHLS 3130V. Global Environmental Health Issues
3 Credits (3)
Introduction to global environmental health challenges in the 21st century with an emphasis on environmental problems as they affect public health and personal well-being.
Learning Outcomes
1. Discuss the major environmental health issues facing our global environment in the 21st century.
2. Discuss the status of our global environmental health.
3. Articulate basic concepts of environmental health and convey and understanding of their value and importance.
4. Discuss, define, and develop insight into the following terms and concepts as they relate to global environmental health: population dynamics, population control, the people-food predicament, impacts of growth on ecosystems, environmental disease, toxic substances, pests, pesticides, food quality, radiation, solid waste, and hazardous waste.
5. Specify common environmental hazards that pose risks to human health and safety.
6. Discuss global human population numbers and the impact on our global environmental health.
7. Describe federal and state regulatory programs, guidelines, and authorities that control environmental health issues.
8. Identify sources of reference research relevant to global environmental health.
9. Identify individual and human behaviors that foster or hinder the well-being of our global environmental health.

PHLS 3210. Foundations of Community Health Education
3 Credits (3)
This course introduces students to principles and practices of community health information, perspectives, and competencies necessary to promote health in various settings (e.g., community, school, workplace, and health care). The course explores concepts related to health and health education, including determinants of health, health equity, and various physical, mental, and environmental health conditions. The historical origins of the profession, the roles and responsibilities of community health educators, and the Certified Health Education Specialist competencies are examined. Equivalent to PHLS 2110 for prerequisite purposes.
Learning Outcomes
1. Define health, three levels of prevention, health education and health promotion, and describe the major determinants of health.
2. Describe the seven major areas of responsibility, major competencies and sub-competencies of a professional health educator and the CHES's possible roles in various community health settings.
3. Describe and examine the historical context and development of the profession of health education.
4. Identify and critique major processes and practices of health education programming.
5. Describe the steps involved in conducting needs assessment, program and intervention planning, implementation, and program evaluation.
6. Identify, examine and describe elected health behavior change theories and models and explore possible applications in health education practice.
7. Identify and describe governmental agency roles, and the ethical and economic dimensions of health education and promotion.
8. Identify health issues and describe effective methods/strategies in health education advocacy.
9. Describe and discuss the future trends and issues in the professional preparation and practice of professional health educators. 1
10. Demonstrate effective and appropriate oral and written communication skills for health education professionals.

PHLS 3220. Foundations of Public Health
3 Credits (3)

The course will focus on principles and major areas of public health, including ecological concepts of healthcare systems and epidemiological approaches to disease promotion and control. Equivalent to PHLS 2120 for prerequisites.

Learning Outcomes

1. Describe public health, including key terms, functions, and services.
2. Compare the differences between personal health and public health.
3. Describe analytical methods of public health, including basic principles of epidemiology and identify sources of statistics and data in public health.
4. Describe determinants of health from a global perspective, including environmental, social, cultural, behavioral, and biological factors.
5. Discuss concepts for prevention, detection, and control of infectious and chronic conditions.
6. Discuss the organization, financing, and delivery of medical and population-based US services with roles of quality, cost, access, and organizational structure in influencing population health.
7. Explain the most important health problems and issues facing our society.

PHLS 4130. Environmental Health
3 Credits (3)

Introduction to environmental health designed to address public health issues. Restricted to: PH,PHL majors.

Learning Outcomes

1. Define the major sources and types of environmental agents.
2. Discuss the transport and fate of these agents in the environment.
3. Identify the carriers or vectors that promote the transfer of these agents from the environment to the human.
4. Describe how these agents interact with biological systems and the mechanisms by which they exert adverse health effects.
5. Analyze public health problems using environmental health knowledge.
6. Evaluate and identify environmental health-related issues.

PHLS 4210. Methods of Community Health Education
3 Credits (3)

Responsibilities of health educators, analysis of social forces affecting health needs, application of wide range of health education methods and instructional media, and program implementation skills. Restricted to: Public Health majors.

Prerequisite: PHLS 3220 or PHLS 2120.

Learning Outcomes

1. Integrate two health education theories or models into community health education practice.
2. Identify two steps for conducting a training needs assessment.
3. Analyze training with different delivery methods.
4. Compare advocacy approaches for health issues.
5. Demonstrate methods for the preparation of materials to reach different audiences.

PHLS 4310. Biometrics and Health Research
3 Credits (3)

Critical analysis of community health research and related methodologies. Restricted to: Public Health majors.

Prerequisite: (MATH 1350G) or MATH 2350G or A ST 311.

Learning Outcomes

1. Compare and contrast a population versus a sample.
2. Explore data using appropriate graphs, charts, and tables.
3. Analyze data using descriptive statistics.
4. Formulate and test statistical hypotheses about population means and proportions.
5. Perform an ANOVA to compare multiple population means.
6. Compute and interpret the correlation between two continuous variables.
7. Distinguish between parametric and non-parametric methods.
8. Explain when to use non-parametric methods and why.

PHLS 4320. Epidemiology
3 Credits (3)

Epidemiologic approaches to disease prevention and control. Factors influencing health status. Restricted to: PHL majors.

Prerequisite: PHLS 3220 or PHLS 2120.

Learning Outcomes

1. Define key epidemiological terms and concepts, such as incidence, prevalence, morbidity, and mortality, and apply these concepts to analyze patterns and trends in disease occurrence and distribution.
2. Design and conduct basic epidemiological studies, including cohort, case-control, and cross-sectional studies, and interpret the results to assess associations between exposures and health outcomes.
3. Demonstrate proficiency in using statistical methods to analyze epidemiological data, including calculating measures of association (relative risk, odds ratio) and understanding their implications for public health research.
4. Critically evaluate epidemiological research articles, identify potential biases and limitations, and discuss the implications for public health practice and policy.

PHLS 4410. Administration of Health Programs
3 Credits (3)

Covers administrative responsibilities, organizational theory, strategic planning, and systems theory as applied to the administration of a variety of health programs. Restricted to: PHL majors.

Prerequisite: PHLS 3220, PHLS 2120, or consent of instructor.

Learning Outcomes

1. Compare types of public health leadership, motivation, and management skills needed for today's work environment.
2. Identify operational responsibilities, including processes for hiring, budgets, motivation, and performance management.
3. Discuss various systems thinking tools for strategic planning.
4. Develop systems planning strategies for a health program promoting collaborative efforts.
5. Compare the characteristics of the United States of America health system and health systems in other countries.

PHLS 4420. Health Program Planning
3 Credits (3)

Planning and development of community health education interventions for behavior change at the individual, family, social network levels of practice. Emphasis on applying program-planning models and designs into a grant-writing project. Restricted to: Public Health majors.

Prerequisite: PHLS 3210 or PHLS 2120 and PHLS 4430.

Learning Outcomes

1. Describe the foundational principles and history of health promotion and education, including the roles of planning in public health program development.
2. Conduct (and use data from) a comprehensive needs assessment to identify and plan to address health problems, risk factors, and priorities within a target population.

3. Apply health behavior theories and models, as well as a logic model or conceptual framework, to guide the planning process and design intervention strategies across individual, interpersonal, organizational, and community levels.
4. Discuss the roles of cultural competency and inclusivity in health programs, considering health literacy, social determinants, and community engagement.
5. Identify key stakeholders and build coalitions to support program planning, resource acquisition, and long-term sustainability.
6. Draft a written health program plan proposal integrating all components of the planning process, including budget and resource plans, timeline and implementation plans, staffing, and logistical considerations.

PHLS 4430. Theoretically-Based Interventions
3 Credits (3)
Identifying and developing interventions to problematic health-related behaviors. Restricted to: Public Health majors.
Prerequisite: PHLS 3220 or PHLS 2120.
Learning Outcomes
1. Describe the foremost behavioral theories.
2. Identify the main concepts contained in each of the foremost behavioral theories.
3. Design health promotion programs based on behavioral theory.
4. Identify the use of behavioral theories in product marketing, social marketing, and public service announcements.
5. Identify the necessary links among theory, research, and health promotion practice.

PHLS 4440. Health Program Evaluation and Research
3 Credits (3)
Covers the application of research and evaluation models for decision-making program and policy development of community health education interventions. Focus on the individual, family, and social network levels of practice.
Prerequisite: PHLS 4420.
Learning Outcomes
1. Discuss the concepts, language, methods, and applications of evaluation research.
2. Demonstrate the ability to search, review, and critically appraise evaluation research.
3. Develop a logic model for an intervention to guide evaluation.
4. Formulate clear and answerable research questions for evaluation.
5. Identify, modify, and/or develop appropriate measures of outcomes that are valid, reliable, and feasible.
6. Discuss ethical issues and potential bias in evaluation.
7. Describe how program evaluation results can be used to influence or impact policy.

PHLS 4510. Public Health Seminar in Community Health Education
1 Credit (1)
Critical analysis of issues in CHE and health care. Readings focus on social, economic, cultural, and political issues as they affect the profession and practice. Emphasis on future, local, national, and international health trends. Restricted to: Public Health majors. May be repeated up to 1 credit.
Prerequisite: PHLS 4320, PHLS 4420, and PHLS 4430 or consent of instructor.

PHLS 4515. Approaches to Community-Focused Public Health
3 Credits (3)
Introductory issues-focused course offering reading, writing, and active learning opportunities (including volunteering). Designed to challenge students toward innovative directions in community-focused public health. Select theories and professional practice areas will be emphasized, and students will practice public-friendly strategies relevant for our complex field.
Learning Outcomes
1. Articulate why, and how, a community problem of concern to them should be viewed as a public health issue (including applying a public health theory or model).
2. Discuss at least one way community-focused public health professionals approach identifying and working on public health issues.
3. Identify credible resources, including peer-reviewed sources as well as governmental and organizational reports and websites, and accurately and effectively use and share information from them with a variety of audiences.

PHLS 4610. Health Disparities: Determinants and Interventions
3 Credits (3)
Investigates: descriptions of health disparities and measurement issues; physical environmental factors, behavioral and emotional variables; impact of aging of the populations, increased racial and ethnic diversity, and technological developments; intervention strategies and evaluation results.
Learning Outcomes
1. Examine the impact of structural racism on health in the United States of America.
2. Identify populations who have systematically experienced greater obstacles to health based on their race or ethnicity, religion, socioeconomic status, gender, age, mental health, cognitive, sensory, or physical disability, sexual orientation or gender identity, geographic location, or other characteristics historically linked to discrimination or exclusion in the United States of America.
3. Identify social and structural determinants of health that influence health and health equity.
4. Examine the role that public health professionals can play in advancing health equity.
5. Examine social and structural barriers to health care access and utilization.
6. Explain cultural competence, cultural humility, cultural safety, and structural competence.
7. Discuss research and program designs in health equity research and practice.
8. Examine the role of social determinants of health in achieving health equity.
9. Advocate for policies that advance health equity.

PHLS 4620V. Cross-Cultural Aspects of Health
3 Credits (3)
An examination of health practices from a variety of cultural perspectives: communication, observation, research, and assimilation. Issues to be addressed will be examined from a number of viewpoints, such as individual, family, community, and professional roles. May be repeated up to 3 credits.

PHLS 4630. International Health Problems
3 Credits (3)

Comparison of domestic health programs and problems with those in other parts of the world; emphasis on political parameters and delivery processes. Additional attention is focused on the health issues of the U.S.-Mexico border. Taught with PHLS 5630.

Learning Outcomes

1. Identify many of the current authoritative sources of information about global health, as a potential aid for future educational, training, and research endeavors.
2. Cite examples of specific issues and case studies in global health.
3. Identify key features of global health.
4. Explain the complexities of global health issues.
5. Explain intervention strategies being used to attack problems in global health.

PHLS 4640. Rural Health Issues
3 Credits (3)

Comprehensive overview of rural health services with Southwestern United States and New Mexico focus. Taught with PHLS 5640.

Learning Outcomes

1. Compare and contrast the major perspectives on rural health.
2. Analyze the social, biological, psychological, and societal factors affecting the health of rural residents.
3. Critically analyze contemporary controversies, such as environmental contamination.
4. Evaluate current empirical research in understanding rural health challenges and resources.

PHLS 4650. Coping with Loss and Grief: A Cross-Cultural Perspective
3 Credits (3)

A cross-cultural perspective to death, loss and grief. Hospice philosophy of caring for the dying will be included. Taught with PHLS 5650.

Learning Outcomes

1. Compare and contrast the major theories in thanatology.
2. Analyze the biological, psychological, social, and societal factors affecting the dying process and attitudes towards death and dying.
3. Critically analyze contemporary controversies, for example, physician-assisted suicide.
4. Evaluate current empirical research in thanatology.

PHLS 4660. U.S.-Mexico Border Health Issues
3 Credits (3)

Interdisciplinary analysis of the impact of living conditions and health issues of communities along the U.S.-Mexico border and of the strategies and initiatives to address these issues. Problem-based learning, case analysis, lecture, guest speakers, computer based instruction, and field trips. Taught with PHLS 5660.

Learning Outcomes

1. Analyze the social, economic, cultural, and environmental determinants of health affecting communities along the U.S.–Mexico border using an interdisciplinary framework.
2. Evaluate public health strategies, binational policies, and community-based initiatives aimed at addressing health disparities and improving living conditions in border regions.
3. Develop evidence-informed recommendations for collaborative interventions that incorporate diverse stakeholder perspectives and respect cultural and contextual factors unique to the U.S.–Mexico border.

PHLS 4670. American Indian Health
3 Credits (3)

Critical health issues facing American Indians in the contemporary world.

Learning Outcomes

1. Compare and contrast the major perspectives on Native American health.
2. Analyze the social, biological, psychological, and societal factors affecting the health of Indigenous populations.
3. Critically analyze contemporary controversies, e.g., governmental oversight of sovereign nations.
4. Evaluate current empirical research in understanding Native American health status.

PHLS 4680. Hispanic Health Issues
3 Credits (3)

The course will familiarize public health students with social determinants of health contributing to Hispanic health disparities and the impact that health and immigration policies have on Hispanics' access to insurance and healthcare utilization, with a spotlight on different Hispanic subgroups. Recommendations for policy and research are also discussed.

Learning Outcomes

1. Explain the historical, ancestral, and national origins contributing to the diversity of the U.S. Hispanic population.
2. Assess obstacles researchers have encountered in explaining the Hispanic Epidemiological Paradox and the ethics surrounding them.
3. Compare and contrast health care coverage and access to health care in Hispanics relative to other racial/ethnic groups.
4. Describe factors contributing to health disparities in chronic and infectious diseases among Hispanics.
5. Explain how U.S. health policies negatively impact Hispanics.

PHLS 4710. Introduction to Gerontology
3 Credits (3)

Social, psychological, and physiological aspects of aging, with an interdisciplinary emphasis on health promotion. Demographic characteristics of the aging population. Taught with PHLS 5710. May be repeated up to 3 credits.

PHLS 4720. Health Promotion for the Older Adult
3 Credits (3)

Common health concerns and lifestyle issues relevant to older adults. Facts about the content area, health behaviors, and practices to promote health and prevent disease; program development strategies applicable to a variety of settings. Taught with PHLS 5720. May be repeated up to 3 credits.

PHLS 4730. Adulthood and Aging
3 Credits (3)

Normal transitions in later life; those occurring from 40 years of age to the end of life are discussed. Changes in interpersonal relationships and adaptations commonly made by individuals and meeting those alterations are presented through research findings, case studies, and autobibliographies. Taught with PHLS 5730. May be repeated up to 3 credits.

PHLS 4740. Aging and Public Policy
3 Credits (3)

Exploration of public policies relating to elders, historical development, current status and trends in public policy for this age group. Impact of political behavior of elders on policy making and implementing processes. May be repeated up to 3 credits.

PHLS 4810. Infectious and Noninfectious Disease Prevention
3 Credits (3)

History, etiology, and prevention of diseases affecting humans. Taught with PHLS 5810.
Prerequisite: PHLS 3220, PHLS 2120, PHLS 4320, or consent of instructor.
Learning Outcomes
1. Describe historical context of disease and health.
2. Identify the role of public health, past and present, in the control of communicable and chronic disease.
3. Identify and evaluate the characteristics of major chronic and communicable diseases.
4. Define, classify, and describe the etiology, incidence, and prevalence of major diseases.
5. Describe risk factors related to gender, race, ethnicity, and lifestyle for major diseases.
6. Identify the major diagnostic and treatment protocols for common diseases of humans.
7. Assess psychosocial influences upon diseases including diet, physical activity, rest, and related lifestyle variables.
8. Determine the impact of major diseases on the quality of life for the patient family.

PHLS 4820. Health Informatics
3 Credits (3)
The application of technology to engage communities and individuals in behavioral and environmental change processes. The course will focus on the use of technology to describe the magnitude of health problems and their sources; analyze risk factors; identify community strengths from which strategies may be defined and tools created to intervene, prevent problems, and promote health and well-being; and continuously evaluate, refine, and implement what works. Taught with PHLS 5820. Restricted to: Restricted to Public Health majors.
Prerequisite: PHLS 3220 or PHLS 2120 or consent of instructor.
Learning Outcomes
1. Identify and list the concepts of informatics and its domains.
2. Explain how major theories and models apply to the adoption and use of health information systems.
3. Use project management tools to plan and monitor progress on an informatics project.
4. Describe basic ethical, legal, and policy-related issues in informatics.
5. Develop approaches to communicate and advocate for the use of technologies to address public health issues.

PHLS 4996. Special Topics
3 Credits (3)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes
1. Varies

PHLS 4997. Independent Study
1-6 Credits (1-6)
Individual studies with prior approval of department head. May be repeated up to 12 credits.
Learning Outcomes
1. Varies

PHLS 4998. Applied Practice Experience
1-6 Credits (1-6)
Senior-standing BPH majors will integrate and apply various concepts related to actual public health practice. Experience aims to prepare students to integrate CEPH foundational competencies and responsibilities of community health education specialists. Approximately 42 hours at a field agency are required per credit hour. Restricted to: BPH majors. May be repeated up to 6 credits.
Prerequisite: PHLS 4210 or concurrent enrollment.
Learning Outcomes
1. Varies.

PHLS 5110. Community and Psychosocial Aspects of Public Health
3 Credits (3)
This course examines the major social and behavioral theories that seek to explain and predict human behaviors. Such theories not only serve to explain health behavior but also serve as guidelines for the development of health promotion and public health programs and interventions and their evaluation. The social determinants of health and health disparities, theoretical models of health behavior change, and intervention/behavior change strategies and tools are explored.
Learning Outcomes
1. Discuss behavioral, social and cultural factors associated with health and illness.
2. Describe major behavioral theories and models.
3. Identify the main concepts/constructs/components of each of the major behavioral theories and models.
4. Design or adapt a public health program applying one of the major behavioral theories/models.
5. Discuss the necessary links of theory public health practice and research.

PHLS 5120. Biostatistical Applications in Public Health
3 Credits (3)
Quantitative methods for public health students including tabular, graphical, and numerical descriptive methods, random sampling, principles of statistical inference, confidence intervals, statistical tests of hypothesis through analysis of variance and regression. Restricted to MPH majors.
Learning Outcomes
1. Prepare data for analysis.
2. Analyze data using descriptive statistical methods.
3. Analyze data using inferential statistical methods (t-tests, ANOVA, regression).
4. Formulate and test statistical hypotheses about population means and proportions.
5. Explain how findings relate to hypotheses or research questions based on statistical results.
6. Use statistical results to draw conclusions.

PHLS 5130. Epidemiological Approaches to Disease Control and Prevention
3 Credits (3)
Basic epidemiological principles applicable to infectious and noninfectious disease. Descriptive techniques and analytic designs, and application of statistical and epidemiological investigation methods included. Restricted to MPH majors.
Learning Outcomes
1. Define basic epidemiologic (EPI) terms used in the measurement of health and disease.
2. Summarize the modes of disease transmission.
3. Calculate and restate basic measures of disease frequency, association, and potential impact.
4. Distinguish between the major sources of epi data.

5. Describe patterns of disease and disease determinants by person, place, and time.
6. Compare the basic PH research designs, their strengths and limitations, including potential sources of bias, and inferences that can be drawn from each.
7. Restate disease causation concepts and the meaning of statistical significance in practice.
8. Explain epi principles of screening for disease and risk factors.
9. Describe basic ethical and legal principles involved in the study of human subjects.

PHLS 5140. Health Services System: Administration and Organization
3 Credits (3)
This course focuses on using a systems approach to identify and analyze factors and interrelationships that influence the operation of health services organizations. Specific attention is to administrative structures and operations, finance and quality among public health departments, hospitals, multi-institutional systems, integrated health systems and strategic alliances.
Learning Outcomes
1. Identify the main components of the organization for health care delivery and health care system in the U.S.
2. Compare health care systems in the U.S. and other developed countries.
3. Discuss resources and the principles of resources management in health care delivery.
4. Apply essential management functions (planning, organizing, staffing, leading, and controlling) to health services organizations.
5. Apply leadership and motivation concepts to the management of health services organizations.
6. Apply the principles and models of decision-making, communication, and managing change to address organizational challenges.
7. Demonstrate the knowledge and skills inherent in interprofessional work
8. Discuss how systems thinking works for healthcare delivery systems.

PHLS 5150. Environmental Public Health Issues
3 Credits (3)
This graduate-level course is primarily designed for Master of Public Health (MPH) students. It aims to provide a comprehensive overview of key areas within environmental health as a public health discipline. The course is intended to enhance your understanding of how environmental issues impact your role as a public health practitioner. Restricted to MPH majors.
Learning Outcomes
1. Define and discuss the history of environmental health.
2. Gain a basic knowledge of science that is fundamental to understanding environmental health issues.
3. Discuss the association between population growth and dissemination of environmental pollutants.
4. Describe methods used in toxicology to assess environmental exposures and hazards.
5. Identify chemical, physical, and microbial agents that originate in the environment and can impact human health.
6. Identify challenges and propose potential ways to deal with them in environmental health practices, with particular attention to issues of environmental justice and equity.

PHLS 5160. Public Health Policy Analysis
3 Credits (3)
This graduate-level course presents the key aspects of the policymaking process in the United States. The course introduces students to the steps necessary to formulate, implement, and modify healthcare policies. Economic, cultural, institutional, and social factors influencing policymaking will be explored. The evolution of federal health policy, including major healthcare reform efforts, will be presented. Students will be provided with the necessary tools to comprehend and explain policymaking. The class will primarily focus on federal-level health policymaking, but several examples of state-level policies will be discussed.
Learning Outcomes
1. Define and describe key health policy concepts: health, health determinants, public policy, and health policy.
2. Appreciate the significance of the Patient Protection and Affordable Care Act (ACA) and other major healthcare reform efforts and laws.
3. Describe the Longest Conceptual Model of the Public Policymaking Process and its key components of policy formulation, implementation, and modification.
4. Articulate the roles played by legislators, interest groups, researchers, and citizens in shaping and influencing health policy.
5. Summarize the roles of the three levels of government in making health policy.
6. Identify major health policy issues currently facing U.S. healthcare.

PHLS 5170. Qualitative Methods in Public Health
3 Credits (3)
This course introduces students to the principles and practices of qualitative research in public health. It emphasizes the value of qualitative inquiry for understanding complex health behaviors, cultural contexts, and social determinants of health. The course covers key methodologies including interviews, focus groups, ethnography, and content analysis. Students will develop skills in qualitative research design, data collection, coding, thematic analysis, and ethical considerations. Students will learn to apply qualitative methods to address public health challenges and to complement quantitative approaches in mixed-methods research.
Learning Outcomes
1. Design qualitative research studies to explore public health issues, including the development of research questions, selection of appropriate methods, and ethical considerations.
2. Conduct qualitative data collection using techniques such as in-depth interviews, focus groups, and participant observation, adhering to principles of cultural competence and research ethics.
3. Analyze qualitative data through coding and thematic analysis, utilizing software tools where appropriate, to identify patterns and derive meaningful insights. Critically evaluate qualitative research for methodological rigor, credibility, and relevance to public health practice and policy.
4. Critically evaluate qualitative research for methodological rigor, credibility, and relevance to public health practice and policy.
5. Communicate qualitative research findings effectively in written and oral formats to diverse audiences, integrating findings into public health strategies and interventions.

PHLS 5210. Foundations & Techniques of Public Health Education
3 Credits (3)

Social, behavioral, and educational aspects of disease prevention and health promotion. Includes history and theoretical basis of health education. May be repeated up to 3 credits.

Learning Outcomes

1. Explain, demonstrate, and apply health communication, education, and promotion knowledge and skill competencies.
2. Discuss the means by which structural biases, social inequities, and other social determinants of health undermine health and create challenges to achieving health equity at interpersonal, organizational, community, societal, cultural, and legal and policy levels.
3. Explain and demonstrate ways in which health communication, education, and promotion techniques can be utilized to increase health equity and reduce health disparities.
4. Utilize health behavior change theories to develop health communication, education and promotion materials, processes, and goals.
5. Identify best practices and evidence-based strategies and programs for use in health communication, education, and promotion.

PHLS 5220. Techniques of Health Communication/Education
3 Credits (3)

Application of a wide range of communication and education theories/methods, including program planning and evaluation, in public health programming. Restricted to: MPH majors. May be repeated up to 3 credits.

Prerequisite: PHLS 5110.

PHLS 5230. Community Organization in Public Health
3 Credits (3)

Strategies for identifying and involving community leaders, community needs assessment, small area analysis and planning, and community-level development strategies. Restricted to: MPH majors. May be repeated up to 3 credits.

Prerequisite: PHLS 5110.

PHLS 5240. Health Program Planning
3 Credits (3)

Covers process of successful public health education program planning and grant writing. Restricted to: MPH majors.

Learning Outcomes

1. Explain, demonstrate, and apply health program planning knowledge and skill competencies.
2. Explain, demonstrate, and design strategies and multi-level planned interventions.
3. Explain, demonstrate, and apply health program proposal writing and presentation knowledge and skills.

PHLS 5250. Evaluative Approaches in Public Health
3 Credits (3)

Survey and analyses of health testing and evaluation procedures, uses and limitations of knowledge and attitude tests, behavioral inventories, check lists, questionnaires, interviews, and other techniques. Restricted to: MPH majors.

Learning Outcomes

1. Understand the foundations of program evaluation.
2. Identify multiple program evaluation methods used to assess public health programs.
3. Examine the appropriate use of each evaluation design (process, outcome evaluation, impact monitoring) in relation to evaluating public health programs.
4. Design program logic models for various public health programs.
5. Gain knowledge related to the selection, design, and implementation of quantitative and qualitative research methods in program evaluation.
6. Understand practical issues in designing and implementing health program evaluation.
7. Assess challenges inherent to program evaluation and be able to describe strategies for navigating these challenges.
8. Explore the roles of program evaluators operating at the community and research levels and as external and internal evaluators.

PHLS 5260. Research and Resources in Community Health
3 Credits (3)

This course introduces the fundamentals of and examines the necessary concepts and skills required for research design, implementation, data analysis, statistical testing, and results reporting. The course explores a variety of approaches to ethical issues in conducting research. Restricted to MPH majors.

Learning Outcomes

1. Understand and critique research as described both in technical reports for example, professional journals and in the popular media for example, newspapers, magazines, TV.
2. Identify and critically review quantitative health science research study designs.
3. Discuss problems associated with methodology and logistics of conducting research.
4. Develop the essential elements for a research plan.
5. Plan, design, and carry out a variety of different research projects.
6. Prepare and present a professional quality research plan.
7. Develop the essential elements for a research plan.

PHLS 5310. Principles of Health Program Management
3 Credits (3)

This course prepares the student to assume a supervisory role in the management of health and human services programs. The course will cover essential management functions such as leadership, organizational assessment, planning, decision-making, organizational structure, budgeting, marketing, and human resource management.

Learning Outcomes

1. Discuss organizational and human resources management in public health activities.
2. Demonstrate the knowledge and skills inherent in budgeting.
3. Apply leadership and motivation concepts to the management of public health activities.
4. Apply the concepts, principles, and theories in management to public health settings.

PHLS 5320. Health Services Organization and Delivery
3 Credits (3)

This course includes the framework of the United States healthcare system; organization and administration of health services; alternate ways of organizing and financing health systems; the roles of the government and free market on health care services; and the barriers to health services delivery. May be repeated up to 3 credits.

PHLS 5330. Public Health Finance and Budget Management
3 Credits (3)

Introduces health care accounting and finance to non-financial students. Students are exposed to the financial structure of health care organizations and the environment within which they operate. Instruction also introduces the use of accounting and financial information in investor-owned and not-for-profit organizations in the health care

industry. Topics include understanding the creation and interpretation of financial statements, financial accounting and reporting requirements, financial analysis, budgeting, and resource allocation.

Learning Outcomes

1. Discuss the healthcare environment in which health services providers operate.
2. Analyze basic financial statements: balance sheet, income statement, statement of changes in equity, and statement of cash flows.
3. Assess the financial condition of health services organizations based on the analysis of their financial statements.
4. Apply financial concepts, principles, and models to financial analyses for managerial accounting.
5. Demonstrate familiarity with budgeting processes and assess the financial performance of the organization using variance analysis.
6. Evaluate the financing and capital investment decisions of the organization.

PHLS 5340. Public Health Law and Ethics
3 Credits (3)

This course examines major legal and ethical concepts and their impact on public health policy and practice. The course examines governmental authority, at various jurisdictional levels, to improve public health. This course will focus on public health law in the United States. Restricted to: MPH majors.

Learning Outcomes

1. Discuss legal and ethical concepts underlying (or related to) public health policy and practice.
2. Articulate ethics-related ideas, from documents such as the American Public Health Association's Public Health Code of Ethics, as they apply to contemporary public health issues.
3. Examine national, regional, state, and local government entities in terms of their authority to use legal and ethical concepts and foundations to improve public health.
4. Design or present a case study to support practitioners' or the public's understanding of the legal and ethical underpinnings of public health policy and practice.

PHLS 5410. Human-Animal Interactions in Environmental Contexts
3 Credits (3)

This MPH course will cover foundational concepts of human-animal interactions as they occur in a wide variety of environmental contexts and biomes. Modules of the course will include foci on zoonotic diseases, the impacts of invasive species, climatic shifts, emergent diseases, and companion animals.

Learning Outcomes

1. Describe the One Health approach to global health and the health of humans, animals, environments, and biomes.
2. Recognize the role of human impacts on environments and biomes as they impact human, animal, and environmental health.
3. Be attuned to the global patterning of increased contact between wild animals and humans and the implications for emergent diseases.
4. Analyze how human-animal interactions positively and negatively impact the health of humans, animals, and environments with emphases on wild, domesticated, companion, and service animals.
5. Make a case for the importance of addressing human-animal interactions, the global climate crisis, and environmental degradation and enhancements as part of a comprehensive public health strategy.
6. Demonstrate how transdisciplinary efforts, policies, and programs can be integrated to address current and emergent public health problems.

PHLS 5420. Global Health: One Health, Climate Change, Human Migration
3 Credits (3)

This MPH course will cover foundational concepts of One Health, impacts of the climate crisis on human, animal, and environmental health, the impacts of global human and animal migration and displacement on global health, social and behavioral science theories, and evidence-based prevention and intervention programs aimed at promoting health of individuals, groups, communities and populations.

Learning Outcomes

1. Describe the One Health approach to global health and the health of humans, animals, environments, and biomes.
2. Recognize the role of social and behavioral factors and the natural history of animals in shaping global mortality and morbidity.
3. Be attuned to the global patterning of public health problems and their implications for solutions.
4. Analyze how human-animal interactions positively and negatively impact the health of humans, animals, and environments.
5. Make a case for the importance of addressing human-animal interactions, the global climate crisis, and environmental degradation and enhancements as part of a comprehensive public health strategy.
6. Demonstrate how transdisciplinary efforts, policies, and programs can be integrated to address current and emergent public health problems.

PHLS 5610. Health Disparities: Determinants and Interventions
3 Credits (3)

Investigates: descriptions of health disparities and measurement issues; physical environmental factors, behavioral and emotional variables; impact of aging of the populations, increased racial and ethnic diversity, and technological developments; intervention strategies and evaluation results. Taught with: PHLS 4610.

Learning Outcomes

1. Examine the impact of structural racism on health in the United States of America.
2. Identify populations who have systematically experienced greater obstacles to health based on their race or ethnicity, religion, socioeconomic status, gender, age, mental health, cognitive, sensory, or physical disability, sexual orientation or gender identity, geographic location, or other characteristics historically linked to discrimination or exclusion in the United States of America.
3. Identify social and structural determinants of health that influence health and health equity.
4. Examine the role that public health professionals can play in advancing health equity.
5. Examine social and structural barriers to health care access and utilization.
6. Explain cultural competence, cultural humility, cultural safety, and structural competence.
7. Discuss research and program designs in health equity research and practice.
8. Examine the role of social determinants of health in achieving health equity.
9. Advocate for policies that advance health equity.

PHLS 5620. Cross-Cultural Aspects of Health
3 Credits (3)
An examination of health practices from a variety of cultural perspectives; communication, observation, research, and assimilation. Issues to be addressed will be examined from a number of viewpoints, such as individual, family, community, and professional roles. May be repeated up to 3 credits.

PHLS 5630. International Health Problems
3 Credits (3)
Comparison of domestic health programs and problems with those in other parts of the world; emphasis on political parameters and delivery processes. Additional attention is focused on the health issues of the U.S.-Mexico border. Taught with: PHLS 4630.
Learning Outcomes
1. Identify many of the current authoritative sources of information about global health, as a potential aid for future educational, training, and research endeavors.
2. Cite examples of specific issues and case studies in global health.
3. Identify key features of global health.
4. Explain the complexities of global health issues.
5. Explain intervention strategies being used to attack problems in global health.

PHLS 5635. International Health Practicum
1-3 Credits (1-3)
Intensive examination of health practices and beliefs from a cultural perspective. Focus on health structure, index of diseases, morbidity, mortality and epidemiological approaches to planning. Required travel (personal travel, lodging, and related expenses are extra). May be repeated up to 3 credits.

PHLS 5640. Rural Health Issues
3 Credits (3)
Comprehensive overview of rural health services with southwestern United States and New Mexico focus. Taught with: PHLS 4640.
Learning Outcomes
1. Compare and contrast the major perspectives on rural health.
2. Analyze the social, biological, psychological, and societal factors affecting the health of rural residents.
3. Critically analyze contemporary controversies, for example, environmental contamination.
4. Evaluate current empirical research in understanding rural health challenges and resources.

PHLS 5650. Coping with Loss and Grief: A Cross-Cultural Perspective
3 Credits (3)
A cross-cultural perspective to death, loss and grief. Hospice philosophy of caring for the dying will be included. Taught with: PHLS 4650.
Learning Outcomes
1. Compare and contrast the major theories in thanatology.
2. Analyze the biological, psychological, social, and societal factors affecting the dying process and attitudes towards death and dying.
3. Critically analyze contemporary controversies, physician-assisted suicide.
4. Evaluate current empirical research in thanatology.

PHLS 5660. U.S.-Mexico Border Health Issues
3 Credits (3)
Interdisciplinary analysis of the impact of living conditions and health issues of communities along the U.S.-Mexico border and of the strategies and initiatives to address these issues. Problem-based learning, case analysis, lecture, guest speakers, computer based instruction, and field trips. Taught with: PHLS 4660.
Learning Outcomes
1. Analyze the social, economic, cultural, and environmental determinants of health affecting communities along the U.S.–Mexico border using an interdisciplinary framework.
2. Evaluate public health strategies, binational policies, and community-based initiatives aimed at addressing health disparities and improving living conditions in border regions.
3. Develop evidence-informed recommendations for collaborative interventions that incorporate diverse stakeholder perspectives and respect cultural and contextual factors unique to the U.S.–Mexico border.

PHLS 5670. American Indian Health
3 Credits (3)
Critical health issues facing American Indians in the contemporary world. May be repeated up to 3 credits.

PHLS 5680. Hispanic Health Issues
3 Credits (3)
The course will familiarize public health students with social determinants of health contributing to Hispanic health disparities and the impact that health and immigration policy has on Hispanics' access to insurance and health care utilization, with a spotlight on different Hispanic subgroups. Recommendations for policy and research are also discussed. Taught with PHLS 4680.
Learning Outcomes
1. Explain the historical, ancestral, and national origins contributing to the diversity of the U.S. Hispanic population.
2. Assess obstacles researchers have encountered in explaining the Hispanic Epidemiological Paradox and the ethics surrounding them.
3. Compare and contrast health care coverage and access to health care in Hispanics relative to other racial and ethnic groups.
4. Describe factors contributing to health disparities in chronic and infectious diseases among Hispanics.
5. Explain how U.S. health policies negatively impact Hispanics.

PHLS 5710. Introduction to Gerontology
3 Credits (3)
Social, psychological, and physiological aspects of aging with an interdisciplinary emphasis on health promotion. Demographic characteristics of the aging population. May be repeated up to 3 credits.

PHLS 5720. Health Promotion for the Older Adult
3 Credits (3)
Common health concerns and lifestyle issues relevant to older adults. Facts about the content area, health behaviors, and practices to promote health and prevent disease; program development strategies applicable to a variety of settings. May be repeated up to 3 credits.

PHLS 5730. Adulthood and Aging
3 Credits (3)
Normal transitions in later life; those occurring from 40 years of age to the end of life are discussed. Changes in interpersonal relationships and adaptations commonly made by individuals and meeting those alterations are presented through research findings, case studies, and autobibliographies. May be repeated up to 3 credits.

PHLS 5810. Infectious and Noninfectious Disease Prevention
3 Credits (3)
History, etiology, and prevention of diseases affecting humans. Taught with PHLS 4810.

Prerequisite: PHLS 3220, PHLS 2120, PHLS 4320, or Consent of Instructor.

Learning Outcomes

1. Describe historical context of disease and health.
2. Identify the role of public health, past and present, in the control of communicable and chronic disease.
3. Identify and evaluate the characteristics of major chronic and communicable diseases.
4. Define, classify, and describe the etiology, incidence, and prevalence of major diseases.
5. Describe risk factors related to gender, race, ethnicity, and lifestyle for major diseases.
6. Identify the major diagnostic and treatment protocols for common diseases of humans.
7. Assess psychosocial influences upon diseases including diet, physical activity, rest, and related lifestyle variables.
8. Determine the impact of major diseases on the quality of life for the patient family.

PHLS 5820. Health Informatics
3 Credits (3)

The application of technology to engage communities and individuals in behavioral and environmental change processes. The course will focus on the use of technology to describe the magnitude of health problems and their sources; analyze risk factors; identify community strengths from which strategies may be defined and tools created to intervene, prevent problems, and promote health and well-being; and continuously evaluate, refine, and implement what works.

Learning Outcomes

1. Identify and list the concepts of informatics and its domains.
2. Explain how major theories and models apply to the adoption and use of health information systems.
3. Use project management tools to plan and monitor progress on an informatics project.
4. Describe basic ethical, legal, and policy-related issues in informatics.
5. Develop approaches to communicate and advocate for the use of technologies to address public health issues.

PHLS 5830. Public Health Preparedness and Response
3 Credits (3)

This course is designed to teach students about the role of public health in emergency preparedness and response. It focuses on the nature of public emergencies as well as the role various sectors have in responding to them. One purpose of this online course is to introduce students to the basics of disaster preparedness and responding to disasters, and to build a base for further development in responder training. The course provides training and resources for a basic understanding of the Incident Command System (ICS) and National Incident Management System (NIMS). May be repeated up to 3 credits.

PHLS 5995. Integrative Learning Experience
1-3 Credits (1-3)

Integrative Learning Experience (ILE) is the culminating experience for MPH students. The course is designed to integrate and apply public health knowledge acquired across the PHLS curriculum through a practice-based or policy-oriented project. Under the supervision of a faculty advisor, students will develop a high-quality written product and present their findings in a public or semi-public forum. The ILE requires students to demonstrate synthesis of at least three CEPH Foundational Competencies and one Concentration-Specific Competency.

Learning Outcomes

1. Synthesize and apply CEPH Foundational and Concentration-Specific Competencies to address a public health problem.
2. Apply evidence-based reasoning and appropriate methodologies to solve a practice- or policy-based public health issue.
3. Produce a professional-quality written deliverable suitable for a public health agency, policymaker, or stakeholder group.
4. Demonstrate effective oral communication in a public or semi-public presentation of project findings.
5. Engage in ethical, professional collaboration with academic and/or community partners throughout the project process.

PHLS 5996. Special Topics
3 Credits (3)

Specific subjects to be announced in the Schedule of Classes. Restricted to: MPH majors. May be repeated up to 12 credits.

Learning Outcomes

1. Varies

PHLS 5997. Independent Study
1-6 Credits (1-6)

Individual studies with prior approval of department head. Consent of Instructor required. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHLS 5998. Applied Practice Experience
1-4 Credits (1-4)

Student will work in a public health setting under the supervision of an experienced public health professional and will use acquired knowledge and skills to conduct a project which addresses a specific public health problem or program need. Projects are agreed upon by the student and faculty. Consent of the instructor is required. Restricted to MPH majors.

Learning Outcomes

1. Varies.

PHLS 5999. Master's Thesis
1-6 Credits (1-6)

Minimum of 4 credits required but may be repeated for a maximum of 6 credits. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

PHYS-PHYSICS

PHYS 1110. Explorations in Physics
1 Credit (1)

This course will introduce students to university resources, pre-professional student societies, learning strategies to help strengthen academic performance, and will explore career paths for graduates. Students will also discuss the roles of physicists in society, physics research being performed at and nearby NMSU, and what the latest discoveries in physics tell us about nature and the universe.

Learning Outcomes

1. Describe effective learning strategies for science/engineering classes.
2. Give examples of impactful scientists from groups underrepresented in physics and describe their career paths.
3. Research examples of positions open to physics majors.
4. Identify critical components of an effective resume.

5. Write a professional cover letter for an internship/undergraduate research application.
6. Discuss the boundaries of ethical science and give an example of an accidental breach of ethics.
7. Describe the societal impact of misinformation about scientific results or research.
8. Explore ways scientists can engage with the general public to shape the discourse of knowledge or the ways scientists are perceived.
9. List some of the burning questions current physicists are trying to answer. 1
10. Establish a sense of community within the department, the university, and the greater physics world. 1
11. Discover useful resources to help with academic success and avoid pitfalls while pursuing a physics degree. 1
12. Better understand the value of a physics degree, and what can be expected entering the workforce or academia. 1
13. Understand and discuss how the field of physics connects with the issues and problems facing society today.

PHYS 1111. Introductory Computational Physics
3 Credits (2+2P)
Introduction to computational techniques for the solution of physics-related problems.
Prerequisite: a C- or better in MATH 1220G or MATH 1250G or MATH 1511G.
Learning Outcomes
1. Use computers for visualizing and analyzing data.
2. Apply techniques of structured programming and software development.
3. Trouble shoot and debug programs.

PHYS 1112. Introductory Physics for the Health Sciences
3 Credits (3)
Algebra-level introduction to topics required for the Health Sciences including basic mechanics (including sound, mechanical waves and fluids), heat and thermodynamics, electricity and magnetism, optics and electromagnetic waves, atomic and nuclear physics and applications to medical imaging. Restricted to Community Colleges campuses only.
Prerequisite(s): MATH 1215 or Equivalent.
Learning Outcomes
1. The objective of the course is to familiarize the student with the concepts and methods used in the underlying physics associated with various Health Science disciplines.
2. The course will demonstrate how the basic principles of mechanics, thermodynamics, electricity, magnetism, electromagnetic waves and optics can be applied to solve particular problems in Health Sciences applications. Introduces the student to selected topics in modern physics including quantum physics, atomic and nuclear physics.

PHYS 1115G. Survey of Physics with Lab
4 Credits (3+3P)
Overview of the concepts and basic phenomena of physics. This course provides a largely descriptive and qualitative treatment with a minimum use of elementary mathematics to solve problems. No previous knowledge of physics is assumed. Includes laboratory.
Learning Outcomes
1. Apply concepts of classical mechanics (such as velocity, acceleration, force, inertia, momentum, torque, work, energy) to simple static and dynamic systems.
2. Apply concepts of thermodynamics (such as heat, temperature, internal energy, entropy) to simple processes.
3. Apply concepts of electricity and magnetism (such as fields, potential, charge conservation, static and dynamic induction) to simple circuits, motors, and other simple contrivances.
4. Apply simple geometric and wave optics in simple situations.
5. Test ideas using modern laboratory equipment.
6. Estimate experimental uncertainties.
7. Use computers to analyze and report laboratory results.
8. Draw appropriate conclusions from quantitative scientific observations.
9. Accurately and clearly communicate the results of scientific experiments.

PHYS 1125G. Physics of Music
4 Credits (3+2P)
Introduction for non-science majors to basic concepts, laws, and skills in physics, in the context of a study of sound, acoustics, and music.
Learning Outcomes
1. Demonstrate converting units and other aspects of dimensional analysis in the working of numerical problems.
2. Apply basic classical mechanics to static and dynamic fluids, including Archimedes'principle and Bernoulli's principle.
3. Apply the general properties of waves to simple models of musical instruments.
4. Demonstrate knowledge of basic operating principles of wind, string, and percussion instruments.
5. Demonstrate knowledge of how objectively measurable properties of sound waves correspond to the perceptions of pitch, loudness, and timbre.
6. Demonstrate understanding of the description of vibrations and waves in terms of Fourier's Theorem and normal modes.
7. Demonstrate understanding of vocalization in terms of physical principles such as resonance and fluid dynamics.
8. Demonstrate understanding of how the ear works.

PHYS 1230G. Algebra-Based Physics I
3 Credits (3)
An algebra-based treatment of Newtonian mechanics. Topics include kinematics and dynamics in one and two dimensions, conservation of energy and momentum, rotational motion, equilibrium, and fluids.
Learning Outcomes
1. Demonstrate converting units and other aspects of dimensional analysis in the working of numerical problems.
2. Apply principles of Newtonian mechanics to predict and account for simple phenomena modeled by the motion of particles in one and two dimensions.
3. Apply principles of Newtonian mechanics to predict and account for simple phenomena modeled by the motion of a rigid body in two dimensions.
4. Apply Newton's theory of gravitation to circular orbits and demonstrate understanding of how Kepler's laws of planetary motion provide the empirical foundation for Newton's theory.
5. Apply the mathematics of vectors to the principles of Newtonian mechanics.
6. Apply principles of Newtonian mechanics to the case of static and dynamic incompressible fluids, including Archimedes'and Bernoulli's principles.

PHYS 1230L. Algebra-Based Physics I Lab
1 Credit (3P)
A series of laboratory experiments associated with the material presented in PHYS 1230G. May be repeated up to 3 credits.
Prerequisite/Corequisite: PHYS 1230G.
Learning Outcomes
1. Explain the scientific method.
2. Test ideas using modern laboratory equipment.
3. Estimate experimental uncertainties using statistical methods.
4. Use computers to analyze and report laboratory results.
5. Draw appropriate conclusions from quantitative scientific observations.
6. Accurately and clearly communicate the results of scientific experiments.

PHYS 1240G. Algebra-Based Physics II
3 Credits (3)
The second half of a two semester algebra-based introduction to Physics. This course covers electricity, magnetism and optics.
Prerequisite(s): a C- or better in PHYS 1230G or PHYS 2230G.
Learning Outcomes
1. Be able to state Coulomb's Law and Gauss's laws and apply them.
2. Apply the concepts of electric charge, electric field and electric potential to solve problems.
3. Analyze simple DC and AC circuits.
4. Apply the Lorentz force to solve problems.
5. Apply Faraday's law of induction (and Lenz's law) to solve problems.
6. Apply ray optics to practical lens systems such as microscopes and corrective lenses.
7. Apply the wave nature of light to the phenomena of reflection, refraction, and diffraction.

PHYS 1240L. Algebra-Based Physics II Lab
1 Credit (3P)
A series of laboratory experiments associated with the material presented in PHYS 1240 May be repeated up to 3 credits.
Prerequisite/Corequisite: PHYS 1240G.
Learning Outcomes
1. Explain the scientific method.
2. Test ideas using modern laboratory equipment.
3. Estimate experimental uncertainties using statistical methods.
4. Use computers to analyze and report laboratory results.
5. Draw appropriate conclusions from quantitative scientific observations.
6. Accurately and clearly communicate the results of scientific experiments.

PHYS 1310G. Calculus -Based Physics I
3 Credits (3)
A calculus level treatment of classical mechanics and waves, which is concerned with the physical motion concepts, forces, energy concepts, momentum, rotational motion, angular momentum, gravity, and static equilibrium.
Prerequisite: a C- or better in ENGR 190 or MATH 1511G or higher.
Learning Outcomes
1. Describe the relationships among position, velocity, and acceleration as functions of time.
2. Use the equations of kinematics to describe motion under constant acceleration.
3. Analyze linear motion using Newton's laws, force, and linear momentum.
4. Analyze rotational motion using torque and angular momentum.
5. Analyze motion using work and energy.

PHYS 1310L. Calculus -Based Physics I Lab
1 Credit (3P)
A series of laboratory experiments associated with the material presented in Calculus-based Physics I. Students will apply the principles and concepts highlighting the main objectives covered in coursework for Calculus-based Physics I.
Prerequisite(s)/Corequisite(s): PHYS 1310G.
Learning Outcomes
1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Experience the relationship between theory and experiment.

PHYS 1311. Problems in Calculus-Based Physics I
0.5-1 Credits (.5-1)
This is a supplemental course for Calculus-based Physics I. May be repeated up to 1 credits.
Corequisite(s): PHYS 1310G.

PHYS 1320G. Calculus -Based Physics II
3 Credits (3)
A calculus level treatment of classical electricity and magnetism. It is strongly recommended that this course is taken at the same time as Calculus-based Physics II laboratory.
Prerequisite: a C- or better in (PHYS 2110 or PHYS 1310G) and (ENGR 190 or MATH 1521G or higher).
Learning Outcomes
1. Apply the concepts of electric charge, electric field and electric potential to solve problems.
2. Sketch the electric field in the vicinity of point, line, sheet, and spherical distributions of static electric charge.
3. Sketch the magnetic field in the vicinity of line, ring, sheet, and solenoid distributions of steady current.
4. Describe the relationship between electric field and electric potential.
5. Calculate the Lorentz force on a moving charge for simple geometries of the fields and use it to analyze the motion of charged particles.
6. Apply the integral forms of Maxwell's equations.
7. Calculate the energy of electromagnetic fields.
8. Analyze DC circuits.

PHYS 1320L. Calculus -Based Physics II Lab
1 Credit (3P)
A series of Laboratory experiments associated with the material presented in Calculus-Based Physics II. Students will apply the principles and concepts highlighting the main objectives covered in coursework for Calculus-Based Physics II.
Prerequisite(s)/Corequisite(s): PHYS 1320G. Prerequisite(s): A C- or better in PHYS 2110L or PHYS 1310L.

Learning Outcomes

1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Experience the relationship between theory and experiment

PHYS 1321. Problems in Calculus-Based Physics II
0.5-1 Credits (.5-1)
This is a supplemental course for Calculus-based Physics II.
Corequisite(s): PHYS 1320G.

PHYS 2110. Mechanics
3 Credits (3)
Newtonian mechanics.
Prerequisite/Corequisite: MATH 1511G or higher.
Learning Outcomes

1. Describe matter as particles or extended objects, analyze forces or torques acting on it, and apply Newton's laws to determine if the object is in equilibrium or predict any change in the motion of such an object.
2. Apply vector algebra to predict motion or analyze interactions in one or two dimensions.
3. Apply techniques of conservation laws (linear momentum, energy, angular momentum) to determine the effect of interactions that are internal or external to the system studied.
4. Analyze systems in simple harmonic motion and explain qualitatively under what condition a driven oscillating system shows the phenomenon of resonance.
5. Use multiple representations to build, interpret and communicate a model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
6. Given two or more cases, perform a ranking task by evaluating the similarities (comparison) or differences (contrast) in the cases and applying physics principles.
7. Self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
8. Analyze real-world phenomena by defining and formulating the question or problem, constructing simplified idealized models(and stating their limitations), and applying appropriate mathematical reasoning to make predictions or explain a phenomenon or function.
9. Communicate effectively with audiences of different scientific backgrounds by recognizing their needs and making the communication relevant and impactful. 1
10. Work collegially and collaboratively in diverse teams both as a leader and as a member in pursuing a common goal.

PHYS 2110L. Experimental Mechanics
1 Credit (3P)
Laboratory experiments associated with the material presented in PHYS 2110. Science majors.
Prerequisite/Corequisite: PHYS 2110.
Learning Outcomes

1. Test scientific questions or ideas using appropriate laboratory equipment.
2. Collect experimental data and evaluate the outcomes of an experiment qualitatively and quantitatively.
3. Estimate measurement uncertainty.
4. Apply appropriate methods of analysis to raw data, including graphical or statistical methods, and computer-based tools.
5. Draw appropriate conclusions from quantitative scientific data.
6. Communicate the process and the outcomes of an experiment and reflect on possible revisions in the procedure.
7. Work effectively as part of a team.
8. Demonstrate professional responsibility.

PHYS 2111. Supplemental Instruction to PHYS 2110
1 Credit (1)
This Optional workshop as a supplement to PHYS 2110. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credit.
Corequisite: PHYS 2110.
Learning Outcomes

1. Analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. In the contexts of concepts and physical laws discussed in PHYS 2110, apply quantitative analysis to solve problems, including the use of scientific notation, unit conversion and vector algebra.
4. Self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. Develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2120. Heat, Light, and Sound
3 Credits (3)
Calculus-level treatment of thermodynamics, geometrical and physical optics, and sound.
Prerequisite: a C- or better in PHYS 2110 or PHYS 1310G, and MATH 1511G or higher.
Learning Outcomes

1. Analyze real world phenomena that meet specific needs and use scientific judgement to draw conclusions.
2. Use multiple representations to build, interpret and communicate scientific models, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. Analyze oscillations and wave phenomena.
4. Analyze properties of sound waves.
5. Analyze properties of light using interference and diffraction.
6. Analyze light propagation through media using index of refraction and optical apparatus.
7. Analyze optical systems using light propagation.
8. Analyze the laws of thermodynamics and use them to describe processes in gases and other states of matter.

PHYS 2120L. Heat, Light, and Sound Laboratory
1 Credit (3P)

Laboratory experiments associated with the material presented in PHYS 2120. Science majors.
Prerequisite: a C- or better in PHYS 2110L or PHYS 1310L.
Prerequisite/Corequisite: PHYS 2120.
Learning Outcomes

1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Understand the relationship between theory and experiment.

PHYS 2121. Supplemental Instruction to PHYS 2120
1 Credit (1)
This optional workshop supplements PHYS 2120 "Heat, Light, and Sound". Students actively apply concepts and methods introduced in PHYS 2120 to problem solving and quantitative analysis. May be repeated up to 1 credit.
Corequisite: PHYS 2120.
Learning Outcomes

1. Analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. In the contexts of concepts and physical laws discussed in PHYS 2121, apply quantitative analysis to solve problems involving wave propagation and interference, geometric optics, heat transfer and thermodynamics.
4. Self-checkreasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. Develop learning strategies and use metacognition to promote thinking in the discipline

PHYS 2140. Electricity and Magnetism
3 Credits (3)
Charges and matter, the electric field, Gauss law, the electric potential, the magnetic field, Ampere's law, Faraday's law, electric circuits, alternating currents, Maxwell's equations, and electromagnetic waves.
Prerequisite: a C- or better in PHYS 2110 or PHYS 1310G, and MATH 1511G or higher.
Prerequisite/Corequisite: MATH 1521G.
Learning Outcomes

1. Analyze real-world phenomena by deciding what information is relevant and constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomenon or function.
2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. Use a physics problem-solving strategy: i. Identify relevant concepts. ii. Introduce and study simplified models. iii. Use symmetry arguments. iv. Establish the relation between known and unknown quantities. v. Calculate a quantitative result using appropriate mathematical methods. vi. Self-check reasonableness of assumptions and solutions.
4. Analyze/predict the interaction of charged particles, dipoles, or conductors with electric or magnetic fields. Apply concepts of force, work, or energy.
5. Describe sources of electric fields or magnetic fields and calculate field vectors for a point in space.
6. Apply Gauss's law to calculate electric fields for symmetric charge distributions or to determine surface charges on conductors in electrostatic equilibrium.
7. Apply Ampere's law and the Law of Biot-Savart to calculate magnetic fields.
8. Evaluate if magnetic flux changes and if an electric field or electric current is induced. Determine the direction of the induced current or the non-Coulomb electric field by applying Lenz's law. Apply Faraday's law to relate the rate of change of magnetic flux with the magnitude of emf induced.
9. Calculate and discuss properties of electric circuits (dc) with resistors, capacitors, and inductors applying Kirchhoff's rules or Ohm's law. 1
10. Discuss how the presence of a capacitor or an inductor modifies the behavior of a (dc) circuit and determine the time dependence of the current. 1
11. For a series RLC-circuit (or RC, LC, RL) with an ac-voltage source apply the concept of impedance or reactance to calculate the current through or voltages across each of the circuit elements, especially in the low-frequency limit, high-frequency limit, or at the resonant frequency.

PHYS 2140L. Electricity & Magnetism Laboratory
1 Credit (3P)
Laboratory experiments associated with the material presented in PHYS 2140.
Prerequisite: a C- or better in PHYS 2110 or PHYS 1310G.
Prerequisite/Corequisite: PHYS 2140.
Learning Outcomes

1. Develop a reasonable hypothesis.
2. Work effectively as part of a team.
3. Take measurements and record measured quantities to the appropriate precision.
4. Estimate error sources in experimental techniques.
5. Apply appropriate methods of analysis to raw data, including using graphical and statistical methods via computer-based tools.
6. Determine whether results and conclusions are reasonable.
7. Present experimental results in written form in appropriate style and depth.
8. Understand the relationship between theory and experiment.

PHYS 2141. Supplemental Instruction to PHYS 2140
1 Credit (1)
Optional workshop as a supplement to PHYS 2140. The tutorial sessions focus on reasoning and hands-on problem solving.
Corequisite: PHYS 2140.
Learning Outcomes

1. Analyze real-world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomenon or function.

2. Use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. In the contexts of concepts and physical laws discussed in PHYS 2140, apply quantitative analysis to solve problems, including the use of symmetry to study electric and magnetic fields. Practice concepts of calculus applied to charge and current distributions.
4. Self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. Develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2230G. General Physics for Life Science I
3 Credits (3)
This algebra-based introduction to general physics covers mechanics, waves, sound, and heat. Special emphasis is given to applications in the life sciences. This course is recommended for students in the life sciences and those preparing for the physics part of the MCAT.
Prerequisite: A C- or better in MATH 1220G or higher.
Learning Outcomes
1. Modeling: analyze real-world phenomena by deciding what information is relevant and constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain phenomena or function; use multiple representations to build, interpret and communicate the model,including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text; critique assumptions and determine how to test the validity of a model and use the comparison of experimental data and prediction to refine the model.
2. Conceptual understanding: describe the motion of any object in terms of displacement, velocity, and acceleration; analyze external forces acting on an object and determine if a system is in equilibrium or relate the net force to changes in motion; predict or analyze motion using conservation laws for energy and momentum; analyze forces and torques fora rigid object in static equilibrium; for a static fluid determine pressure and the buoyant force; apply idealized models of fluid flow to the circulatory system; describe the properties of pressure waves known as sound, apply the model of standing waves to musical instruments and discuss how sound is used to sense the environment; predict qualitative changes in the internal energy of a thermodynamic system when energy has been transferred due to work or heat and justify those predictions using conservation of energy (First law of thermodynamics). Identify which heat transfer processes occur in a described situation.
3. Quantitative reasoning: use a physics problem-solving strategy (Identify relevant concepts; Introduce and study simplified models; Use symmetry arguments; Establish the relation between known and unknown quantities; Calculate a quantitative result using appropriate mathematical methods; Self-check reasonableness of assumptions and solutions); use scientific notation accurately and convert units if necessary.
4. Communicating scientific information: interpret or generate graphs or other visual representations and be able to switch between various representations including text,mathematical description, or diagrams.

PHYS 2230L. Laboratory to General Physics for Life Science I
1 Credit (1)
Laboratory experiments in topics associated with material presented in PHYS 2230G.
Prerequisite(s)/Corequisite(s): PHYS 2230G. Restricted to Las Cruces campus only.

PHYS 2231. Supplemental Instruction to General Physics for Life Sciences I
1 Credit (1)
This optional workshop supplements Physics for Life Sciences I. The tutorial sessions focus on reasoning and hands-on problem solving.
Corequisite: PHYS 2230G.
Learning Outcomes
1. analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. in the contexts of concepts and physical laws discussed in PHYS 2230, apply quantitative analysis to solve problems, including the use of scientific notation, unit conversion and vector algebra.
4. self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2240G. General Physics for Life Science II
3 Credits (3)
This algebra-based course covers electricity, magnetism, light, atomic physics, and radioactivity. Special emphasis is given to applications in the life sciences This course is recommended for students in the life sciences and those preparing for the physics part of the MCAT.
Prerequisite: a C- or better in PHYS 1230G or PHYS 2230G, and MATH 1220G or higher.
Learning Outcomes
1. Modeling: analyze real world phenomena by constructing simplified idealized models (an abstract description) that allow making predictions or explaining a phenomena or function; use multiple representations to build and communicate the model, including sketches, mathematical expressions, diagrams or graphs; decide what information is relevant and critique assumptions and models of others; determine how to test the validity of a model and use comparison of experimental data and prediction to refine the model.
2. Conceptual understanding: electric or magnetic fields can be used to describe interactions of objects that contain charges with their surroundings; changes that occur as a result of interactions are constrained by conservation laws (such as conservation of energy, conservation of charge or conservation of nucleon number); many macroscopic properties of materials can be described using microscopic models or related to their geometry; electromagnetic radiation can be modeled as a wave or as fundamental particles (photons); the direction of propagation of a wave may change when it encounters a boundary surface between two media of different properties (reflection or refraction); the spontaneous radioactive decay of nuclei is described by probability.
3. Quantitative reasoning: apply quantitative analysis and appropriate mathematical reasoning to describe or explain phenomena; use scientific notation accurately and convert units if necessary.
4. Communicating scientific information: interpretor generate graphs or other visual representations (e.g. field lines, equipotential lines) and be able to switch between various representations including text, mathematical description, or diagrams.

PHYS 2240L. Laboratory to General Physics for Life Science II
1 Credit (1)

Laboratory experiments in topics associated with material presented in PHYS 2240.
Prerequisite(s)/Corequisite(s): PHYS 2240G. Restricted to Las Cruces campus only.

PHYS 2241. Supplemental Instruction to General Physics for Life Sciences II
1 Credit (1)
This optional workshop is a supplement to Physics for Life Science II. The tutorial sessions focus on reasoning and hands-on problem solving. May be repeated up to 1 credits.
Corequisite(s): PHYS 2240G.
Learning Outcomes
1. analyze real world phenomena by constructing simplified idealized models and appropriate mathematical reasoning to make predictions or explain a phenomena or function.
2. use multiple representations to build, interpret and communicate the model, including visual representations such as sketches or diagrams, mathematical expressions, graphs, or text.
3. in the contexts of concepts and physical laws discussed in PHYS 2240, apply quantitative analysis to solve problems, including the use of scientific notation, unit conversion and vector algebra.
4. self-check reasonableness of assumptions and solutions, making use of limiting cases or symmetry arguments.
5. develop learning strategies and use metacognition to promote thinking in the discipline.

PHYS 2996. Special Topics
1,4 Credits
Topics to be announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes
1. Varies.

PHYS 2997. Independent Study
1-3 Credits
Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.
Learning Outcomes
1. Varies

PHYS 303V. Energy and Society in the New Millennium
3 Credits (3)
Traditional and alternative sources of energy. Contemporary areas of concern such as the state of depletion of fossil fuels; nuclear energy, solar energy, and other energy sources; environmental effects; nuclear weapons; and health effects of radiation. Discussion of physical principles and impact on society. Focus on scientific questions involved in making decisions in these areas. No physics background required.

PHYS 304. Forensic Physics
4 Credits (3+3P)
Theories, laboratory, and field techniques in the area of forensic physics.

PHYS 305V. The Search for Water in the Solar System
3 Credits (3)
Examines the formation, abundance and ubiquity of water in our Solar System stemming from comets, Martian and Lunar poles, Earth's interior and into the outer reaches of the Solar System. Topics will include nuclear synthesis, Solar System formation, remote sensing, as well as past, present and future NASA missions for water.
Learning Outcomes
1. Learn how to apply scientific reasoning for understanding the evolution of the universe.
2. Learn the location of possible water resources in the solar system and beyond.
3. Learn how to use remote sensing to identify water in distant stellar objects and their atmospheres.
4. Acquire the ability to apply knowledge of mathematics, science and applied sciences (scientific expertise).
5. Recognize the need for an ability to engage in life-long learning (Life-long learning).

PHYS 315. Modern Physics
3 Credits (3)
An introduction to relativity and quantum mechanics, with applications to atoms molecules, solids, nuclei, and elementary particles.
Prerequisite: a C- or better in MATH 2530G and PHYS 2140 or PHYS 1320G.
Learning Outcomes
1. Communication: an ability to communicate effectively with a range of audiences.
2. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
3. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 316. Supplemental Instructions to PHYS 315
1 Credit (1)
This optional workshop supplements PHYS 315 "Modern Physics". Students actively apply concepts and methods introduced in PHYS 315 to problem solving and quantitative analysis.
Corequisite(s): PHYS 315.

PHYS 325. Intermediate Experimental Physics
3 Credits (1+6P)
An exploration of a variety of experimental techniques in physics with an emphasis on the proper determination of statistical and systematic uncertainties. Students will work in teams and prepare professional written and oral reports of their work. This course cannot be used to replace M E 345 for students majoring in engineering.
Prerequisite(s)/Corequisite(s): PHYS 315. Prerequisite(s): a C- or better in PHYS 2140L or PHYS 1320L.
Learning Outcomes
1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.

5. Collect, Analyze, and Interpret Data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 350. Special Topics
1-3 Credits
Lectures, demonstrations, and discussions on such topics as lasers and holography, energy sources, clouds, and biophysics. May be repeated for a maximum of 12 credits under different subtitles.

PHYS 380. Individual Study
1-3 Credits
Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

PHYS 395. Intermediate Mathematical Methods of Physics
3 Credits (3)
Introduction to the mathematics used in intermediate-level physics courses. Topics include vector calculus, curvilinear coordinates, matrices, linear algebra, function spaces, partial differential equations, and special functions. This course cannot be used to replace M E 228 or M E 328 for students majoring in engineering. May be repeated up to 3 credits.
Prerequisite(s)/Corequisite(s): MATH 3160. Prerequisite(s): a C- or better in MATH 2530G.
Learning Outcomes
1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 400. Undergraduate Research
1-3 Credits
May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

PHYS 420. Capstone Project I
3 Credits (3P)
Application of engineering physics principles to a significant design project. Includes teamwork, written and oral communication and realistic technical, economic and public safety requirements.

PHYS 421. Capstone Project II
3 Credits (3P)
Continuation of PHYS 420.

PHYS 450. Selected Topics
1-3 Credits
Readings, lectures or laboratory studies in selected areas of physics. May be repeated for a maximum of 12 credits.

PHYS 451. Intermediate Mechanics I
3 Credits (3)
Newtonian mechanics, including an introduction to the Lagrangian formulation. Topics include central force motion, rigid body motion, noninertial reference frames, oscillating systems, and classical scattering.
Prerequisite(s)/Corequisite(s): MATH 3160. Prerequisite(s): a C- or better in PHYS 2110 or PHYS 1310G, and MATH 2530G.
Learning Outcomes
1. Set up equations of motion for classical mechanical systems and solve them.
2. Identify conserved quantities and understand the circumstances under which they arise (symmetries); in particular, know how to use conservation of energy, momentum, angular momentum to solve problems.
3. Fluently use three-dimensional calculus as a language to do the above; be able to use spherical and cylindrical coordinates.
4. Understand the paradigmatic examples of the harmonic oscillator, central force (in particular, gravitational) motion and rigid body motion, which serve as starting points for investigating more complicated realistic problems.

PHYS 454. Intermediate Modern Physics I
3 Credits (3)
Introduction to quantum mechanics, focusing on the role of angular momentum and symmetries, with application to many atomic and subatomic systems. Specific topics include intrinsic spin, matrix representation of wave functions and observables, time evolution, and motion in one dimension.
Prerequisite: a C- or better in PHYS 315.
Prerequisite/Corequisite: MATH 3160 and PHYS 395.
Learning Outcomes
1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 455. Intermediate Modern Physics II
3 Credits (3)
Continuation of subject matter of PHYS 454. Specific topics include rotation and translation in three dimensions, solution of central potential problems, perturbation theory, physics of identical particles, scattering theory, and the interaction between photons and atoms.
Prerequisite: a C- or better in PHYS 454, MATH 3160, and PHYS 395.
Learning Outcomes
1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 461. Intermediate Electricity and Magnetism I
3 Credits (3)
The first part of a two-course sequence in classical electrodynamics. Covered topics include static electric and magnetic fields, Laplace's and Poisson's equations, electromagnetic work and energy, Lorentz force, Gauss's, Biot-Savart, and Ampere's laws, Maxwell's equations, as well as electric and magnetic fields in matter.
Prerequisite: a C- or better in PHYS 2140 or PHYS 1320G or equivalent and a C- or better in MATH 2530G.
Prerequisite/Corequisite: MATH 3160 and PHYS 395.
Learning Outcomes
1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 462. Intermediate Electricity and Magnetism II
3 Credits (3)
Continuation of subject matter of PHYS 461. Covered topics include Maxwell's equations and their applications, electromagnetic waves, reflection, refraction, dispersion, radiating systems, interference

and diffraction, as well as Lorentz transformations and relativistic electrodynamics.
Prerequisite: a C- or better in PHYS 461, MATH 3160, and PHYS 395.
Learning Outcomes
1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 468. Intermediate X-ray Diffraction
3 Credits (3)
Introduction to x-ray diffraction and reflectivity spectra. Topics include X-ray sources and detectors, atomic spectra, characteristic x-rays, thermionic emission, synchrotron radiation, instrument components, and beam conditioners. Prerequisite(s): a C- or better in PHYS 315 and PHYS 325
Learning Outcomes
1. Knowledge of structural properties of materials
2. Experimental x-ray characterization techniques
3. Presentation and writing skills in the discipline
4. Ethics, teamwork, and career opportunities

PHYS 471. Modern Experimental Optics
3 Credits (1+6P)
Cumulative experience course in experimental optics.
Prerequisite: a C- or better in PHYS 315 and PHYS 325.
Learning Outcomes
1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and professional responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 475. Advanced Laboratory Practices for Materials
3 Credits (1+6P)
Cumulative experience course in advanced laboratory practices involving experiments in atomic, molecular, and condensed matter physics.
Prerequisite: a C- or better in PHYS 315 and PHYS 325.
Learning Outcomes
1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, Analyze, and Interpret Data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 476. Computational Physics
3 Credits (3)
Scientific visualization, numerical differentiation and interpolation, numerical integration, root finding, linear algebra, eigensystems, ODE's, Boundary value problems, PDE's, Monte-Carlo calculations, data description and analysis, Fast Fourier Transforms, and applications to advanced physics problems. Recommended is the knowledge of a programming language.
Prerequisite: a C- or better in PHYS 1111 or equivalent and MATH 3160.
Learning Outcomes
1. learn how to use computers for solving problems in the physical sciences,
2. obtain skills to implement numerical simulation and modeling strategies,
3. learn how to monitor and analyze data graphically, during and after computation,
4. obtain workflow organization skills needed for the solution of complicated systems.

PHYS 480. Thermodynamics
3 Credits (3)
Thermodynamics and statistical mechanics. Basic concepts of temperature, heat, entropy, equilibrium, reversible and irreversible processes. Applications to solids, liquids, and gases.
Prerequisite: a C- or better in PHYS 2120, PHYS 315, and MATH 2530G.
Learning Outcomes
1. Problem solving: an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. Ability to learn on your own: an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

PHYS 485. Independent Study
1-3 Credits
Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.
Prerequisite: consent of instructor.

PHYS 488. Introduction to Condensed Matter Physics
3 Credits (3)
Crystal structure, X-ray diffraction, energy band theory, phonons, cohesive energy, conductivities, specific heats, p-n junctions, defects, surfaces, and magnetic, optical, and low-temperature properties.
Prerequisite: a C- or better in PHYS 315.
Learning Outcomes
1. Learn the fundamental concepts of solid-state physics: classification of solids, crystal structure, band structure of solids, lattice vibrations, optical and magnetic properties of solids.

2. Develop an ability to formulate and solve complex problems in solid state physics by applying the fundamental principles of physics and mathematics.
3. Develop and ability to acquire and apply new knowledge using appropriate learning strategies.

PHYS 489. Introduction to Modern Materials
3 Credits (3)
Structure and mechanical, thermal, electric, and magnetic properties of materials. Modern experimental techniques for the study of material properties.
Prerequisite: a C- or better in PHYS 315.
Learning Outcomes
1. Learn the fundamental concepts of the physics of modern materials, such as crystal structure, properties of materials, and experimental techniques.
2. Develop an ability to formulate and solve complex problems in the area of physics of modern materials by applying the principles of physics and mathematics.
3. Develop an ability to acquire and apply new knowledge using appropriate learning strategies.

PHYS 493. Experimental Nuclear Physics
3 Credits (1+6P)
Cumulative experience course in nuclear physics such as measurement of radioactivity, absorption of radiation, nuclear spectrometry.
Prerequisite: a C- or better in PHYS 315 and PHYS 325.
Learning Outcomes
1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communications: an ability to communicate effectively with a range of audiences.
3. Ethical and professional responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 495. Mathematical Methods of Physics I
3 Credits (3)
Applications of mathematics to experimental and theoretical physics. Topics include vector analysis, Fourier series and transforms, Green's functions, special functions, complex variables, tensor algebra and analysis.
Prerequisite: a C- or better in MATH 3160 and PHYS 395.
Learning Outcomes
1. Deploy the tools of vector analysis and expansion into complete sets of functions to treat problems arising, e.g., in electrodynamics.
2. Understand the elements of functional analysis underpinning, e.g., quantum mechanics, such as representations, operators and their inverses and spectra.
3. Evaluate integrals of analytic functions using the calculus of residues.
4. Take advantage of the transformation behavior, under symmetry operations, of representations of physical quantities, by casting physical relations in tensor language.

PHYS 500. Special Topics Seminar
1-2 Credits
Treatment of topics not covered by regular courses. Graded S/U. May be repeated.

PHYS 511. Mathematical Methods of Physics I
3 Credits (3)
Applications of mathematics to experimental and theoretical physics. Topics include vector analysis, Fourier series and transforms, Green's functions, special functions, complex variables, tensor algebra and analysis.
Learning Outcomes
1. Deploy the tools of vector analysis and expansion into complete sets of functions to treat problems arising, e.g., in electrodynamics.
2. Understand the elements of functional analysis underpinning, e.g., quantum mechanics, such as representations, operators and their inverses and spectra.
3. Evaluate integrals of analytic functions using the calculus of residues.
4. Take advantage of the transformation behavior, under symmetry operations, of representations of physical quantities, by casting physical relations in tensor language.

PHYS 520. Selected Topics
1-3 Credits
This is a lecture/laboratory course designed to present the basic concepts, the techniques and the tools to synthesize and characterize nanometer scale materials, and the latest achievements in current and future nanotechnology applications in engineering, materials, physics, chemistry, biology, electronics and energy. It is intended for a multidisciplinary audience with a variety of backgrounds. This course should be suitable for graduate students as well as advanced undergraduates. Topics covered will include: nanoscience and nanotechnology, nanofabrication, self-assembly, colloidal chemistry, sol-gel, carbon nanotubes, graphene, thin film, lithography, physical vapor deposition, chemical vapor deposition, quantum dots, lithium batteries, X-ray diffraction, scanning electron microscopy, transmission electron microscopy, nanoelectronics, nanophotonics and nanomagnetics, etc. Students must also have completed (EH&S Safety training to include the courses: (1) Employee & Hazard Communication Safety (HazCom); (2) Hazardous Waste Management; and (3) Laboratory Standard) trainings to enroll. Crosslisted with: CHME 467 . May be repeated up to 3 credits.
Prerequisite: (CHEM 1226 or CHEM 1215G), (PHYS 1230G or PHYS 1310G).

PHYS 521. Individual Study
1-3 Credits
Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.
Prerequisites: graduate standing, consent of instructor, and selection of a specific topic prior to registration.

PHYS 528. Fundamentals of Photonics
4 Credits (3+3P)
Ray, wave and guided optics, lasers and thermal sources, radiometry, photon detection and signal-to-noise ratio. Elements of photonic crystals, polarization, acousto-optics, electro-optics, and optical nanostructures.

Recommended foundation (PHYS 1320G or PHYS2120) and (E E 473 or PHYS 473), Taught with E E 478. Crosslisted with E E 528.

Learning Outcomes

1. Describe the fundamental properties of light.
2. Formulate the concepts of ray, wave, and photon optics mathematically.
3. Represent and incorporate basic elements of an optical system.
4. Perform an analysis of a simple photonic/optical system mathematically by hand and with computer tools such as MATLAB.
5. Discuss ethical, societal, and professional issues related to photonics and optics.

PHYS 551. Classical Mechanics
3 Credits (3)

Lagrangian and Hamiltonian formulation of dynamics. Advanced treatments of most topics listed under PHYS 451, plus canonical transformations and Hamilton-Jacobi theory. PHYS 451 strongly recommended.

PHYS 554. Quantum Mechanics I
3 Credits (3)

Wave function, indeterminacy, classical limit. Schrodinger equation. Atomic and nuclear systems. Angular momentum, intrinsic spin, identical particles. Scattering theory. Mathematical formalism, symmetry and conserved quantities. Perturbation theory. Dirac theory, introduction to quantized fields. PHYS 451 and PHYS 454 strongly recommended.

PHYS 555. Quantum Mechanics II
3 Credits (3)

Continuation of topics in PHYS 554.
Prerequisites: PHYS 554 or consent of instructor.

PHYS 561. Electromagnetic Theory I
3 Credits (3)

Detailed advanced treatments of most topics listed under PHYS 461, PHYS 462, plus multipole radiation, collisions of charged particles and bremsstrahlung, scattering, and radiation reaction. PHYS 461 and PHYS 462 strongly recommended.

PHYS 562. Electromagnetic Theory II
3 Credits (3)

Continuation of topics in PHYS 561.
Prerequisites: PHYS 561 or consent of instructor.

PHYS 568. Elements of X-ray Diffraction
3 Credits (3)

Same as PHYS 468, but additional work required. Crosslisted with: CHME 588.

PHYS 571. Advanced Experimental Optics
3 Credits (1+6P)

Taught with PHYS 471 with additional work required at the graduate level.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and professional responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 575. Advanced Physics Laboratory
3 Credits (1+6P)

Selected experiments in atomic, molecular, nuclear and condensed-matter physics.

Learning Outcomes

1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 576. Advanced Computational Physics I
3 Credits (3)

Advanced treatment of topics listed under PHYS 476 plus additional work. Applications of numerical methods to advanced physics problems. Recommended is the knowledge of a programming language.

Learning Outcomes

1. learn to numerically solve problems that require higher mathematical and theoretical analysis,
2. experience how graduate research will be advanced and accelerated by the use of scientific computing skills.

PHYS 584. Statistical Mechanics
3 Credits (3)

Thermodynamics review. Probability, entropy, equilibrium. Canonical and grand canonical ensembles. Classical and quantum statistics. Degenerate and classical gases. Application to the equilibrium properties of solids, liquids, and gases. Kinetic theory and transport processes.

PHYS 589. Modern Materials
3 Credits (3)

Same as PHYS 489 with differentiated assignments for graduate students. PHYS 554 recommended.

Learning Outcomes

1. Learn the fundamental concepts of the physics of modern materials, such as crystal structure, properties of materials, and experimental techniques.
2. Develop an ability to formulate and solve complex problems in the area of physics of modern materials by applying the principles of physics and mathematics.

3. Develop an ability to acquire and apply new knowledge using appropriate learning strategies.

PHYS 591. Advanced High-Energy Physics I
3 Credits (3)
Taught with PHYS 491 with additional work required at the graduate level.
Prerequisite(s): PHYS 555 or consent of instructor.

PHYS 593. Advanced Experimental Nuclear Physics
3 Credits (1+6P)
Advanced experimental investigation of topics such as measurement of radioactivity, absorption of radiation, and nuclear spectrometry.
Learning Outcomes
1. Design within constraints: an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
2. Communication: an ability to communicate effectively with a range of audiences.
3. Ethical and Professional Responsibilities: an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
4. Teamwork: an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
5. Collect, analyze, and interpret data: an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

PHYS 597. Space Plasma Physics
3 Credits (3)
Same as PHYS 497 but with added requirements.

PHYS 599. Master's Thesis
1-15 Credits (1-15)
Thesis.

PHYS 600. Research
1-15 Credits
Doctoral research. May be repeated.

PHYS 620. Advanced Topics in Physics
1-3 Credits
Advanced formal treatment of topics not covered in regular courses. May be repeated for a maximum of 9 credits.
Prerequisite: consent of instructor.

PHYS 650. General Relativity I
3 Credits (3)
Basic foundations and principles of general relativity, derivation of the Einstein field equations and their consequences, the linearized theory, the Bel-Petrov classification of the curvature tensor, derivation of the Schwarzschild solution and the four basic tests of general relativity.
Prerequisite(s): PHYS 511 or PHYS 561 or consent of instructor.

PHYS 680. Independent Study
1-3 Credits
Individual analytical or laboratory studies directed by a faculty member. May be repeated for a maximum of 6 credits.
Prerequisite: graduate standing or consent of instructor.

PHYS 688. Advanced Condensed Matter Physics
3 Credits (3)
Continuation of the advanced condensed matter physics presented in PHYS 588. Topics include electronic structure methods, optical, magnetic, and transport properties of solids, semiconductors, crystalline defects, nanostructures, and noncrystalline solids. PHYS 588 strongly recommended.
Learning Outcomes
1. Learn the fundamental concepts of advanced condensed state physics: band theory of solids, electronic structure methods, optical and magnetic properties of solids, bulk semiconductors, and properties of nano-structured materials.
2. Develop an ability to formulate and solve complex problems in advanced condensed matter physics.
3. Develop an ability to to study independently and acquire new knowledge using appropriate learning strategies.

PHYS 689. Advanced Modern Materials
3 Credits (3)
Advanced topics in the physics of modern materials, such as crystalline, amorphous, polymeric, nanocrystalline, layered, and composite materials and their surfaces and interfaces. PHYS 555, PHYS 588, and PHYS 589 recommended.
Learning Outcomes
1. Learn the fundamental concepts of the physics of modern materials, such as crystalline, amorphous, polymeric, nanostructured, layered, and composite materials.
2. Develop an ability to formulate and solve complex problems in the area of advanced physics of modern materials.
3. Develop an ability to to study independently and acquire new knowledge using appropriate learning strategies.

PHYS 691. Quantum Field Theory I
3 Credits (3)
Path integrals, gauge invariance, relativistic quantum mechanics, canonical quantization, relativistic quantum field theory, introduction to QED.
Prerequisites: PHYS 555 and PHYS 562, or consent of instructor.

PHYS 692. Quantum Field Theory II
3 Credits (3)
QED, running coupling constant, QCD, electroweak theory, asymptotic freedom, deep inelastic scattering, basic QCD phenomenology, path integrals in quantum field theory, lattice QCD.
Prerequisite: PHYS 691 or consent of instructor.

PHYS 700. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation.

PL-S-PARALEGAL SERVICES

PL S 160. Legal System for the Paralegal
3 Credits (3)
Introduction to the court system, administrative agencies, functions of law offices, and professional conduct and legal ethics. Restricted to: Community Colleges only.
Prerequisite(s): ACT standard score in English of 16 or higher or a Compass score 76 or higher; for those scoring 13-15 in English on ACT or 35-75 on Compass, successful complete of CCDE 105N or CCDE 110N; for those scoring 12 or below on the ACT standard score in English or 34 or below on the Compass, successful completion of CCDE 105N & CCDE 110N.

PL S 162. The Virtual Law Office
3 Credits (3)
The Virtual Law Office class is a 'hands-on', project oriented course designated to provide the student with the basic law office skills needed to function successfully in a law office setting. The student will gain a practical, working knowledge of the procedures necessary to work in a law office. The skills learned in the class will directly translate to real life situations. Restricted to: Community Colleges only.
Prerequisite(s): PL S 160.

PL S 190. Criminal Law for the Paralegal
3 Credits (3)
Introduction to federal and state criminal law; criminal proceedings, prosecution and defense, sentencing and appeal.
Prerequisite: PL S 160.

PL S 200. Legal Ethics for the Paralegal
3 Credits (3)
Introduction to ethical dilemmas faced in the workforce and the rules of ethics developed by the American Bar Association, various national paralegal organizations, and the Supreme Court of New Mexico. Restricted to: Community Colleges only.
Prerequisite(s): PL S 160.

PL S 203. Immigration Law
3 Credits (3)
Survey of the basics of immigration law including the rights and obligations of citizenship and the naturalization process.
Prerequisite: PL S 160.

PL S 221. Internship I
2-4 Credits (2-4)
Work experience that directly relates to a student's major field of study that provides the student an opportunity to explore career paths and apply knowledge and theory learned in the classroom. Internships can be paid or unpaid. Students are supervised/evaluated by both the employer and the instructor. May be repeated up to 4 credits.
Prerequisite/Corequisite: PL S 274.
Learning Outcomes
1. To identify and demonstrate professional written and oral communication in a professional legal environment.
2. To identify and demonstrate the interpersonal relationships and the paralegal profession.
3. To identify and apply the knowledge and skills learned in the classroom rules, including the rules of professional responsibility, in a professional legal environment.
4. To demonstrate proficiency in appropriate technology in a professional legal environment.
5. To evaluate the internship experience so that the student is better informed when choosing future employment.

PL S 222. Internship II
1-3 Credits
Continuation of PL S 221. Each credit requires specified number of hours of on-the-job work experience. Restricted to Community Colleges campuses only.
Prerequisite(s): PL S 221.

PL S 231. The Law of Commerce for the Paralegal
3 Credits (3)
Law of contracts, negotiable instruments, bank transfers, secured transactions, debtor-creditor relations, agency, and business types and their formation. Students will study the relevant statutes as well as draft documents associated with these types of legal practice. Restricted to: Community Colleges only.
Prerequisite(s): PL S 160.

PL S 274. Legal Research and Writing for the Paralegal I
3 Credits (3)
Legal research materials and techniques will be identified and studied; introduction to online legal research. Legal documents will be prepared and written based on the student's original research, including a Legal Memorandum.
Prerequisite: PL S 160 and ENGL 1110G.
Learning Outcomes
1. Identify the major legal resources.
2. Broadly identify the different types of jurisdiction.
3. Research and describe statutory law.
4. Research and describe case law through a case brief.
5. Identify and write legal information gained from secondary sources.
6. Identify and draft proper legal citations using Bluebook.
7. Analyze and apply valid legal research.
8. Compose an effective legal memorandum.

PL S 275. Tort and Insurance for the Paralegal
3 Credits (3)
Primary legal principles of tort and insurance law and means of establishing insurance plans, types of torts and insurance, as well as use of specific forms and procedures relating to these areas.
Prerequisite: PL S 160.

PL S 276. Wills, Trusts, and Probate for the Paralegal
3 Credits (3)
Analysis of New Mexico statutes, rules, and cases associated with wills and trusts. Study of the probate process. Emphasis on understanding the documents and the practical application of the law and on preparing and drafting documents to address clients' needs.
Prerequisite: PL S 160.
Learning Outcomes
1. Identify, discuss, and apply selected terms and concepts related to the management of illness or incapacity without using guardianships or conservatorships.
2. Identity, define, examine, and discuss selected terms and concepts related to the management of illness or incapacity using guardianships or conservatorships.
3. Identify, examine, discuss, and apply selected terms and concepts related to the use of a Last Will and Testament in estate planning.
4. Identify, discuss, and apply selected terms and standards related to intestate succession and transferring property outside a will.
5. Identify, discuss, and apply selected terms and concepts related to the use of trusts in estate planning.
6. Identify, discuss, and apply selected terms and concepts in the role of probate courts in estate planning.

PL S 277. Family Law for the Paralegal
3 Credits (3)
Examine techniques for effective lawyer-client interaction including conducting client interviews, and practical application of research and drafting of documents and court pleadings in the field of Family Law. Analysis of laws relating to marriage, divorce, custody, child support, adoption, name change, guardianship, and paternity.
Prerequisite: PL S 160.

Learning Outcomes

1. Examine the role as a family law paralegal and how it will intersect with the different areas of law.
2. Draft a client intake memorandum conveying relevant facts for attorney use.
3. Identify the major terminology for premarital law and traditional marriage law.
4. Draft a premarital agreement.
5. Discuss how a marriage may legally dissolve by annulment and by divorce.
6. Draft a divorce complaint/petition.
7. Demonstrate a working knowledge of the legal issues involved in separations agreements, custody issues, and child support.
8. Draft a separation agreement, child custody agreement, and child support agreement.
9. Describe the different types of parentage and how one can obtain and lose that right. 1
10. Explain the varying steps taken for adoption.

PL S 278. Litigation for the Paralegal
3 Credits (3)
The law of procedure and evidence will be considered through rules and cases. Case situations will be used to identify and solve problems.
Prerequisite: PL S 160.

PL S 279. Legal Research and Writing for the Paralegal II
3 Credits (3)
Continuation of PL S 274. Advanced training in legal research with a focus on analysis, writing, and preparation of pleadings, including a trial court legal brief.
Prerequisite: PL S 274.
Learning Outcomes

1. Research legal topics using the internet.
2. Create a legal research strategy and demonstrate complex legal research.
3. Recognize and implement grammar rules.
4. Draft an effective legal letter.
5. Draft an effective legal brief.
6. Identify and draft proper legal citations using Bluebook.
7. Using advanced legal analysis, draft an effective legal brief.

PL S 298. Independent Study
1-3 Credits (1-3)
Individual studies directed by consenting faculty with prior approval by department head. Restricted to Community Colleges campuses only.
Prerequisite(s): PL S 160.

PLEN-PLANT,ENVRMTL SCIENCES

PLEN 5401. Introduction to AI in Agriculture
3 Credits (3)
This course introduces the fundamental concepts, tools, and techniques used to develop and deploy AI systems relevant to agriculture, food production, natural resources, and the environment. Students will gain experience and familiarity with how AI technologies, such as machine learning, computer vision, and IoT, are applied to real-world problems such as precision farming and ranching, crop disease detection, crop breeding, environmental monitoring, natural resource management, and food systems. The course will incorporate concepts of responsible and ethical use of AI in agriculture and natural resource management.
Learning Outcomes

1. Describe the structure of modern agricultural systems through short essays.
2. Classify agricultural challenges by their impact on productivity using case study analysis.
3. Compare traditional and technology-aided approaches to solving farm-level problems in a written critique.
4. Explain how predictive analytics improve yield estimates by interpreting model outputs from sample datasets.
5. Demonstrate the use of a simple AI tool with agricultural data.
6. Evaluate the effectiveness of AI solutions in published case studies using a structured rubric.
7. Design a prototype AI solution and justify its feasibility.
8. Troubleshoot limitations of AI applications through scenario-based discussions.
9. Identify biases in agricultural datasets through hands-on data audits. 1
10. Discuss ethical dilemmas of deploying AI in agriculture. 1
11. Develop guidelines for responsible AI deployment in agriculture.

PLEN 5403. AI Applications in Agriculture, Plant & Environmental Sciences
3 Credits (3)
Practical application of AI concepts, tools, and techniques to agriculture production systems, crop and livestock management, natural resource management, wildlife, and plant and environmental sciences. The course will consider how AI can be used to inform management of agricultural and environmental systems where temporal and spatial variability, feedbacks, and human decision-making create complex, non-linear systems. Data forms, sources, privacy, and security, will also be considered.
Learning Outcomes

1. Develop understanding of various agricultural science fields including agronomy, horticulture, soils, and environmental science.
2. Work with and analyze various agricultural monitoring and measurement data types.
3. Identify major problems and issues facing current and future agricultural production that can be assisted by Artificial Intelligence and Machine Learning.
4. Understand the evolution of agriculture and how machine learning is shaping the future of farming.
5. Explain how and apply clustering and dimensionality reduction techniques help with soil zoning, crop segmentation, and large-scale data analysis.
6. Explain how and apply machine learning can enhance crop price forecasting, logistics, and reduce post-harvest loss.
7. Examine data privacy, algorithmic bias, and the ethical considerations of AI in agriculture (ethics).
8. Discuss future directions including autonomous systems, AI for climate-smart farming, and next-gen opportunities in Agri-AI.

PLEN 6110. Arid Land Water Resources
3 Credits (2+2P)
The course will cover various issues of relevance to water resources and water supply management within the Southwest US and other semiarid and arid regions. Discussions may include development and sustainability, climate change and drought, socioeconomic and cultural, and transboundary issues. Students will develop literature reviews, draft proposals, and conduct presentations. May be repeated up to 3 credits.

Learning Outcomes

1. Write an original research paper based on a literature review that is conceptualized, researched, and orally presented in class.
2. Conduct literature review research and develop a research proposal.
3. Communicate effectively (both oral and written) including engaging in discussion and debate.
4. Describe contemporary issues in water resources in the Southwest US and other arid lands.

PLEN 6120. Instrumentation in Agronomy
3 Credits (3)
Use of instruments used in research in all areas of agronomy including gas chromatography, high performance liquid chromatography, neutron soil moisture probe, and other instruments. May be repeated up to 3 credits.

PLEN 6130. Introduction to Scientific Writing
3 Credits (3)
Students will learn how to communicate, through written format, to both the scientific community and diverse audiences. Students will be introduced to new technologies and new genres of scientific writing. Students will also learn basic reviewing and writing skills that underlie efficient preparation of literature reviews, scientific manuscripts, project reports, blog-posts, opinion or perspective pieces for more popular venues, advocacy articles for legislators, and descriptive pieces for popular venues such as newspapers, magazines, and broadcast media. Emphasis will be on the communication of experimental findings in peer-reviewed scientific journals.
Learning Outcomes

1. Students will review the basics of rhetoric and the technology of language.
2. Students will learn how to overcome writing barriers and gain confidence in their writing skills.
3. Students will improve their writing skills so that manuscript preparation becomes more efficient and productive.
4. Students will learn professional standards for the conduct of ethical reporting of scientific results.
5. Students will learn to recognize structural and stylistic elements in scientific articles that help researchers achieve certain communication goals.
6. Students will learn the basics of table, figure, diagram, and image presentation in manuscripts.
7. Literature reviews, framed so that they answer an important question in the field, and lead to peer-reviewed publication, may also be prepared. (With permission of the instructor.)

PLEN 6210. Advanced Scientific Writing
3 Credits (3)
Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Students are required to have analyzed data ready for incorporation into a finished manuscript. Students will learn professional standards for the conduct of ethical reporting of scientific results. At the end of the course, a manuscript ready for submission to a peer-reviewed journal will have been completed.
Prerequisites: EPWS/AGRO/HORT/SOIL 5213.
Learning Outcomes

1. Students will review the basics of rhetoric and the technology of language.
2. Students will learn how to overcome writing barriers and gain confidence in their writing skills.
3. Students will improve their writing skills so that manuscript preparation becomes more efficient and productive.
4. Students will learn professional standards for the conduct of ethical reporting of scientific results.
5. Students will learn to recognize structural and stylistic elements in scientific articles that help researchers achieve certain communication goals.
6. Students will learn the basics of table, figure, diagram, and image presentation in manuscripts.
7. Literature reviews, framed so that they answer an important question in the field, and lead to peer-reviewed publication, may also be prepared. (With permission of the instructor.)

PLEN 6225. Advanced Scientific Writing
3 Credits (3)
Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review. Students are required to have analyzed data ready for incorporation into a finished manuscript. Students will learn professional standards for the conduct of ethical reporting of scientific results. At the end of the course, a manuscript ready for submission to a peer-reviewed journal will have been completed.
Prerequisite: AGRO/HORT/SOIL/EPWS 513, or EPWS 613, or PLEN 6130.
Learning Outcomes

1. Students will learn how to overcome writing barriers and develop a writing schedule.
2. Students will learn how to better organize the results of their experiments into effective tables and figures.
3. Students will improve their writing skills so that manuscript preparation becomes more efficient and productive.
4. Students will learn how to successfully navigate a manuscript through the entire manuscript preparation, revision, review, and publishing process.
5. Students will learn professional standards for the conduct of ethical reporting of scientific results.
6. Students will learn professional standards for conducting objective, rigorous reviews of scientific manuscripts.
7. Students will successfully communicate their research findings to the scientific community through publication in peer-reviewed, scientific journals.

PLEN 6320. Advanced Soil Physics
3 Credits (3)
Advanced treatment of soil physics, modeling, includes working on an existing/new research project, modeling existing or new data, step by step guide on the use of some 1-D and 2-D models. Specific areas of specialization will be field scale variability of soil properties, water flow, solute transport, and plant water relations. May be repeated up to 3 credits.

PLEN 6410. Moisture Heat Contaminant Transport Modeling
3 Credits (3)
Provides clear coverage of the basic principles of heat, moisture and contaminant transport through porous media, and a step-by-step guidance and hands on application on the use of some spreadsheet based and physically based one-and two-dimensional transport models. A similar course does not exist in the college for students that can encourage them to pursue modeling as a means of solving vadose zone and groundwater contamination and remediation problems. Consent of instructor required. May be repeated up to 3 credits.

PLEN 6415. Breeding for Plant Disease Resistance
3 Credits (3)
A practically-oriented course of lectures and discussion on concepts and principles of breeding for disease and pest resistance. Labs familiarize students with preparation, quantification, and application of inoculum to hosts. May be repeated up to 3 credits.

PLEN 6420. Advanced Crop Breeding
4 Credits (3+3P)
Applications of breeding principles to crop improvement. Emphasis on breeding methodologies using modern techniques, including biotechnology. May be repeated up to 4 credits.
Learning Outcomes
1. Apply advanced breeding principles and methodologies (conventional and molecular) to the genetic improvement of crops, including self- and cross-pollinated species.
2. Analyze and interpret scientific literature related to plant breeding, with emphasis on critical evaluation of experimental design, data analysis, and breeding outcomes.
3. Utilize genomics tools such as marker-assisted selection, genome-wide association studies (GWAS), and genomic selection in developing breeding strategies for crop improvement.
4. Demonstrate proficiency in quantitative genetics concepts by estimating genetic parameters (heritability, combining ability, genetic gain) and conducting DNA marker-trait association analyses.
5. Integrate plant breeding theories and practices to effectively communicate solutions in professional settings, including job presentations simulating real-world plant breeding positions.

PLEN 6425. Biometrical Genetics and Plant Breeding
3 Credits (3)
A statistical approach to gene action and population parameters as applied to plant improvement. May be repeated up to 3 credits.

PLEN 6610. Introduction to Environmental and Ecological Modeling
4 Credits (4)
The course introduces approaches to modeling environmental and ecological processes. Provides students with valuable tools for mathematical and simulation modeling of environmental systems.
Learning Outcomes
1. Familiarity with diverse modeling approaches used in ecology and environmental sciences.
2. The skills and confidence to use simulation approaches for problem-solving.
3. Familiarity in using 'R' as a tool for data analysis and simulation modeling.
4. An improved understanding and appreciation of complex environmental and ecological issues.

PLEN 6810. University Teaching Experience
1-3 Credits (1-3)
Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ENVS course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures. Consent of instructor required. May be repeated up to 3 credits.
Learning Outcomes
1. Incorporate a variety of teaching and learning strategies.
2. Coach and encourage students to answer questions and solve problems.
3. Engage students in active and collaborative learning.
4. Implement appropriate assessment strategies.
5. Use technology in teaching and learning.

PLEN 6910. Doctoral Seminar
1 Credit (1)
Current research discussions presented by doctoral level graduate students. Not more than 2 credits toward the degree. May be repeated up to 2 credits.

PLEN 6920. Doctoral Proposal
1 Credit (1)
Current research proposal written by doctoral level graduate students. Not more than 1 credits toward the degree. May be repeated up to 1 credit.

PLEN 6991. Doctoral Research
1-15 Credits (1-15)
Research. May be repeated up to 88 credits.
Learning Outcomes
1. Varies

PLEN 6996. Advanced Topics
1-6 Credits (1-6)
Topics of current interest, designated by title and credit. Maximum of 6 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits.

PLEN 7000. Doctoral Dissertation
1-15 Credits (1-15)
Dissertation. May be repeated up to 88 credits.
Learning Outcomes
1. Varies

POLS-POLITICAL SCIENCE

POLS 1110G. Introduction to Political Science
3 Credits (3)
This course covers fundamental concepts in political science, such as political theories, ideologies, and government systems.
Learning Outcomes
1. Construct reasoned civic discourse to advocate a stance or examine alternate positions.
2. Identify fundamental concepts and theories in politicalscience.
3. Analyze data and information in order to gain a deeper understanding of the material.
4. Articulate how the public influence and are influenced by politics.
5. Identify and compare government systems from democracy to authoritarian, as well as models of analysis of contemporary international relations.

POLS 1111. Introductory Government Seminar
1 Credit (1)
Introduction to the government major. Designed to assist students in planning college experience and preparing for upper division course work and resesarch May be repeated up to 1 credit.
Learning Outcomes
1. This course is designed for the beginning government major.
2. Its goal is to improve your educational experience at the university and within the Department of Government. In this class we hope to develop some basic skills necessary for successful completion of a degree in Government.
3. These include the skills of critical reading, critical writing, oral presentation and research methods.

4. Additionally, we will use this seminar to introduce you to Government faculty, to plan your government degree and to acquaint you with the services and opportunities the department and the university has to offer.
5. Finally, we hope to begin the discussion of where you will go next, when you complete your degree in Government.

POLS 1120G. American National Government
3 Credits (3)
This course explains the role of American national government, its formation and principles of the Constitution; relation of state to the national government; political parties and their relationship to interest groups. This course also explains the structure of the legislative, executive, and judicial branches.
Learning Outcomes
1. Explain the historical and political foundations of the government of the United States;
2. Explain the precursors to, and the development and adoption of the United States Constitution;
3. Explain the United States federal system, the basics of federalism, and the changing relationship of state and federal power;
4. Describe the power, structure and operation of the main institutions of government, namely the legislative, executive, judicial, and the federal bureaucracy;
5. Explain the development and role of political parties and interest groups;
6. Identify the constitutional basis of civil rights and civil liberties and their changing interpretation; and
7. Describe the role of demographics, public opinion and the media in American politics.

POLS 1130G. Issues in American Politics
3 Credits (3)
This course is designed to introduce the students to the contemporary study of American political issues. The course analysis of government policies, examining various approaches to the economy, democracy and the structure and the function of American political institutions.
Learning Outcomes
1. Explain the basic themes and concepts of political science and their application to contemporary issues.
2. Explain the major forces, interests, and institutions of American democratic politics.
3. Describe and define how beliefs, assumptions, and values are influences by factors such as politics, geography, economics, culture, biology, history, and social institutions.

POLS 2120G. International Relations
3 Credits (3)
This course covers the analysis of significant factors in world politics, including nationalism, national interest, political economy, ideology, international conflict and collaboration, balance of power, deterrence, international law, and international organization.
Learning Outcomes
1. Explain the interrelationships between countries and people in the world,
2. Demonstrate an awareness of current events in the world.
3. Describe several theories of International Relations
4. Explain and identify theories of power and decision making among states in the world.
5. Describe and evaluate issues that relate to International Politics, and how individuals are affected by them.
6. Describe the role of Intergovernmental Organizations in International Politics.
7. Identify the role war plays in International Politics.
8. Explain how economics is intertwined with International Politics.
9. Demonstrate an understanding of role of international terrorism and its impacts on global diplomacy. 1
10. Articulate how beliefs, assumptions, and values are influenced by factors such as politics, geography, economics, culture, history, government, and social institutions.

POLS 2996. Special Topics
3 Credits (3)
Specific topics to be announced in Schedule of Classes. Community Colleges only. May be repeated for a maximum of 12 credits.
Learning Outcomes
1. Varies

POLS 300. Political Research Skills
3 Credits (3)
Introduction to methods of political analysis and fundamentals of research design, including basic methods for the collection and analysis of political data.
Learning Outcomes
1. To gain understanding of research design and methods for collection and analysis of political data.
2. To understand how political scientists collect and analyze data in their research.
3. To appreciate the ethical and methodological issues that are common in political science research.

POLS 308. Prepping for Law School Admissions Test
1 Credit (1)
This workshop helps students understand the law school application process and prepare to take the Law School Admissions Test (LSAT). May be repeated up to 2 credits.
Learning Outcomes
1. To prepare students to do well in the Law School Admissions Test (LSAT).
2. To help students understand the law school application process.

POLS 313. Model United Nations
3 Credits (3)
Issues related to the United Nations and international law/organizations through simulations, discussions and research projects.
Prerequisite: GPA of 2.5 or better and consent of instructor.
Learning Outcomes
1. Articulate a strong understanding of the UN in international politics and diplomacy.
2. Demonstrate ability in conducting research, public speaking, and diplomacy skills.
3. Demonstrate literacy in current global issues and the politics and cultures of the countries that students are assigned to represent.
4. Express global understanding and appreciation of cultural activities.

POLS 314. Advanced Model UN
3 Credits (3)
Advanced topics, research and preparation for Model United Nations activities. Consent of instructor required. Restricted to: Main campus only.

Prerequisite(s): POLS 313, minimum GPA 2.5.

POLS 315. Politics and Film
3 Credits (3)
Exploration of political themes, images, and representation in film and other media. May be repeated for a maximum of 6 credits under different subtitles.

POLS 320. Making Public Policy
3 Credits (3)
The course examines how U.S. public policy is made, including the examination of the major institutional and non-institutional players, politics, issues and power critical to the policy process. Interactive discussion sessions bridge theory to policy-making and political action in substantive policy issues. Restricted to: Main campus only. May be repeated up to 3 credits.
Learning Outcomes
1. Develop knowledge of how public policy is made in the United States at various levels of government (federal, state and local) and in relation to demands from interest groups and other stakeholders
2. Develop knowledge of specific public policy areas (such as environmental policy, energy policy, etc.
3. Develop excellence in research skills as well as written and oral communication of topics in the area of domestic policy

POLS 321. Topics in Public Policy
3 Credits (3)
Course examines issues in public policy. May be repeated up to 6 credits.
Learning Outcomes
1. Develop knowledge and analytical skills with regard to particular topics within the subfield of public policy

POLS 324. Environmental Policy & Administration
3 Credits (3)
This course introduces students to the history, development and formation of the central dimensions of environmental policy, politics and administration in the United States. Students also explore key substantive environmental policy issues (energy policy, natural resource and waste management policies, national parks and wildlife protection, and air and water pollution), and the global dimensions of climate change, environmental justice and sustainability. May be repeated up to 3 credits.
Learning Outcomes
1. Develop knowledge of historical and contemporary aspects of environmental policy, politics and administration in the United States
2. Develop ability to critically analyze environmental policy debates
3. Develop ability to effectively communicate analysis of environmental policy and administration in oral and written forms

POLS 325. Education Policy and Politics
3 Credits (3)
Overview of current pressing policy issues and political debates on education in the U.S., including school choice, vouchers, accountability, and affirmative action. Multiple topics and perspectives covered, with political economy as the main approach. May be repeated up to 3 credits.
Learning Outcomes
1. Understand the historical development and changing federal role in education policy, including major federal education laws and reforms.
2. Examine critical issues and trends in federal education policy, as well as the various actors and perspectives involved in education debates and decision-making.
3. Explore policy process theories and apply them to the analysis of federal education events.
4. Study in depth a federal education policy issue by examining its progress through the various stages of the policy process.

POLS 326. Public Policy & Indigenous Communities
3 Credits (3)
Study of historical and contemporary public policy and law that deals with the special legal status of Native American tribes and tribal members.
Learning Outcomes
1. Become familiar with the body of public policy and the area of law that deals with the special legal status of Native American tribes and tribal members
2. Examine the history, the public policy and the law that has impacted the ability of these indigenous communities to exercise their inherent sovereignty
3. Investigate the history, legislation, policies and landmark cases that have shaped this important area of government in the United States

POLS 330. Introduction to Public Administration
3 Credits (3)
Public administration involves the full range of government agencies, non-profit organizations, and private contractors involved in the implementation of public policy at the federal, state, and local level. This course introduces students to the formal study of public administration and will explore major challenges in public service, the management of public and non-profit organizations, administrative ethics and law, leadership theory, and financial and personnel management. Restricted to: Main campus only. May be repeated up to 3 credits.
Learning Outcomes
1. Gain a strong foundation in the the major issues, theories and challenges of public administration
2. Develop skills to critically analyze key problems in public administration
3. Develop ability to effectively communicate the main issues, theories and challenges of public administration in both oral and written form

POLS 331. Special Topics in Public Administration
3 Credits (3)
Special topics in public administration. May be repeated for a maximum of 6 credits under different subtitles.

POLS 335. Management of Nonprofit Organizations
3 Credits (3)
This course provides an introduction to the nonprofit sector, its nature, scope, and functions, and an overview of a range of nonprofit management concerns and practices. Students will confront the critical issues facing the sector. Activities are designed to expand the management skills of students by offering analytical tools and knowledge, and providing opportunities to test the application of these skills. May be repeated up to 3 credits.
Learning Outcomes
1. Gain a strong foundation in the study of nonprofit organizations and management issues
2. Expand students' management skills
3. Gain experience in application of management skills

POLS 343. Congress and the Legislative Process
3 Credits (3)
This class reviews the history, structure, membership, operation, power and culture of the American Congress. Restricted to: Main campus only.

Learning Outcomes

1. Develop knowledge of the functions and goals of the US Congress, specifically how federal legislation is drafted, debated and passed.
2. Develop skills in debating legislative bills through in-class simulations
3. Develop excellence in research and written and oral communication of significant topics in the study of the US Congress and legislative processes

POLS 345. The Supreme Court
3 Credits (3)
This class studies the history and operation of the Supreme Court, as well as landmark cases that have shaped American government and the Court.

POLS 348. Political Parties and Interest Groups
3 Credits (3)
Organization, principles, and functions of political parties and interest groups in the U.S.

POLS 350. Special Topics in American Government
3 Credits (3)
Special topics in American government. May be repeated for a maximum of 6 credits under different subtitles.

POLS 351V. Conspiracy Theories in American Politics
3 Credits (3)
This course explores the origins, evolution, and impact of conspiracy theories in American politics. Students analyze prominent theories, their formation and spread, and their influence on public discourse and political life.

Learning Outcomes

1. Identify and analyze the historical origins and evolution of conspiracy theories in American politics.
2. Evaluate the impact of conspiracy theories on public discourse, political movements, and government policies.
3. Critically assess the evidence and arguments presented in support of various conspiracy theories.
4. Explore the psychological factors that contribute to belief in conspiracy theories and their influence on individual and collective behavior.

POLS 353. Women and Politics
3 Credits (3)
An examination of women's participation in U.S. electoral politics as voters, candidates, and officeholders; political activism in issue-based movements and strategies for affecting public policy; leadership as administrators and managers in public service agencies. Also explores the influence of feminism in changing women's roles socially, legally, and politically.

POLS 354. Native American Politics
3 Credits (3)
This course explores the rights of Native Americans and the politics, policy, and administration of tribal governments with a focus on the history and current relationship between Native Nations and the US political system. Students will learn about Native peoples' cultural responses, forms of resistance, and adaptations to colonization. Restricted to: Main campus only.

Learning Outcomes

1. Develop a strong understanding of historical and contemporary issues in Native American policy in the United States
2. Develop skills to critically analyze debates over Native American policy
3. Develop skills to effectively communicate analysis of Native American policy in oral and written forms

POLS 360. World Politics
3 Credits (3)
Introduction to major theories and concepts for understanding fundamental problems and issues in international relations May be repeated up to 3 credits.

Learning Outcomes

1. Identify and critically evaluate the major concepts (theory) and practices (reality) of International Relations.
2. Identify, define, and critically think about themes and key issues unique to International Relations and evaluate their pros and cons.
3. Develop knowledge, analytical ability and critical thinking about global efforts and challenges to International Relations.

POLS 361. Special Topics in International Relations
3 Credits (3)
Course examines contemporary issues in international relations. Repeatable under different subtitles. May be repeated up to 6 credits.

POLS 362. International Political Economy
3 Credits (3)
Political factors in international economic relations; theories of political economy.

POLS 364. National Security
3 Credits (3)
Analysis of theories, concepts, historical development and current issues of significance for US national security

Learning Outcomes

1. Analyze international issues from a National Security policy perspective and examine major theoretical approaches (or "paradigms") of National Security
2. Critically examine the historical evolution and the most prominent and contemporary challenges of National Security
3. Acquire abilities to synthesize and articulate important debates in the National Security literature and connect them to current national, regional, and global crises.

POLS 365. Introduction to Security Studies
3 Credits (3)
Introduction to the field of security studies, with focus on theories and issues in the study of security in international politics, including emerging 21st century security challenges related to cyberspace, A.I., information warfare and virtual deterrence.

Learning Outcomes

1. Analyze international issues from a security studies perspective and examine major theoretical approaches (or "paradigms") of security studies
2. Critically examine the historical evolution and the most prominent and contemporary challenges of security studies
3. Synthesize and articulate important debates in the security studies literature and connect them to current national, regional, and global challenges and crises.

POLS 366. American Foreign Policy
3 Credits (3)
Formulation, content and rationale of current foreign policies of the U.S. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of the historical development and current practice of US foreign policy
2. Develop the skills necessary to conduct independent research and written and oral communication of significant topics in US foreign policy

POLS 367. Terrorism
3 Credits (3)
An introductory course using an interdisciplinary framework to explore definitions, historical roots, contemporary manifestations and future trends in political terrorism.

POLS 368. Human Security
3 Credits (3)
Introduction to human security, its focus on security of the individual as opposed to the security of the state since the end of the Cold War and the emergence of global challenges such as environmental crises, public health, and cybersecurity of the virtual self.

Learning Outcomes

1. Identify and critically evaluate the major concepts and practices in human security
2. Define, identify and critically think about key issue areas in human security
3. Develop a coherent body of research in regard to a human security topic of your interest; engage with complex knowledge about human security and apply your analysis to a specific phenomenon.
4. Investigate current, global efforts and challenges in regard to human security.

POLS 370. Comparative Politics
3 Credits (3)
Comparative study of similarities and differences to be found in political systems across the world, with emphasis on the structure and performance of modern states, accountability of government institutions, parties and elections, social movements, and public policies. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of main issues and concepts in the study of comparative politics.
2. Increase analytical ability to explain similarities and differences between political systems
3. Promote critical thinking regarding the human and environmental consequences of government policies in addressing common public policy problems.

POLS 371. Latin American Politics
3 Credits (3)
Comparative study of government systems and political change in Latin American countries, with focus on challenges of social inequality, democratization, regional integration, relations with the United States, and the rights of women, LGBTQ* community, Indigenous and Afro-descendent peoples. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of how historical legacies, domestic politics, and global relations shape contemporary politics in Latin America
2. Increase analytical ability to explain similarities and variation in contemporary politics in Latin America
3. Develop critical thinking regarding how to explain the persistence and political implications of socioeconomic inequalities and discrimination in Latin America
4. Develop oral and written communication skills in expressing knowledge, concepts, and comparative analysis

POLS 372. Special Topics in Comparative Politics
3 Credits (3)
Course examines contemporary issues in comparative politics. May be repeated under different subtitles. Restricted to: Main campus only.

POLS 373. Resistance Movements in World Politics
3 Credits (3)
Comparative study of contemporary resistance movements and social protests around the world with a focus on their origins, demands, ideologies, strategies and impacts. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of concepts of power and resistance movements and their applicability in many parts of the world.
2. Increase analytical ability to explain variation in the motives, strategies and impacts of resistance movements.
3. Promote critical thinking regarding how we choose to address inequalities, injustices and dissent.
4. Develop oral and written communication skills of key concepts and original research.

POLS 378. U.S.-Mexico Border Politics
3 Credits (3)
Analysis of contemporary challenges facing the U.S.-Mexican border, including immigration, binational cooperation, drug trafficking, corruption, human rights violations and security. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of the main issues and controversies in US-Mexico border politics.
2. Increase analytical ability to explain the implementation and results of border policies for local communities and the environment.
3. Promote critical thinking regarding the merits of alternative policies and future possibilities.

POLS 379. Mexican Politics
3 Credits (3)
Study of the politics and government of contemporary Mexico with focus on challenges of democratization, human rights, public policies, Mexico-US relations, and internal security. May be repeated up to 3 credits.

Learning Outcomes

1. Develop knowledge of main issues and concepts in the study of Mexican politics.
2. Develop ability to conduct online research on current issues in Mexican politics.
3. Promote critical thinking regarding the causes and consequences of criminal violence in Mexican politics and how it may be best addressed.

POLS 380V. Political Ideologies
3 Credits (3)
Introduction to the prevailing political ideologies in the modern world and the ways in which modern nations operating under one or more of these ideologies attempt to answer fundamental questions about the allocation and distribution of rights, liberties, and other things of value. In addition, the course work and discussions attempt to address recent political, social, and economic events in various areas of the world. May be repeated up to 3 credits.

Learning Outcomes

1. To understand the historical origins of major political ideologies and their impacts on different societies.

2. To communicate in oral presentation and written work the main characteristics of different political ideologies in a comparative context.
3. To analyze current uses of political ideologies in government and society.

POLS 382. Classical Political Thought
3 Credits (3)
Analysis of main currents in political thought from ancient Greece and Rome to the high Middle Ages.

POLS 383. Modern Political Thought
3 Credits (3)
Historical and theoretical examination of political ideas and ideologies from Machiavelli to Nietzsche. Topics include liberalism, conservatism, romanticism, communism, and Nihilism.

POLS 385. American Political Thought
3 Credits (3)
Introduction to major American thinkers and historical currents from colonial time to the present. May be repeated up to 3 credits.
Learning Outcomes
1. To understand the nature of the specifically American form of constitutionalism, as compared to its alternatives;
2. To understand the idea of progress in American history, including its colonial origins and its contemporary manifestation under the terms of progressivist ideology;
3. To understand the meaning and origin of American conservatism, and its place in contemporary political life;
4. To understand the dynamics of shifting political and institutional power relationships (including issues of centralization and decentralization) in relation to the above; and
5. To understand the general relationship between cultural phenomena and questions of political order.

POLS 387. Religion and Politics
3 Credits (3)
Survey of major points of interaction between politics and religion in the U.S., using theoretical, historical, and institutional analysis.

POLS 388. Contemporary Political Thought
3 Credits (3)
Introduction to the major thinkers and political arguments in contemporary political thought, from after Nietzsche to the present day. Topics include liberalism, fascism, existentialism, and post-liberal thought.
Learning Outcomes
1. Demonstrate an understanding of the critical debates related to political ideologies and movements from the 20th century to the present day.
2. Evaluate the historical, cultural, and intellectual contexts that have shaped contemporary political thought.
3. Critically examine the historical evolution of political thought in the post-Nietzschean world, including its political, cultural, and intellectual causes.

POLS 390. Special Topics in Public Law
3 Credits (3)
Course examines various issues in public law. May be repeated under different subtitles.

POLS 391. Constitutional Law
3 Credits (3)
The class explores the reasoning and political context of the Supreme Court cases that define the distribution and limits of governmental powers and duties under the U.S. Constitution, including separation of powers and federalism. Restricted to: Main campus only.

POLS 392. Civil Liberties
3 Credits (3)
The course examines the reasoning and political context of major Supreme Court cases defining constitutional rights of free speech, religious liberty, free press and criminal procedural rights.

POLS 394. Judicial Process
3 Credits (3)
Class examines the structure, function and purpose of the American judicial system. Restricted to: Main campus only.

POLS 395. Law and Society
3 Credits (3)
Class critically explores the development, role and impact of law on society, covering different philosophies and theories of law, different world legal systems, and different issue areas of law and society. Restricted to: Main campus only. May be repeated up to 3 credits.
Learning Outcomes
1. To understand the development, role and impac to law on society
2. To gain knowledge of different philosophies and theories of law
3. To gain knowledge of different legal systems around the world and key issues in law and society
4. To gain skills in critical analysis of debates in law and society
5. To gain skills in effective communication of analysis of law and society in oral and written forms

POLS 396. International Law
3 Credits (3)
Nature, growth, and scope of law of nations, rights and obligations of states in peace and war, current issues.

POLS 399. New Mexico Law
3 Credits (3)
Examination of the history, development and implementation of law in New Mexico with an emphasis on legal issues unique to New Mexico. Crosslisted with: CJUS 399. May be repeated up to 3 credits.
Learning Outcomes
1. To understant the unique legal issues of New Mexico through critical examination of the history, development and implementation of law in the state.
2. To develop skills to critically analze debates over legal issues in New Mexico.
3. To develop skills to effectively communicate analysis of legal issues in New Mexico in oral and written forms.

POLS 405. Directed Readings
1-3 Credits
Individualized readings. Course subtitled. May be repeated for a maximum of 6 credits. Graded S/U. Consent of instructor required.

POLS 406. Independent Study
1-3 Credits
Individualized research. Course subtitled. May be repeated for a maximum of 6 credits. Consent of instructor required.

POLS 407. Workshop
1-6 Credits (1-6)
Focus on skills related to careers in government and political science. Specific topics announced in the Schedule of Classes; Only three credits

apply toward government major or minor requirements. May be repeated up to 6 credits.

Learning Outcomes

1. Develop skills related to careers in government and public service

POLS 410. Internship
1-12 Credits
Hands-on experience working with public agencies, political campaigns, elected officials & non-profits. May be repeated for a maximum of 12 credits; only 3 credits apply toward government major or minor requirements. Consent of instructor required. Graded: S/U.
Prerequisite(s): Completion of 12 government credits, 2.5 GPA, junior and above standing.

POLS 411. Service Learning Experience
3 Credits (3)
Experiential learning through a community service project. May be subtitled to reflect service activity. May be repeated for a total of 6 credits; only 3 credits apply toward government major or minor requirements.
Prerequisites: completion of 12 government credits, junior or above standing, and consent of instructor.

POLS 412. Practicum in Student Government
3 Credits (3)
Research of issues in student government. Consent of instructor required. Graded: S/U.
Prerequisite(s): Student government participation, completion of 12 POLS credits, junior or senior standing.

POLS 415. Senior Seminar
2 Credits (2)
Review and integration of political skills acquired in the Government Department. Students will focus on critical essay writing and oral presentation of a synthesis of knowledge gained from prior departmental coursework May be repeated up to 2 credits.

Learning Outcomes

1. To integrate knowledge from various classes during the students' coursework as a Government major.
2. To effectively communicate in oral and written forms a synthesis of main issues, theories, scholars and actors in the various sub-fields of the government major.

POLS 469. Globalization
3 Credits (3)
Analysis of the globalization process. Covers theories of globalization, the global economy, political globalization, global culture, transnational social movements, transnational migration and world labor market, global cities, and local-global linkages. Same as SOCI 4460. May be repeated up to 3 credits.

POLS 493. Mass Communications Law
3 Credits (3)
Examination of legal issues relating to mass media in the United States. Invasion of privacy, libel, sedition, copyright, and advertising regulation. Same as JOUR 493 and COMM 493.

POLS 502. Research Methods in Government
3 Credits (3)
Contemporary methods of political analysis, including mathematical and statistical techniques and computer applications. MPA students must complete this class with a B- or better. MA students must complete either POLS 502 or POLS 503 with a B- or better.

POLS 503. Qualitative Research Methods
3 Credits (3)
An overview of qualitative research methods such as fieldwork, ethnography, content analysis, case studies, focus groups and grounded theory. Introduces students to epistemology (the study of knowledge) and to basic components of research design. Explores activist scholarship, ethical dilemmas in research, and software tools for computer assisted analysis. Especially useful for students preparing theses, dissertation, or other research projects. MA students must complete either POLS 503 or POLS 502 with a B- or better.

POLS 505. Directed Readings
1-3 Credits
Selected topics in government. May be repeated for a total of 6 credits. Graded S/U.
Prerequisite: consent of instructor.

POLS 510. Internship
1-6 Credits
Assignment with a public agency and research report. Only 3 credits apply toward degree requirements. Graded S/U.
Prerequisite: approval of graduate advisor.

POLS 517. Selected Topics in Government
3 Credits (3)
Selected issues which may cross sub-fields of the discipline. May be repeated for a total of 6 credits.

POLS 519. Proseminar in Public Administration
3 Credits (3)
Review of classic and contemporary theory and practice in public administration. Application of written and oral skills to the presentation and defense of essays on various aspects of public administration. To be completed with a B- or better.
Prerequisite(s): 30 credits of M.P.A.

POLS 522. Public Sector Economics I
3 Credits (3)
Introduction to the economic rationale for government intervention in the economy and the effects of that intervention on economic agents and the economy in general. Emphasis on the expenditure side of government policies. Same as AEEC 522.

POLS 524. Introduction to the Nonprofit Sector
3 Credits (3)
Advanced study of the nature and operation of the nonprofit sector and how it interacts with public policy. The course provides an overview of the nonprofit sector, its scope, structure, history, values, distinct contributions to society, place in the government service delivery systems, and selected public policy issues that affect it.

Learning Outcomes

1. Demonstrate an understanding of the unique nature of the nonprofit sector, and distinguish it from the public (government) and private (business, for-profit) sectors in form and delivery systems.
2. Provide a description of the historical, theoretical, and legal perspectives on nonprofit organizations, as well as current trends and challenges facing the sector.
3. Evaluate the scope of the nonprofit activity in the U.S. and demonstrate an understanding of the major nonprofit subsectors, such as health care, arts, social service, and religious organizations.
4. Determine how nonprofit organizations and business firms can constructively learn from one another.
5. Explain and justify the role and function of nonprofit organizations and the myriad ways in which nonprofit organizations serve our communities and enhance our society.

POLS 525. Seminar in the Nonprofit and Philanthropic Sector
3 Credits (3)
Advanced study of the role of philanthropy and nonprofit organizations in society. Addresses the theoretical and academic foundations of research literature in the field from a variety of disciplines.

Learning Outcomes
1. A better understanding of the various issues and topics of the Nonprofit/Philanthropic sector studied by scholars in the field.
2. An ability to discuss major findings and theories in the field of Nonprofit and Philanthropic Studies.
3. The knowledge to discuss and critique research designs and methods that have been utilized in Nonprofit/Philanthropic Studies.
4. An ability to frame new research questions (and/or, extend knowledge) related to nonprofit organizations and philanthropy.

POLS 526. Performance Management of Public and Nonprofit Organizations
3 Credits (3)
Advanced study of the theory and practice of performance measurement and management, how to select key performance indicators, implement a performance management system and use performance measures. Examines importance of leadership roles and accountability in managing public and nonprofit organizations.

Learning Outcomes
1. To understand the inextricable connection between performance measurement and strategic planning in developing effective organizations.
2. To develop the skills to implement performance management systems in organizations, regardless of level of authority within these organizations.
3. To gain skills to adeptly navigate organizational challenges that impede implementation of performance management systems.

POLS 527. Issues in Public Management
3 Credits (3)
Selected issues in public management. May be repeated under different subtitles for a total of 6 credits.

POLS 530. Seminar in Public Policy
3 Credits (3)
Survey of the political, administrative, and technical aspects of policy making in government. MA students taking POLS 530 as part of their core requirements must complete the class with a B- or better.

POLS 536. Public Policy and Indigenous Communities
3 Credits (3)
Indigenous communities are found throughout North, Central and South America. This course addresses the history, development and governance of these communities. Different sections of the course may choose to focus on different indigenous communities. All courses will consider the principles of governance internal to indigenous communities as well as the governing relationships between indigenous communities and modern states.

POLS 537. Issues in Public Policy
3 Credits (3)
Selected issues in public policy. May be repeated under a different subtitle for a total of 6 credits.

POLS 540. Seminar in Public Administration
3 Credits (3)
Survey course on the theory and practice of program, personnel, and financial management in government and the private, nonprofit sector. MA students taking POLS 540 as part of their core requirements must complete the class with a B- or better.

POLS 541. Public Budgeting
3 Credits (3)
Budgetary processes; budget classification, analysis, and evaluation. MPA students must complete this class with a B- or better.

POLS 542. Public Sector Human Resources Management
3 Credits (3)
Exploration of public personnel systems and practices, including job analysis, compensation, performance evaluation, recruitment, and labor-management relations. MPA students must complete this class with a B- or better.

POLS 543. Skills Workshop
1-6 Credits (1-6)
Focus on management of task skills in selected areas of public administration. Specific topics will appear in the Schedule of Classes. May be repeated up to 6 credits.

Learning Outcomes
1. Develop specific skills related to the practice of public administration

POLS 544. Public Policy Analysis
3 Credits (3)
Environment of policy analysis; various descriptive and quantitative designs for analyzing and evaluating public policy. Problems of policy analysis. MPA students must complete this class with a B- or better.
Prerequisite(s): POLS 502 or consent of instructor.

POLS 547. Government Organizations
3 Credits (3)
Historical overview and present applications of organization theory in public management. MPA students must complete this class with a B- or better.

POLS 548. Public Sector Leadership
3 Credits (3)
Theories and styles of leadership.

POLS 549. Ethics in Government
3 Credits (3)
Examination of standards, perspectives, and issues for ethical decision-making in public agencies. MPA students must complete this class with a B- or better.

POLS 550. Seminar in American Politics
3 Credits (3)
Overview of American political institutions. Includes study of American constitutional theory; legislative, executive, and judicial functions and processes; political parties and interest groups; and public policy formulation. MA students taking POLS 550 as part of their core requirements must complete the class with a B- or better.

POLS 560. Seminar in International Relations Theory
3 Credits (3)
A critical overview of leading approaches and controversies in international relations theory. The purpose of the course is to introduce students to contending theoretical perspectives and conceptual frameworks that help make sense of contemporary world politics. MA students taking POLS 560 as part of their core requirements must complete the class with a B- or better.

POLS 563. Issues in International Relations
3 Credits (3)
Selected issues in international relations. May be repeated under a different subtitle for a total of 6 credits.

POLS 564. Advanced National Security Policy
3 Credits (3)
Major topical, theoretical, and regional issues in national security policy.

POLS 565. Advanced Issues in Security Studies
3 Credits (3)
Advanced study of theories, concepts and key issues in the area of security studies, including historical security problems and emerging 21st century challenges related to cyberspace, A.I., information warfare and virtual deterrence.

Learning Outcomes
1. Analyze international issues from a security studies perspective and examine major theoretical approaches (or "paradigms") of security studies.
2. Critically examine the historical evolution and the most prominent and contemporary challenges of security studies.
3. Synthesize and articulate important debates in the security studies literature and connect them to current national, regional, and global challenges and crises.

POLS 567. Advanced Issues in Terrorism
3 Credits (3)
Advanced study of theories of the causes of terrorism, responses to varieties of terrorism, and major issues in the study of terrorism, historically and today

Learning Outcomes
1. Examine core ideas in studies of terrorism (theoretically and factually)
2. Introduce and develop an understanding about the causes of terrorism and possible solutions
3. Acquire abilities to gain knowledge, think critically, analytically, and synthetically of countries and violence, and varieties of terrorism over time and throughout the world.

POLS 568. Advanced Issues in Human Security
3 Credits (3)
Advanced study of major theories, concepts and issues in the study of human security, such as environmental crises, public health, and cybersecurity of the virtual self.

Learning Outcomes
1. Identify and critically evaluate the major concepts and practices in human security;
2. Define, identify and critically think about key issue areas in human security.
3. Develop a coherent body of research in regard to a human security topic of your interest; engage with complex knowledge about human security and apply your analysis to a specific phenomenon.
4. Investigate current, global efforts and challenges in regard to human security.

POLS 569. Advanced Issues in Globalization
3 Credits (3)
Analysis of the globalization process. Covers theories of globalization; global economy; political globalization; global culture; transnational social movements; transnational migration and world labor market; global cities; local-global linkages. Same as SOCI 5460. May be repeated up to 3 credits.

POLS 570. Seminar in Comparative Politics
3 Credits (3)
Examination of methods used for comparing various types of political entities. Investigation of criteria needed to examine a concept across cultures or national boundaries. MA students taking POLS 570 as part of their core requirements must complete the class with a B- or better.

POLS 574. Contemporary Comparative Studies
3 Credits (3)
Major topical, theoretical, and regional issues in international politics. May be repeated once.

POLS 578. Seminar in the U.S.-Mexican Border
3 Credits (3)
An analysis of the political environment along the United States-Mexico border and a survey of the literature available for a number of contemporary issues.

POLS 579. Seminar in Mexican Politics
3 Credits (3)
Advanced research on politics and government of Mexico.

POLS 580. Seminar in Political Theory
3 Credits (3)
Examination of major issues in political theory, including democracy, sovereignty, classical and modern traditions of thought. May be repeated with different subject matter. MA students taking POLS 580 as part of their core requirements must complete the class with a B- or better.

POLS 587. Seminar in Religion and Politics
3 Credits (3)
Historical, theoretical and comparative analyses of the interaction between politics and religion.

POLS 593. Issues in Public Law
3 Credits (3)
Selected issues in public law. May be repeated under a different subtitle for a total of 6 credits.

POLS 596. International Law
3 Credits (3)
Nature, growth and scope of law of nations; rights and obligations of states in peace and war; current issues.

POLS 598. Special Research Programs
1-3 Credits
Individual investigations either theoretical, analytical or experimental. Three credits may be taken per semester for a total of 6 credits for thesis students, and 9 credits for non-thesis students. Consent of instructor required.

POLS 599. Master's Thesis
1-15 Credits
Thesis.

PORT-PORTUGUESE

PORT 1110. Portuguese I
3 Credits (3)
Designed for students with no previous exposure to Portuguese, this course develops basic listening, speaking, reading, and writing skills. This is an introductory course aimed at teaching the student to communicate in Portuguese in everyday situations.

Learning Outcomes
1. Students can communicate and exchange information about familiar topics using phrases and simple sentences, sometimes supported by memorized language.
2. Students can handle most short social interactions in everyday situations by asking and answering simple questions.
3. Students can write short messages and notes on familiar topics related to everyday life.

4. Students can often understand words, phrases, and simple sentences related to everyday life.
5. Students can recognize pieces of information and sometimes understand the main topic of what is being said.
6. Students can understand familiar words, phrases, and sentences within short and simple texts related to everyday life.
7. Students can sometimes understand the main idea of what they have read.
8. Students can make connections between beliefs, behaviors and cultural artifactsof the Portuguese-speaking world, and make informed cross-cultural comparisons.

PORT 1120. Portuguese II
3 Credits (3)
A continuation of Portuguese I, students will develop a broader foundation in skills gained during the first semester, including understanding, speaking, reading and writing Portuguese. Students will also gain more in- depth knowledge of Portuguese-speaking cultures.
Prerequisite: C or better in PORT 1110 or consent of instructor.
Learning Outcomes
1. Students can participate in conversations on a number of familiar topics using simple sentences.
2. Students can handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can write about familiar topics and present information using a series of simple sentences.
4. Students can understand the main idea in short, simple messages and presentations on familiar topics.
5. Students can understand the main idea of simple conversations that they overhear.
6. Students can understand the main idea of short and simple texts when the topic is familiar.
7. Students can begin to narrate and describe simple events in the past.
8. Students can make broader connections between beliefs, behaviors and cultural artifacts of the Portuguese-speaking world, and make informed cross-cultural comparisons.

PORT 364V. Brazilian Culture Through Popular Music
3 Credits
This course will present students with an overview of Brazilian popular music, from the late nineteenth century to the present day, concentrating on the 60s, 70s, 80s of the 20th Century. It aims to discuss topics about cultural aspects and current issues in Brazil. It is designed to give students some introductory experience in Portuguese language and emphasizes skill development and refinement in the area of critical reading and writing.
Learning Outcomes
1. Be able to identify and distinguish the Brazilian musical styles including in the course.
2. Informatively discuss the main historical events in Brazil from the XVI to the XXI Century.
3. Be able to link the different musical styles to specific periods and events in Brazilian history.
4. Evaluate Brazil's the triple heritage (Indigenous, European, and African) and how it reflects on the notion of being Brazilian.
5. Demonstrate insight of how globalization has influenced Brazilian music, as well as of the transnational aspects of Brazilian music.
6. Be able to use the previous knowledge to discuss current notions of Brazilian identity, as well as recent developments in Brazilian music and society.
7. Be able to informatively relate Brazilian culture to their own.

PORT 453. Independent Luso-Brazilian Studies
1-3 Credits (1-3)
Individualized, self-paced projects for advanced students in Luso-Brazilian studies. May be repeated up to 12 credits. Consent of Instructor required.

PORT 513. Graduate Portuguese for Romance Language Students I
3 Credits (3)
Portuguese for beginners at the graduate level. May be completed on campus or via Study Abroad. Credit can be applied towards fulfilling the second language requirement. Credit is not accepted towards any graduate level major or minor.

PORT 514. Graduate Portuguese for Romance Language Students II
3 Credits (3)
Portuguese for beginners at the graduate level. May be completed on campus or via Study Abroad. Credit can be applied towards fulfilling the second language requirement. Credit is not accepted towards any graduate level major or minor.
Prerequisite(s): Language placement exam or C or better in PORT 513, or consent of instructor.

PSYC-PSYCHOLOGY

PSYC 1110G. Introduction to Psychology
3 Credits (3)
This course will introduce students to the concepts, theories, significant findings, methodologies, and terminology that apply to the field of psychology.
Learning Outcomes
1. Explain how the scientific method and psychological research methodologies are used to study the mind and behavior.
2. Recall key terms, concepts, and theories in the areas of neuroscience, learning, memory, cognition, intelligence, motivation and emotion, development, personality, health, disorders and therapies, and social psychology.
3. Explain how information provided in this course can be applied to life in the real world.
4. Identify the major theoretical schools of thought that exist in psychology as they relate to the self, the culture, and the society.

PSYC 1115. Introduction to the Psychology Major
1 Credit (1)
This course is designed to give Psychology majors the knowledge and tools they need to get the most out of the major and assist them in making informed decisions about career choices in Psychology. There are two main goals for this course. The first is to provide students with helpful tools and resources to enhance their experience as a Psychology major. The second goal is to delineate the knowledge and skills that students are expected to acquire with a Psychology degree and to convey how these can be applied in their future academic, professional, and personal endeavors beyond graduation. During the semester, students will discuss the subdisciplines of Psychology and explore career options with varying levels of education. Students will learn about course requirements for the Psychology major and experiential learning opportunities available outside the classroom. This 1-credit course is required for Psychology majors. It is recommended that students take

this course as soon as they declare Psychology as their major. This course may be taken in conjunction with Introduction to Psychology.
Prerequisite/Corequisite: PSYC 1110G.

Learning Outcomes

1. Demonstrate knowledge and understanding of the subdisciplines of Psychology.
2. Demonstrate knowledge and understanding of the requirements of the Psychology major and experiential opportunities available to Psychology majors.
3. Identify career opportunities available to individuals with varying levels of education in Psychology and related fields (e.g., BA, MA, PhD, etc.).
4. Adopt strategies to prepare for future success in a job search or graduate school application.
5. Exhibit information literacy skills (e.g., literature searches, use of APA format) that will facilitate success in future Psychology courses.
6. Identify personal attributes as a student, areas of Psychology that are aligned with personal strengths, and strategies to make the most of personal strengths as a student.

PSYC 2110. Social Psychology
3 Credits (3)

This course is an introduction to the scientific study of human social influence and interaction, and explores how an individual's actions, emotions, attitudes and thought processes are influenced by society and other individuals. May be repeated up to 3 credits.
Prerequisite: PSYC 1110G, MATH 1215, and ENGL 1110G.

Learning Outcomes

1. Identify concepts, theories, scientific methods, and research findings relevant to social psychology.
2. Explain how situational, social, and individual factors influence behavior.
3. Apply social psychological concepts to real-life events, current social issues and problems, and one's own life.

PSYC 2120. Developmental Psychology
3 Credits (3)

Study of human physical and psychological change and stability from a lifespan development perspective. May be repeated up to 3 credits.
Prerequisite: PSYC 1110G, MATH 1215, and ENGL 1110G.

Learning Outcomes

1. Explain theories, methods and research findings of lifespan developmental psychology.
2. Describe the interaction between physical, cognitive, and psychosocial development across the lifespan.
3. Compare and contrast major developmental theories and discuss what each brings to or adds to the study of lifespan developmental psychology.
4. Identify factors that influence psychological development across the lifespan.
5. Apply basic principles of developmental psychology to one's own life experiences.
6. Analyze historical and cultural factors that influence development across the lifespan.

PSYC 2210. Abnormal Psychology
3 Credits (3)

This course provides students with an introduction to the field of abnormal psychology. Subject areas include history, methods, theories, etiologies, classification and treatment of disorders. May be repeated up to 3 credits.
Prerequisite: PSYC 1110G, MATH 1215 and ENGL 1110G.

Learning Outcomes

1. Recognize terms used within the field of abnormal psychology.
2. Compare various methods for defining abnormal behavior.
3. Evaluate the development of classification systems that define "normal" and "abnormal" from historical, social, and cultural contexts.
4. Critically evaluate the symptoms and etiologies of mental health disorders in the current psychological diagnostic system.
5. Describe treatment modalities for mental health disorders.
6. Identify biological and psychological processes in mental health disorders.

PSYC 2220. Cognitive Psychology
3 Credits (3)

The course provides an overview of human cognitive processes such as attention, perception, memory, language, categorization, decision-making, reasoning, and problem solving. Includes methods, theories, and applications. May be repeated up to 3 credits.
Prerequisite: PSYC 1110G, MATH 1215, and ENGL 1110G.

Learning Outcomes

1. Describe research findings in the major areas of human cognition.
2. Differentiate the research methods used to study the various topics in cognitive psychology.
3. Apply theories of cognition to the results of laboratory research.
4. Apply the research on cognitive psychology to topics in the real world.

PSYC 2221. Applied Psychology
3 Credits (3)

Explanation of the psychological principles of everyday living. Emphasizes motivation, learning of intelligent behavior, and applications of psychology to social issues. Community Colleges only.

Learning Outcomes

1. The objective of this course is to orient students to the personality characteristics, interpersonal competencies, ethical decision-making skills, and other professional traits associated with pursuing a career in a helping profession.
2. Identify the requirements for becoming a helping professional, characteristics of a skilled helper, and cultural factors that impact helping professionals
3. Explain your personal strengths and weaknesses as a potential helper.
4. Demonstrate appropriate helping strategies based upon the special characteristics of clients.
5. Compare the capabilities that individual, family, group, community, and online interventions offer you as a future helper.
6. Identify the ethical and legal issues that impact helping professionals
7. Analyze the potential impact of your future ethical and professional standards as a helping professional
8. Explain how your role as a helping professional is impacted by your professional affiliation and ethical principles
9. Analyze how worsening personal problems and increasing stress can impact the kinds and quality of our responses to life and the people around us.

PSYC 2230. Psychology of Adjustment
3 Credits (3)

This course focuses on the individual's adjustment to society, and the application of psychological principles to the understanding of adjustment.

Learning Outcomes

1. Explain the internal and external factors associated with the psychology of adjustment.
2. Evaluate contributions from psychology to adjustment concepts and processes.
3. Describe the different explanations of how individuals adjust to their environments.
4. Describe how self-identities develop and how they affect relations with others.
5. Identify resources available for assistance with adjustment-related concerns.

PSYC 2250. Brain and Behavior
3 Credits (3)

A general survey of the biological foundations of behavior and mental processes. Students will gain an understanding of anatomy, physiology, and chemistry of the nervous system and their relationships to human behavior. May be repeated up to 3 credits.

Prerequisite: PSYC 1110G, MATH 1215 and ENGL 1110G.

Learning Outcomes

1. Identify and describe basic neuroanatomical structures and functions.
2. Identify and describe chemical processes of the nervous system.
3. Apply course concepts to psychological processes, such as learning, memory, sensation, perception, drive states, sleep, and language.
4. Apply course concepts to psychological disorders, such as schizophrenia and mood and anxiety disorders.
5. Describe the techniques used to study the relationship between brain and behavior.

PSYC 2311. A Study of Substance Abuse through Learning
3 Credits (3)

Physiological and psychological impact of drug use on human behavior. Emphasizes practical applications of intervention and prevention in the community. Community Colleges only.

Learning Outcomes

1. Through readings and discussions, students will be able to describe the role that gender, ethnicity, and age have in alcohol and drug use.
2. Through readings and discussions, students will be able to learn past and current perspectives of addiction.
3. Through readings, discussions and student presentations, students will be able to distinguish between different types of abuse-able drugs and be able to classify them.
4. Through readings, discussions, lectures and guest speaker's students will be able to describe the role of addiction and criminal behavior.
5. Through readings and discussions, students will be able to discuss the Models and Theories of Drug Dependence and Addiction.
6. Through readings, discussions and evaluation of case studies students will be able to discuss the definitions of Substance Abuse, Dependence Addiction.
7. Through readings and discussions, students will be able to acquaint themselves with the effects of Addictive Behavior on Family Systems.
8. Through readings discussions, students will be able to Discuss Disorders Co-Occurring with Substance Abuse
9. Through readings and community service learning outing, students will be able to discuss how important the concepts of Prevention, Intervention and Treatment in drug addiction.1
10. Through readings and community service learning outing students will be able to discuss Alcohol/Drug Recovery Treatment Relapse Prevention 1
11. Through completion of Service Learning and field assignment students will be able to discuss the role of AA/NA in Recovery Treatment. 1
12. Through attendance of a Drug Court Hearing students will be knowledgeable of the role of Drug Courts in prevention and treatment of drug addiction.

PSYC 3110. Experimental Methods
4 Credits (3+1P)

The basic skills of literature search, experimental design, research methodology, and research reporting are emphasized; includes laboratory.

Prerequisite: PSYC 1110G, PSYC 1115, PSYC 2110, PSYC 2220, and either MATH 1350G, MATH 2350G, or A ST 311.

Learning Outcomes

1. Identify, discuss, synthesize, and present original scientific literature (journal articles) on specific psychological research topics.
2. Pose a testable research question and suggest falsifiable hypotheses.
3. Design and conduct a behavioral research study that satisfies the scientific goals of description, prediction, and explanation.
4. Draw conclusions based on the results of statistical analyses.
5. Write up a behavioral research study in APA format.
6. Discuss and apply the ethical considerations pertaining to conducting psychological research.
7. Apply the techniques of psychological research to real-world societal concerns.

PSYC 3120. Psychological Measurement
3 Credits (3)

The objective of this class is for you to develop broad conceptual knowledge, as well as specific concrete skills, when developing, analyzing and interpreting psychological measures and the data that come from them. We will learn through in-depth discussion and hands-on applications: e.g., exploring the purpose and meaning of measurement, taking a wide range of actual measures, analyzing measurement data in a variety of different ways. Overall, you will learn from this class whether a measure/test is measuring what we think it should, on the basis of reliability, validity, and fairness.

Prerequisite: PSYC 1110G, PSYC 1115, PSYC 2110, PSYC 2220.

Learning Outcomes

1. Learn how to develop, analyze, and interpret psychological measures.
2. Learn how to determine whether a measure/test is measuring what we think it should, on the basis of reliability, validity, and fairness.

PSYC 3210. Perception
3 Credits (3)

Primary emphasis on vision. Topics include measurement of sensations, development of visual-motor coordination, reading, speech perception, picture perception, illusions, 3-dimensional space, and causes and consequences of visual abnormalities.

Prerequisite: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 3110.

Learning Outcomes

1. To provide a comprehensive knowledge of topics within sensation and perception, including topics in vision, hearing, smell, taste, and touch.

PSYC 3220. Learning
3 Credits (3)
Covers: habituation, Pavlovian conditioning, Thorndikian learning, stimulus generalization, transfer of training, and the learning and forgetting of related and unrelated material.
Prerequisite: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 3110.

Learning Outcomes

1. Recognize and distinguish between various learning situations, especially classical/Pavlovian and Instrumental learning and their many facets and applications.
2. Identify some of the key conditions necessary for learning to take place, and that may prevent learning from taking place – rather more nuanced than most intro psych books suggest.
3. Identify and evaluate different basic situations to suggest how learning might be structured to cause changes in behavior in both humans and other animals.

PSYC 3230. Memory
3 Credits (3)
Examines facets of human memory from the information processing viewpoint, including encoding, storage, and retrieval and memory-aiding techniques.
Prerequisite: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 3110 or consent of instructor.

PSYC 3310. Emotion
3 Credits (3)
An overview of the past century of research on human emotion from WIlliam James to Antonio Damasio. Explores a cognitive science perspective on emotion that includes questions about developmental, physiological, and evolutionary aspects of emotion and an exploration of the proximate and ultimate functions of emotion. Topics range from understanding the feeling component of emotion to understanding the role of facial displays of emotion.
Prerequisite: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311G, and PSYC 3110 or consent of instructor.

PSYC 3320. Psychology of Personality
3 Credits (3)
Introduces personality theories and supporting research. Psychoanalytic, physiological, and behavioral theories as they apply to personality are examined. Focuses on normal personality functioning.
Prerequisite: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 3110.

PSYC 3330. Sexual Behavior
3 Credits (3)
Examines viewpoints of the evolution, control and function of human sexual behavior. Includes human sexuality, reproduction, male-female conflicts and the social implications of sex.
Prerequisite: PSYC 1110G, MATH 1215, and ENGL 1110G.

PSYC 3410. Health Psychology
3 Credits (3)
Life stress, surgical stress, coronary-prone behavior, biofeedback, pain control, psychosocial approaches to geriatrics and cancer, behavioral treatments for addictions, obesity, and interpersonal issues in health care.
Prerequisite: PSYC 1110G.

PSYC 3510. Psychology and the Law
3 Credits (3)
Discretionary practices in the judicial system including pretrial procedures, jury selection, jury decision making, eyewitness testimony, insanity, expert witnesses, and probation judgments.
Prerequisite: PSYC 1110G.

PSYC 3520. Evolutionary Psychology
3 Credits (3)
This course introduces the student to the science of Evolutionary Psychology. In this class we will explore how evolutionary psychologists think about a variety of topics ranging from our capacity for (and appreciation of) art, emotions, and beauty to an exploration of the "design" of our minds in regards to mating, status striving, social behavior and cultural production.
Prerequisite: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311G, and PSYC 3110 or consent of instructor.

PSYC 359. Psychology of Gender
3 Credits (3)
Examines theories and research on the psychological functioning of women and men in North American society, including influential theories of gender in psychology and current controversies in the psychological literature. Topics include those unique to women and unique to men in development across the lifespan, work, physical and mental health, sexuality, victimization, gender stereotypes, gender comparisons in abilities and personality, and biological, social, and cultural influences on behavior. Crosslisted with: GNDR 359.
Prerequisite: PSYC 1110G.

PSYC 3910. Advanced Research Seminar
4 Credits (2+4P)
Psychological research in conjunction with designing, conducting, writing, and presenting an independent research project. May also include various computer applications. Will discuss issues regarding application to graduate programs. Course should be taken no later than the first semester of senior year. May be repeated up to 4 credits.
Prerequisite: PSYC 3110.

PSYC 3996. Special Topics
1-3 Credits
May be taken under different subtitles announced in the Schedule of Classes for unlimited credit. May not be taken twice under the same subtitle. May be repeated up to 12 credits.
Prerequisite: PSYC 1110G.

PSYC 4210. Thinking
3 Credits (3)
Research and theory pertaining to human thinking and problem solving. Effective problem-solving methods and common obstacles to problem solving are analyzed.
Prerequisite: PSYC 1110G and PSYC 3110.

PSYC 4220. Human-Computer Psychology
3 Credits (3)
Theories, methodologies, and data from psychology applicable to interface design, with an emphasis on construction and application of conceptual psychological models.
Prerequisite: PSYC 1110G, and one of: MATH 1350G, MATH 2350G, or A ST 311, and PSYC 3110 or consent of instructor.

PSYC 4510. History & Systems of Psychology
3 Credits (3)
History of the scientific study of the mind and behavior. Covers the historical origins of philosophical and scientific approaches to

Psychology and the development of influential schools of thought in psychology from the Classical Period through the Modern Era.
Prerequisite: PSYC 1110G and PSYC 3110.

Learning Outcomes

1. Apply knowledge of important historical events/figures in scientific psychology by demonstrating an ability to explain how past ideas/thinkers/events have shaped current theory and methodology in scientific psychology.
2. Explain key ideas and concepts in contemporary scientific psychology by demonstrating an ability to draw connections between our current understanding and earlier approaches to the study of the mind.
3. Generate sophisticated arguments/opinions regarding contemporary questions in scientific psychology by demonstrating an ability to frame questions that draw upon a sophisticated understanding of the history of scientific psychology, while also being able to distinguish between well-informed and naïve answers to those questions.

PSYC 4991. Research
1-3 Credits
Individual research projects supervised by a department faculty member. May be repeated up to 6 credits.
Prerequisite: PSYC 3110 and consent of instructor.

Learning Outcomes

1. Varies.

PSYC 4992. Directed Readings
1-3 Credits
May be repeated up to 6 credits.
Prerequisite: PSYC 1110G and consent of instructor.

PSYC 4996. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits.

Learning Outcomes

1. Varies.

PSYC 4998. Field Experience
1-3 Credits
Working with preschool, juvenile delinquent, handicapped, aged, convict, or mentally ill. Approximately five hours scheduled work per week per credit. May be repeated up to 6 credits.
Prerequisite: 6 psychology credits and consent of instructor.

Learning Outcomes

1. Varies.

PSYC 4999. Senior Capstone Seminar in Psychology
1 Credit (1)
In an architectural context, a capstone is the top-most stone that completes a building. In an academic context, a capstone is the final class that completes a student's curriculum. Capstone classes provide students with an opportunity "to demonstrate comprehensive learning in their major through some type of product or performance" (Palomba & Banta, 1999, p. 124). In other words, a capstone is a class in which senior psychology majors are required to pull together what they have learned in their previous classes and use this integrating experience to demonstrate they are capable of doing what they should be able to do when they graduate from the program (e.g., think critically and develop a realistic plan to pursue a career in psychology or a psychology-related field). This process serves a dual purpose. First, it allows psychology majors with a final opportunity to practice and demonstrate the skills they will need to succeed after graduation on the job or in graduate school. Second, it provides the Psychology Department with a final opportunity to assess whether or not it has been successful in its mission to produce competent psychology majors.
Prerequisite: PSYC 3110, PSYC 3120.

Learning Outcomes

1. Demonstrate critical thinking skills by reading and discussing current topics in Psychology.
2. Demonstrate content knowledge in Psychology by reading and discussing current topics in Psychology.
3. Demonstrate critical thinking skills by performing standardized assessments administered by the Department of Psychology.
4. Demonstrate content knowledge by performing standardized assessments administered by the Department of Psychology.

PSYC 5110. Quantitative Methods in Psychology I
3 Credits (3)
Statistical concepts emphasizing distributions and methods most appropriate to the data, models, and theories in psychology. Emphasis on distributions, probability and basic inferential statistics in Psychological research. Includes basics of Analysis of Variance (ANOVA) and Multiple Regression in Psychological research.

Learning Outcomes

1. Students will be able to recognize appropriate usage of, and be able to implement, basic statistical techniques: Central tendency, variability, z-scores, t-tests, ANOVA, correlation, two predictor regression.

PSYC 5120. Quantitative Methods in Psychology II
3 Credits (3)
Statistical concepts emphasizing distributions and methods most appropriate to the data, models, and theories in psychology. Emphasis on advanced ANOVA and Multiple Regression in Psychological research.
Prerequisite: PSYC 5110 or equivalent.

Learning Outcomes

1. Students will become familiar with situations and applications of advanced ANOVA techniques and Multiple Regression and Correlation.

PSYC 5210. Computer Methodology
3 Credits (3)
Use of computers in psychological research with emphasis on developing experimental control programs.

PSYC 5220. Methods in Cognitive Psychology
3 Credits (3)
Experimental and correlational methodologies appropriate for investigating cognitive psychological theories and problems.
Prerequisite: PSYC 5320 or consent of instructor.

PSYC 5230. Methods in Social Psychology
3 Credits (3)
Experimental, quasi-experimental, and correlational methodologies appropriate for investigating social psychological theories and problems.
Prerequisite: Graduate student in psychology or consent of instructor.

PSYC 5310. Engineering Psychology
3 Credits (3)
Covers concepts, methods, and findings of human performance. Treats the human as a subsystem that receives, stores and processes information, makes decisions, and acts within a human-machine environment system.

PSYC 5320. Cognition
3 Credits (3)

Examines theoretical and empirical work on human cognition. Topics include: information processing theories, pattern recognition, memory, attention, language, problem solving, decision making, and reasoning.

PSYC 5330. Social Psychology
3 Credits (3)
Current and traditional theories, research findings, and research methodologies of social psychology.

PSYC 5340. Learning and Memory
3 Credits (3)
Classical areas of learning, including instrumental and classical conditioning paradigms, habituation, reinforcement variables, stimulus generalization and transfer, and memory.

PSYC 5350. Sensation and Perception
3 Credits (3)
Stimulus and decision variables in judging auditory and visual events. Topics include: detection of signals; signal intensity versus perceived strength; size, shape, and movement perception; reading and listening.

PSYC 540. History and Systems of Psychology
3 Credits (3)
History of scientific method emphasizing outstanding methodological problems of contemporary science, especially psychology. Covers recent history of psychology and development of schools of psychology.

PSYC 5410. Foundations of College Teaching
3 Credits (3)
This class serves both new and experienced teachers. It will help new teachers design and conduct a successful course and help experienced teachers improve their teaching.
Learning Outcomes
1. Identify best practices in research on the scholarship of teaching and learning.
2. Create effective learning activities that: balance theoretical principles and broad application of disciplinary topics, discourage the unauthorized use of generative AI, effectively integrate academic digital tools as appropriate.
3. Practice effective communication and course delivery skills by teaching short lessons given to classmates.
4. Examine tools and techniques for professional development and self-assessment.
5. Explore effective and ethical uses generative AI.

PSYC 5910. Research Seminar in Psychology
1 Credit (1)
Presentations on research by students, faculty, and guest speakers. May be repeated up to 99 credits.
Learning Outcomes
1. Varies.

PSYC 5991. Special Research Programs
1-3 Credits
Individual investigations either analytical or experimental. May be repeated up to 99 credits.
Learning Outcomes
1. Varies.

PSYC 5996. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 99 credits.
Learning Outcomes
1. Varies.

PSYC 5999. Master's Thesis
1-15 Credits
Thesis. May be repeated up to 88 credits.
Learning Outcomes
1. Varies.

PSYC 698. Special Research Programs
1-3 Credits
Individual investigations either analytical or experimental. May be repeated for credit.

PSYC 6991. Doctoral Research
1-15 Credits
This course number is used for assigning credit for research performed prior to successful completion of the doctoral qualifying examination. May be repeated up to 88 credits.
Learning Outcomes
1. Varies on research.

PSYC 7000. Doctoral Dissertation
1-15 Credits
Dissertation. May be repeated up to 88 credits.
Learning Outcomes
1. Varies.

RADT-RADIOLOGIC TECHNOLOGY

RADT 1115. Fundamentals of Radiographic Imaging
2 Credits (2)
This course provides students with an in-depth knowledge of radiographic exposure techniques and the factors affecting radiographic image quality. It covers digital imaging with related accessories and emphasizes radiographic critique for diagnostic quality control. Additionally, the course reinforces radiologic fundamentals, introducing instrumentation and technology used in digital imaging. Topics include capturing, processing, displaying, and managing digital images, as well as exposure techniques and exposure indicators. Laboratory activities provided to reinforce radiographic concepts.
Learning Outcomes
1. Explain the principles of radiation production, image formation, and digital imaging systems.
2. Demonstrate proper techniques for exposure selection, scatter control, and radiation protection.
3. Compare radiographic digital imaging systems, assessing their advantages and limitations.
4. Evaluate radiographic images for technical accuracy and apply necessary adjustments.
5. Apply quality control measures and automatic exposure control to ensure optimal imaging outcomes.

RADT 1130L. Introduction to Radiographic Imaging Applied Clinic Skills
1 Credit (3P)
Applied clinical skills Laboratory to provide the student with an in-depth knowledge of radiographic exposure technique and the factors affecting radiographic image quality.
Corequisite: RADT 1115.
Learning Outcomes
1. Demonstrate techniques for radiographic scatter control and grid utilization.

2. Apply exposure selection principles.
3. Analyze and utilize automatic exposure control in imaging.
4. Assess radiographic images for technical accuracy and make necessary adjustments.
5. Apply radiation protection methods for patients and personnel.
6. Utilize radiographic equipment and apply quality control measures.

RADT 1140. Radiographic Positioning I
2 Credits (2)
This course covers the fundamental principles and techniques of diagnostic radiography, including radiographic procedures, patient positioning, terminology, and the mechanics of image production. Students will learn and apply these concepts to the upper and lower extremities, chest, abdomen, and pelvis/hip. The course emphasizes radiographic anatomy, particularly osteology and arthrology, as it relates to routine radiographic procedures.
Learning Outcomes
1. Master radiographic terminology related to positioning, projection, anatomy, medical abbreviations, positioning aids, accessory equipment, and lead markers, explaining their function and application.
2. Evaluate patient care considerations.
3. Explain the basic principles of radiation protection.
4. Describe the basic principles of image acquisition, display, and standards, including common errors, appearance characteristics, procedural factors, and corrective actions.
5. Evaluate orders, requests, and diagnostic reports.

RADT 1140L. Radiographic Positioning I Laboratory
1 Credit (3P)
Applied clinical skills Laboratory in radiographic procedures and positioning concepts, techniques, terminology, and mechanics related to upper and lower extremities, chest, abdomen and pelvis/hip.
Corequisite: RADT 1140.
Learning Outcomes
1. Apply knowledge of radiographic procedures, including routine and special views, to clinical simulations for the chest, abdomen, and upper and lower extremities.
2. Demonstrating understanding of positioning considerations.
3. Analyze radiographic images.
4. Apply the basic principles of radiation protection.
5. Apply basic principles of image acquisition, display, and standards, considering common errors, appearance characteristics, procedural factors, and corrective actions.

RADT 1150. Radiographic Positioning II
2 Credits (2)
Continuation of Radiographic Positioning I including a study of the osteology and arthrology of the thorax, vertebral column, skull, facial bones, and sinuses. Discussion and demonstration of the related standard and special radiographic projections resents the fundamentals of radiographic anatomy, positioning, and terminology used in routine fluoroscopic procedures of the gastrointestinal and genitourinary tract with discussion and demonstration of the related radiographic projections.
Prerequisite: RADT 1140.
Learning Outcomes
1. Identify preparation and positioning aides for Radiological Procedures.
2. Identify evaluation criteria to determine acceptable radiographs.
3. Identify anatomy and physiology for Radiological Procedures.
4. Show use of patient care and radiation protection practices in Radiological Procedures.

RADT 1150L. Radiographic Positioning II Laboratory
1 Credit (3P)
Continuation of Radiographic Positioning I. Applied Clinical Skills Laboratory: Includes vertebral column, skull, facial bones, sinuses, gastrointestinal, urinary, and fluroscopic procedures.
Corequisite: RADT 1150.
Learning Outcomes
1. Model knowledge of radiographic procedures, including routine floroscopic procedures.
2. Evaluate positioning considerations.
3. Demonstrate Radiological Procedures and apply proper patient position and CR placement to obtain proper evaluation criteria.

RADT 1154. Radiographic Anatomy and Physiology
3 Credits (3)
Basic A&P for radiographic application. Includes a systems approach to body structures and organs as they relate to anatomical projections, radiographic identification, and various imaging modalities.
Prerequisite: C- or above in the following courses AHS 153 or AHS 140 or BIOL 2210 or BIOL 1130, or consent of instructor.
Learning Outcomes
1. Identify and Laboratoryel the anatomy associated with diagnostic X-ray images.
2. Critique x-ray images for the presence or absence of anatomy in deciding whether the x-ray is appropriately positioned and diagnostic for radiologist assessment.
3. Locate anatomical systems based on background knowledge of typical anatomical locations and identify normal course of system function for appropriate positioning, patient instructions, and x-ray imaging.
4. Apply knowledge in a testing environment mimicking what is expected for the ARRT Registry.

RADT 1175. Introduction to Radiologic Technology and Patient Care
3 Credits (3)
This course provides a foundational overview of the radiology profession, encompassing basic patient care skills, professional standards, and ethical/legal principles. Students will learn essential skills such as patient transportation, vital sign assessment, and effective communication, while also being introduced to specific radiographic patient care techniques including history taking, immobilization, managing medical emergencies, and the administration of contrast media and radiopharmaceuticals. Additionally, the course will cover core concepts of radiation protection, and basic and specialized procedures, all within the framework of professional ethics and terminology.
Learning Outcomes
1. Demonstrate a working knowledge of medical terminology, procedures, and the roles of various healthcare professionals, including those specializing in medical imaging and radiologic sciences.
2. Critically analyze medical reports, orders, and requests, applying evidence-based practices to inform patient care decisions.
3. Evaluate patient health status using vital signs, Laboratory tests, pain assessments, and patient records, and respond appropriately to medical emergencies and traumatic injuries.

4. Implement infection control protocols, utilizing appropriate procedures, equipment, and knowledge of infectious pathogens.
5. Explain drug classifications, administration routes, safety practices, and the use of contrast agents in radiography.
6. Apply ethical principles and legal considerations to healthcare scenarios, including informed consent and navigating ethically complex situations.
7. Exhibit professional behavior in healthcare settings, demonstrating effective communication, cultural sensitivity, and an understanding of the psychological aspects of patient care.

RADT 1190. CT Equipment and Methodology
3 Credits (3)
Skill development in the operation of computed tomographic equipment, focusing on routine protocols, image quality, and quality assurance and radiation protection.
Learning Outcomes
1. Demonstrate acquisition of comprehensive technical knowledge by obtaining a seventy-five percent or greater on all quizzes and exam assessments (this is in alignment with the scoring expectations for the national registry exam).
2. Manipulate and choose the appropriate scan parameters and technical factors on CT equipment while applying the technical science supporting the decision.
3. Demonstrate appropriate use of post-processing options and provide diagnostic quality images.
4. Abide by radiation safety and dosimetry standards for patient care by demonstrating ALARA standards.
5. Select CT scan manipulations for optimal demonstration of anatomic region, according to protocol (delayed imaging, multiplanar reconstructions, filters) and with safe use of iodinated contrast mediums.
6. Recognize and reduce factors that may inhibit diagnostic image quality.

RADT 1191. Computed Tomography (CT) Imaging and Equipment
4 Credits (4)
This course serves as an introduction to computed tomography (CT) for current radiologic technology students. Course will include information on clinical equipment and application of x-rays in CT, CT image formation, evaluation, and archiving, patient radiation safety and dose, and patient interactions and management for imaging.
Learning Outcomes
1. Demonstrate acquisition of comprehensive technical knowledge by obtaining a seventy-five percent or greater on all quizzes and exam assessments (this is in alignment with the scoring expectations for the national registry exam).
2. Identify critical components of CT system equipment and what their purposes are in creating a CT image.
3. Identify CT parameters which allow for safely administering radiation dose; particularly to pediatric patients.
4. List and define the steps required to acquire a CT image, including the theory behind x-ray interaction/absorption/ attenuation, detector capabilities, appropriate reconstruction options, and computer equipment.
5. Identify image display functions and radiology informatic options.
6. Identify the major technical components of image display in CT and common artifacts, including how to reduce artifacts.

RADT 1520. Radiation Biology and Protection
2 Credits (2)
This course explores the biological effects of ionizing radiation on human cells and tissues, including genetic, somatic, short-term, and long-term effects. It covers radiation measurements, policies, and protection measures for technologists, patients, and others, emphasizing minimizing exposure and basic protection methods. The course also reviews current regulations and recommendations by the NRCP and ICRP.
Prerequisite: C- or above in RADT 1115.
Learning Outcomes
1. Radiobiology: Explain fundamental principles, molecular/cellular aspects, early/late radiation effects, and related regulations/ terminology.
2. Radiation Protection: Describe health physics, protection design, and patient/personnel dose management, including methods to limit radiation exposure.
3. Human Biology Ionization: Discuss relevant aspects of human biology and the consequences of ionization in human cells.
4. Cellular Response to Radiation: Examine factors affecting cell radiosensitivity, direct/indirect effects of radiation, dose-response relationships, and the significance of LD50/30 and LD50/60 radiation.

RADT 1811. Radiographic Positioning I Clinical Experience
1 Credit (4P)
Introduction to the clinical environment. Students will complete administrative duties, perform basic diagnostic radiography exams and provide patient care under the direct/indirect supervision of a qualified registered radiologic technologist as required and assigned.
Corequisite: RADT 1140.
Learning Outcomes
1. Demonstrate the ability to safely produce diagnostic radiographic images.
2. Appropriately position patients, identify radiographic anatomy and pathological conditions.

RADT 1812. Radiographic Positioning II Clinical Experience
1 Credit (4P)
Clinical Experience: Students will complete administrative duties, perform diagnostic radiography exams, and provide patient care under the direct/ indirect supervision of a qualified registered radiologic technologist as required and assigned.
Corequisite: RADT 1150.
Learning Outcomes
1. Demonstrate the ability to safely produce diagnostic radiographic images.
2. Appropriately position patients, identify radiographic anatomy and pathological conditions.
3. Model effective communication skills.

RADT 1997. Radiologic Technology Independent Study
1-6 Credits (1-6)
Varies. May be repeated up to 6 credits.
Learning Outcomes
1. Varies.

RADT 2250. Radiographic Image Critique
2 Credits (2)
This course reviews radiographs, evaluating anatomy and technical quality, including positioning and technique. Students learn to make adjustments and reinforce concepts through classroom activities.
Prerequisite: RADT 2811.

Learning Outcomes

1. Optimal Projections Labeling: State key components of optimal projections, properly display body structures, and accurately Laboratoryel projections using markers and annotations.
2. Comprehensive Imaging Knowledge: For all major body regions (chest, abdomen, extremities, pelvis, shoulder girdle, bony thorax, spine, skull): identify anatomy, state technical data, identify positioning errors, describe considerations for special conditions (air-fluid levels, motion, pathology), and discuss adaptive techniques.
3. Digital Imaging: Demonstrate familiarity with digital image acquisition, errors, and display.
4. Image Analysis: Perform image analysis, including appearance standards, characteristics, procedural factors, and corrective actions.

RADT 2404. Radiographic Special Modalities
3 Credits (3)
Introduction and discussion of various special procedures and modalities including but not limited to: interventional radiography, computed tomography, magnetic resonance imaging, nuclear medicine, radiation therapy, ultrasound.
Prerequisite: RADT 1115.
Learning Outcomes

1. Attain basic knowledge of the various imaging modalities and differentiate between images produced by those modalities.
2. Explain general equipment requirements.
3. Identify various contrast agents used by different modalities and define potential contraindications.
4. Explain the use of artificial intelligence for the various modalities.

RADT 2408. Radiographic Pathology
3 Credits (3)
This course explores the pathology of major body systems and corresponding radiographic imaging techniques. Students learn about disease processes (etiology, signs/symptoms, diagnosis, and treatment) and identify pathological signs on various images, emphasizing radiography. Fundamental anatomy and physiology are integrated, focusing on anatomical projections, radiographic identification, and imaging modalities (including CT and MRI).
Prerequisite: RADT 1154.
Learning Outcomes

1. Describe and identify anatomical structures on diagrams and radiographs.
2. Classify and explain pathological conditions affecting major body systems.
3. Identify pathologies, assess radiographic appearance, and evaluate imaging accuracy.
4. Define key terms, use medical abbreviations, and understand diagnostic reports.
5. Position patients correctly, assess images, and apply technical adjustments.
6. Identify radiation types, effects, and imaging modalities for diagnosis and treatment.
7. Critique images, locate pathology, and demonstrate readiness for certification exams.

RADT 2410. Radiographic Physics and Equipment
3 Credits (3)
This course offers a comprehensive exploration of the physical principles of diagnostic radiography, covering radiologic physics, imaging theory, and quality assurance. Students will examine atomic structure, electromagnetism, X-ray production and interaction, exposure factors, scatter control, and image characteristics. The curriculum also includes digital fluoroscopy, X-ray circuitry, and an introduction to advanced imaging modalities such as mammography, CT, and MRI.
Prerequisite/Corequisite: C- or above in RADT 1115.
Learning Outcomes

1. Explain the structure of atoms and types of radiation.
2. Describe X-ray production and factors affecting image quality.
3. Explain photon interactions with matter.
4. Identify key components of the X-ray circuit and X-ray tube.
5. Apply physics and math principles to radiographic procedures and equipment.
6. Analyze radiographic images for accuracy and quality.

RADT 2811. Clinical Experience I
4 Credits (4P)
Clinical Experience: Students will complete administrative duties, perform diagnostic radiography exams, and provide patient care under the direct/indirect supervision of a qualified registered radiologic technologist as required and assigned.
Prerequisite: RADT 2410.
Learning Outcomes

1. Demonstrate the ability to safely produce diagnostic radiographic images.
2. Appropriately position patients, identify radiographic anatomy and pathological conditions.
3. Demonstrate effective communication skills.
4. Accurately document/record data in accordance with clinical site policies and procedures.

RADT 2812. Clinical Experience II
6 Credits (6P)
Clinical Experience: Students will complete administrative duties, perform diagnostic radiograph exams, and provide patient care under direct/indirect supervision of a qualified registered radiologic technologist as assigned. Evening/weekend, CT, and OR rotations will be offered where available.
Prerequisite: RADT 2811.
Learning Outcomes

1. Demonstrate the ability to safely produce diagnostic radiographic images.
2. Appropriately position patients, identify radiographic anatomy and pathological conditions.
3. Demonstrate effective communication skills.
4. Accurately document/record data in accordance with clinical site policies and procedures.
5. Demonstrate the ability to use independent judgement.
6. Analyze radiographic images for technical and positioning accuracy to make modifications as needed.
7. Conduct themselves in a professional manner to function effectively as a member of the healthcare team.

RADT 2813. Clinical Experience III
3 Credits (3P)
Clinical Experience: Students will complete administrative duties, perform diagnostic radiography exams, and provide patient care under the direct/indirect supervision of a qualified registered radiologic technologist as required and assigned. Evening/weekend, CT and OR rotations will be offered where available.
Prerequisite: C- or above in RADT 2812.

Learning Outcomes

1. Students will demonstrate the ability to safely produce diagnostic radiographic images.
2. Be able to position patients and identify radiographic anatomy and pathological conditions.
3. Demonstrate effective communication skills.
4. Accurately document/record data in accordance with clinical site policies and procedures.
5. Demonstrate the ability to use independent judgement.
6. Analyze radiographic images for technical and positioning accuracy to make modifications as needed.
7. Conduct themselves in a professional manner to function effectively as a member of the healthcare team.
8. Identify opportunities for professional growth within medical imaging sciences.

RADT 2814. Special Modalities Clinical Experience IV
3 Credits (3P)
Clinical Experience: Special rotations in advanced imaging modalities to include but are not limited to nuclear medicine, sonography, mammography, MRI, CT, interventional radiology, and cardiac catheterization Laboratory.
Corequisite: C- or above in RADT 2404.
Learning Outcomes

1. Identify, compare, and evaluate various specialized modalities in medical imaging, including but not limited to Computed Tomography (CT), Magnetic Resonance Imaging (MRI), Ultrasound, Nuclear Medicine, and Interventional Radiology.
2. Demonstrate principles, applications, and patient care considerations associated with each modality, as well as the role of advanced imaging in diagnosis and treatment within the healthcare setting.
3. Demonstrate effective communication skills.
4. Conduct themselves in a professional manner to function effectively as a member of the healthcare team.
5. Identify various opportunities for professional growth within medical imaging sciences.
6. Develop and refine professional job-seeking skills, including crafting an effective resume and cover letter, preparing for interviews, and demonstrating workplace professionalism.

RADT 2817. Cross Sectional Anatomy for Medical Imaging
3 Credits (3)
Anatomic relationships that are present under various sectional orientations as depicted by computed tomography or magnetic resonance imaging.
Learning Outcomes

1. Identify and Laboratoryel the anatomy associated with the topical outline in diagnostic CT images.
2. Critique CT images for the presence or absence of anatomy and pathology in deciding whether the image is appropriately positioned and diagnostic for radiologist assessment.
3. Locate anatomical systems and possible pathology based on background knowledge of typical anatomical locations and identify normal course of system function for appropriate positioning, patient instructions, and CT imaging.

RADT 2818. Clinical Experience I (Computed Tomography)
2 Credits (2P)
A basic, introductory health-related, work-based learning experience that enables students to apply specialized occupational theory, skills, and concepts. The clinic professional provides direct supervision.
Learning Outcomes

1. Complete at least 55 high-quality CT scans while maintaining good standing.
2. Engage appropriately with patients using verbal and nonverbal communication at a beginner level.
3. Identify necessary Laboratory values for contrast-enhanced CT exams at a beginner level.
4. Evaluate personal/occupational radiation exposure and explain CT dose measurement.
5. Use post-processing tools to produce diagnostic-quality images and adjust CT parameters for optimal imaging and contrast.

RADT 2819. Clinical Experience II (Computed Tomography)
2 Credits (2P)
An intermediate health-related work-based learning experience that enables students to apply specialized occupational theory, skills, and concepts. The clinic professional provides direct supervision.
Learning Outcomes

1. Complete at least 100 high-quality CT scans while maintaining good standing.
2. Engage appropriately with patients using verbal and nonverbal communication.
3. Identify necessary Laboratory values for contrast-enhanced CT exams.
4. Evaluate personal/occupational radiation exposure and explain CT dose measurement.
5. Use post-processing tools to produce diagnostic-quality images and adjust CT parameters for optimal imaging and contrast safety.

RADT 2820. Clinical Experience III (Computed Tomography)
2 Credits (2P)
Advanced health-related work-based learning experience that enables the student to apply specialized occupational theory, skills and concepts. Direct supervision is provided by the clinic professional. Upon completion, students will be able to assume most of the duties of an experienced imaging professional in Computed Tomography.
Prerequisite: RADT 2819.
Learning Outcomes

1. Complete at least 125 high-quality CT scans while maintaining good standing.
2. Engage appropriately with patients using verbal and nonverbal communication.
3. Identify necessary Laboratory values for contrast-enhanced CT exams.
4. Evaluate personal/occupational radiation exposure and explain CT dose measurement.
5. Use post-processing tools to produce diagnostic-quality images and adjust CT parameters for optimal imaging and contrast safety.

RADT 2999. Radiologic Technology Capstone
3 Credits (3)
Varies.
Prerequisite: RADT 2812.
Learning Outcomes

1. Varies.

READ-READING

READ 3110. Instruction for Special Reading Needs
3 Credits (3)
Emphasizes appropriate techniques for teaching reading to learners with special needs. Restricted to: TEP. EED, ECED, SED, and SPED majors.
Learning Outcomes
1. Students will demonstrate basic knowledge of the five domains of reading.
2. Students will demonstrate knowledge of characteristics of reading disabilities (including dyslexia) and the cognitive and linguistic difficulties that may underlie these disabilities.
3. Students will recognize the cultural, environmental and social factors that can impact reading success.
4. Students will explore instructional practices in phonological awareness, phonics, spelling, vocabulary and comprehension that are consistent with current scientific research findings.
5. Students will use or analyze informal and/or criterion-based assessments for determining students' skills in phonological awareness, word identification, and reading fluency and for determining appropriate instructional goals for students.
6. Students will be able to develop a Professional Learning Community by researching and sharing the effectiveness of various strategies/methods/commercial programs for different domains of reading.

READ 3996. Special Topics
1-3 Credits (1-3)
Each course will be identified by a qualifying subtitle. A maximum of 3 credits in any one semester and a grand total of 6 credits. May be repeated up to 6 credits.
Learning Outcomes
1. Engage in the study of a specific literacy topic.

READ 4310. Elementary School Literacy I
3 Credits (2+2P)
Reading development, curriculum, and instruction in the elementary grades. Required of all elementary education majors. May be repeated up to 3 credits.
Corequisite: EDUC 4310, EDUC 4320, SPED 3120.
Learning Outcomes
1. Articulate an understanding of developmental theories and processes and their implication for appropriate methods of teaching reading.
2. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework.
3. Provide and use anti-bias literacy materials and experiences, including primary language materials.
4. Plan appropriate whole group, small group and individual activities that include culturally and linguistically responsive instruction and appropriate accommodations for working with children with special needs.
5. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer.
6. Understand the role of family and community in literacy development and respect and promote the use of the child's home language for learning.
7. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society.
8. Demonstrate knowledge of and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need.

READ 4320. Elementary School Literacy II
3 Credits (2+2P)
Reading development in curriculum and instruction with assessment and evaluation in the elementary grades (K 8). May be repeated up to 3 credits.
Prerequisite: READ 4310.
Corequisite: EDUC 4330.
Learning Outcomes
1. Engage in reflection on current theoretical perspectives on the reading process, such as understanding linguistics, psycholinguistics, sociolinguistics and their relationships in the reading process, and the role of literacy in schools and our society.
2. Apply knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework to include culturally and linguistically responsive instruction and appropriate accommodations for working with children with special needs.
3. Evaluate instructional materials in terms of their approach to reading, consider their possible use with children, and adapt the materials so that they reflect an appreciation for child-centeredness and cultural diversity in learning.
4. Use miscue analysis and other literacy assessment tools to understand, describe, and evaluate students' reading strategies and formulate an instructional plan tied to assessment.
5. Utilize children's literature, including multicultural, multilingual children's literature to plan, implement and reflect on innovative strategies for literacy scaffolding.
6. Define oneself as a literate person and revalue readers and writers, and users of language.

READ 4330. Content Area Literacy
3 Credits (2+2P)
Surveys integrated reading/writing/discursive practices in middle/secondary content areas. Taught with READ 5330. Restricted to: TEP-SED majors. May be repeated up to 3 credits.
Learning Outcomes
1. Analyze literacy processes, as they pertain to adolescent learners.
2. Discuss current trends and issues in content area literacy instruction with a specific focus on practices that promote achievement and equity.
3. Evaluate instructional practices that help students use reading, writing, speaking, listening, viewing and visually representing to learn the content areas.
4. Illustrate ethical reasoning and decision making in your approach to content area literacy education.
5. Integrate research, reflection, and best practices that positively impact students in a diverse society.

READ 4530. Teaching Secondary ELA & Social Studies Using Primary Sources, Memoir & Autobiography
3 Credits (3)
This course prepares future language arts and social studies educators to teach structured literacy effectively at the secondary level, with a focus on social studies content for cross-disciplinary instruction. Students will explore reading development and the five essential components of reading—phonemic awareness, phonics, vocabulary, comprehension, and fluency—with particular attention to systematic instruction of vocabulary,

comprehension, and fluency strategies relevant to secondary texts. Through engagement with primary and secondary sources, memoirs/autobiographies, and historical fiction, students will develop instructional approaches to support real-world reading applications, text analysis, inquiry, and historical thinking.

Learning Outcomes

1. Explain the five components of evidence-based reading instruction and their relevance at the secondary level.
2. Design lessons that build Tier 2 (cross-disciplinary) and Tier 3 (discipline-specific) vocabulary knowledge in social studies contexts.
3. Develop instructional strategies to support comprehension and critical thinking through practices such as activating prior knowledge, questioning texts, making inferences, and synthesizing information.
4. Create activities that promote oral reading fluency with an emphasis on prosody, pacing, and expression.
5. Execute a lesson plan that integrates social studies texts—including primary and secondary sources, memoirs/autobiographies, and historical fiction—into reading instruction to foster cross-disciplinary instruction in the humanities.

READ 5210. Language and Literacy Acquisition
3 Credits (3)

Framework and strategies of language and literacy acquisition with attention to bilingual learners and the interrelationship among reading, writing, and oral language. May be repeated up to 3 credits.

READ 5220. Sociopsycholinguistics of Reading
3 Credits (3)

Examines current research on reading process, learning to read, and teaching children to read and evaluates current programs and materials. May be repeated up to 3 credits.

READ 5310. Elementary School Literacy I
3 Credits (2+2P)

Reading development, curriculum, and instruction in the elementary grades. Same as READ 4310 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Corequisite: ECED 5810, EDUC 5310, and EDUC 5320.

Learning Outcomes

1. Articulate an understanding of developmental theories and processes and their implication for appropriate methods of teaching reading;
2. Demonstrate knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework;
3. Provide and use anti-bias literacy materials and experiences, including primary language materials;
4. Plan appropriate whole group, small group and individual activities that include culturally and linguistically responsive instruction and appropriate accommodations for working with children with special needs;
5. Understand and articulate the concept of emergent literacy and the processes toward becoming an authentic reader and writer;
6. Understand the role of family and community in literacy development and respect and promote the use of the child's home language for learning;
7. Engage in reflection on current theoretical perspectives on the reading process and the role of print literacy in schools and our society;
8. Demonstrate knowledge of and use effectively, a wide range of literacy assessment strategies and instruments to determine a child's strengths and areas of need.

READ 5320. Elementary School Literacy II
3 Credits (2+2P)

Reading development in curriculum and instruction with assessment and evaluation in the elementary grades (K-8). Same as READ 4320 with differentiated assignments for graduate students. May be repeated up to 3 credits.

Prerequisite: READ 5310.

Corequisite: EDUC 5330.

Learning Outcomes

1. Engage in reflection on current theoretical perspectives on the reading process, such as understanding linguistics, psycholinguistics, sociolinguistics and their relationships in the reading process,and the role of literacy in schools and our society;
2. Apply knowledge of various instructional approaches and strategies for promoting literacy within an integrated curriculum framework to include culturally and linguistically responsive instruction and appropriate accommodations for working with children with special needs;
3. Evaluate instructional materials in terms of their approach to reading, consider their possible use with children, and adapt the materials so that they reflect an appreciation for child-centeredness and cultural diversity in learning;
4. Use miscue analysis and other literacy assessment tools to understand, describe, and evaluate students' reading strategies and formulate an instructional plan tied to assessment;
5. Utilize children's literature, including multicultural, multilingual children's literature to plan, implement and reflect on innovative strategies for literacy scaffolding;
6. Define oneself as a literate person and revalue readers and writers, and users of language.

READ 5330. Content Area Literacy
3 Credits (3)

Surveys integrated reading/writing/discursive practices in middle/secondary content areas. "Master' plus Secondary Licensure students Only" and "TEP admission required" May be repeated up to 3 credits.

Prerequisite: SPED 5105, EDUC 5120, EDUC 5110.

Learning Outcomes

1. Define the purpose of schooling begin to articulate the implications for the teacher, youth, teaching, and learning.
2. Explore the historical dimensions of reading instruction in secondary education.
3. Explore the quality and character of life in schools along with the implications for all stakeholders.
4. Explore the roles of reading, writing, listening, and speaking in the content areas.
5. Discuss general pedagogical considerations that extend across all subject matter.
6. Promote the concept that learning in all areas is more authentic and meaningful when knowledge of diverse youth and their communities, content, and pedagogy are valued.
7. Practice strategies that integrate literacy, content, and knowledge of youth.
8. Explore literature in the content area.

9. Develop lesson plans that combine reading, writing, listening, and speaking in the content area that support diversity, integrate technology, and promote effective communication 1
10. Examine the needs of struggling readers. 1
11. Examine the Common Core Standards. 1
12. Engage in research and writing that supports the development of your professional identity as an educator and graduate-level student.

READ 5340. Literacy Assessment and Evaluation
3 Credits (3)
Theoretical and practical aspects of using formal and informal assessment and evaluation procedures in literacy curriculum and instruction. May be repeated up to 3 credits.
Learning Outcomes
1. Students will be able to understand and implement various strategies for assessing and evaluating the literacy practices and knowledge of students.

READ 5350. Adult and Family Literacy
3 Credits (3)
Principles, practices, and instructional materials for adult and family literacy. May be repeated up to 3 credits.
Learning Outcomes
1. Students will be able to understand and implement various strategies for engaging students and their families through literacy practices in a variety of classroom and home settings.

READ 5360. Digital Literacies
3 Credits (3)
Digital Literacies study focuses on the multiple relationships between how we express ourselves to one another and the multiple technological systems and networks that provide context, meaning, and shape to those expressions in both social and academic spaces. This course is designed to examine new literacies theory as it applies to teaching applications and current research on digital literacies within K-12 education. As 21st Century practitioner scholars, we are concerned with both the social aspects of literacy practices, understanding that school-based operations are inseparable from the sociocultural contexts in which they are enacted. Must be an NMSU graduate student to participate in this course.
Prerequisite: READ 5340 with a B- or better.
Learning Outcomes
1. Critically assess K-12 implementation of digital literacies across content area curriculum and instruction.
2. Examine seminal and current research on digital literacies' theory, pedagogy, and practice.
3. Determine the level of cultural relevance in schools and pedagogies for 21st Century students.
4. Interpret how social categories relevant to digital literacy contribute to construction of identity.
5. Develop a critical digital pedagogy that addresses the literacy practices of all learners.

READ 5410. Theory and Pedagogy of Literature for Children and Adolescents
3 Credits (3)
This course provides an in-depth exploration of pedagogy and theory related to literature for adolescents. Students must be in Graduate Standing. May be repeated up to 3 credits.
Learning Outcomes
1. Analyze literacy processes, as they pertain to adolescent learners.
2. Discuss current trends and issues in content area literacy instruction with a specific focus on practices that promote achievement and equity.
3. Evaluate instructional practices that help students use reading, writing, speaking, listening, viewing and visually representing to learn the content areas.
4. Illustrate ethical reasoning and decision making in your approach to content area literacy education.
5. Integrate research, reflection, and best practices that positively impact students in a diverse society.

READ 5420. Theory and Pedagogy of Writing
3 Credits (3)
This course is designed to examine critical writing theory and pedagogy for K-12 teaching and learning, including inclusive and multicultural approaches, with an emphasis in constructive, collaborative practices, and the integration of digital tools across several genres of writing. Through sequential, thematic units, coursework will emphasize: 1) the study of formative theories along with the development of instructional practices to promote achievement and equity in writing education; 2) the application of these skills through pedagogy and curriculum building, and 3) the construction of broad understandings of craft within the context of the current policies and standards which impact education both regionally and nationally.
Learning Outcomes
1. Critically assess writing curriculum and instruction in K-12 learning environments.
2. Develop a critical writing pedagogy that addresses the literacy practices of all learners.
3. Measure the alignment of writing structures in schools with students' cultural literacies.
4. Interpret how social categories relevant to education contribute to construction of identity.
5. Formulate engaging strategies that develop writers who are competent in multiple genres.

READ 5530. Teaching Secondary ELA & Social Studies Using Primary Sources, Memoir & Autobiography
3 Credits (3)
This course prepares future language arts and social studies educators to teach structured literacy effectively at the secondary level, with a focus on social studies content for cross-disciplinary instruction. Students will explore reading development and the five essential components of reading—phonemic awareness, phonics, vocabulary, comprehension, and fluency—with particular attention to systematic instruction of vocabulary, comprehension, and fluency strategies relevant to secondary texts. Through engagement with primary and secondary sources, memoirs/autobiographies, and historical fiction, students will develop instructional approaches to support real-world reading applications, text analysis, inquiry, and historical thinking.
Learning Outcomes
1. Explain the five components of evidence-based reading instruction and their relevance at the secondary level.
2. Design lessons that build Tier 2 (cross-disciplinary) and Tier 3 (discipline-specific) vocabulary knowledge in social studies contexts.
3. Develop instructional strategies to support comprehension and critical thinking through practices such as activating prior knowledge, questioning texts, making inferences, and synthesizing information.

4. Create activities that promote oral reading fluency with an emphasis on prosody, pacing, and expression.
5. Design and execute a lesson plan that integrates social studies texts—including primary and secondary sources, memoirs/autobiographies, and historical fiction—into reading instruction to foster cross-disciplinary instruction in the humanities.

READ 5990. Practicum in Literacy Education
1-6 Credits (1-6)
Supervised laboratory experience with children with reading difficulties. The student implements a program of specific procedures to aid the disabled reader. May be repeated up to 6 credits.
Prerequisite: READ 5340.
Learning Outcomes
1. Students will be able to understand and implement various strategies for assessing and evaluating the literacy practices and knowledge of students.

READ 5992. Special Studies in Literacy
1-6 Credits (1-6)
Each study will be designated by a qualifying subtitle. Taught with READ 6992. May be repeated up to 99 credits.
Learning Outcomes
1. Engage in a specific literacy topic.

READ 5996. Selected Topics in Literacy
1-6 Credits (1-6)
Offered under different subtitles in the Schedule of Classes. Taught with READ 6996 with differentiated subjects for doctoral students. May be repeated up to 6 credits.
Learning Outcomes
1. Engage in the study of a specific literacy topic.

READ 6110. Critical Issues in Literacy Education
3 Credits (3)
Critical issues from historical to current perspectives. May be repeated up to 3 credits.
Learning Outcomes
1. Understand the multiple critical issues central to literacy education from both a historical and contemporary perspective.

READ 6120. Multiple Critical Literacies
3 Credits (3)
An exploration of the multiple literacies that operate on the individual, classroom, community, cultural and societal levels. Same as BLED 6120. May be repeated up to 3 credits.

READ 6130. Multiculturalism, Literature, and Inquiry
3 Credits (3)
Advanced exploration and examination of critical multicultural language education vis-a-vis children's adolescent, young adult, and adult literature, with an eye toward problematizing assumptions about literacy, articulating issues of social justice and enacting transactive, transformative pedagogy. May be repeated up to 3 credits.
Learning Outcomes
1. Understand the theories and approaches necessary for conducting inquiry reading and writing.

READ 6210. Ethnography of Reading and Writing
3 Credits (3)
Covers the dynamics of data interpretation and critical analysis in the study of literacy. May be repeated up to 3 credits.
Learning Outcomes
1. Understand the theories and approaches necessary for conducting ethnographic studies in reading and writing.

READ 6320. Praxis and Reflexivity
3 Credits (3)
The cyclical research processes of continuous self and systemic (re)evaluation vis-a-vis classroom, community, and society with an eye toward reflection, growth, change, and larger forms of social agency. Restricted to doctoral-level students of any major. Same as BLED 6220, EDUC 6220. May be repeated up to 3 credits.

READ 6991. Doctoral Research in Literacy
1-15 Credits (1-15)
Research on topic of interest. May be repeated up to 88 credits.
Learning Outcomes
1. Engage in the study of a specific literacy topic at the doctoral level.

READ 6992. Special Studies in Literacy
1-6 Credits (1-6)
Offered under different subtitles in the Schedule of Classes. Taught with READ 5992 with differentiated assignments for doctoral students. May be repeated up to 6 credits.
Learning Outcomes
1. Engage in the study of a specific literacy topic at the doctoral level.

READ 6996. Selected Topics in Literacy
1-6 Credits (1-6)
Offered under various subtitles that indicate the subject matter. Same as READ 5996. May be repeated up to 99 credits.
Learning Outcomes
1. Engage in the study of a specific literacy topic at the doctoral level.

READ 6997. Independent Study Topics in Reading
1-6 Credits (1-6)
A problem and seminar course for those pursuing an advanced degree. Each course will have an appropriate subtitle. May be repeated up to 99 credits.
Learning Outcomes
1. Engage in the study of a specific literacy topic at the doctoral level.

READ 6999. Research Project
1-15 Credits (1-15)
Offered primarily for those pursuing the research requirement for the Ed.S. degree. Each research project will be designated by a qualifying subtitle. May be repeated up to 88 credits.
Learning Outcomes
1. Engage in the study of a specific literacy topic at the doctoral level.

RESP - RESPIRATORY THERAPY

RESP 1140. Respiratory Therapy Pharmacology
3 Credits (3)
Principles of pharmacology, drug dose calculations, and drug receptor theory as it relates to patients with cardiopulmonary disease. Includes specific emphasis on drugs used by respiratory care practitioners as well as discussion of other drugs used in the treatment of patients under their care.
Learning Outcomes
1. Have an introductory level of knowledge of the basic general principles of pharmacology that relate to all medications, drug actions, routes of administration etc.
2. Accurately calculate typical drug-dose calculations.

3. Demonstrate an in-depth knowledge of the mode of action, desired clinical effect and common and serious adverse effects of the medications commonly used in respiratory care.
4. Relate pharmacologic therapy to common pulmonary pathologies.
5. Effectively evaluate and educate patients regarding self-management of asthma and smoking cessation techniques.
6. Understand the underlying neurophysiology involved with each class of drugs studied in this course.

RESP 1150. Respiratory Therapy I
3 Credits (3)
Introduces respiratory therapy as a health sciences profession. Topics include cardiopulmonary assessment, medical gas administration, aerosol therapy, oxygen therapy, microbiology, infection control, equipment maintenance, incentive breathing exercises and chest physiotherapy.
Learning Outcomes
1. Accurately perform a complete cardiopulmonary assessment of any non-critically ill patient.
2. Apply knowledge of the basic anatomy and physiology of the cardiopulmonary system, especially as it relates to the transportation of oxygen in the human body.
3. Correctly set up equipment and assess effectiveness of bland aerosol equipment.
4. Relate how microbiology impacts respiratory therapy to include using the correct technique for the isolation of patients and utilizing standard precautions in the clinical setting.
5. Evaluate the procedures for cleaning and sterilization of respiratory therapy equipment.
6. Apply basic respiratory treatment to include chest physiotherapy, airway maintenance, and basic medication administration.

RESP 1150L. Respiratory Therapy I Laboratory
2 Credits (2)
Students practice cardiopulmonary assessment, medical gas administration, aerosol therapy, oxygen therapy, microbiology, infection control, equipment maintenance, incentive breathing exercises and chest physiotherapy using state of the art equipment in the learning Laboratory under simulated patient situations.
Learning Outcomes
1. Accurately perform a complete cardiopulmonary assessment of any non-critically ill patient.
2. Apply knowledge of the basic anatomy and physiology of the cardiopulmonary system, especially as it relates to the transportation of oxygen in the human body.
3. Correctly set up equipment and assess effectiveness of bland aerosol equipment.
4. Relate how microbiology impacts respiratory therapy to include using the correct technique for the isolation of patients and utilizing standard precautions in the clinical setting.
5. Evaluate the procedures for cleaning and sterilization of respiratory therapy equipment.
6. Apply basic respiratory treatment to include chest physiotherapy, airway maintenance, and basic medication administration.

RESP 1250. Respiratory Therapy II
4 Credits (4)
Advanced respiratory care techniques. Emphasis on airway management, aerosol treatment, chest physiotherapy, pharmacology, posture pressure breathing, and pulmonary rehabilitation.
Prerequisite: C or Better in RESP 1150 & RESP 1150 L.
Corequisite: RESP 1250 L.
Learning Outcomes
1. Demonstrate a comprehensive understanding of the anatomy and physiology of the arterial system.
2. Apply and explain the basic principles of pharmacology therapy as it relates to the cardiopulmonary system.
3. Analyze and differentiate the basic pulmonary physiology associated with restrictive and obstructive disease processes, analyze test results to identify abnormal findings.
4. Interpret and apply advanced airway management techniques including endotracheal intubation, tracheostomy, laryngeal mask airway, and supraglottic airway.
5. Describe and interpret radiographic images to assess respiratory and cardiopulmonary conditions.
6. Identify the anatomy, physiology and the electrical conduction of the heart.
7. Differentiate between invasive and non-invasive mechanical ventilation techniques, explaining their indications and contraindications.
8. Demonstrate knowledge of emergency life support related to respiratory therapy.

RESP 1250L. Respiratory Therapy II Laboratory
2 Credits (6P)
Students practice airway management, pulmonary function testing, arterial puncture and blood gas analysis and administering home care therapy procedures using state of the art equipment in the learning Laboratory under simulated patient situations. May be repeated up to 2 credits.
Prerequisite: C or Better in the following Courses: RESP 1150, RESP 1150L and RESP 1140.
Learning Outcomes
1. Demonstrate the correct setup, operation, and maintenance of various respiratory therapy equipment; to include oxygen delivery systems, medication delivery devices CPAP/BiPAP machines and ventilators.
2. Complete respiratory assessments including vital signs: arterial blood gas ECG, pulmonary function test and ECG interpretations.
3. Properly assess and ensure airway patency.
4. Respond and react to airway emergencies and initiate proper treatment as indicated.

RESP 1330. Respiratory Therapy II Clinical
3 Credits (9P)
Supervised practice and application in a hospital setting. May be repeated up to 3 credits.
Prerequisite: C or Better in the following courses: RESP 1150 & RESP 1150 L.
Learning Outcomes
1. Maintain Patient confidentiality/privacy as defined by HIPAA.
2. Use critical thinking, problem solving and ethical decision-making in the assessment, diagnosis, planning, evaluation, and implementation of respiratory procedures.
3. Recognize emergency situations and respond appropriately.
4. Compose a patient assessment Compose a patient SOAP/Patient Assessment document.
5. Demonstrate and perform cardiopulmonary diagnostic procedures.
6. Demonstrate how to set up and maintain a mechanical ventilator.

7. Demonstrate appropriate patient/physician interactions in the clinical setting.

RESP 2110. Respiratory Therapy Cardiopulmonary
2 Credits (2)
This course delves into the study of commonly encountered respiratory disorders in adult patients. It encompasses an in-depth examination of the etiology, pathology, pathogenesis, clinical manifestations, and treatment of a variety of common adult pulmonary diseases.
Prerequisite: C or better in the following courses: RESP 2230 RESP 2230L.
Learning Outcomes
1. Identify and describe common adult respiratory disorders, explaining their etiology, pathology, and clinical manifestations, they will be able to formulate appropriate treatment plans for patients with pulmonary diseases, evaluating diagnostic data and applying evidence-based practices.
2. Recognize preventative strategies for respiratory diseases and demonstrate an understanding of COPD, asthma, and pulmonary infections.
3. Apply patient safety and infection control principles while demonstrating effective communication and interprofessional collaboration.

RESP 2120. Respiratory Therapy III
2 Credits (2)
Presents basic concepts of adult care medicine including adult intensive care and pathophysiology of diseases, introduction to concepts of positive pressure ventilation and advanced airway care. Introduction to positive pressure mechanical ventilation equipment and procedures related to basic critical care medicine for adults using state of the art equipment and computer simulations in the learning Laboratory.
Prerequisite: C or better in the following courses: RESP 1250, RESP 1250L, and RESP 1330.
Corequisite: RESP 2120L.
Learning Outcomes
1. Classify foundational concepts and core knowledge of mechanical ventilation.
2. Monitor mechanical ventilation and assessment of patients receiving mechanical ventilation and in the intensive care units.
3. Evaluate when and how to discontinue a patient from ventilation and long-term ventilation.
4. Successfully initiate ventilation.

RESP 2120L. Respiratory Therapy III Laboratory
2 Credits (2)
Introduction to positive pressure mechanical ventilation equipment and procedures related to basic critical care medicine for adults using state of the art equipment and computer simulations in the learning Laboratory.
Prerequisite: C or better in the following courses: RESP 1250, RESP 1250L, and RESP 1330.
Learning Outcomes
1. Apply didactic skills to hands-on, scenario based learning.
2. Compare and contrast the components and settings of mechanical ventilation, IPPB, BiPAP, airway care parameters, components, and settings.
3. Analyze blood gases and advanced pharmacology.
4. Practice airway care and extubation techniques.
5. Explain ACLS protocols and their relevance in emergency situations and interpret hemodynamic monitoring data to assess patient status and guide treatment decisions.

RESP 2150. Neonatal and Pediatric Respiratory Theory
3 Credits (3)
Presents cardiopulmonary assessment and diagnosis in advanced neonatal and pediatric critical care including correlation of cardiopulmonary anatomy, physiology and pathophysiology with evaluation of cardiopulmonary function. Presents concepts of rehabilitative practice for patients with chronic cardiopulmonary diseases. Introduces strategies for successful completion of national board exams. Presents mechanical ventilation procedures related to critical care medicine for children and infants using state of the art equipment and computer simulation in the learning Laboratory.
Prerequisite: C or better in the following courses: RESP 2230, RESP 2230L, RESP 2110 and RESP 2330.
Corequisite: RESP 2150L.
Learning Outcomes
1. Accurately identify and perform a complete cardiopulmonary assessment of a critically ill pediatric patient.
2. Identify and perform a complete cardiopulmonary assessment of a critically ill neonatal patient.
3. Summarize review-content and complete mock CRT and RRT examinations.
4. Compare and contrast the components of pediatric and neonatal ventilators.
5. Correctly perform and assess effectiveness of respiratory therapy on neonatal/pediatric patients.

RESP 2150L. Neonatal and Pediatric Respiratory Laboratory
2 Credits (6P)
Presents mechanical ventilation procedures related to critical care medicine for neonatal and pediatric, children and infants using state of the art equipment and computer simulation in the learning Laboratory. Students will focus on cardiopulmonary assessment and diagnosis with correlation of cardiopulmonary anatomy, physiology and pathophysiology and evaluation of cardiopulmonary function.
Prerequisite: C or better in the following courses: RESP 2230, RESP 2230L, RESP 2110 and RESP 2330.
Corequisite: RESP 2150.
Learning Outcomes
1. Accurately identify and perform a complete cardiopulmonary assessment of a critically ill pediatric patient.
2. Identify and perform a complete cardiopulmonary assessment of a critically ill neonatal patient.
3. Summarize review-content and complete mock CRT and RRT examinations.
4. Compare and contrast the components of pediatric and neonatal ventilators.
5. Correctly perform and assess effectiveness of respiratory therapy on neonatal/pediatric patients.

RESP 2230. Respiratory Therapy V
3 Credits (3)
Emphasis on special modalities.
Prerequisite: C or Better in RESP 2120, 2120L & 2330.
Learning Outcomes
1. Demonstrate and perform cardiopulmonary diagnostic procedures.
2. Determine appropriate interventions in a critical medical situation.

3. Demonstrate how to setup and maintain a mechanical ventilator.
4. Formulate appropriate cardiopulmonary treatment plans.

RESP 2230L. Respiratory Therapy V Laboratory
2 Credits (2)
Advanced practice and procedures of respiratory care. Requires a C or better to remain in program.
Prerequisite: C or better in the Following: RESP 2120L & RESP 2120, RESP 2330.
Learning Outcomes
1. Demonstrate and perform cardiopulmonary diagnostic procedures.
2. Formulate appropriate cardiopulmonary treatment plans.
3. Determine appropriate interventions in a critical medical situation.
4. Demonstrate how to setup and maintain a mechanical ventilator.

RESP 2242. Pediatric Advanced Life Support (PALS)
1 Credit (1)
Etiology, diagnosis, clinical manifestations, and management of cardiopulmonary disorders related to respiratory care.
Prerequisite: C or Better in RESP 2230 & RESP 2230L.
Corequisite: RESP 2230.
Learning Outcomes
1. Accurately identify and perform a complete cardiopulmonary assessment of a critically ill pediatric patient.
2. Summarize review-content and complete mock CRT and RRT examinations.
3. Compare and contrast the components of pediatric and neonatal ventilators.
4. Correctly perform and assess effectiveness of respiratory therapy on neonatal/pediatric patients.

RESP 2243. Respiratory Therapy Neonatal Resuscitation
1 Credit (1)
Advanced practice of the neonatal resuscitation and certification. Students must be admitted into program to enroll in this course.
Prerequisite: C or better in the following courses: RESP 2230, RESP 2230L.
Learning Outcomes
1. Use critical thinking, problem solving and ethical decision-making in the assessment, diagnosis, planning, evaluation, and implementation of respiratory procedures.
2. Recognize emergency situations and respond appropriately.
3. Compose a patient assessment Compose a patient SOAP/Patient Assessment document.
4. Demonstrate and perform cardiopulmonary diagnostic procedures.

RESP 2330. Respiratory Therapy IV Clinical
3 Credits (9P)
Emphasis on mechanical ventilators.
Prerequisite: C or better in the following courses: RESP 1250, RESP 1250L, and RESP 1330.
Learning Outcomes
1. Maintain Patient confidentiality/privacy as defined by HIPAA.
2. Use critical thinking, problem solving and ethical decision-making in the assessment, diagnosis, planning, evaluation, and implementation of respiratory procedures.
3. Recognize emergency situations and respond appropriately.
4. Compose a patient assessment Compose a patient SOAP/Patient Assessment document.
5. Demonstrate and perform cardiopulmonary diagnostic procedures.
6. Demonstrate how to set up and maintain a mechanical ventilator.
7. Demonstrate appropriate patient/physician interactions in the clinical setting.

RESP 2332. Respiratory Therapy V Clinical
3 Credits (3)
Emphasis on special modalities.
Prerequisite: C or better in the following courses: RESP 2120 and RESP 2120L.
Learning Outcomes
1. Demonstrate and perform cardiopulmonary diagnostics procedures during mechanical ventilation.
2. Demonstrate appropriate patient/physician interactions needed in the clinical setting.
3. Demonstrate how to set up, maintain, and wean a patient from a mechanical ventilator.
4. Compose a patient assessment on a patient receiving mechanical ventilation.
5. Formulate appropriate cardiopulmonary treatment plans for mechanical ventilation.
6. Determine appropriate interventions in a critical medical situation.
7. Document ventilator parameters, alarm settings, and patent assessment.

RESP 2334. Respiratory Therapy VI Clinical
3 Credits (9P)
Advanced Clinical experience on special modalities.
Prerequisite: C or better in the following courses: RESP 2230, RESP 2230L, RESP 2110 and RESP 2330.
Learning Outcomes
1. Maintain Patient confidentiality/privacy as defined by HIPAA.
2. Use critical thinking, problem solving and ethical decision-making in the assessment, diagnosis, planning, evaluation, and implementation of respiratory procedures.
3. Recognize emergency situations and respond appropriately.
4. Compose a patient assessment Compose a patient SOAP/Patient Assessment document.
5. Demonstrate and perform cardiopulmonary diagnostic procedures.
6. Demonstrate how to set up and maintain a mechanical ventilator.
7. Demonstrate appropriate patient/physician interactions in the clinical setting.

RGSC-RANGE SCIENCE

RGSC 1110. The Range Science Profession
1 Credit (1)
Introduction to scientific disciplines and career opportunities in rangeland science and management.
Learning Outcomes
1. To introduce students to the Range Science program and to a variety of career opportunities in Range Science.
2. To develop an individualized course curriculum that prepares the student to achieve their career goals.
3. To examine opportunities to gain practical work experience through internships and cooperative employment.

RGSC 2110. Introduction to Rangeland Management
3 Credits (3)

This course covers the principles of managing and understanding pasture and rangelands. Plant physiology and ecology, plant communities and rangeland sustainability and how they relate to livestock production and wildlife management will be discussed. Restricted to: Main campus only.

Learning Outcomes

1. Understand rangeland management operations.
2. Identify rangeland plants.
3. Gain a perspective of watershed management.
4. Discuss the management of rangeland resources.
5. Understand the process of rangeland evaluation through a broad understanding of monitoring and production of these rangelands.
6. Gain a perspective of the correlation of rangelands and the economic principles guiding resource management.
7. Understand the process of rangeland condition.
8. Understand the concepts of stocking rates and usage of rangelands.
9. Gain a broad perspective of different classes of land ownership; Tribal, federal, private and state. 1
10. Recognize vegetative communities, ecological sites, plant physiology andapplication to rangeland management considerations.

RGSC 2996. Special Topics
1-4 Credits

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

Learning Outcomes

1. Varies

RGSC 302V. Forestry and Society
3 Credits (3)

Global study of the development and use of forest resources for production of wood, fuel, fiber, and food products. Climatic, edaphic, cultural, and economic influences on forests of the world evaluated. Same as HORT 302V.

Learning Outcomes

1. Demonstrate comprehension of basic plant physiology.
2. Analyze various inputs and environmental factors that affect trees and forests.
3. Identify forest biomes based on plant morphology and environmental characteristics.
4. Categorize different types of forest products and harvesting methods.
5. Compare and contrast various forest management practices in the US and worldwide.
6. Evaluate climate and ecological issues as they relate to society.
7. Develop an awareness of the interconnection of nature and society.

RGSC 316. Rangeland Plants
3 Credits (2+3P)

Identification, classification, cultural uses, and economic importance of native and introduced rangeland plants. May be repeated up to 3 credits.

Learning Outcomes

1. Describe the physical characteristics of plants within key Representative Rangeland Plant Groups.
2. Explain the scientific classification system and accurately place plants within the correct taxonomic hierarchy (kingdom to species).
3. Apply plant morphology and classification knowledge to identify rangeland plants using field guides, dichotomous keys, and other botanical tools.
4. Demonstrate proficiency in field methods through plant surveys and specimen collection, connecting practical skills with theoretical concepts.
5. Analyze selected rangeland plant species for their unique traits, ecological roles, and potential uses in land management or restoration.

RGSC 317. Rangeland Communities
3 Credits (3)

Rangeland associations and communities, their plant species composition, and ecological factors affecting management of communities.

Learning Outcomes

1. Identify and distinguish the major rangeland associations and plant communities found across different regions of the United States.
2. Explain the ecological and geographical characteristics (ecogeographic) of rangeland communities and evaluate the primary management challenges associated with each.
3. Recognize and describe key plant and wildlife species that characterize each rangeland community, highlighting their ecological roles and interactions.

RGSC 318. Watershed Management
3 Credits (2+2P)

Management of rangeland and forest watersheds with emphasis on hydrologic cycle and land use effects on runoff and water quality. May be repeated up to 3 credits.

Learning Outcomes

1. Understand impacts of land use on water quantity and quality.
2. Quantify components of the hydrologic cycle.
3. Learn watershed management techniques and practices.
4. Apply scientific principles to evaluate current issues in watershed management.

RGSC 325. Rangeland Restoration Ecology
3 Credits (3)

Principles and practices of vegetation management and ecological restoration. Course emphasizes problems associated with rangeland degradation, and implementation of rangeland restoration and improvements.

Prerequisite: Sophomore standing or consent of instructor.

Learning Outcomes

1. Use fundamental knowledge of plants, soils, and climate to explain how changes in the structure and function of ecological systems can cause ecological degradation, and how management actions can implement changes to facilitate ecological restoration.
2. Compare and contrast the four major plant control methods (mechanical, chemical, fire, and biological) in terms of their effects on vegetation and soils and demonstrate how this knowledge informs management decisions.
3. Describe the biotic and abiotic factors that must be considered to design and implement feasible revegetation and restoration plans and explain the importance of these factors in an ecological context.
4. Apply the concepts and principles learned in this course to predict the effect of vegetation management activities on common North American rangeland plant communities.
5. Effectively communicate understanding of land degradation and restoration practices via writing and oral presentations.

RGSC 350. Special Topics
1-4 Credits

Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester and a grand total of 9 credits.

RGSC 357. Grass Taxonomy and Identification
3 Credits (1+4P)
Taxonomy of grasses; grass anatomy, variation in reproductive structures, and identification of grasses by sight and through the use of dichotomous keys. Students must be Junior standing to enroll in this course. May be repeated up to 3 credits.

Learning Outcomes

1. Use terminology to describe and identify grasses.
2. Apply dichotomous keys to unknown grass species so they can be identified.
3. Recognize numerous important rangeland grasses.
4. Understand the taxonomic classification of grasses.
5. Describe the important characteristics of grasses for disciplines related to range science, wildlife management, and natural history.

RGSC 390. Internship
1-3 Credits
Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 3 credits toward a degree. May be repeated up to 3 credits.

Learning Outcomes

1. Apply foundational knowledge of rangeland science to practical field and management settings.
2. Gain firsthand experience working with professionals in the rangeland ecology and management field and develop key workplace skills such as communication, collaboration, and time management.
3. Describe the goals, roles, and daily operations of the host agency or organization, and reflect on how the internship experience informs their career interests and personal development.
4. Through documentation and final reporting, students will demonstrate an ability to communicate the value of their internship work and articulate how it connects to broader concepts in rangeland ecology and management.

RGSC 402. Seminar
1 Credit (1)
A seminar course designed to inform students of the career opportunities, develop their interviewing and other interpersonal skills may also include reading, discussions, written reports, and seminar presentations of current relevant literature.
Prerequisite(s): Senior standing.

RGSC 402 H. Range Science Seminar
1 Credit (1)
Taught with RGSC 402 with additional work.
Prerequisite(s): Meets Honors eligibility and/or Crimson Scholar status and senior standing.

RGSC 440. Rangeland Resource Ecology
3 Credits (3)
Plant adaptations to arid environments. Life histories of arid land plants. Biotic interactions among rangeland organisms. Arid land plant communities: their physiognomy, diversity, productivity, and response to disturbance. Arid land ecosystem dynamics.

Learning Outcomes

1. Students who complete this course will have a better understanding of mechanisms that determine how rangeland plant communities and ecosystems respond to natural and human-induced disturbance regimes.

RGSC 440 L. Rangeland Resource Ecology Lab
1 Credit (2P)
Living and nonliving factors of the range environment, the life forms and role of range plants and animals on succession and interactions in range ecosystems. Corerequisite(s): RGSC 440. May be repeated up to 1 credit.

Learning Outcomes

1. Students who complete this course will gain a comprehensive understanding of the interplay between abiotic and biotic factors in shaping rangeland plant communities.
2. Learn how rangeland ecosystems adapt and respond to both natural and human-induced disturbances and change.
3. Students will apply field measurement techniques and remote sensing to develop and evaluate rangeland monitoring assessment plans.

RGSC 448. Problems
1-4 Credits (1-4)
Individual investigation in a specific area of range science. Maximum of 4 credits per semester and a grand total of 6 credits. Consent of Instructor required.

RGSC 452. Vegetation Measurements for Rangeland Assessment
4 Credits (2+4P)
Sampling principles, sampling design, and measurement methods used to quantify vegetation attributes and to assess the structure and function of rangeland ecosystems. Laboratory emphasizes practical field techniques, quantitative analysis, and interpretation of results. May be repeated up to 4 credits.
Prerequisite: RGSC 294 and A ST 311.

Learning Outcomes

1. Choose from many available tools and methods for measuring and quantifying vegetation.
2. Design appropriate sampling protocols to meet monitoring objectives in various types of vegetation.
3. Measure vegetation cover, density, frequency, species inventory and production on rangelands.
4. Estimate utilization of forage.
5. Explain advantages and disadvantages of different sampling and measurement methods.
6. Use standard approaches to land classification and evaluation to interpret results in the context of resource management decisions.
7. Clearly communicate results through graphics as well as writing.

RGSC 458. Livestock Behavior, Welfare and Handling
3 Credits (2+3P)
Principles of animal behavior and evaluation of management practices on animal welfare in confined and rangeland livestock operations. Low stress livestock handling techniques. Design of livestock handling facilities. Crosslisted with: ANSC 458
Prerequisite(s): RGSC 2110 or ANSC 1120.

RGSC 460. Rangeland and Natural Resource Planning and Management
4 Credits (3+3P)
Planning and problem solving in rangeland and natural resource management. Public land planning and policy. Application of land management principles to resolve rangeland, riparian and habitat issues. May be repeated up to 4 credits.
Prerequisite: Senior or graduate student standing.

Learning Outcomes

1. Apply previous course work and skills to evaluate approaches to rangeland management issues.

2. Prepare a proposal for a practitioner-scientist research and management project which will include a comprehensive literature review of a specific topic, a directed research and project objective, partnerships among stakeholders, a project budget and timeline, and a monitoring and evaluation plan.

RGSC 485. Land Cover Analysis for Natural Resources
3 Credits (3)
This course is designed to help students understand, manipulate and extract Earth Observation (EO) data and to conduct land cover analysis related to natural resources including water and vegetation. The course provides and highlights means to identify and access EO data in different formats, extract meaningful information, and to help students developing critical thinking skills. The course introduces tools such as python and ArcGIS Pro to handle different data formats (e.g. hdf) efficiently; develop and present creative maps. The course provides basic information about how to conduct land use, land cover change analysis, mapping vegetation, water related variables and plant and animal distribution analysis.
Learning Outcomes
1. Identify sources of and obtain land cover GIS data.
2. Handle GIS data in different formats.
3. Extract meaningful information.
4. Development of qualitative reasoning and analytical thinking skills to address research questions related to natural resources.

RGSC 509. Approaches to Rangeland Research
3 Credits (3)
Experimental design and statistical analysis of experimental results.
Prerequisite: A ST 505 or consent of instructor.
Learning Outcomes
1. Define and articulate problems related to rangeland resources with clarity and relevance.
2. Formulate researchable questions based on clearly defined problems.
3. Identify and justify key variables relevant to addressing specific research questions.
4. Develop testable hypotheses and clearly defined research objectives.
5. Evaluate and compare alternative sampling methods for rangeland data collection.
6. Assess the strengths and limitations of various experimental designs in rangeland research.
7. Use statistical software tools, including Excel and SAS, to organize, analyze, and interpret data.
8. Critically analyze research publications and ongoing projects, including those of peers and professionals, for methodological rigor and scientific validity.

RGSC 513. Advanced Rangeland Ecology
3 Credits (3)
Overview of the current state of knowledge in selected areas of rangeland ecology, with emphasis on currently developing ideas and issues relevant to rangeland management.
Prerequisite: RGSC 440 or equivalent.
Learning Outcomes
1. Define rangelands and describe their global distribution, ecological characteristics, and historical context within the field of natural resource management.
2. Explain key ecological principles and functional traits (morphology and physiology) that influence rangeland ecosystem structure, function, and response to disturbance.
3. Apply foundational methods for rangeland inventory, monitoring, and assessment, including techniques for evaluating vegetation, soil condition, and ecosystem health.
4. Evaluate strategies for sustainable rangeland management, including livestock grazing systems, vegetation management, restoration practices, and watershed/riparian area protection.

RGSC 515. Graduate Seminar
1 Credit (1)
Current topics. Graded S/U.

RGSC 516. Arid Land Management
3 Credits (3)
Survey of seminal and current literature dealing with management of arid and semiarid lands including soil-plant-animal interactions, plant community ecology, arid land assessment methods, and arid land hydrology.
Learning Outcomes
1. Gain a better understanding of the basic science underlying the management of semi-arid and arid range lands.
2. Have an increased appreciation of relevant topics, seminal papers, as well as key researchers in each of the areas of arid land management mentioned above.
3. Become familiarized with the history, academic traditions, and current issues in arid land management in the western United States.

RGSC 518. Watershed Methods and Management
3 Credits (3)
Management of rangeland and forest watersheds with emphasis on the hydrologic cycle and land use effects on runoff and water quality. Hydrologic monitoring methods problem sets required for graduate credit.
Learning Outcomes
1. Understand impacts of land use on water quantity and quality.
2. Quantify components of the hydrologic cycle.
3. Learn watershed management techniques and practices.
4. Apply scientific principles to evaluate current issues in watershed management.

RGSC 520. Arid Land Plant Herbivore Interactions
3 Credits (3)
Survey of seminal and current literature dealing with plant- and animal-related factors that influence herbivory patterns in arid landscapes. Although ungulate herbivory is a central focus of the course, the role of plant defenses in deterring both vertebrate and invertebrate herbivores is discussed in detail.
Learning Outcomes
1. To develop a holistic systems thinking and problem-solving approach to understanding plant and animal interrelationships, as well as addressing issues relevant to both managed and natural ecosystems.
2. Students who complete this course will develop a comprehensive understanding of these dynamics and be equipped with the skills to apply this knowledge in practical scenarios.
3. Students will deepen their understanding of how to read, review, and present scientific literature, and conduct scientific paper annotations.
4. Develop a first draft of a scientific paper reporting either experimental results, a meta-analysis of existing data, or an in-depth literature review on a topic related to the student's dissertation.

RGSC 525. Advanced Rangeland Restoration Ecology
3 Credits (3)

Theory and application of restoration ecology and the principles and practices of ecological restoration. Course emphasizes problems associated with rangeland degradation and highlights current restoration management actions.

Learning Outcomes

1. Use fundamental knowledge of plants, soils, and climate to explain how changes in the structure and function of ecological systems can cause ecological degradation, and how management actions can implement changes to facilitate ecological restoration.
2. Compare and contrast the four major plant control methods (mechanical, chemical, fire, and biological) in terms of their effects on vegetation and soils and demonstrate how this knowledge informs management decisions.
3. Describe the biotic and abiotic factors that must be considered to design and implement feasible revegetation and restoration plans and explain the importance of these factors in an ecological context.
4. Apply the concepts and principles learned in this course to predict the effect of vegetation management activities on common North American rangeland plant communities.
5. Effectively communicate understanding of land degradation and restoration practices via writing and oral presentations.

RGSC 550. Special Topics
1-4 Credits

Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

RGSC 551. Earth Data Retrieval
3 Credits (3)

This course covers topics related to identifying sources, preprocessing, utilizing earth data that can be used to monitor some hydrological and water related variables, vegetation growth and related biophysical properties. The course focuses on developing students' skills on how to handle and analyze high-level large amounts of research data in different formats (i.e. .hdf). The course highlights the use of remote sensing and land surface models-based (NLDAS) earth observation datasets (e.g. NDVI, LST, Ta, and ET). The course uses some open-source tools including Python, API as well as MATLAB. Crosslisted with: WSAM 551.

Learning Outcomes

1. Identify, retrieve, and visualize earth observation datasets that are relevant to individual research activities.
2. Understand the nature and formats of earth observation data.
3. Handle, process, and conduct quantitative analysis of earth observation datasets using python, MATLAB, and cloud computing (GEE).
4. Development of qualitative reasoning and analytical thinking skills to address research questions related to earth observation datasets.

RGSC 557. Advanced Grass Taxonomy and Identification
3 Credits (1+4P)

Taxonomy of grasses; grass anatomy, variation in reproductive structures, and identification of grasses by sight and through the use of dichotomous keys. Additional writing and grass identification assignments are required for graduate credit. May be repeated up to 3 credits.

Learning Outcomes

1. Use terminology to describe and identify grasses.
2. Apply dichotomous keys to unknown grass species so they can be identified.
3. Recognize numerous important rangeland grasses.
4. Understand the taxonomic classification of grasses.
5. Describe the important characteristics of grasses for disciplines related to range science, wildlife management, and natural history.

RGSC 575. Climate Studies, Water and Society
3 Credits (3)

The course provides a brief description of the Earth's climate system, an in-depth review and methodologies used to investigate climate change and variability, evidence of climate change on natural systems (water availability) vulnerability of human systems (e.g. agriculture) to climate change, and mitigation and adaptation strategies.

Learning Outcomes

1. Know, identify, and interrogate Earth's climate observation datasets.
2. Evaluate and understand Earth's climate systems.
3. Conduct meaningful investigations, prediction, and inferencing.
4. Critical thinking about climate change impacts on human and natural resources.

RGSC 585. Land Cover Analysis for Natural Resources
3 Credits (3)

This course is designed to help students understand, manipulate and extract Earth Observation (EO) data and to conduct land cover analysis related to natural resources including water and vegetation. The course provides and highlights means to identify and access EO data in different formats, extract meaningful information, and to help students developing critical thinking skills. The course introduces tools such as python and ArcGIS Pro to handle different data formats (e.g. hdf) efficiently; develop and present creative maps. The course provides basic information about how to conduct land use, land cover change analysis, mapping vegetation, water related variables and plant and animal distribution analysis. Crosslisted with: WSAM 585.

Learning Outcomes

1. Identify sources of and obtain land cover GIS data.
2. Handle GIS data in different formats.
3. Extract meaningful information.
4. Development of qualitative reasoning and analytical thinking skills to address research questions related to natural resources.

RGSC 589. Landscape Hydrology Modeling
3 Credits (3)

The course "Landscape Hydrology Modeling" offers topics related to the physical hydrological processes that occur at different spatial and temporal scales in terms of understanding, quantitative evaluation, modeling, and visualization. It addresses precipitation, runoff, infiltration, and evaporation, as well as understanding impact of land use change on these processes. The course highlights and provide training on the use of hydrological modeling tools including WMS software, HydroVIS and ArcGIS software to help students understand, model, manipulate, and visualize hydrological data processes. The course offers hands-on learning experience on the use of these tools.

Learning Outcomes

1. Identify the different components of a landscape scale hydrologic system and quantitatively evaluate the associated physical processes including precipitation, runoff, streamflow, infiltration, evapotranspiration.
2. Retrieve and visualize a hydrologic system data along with the associated datasets.
3. Be able to model hydrological processes within a watershed and understand the streamflow generation process and the effect of vegetation and topography on streamflow generation.

4. Gain knowledge about, and be able to use, some of the available tools that can be used in spatial and temporal hydrological process modeling.

RGSC 598. Special Research Program
1-4 Credits
Individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

RGSC 599. Master's Thesis
15 Credits
Thesis. Consent of Instructor required. Thesis/Dissertation Grading.

RGSC 600. Doctoral Research
1-15 Credits
Research. Consent of Instructor required. Thesis/Dissertation Grading.

RGSC 616. Advanced Arid Land Management
3 Credits (3)
In depth discussion of seminal and current literature dealing with management of arid and semiarid lands including land tenure systems, soil-plant-animal interactions (emphasis on livestock grazing), plant community ecology and assessment methods, and arid land hydrology.

RGSC 620. Advanced Arid Land Plant-Herbivore Interactions
3 Credits (3)
In depth discussion of seminal work dealing with plant- and animal-related factors that influence herbivory patterns in arid landscapes. Although ungulate herbivory is a central focus of the course, the role of plant defenses in deterring both vertebrate and invertebrate herbivores is discussed in detail.

Learning Outcomes

1. To develop a holistic systems thinking and problem-solving approach to understanding plant and animal interrelationships, as well as addressing issues relevant to both managed and natural ecosystems.
2. Students will deepen their understanding of how to read, review, and present scientific literature, and conduct scientific paper annotations.
3. Develop a first draft of a scientific paper reporting either experimental results, a meta-analysis of existing data, or an in-depth literature review on a topic related to the student's dissertation.
4. Students who complete this course will develop a comprehensive understanding of these dynamics and be equipped with the skills to apply this knowledge in practical scenarios.

RGSC 698. Special Research Programs
1-4 Credits (1-4)
Advanced individual investigations, either analytical or experimental. Maximum of 4 credits per semester. No more than 6 credits toward a degree. Consent of Instructor required.

RGSC 700. Doctoral Dissertation
15 Credits
Dissertation. Consent of Instructor required. Thesis/Dissertation Grading.

RXPP-PRESCRIP PRIV PRAC PSYCH

RXPP 6110. Introduction to Psychopharmacology for Psychologists I
3 Credits (3)
This course is an introduction to physiology and an overview of gross and microanatomy, with a focus on gross, micro, and chemical anatomy of the nervous system. By the end of the course, psychologists will have an up-to-date understanding of human psychology, anatomy, and neuroanatomy. Doctorate of Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

RXPP 6120. Introduction to Psychopharmacology for Psychologists II
3 Credits (3)
Principles of organic chemistry and human biochemistry necessary for the understanding of psychopharmacology are discussed and related to the major transmitter systems and dynamics of transmission. By the end of the course, students will have an up-to-date understanding of biochemistry on which to base further didactic study in psychopharmacology. Doctorate of Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

RXPP 6210. Clinical Psychopharmacology I
3 Credits (3)
This course begins with an introduction to the scope of pharmacology; pharmacoepidemiology, ethical, and legal issues (informed consent, State and Federal regulation of drugs and prescribing, sources of drug information and computer aids) and continues with the principles of pharmacokinetics and pharmacodynamics as they relate to the use of psychotropic medications. It concludes with an introduction to the treatment of anxiety disorders from a biopsychosocial model of care with special emphasis on psychopharmacology for anxiety disorders. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

RXPP 6220. Clinical Psychopharmacology II
3 Credits (3)
This course is a thorough investigation of the diagnosis and treatment of affective disorders from a biopsychosocial model of care. Particular emphasis is given to psychopharmacological treatment of depressive disorders and bipolar disorders. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

RXPP 6230. Clinical Psychopharmacology III
3 Credits (3)
This course is an intensive study of the treatment of psychosis from a biopsychosocial model of care. Special consideration is given to: first, second, and third generation antipsychotic drugs and their pharmacology and clinical uses; neurological and metabolic disorders associated with antipsychotic use; and appropriate use of antipsychotics in children and the elderly. Special attention is then given to child and adolescent psychopharmacology, including drugs used in pregnancy and lactation, teratogenicity, embryotoxicity, developmental disorders, conduct disorders, ADHD, and special considerations in use of approved drugs in children. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. Restricted to the Clinical Psychopharmacology program. May be repeated up to 3 credits.

Learning Outcomes

1. Delineate the biochemical mechanisms underlying the pharmacological efficacy of the three generations of antipsychotic drugs.
2. Differentiate the effects and side effects of first, second and third generation of antipsychotic drugs.

3. Describe the effects of various antipsychotic drugs on the positive and negative symptoms of schizophrenia; including the neurological projections within the Central Nervous System.
4. Describe the biochemical and physiological basis of adverse reactions with antipsychotic treatments.
5. Select anti-psychotics using evidence based criteria and manage the medical issues that arise from their use.
6. Identify the various signs of side effects to antipsychotic drugs and use the appropriate techniques for assessing their severity including the administration of appropriate rating scales assessing those side effects (e.g. AIMS, BMI)
7. Examine the cost-benefit ratio of psychotropic use for adult, child, adolescent and elderly patients with psychotic disorders.
8. Become familiar with current treatment algorithms for the management of psychotic disorders and their limitations.
9. Learn which anti-psychotics that have FDA approval, as well as those that are used off-label in the treatment of children, adolescents and the elderly.

RXPP 6310. Pathophysiology for Psychologists I
3 Credits (3)
This course is an introduction to human clinical physical assessment, history taking, charting, and laboratory testing and neuroimaging. An important emphasis is in functional neuroanatomy and diagnosis and assessment of neurological disorders; role of different components of human nervous system in health and disease; stroke, seizures, and movement disorders (chorea, athetosos, dystonias, dyskinesias, Parkinsonism, akathesia, iatrogenic neurological disorders). Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

RXPP 6320. Pathophysiology for Psychologists II
3 Credits (3)
Physical assessment and pathophysiology of the cardiovascular system is studied in depth: structure and function of the heart and major blood vessels; innervation of the heart and vessels; electrocardiogram; components of blood; lymphatics; and physical assessment of cardiac function. The physical assessment and pathophysiology of eyes, ears, nose, and the immune system are studied in depth; anatomy and physiology of special senses; assessment of cranial nerves and sensory function; immune function and psychoimmunology. The physical examination and pathophysiology of the chest and pulmonary system and its relationship to the cardiac system is also studied. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean.
Learning Outcomes
1. Receive an overview of the pathophysiological mechanisms, relevant assessment findings, treatment recommendations within the pulmonary system.
2. Describe at least 2 symptoms and treatments of COPD.
3. Name at least 2 the symptoms and treatments for asthma.
4. Identify at least 2 signs and symptoms of Cheyne-Stokes respiration.
5. List at least 2 the signs and symptoms of Atelectasis.
6. Explain at least 2 signs and symptoms of Pleurisy.
7. Label at least 2 the signs and symptoms of Emphysema.
8. Explain the signs and symptoms of Tuberculosis.
9. Name at least 2 diagnostic tests that are indicative of a low oxygen level. 1
10. Diagram 2 pathways of oxygenated and de oxygenated blood throughout the body. 1
11. Synthesize assessment findings of pulmonary system into diagnoses using a deliberate and systematic process of data collection and analysis. 1
12. Demonstrate critical thinking and use of research findings in the analysis of a comprehensive health assessment of the pulmonary and circulatory systems as the basis for advanced therapeutic practice interventions.

RXPP 6330. Pathophysiology for Psychologists III
3 Credits (3)
This course continues with an in-depth study of the chest and pulmonary system: pulmonary function and assessment; respiratory exchange and respiratory involvement in acid: base regulation, disorders of respiratory function. The physical assessment of pathophysiology of the gastrointestinal system is discussed in depth: digestion, absorption and excretion of drugs and nutrients from the GI system; disorders of GI function; hepatic function; innervation of GI tract; endocrine and exocrine functions of GI system; physical assessment of GI function. The functions and pathophysiology of the male and female reproductive system, endocrine system, and renal system are discussed as they relate to psychopharmacology. Doctorate of Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

RXPP 6410. Psychopharmacological Treatment in Special Populations I
3 Credits (3)
The psychopharmacology of several special populations are discussed in detail in this course. Geriatric psychopharmacology includes: geriatric physiology; cardiac, renal, hepatic changes with aging; pharmacokinetics/dynamics in the elderly; cognition enhancers in Alzheimer's and other dementias. Special treatment of personality disorders, eating disorders, the importance of racial, ethnic, and gender differences and culturally sensitive practice is presented with applications. Pain management psychopharmacology is over-viewed, including: pharmacology of opioid and non-opioid analgesics; pain syndromes; acute and chronic pain; headache; pharmacological and non-pharmacological approaches to pain management; pharmacology and actions of abused substances: acute effects, withdrawal, biochemistry of tolerance and dependence, brain central reward pathways. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Use a GFR calculator to assess the renal function of an elderly patient.
2. Select the most appropriate antidepressant medication for an elderly patient considering the patient's current level of renal function.
3. Analyze a patient's medication list and calculate the Beers score for the patients' medication list.
4. Use knowledge gained from analysis of the patient's Beers score to select an appropriate medication for the following conditions: insomnia; psychosis; depression anxiety.
5. List three psychotropic medications that do not require a dose adjustment based on the patient's GFR.

6. Analyze an elderly patient's current medication list using the STOPP/START guidelines.
7. Select the most appropriate medication for a patient experiencing delirium consistent with the STOPP/START guidelines.
8. Calculate an elderly patient's vulnerability score using the VES – thirteen.
9. List three psychotropic medications that are hepatotoxic and should not be used in patients with cirrhosis. 1
10. List the 10 most common medical illnesses in the elderly. 1
11. Calculate the Child-Turcotte-Pugh Score of hepatic function for a patient. 1
12. Review the current availability of empirically validated Decision Support Tools (DST's) for the treatment of Late Life Depression (LLD) and decide whether the use of DST is supported by the evidence. 1
13. Defend a risk/benefit analysis for the use of the following medication classes in the elderly: SGA's; AZD Rx's; hypnotics; mood stabilizers. 1
14. Explain the relationship between outcome and sponsorship in studies of the comparative efficacy of psychotropic medications and psychotherapy in older adults. 1
15. List expected dosage adjustments for benzodiazepines, SSRI's, anticonvulsants, and hypnotics in older adults. 1
16. Select the appropriate medication for each of 5 patients in cases presented during the class.

RXPP 6420. Psychopharmacological Treatment in Special Populations II
3 Credits (3)
The pathophysiology and treatment of substance use disorders from a biopsychosocial model is presented. Issues of medical comorbidity are studied: psychopharmacological treatment in the medically compromised patient, including case studies and review of comprehensive treatment models; mental disorders due to a general medical condition and/or adverse drug reactions; and referral practices to specialists. Diagnostic rating scales and psychiatric instruments of use to the prescribing psychologist are presented. The course ends with an integration of psychotherapy and pharmacotherapy, including ethical issues such as the right to refuse treatment, treatment compliance/adherence, risk management, and the role of the medical psychologist in the modern, integrated healthcare system. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.

RXPP 6510. Supervised Experience in Psychopharmacology I
1-3 Credits (1-3)
In this applied course, students employ their knowledge of psychopharmacology in treatment setting. Students will participate in the treatment of 50 patients for a minimum of 200 hours under the supervision of a physician. Number of credits taken to be determined in consultation with RXPP Training Director. Maximum of 3 credit hours required by degree program. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Students will complete eighty hours of practicum in a health care setting while supervised by a licensed physician.
2. Students will demonstrate expertise in providing basic vitals, physical assessment, and laboratory interpretation skills they have been taught in class.
3. Students will demonstrate expertise in performing diagnostics (e.g. imagining studies), differential diagnoses, clinical medicine, and instrumentation.

RXPP 6520. Supervised Experience in Psychopharmacology II
1-3 Credits (1-3)
Continuation and completion of supervised experience in RXPP 6510. Students will participate in the treatment of 50 additional patients for a minimum of 200 hours under the supervision of a physician. The RXPP 6510/6520 sequence must be completed no sooner than three months and no later than three years from initiation. Number of credit hours taken to be determined in consultation with RXPP Training Director. Maximum of 3 credit hours required by degree program. Doctorate in Psychology required. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 3 credits.
Learning Outcomes
1. Students will be monitoring the psycho-biosocial treatment of 100 patients, for a minimum of 400 hours.
2. Students will demonstrate expertise in combining psychotropic medication along with psychotherapy.
3. Students will demonstrate knowledge and expertise is practicing enhanced patient education; and making psychotropic medication recommendations, management,and/or consulting with, as needed, allied health professionals.

RXPP 6996. Selected Topics
1-6 Credits (1-6)
Offered under various subtitles which indicate the subject matter covered. A maximum of 6 credits in any one semester and a total of 18 credits overall. Non-majors may be permitted to enroll in this course under limited circumstances with the permission of the course instructor, department head, and graduate school dean. May be repeated up to 18 credits.

SIGN-SIGN LANGUAGE

SIGN 1110. American Sign Language I
3 Credits (3)
American Sign Language I is an introductory level language course in the language of the American Deaf Culture. Content includes ASL vocabulary and conversational skills; linguistic features of ASL; and skills in narrative/storytelling. In-class activities, comprehension and expressive examinations, narrative and storytelling assignments in addition to semester projects are venues for students to demonstrate their learning. In addition, Deaf Culture and Deaf Community issues are addressed. May be repeated up to 3 credits.
Learning Outcomes
1. Engage in basic conversations using ASL, such as introducing oneself, exchanging personnel information, and talking about one's surroundings.
2. Demonstrate the use of grammatical structures, including spatial referencing, use of classifiers, role shifting, ASL syntax, and non-manual signals (NMS).
3. Demonstrate clear sign production using an understanding of sign parameters: handshapes, movement, location, palm orientation, and NMS in targeted lexicon.
4. Demonstrate the use of basic ASL vocabulary and expressions necessary for conversationsabout real-life situations.

5. Evaluate and provide feedback concerning peers' and one's own uses of ASL.
6. Develop culturally-appropriate behaviors and conversation strategies within a variety of contexts for interacting with people who are Deaf.
7. Demonstrate effective use of comprehension and expressive ASL skills through narrative and/or storytelling activities.
8. Describe issues of the American Deaf community and Culture.

SIGN 1120. American Sign Language II
3 Credits (3)
American Sign Language II is a continuation course that builds on concepts and skills developed in American Sign Language I. Students gain further exposure to ASL structure and grammar, and Deaf Culture and the Deaf community. Emphasis is on increasing students' ability to comprehend other signers and express themselves with more elaboration when conversing or presenting in ASL. May be repeated up to 3 credits.
Prerequisite: SIGN 1110 or consent of instructor.
Learning Outcomes
1. Further develop basic conversational skills in ASL, taking on more complicated topics.
2. Apply knowledge of ASL grammar, including classifiers, spatial referencing and agreement, role shifting, and non-manual markers.
3. Develop ASL vocabulary, fingerspelling, number, narrative and storytelling skills.
4. Evaluate and provide feedback concerning peers' and one's own uses of ASL.
5. Demonstrate effective use of comprehension and expressive ASL skills through conversation, discussion, narrative and/or storytelling activities.
6. Demonstrate knowledge and appreciation of the American Deaf community and ASL
7. Through first-hand experience in the American Deaf community and ASL, relate and reflect on perspectives of the community.

SIGN 2110. American Sign Language III
3 Credits (3)
This is an intermediate level course in American Sign Language (ASL). Expected areas of intermediate skill and knowledge development include: language comprehension and production, conversational use, narratives, ASL language features and further knowledge of and interaction with Deaf culture and the Deaf community. May be repeated up to 3 credits.
Prerequisite: SIGN 1120.
Learning Outcomes
1. Demonstrate intermediate ASL vocabulary, conversation and narrative/storytelling skills.
2. Demonstrate fundamental ASL features including visual/spatial orientation, constructed dialogue and action, spatial referencing, classifiers, non-manual behaviors and syntax/word order.
3. Demonstrate appropriate use of cultural behaviors and conversational strategies.
4. Translate written and spoken English to ASL and vice versa.
5. Self-evaluate and provide feedback to peers concerning ASL usage.
6. Examine the culture of the American Deaf community through engaging in community activities and its language.

SIGN 3110. American Sign Language IV
3 Credits (3)
This course is a continuation of SIGN 2110 (ASL III) with a focus on more complex grammatical features. Involves intensive practice to include the advance skills of receptive/expressive abilities in complex grammatical dialogues and storytelling, conversational use and expressing narratives. May be repeated up to 9 credits.
Prerequisite: SIGN 2110.
Learning Outcomes
1. Students will recognize sociolinguistic variation in American Sign Language.
2. Students will develop proficiency by learning the semantic and grammatical accuracy of American Sign Language.
3. Students will be able to utilize different strategies dependent on the communication contexts.
4. Students will enhance their receptive and expressive language ability as needed to integrate into the Deaf Culture by communicating in American Sign Language.

SIGN 3210. Introduction to Deaf Community
3 Credits (3)
This course is an introduction to American Deaf Community's cultural versus clinical view of deafness with emphasizes on the language, physical, educational, social, political, and cultural implications within the context of deaf and hard of hearing individuals. The course emphasizes personal lives, family and their current educational and vocational programs, legislation, technology, oppression, and other issues. May be repeated up to 6 credits.
Prerequisite: SIGN 1110 American Sign Language I & SIGN 1120 American Sign Language II.
Learning Outcomes
1. Students will define and comprehend basic terms, causes, conditions and processes relating to hearing loss and how it impacts an individual's personal life, family, language education and vocational services.
2. Students will identify professionals involved in the field and their roles, functions, and professional credentials.
3. Students will identify and define common language and communication methods utilized by deaf and hard of hearing people.
4. Students will compare and contrast cultural versus pathological views of Deaf Community.

SIGN 4110. Deaf Culture
3 Credits (3)
This course offers a historical and contemporary overview of all genres of American Deaf Culture. Topics include education, socio-cultural, political, and economic aspects of the Deaf culture. Cultural identity, values, group norms, communication, language, and the significant contributions made by Deaf/deaf people to the world.
Prerequisite: SIGN 1110 American Sign Language I and SIGN 1120 American Sign Language II.
Learning Outcomes
1. Students will comprehend the Deaf Cultures in America from a multicultural perspective by recognizing the political and cultural importance of the ASL as a language.
2. Students will discuss past, present and future trends for D/deaf and Hard of Hearing communities by outlining the historical roots of American Deaf culture and education.
3. Students will comprehend how significant federal, state, and local legislation contributes to the lives of D/deaf and Hard of Hearing people.

SMET-SCIENCE/MATH/ENG/TECH

SMET 101. Introduction to Science, Mathematics, Engineering, and Technology
1 Credit (1)
An introductory course for science, mathematics, engineering, or technology students, emphasizing introduction to their disciplines. Development of critical thinking and academic success skills for technical disciplines, as well as degree planning for the major.
Learning Outcomes
1. Apply the scientific method of constructing and testing hypotheses.
2. Design and conduct an experiment using Radio Jove.
3. Apply astrobiological knowledge to solve human problems.
4. Develop competence in appropriate scientific laboratory techniques.

SMET 102. Introduction to Engineering Design.
1 Credit (1)
Fundamental concepts of engineering design developed through analysis of case studies and hands-on design projects.
Learning Outcomes
1. Identify assumptions within a given context and be able to predict outcomes through data analysis.
2. Obtain, interpret and analyze numerical information through the use of appropriate tables, diagrams, and algorithms.
3. Develop competency in conveying astrobiological knowledge through laboratory reports and/or written assignments following proper APA documentation style.
4. Design antenna configurations to increase the frequency of the radio Jove.

SMET 201. Research for Visiting Community College Students
1 Credit (1)
Research experience for visiting community college students. Consent of instructor required. Restricted to: Main campus only.

SMET 301. Undergraduate Research Assistantship
0.5 Credits (.5)
Undergraduate research experience in science, technology, engineering, and mathematics Consent of instructor required. Graded: S/U.

SOCI-SOCIOLOGY

SOCI 1110G. Introduction to Sociology
3 Credits (3)
This course will introduce students to the basic concepts and theories of sociology, as well as to the methods utilized in sociological research. The course will address how sociological concepts and theories can be utilized to analyze and interpret our social world, and how profoundly our society and the groups to which students belong influence them. Students will be given the opportunity to challenge their "taken-for-granted" or "common sense" understandings about society, social institutions, and social issues. Special attention will also be paid to the intimate connections between their personal lives and the larger structural features of social life. In addition, the implications of social inequalities, such as race/ethnicity, gender, and social class will be central to the course's examination of social life in the United States.
Learning Outcomes
1. Define sociological perspectives and the contributions that sociological knowledge can bring to the social sciences.
2. Understand the sociological imagination and explain the relationships between social structures, social forces and individuals.
3. Demonstrate the ability to apply the perspectives of symbolic interactionist theory, conflict theory, and structural-functionalist theory to qualitative and/or quantitative data.
4. Understand and explain intersectionality and the connections between race, class, gender, disability, sexual identity and other forms of structural inequality.

SOCI 2230. Sociology of Sexuality
3 Credits (3)
This course explores all aspects of human sexuality from a sociological perspective. Topics include, but are not limited to, sex work, intimate relationships, sexual response, political movements, power, and the social construction of sexuality. The course also considers how various social statuses such as ethnicity, gender, and social class intersect with sexuality.
Learning Outcomes
1. Identify the central research questions, theories, and methodologies used in the study of human sexuality.
2. Identify and describe biological, cultural, social, and psychological sexual behaviors and response across the lifespan.
3. Identify and describe trends and changes that influence sexual attitudes and values in the U.S. and globally.
4. Describe how sexuality is influenced by contextual factors, such as race/ethnicity, gender, socioeconomic status, disability, and nationality.

SOCI 2240. Sociology of Intimate Relationships and Family
3 Credits (3)
This course provides an overview of contemporary intimate relationships and families from sociological perspectives. We will examine intimate relationships and families as social constructions whose meanings have changed over time and from place to place. This course will aid students in developing a greater understanding of intimate relationships and families as institutions in contemporary U.S. society. Intersections of race, class, gender, sexual orientation, nationality, and other factors within these institutions will be addressed. Community Colleges only. May be repeated up to 3 credits.
Learning Outcomes
1. Explain the sociological approaches to researching intimate relationships and families.
2. Describe important sociological research findings concerning intimate relationships and families.
3. Explain how intimate and familial relationships are affected by multiple intersecting inequalities and ongoing events in other social institutions.

SOCI 2261. Issues in Death and Dying
3 Credits (3)
Major personal and social issues related to the process of dying in our culture. Community Colleges only.
Learning Outcomes
1. be able to understand the diversity of the death experience and the various options available in coping with death and bereavement as shown by the student's participation in class discussions and field trips.
2. better understand death and dying as social phenomena as shown by the student's reaction papers.
3. have taken an in-depth look at her or his own death with a researched paper. Comprehension will be shown by the student's grade on the paper.

SOCI 2310G. Contemporary Social Problems
3 Credits (3)
This course studies the nature, scope, and effects of social problems and their solutions. The course will concentrate on sociological perspectives, theories, and key concepts when investigating problems, such as inequality, poverty, racism, alienation, family life, sexuality, gender, urbanization, work, aging, crime, war and terrorism, environmental degradation, and mass media. This course is designed to build students' sociological understanding of how sociological approaches attempt to clarify various issues confronting contemporary life, as well as how sociologists view solutions to these problems.
Learning Outcomes
1. Identify and explain major social problems in the United States, and how social problems become constructed as problems.
2. Describe and analyze policy related solutions associated with social problems from various perspectives.
3. Critically examine social problems through the use of sociological theories, methods, and empirical techniques.
4. Identify connections, both national and global, between social problems and social inequalities (e.g., social class, race/ethnicity, and gender/sexuality).

SOCI 3110V. Sociology of Religion
3 Credits (3)
Provides an overview of old and new methods and theories for the study of religion. Exposure to the ways groups of people in diverse cultural systems construct and change their religious traditions to serve practical and meaningful ends. May be repeated up to 3 credits.

SOCI 3120V. Introduction to Population Studies
3 Credits (3)
Determinants and consequences of changes in fertility, mortality and migration patterns. Introduction to techniques of demographic analysis. Focus on U.S. and world population issues and their relation to social, cultural, and economic systems. May be repeated up to 3 credits.

SOCI 3150. Social Research: Methods
3 Credits (3)
An introduction to research design and data collection strategies commonly employed in the social sciences. Topics include experiments, survey research and various other quantitative and qualitative methods. May be repeated up to 3 credits.
Prerequisite: SOCI 1110G.

SOCI 3160. Sociological Research: Analysis
3 Credits (3)
Elementary data analysis class emphasizing descriptive and inferential statistical techniques commonly employed in the social sciences. Topics range from one variable analysis through regression and correlation analysis of two variables. May be repeated up to 3 credits.
Prerequisite: SOCI 1110G.
Learning Outcomes
1. Critically evaluate understand social statistics from various common sources such as TV, newspapers, research reports, and scholarly articles. --Assessed via discussion, assignments and exams.

SOCI 3165. Sociological Theory
3 Credits (3)
Analysis of the main historical themes underlying contemporary sociological theory. May be repeated up to 3 credits.
Prerequisite: SOCI 1110G.

SOCI 3240. Sociology of the Family
3 Credits (3)
Family patterns, dynamics, and processes in North American and other contemporary families. Emphasis on diversity. May be repeated up to 3 credits.
Learning Outcomes
1. Family patterns, dynamics, and processes in North American and other contemporary families. Emphasis on diversity.

SOCI 3245V. Comparative Family Systems
3 Credits (3)
A comparative analysis of family forms and characteristics in various societies. An examination of the diversity of family practices among ethnic and class groups in the United States. May be repeated up to 3 credits.

SOCI 3250. Sociology of Childhood
3 Credits (3)
This course examines theories, methods, and empirical research in several areas of the sociology of childhood. Major themes are: (1) how social structure constrains children's lives, (2) how children negotiate, share, and create culture, and (3) how children's experiences vary within and across societies. May be repeated up to 3 credits.

SOCI 3255. Youth and Society
3 Credits (3)
Comparative historical analysis of social, economic and cultural forces affecting young people. Emphasis on organizational and institutional effects on the well being of children and young adults. May be repeated up to 3 credits.

SOCI 3270. Gender and Society
3 Credits (3)
Overview of issues related to gender, including how gender is constructed and reproduced in our society. Gender is examined from social psychological and institutional perspectives. May be repeated up to 3 credits.

SOCI 3310V. Social Issues in the Rural Americas
3 Credits (3)
Discussion of the major social issues facing the rural United States and borderland areas. Topics include the social history, governmental policies, water rights, land issues and labor. May be repeated up to 3 credits.

SOCI 3315. Urban Society in a Global World: Problems, Prospects, and Promises
3 Credits (3)
Identification and analysis of the causes and consequences of social issues in urban environments including poverty, crime, terrorism, urban social policy, suburban flight, disinvestment, and deindustrialization. Special emphasis on global forces affecting global urban environments around the world. May be repeated up to 3 credits.

SOCI 3330. Environmental Sociology
3 Credits (3)
This course provides a sociological examination of the interconnections of human social organization and the biophysical environment. The goal is to make sense of these complex interconnections between society and the environment--including examination of potential causes and solutions to environmental problems in real world settings. May be repeated up to 3 credits.

SOCI 3340V. Social Change
3 Credits (3)
Explanations of autonomous and directed social change as occurring at the individual, organizational, societal, and international levels. Case studies from around the world. May be repeated up to 3 credits.

SOCI 3410. Race and Ethnic Relations
3 Credits (3)
Dynamics of racial prejudice and patterns of racial and ethnic interaction in the United States. May be repeated up to 3 credits.

SOCI 3415. Social Inequality
3 Credits (3)
Analysis of the social distinctions arising from sex, age, occupation, and ethnicity. Emphasis on indicators of social class and patterns of social mobility. May be repeated up to 3 credits.

SOCI 3510. Crime and Society
3 Credits (3)
Analysis of crime at the interpersonal, organizational, and social structure levels in society. Exploration of contemporary images of crime in mass media. Examination of connections between race, class, gender, and crime in U.S. society. May be repeated up to 3 credits.

SOCI 3520. Juvenile Delinquency
3 Credits (3)
Nature, extent, and causes of juvenile delinquency; juvenile justice; modern methods of treatment; programs of prevention. May be repeated up to 3 credits.

SOCI 3610V. Sociology of Pop Culture
3 Credits (3)
This course will provide students with a sociological look at creation, distribution, and effects of popular culture that have shaped, preserved, and conveyed distorted images of social class, race, gender and history to unwary consumers. May be repeated up to 3 credits.

SOCI 3620V. Sports and Society: A Global Perspective
3 Credits (3)
A critical examination of sports in a global context, emphasizing the social and cultural factors that shape the world of sports and the consequences of sports for societies. Course examines issues of social inequality, violence, media and corporate influence, religion and sports, and the student-athlete experience. May be repeated up to 3 credits.

SOCI 3630. Culture and Social Life
3 Credits (3)
What exactly does culture look like, and how precisely does it shape---and is shaped by---social behavior? These are the core questions in the sociology of culture and will be the focus of this course. The course begins with an overview of the various ways that culture has been defined in sociological theory and research. The course will then focus on various topics within the contemporary sociology of culture, including, but not limited to, culture and cognition, the production of culture, culture and politics, and culture and inequality.
Learning Outcomes
1. Finish the course with an understanding of the different ways that culture is defined in sociological research.
2. Understand the various ways that culture affects social behavior and how social behavior shapes and changes culture.
3. Finish the course with a sociological imagination that is expanded to included cultural theory.
4. Finish the course with the ability to formulate research projects that involve cultural theories.

SOCI 3635V. Food and Society
3 Credits (3)
This course explores how food and food products are produced, prepared, and consumed. We examine social and structural inequalities, economics, the food-health crisis, and the environmental, political, cultural, and symbolic dimensions of food systems and food-related behaviors. We also discuss the impact of race, class, gender, and socioeconomic matters on food-related issues and investigate how social problems in the food system reflect an ongoing tension between individuals and the power of social institutions.
Learning Outcomes
1. Discuss food, food systems, and food-related topics using sociological terms, concepts, and theories using empirically-based and scholarly research.
2. Demonstrate how sociological perspectives regarding food, food systems, and eating practices can be viewed as social issues and socially constructed.
3. Apply food as a lens to study opportunities and patterns of consumption, distribution, and production, which reflect existing social inequalities.
4. Apply a sociological perspective to students' eating habits, food environments, and food cultures.
5. Identify themselves as competent social actors exploring ways they can make positive contributions to society and be catalysts for change.
6. Develop and express interpretation and analysis of sociological principles through formal and informal writing.

SOCI 3640. Sociology of Digital Media
3 Credits (3)
This course explores how the social, political-economic, and cultural landscape is changing in relation to digital media and information technologies.
Learning Outcomes
1. Develop analytical tools for understanding the complex information society.
2. Examine how the cultural, political, and social environments are changing with the emergence of new media and digital technologies.
3. Place the relationship between society and new media in context – what is interesting about these "new" technologies?
4. Successfully develop, conduct, and present a final project.
5. Understand a central and contemporary issue within the study of social media from a sociological perspective.

SOCI 3645. Music in Society
3 Credits (3)
This course reviews historical, contemporary, and emerging forms of music. We will analyze the fascinating interplay between music and society, delving into how music reflects and shapes cultural attitudes and beliefs. Our focus views music as a primary source of meaning in our lives, exploring individual experiences and collective behavior and analyzing the central role of music in social life and society.
Learning Outcomes
1. Discuss music and its social and individual impact using sociological terms, concepts, and theories.
2. Apply a sociological perspective (using sociological theories and methods) to ask/answer questions about music and music-related topics.
3. Analyze the tremendous influence music has on our understanding and expressions of race, class, gender, sexual orientation, socioeconomic status, and contemporary culture.
4. Examine diversity and culture as they intersect with music in both historical and contemporary contexts.
5. Illustrate the role of music in collective identity and social movements.

6. Identify themselves as competent social actors exploring ways they can make positive contributions to society and be catalysts for change.

SOCI 3650. Film in Society
3 Credits (3)
Using historical, cultural, and social perspectives, this course analyzes the comprehensive scope of classic and contemporary films. It uses examples from a variety of films to discuss how meaning is socially constructed and presented and its overall function in society. We explore the topics of identity, race, social class, gender, sexuality, education, courtship and marriage, religion, and many other elements of society.
Learning Outcomes
1. Express a working knowledge of sociological inquiry and sociological terms, concepts, and the major theoretical approaches that sociologists use to understand the complexities of film in society.
2. Explain how the human experience, personal values, and ideas are shaped and expressed by films at both individual and structural levels.
3. Illustrate expressions of intersectionality and the presentation expressed in contemporary film.
4. Apply a broad, sociological perspective to understand the complex issues involved in the social construction and perpetuation of contemporary social problems.
5. Evaluate the power of classical and contemporary film and their influence on human experience, personal identity, social values and ethics, and American culture.
6. Identify ourselves as competent social actors exploring ways we can make positive contributions to society and be catalysts for change.
7. Develop and express interpretation and analysis of sociological principles through formal and informal writing.

SOCI 4150. Networked and Connected
3 Credits (3)
Introduction to social network analysis in sociology. First half of the course focuses on understanding the structure of social networks. Second half of the course involves examining real-world social networks ranging from romantic relationships to political parties.
Learning Outcomes
1. Finish the course with the ability to interpret, question, and discuss network science theories and methods.
2. Understand which type of network method is appropriate for different kinds of research questions.
3. Finish the course with basic programming and network analysis skills in the R statistical computing environment.

SOCI 4155. Textual Analysis of Digital and Social Media
3 Credits (3)
Introduction to some of the methods that social scientists use to analyze digital and social media. Focus is on developing the fundamentals for designing and conducting text analysis projects.
Learning Outcomes
1. Finish the course with the ability to interpret, question, and discuss text analysis methods accurately.
2. Understand which type of text analysis method is appropriate for different kinds of research questions.
3. Finish the course with basic programming and data analysis skills in the R statistical computing environment.

SOCI 4160. Visualizing Social Life
3 Credits (3)
Introduction to how to communicate sociological findings using graphics. Emphasis is on finding meaningful trends in real-world social science data and creating graphics that best communicate those associations or trends.
Learning Outcomes
1. Finish the course with the ability to create, interrogate, and interpret data visualization.
2. Understand which type of graphic is appropriate for different kinds of social science data.
3. Finish the course with basic programming and data visualization skills in the R statistical computing environment, especially with the ggplot2 package.

SOCI 4240V. Comparative Global Family Systems
3 Credits (3)
The study of families around the world. The comparison will include how capitalism and power differentials have affected the course of family history, gender relations, and family life today. May be repeated up to 3 credits.

SOCI 4270. Sex and Gender
3 Credits (3)
This course is an advanced exploration of gender from a sociological perspective. Topics include cultural constructions of gender, socialization and identity formation. In addition, the course examines how gender is relevant within the institutions of family, work, education, religion and politics, with particular focus on how gender is linked to inequality.
Learning Outcomes
1. Differentiate between biological, psychological and sociological perspectives on sex and gender.
2. Demonstrate an understanding of the social construction of gender.
3. Demonstrate an understanding of gender as it intersects with other social identities such as sexuality, race, ethnicity, religion, and class.
4. Identify the role of culture and socialization in the development of gender.
5. Apply a sociological understanding to how gender is relevant within the institutions of family, work, education, religion, the media and politics.

SOCI 4310. Community Development
3 Credits (3)
This is a holistic view of community development with an emphasis upon how economic development efforts can become more inclusive and sustainable. Topics include examining what 'community' means, community development versus economic development, and alternative economic activities. May be repeated up to 3 credits.
Prerequisite: SOCI 1110G.

SOCI 4315. Public Sociology
3 Credits (3)
This course examines both the theory and practice of public sociology. The course begins by examining the theoretical aspects, challenges, and critiques informing public sociology. After setting these foundations the remainder of the course examines different ways of applying public sociology, whether in the K-12 classroom, through community engagement activities such as nonprofit work, or other endeavors that seek to make the world a better place.
Learning Outcomes
1. Understand the theoretical foundations and debates within public sociology 2)Understand various ways public sociology can be practiced outside academia

SOCI 4317. Social Transformation
3 Credits (3)
This course examines various components of social change. The primary intention of this course is to help students better understand how the United States, and the world, has changed and continues to change. The course begins by examining how social change influences one's personal life, then focuses upon how social change influences inequalities in the United States. The course concludes by examining how individuals can engage in creating social change.

Learning Outcomes
1. Identify how social change has influenced, and continues to influence, their personal lives.
2. Identify the causes and patterns of social change.
3. Identify how different sociological theoretical paradigms and theories explain different facets of social change.
4. Apply these various theoretical perspectives learned to various types of social change.

SOCI 4320. Social Movements and Activism
3 Credits (3)
An overview and exploration of the key concepts of collective behavior and social movements as they apply to both historical and contemporary trends and movements. We examine also social movement tactics and their effectiveness in shaping policy and social norms. May be repeated up to 3 credits.

Learning Outcomes
1. Demonstrate understanding of social movement theory and how it applies to particular cases.
2. Identify and analyze how social movements emerge and the conditions that their success depends on.
3. Analyze the role that movements play in transitions to and consolidations of democracy.
4. Critically examine how: a) State repression incites or threatens the development of movements, and b) which strategies movements use for communicating with the larger society.
5. Demonstrate knowledge of a specific social movement and its relations to broader questions of social, economic, political, and cultural transformations.

SOCI 4325. Digital Media and Activism
3 Credits (3)
This course introduces the study of social movements and activism and their relationship with digital and social media.

Learning Outcomes
1. Understand the most relevant theories of social movements and how these have been affected by the new digital media ecology.
2. Critically examine how the qualities and attributes of digital media contribute to the operation, growth, and success of contemporary activism around the world.
3. Place the relationship between social movements and new media in context.
4. Understand a central and contemporary social movement and its use of social media to further its goals.

SOCI 4335V. Advanced Environmental Sociology
3 Credits (3)
Advanced examination of societal responses to environmental problems including social adjustments to natural and technological hazards, sociocultural aspects of technological risk and impact assessment, and emergence of environmental social movements. May be repeated up to 3 credits.

SOCI 4337. Human Society and the Environment
3 Credits (3)
This course explores the relationship between human societies and the natural environment, with an emphasis on both sustainable human and environmental relationships. May be repeated up to 3 credits.
Prerequisite: SOCI 1110G.

SOCI 4410. Diversity in Alternative Families
3 Credits (3)
Cross-cultural examination of diversity among and within families: analysis of family diversity includes consideration of the theoretical frameworks, ideological commitments, personal experiences, and methodological approaches to examine family life. May be repeated up to 3 credits.

SOCI 4420. Sociology of Latinos/as in the United States
3 Credits (3)
In-depth examination and comparative analysis of political and economic issues affecting Latino/a culture and behavior. Includes the Chicano/a and larger Latino/a movements, the border, immigration, language policies, education, religion, labor, and Latina women s issues. Recommended preparatory courses: SOCI 1110G, SOCI 3410, or HIST 367. May be repeated up to 3 credits.

SOCI 4430. International Migration
3 Credits (3)
This course examines international migration as a social process, focusing on the American experience. Students will examine historical and comparative literature on immigration that puts contemporary questions about policy and immigrant assimilation into a broader sociological perspective. May be repeated up to 3 credits.
Prerequisite: SOCI 1110G.

SOCI 4450. Power and Politics in America
3 Credits (3)
This course provides an introduction to the study of Political Sociology with a focus on the United States. Political Sociology studies the social bases of politics and political systems and facilitates the understanding of the processes and consequences of power distributions in the United States. May be repeated up to 3 credits.
Prerequisite: SOCI 1110G.

SOCI 4455. Inequality and Public Policy
3 Credits (3)
This course explores the reciprocal relationship between inequality and public policy, with a particular focus on poverty and anti-poverty policy in the contemporary United States.

Learning Outcomes
1. Understand and compare different ways in which poverty has been historically measured and understood
2. Understand and apply various types of social inequality
3. Critically read and evaluate empirical research measuring, and policy proposals addressing, poverty and inequality
4. Write your own policy evaluation including empirically grounded policy recommendations
5. More effectively participate in policy debates regarding inequality and poverty

SOCI 4460. Globalization
3 Credits (3)
Analysis of the globalization process. Covers theories of globalization, the global economy, political globalization, global culture, transnational

social movements, transnational migration and world labor market, global cities, and local-global linkages. Same as POLS 469. May be repeated up to 3 credits.

SOCI 4510. Social Deviance
3 Credits (3)
Theoretical approaches to the study of social deviance with emphasis on critical theories. Exploration of forms of deviance in society. Examination of social construction of deviance within mass media and systems of social control. May be repeated up to 3 credits.

SOCI 4555. Sociology of Education
3 Credits (3)
Socio-political and economic factors that shape the structure and operation of educational institutions in modern complex societies. Socio-historical development of the school as a microcosm of society, with examples from American and other school systems. May be repeated up to 3 credits.

SOCI 4992. Directed Readings
1-3 Credits (1-3)
Individual readings or research for either majors or nonmajors. Consent of Instructor required. May be repeated up to 6 credits.

SOCI 4996. Special Topics
3 Credits (3)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 12 credits.
Learning Outcomes
1. Varies

SOCI 4998. Internship
1-6 Credits (1-6)
Supervised participation in an appropriate community setting. Taught with SOCI 5998. May be repeated up to 9 credits.

SOCI 4999. Sociology Senior Seminar
3 Credits (3)
The main goal of this course is to provide Sociology students the opportunity to integrate the knowledge acquired from the classroom with personal real-world experiences in order to explore how a sociological perspective can be applied to one's everyday life and work. Students must be in senior standing to enroll in this course. May be repeated up to 3 credits.
Prerequisite: SOCI 1110G.
Learning Outcomes
1. Refine and demonstrate students' sociological imaginations.
2. Engage in critical self-reflection by practicing sociological mindfulness on a regular basis.
3. Have the opportunity to apply sociological concepts to a real-world setting.
4. Have the opportunity to critically apply and evaluate the utility of select social theories to a real-world setting.
5. Refine critical writing and thinking skills through class discussions.

SOCI 5110. Perspectives on Sociology
3 Credits (3)
Overview of Sociology and development of students' sociological imaginations. Understanding the place of sociology in career development and the application of Sociology and sociological concepts to the real world. May be repeated up to 3 credits.
Learning Outcomes
1. Refine students' sociological imaginations.
2. Engage in critical self-reflection by practicing sociological mindfulness on a regular basis.
3. Have the opportunity to apply sociological concepts to the real world.
4. Explore how students can utilize sociology in achieving their career goals.
5. Refine students' critical writing and thinking skills through class discussions.

SOCI 5150. Seminar in Social Networks
3 Credits (3)
Advanced introduction to social network methods. First half of the course focuses on understanding the structure of social networks. Second half of the course involves examining real-world social networks ranging from romantic relationships to political parties. Includes hands-on experience with the R statistical computing environment
Learning Outcomes
1. Finish the course with the ability to interpret, question, and discuss network science theories and methods.
2. Understand which type of network method is appropriate for different kinds of research questions.
3. Finish the course with basic programming and network analysis skills in the R statistical computing environment.

SOCI 5153. Seminar in Sociological Research
3 Credits (3)
Exploration of research methods, issues, and practical application. Students must be in graduate standing.
Learning Outcomes
1. Develop the ability to use terms and concepts employed in quantitative social science research methodologies.
2. Understand and critically assess findings published in academic journals and in the public sphere based on your knowledge of research design, for example, the fit of methods, data, and argument.
3. Finish the course with the ability to plan and carry out quantitative research projects on topics relevant to a variety of academic disciplines.

SOCI 5155. Seminar in Text Analysis for the Social Sciences
3 Credits (3)
Advanced exploration into some of the methods that social scientists use to analyze digital and social media. Focus is on developing the fundamentals for designing and conducting text analysis projects. Includes hands-on experience with the R statistical computing environment.
Learning Outcomes
1. Finish the course with the ability to interpret, question, and discuss text analysis methods accurately.
2. Understand which type of text analysis method is appropriate for different kinds of research questions.
3. Finish the course with basic programming and data analysis skills in the R statistical computing environment.

SOCI 5157. Seminar in Qualitative Research Methods
3 Credits (3)
This course provides an in-depth examination of qualitative research methods, including the logic, time, and purpose of using such methods. Students must be in Graduate standing.

SOCI 5158. Seminar in Visual Ethnographic Methodology
3 Credits (3)
This course focuses on the potential and the qualities of visual data collection in research and will start with a review of the diversity of research strategies and ethics that incorporate visual data. We will discuss different ways of using visual methods in research alongside epistemological theory of understanding what it means to look at the world. We will use our own experiences of looking and feeling to consider what visual methods can contribute to effective ethnographic research. Students must be graduate students to enroll.
Learning Outcomes
1. Learn the basic fundaments of visual qualitative inquiry.
2. Learn the concept of ethics and reflexivity in qualitative research.
3. Learn how to design visual qualitative research.
4. Understand the different methods used in visual qualitative research.
5. Select and use appropriate visual qualitative methods to answer research questions.

SOCI 5160. Seminar in Data Visualization
3 Credits (3)
Advanced exploration into how to communicate sociological findings using graphics. Emphasis is on finding meaningful trends in real-world social science data and creating graphics that best communicate those associations or trends. Includes hands-on experience with the R statistical computing environment, especially the ggplot2 package.
Learning Outcomes
1. Finish the course with the ability to create, interrogate, and interpret data visualization.
2. Understand which type of graphic is appropriate for different kinds of social science data.
3. Finish the course with basic programming and data visualization skills in the R statistical computing environment, especially with the ggplot2 package.

SOCI 5163. Issues in Advanced Quantitative Analysis
3 Credits (3)
Advanced methods of sociological analysis are examined in detail. May be repeated up to 3 credits.
Learning Outcomes
1. Finish the course with the ability to interpret, question, and discuss social statistics and their applications.
2. Understand which type of statistical method/analysis is appropriate for different kinds of research questions.
3. Finish the course with basic programming and data analysis skills in a statistical computing environment.

SOCI 5165. Foundations of Social Theory
3 Credits (3)
Analysis of classical social thought within the discipline. Restricted to: Sociology majors. May be repeated up to 3 credits.
Learning Outcomes
1. Know and have an understanding of the history of social thought in Sociology.
2. Know and have an understanding of the fundamental underlying assumptions of many social theories.
3. Be able to effectively write showing an understanding of the theorists/theories as they apply to social phenomena.
4. Be able to openly discuss with confidence the various tenets of social theory.

SOCI 5166. Seminar in Contemporary Theory
3 Credits (3)
This course equips students with the ability to critically analyze contemporary social theory (post World War II) with a particular focus on how these texts apply theoretical frameworks to pressing issues of our time.
Learning Outcomes
1. Understand the main conceptual and theoretical frameworks that have influenced social research post World War II.
2. Improve critical thinking through cross-cultural and cross-disciplinary analyses of social forces.
3. Identify one's own work and interests within/and in relation to these perspectives.
4. Comprehend and evaluate sociology as a discipline that has been shaped by diverse sets of social phenomena.

SOCI 5170. Seminar in Individual and Society
3 Credits (3)
Examines reciprocal relationship between individual and society. Topics include socialization, social influence and persuasion, group structure and performance, altruism, aggression, interpersonal attraction, group cohesion and conformity, and intergroup conflict. May be repeated up to 3 credits.
Learning Outcomes
1. Know and understand the theoretical antecedents for Social Psychology.
2. Know and understand the fundamental underlying assumptions of Social Psychology approaches in Sociology.
3. Know and understand the history and development of Social Psychological Theories.
4. Be able to effectively write a literature review addressing specific topics utilizing Social Psychology as an underlying framework.
5. Understand the relationship between the individual and society, particularly addressing the relationship between structure and agency.

SOCI 5175. Seminar in Symbolic Interaction
3 Credits (3)
This seminar will provide you a backdrop on Symbolic Interactionism, focusing on the direct and indirect antecedents of the theory, as well as current research and theoretical development up to the present. May be repeated up to 3 credits.
Learning Outcomes
1. Know and understand the theoretical antecedents for Symbolic Interaction.
2. Know and understand the fundamental underlying assumptions of Symbolic Interaction.
3. Know and understand the history and development of Symbolic Interaction.
4. Be able to effectively write a literature review addressing specific topics utilizing Symbolic Interaction as an underlying framework.
5. Be able to openly discuss the various tenets of Symbolic Interaction with confidence.

SOCI 5270. Seminar in Sex and Gender
3 Credits (3)
Comprehensive examination of current gender identity and gender stratification issues. May be repeated up to 3 credits.

Learning Outcomes

1. Gain an understanding of gender from a sociological perspective.
2. Critically examine how gender shapes and is shaped by personal interaction and meaning and how it is embedded in the structure of our social institutions.
3. Understand the relationship between gender, the body, media and violence.
4. Gain competence in discussing the biological and psychological explanations of gender differences as well as in discussing cultural and gender socialization and identity formation.
5. Examine how gender is relevant within the institutions of family, work, and education with particular focus on how gender is linked to inequality.

SOCI 5310. Seminar in Community Development
3 Credits (3)

This is in an advanced seminar addressing a holistic view of community development with an emphasis upon how economic development efforts can become more inclusive and sustainable. Students must be in a graduate student to enroll. May be repeated up to 3 credits.

Learning Outcomes

1. Define community development.
2. Apply the different theoretical approaches to community development to an issue.
3. Identify the major challenges confronting various communities today.
4. Understand emerging and radical community development initiatives in both theory and practice.

SOCI 5315. Seminar in Public Sociology
3 Credits (3)

This course examines both the theory and practice of public sociology. The course begins by examining the theoretical aspects, challenges, and critiques informing public sociology. After setting these foundations the remainder of the course examines different ways of applying public sociology, whether in the K-12 classroom, through community engagement activities such as nonprofit work, or other endeavors that seek to make the world a better place.

Learning Outcomes

1. Understand the theoretical foundations and debates within public sociology
2. Understand various ways public sociology can be practiced outside academia

SOCI 5317. Seminar in Social Transformation
3 Credits (3)

This is in an advanced seminar addressing various components of social change. The primary intention of this course is to help students better understand how the United States, and the world, has changed and continues to change. The course begins by examining how social change influences one's personal life, then focuses upon how social change influences inequalities in the United States. The course concludes by examining how individuals can engage in creating social change.

Learning Outcomes

1. Identify how social change has influenced, and continues to influence, their personal lives.
2. Identify the causes and patterns of social change.
3. Identify how different sociological theoretical paradigms and theories explain different facets of social change.
4. Apply these various theoretical perspectives learned to various types of social change.

SOCI 5320. Seminar in Social Movements and Activism
3 Credits (3)

An advanced exploration of the key concepts of collective behavior and social movements as they apply to both historical and contemporary trends and movements. We examine also social movement tactics and their effectiveness in shaping policy and social norms. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate comprehensive understanding of social movement theory and how it applies to particular cases.
2. Identify and analyze how social movements emerge and the conditions that their success depends on.
3. Analyze the role that movements play in transitions to and consolidations of democracy.
4. Critically examine how: a) State repression incites or threatens the development of movements, and b) which strategies movements use for communicating with the larger society.
5. Exhibit scholarly professionalization by successfully developing, conducting and presenting a research project.
6. Demonstrate in-depth knowledge of a specific social movement and its relations to broader questions of social, economic, political, and cultural transformations.

SOCI 5325. Seminar in Digital Media and Activism
3 Credits (3)

This seminar will investigate the interaction between digital media, social movements, and social change.

Learning Outcomes

1. Demonstrate comprehensive understanding of the most relevant theories of social movements and how these have been affected by the new digital media ecology.
2. Critically examine how the specific qualities and attributes of digital media contribute to the operation, growth, and success of contemporary social movements and activism around the world.
3. Place the relationship between social movements and new media in context – what is interesting about these "new" technologies?
4. Exhibit scholarly professionalization by successfully developing, conducting and presenting a research project.
5. Demonstrate in-depth knowledge of a central and contemporary social movement and its use of social media to further its goals.

SOCI 5335. Seminar Environmental Sociology
3 Credits (3)

Advanced examination of societal responses to environmental problems including social adjustments to natural and technological hazards, sociocultural aspects of technological risk and impact assessment, and emergence of environmental social movements. May be repeated up to 3 credits.

SOCI 5337. Seminar in Human Society and the Environment
3 Credits (3)

This is an advanced seminar exploring the relationship between human societies and the natural environment, with an emphasis on both sustainable human and environmental relationships. May be repeated up to 3 credits.

Prerequisite: Graduate Student Status.

SOCI 5410. Seminar in Race and Ethnic Relations
3 Credits (3)

In-depth analysis of the dynamics of prejudice/discrimination and patterns of intergroup interaction in the U.S. May be repeated up to 3 credits.

Learning Outcomes

1. Identify a diverse set of critical sociological approaches to studying race, ethnicity, and racism within the United States.
2. Understand the social construction of race, racialized modernity, and the unequal distribution of racialized power and privilege in local, regional, national, and transnational contexts.
3. Examine the racialized structures of US society and give special consideration to how processes, discourses, and structures of white supremacy and racialization intersect with other systems of inequality, particularly gender, class, sexuality, nation, and settler colonialism.

SOCI 5415. Seminar in Social Stratification
3 Credits (3)

Advanced examination of theories of stratification and current methods of stratification research. Focus on differences by ethnicity, race, class and gender. May be repeated up to 3 credits.

Learning Outcomes

1. Gain an appreciation of the role of stratification as a powerful determinant of the opportunities that individuals experience in modern societies.
2. Critically consider the functions and repercussions of stratification for the individual and society.

SOCI 5420. Seminar in Sociology of Latinos/as in the United States
3 Credits (3)

In-depth examination and comparative analysis of political and economic issues affecting Latino/a culture and behavior. Topics include the Chicano/a and larger Latina/o movements, the border, immigration, language policies, education, religion, labor and Latina women s issues. May be repeated up to 3 credits.

Learning Outcomes

1. Examine the challenges currently facing the Latino population in the U.S. with special attention to three Latino subgroups: Puerto Ricans, Mexican-Americans, and Cubans.
2. Identify that latina/o experiences and identities are far from homogenous.
3. Understand how then has a sense of “Latino community” been created if this is the case? What is a Latina/o? And, how are individual identities among the many Latina/o identities shaped by difference?
4. Know the major Latino peoples, their immigration, migration and settlement patterns, identity formation, socioeconomic and labor conditions, politics, gender relations, and bilingualism.

SOCI 5430. Seminar in International Migration
3 Credits (3)

This course examines international migration as a social process, focusing on the American experience. Students will examine historical and comparative literature on immigration that puts contemporary questions about policy and immigrant assimilation into a broader sociological perspective. Students must be Graduate students to enroll. May be repeated up to 3 credits.

Learning Outcomes

1. Acquire in-depth knowledge, and develop a broad understanding of the historical and theoretical development, of the sociological sub-field of immigration.
2. Develop an ability to examine the processes involved in international migration, and the socioeconomic trajectories of different immigrant groups in the United States, analytically, critically, and comparatively.
3. Develop an understanding of how various social constructs (such as national origin, nativity, generation, length of time spent in the United States, citizenship, legal status, class, race, ethnicity, gender, and religion) influence immigrants’ social positions and organize their daily lives.

SOCI 5440. Seminar in Sociological Perspectives on the U.S.-Mexico Border
3 Credits (3)

Theoretical perspectives and current research on U.S.-Mexico border region, including migration, identity, health, gender, and environment. May be repeated up to 3 credits.

Learning Outcomes

1. Use history, sociology, geography, anthropology, and other disciplines as a framework for understanding the border and analyzing border lives and structural dynamics.
2. Understand border identities, including nationality, ethnicity, and class, and apply them to analyzing border lives.
3. Understand border orientations (nationalist/binationalist; unicultural/bicultural) and apply them to analyzing border lives.
4. Recognize and analyze multiple, often conflicting, perspectives on border issues.
5. Apply the "multiple perspective" approach to U.S.-Mexico migration and know objective facts, humanistic understandings, and policy options for that issue.
6. Use the tools of "culture" and "social structure" to understand border working people, especially those facing poverty, low wages, low or no benefits, and discrimination in public.
7. Use comparisons to other borders to understand two important topics: (a) Border symbols and politics; (b)Border consumption, commerce, smuggling, and other cross-border transactions.

SOCI 5450. Seminar in Power and Politics in the United States
3 Credits (3)

This is an advanced seminar addressing the study of Political Sociology with a focus on the United States. Political Sociology studies the social bases of politics and political systems. it facilitates an understanding of the processes and consequences of power distributions in the United States. Students must be Graduate students to enroll. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate comprehensive understanding of the most relevant theories of political sociology and how these apply to current political issues of the United States.
2. Critically examine the role that civil society plays in shaping contemporary political processes in the United States.
3. Critically examine the role that civil society plays in shaping contemporary political processes in the United States.
4. Exhibit scholarly professionalization by successfully developing, conducting and presenting a research project.
5. Demonstrate in-depth knowledge of a central and contemporary political issue and its relations to broader questions of social, economic and cultural transformations in America.

SOCI 5455. Seminar in Inequality and Public Policy
3 Credits (3)

This course explores the reciprocal relationship between inequality and public policy, with a particular focus on poverty and anti-poverty policy in the contemporary United States.

Learning Outcomes

1. Understand and compare different ways in which poverty has been historically measured and understood.
2. Understand and apply various types of social inequality.
3. Critically read and evaluate empirical research measuring, and policy proposals addressing, poverty and inequality.
4. Write your own policy evaluation including empirically grounded policy recommendations.
5. More effectively participate in policy debates regarding inequality and poverty.

SOCI 5460. Advanced Issues in Globalization
3 Credits (3)
Analysis of the globalization process. Covers theories of globalization; global economy; political globalization; global culture; transnational social movements; transnational migration and world labor market; global cities; local-global linkages. Same as POLS 569. May be repeated up to 3 credits.

SOCI 5510. Issues in Social Deviance
3 Credits (3)
Selected forms of deviant behavior, social issues, and social problems. May be repeated up to 3 credits.

SOCI 5515. Sociology of Organizations
3 Credits (3)
Sociological models of formal organizations relevant to business, education, government, healthcare, military, and religion. Focus on internal organizational structure and dynamics plus the reciprocal relationship between organizations and their operating environment. May be repeated up to 3 credits.

SOCI 5555. Advanced Sociology of Education
3 Credits (3)
Socio-political and economic factors that shape the structure and operation of educational institutions in modern complex societies. Socio-historical development of the school as a microcosm of society, with examples from American and other school systems. May be repeated up to 3 credits.

SOCI 5610. Seminar in Popular Culture
3 Credits (3)
This course delves into Popular Culture and how Sociologists define and evaluate Popular Culture in the world today. Students will learn about diverse forms of Popular Culture, their meanings, and how social theory is applied to how Popular Culture is commodified and consumed. Students must be a graduate student to enroll.

Learning Outcomes

1. Explain and show an advanced understanding of the relationship of popular to culture.
2. Have an in-depth knowledge of Critical Theory as it applies to the culture industry.
3. Understand the relationship of the individual and social issues to both popular culture and technologically driven cultural changes.
4. Apply critical thinking about the popular culture experienced in your day-to-day existence and its meaning to everyday life.
5. Read empirical and theoretical writings, summarize and expand upon their core ideas.
6. Be able to discuss as well as compare and contrast various issues associated with popular culture.

SOCI 5630. Seminar in Culture and Social Life
3 Credits (3)
What exactly does culture look like, and how precisely does it shape---and is shaped by---social behavior? These are the core questions in the sociology of culture and will be the focus of this course. The course begins with an overview of the various ways that culture has been defined in sociological theory and research. The course will then focus on various topics within the contemporary sociology of culture, including, but not limited to, culture and cognition, the production of culture, culture and politics, and culture and inequality.

Learning Outcomes

1. Finish the course with an understanding of the different ways that culture is defined in sociological research.
2. Understand the various ways that culture affects social behavior and how social behavior shapes and changes culture.
3. Finish the course with a sociological imagination that is expanded to included cultural theory.
4. Finish the course with the ability to formulate research projects that involve cultural theories.

SOCI 5640. Seminar in Sociology of Digital Media
3 Credits (3)
This course explores how the social, political-economic, and cultural landscape is changing in relation to digital media and information technologies. Seminar participants work together to explore frameworks, methods, and tools for understanding networked society in the digital media ecology.

Learning Outcomes

1. Develop analytical tools for understanding the complex information society.
2. Examine how the cultural, political, and social environments are changing with the emergence of new media and digital technologies.
3. Place the relationship between society and new media in context – what is interesting about these “new” technologies?
4. Exhibit scholarly professionalization by successfully developing, conducting and presenting a final project.
5. Demonstrate in-depth knowledge of a central and contemporary issue within the study of social media from a sociological perspective.

SOCI 5991. Special Research Problems
1-3 Credits (1-3)
Individual analytic or experimental investigations. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

SOCI 5996. Graduate Special Topics
3 Credits (3)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 99 credits.

Learning Outcomes

1. Varies

SOCI 5998. Internship
1-6 Credits (1-6)
Supervised participation in appropriate occupational setting. Taught with SOCI 4998 with additional work required at the graduate level. May be repeated up to 12 credits.

Learning Outcomes
1. Various

SOCI 5999. Master's Thesis
1-6 Credits (1-6)
Thesis. Consent of instructor required. Restricted to Sociology majors. May be repeated up to 88 credits.
Learning Outcomes
1. Various

SOCI 6998. Dissertation Research Design in CSS
3 Credits (3)
Design and development of dissertation research project proposal drafts individually and/or in direct collaboration with advisors, peers, and/or community partners.
Learning Outcomes
1. Describe and articulate the topic and questions for the dissertation research proposal.
2. Describe and articulate the methodology and data analysis plan for the dissertation research proposal.
3. Write a completed draft of the dissertation research proposal.
4. Develop a complete draft of the dissertation proposal oral defense slide deck.
5. Prepare for the written and oral comprehensive examination.

SOCI 7000. Dissertation
1-15 Credits
Completion of major research project on a significant aspect that demonstrates expertise in computational social science. Dissemination of findings in academic and community forums. Students must have approval from their doctoral committee to enroll. Students must have completed 36 credits in the Computational Social Science PhD Program and have approval from their doctoral committee to enroll. May be repeated up to 36 credits.
Prerequisite: SOCI 5110, SOCI5150, SOCI5155, SOCI 5166, SOCI 5163, SOCI 6998 and either CS 453 or CS 458 with a grade of B- or better.
Learning Outcomes
1. Completion of a significant and in-depth research project in an area that demonstrates expertise in computational social science.
2. Presentation of findings in academic conferences.
3. Preparation of publishable work from the dissertation research.
4. Dissemination of findings in alternative formats for community partners and the general public.

SOIL-SOIL

SOIL 2110. Introduction to Soil Science
3 Credits (3)
An overview of fundamental concepts in soil science and soils as a natural resource. Students will be introduced to the physical, chemical, and biological properties as it relates to soil management in environmental science, conservation, and agronomy. May be repeated up to 3 credits.
Prerequisite: (CHEM 1120G and MATH 1215 or higher) or CHEM 1215G.
Learning Outcomes
1. Understand and use the technical terminology associated with the use and management of soils.
2. Understand the classification of soils and the processes leading to their formation.
3. Identify key physical, chemical, and biological properties of soils.
4. Explain the impact of land use and management decisions as it relates to soil degradation and environmental problems.

SOIL 2110L. Introduction to Soil Science Laboratory
1 Credit (1)
Morphological, chemical, physical and biological properties of soil in the laboratory and field.
Corequisite(s): SOIL 2110.
Learning Outcomes
1. Learn techniques for sampling and characterizing soils in the region.
2. Understand how soils are formed and the processes that occur within the soil profile.
3. Gain fundamental knowledge on soil physical, chemical, and biological properties and how each can influence the overall function of a particular soil.
4. Develop critical thinking and analytical skills within laboratory and field settings.
5. Encourage collaboration, inclusiveness and critical thinking.

SOIL 2996. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required.
Learning Outcomes
1. Varies

SOIL 300. Special Topics
1-4 Credits
Specific subjects and credits announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree. May be repeated up to 9 credits. Consent of Instructor required. Restricted to Las Cruces campus only.

SOIL 312. Soil Management and Fertility
3 Credits (3)
Management, conservation, and fertility of soils; physical conditions affecting growth, nutrition, and plant production.
Prerequisite: SOIL 2110.
Corequisite: SOIL 312L.
Learning Outcomes
1. Explain the elements affecting soil productivity.
2. Determine what factors influence fertilizer use and needs.
3. Identify factors affecting soil pH and summarize materials used for pH modification.
4. Recognize typical nutrient deficiency symptoms and their general location on the plant.
5. Calculate soil amendment amounts needed for field applications.

SOIL 312 L. Soil Management and Fertility Lab
1 Credit (1)
Hands-on experience. Includes field trips, videos, calculations, visiting lecturers and other lab activities as possible.
Prerequisite: SOIL 2110.
Corequisite: SOIL 312.
Learning Outcomes
1. Use proper procedures to collect soil samples and prepare them for analyses including documentation, pretreatment, and storage.
2. Extract various nutrients from soil and interpret/convey the results in written reports.
3. Explain the difference between total and plant-available nutrients.

4. Observe lab analytical procedures and field practices common in soil fertility and management.
5. Calculate the amounts of nutrients in soil samples and convert to field scale.

SOIL 370. Environmental Soil Science
3 Credits (3)
Continuation of SOIL 2110 that emphasizes soil properties and processes that directly relate to environmental pollution problems. Same as ENVS 370.
Prerequisite: SOIL 2110.

SOIL 391. Internship
1-6 Credits (1-6)
Professional work experience under the joint supervision of the employer and a faculty member. A written report is required. No more than 6 credits toward a degree. Consent of Instructor required. Graded: S/U Grading (S/U, Audit).

SOIL 424. Soil Chemistry
3 Credits (3)
Basic elements of soil chemistry including clay mineralogy, cation and anion exchange and the chemistry of problem (acid, saline and flooded) soils. Credit not given for both SOIL 424 and SOIL 479.
Prerequisite: SOIL 2110L or CHEM 1215G and CHEM 1225G.
Learning Outcomes
1. Explain the solid and liquid phases of soil.
2. Describe the chemical reactions and processes that occur between various soil phases.
3. Describe the techniques used to promote plant productivity and land remediation.
4. Calculate nutrient and contaminant concentrations in soil samples and convert to field scale.
5. Calculate soil chemical properties including CEC, pH, EC, SAR, nitrate, and convert them between old and new units.

SOIL 447. Seminar
1 Credit (1)
Organization, preparation, and presentation of current topics in agronomy, environmental sciences, horticulture, and soil science. Crosslisted with: AGRO 447, HORT 447 and ENVS 447.
Learning Outcomes
1. Develop professional communication skills through teamwork, case study preparation and presentation, data interpretation, and role-playing in mock interviews.
2. Prepare a professional resume, personal statement of goals for graduate school or permanent employment and make a Case Study presentation to faculty and peers.

SOIL 449. Special Problems
1-3 Credits
Research problem, experience training, or other special study approved by a faculty adviser. Maximum of 3 credits per semester and a grand total of 6 credits. May be repeated up to 6 credits. Consent of Instructor required.

SOIL 450. Special Topics
1-4 Credits
Specific subjects to be announced in the Schedule of Classes. Maximum of 4 credits per semester and a total of 9 credits towards a degree. May be repeated up to 9 credits. Consent of Instructor required.

SOIL 456. Irrigation and Drainage
3 Credits (3)
Principles and practices required for irrigation to exist as a permanent economy. Equipment and methods for measurement and control of water.

SOIL 472. Soil Morphology and Classification
4 Credits (2+2P)
Same as SOIL 472. Crosslisted with: SOIL 472.
Learning Outcomes
1. Describe soil profile morphology at a competitive level.
2. Understand the processes that drive soil formation and use this knowledge to identify common landforms.
3. Classify soils using Soil Taxonomy.
4. Interpret available soil mapping products to infer soil use and management conditions.

SOIL 476. Soil Microbiology
3 Credits (3)
Nature and physiology of soil microorganisms, how they affect plant growth and recycle nutrients. Land farming, bioremediation and other environmental problems as influenced by soil microorganisms. SOIL 2110 and BIOL 311 recommended. Same as BIOL 476.
Learning Outcomes
1. Explain foundational concepts of the soil environment and soil microbiology, including the soil habitat, the rhizosphere, microbial taxonomy, and microbial cell structure and function.
2. Analyze the diversity, physiology, and ecological functions of soil microorganisms—such as bacteria, archaea, fungi, micro-algae, and micro-fauna—and evaluate their interactions with plants and the soil environment.
3. Apply core soil microbiological techniques—including culturing, inoculation, microscopy, and DNA sequencing—to isolate, identify, and characterize soil microorganisms.
4. Evaluate real-world applications of soil microbiology in areas such as organic matter decomposition, nutrient cycling, integrated disease management, bioremediation, and wastewater treatment.
5. Effectively Communicate evidence-based strategies for enhancing soil microbial diversity and soil health through practices like soil amendments, cover cropping, crop rotation, and conservation tillage.

SOIL 476 L. Soil Microbiology Laboratory
1 Credit (3P)
Enumeration of soil microorganisms, their activities, and transformations they mediate. May be repeated up to 1 credit.
Corequisite: SOIL 476.
Learning Outcomes
1. Collect, store, and characterize soil samples using appropriate and sterile techniques of soil microbiology.
2. Observe, describe, and recognize major groups of microbial organisms
3. Develop skills in basic microscopy, isolation and culturing of soil microbes
4. Acquire basic DNA-based molecular skills in soil microbiology.
5. Compare and evaluate soil samples from different microhabitats regarding their soil microbiota.
6. Apply the scientific method including the following steps: developing a research question, constructing a testable hypothesis, design a research study to test the hypothesis, perform the experiment and collect data, analyze the results, evaluate the results and support/reject the hypothesis, and report the results.

SOIL 477. Environmental Soil Physics
3 Credits (3)

A description of the physical characteristics of porous media including soil. Examination of processes describing the transport of water, chemicals, heat and gases through porous media with application to environmental quality, waste management, and crop production.

SOIL 477 L. Environmental Soil Physics Laboratory
1 Credit (1)
Concurrent enrollment with SOIL 477 recommended. Hands on experience with techniques for characterizing soil physical properties such as particle size distribution, bulk density, water retention, hydraulic conductivity and solute transport. Demonstrations of field and laboratory techniques for measuring moisture content, soil water potential, gas/air flow and thermal conductivity.
Prerequisite(s): SOIL 2110.

SOIL 479. Environmental Soil Chemistry
3 Credits (3)
Basic elements of soil chemistry including discussion of clay mineralogy, cation and anion exchange and the chemistry of problem (acid, saline and flooded) soils. Credit not given for both SOIL 424 and SOIL 479.
Prerequisite: SOIL 2110L or CHEM 1215G and CHEM 1225G.
Learning Outcomes
1. Describe and explain the solid and liquid phases of soil.
2. Explain the chemical reactions and processes that occur between soil phases.
3. Use soil chemistry processes and properties to promote plant productivity and land remediation.
4. Calculate nutrient and contaminant concentrations in soil samples and convert to field scale.
5. Calculate soil chemical properties including CEC, pH, EC, SAR, nitrate, and convert them between old and new units.

SOIL 500. Special Topics
1-4 Credits
Specific subjects and credits to be announced in the Schedule of Classes. Maximum of 4 credits per semester. No more than 9 credits toward a degree.

SOIL 505. Research Orientation
4 Credits (3+2P)
Training in writing research proposals, presentation of research results, and interpretation of research results. Crosslisted with: HORT 505, AGRO 505 and ENVS 505.
Learning Outcomes
1. Gain insight into the nature of scientific research and skills vital for graduate research and future careers in science.
2. Navigate graduate school processes and protocols.
3. Demonstrate critical thinking.
4. Generate a scientific hypothesis.
5. Communicate science effectively in written and oral formats, including drafting a proposal for thesis or dissertation research.

SOIL 513. Introduction to Scientific Writing
3 Credits (3)
Students will learn how to communicate, through written format, to both the scientific community and diverse audiences. Students will be introduced to new technologies and new genres of scientific writing. Students will also learn basic reviewing and writing skills that underlie efficient preparation of literature reviews, scientific manuscripts, project reports, blog-posts, opinion or perspective pieces for more popular venues, advocacy articles for legislators, and descriptive pieces for popular venues such as newspapers, magazines, and broadcast media. Emphasis will be on the communication of experimental findings in peer-reviewed scientific journals.
Learning Outcomes
1. Students will review the basics of rhetoric and the technology of language.
2. Students will learn how to overcome writing barriers and gain confidence in their writing skills.
3. Students will improve their writing skills so that manuscript preparation becomes more efficient and productive.
4. Students will learn professional standards for the conduct of ethical reporting of scientific results.
5. Students will learn to recognize structural and stylistic elements in scientific articles that help researchers achieve certain communication goals.
6. Students will learn the basics of table, figure, diagram, and image presentation in manuscripts.
7. Literature reviews, framed so that they answer an important question in the field, and lead to peer-reviewed publication, may also be prepared. (With permission of the instructor.)

SOIL 525. Scientific Writing- How to be a Productive and Effective Writer
1-3 Credits (1-3)
Students will learn to improve their writing skills so that their manuscript preparation process is more efficient and productive. Students will also gain experience in peer-review Crosslisted with: AGRO 525, AGRO 625, HORT 525, HORT 625, SOIL 625 and EPWS 525.

SOIL 590. Graduate Seminar
1 Credit (1)
Current research discussions presented by master level graduate students. Not more than one credit toward the degree. Same as AGRO/HORT 590. Crosslisted with: AGRO 590 and HORT 590.

SOIL 596. Masters Proposal
1 Credit (1)
Current research proposal written by masters level graduate students. Consent of Instructor required. Crosslisted with: AGRO 596, ENVS 596, GENE 596 and HORT 596. Students must be a Master level graduate student to enroll in this course. Restricted to: Masters HORT; Masters PLEN majors.

SOIL 597. University Teaching Experience
1-3 Credits (1-3)
Certain graduate students will be permitted to teach up to one-third of one AGRO/HORT/SOIL/ENVS course. The student will prepare and deliver lectures and will prepare, administer, and grade at least one examination. The professor in charge of the course will attend and evaluate the student's lectures.

SOIL 598. Special Research Programs
1-6 Credits
Individual investigations, either analytical or experimental. Maximum of 6 credits per semester. No more than 9 credits toward a degree.

SOWK-SOCIAL WORK

SOWK 2110G. Introduction to Human Services & Social Work
3 Credits (3)
This course is for students who are interested in social welfare issues and/or are considering entering a social service profession. The course presents an overview of social problems, issues and trends, and the network of social agencies developed to address these concerns. The course examines the influence of personal and professional values and

ethics on the helping relationship. The concept of social welfare will be discussed from a social work perspective (with an emphasis on social justice), and students will gain a basic understanding of social work in U.S. society, social work career opportunities, and contemporary issues facing social workers. Approaches relevant to work with individuals, families, groups and communities are presented, with special emphasis on Hispanic and Indigenous populations of New Mexico and the Southwest. May be repeated up to 3 credits.

Learning Outcomes

1. Explain the interactions of social institutions, cultural factors, dimensions of identity, and environment with the human development and behavior of individuals.
2. Demonstrate knowledge of the social work profession's focus on addressing contemporary social issues in the United States.
3. Describe the mission and services provided by social service agencies at the regional, national, and global levels.
4. Demonstrate a basic understanding of the social work profession, its history, career opportunities, and contemporary issues facing social workers in the United States today.
5. Recognize how students' knowledge, skills, and attitudes impact their competence as helping professionals.

SOWK 3110. Sociocultural Concepts
3 Credits (3)

Theoretical and sociohistorical perspectives on racism, sexism, ageism, heterosexism, classism, ableism, and other forms of discrimination and oppression. Cultural diversity, strengths, and Southwest and border issues are examined. May be repeated up to 3 credits.

Learning Outcomes

1. Examine the role culture, gender, sexual orientation, and socio-economic class play in the way people think, feel, and behave.
2. Examine how diverse populations have been oppressed and exploited by dominant groups throughout U.S. history.
3. Analyze the effects of stereotypes, fallacies, and misconceptions about groups that experience oppression such as the LGBTQIA2S + community, the Elderly, People with Disabilities, BIPOC and people from low socio economic backgrounds and other socially marginalized groups.
4. Recognize theoretical models that describe various forms of discrimination, oppression, privilege and power.
5. Be familiar with relevant knowledge regarding the Southwest, border issues, Native American and Latinx/Chicanx/Hispanic content.
6. Recognize and implement anti racist, anti oppressive, and practice decolonization/indigenization and cultural humility in social work practice and social justice.

SOWK 3120. Human Behavior and the Social Environment I
3 Credits (3)

Major theories of human behavior and the life span from conception to adolescence.

Learning Outcomes

1. Students demonstrate knowledge of human development, diversity, and identity formation.
2. Students will explain how racism and oppression impact human behavior and the social environment.
3. Students will examine environmental systems (families, groups, organizations, and communities) and the complex interplay of biological, psychological, social, spiritual, and cultural dimensions that impact the social work engagement process.
4. Students will assess developmental theories to assess the complex interplay of biological, psychological, social, spiritual, and cultural.
5. Students will apply knowledge of major theories of infancy, childhood, and adolescent development to social work interventions.

SOWK 3130. Human Behavior and the Social Environment II
3 Credits (3)

Continuation of SOWK 3120. Major theories of human behavior and the life span from young adulthood through old age. Restricted to: S WK majors.

Prerequisite: SOWK 3120.

Learning Outcomes

1. Assess human behavior and the environment at the micro, mezzo, and macro levels to understand clients needs.
2. Critique the major theories of human behavior and development processes in the social environment.
3. Apply knowledge of major theories of human behavior and development processes in the social environment.
4. Demonstrate cultural sensitivity and humility for human diversity in micro, mezzo, and macro practice.
5. Apply knowledge of biological, psychological, and sociological aspects of human development and the social environment.

SOWK 3140V. Introduction to Social Policy: History
3 Credits (3)

Historical overview of the economic, political, and cultural impact on social welfare policy, institutions, and professions with international content. May be repeated up to 3 credits.

Learning Outcomes

1. Students will use reflection and self- regulation to manage personal values as they engage in discussion and written reflection around underlying values in social welfare.
2. Students will apply and communicate understanding of the importance of diversity and difference in shaping life experiences in practice at the macro level through written reflection.
3. Students will apply self-awareness and self-regulation to manage the influence of personal biases and values in working with diverse clients and constituencies through self-reflective discussions.
4. Students will apply their understanding of social, economic, and environmental justice to analyze social policy and advocate for just policies.
5. Through policy analysis and review of policy research, students will Identify social policy at the local, state, and federal level that impacts well-being, service delivery, and access to social services; assess how social welfare and economic policies impact the delivery of and access to social services, and apply critical thinking to analyze, formulate, and advocate for policies that advance human rights and social, economic, and environmental justice.

SOWK 3150. Social Work Research
3 Credits (3)

This undergraduate course is designed to prepare students to be effective consumers of research and to evaluate their own practice. Students will learn to read, critically evaluate and use the research of others to select interventions that are based on evidence of effectiveness. Students will demonstrate the knowledge, values and skills to be critical consumers of research for effective and ethical practice as well as possess the basic skills necessary to evaluate their own social work professional practice. Restricted to Social Work majors.

Prerequisite: MATH 1350G or STAT 2350G.

Learning Outcomes

1. Demonstrate a) understanding of core principles or scientific research and b) methods of analyzing and applying scientific research in social work practice.
2. Demonstrate and apply the integration of social work values and ethics within application of research principles and practices.

SOWK 3210. Social Work Practice Skills
3 Credits (3)
Introduction to generalist social work practice. Interpersonal skills, values, and ethics required in the helping relationship. Taught in a small-group format. Restricted to: S WK majors.
Learning Outcomes

1. Students will explain the role of ethics, values, and principles in generalist social work practice.
2. Students will demonstrate promotion of human rights and social justice in the generalist social work context.
3. Students will demonstrate social work skills of engagement.
4. Students will demonstrate social work skills of assessment with clients.
5. Students will demonstrate social work skills of intervention with clients.
6. Students will demonstrate social work skills of evaluation of practice with clients.

SOWK 3220. Social Work Practice with Individuals
3 Credits (3)
Generalist social work practice theory and skills in engagement, information gathering, assessments, planning, interventions, evaluation, and termination with individual client systems. Restricted to: S WK majors.
Prerequisite: SOWK 3210.
Learning Outcomes

1. Apply skills in ethical and professional standards of the NASW Code of Ethics.
2. Exercise social work direct practice skills of engagement (for example, person-in-environment, human behavior, interprofessional conceptual frameworks, and interpersonal skills).
3. Assess the human behavior, environment, and culture of clients and constituents to understand needs.
4. Critically select appropriate interventions to meet client and constituent needs.
5. Evaluate the results of interventions and goals for change.

SOWK 3230. Social Work Practice with Families
3 Credits (3)
Generalist social work practice theory and skills in engagement, information gathering, assessments, planning, interventions, evaluation, and termination with multicultural family systems.
Prerequisite: SOWK 3210.
Learning Outcomes

1. Students will engage in critical reflection around the value base of social work and its ethical standards as they are applied to work with families.
2. Students will describe how personal experiences in their families of origin impact their professional judgement and behavior.
3. Students will explain how engagement is an ongoing component of the dynamic process of social work with families.
4. Students will demonstrate strategies for engagement with diverse families in order to advance practice effectiveness.
5. Students will demonstrate strategies for assessment with diverse families in order to advance practice effectiveness.
6. Students will demonstrate strategies for intervention with diverse families in order to advance practice effectiveness.

SOWK 4110. Social Welfare Policy: Legislation
3 Credits (3)
Policy practice related to the formation of current social welfare policies that promote social and economic justice. Emphasis is on the development and influences of social policy, policy analysis, and the policy change process. Restricted to: S WK majors. May be repeated up to 3 credits.
Learning Outcomes

1. Describe the social policy development and influence process.
2. Apply a framework for the analysis of current and proposed social policy.
3. Identify and discuss current legislation which addresses social and economic justice.
4. Articulate gaps and/or problems in existing social welfare policies and in social welfare programs.
5. Identify strategies which are appropriate to baccalaureate level practice that may influence policymakers on behalf of people in need.

SOWK 4210. Generalist Social Work Practice with Organizations and Communities
3 Credits (3)
This course focuses on generalist social work values, knowledge and skills regarding practice with larger systems. Course content will include theories of community and organizational assessment and intervention. Strategies for advocacy and change, leadership for community and organizational change. May be repeated up to 3 credits.
Learning Outcomes

1. Analyze various macro theories and apply two or more to a particular issue within a local community or organization.
2. Describe the historical context/foundation of macro practice in social work and identify its application in the community.
3. Identify ethical principles related to macro practice.
4. Describe the use of macro level practice in empowering diverse and oppressed populations
5. Describe an evidence-based practice framework for social work intervention with communities and organizations.

SOWK 4220. Generalist Social Work Practice with Groups
3 Credits (3)
Generalist social work practice skills with group client systems focusing on the planned change process and the empowerment of oppressed populations. Restricted to: S WK majors. May be repeated up to 3 credits.
Learning Outcomes

1. Students will compare foundational concepts of group work practice in social work.
2. Students will examine how diversity shapes clients life experiences in group practice at the micro, mezzo, and macro levels.
3. Students will differentiate the group process in social work, including group development, roles, norms, and dynamics.
4. Students will apply generalist social work practice knowledge, values, and skills when engaging diversity and difference in practice with group client systems.
5. Students will demonstrate skills of engagement, planning, intervention, and evaluation with group client systems.

SOWK 4230. Family and Child Welfare Practice
3 Credits (3)
Current issues and interventions in child protection, foster care, family preservation and support, family reunification, adoption and permanency planning. Course required for Child Welfare Scholarship Program students.

Learning Outcomes

1. Self-assess professional strengths and limitations as a helping professional.
2. Critically examine biases and assumptions through reflective practices.
3. Describe child welfare practices and trends.
4. Apply trauma-informed engagement practices with diverse child welfare populations.
5. Conduct trauma-informed and culturally responsive assessment and intervention with diverse child welfare population.

SOWK 4240. Professionalism in the Field of Social Work
3 Credits (3)
Students will use the field experience as the backdrop for assessing their own progress toward entry level generalist social work practice; to integrate coursework and field experience to develop their professional foundation. Restricted to: S WK majors.
Corequisite: SOWK 4321.

Learning Outcomes

1. Demonstrate professional demeanor in behavior; appearance; and oral, written and electronic communication.
2. Use technology ethically and appropriately to facilitate practice outcomes.
3. Use reflection and self-regulation to manage personal values and maintain professionalism in practice situations.
4. Apply and communicate understanding of the importance of diversity and difference in shaping life experiences in practice at the micro, mezzo, and macro levels.
5. Apply self-awareness and self-regulation to manage the influence of personal biases and values in working with diverse clients and constituencies.
6. Apply their understanding of social, economic, and environmental justice to advocate for human rights at the individual and system levels.
7. Use and translate research evidence to inform and improve practice, policy, and service delivery.
8. Identify social policy at the local, state, and federal level that impacts well-being, service delivery, and access to social services.
9. Apply critical thinking to analyze, formulate, and advocate for policies that advance human rights and social, economic, and environmental justice. 1
10. Apply knowledge of human behavior and the social environment, person-in-environment, and other multidisciplinary theoretical frameworks to engage with clients and constituencies. 1
11. Collect and organize data, and apply critical thinking to interpret information from clients and constituencies. 1
12. Critically choose and implement interventions to achieve practice goals and enhance capacities of clients and constituencies. 1
13. Select and use appropriate methods for evaluation of outcomes. 1
14. Apply evaluation findings to improve practice effectiveness at the micro, mezzo and macro levels.

SOWK 4310. Practicum I
3 Credits (3)
Supervised professional practice in a community social service agency, providing experiential learning and instruction. 240 clock hours required. Restricted to: S WK majors.
Corequisite: SOWK 4311.

Learning Outcomes

1. Make ethical decisions by applying the standards of the NASW Code of Ethics, relevant laws and regulations, models for ethical decision-making, ethical conduct of research, and additional codes of ethics as appropriate to context.
2. Use reflection and self-regulation to manage personal values and maintain professionalism in practice situations.
3. Demonstrate professional demeanor in behavior; appearance; and oral, written, and electronic communication.
4. Use technology ethically and appropriately to facilitate practice outcomes.
5. Use supervision and consultation to guide professional judgment and behavior.
6. Apply their understanding of social, economic, and environmental justice to advocate for human rights at the individual and system levels.
7. Engage in practices that advance social, economic, and environmental justice.
8. Apply and communicate understanding of the importance of diversity and difference in shaping life experiences in practice at the micro, mezzo, and macro levels.
9. Apply self-awareness and self- regulation to manage the influence of personal biases and values in working with diverse clients and constituencies. 1
10. Use practice experience and theory to inform scientific inquiry and research. 1
11. Apply critical thinking to engage in analysis of quantitative and qualitative research methods and research findings. 1
12. Use and translate research evidence to inform and improve practice, policy, and service delivery. 1
13. Identify social policy at the local, state, and federal level that impacts well-being, service delivery, and access to social services. 1
14. Assess how social welfare and economic policies impact the delivery of and access to social services. 1
15. Apply critical thinking to analyze, formulate, and advocate for policies that advance human rights and social, economic, and environmental justice. 1
16. Apply knowledge of human behavior and the social environment, person-in- environment, and other multidisciplinary theoretical frameworks to engage with clients and constituencies. 1
17. Use empathy, reflection, and interpersonal skills to effectively engage diverse clients and constituencies. 1
18. Collect and organize data, and apply critical thinking to interpret information from clients and constituencies. 1
19. Apply knowledge of human behavior and the social environment, person-in- environment, and other multidisciplinary theoretical frameworks in the analysis of assessment data from clients and constituencies. 2
20. Critically choose and implement interventions to achieve practice goals and enhance capacities of clients and constituencies. 2

21. Apply knowledge of human behavior and the social environment, person-in- environment, and other multidisciplinary theoretical frameworks in interventions with clients and constituencies. 2
22. Use inter-professional collaboration as appropriate to achieve beneficial practice outcomes. 2
23. Negotiate, mediate, and advocate with and on behalf of diverse clients and constituencies. 2
24. Facilitate effective transitions and endings that advance mutually agreed-on goals. 2
25. Select and use appropriate methods for evaluation of outcomes. 2
26. Apply knowledge of human behavior and the social environment, person-in- environment, and other multidisciplinary theoretical frameworks in the evaluation of outcomes. 2
27. Critically analyze, monitor, and evaluate intervention and program processes and outcomes. 2
28. Apply evaluation findings to improve practice effectiveness at the micro, mezzo, and macro levels.

SOWK 4311. Practicum Seminar I
3 Credits (3)
The practicum seminar course will provide students the opportunities to integrate coursework and field practice experience learning to develop social work competencies. Restricted to: S WK majors.
Corequisite: SOWK 4310.
Learning Outcomes
1. Identify real-world applications of social work competencies.
2. Develop individualized learning goals for your practicum experience that align with the social work competencies.
3. Demonstrate evidence of ethical and professional behaviors in your practicum experience that are aligned with the social work competencies.
4. Reflect on the practice skills of professional social workers in your practicum setting.
5. Valuate the development of your personal practice skills in your practicum setting.

SOWK 4320. Practicum II
3 Credits (3)
This course is a continuation of a supervised professional practice in a community social service agency, providing experiential learning and instruction. 240 clock hours required. Restricted to: S WK majors.
Corequisite: SOWK 4321.
Learning Outcomes
1. Recognize course expectations, practicum requirements and procedures.
2. Recognize social work competencies, and requirements of learning contract goals.
3. Develop learning goals as related to Practicum.
4. Demonstrate Ethical and professional behavior.
5. Critically reflect on their practicum experience.
6. Explain the importance of ethics in social work.
7. Utilize knowledge of culture and background as it relates to documentation and reflection.
8. Articulate how differences in culture impact social work.

SOWK 4321. Practicum Seminar II
3 Credits (3)
The practicum seminar course will provide students the opportunities to integrate coursework and field practice experience learning to demonstrate social work competencies. Restricted to: S WK majors.
Corequisite: SOWK 4320.
Learning Outcomes
1. Make ethical decisions by applying the standards of the National Association of Social Workers Code of Ethics, relevant laws and regulations, models for ethical decision making, ethical conduct of research, and additional codes of ethics within the profession as appropriate to the context; The Nine Social Work Competencies 2022 Educational Policy and Accreditation Standards.
2. Demonstrate professional behavior; appearance; and oral, written, and electronic communication.
3. Use technology ethically and appropriately to facilitate practice outcomes.
4. Use supervision and consultation to guide professional judgment and behavior.
5. Apply research findings to inform and improve practice, policy, and programs.
6. Identify ethical, culturally informed, anti-racist, and anti-oppressive strategies that address inherent biases for use in quantitative and qualitative research methods to advance the purposes of social work.
7. Demonstrate anti-racist and anti-oppressive social work practice at the individual, family, group, organizational, community, research, and policy levels.
8. Demonstrate cultural humility by applying critical reflection, self-awareness, and self-regulation to manage the influence of bias, power, privilege, and values in working with clients and constituencies, acknowledging them as experts of their own lived experiences.
9. Advocate for human rights at the individual, family, group, organizational, and community system levels. 1
10. Engage in practices that advance human rights to promote social, racial, economic, and environmental justice. 1
11. Select and use culturally responsive methods for evaluation of outcomes. 1
12. Critically analyze outcomes and apply evaluation findings to improve practice effectiveness with individuals, families, groups, organizations, and communities. 1
13. Use social justice, anti-racist, and anti-oppressive lenses to assess how social welfare policies affect the delivery of and access to social services. 1
14. Apply critical thinking to analyze, formulate, and advocate for policies that advance human rights and social, racial, economic, and environmental justice. 1
15. Apply knowledge of human behavior and person-in-environment, as well as interprofessional conceptual frameworks, to engage with clients and constituencies. 1
16. Use empathy, reflection, and interpersonal skills to engage in culturally responsive practice with clients and constituencies. 1
17. Apply theories of human behavior and person-in-environment, as well as other culturally responsive and interprofessional conceptual frameworks, when assessing clients and constituencies. 1
18. Demonstrate respect for client self-determination during the assessment process by collaborating with clients and constituencies in developing a mutually agreed-upon plan. 1

19. Engage with clients and constituencies to critically choose and implement culturally responsive, evidence-informed interventions to achieve client and constituency goals. 2
20. Incorporate culturally responsive methods to negotiate, mediate, and advocate with and on behalf of clients and constituencies.

SOWK 4510. Family and Child Welfare Policy
3 Credits (3)
This course is designed to provide students with an understanding of the history and evolution of child welfare policies, initiatives and factors that influence advocacy and practices within the child welfare system. Child welfare policies and services specific to the state of New Mexico are infused throughout the course. May be repeated up to 3 credits.

SOWK 4996. Special Topics
3 Credits (3)
Specific subjects to be announced in the Schedule of Classes. May be used as a mandatory practice elective. Junior or above standing, majors or consent of instructor. Restricted to: S WK majors. May be repeated up to 3 credits.
Learning Outcomes
1. Varies

SOWK 4997. Independent Study
1-6 Credits (1-6)
Individual studies directed by consenting faculty with the prior approval of the department head. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

SOWK 5110. Sociocultural Concepts and Populations of the Southwest
3 Credits (3)
Theoretical and sociohistorical perspectives on racism, sexism, ageism, heterosexism, classism, ableism, and other forms of discrimination and oppression. Cultural diversity, strengths, and Southwest and border issues emphasized. This course examines the social and cultural landscape of the U.S. Southwest, with a focus on the diverse populations that call this region home. The historical and contemporary experiences of marginalized communities, analyzing the impact of discrimination, oppression, and economic deprivation on their lives will be explored.
Learning Outcomes
1. Correlate the implications of cultural diversity and competent Social Work practice.
2. Apply theories and perspectives on oppression within diverse individuals, groups, and populations.
3. Discuss cultural identities and how intersectionality of social factors affects individuals.
4. Articulate the importance of a cultural competency perspective in Social Work practice.
5. Reflect on your individual cultural identity and experiences and how they influence your approach to culturally grounded Social Work practice.

SOWK 5135. Human Behavior in the Social Environment
3 Credits (3)
The major theories of human behavior and the life span from conception through adolescence, adulthood, and old age. Focuses both on the areas of concern and risk for client systems and on the opportunities and strengths in the social environment.
Learning Outcomes
1. Apply knowledge of human behavior and the social environment, person-in-environment, and other multidisciplinary theoretical frameworks.
2. Evaluate the functioning of individuals, families, and groups through biological, psychological, spiritual, and cultural dimensions.
3. Apply conceptual/theoretical frameworks to assess the functioning of individuals (children, adolescents, and adults), families, groups, organizations and communities.
4. Analyze the ways in which social systems facilitate or impede health and well-being of individuals and families.
5. Evaluate the complex interplay of the environment (family, groups, communities, and organizations) and developmental factors on infants, children, adolescents, and adults of diverse communities.
6. Evaluate theories and their role in assessment with children, adolescents, adults, families, groups, organizations, and communities.

SOWK 5155. Social Policy Issues, Analysis and Change
3 Credits (3)
An overview of social and economic problems in the United States and the historical and current social welfare policies aimed at alleviating these problems. Emphasis on developing an awareness and ability to create, analyze, and change policies that impact vulnerable populations.
Learning Outcomes
1. Comprehend the values, institutional, political, and economic forces that drive social problems and social welfare policy in the US.
2. Analyze past, current, and future social policies developed to respond to social problems from a lens that considers the historical, social, cultural, economic, organizational, environmental, and global influences on social problems and the impact on diverse populations of the Southwest.
3. Evaluate how social work values, ethics, and research impact social policy development, evaluation, and implementation of social policy.
4. Apply a multilevel policy advocacy framework to advocate for policies that promote human rights, social and economic justice and addresses culturally influenced barriers to services presented by practitioners, organizations, and larger systems for populations of the Southwest.

SOWK 5165. Generalist Social Work Practice
3 Credits (3)
An introduction to generalist social work practice skills, focusing on the theoretical foundations of social work as a profession and implementing the planned change process with individual, family, group, community, and organizational client systems within a social work values and ethics framework.
Learning Outcomes
1. Explain the just practice framework for social work practice.
2. Analyze the value of critical self-reflection as a foundation for social work practice.
3. Apply the ethical principles and standards in the NASW code of ethics to frameworks for ethical decision making.
4. Critically select theoretical orientations to address client needs.
5. Apply the planned change process to a range of client systems (individuals, groups, families, communities, and organizations).
6. Demonstrate skills for engagement and assessment with single-client systems.

7. Evaluate the results of intervention/action and evaluation plans of change.

SOWK 5180. Generalist Practicum Experience I
3 Credits (3)
Supervised professional practice in a community social service agency, providing experiential instruction and learning. 225 clock hours required. Seminar required. Restricted to: MSW majors.

SOWK 5181. Generalist Practicum Seminar I
3 Credits (3)
This practicum seminar assists students in integrating knowledge, skills, values, and ethical principles gained in practice and theory courses into social work practice settings. This seminar also aids students in integrating social work practice processes in service planning and delivery. Students explore skills of collaboration and consultation by presenting practicum case examples.
Corequisite: SOWK 5180.
Learning Outcomes
1. Increase awareness of personal strengths and challenges as a developing social work practitioner.
2. Employ knowledge, skills, values, and ethical principles from practice and theory courses in social work practice.
3. Demonstrate application of research findings to social work practice.
4. Collaborate and consult effectively with peers and practicum liaison.
5. Generalize the Council on Social Work Education's core competencies to social work practice.

SOWK 5190. Generalist Practicum Experience II
3 Credits (3)
Supervised professional practice in a community social service agency. 225 clock hours required. Seminar required. Restricted to: MSW majors.
Prerequisite: SOWK 5180.

SOWK 5191. Generalist Practicum Seminar II
3 Credits (3)
This practicum seminar builds on learning from Generalist Practicum Seminar I and assists students in integrating knowledge, skills, values, and ethical principles gained in practice and theory courses into social work practice settings. This seminar also aids students in integrating social work practice processes in service planning and delivery. Students explore skills of collaboration and consultation by presenting practicum case examples.
Prerequisite: SOWK 5180 and SOWK 5181.
Corequisite: SOWK 5190.
Learning Outcomes
1. Increase awareness of personal strengths and challenges as a developing social work practitioner.
2. Employ knowledge, skills, values, and ethical principles from practice and theory courses in social work practice.
3. Demonstrate application of research findings to social work practice.
4. Collaborate and consult effectively with others.
5. Generalize the Council on Social Work Education's core competencies to social work practice.

SOWK 5210. Core Components for Trauma Informed Practice
3 Credits (3)
This course facilitates students' acquisition of the knowledge, skills, and attitudes necessary to effectively use 12 common trauma-informed practice elements in interventions for and the treatment of traumatized children and their families. The course conceptualizes a trajectory of intervention that considers the impact of trauma, intervention objectives, and the practice elements needed to facilitate the intervention objectives. This course is taught using an inquiry-based learning (IBL) pedagogy to enhance students' engagement and learning using full-length cases to exemplify a range of different clients a clinician might encounter.
Learning Outcomes
1. Demonstrate cultural humility by applying critical reflection, self-awareness, and self-regulation to manage the influence of bias, power, privilege, and values in working with clients and constituencies, acknowledging them as experts regarding their own lived experiences.
2. Apply knowledge of human behavior and person-in-environment, as well as interprofessional conceptual frameworks to engage with clients and constituencies.
3. Demonstrate respect for client self-determination during the assessment process by collaborating with clients and constituencies in developing mutually agreed-on goals.
4. Engage with clients and constituencies to critically choose and implement culturally responsive, evidenced-informed interventions to achieve mutually agreed-on plans and increase the capacities of clients and constituencies.

SOWK 5230. Applied Social Work Research
3 Credits (3)
Introduction to skills for research-informed practice and practice-informed research, including problem formulation, research designs, measurement, instrumentation, data collection and analysis, use of human participants in research, and application of research knowledge and professional ethics to social work practice. Focus on the critical analysis, interpretation, and application of existing research and use of data to inform practice and advance the field across a range of client systems.
Learning Outcomes
1. Describe key concepts, theories, and methodologies used in social work research, including qualitative and quantitative approaches.
2. Apply ethical and cultural considerations in social work research and how these apply to working with vulnerable populations.
3. Critically evaluate existing social work research, identifying potential biases, limitations, and areas for improvement.
4. Develop comprehensive research, integrating theory, ethical standards, and appropriate methods to address real-world social work problems.

SOWK 5240. Leadership in Public Health Social Work
3 Credits (3)
This course explores the integrated application of Public Health Social Work (PHSW) models and theories of practice, addressing community and organizational assessment and intervention, interpretation of contexts of power and influence, capacity for conflict and alliances, and strategies for advocacy to promote community and organizational transformation. This course will emphasize assessing and sustaining culturally-sustaining, critical trauma theory-informed rural, tribal, and border area systems response to critical PHSW issues. This course is also designed to prepare students graduating in May 2022 for their MSW Final Program Examination and MPH Competency Exams.
Learning Outcomes
1. Apply Public Health Social Work competencies to social work and public health practice settings.
2. Demonstrate culturally humble, trauma informed public health social work knowledge, skills and values in social work and public health practice settings.

3. Examine culturally- and identity-relevant public health social work practice considerations when serving in border area, tribal and rural communities.
4. Design and implement community and organizational assessment through an integrated public health social work framework.

SOWK 5260. Leadership Action Project
1 Credit (1)
This skills-based course prepares MSW students for management in government and nonprofit organizational contexts, including how to prepare and analyze organizational budgets, develop grant proposals and reports and develop a leadership platform.
Learning Outcomes
1. Identify a problem that can be addressed through new programming, policy change, or collective action.
2. Assess needs and assets through the collection and/or analysis of multiple data sources.
3. Create a proposal to address an identified problem through policy, programming, or collective action.
4. Demonstrate leadership to persuade stakeholders of the relevance and feasibility of a proposal.

SOWK 5270. Social Work Ethics
1 Credit (1)
A bridge course for Advanced Standing students intended to provide a firm foundation in ethical practice before entry into the advanced year. May be repeated up to 2 credits.
Prerequisite: SOWK 5180 and SOWK 5190.
Corequisite: SOWK 5281.
Learning Outcomes
1. Learners will analyze the social work code of ethics.
2. Learners will apply frameworks for ethical decision making.

SOWK 5271. Social Work Policy
1 Credit (1)
A bridge course for Advanced Standing students intended to provide a firm foundation in policy practice before entry into the advanced year. May be repeated up to 2 credits.
Prerequisite: SOWK 5180 and SOWK 5190.
Corequisite: SOWK 5281.
Learning Outcomes
1. Learners will describe key policies impacting social work practice.
2. Learners will analyze policy.
3. Learners will articular policy recommendations and steps for engagement in policy practice.

SOWK 5272. Social Work Research
1 Credit (1)
A bridge course for Advanced Standing students intended to provide a firm foundation research-informed practice and practice-informed research before entry into the advanced year. May be repeated up to 2 credits.
Prerequisite: SOWK 5180 and SOWK 5190.
Corequisite: SOWK 5281.
Learning Outcomes
1. Learners will critically analyze existing research for application to practice.
2. Learners will demonstrate skills for collecting data to inform practice.

SOWK 5280. Advanced Generalist Practicum Experience I
3 Credits (3)
Supervised professional practice in a community social service agency providing experiential learning in advanced generalist practice. 250 clock hours required. Seminar required. Restricted to: MSW majors.
Prerequisite: SOWK 5190.

SOWK 5281. Advanced Generalist Practicum Seminar I
2 Credits
This practicum seminar builds upon students' knowledge, skills, values, and cognitive and affective processes attained in their generalist year to apply, analyze and evaluate advanced generalist social work service planning and delivery with diverse populations. Students develop professional social work practice knowledge in micro, mezzo, macro, and multidisciplinary settings.
Prerequisite: SOWK 5190 and SOWK 5191.
Corequisite: SOWK 5280.
Learning Outcomes
1. Incorporate the Council on Social Work Education's core competencies with social work practice skills and behaviors.
2. Analyze and evaluate the efficacy of social work interventions.
3. Perform critical reflectivity and skills of cultural humility to serve diverse populations competently.
4. Integrate complex critical thinking with various theories and interventions to address complex and diverse practice contexts.

SOWK 5290. Advanced Generalist Practicum Experience II
3 Credits (3)
Supervised professional practice in a community social service agency providing experiential learning in advanced generalist practice. 250 clock hours required. Seminar required. Restricted to: MSW majors.
Prerequisite: SOWK 5280.

SOWK 5291. Advanced Generalist Practicum Seminar II
2 Credits
This practicum seminar builds on learning from Advanced Practicum Seminar I and students' knowledge, skills, values, cognitive and affective processes attained in their generalist year to apply, analyze and evaluate advanced generalist social work service planning and delivery with diverse populations. Students develop knowledge of professional social work practice in micro, mezzo, macro, and multidisciplinary settings.
Prerequisite: SOWK 5280 and SOWK 5281.
Corequisite: SOWK 5290.
Learning Outcomes
1. Incorporate the Council on Social Work Education's core competencies with social work practice skills and behaviors.
2. Analyze and evaluate the efficacy of social work interventions.
3. Perform critical reflectivity and skills of cultural humility to serve diverse populations competently.
4. Integrate complex critical thinking with various theories and interventions to address complex and diverse practice contexts.

SOWK 5310. Social Work Mental Health Practice
3 Credits (3)
This course is designed to add to the practice sequence for Masters Level students in Social Work. It addresses social work assessment of major mental health issues across the life span with an emphasis on resiliency and coping skills. Culturally responsive practices are applied to the major issues of mental health. Basic psychopharmacology, neurobiology and the ways in which Social Workers interact with clients to aid education and effective treatment of medical interventions will be a prominent part of this course. Evidence-based practices useful for work in various disorders will be incorporated.

Learning Outcomes

1. Critically analyze the concepts of mental health and psychopathology.
2. Assess social, political, and economic conditions which interfere with mental health, focusing on populations at risk for discrimination and oppression.
3. Conduct assessments of mental and emotional functioning using approved models and tools.
4. Apply DSM 5 criteria across a range of diverse populations.
5. Differentiate culturally based behaviors from psychopathology.
6. Recognize connections between psychopharmacological interventions, symptom reduction, and side effects.
7. Identify evidence-based practices for work with clients exhibiting a range of mental disorders.

SOWK 5320. Advanced Practice with Individuals
3 Credits (3)
This class builds on Foundation Year Practice courses by integrating theory and practice, and advancing skills in selecting, applying and evaluating practice interventions in a culturally sensitive manner with individuals.
Prerequisite: SOWK 5165.
Learning Outcomes

1. Demonstrate professional behavior, appearance, and oral, written, and electronic communication.
2. Apply cultural understanding, intersectionality, and anti-oppressive social work theories to direct practice with individuals.
3. Assess individuals through the lenses of client self-determination, theories of human behavior, person-in-environment, and culturally responsive conceptual frameworks.
4. Provide culturally responsive, evidence-informed interventions in direct practice with individuals.
5. Evaluate principles of direct practice with individuals.

SOWK 5330. Advanced Practice with Groups
3 Credits (3)
This course will address the knowledge, values and skills needed to work effectively with diverse populations in group settings. The course will build on Foundation Year courses by integrating theory and practice, and advancing skills in selecting, applying and evaluating practice interventions in a culturally sensitive manner with social work groups.
Prerequisite: SOWK 5165.
Learning Outcomes

1. Demonstrate the ability to conduct a group.
2. Apply a theoretically informed knowledge base of group development as it is executed across systems.
3. Demonstrate knowledge of the variety of roles that group leaders and participants need to address in accomplishing the successful mission of the group.
4. Establish a process that encourages clients to embrace the mutual aid function of groups, embracing an attention to multiple helping relationships.
5. Advocate for a democratic process within all groups, encouraging a mutual emphasis on empowerment.
6. Apply skills for social work assessment to group assessments.

SOWK 5340. Advanced Practice with Families
3 Credits (3)
This class builds on Foundation Year Practice courses by integrating theory and practice, and advancing skills in selecting, applying, and evaluating practice interventions in a culturally sensitive manner with families. Restricted to: MSW majors.
Prerequisite: SOWK 5165.
Learning Outcomes

1. Demonstrate professional behavior, ethical conduct, and effective communication in all aspects of family practice.
2. Apply cultural humility and intersectionality to assess and engage with diverse family systems.
3. Conduct comprehensive family assessments using person-in-environment and systems-based approaches.
4. Implement evidence-based interventions that address the unique needs of diverse family systems.
5. Reflect on and evaluate professional practice to ensure growth and improve client outcomes.

SOWK 5350. Advanced Practice with Communities and Organizations
3 Credits (3)
This class builds on Foundation Year Practice courses by integrating theory and practice, and advancing skills in selecting, applying, and evaluating practice interventions in a culturally sensitive manner with organizations and communities. Restricted to: MSW majors.
Prerequisite: SOWK 5165.
Learning Outcomes

1. Integrate professional values, ethical standards, relevant laws and regulations into practice at the micro, mezzo, and macro levels, involving ethical decision-making and principles of critical thinking in practice, research, and policy.
2. Apply frameworks to understand their role in relationship to other professions, leaders and connectors in engaging in interprofessional teams in various settings.
3. Use self-reflection and self-awareness while engaging with diverse client populations using a range of social work practice roles in ethnically diverse communities.
4. Identify at-risk populations to determine their needs within community and organizational settings and determine what social and economic forces affect those persons at risk.
5. Analyze communities from both systems and ecological perspectives and apply ethnographic methods to conduct a community assessment project.
6. Apply policy knowledge and macro practice skills to advance human rights and social justice within practice settings at the micro, mezzo, and macro levels.
7. Identify at-risk populations to determine their needs in community and organizational settings and determine what social and economic forces influence those persons at risk.
8. Engage effectively in “asset mapping” that identifies existing and needed services for populations in a community settings and organizations.

SOWK 5510. Family and Child Welfare Policy
3 Credits (3)
This course will enhance students’ ability to offer child welfare services that respect cultural differences, reflect current policy knowledge concerning child maltreatment, build on the advocacy and protective capacities of individuals, families and communities and encourage permanency for children and preservation of families. Required basic knowledge of child welfare and assessment skills. Outside majors require instructor permission. May be repeated up to 3 credits.

SOWK 5530. Family/Child Welfare Practice
3 Credits (3)

Current issues and interventions in child protection, foster care, family preservation and support, family reunification, adoption and permanency planning.

Learning Outcomes

1. Students will identify and analyze approaches to child protection, foster care, family preservation and support, family reunification, adoption and permanency planning.

SOWK 5540. Introduction to School Social Work Practice in Diverse Communities

3 Credits (3)

An introduction to school social work in diverse communities beginning with systems of service for children with disabilities ages 0-3, continuing into early childhood and emphasizing services in pk-12 settings. The course explores school social work history and roles, ethics for school-based practice, Family support engagement, theoretical frameworks for school-based practice including critical disability theory, major education policies which impact school social work, schoolwide approaches to supporting student wellbeing, and approaches to targeted behavior interventions in schools. Emphasis is placed on culturally and linguistically relevant approaches to practice with diverse communities throughout.

Learning Outcomes

1. Critically analyze the role of the school social worker and how it is distinct from other social work roles.
2. Analyze the role of key federal, state, and district policies on school social work ethics and practice.
3. Apply critical disability theory to analyze approaches to school social work practice and intervention.
4. Describe and evaluate key approaches to school social work practice for students aged birth to twenty one.
5. Analyze the role of culturally and linguistically responsive family engagement and advocacy in school social work practice.

SOWK 5560. Advanced School Social Work Practice: Diverse Students and Families with Special Needs

3 Credits (3)

Advanced policy and practice for school social workers supporting students receiving special education services beginning in early childhood and continuing through primary and secondary school settings. The curriculum will include culturally and linguistically appropriate knowledge, assessment, and interventions for diverse children and families with disabilities. The curriculum that is to be developed will include culturally relevant interventions for students with disabilities, special education policy, writing IEP reports and goals, and engaging in culturally and linguistically engaged family support and advocacy based on scientifically based information. The course will also provide a strong focus on special education specific policy and regulations. Assignments will be created to align with competency knowledge and application (Prerequisite SOWK 5540).

Prerequisite: SOWK 5540.

Learning Outcomes

1. Understand the roles and responsibilities of Related Service Providers (RSP) working with diverse populations.
2. Apply special education policy to practice in schools.
3. Connect culturally responsive advocacy skills and practices to related service social work.
4. Illustrate EBP to engage and assess needs of diverse children with disabilities and their families.
5. Implement and Evaluate EBP for diverse children with disabilities and their families.

SOWK 5994. Final Exit Project

1 Credit (1)

Final Exit Project. This 1-credit course is the School of Social Work's competency examination. The final exit project is non-thesis summative examination of students' ability to apply the Council on Social Work Education's core competencies to a case study. Students may only enroll in this course during the final semester of their MSW Program. May be repeated up to 2 credits.

Prerequisites: 45 Credit Hours and SOWK 5190.

Learning Outcomes

1. Apply Council on Social Work Education's core competencies to a case study.

SOWK 5996. Special Topics

1-3 Credits (1-3)

Specific subjects to be announced in the Schedule of Classes. Open to graduate students in related disciplines and to community professionals in related disciplines and to community professionals in related fields. May be repeated up to 99 credits.

Learning Outcomes

1. Varies

SOWK 5997. Independent Study

1-3 Credits (1-3)

Individual study to augment depth of knowledge in area related to course of study. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

SOWK 5999. Graduate Thesis

1-6 Credits (1-6)

Required for thesis option. May be repeated up to 6 credits.

Learning Outcomes

1. Varies

SPAN-SPANISH

SPAN 1110. Spanish I

4 Credits (4)

Designed for students with little exposure to Spanish, this course develops basic listening, speaking, reading, and writing skills and basic intercultural competence in interpretive, interpersonal and presentational modes of communication at the Novice Level of proficiency based on ACTFL guidelines. During this course, students perform better and stronger in the Novice Mid level while some abilities emerge in the Novice High range. This is an introductory course aimed at helping the student to communicate in Spanish in everyday familiar situations via recognition and production of practiced or memorized words, phrases, and simple sentences.

Prerequisite(s): language placement and/or assessment by departmental examination.

Learning Outcomes

1. Students can communicate on very familiar topics using a variety of words and phrases that they have practiced and memorized.
2. Students can present information about myself and some other very familiar topics using a variety of words, phrases, and memorized expressions.
3. Students can write short messages and notes on familiar topics related to everyday life.

4. Students can often understand words, phrases, and simple sentences related to everyday life.
5. Students can recognize pieces of information and some-times understand the main topic of what is being said.
6. Students can understand familiar words, phrases, and sentences within short and simple texts related to everyday life.
7. Students can sometimes understand the main idea of what they have read.

SPAN 1120. Spanish II
4 Credits (4)
Designed for students with some degree of exposure to Spanish in high school and/or at home, this course continues to develop basic listening, speaking, reading, and writing skills and basic intercultural competence in interpretive, interpersonal and presentational modes of communication based at the Novice High Level of proficiency based on ACTFL guidelines, although a few abilities may emerge in the Intermediate Low Level. Students in this course communicate in Spanish in familiar topics using a variety of words, phrases, simple sentences and questions that have been highly practiced and memorized.
Prerequisite: language placement and/or assessment by departmental examination or a C- or better in SPAN 1110.
Learning Outcomes
1. Students can participate in conversations on a number of familiar topics using simple sentences.
2. Students can handle short social interactions in everyday situations by asking and answering simple questions.
3. Students can present basic information on familiar topics using language they have practiced using phrases and simple sentences.
4. Students can write briefly about most familiar topics and present information using a series of simple sentences.
5. Students can understand the main idea in short, simple messages and presentations on familiar topics.
6. Students can understand the main idea of simple conversations that they overhear.
7. Students can understand the main idea of short and simple texts when the topic is familiar.

SPAN 1210. Elementary Spanish for Heritage Learners I
3 Credits (3)
This is a beginning-level Spanish course designed for students who have a cultural connection to the Spanish language. Some students have had very little exposure to the language and enter the class to develop beginning-level skills. Other students may have grown up hearing the heritage language in the community and may understand some Spanish and speak at a basic level as a result. The objective is to draw upon the connection to the heritage language as a source of motivation and engagement for our learning communities. At the same time, we build upon the language base that students may already have as a result of their heritage learner experience in order to develop new proficiencies in Spanish and reactivate the Spanish that students have learned previously. By the end of this course, students will be able to describe their home, campus surroundings and common activities including cultural traditions. At the same time, students gain cultural competency and develop a critical understanding of their linguistic and cultural background. Students who have previously earned a C or better in SPAN 1110 or SPAN 1120 may not recieve credit for this course.
Learning Outcomes
1. Interpersonal Communication: Students can engage in exchanges in culturally appropriate ways using understandable pronunciation on familiar topics using contextualized words, phrases, common idiomatic expressions, and simple sentences.
2. Written expression: Students can write an essay/poem/story/creative sketch/lyric in the target language that describes a past/present/future (fictional) event to the reader.
3. Interpretive listening: Students can understand familiar questions and statements from simple sentences in conversations.
4. Interpretive reading: Students can identify the topic and some isolated facts from simple sentences in informational and fictional texts.
5. Critical cultural awareness: Students can recognize and explain some of the issues facing bilingual communities in accordance to the instructor expertise and articulation with subsequent courses.

SPAN 1220. Spanish for Heritage Learners II
3 Credits (3)
Spanish as a Heritage Language II is a second semester class designed for students who have developed some basic Spanish proficiency from previous classes and/or from community experiences. This course provides students with the opportunity to develop their proficiency in the four language skills (speaking, listening, reading, and writing). Class activities are designed to strengthen oral communication skills (speaking and listening) through a variety of group activities. By the end of the course students will be able to understand and produce narrations of past events in oral and written Spanish. In order to foster a desire to revitalize and maintain the Spanish language in the US context we attempt to raise students' critical awareness of what it means to be part of a specific speech community.
Learning Outcomes
1. Interpersonal Communication: Students can engage in basic but authentic conversations through providing and obtaining information, expressing likes and dislikes, describing their daily lives, and narrating simple events in the past.
2. Written expression: Students can write an essay/poem/story/creative sketch/lyric in the target language, and that describes a past (fictional) event to the reader.
3. Interpretive listening: can identify the main idea in short conversations.
4. Interpretive reading: Students can identify the topic and related information from simple sentences in short informational and fictional texts.
5. Critical cultural awareness: Students can recognize and explain some of the issues facing bilingual communities in accordance to the instructor expertise and articulation with previous and subsequent courses.

SPAN 1410. Spanish for Health Care Professions
3 Credits (3)
This course is designed to develop the student's ability to understand, speak, read and write the Spanish language within a health profession framework because linguistic and cultural knowledge are essential for communication with patients. Restricted to Community Colleges campuses.
Prerequisite: SPAN 1511.
Learning Outcomes
1. Demonstrate acquisition of intermedia communicative skills in the area of listening, speaking, reading, and writing.
2. Comprehend and participate in conversations in Spanish.
3. Have a working vocabulary which enables to recognize and exchange information in Spanish.

4. Be able to apply some basic and intermediate grammar rules in Spanish.

SPAN 1511. Spanish for Human Services
3 Credits (3)
An introductory Spanish course for professionals in the human services. The course focuses on pertinent vocabulary for situations commonly encountered by professionals in areas such as social work, counseling, case management, Social Security, Medicare, health services, food stamps, child support, vocational rehabilitation, senior citizen issues and other areas. Basic Spanish pronunciation and grammar are introduced in the context of practical social-services situations.
Learning Outcomes
1. Augment basic vocabulary pertinent to professional roles (Vocabulary Journal).
2. Display increased confidence about pronunciation of Spanish and Spanish sentence structure (Role Play Interview).
3. Identify cultural norms working with Hispanic individuals and families (interview of Hispanic Professional).
4. Translate and explain agency forms and documents (Translation of Agency Form).
5. Display listening comprehension of typical dialogues which take place in a variety of human services agencies (Final Exam).

SPAN 2110. Spanish III
3 Credits (3)
This course is based on the integration of learning outcomes across Interpersonal, Interpretive, and Presentational Modes of Communication at the Intermediate Low Level of proficiency based on ACTFL guidelines. Students accomplish real-world communicative tasks in culturally appropriate ways as they gain familiarity with the target culture(s). This is an intermediate course aimed at helping the student to communicate in Spanish on familiar topics about self, others and everyday life at the same time that they recognize and handle short social interactions in interactions in everyday situations by asking and answering a variety of questions.
Prerequisite: language placement and assessment by departmental examination or C or better in SPAN 1120.
Learning Outcomes
1. Students can participate in conversations on familiar topics using sentences and series of sentences.
2. Students can handle short social interactions in everyday situations by asking and answering a variety of questions.
3. Students can usually say what they want to say about themselves and their everyday life.
4. Students can make presentations on a wide variety of familiar topics using connected sentences
5. Students can write on a wide variety of familiar topics using connected sentences.
6. Students can understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies.
7. Students can under-stand the main idea in conversations that they overhear.
8. Students can understand the main idea of texts related to everyday life and personal interests or studies.

SPAN 2120. Spanish IV
3 Credits (3)
This course is based on the integration of learning outcomes across Interpersonal, Interpretive, and Presentational Modes of Communication at the Intermediate Low Level of proficiency based on ACTFL guidelines. Students accomplish real-world communicative tasks in culturally appropriate ways as they gain familiarity with the target culture(s). This is an intermediate course aimed at helping the student to communicate in Spanish on familiar topics about self, others and everyday life at the same time that they recognize and handle short social interactions in interactions in everyday situations by asking and answering a variety of questions.
Prerequisite: language placement and assessment by departmental examination or C or better in SPAN 2110.
Learning Outcomes
1. Students can participate with ease and confidence in conversations on familiar topics.
2. Students can usually talk about events and experiences in various time frames.
3. Students can usually describe people, places, and things.
4. Students can handle social interactions in everyday situations, sometimes even when there is an unexpected complication.
5. Students can make presentations in a generally organized way on school, work, and community topics, and on topics they have researched.
6. Students can make presentations on some events and experiences in various time frames.
7. Students can write on topics related to school, work, and community in a generally organized way.
8. Students can write some simple paragraphs about events and experiences in various time frames.
9. Students can easily understand the main idea in messages and presentations on a variety of topics related to everyday life and personal interests and studies. 1
10. Students can usually understand a few details of what they overhear in conversations, even when something unexpected is expressed. 1
11. Students can sometimes follow what they hear about events and experiences in various time frames. 1
12. Students can easily understand the main idea of texts related to everyday life, personal interests, and studies. 1
13. Students can sometimes follow stories and descriptions about events and experiences in various time frames.

SPAN 2210. Spanish for Heritage Learners III
3 Credits (3)
Intermediate Spanish for Heritage Speakers I is a third semester course designed for students who have been raised in a Spanish-speaking environment and speak, or understand, some Spanish as a result of hearing it in the home, and in the community by family, friends, and neighbors. Students in this course will continue to develop their ability to narrate events in the past and will be able to describe hypothetical situations. Students will also develop their ability to express wishes, desires, and necessities. This course will help the student build confidence in their Spanish abilities and expand the language use in the areas of writing, reading, oral production and listening comprehension. In order to foster a desire to revitalize and maintain the Spanish language we attempt to raise students' critical awareness of wider issues facing Spanish speakers in the US context. May be repeated up to 3 credits.
Learning Outcomes
1. Interpersonal Communication: Students can exchange information on a wide variety of familiar topics in which the students use appropriate

vocabulary to describe their daily lives and narrate events in the past with some degree of ease and confidence.
2. Written expression: Students can write an essay/poem/story/creative sketch/lyric in the target language, and that effectively conveys a series of past (fictional) events to the reader that may include recent and distant past.
3. Interpretive listening: Students can identify the main idea and key information in short straightforward conversations.
4. Interpretive reading: Students can understand the main idea and key information in short straightforward informational and fictional texts.
5. Critical cultural awareness: Students can recognize and explain some of the issues facing bilingual communities in accordance to the instructor expertise and articulation with previous and subsequent courses.

SPAN 305. Topics in Hispanic Civilization
3 Credits (3)
Group study of selected topics focusing on Hispanic culture and civilization. Topics announced in the Schedule of Classes. May be repeated for a maximum of 6 credits.
Prerequisite: SPAN 2120 or SPAN 2210 or consent of instructor.

SPAN 306. Special Topics
3 Credits (3)
Group study of Spanish for specialized purposes (e.g. court interpreting, professional language for bilingual teachers, technical writing for the business community). Course subtitled in the Schedule of Classes. May be repeated for a maximum of 12 credits.
Prerequisite: SPAN 2120 or SPAN 2210 or consent of instructor.

SPAN 316. Grammar for Non-Native Speakers of Spanish
3 Credits (3)
For students who did not grow up speaking Spanish. A review of the rules of Spanish grammar. Students cannot receive credit for both SPAN 316 and SPAN 318.
Prerequisite(s): SPAN 2120 or SPAN 2210 or consent of instructor.
Learning Outcomes
1. Students will be better equipped academically to continue into upper-division Spanish courses.
2. Students will be better equipped to communicate in Spanish by becoming more adept at using a variety of grammatical structures.
3. Students will gain an appreciation for diverse languages and cultures that exist in the borderlands and will be able to contribute to the diversity.
4. Students will gain critical thinking skills as they develop their bilingual abilities.
5. Students will be encouraged after becoming bilingual and will desire to make language learning life-long goal.

SPAN 317. Composition for Non-Native Speakers of Spanish
3 Credits (3)
For students who did not grow up speaking Spanish. Development of professional and academic writing skills in Spanish. Students cannot receive credit for both SPAN 317 and SPAN 319.
Prerequisite(s): SPAN 2120 or SPAN 2210 or consent of instructor.
Learning Outcomes
1. Students will be better equipped academically to continue into upper-division Spanish courses.
2. Students will be better equipped to communicate in written Spanishby employing a more clear and structured writing style.
3. Students will gain an appreciation for diverse languages and cultures that exist in the borderlands and will be able to contribute to the diversity.
4. Students will gain critical thinking skills as they develop their bilingual abilities.
5. Students will be encouraged after becoming bilingual and will desire to make language learning life-long goal.

SPAN 318. Grammar for Heritage/Native Speakers of Spanish
3 Credits (3)
For students who speak or have been exposed to Spanish at home or in the community. A review of grammatical concepts and analysis of both spoken and written Spanish. Students cannot receive credit for both SPAN 316 and SPAN 318.
Prerequisite(s): SPAN 2120 or SPAN 2210 or consent of instructor.
Learning Outcomes
1. Students will be better equipped academically to continue into upper division Spanish courses.
2. Students will be better equipped to communicate in written and spoken Spanish by using a variety of grammatical structures.
3. Students will sharpen their Spanish communication skills, which will assist them in securing employment as bilingual speakers.
4. Students will develop a stronger appreciation for the Spanish communication skills and cultural awareness which will assist them in contributing to their communities in meaningful ways.
5. Students will gain critical thinking skills as they sharpen their bilingual abilities.

SPAN 319. Composition for Heritage/Native Speakers of Spanish
3 Credits (3)
For students who speak or have been exposed to Spanish at home or in the community. Development of writing strategies, styles and techniques in the Spanish language. Students cannot receive credit for both SPAN 317 and SPAN 319.
Prerequisite(s): SPAN 2120 or SPAN 2210 or consent of instructor.
Learning Outcomes
1. Students will be better equipped academically to continue into upper-division Spanish courses.
2. Students will be better equipped to communicate in written Spanish by employing a more clear and structured writing style.
3. Students will gain an appreciation for diverse languages and cultures that exist in the borderlands and will be able to contribute to the diversity.
4. Students will gain critical thinking skills as they develop their bilingual abilities.
5. Students will be encouraged after becoming bilingual and will desire to make language learning life-long goal.

SPAN 325. Advanced Conversation
3 Credits (3)
Intensive oral practice. Not open to heritage/native speakers of Spanish.
Prerequisite(s): SPAN 2120 or consent of instructor.

SPAN 327. Spanish in the Community
3 Credits (3)
Emphasis on use of Spanish outside the classroom in the local communities. Activities include but are not limited to oral histories, language mentoring in schools, assisting with cultural activities and language research.
Prerequisite: SPAN 2120 or SPAN 2210 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn how to apply bilingual and bicultural skills to serve the community.

SPAN 330. Variations in Spanish
3 Credits (3)
The study of social variation within the Spanish language, examining both social and linguistic factors that affect language change.
Prerequisite: SPAN 316 or SPAN 318 or consent of instructor.
Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the terms and concepts related to linguistic variations.
5. Students will learn about variations in the Spanish language and how to apply these ideas to a greater linguistics body of knowledge.

SPAN 340. Introduction to Spanish Linguistics
3 Credits (3)
General aspects of Spanish linguistics: traditional, descriptive, historical and dialectal.
Prerequisite: SPAN 316 or SPAN 318 or consent of instructor.
Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the terms and concepts related to Spanish linguistics.
5. Students will learn about a wide range of linguistics topics and how to apply these ideas to a greater linguistics body of knowledge.

SPAN 350. Introduction to Chicano Studies
3 Credits (3)
Covers Mexican-American life including language, history, education, politics and literature.
Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of Chicano Studies.
5. Students will learn about various Chicano cultural and historical themes and how they affect the Chicano community today.

SPAN 361. US-Mexico Border Culture & Literature
3 Credits (3)
Study of major authors and/or cultural trends in the U.S.-Mexico border. Selected subject to be identified by subtitle in the Schedule of Classes. May be repeated up to 6 credits.
Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of border literature and culture.
5. Students will learn about the value of US-Mexico border culture and literature and how they help form unique border communities.

SPAN 364V. Culture and Civilization of Mexico
3 Credits (3)
Familiarization with culture, civilization and regions of Mexico. History, geography, art, literature, folklore, customs, economics and politics of each region. Impact of Mexican culture and civilization on the Southwest United States. Taught in English. Does not satisfy Arts and Sciences second language requirement.

SPAN 365V. Culture and Civilization of Spanish America
3 Credits (3)
Familiarization with culture, civilization and regions of Spanish America. Study of history, geography, art, literature, folklore, customs, economics and politics of each region. Impact of Spanish American culture and civilization on the Southwest United States. Taught in English. Does not satisfy College of Arts and Sciences second language requirement.

SPAN 380. Introduction to Hispanic Literature
3 Credits (3)
Works in Spanish, all genres and periods. How to read literature in all forms.
Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of Hispanic literature..
5. Students will read foundational Hispanic texts of various genres and periods and learn how they create and inform Hispanic histories, identities, and nations.

SPAN 385. Introduction to Chicano/US-Mexican Literature
3 Credits (3)
Introduction to the study of major works by Chicano/US-Mexican authors.
Prerequisite: SPAN 380 or consent of instructor.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of Chicano literature.
5. Students will read foundational Chicano texts of various genres and learn how they create and sustain a national Chicano consciousness.

SPAN 388. Contemporary Hispanic Literature
3 Credits (3)
Study of Peninsular and Spanish-American literature from the 20th century to the present.
Prerequisite: SPAN 380 or consent of instructor.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of Hispanic literature.
5. Students will read foundational Hispanic texts of various genres from the 20th and 21st centuries and learn how they create and inform Hispanic histories, identities, and nations.

SPAN 393. Introduction to Translation and Interpretation
3 Credits (3)
General aspects of translation and interpretation from English to Spanish and Spanish to English. Selected subject to be identified by subtitle in the Schedule of Classes.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms, concepts, and strategies related to translation and interpretation.
5. Students will learn how to translate written texts and/or interpret live communication between the Spanish and English languages. However, other languages may be included at instructor's discretion.

SPAN 399. Independent Studies in Literature, Language, or Culture
1-3 Credits
Individualized, self-paced projects for advanced students. Students must present formal proposal of study.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn how to connect the value between literature, language, and culture and how to apply this knowledge to serve their community.

SPAN 411. Creative Writing
3 Credits (3)
Creative writing in Spanish.
Prerequisite: SPAN 380 or consent of instructor.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of creative writing and the publication process.
5. Students will read and learn about the process and types of creative writing and publication, how to create original texts, and how to edit and publish creating works.

SPAN 412. Spanish-American Poetry
3 Credits (3)
Study of major works by Spanish-American poets.
Prerequisite: SPAN 380 or consent of instructor.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of the poetry genre.
5. Students will read foundational Hispanic poetry from different periods and learn how poets and poetry create and inform Hispanic histories, identities, and nations.

SPAN 414. Coyolxauhqui: La literatura chicana femenil
3 Credits (3)
This course is designed to introduce students to Chicano Studies through the exploration of literature and cultural representations. Students will examine the history of Chican@s and discuss contemporary issues affecting their life, work, and expressions. The study of cultural representations such as Coyolxauhqui, La Malinche, La Virgen de

Guadalupe, La Llorona, La Maqui-Loca, and La Chican@ Queer through a feminist perspective will allow a closer look at the work done by Chicana writers, poets, and artists who share a locus of enunciation. Most importantly, this course helps situating the individual experiences in relationship and connection to other Chican@s in the world.

Learning Outcomes

1. Become familiar with the main theoretical and pedagogical aspects of Chican@ Studies through a feminist perspective.
2. Reflect on the diversity of Chican@ scholars.
3. Observe the uniqueness in Chican@ Studies as compared to other fields.
4. Critically examine current research areas involving the interdisciplinary field.
5. Explore innovative theoretical research in history, politics and cultural topics.

SPAN 418. Spanish-American Short Story
3 Credits (3)

Study of major short stories by Spanish-American authors.
Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of the short story genre.
5. Students will read foundational Hispanic short stories from various periods and learn how this genre creates and informs Hispanic histories, identities, and nations.

SPAN 419. Spanish American Drama
3 Credits (3)

Study of major works by Spanish-American dramatists.
Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of the drama genre.
5. Students will read foundational Hispanic short stories from various periods and learn how this genre creates and informs Hispanic histories, identities, and nations.

SPAN 420. The Art of Storytelling
3 Credits (3)

The study of the genesis of storytelling and its structure, learning how and why to apply oral storytelling in our personal and professional lives, and practicing the art of storytelling in front of an audience.
Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of oral storytelling and the significance of this skill in creating personal and national narratives.
5. Students will learn how to write and present original oral stories, myths, and other forms of oral storytelling for a public audience.

SPAN 421. New Mexico Culture and Literature
3 Credits (3)

The study of the development and flourishing of New Mexican culture and literature.
Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn about key cultural, literary, and historical elements of New Mexico.
5. Students will learn how to apply knowledge about New Mexico to serve their communities.

SPAN 422. Cultural Production of Hispanic Revolutions and Wars
3 Credits (3)

The study of Hispanic literature, art, and film dealing with revolutionary movements and wars.
Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of revolutions and wars as they relate to literary production and other modes of cultural expression.
5. Students will learn about various revolutions and wars throughout Spain and Latin America and how they have helped form our regional and national identities, especially through a cultural production lens.

SPAN 423. Colonial Legacy: Representations in Chican@ Literature & Culture
3 Credits (3)

The course offers an overview of the research surrounding the legacy of colonial practices. Presents key concepts in colonial studies (colonialism,

colonies, colonization, enclosures, exploitation, settlements), along with the ideologies of colonialism, to build the theoretical framework that will help analyze our colonial legacy through the exploration of Chican@ literature and cultural representations of writers, poets, and artists. Students will reflect on their own colonial/postcolonial ideologies and practices. The course helps situate the individual experiences in relationship and connection to others in the world.

Learning Outcomes

1. Become familiar with the main theoretical and pedagogical aspects of colonial studies.
2. Reflect, observe and explore the colonial practices and approaches.
3. Critically examine current research areas involving the interdisciplinary field.
4. Explore innovative theoretical research in history, politics, literature and culture.

SPAN 424. Post-Modern Hispanic Literature
3 Credits (3)

The study of Post-Modern experimental literary genres, from Post-boom to the present.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of post-modernism, especially in relation to Hispanic literary production.
5. Students will read a variety of post-modern Hispanic texts from various genres and learn how they help develop regional and national identities.

SPAN 426. Spanish-American Novel
3 Credits (3)

Study of major works by Spanish-American novelists.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of the novel genre.
5. Students will read foundational Hispanic novels from various periods and learn how this genre creates and informs Hispanic histories, identities, and nations.

SPAN 427. Chicano Literature
3 Credits (3)

Study of Chicano/US-Mexican authors.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop advanced comprehension of the terms and concepts of Chicano literature.
5. Students will read foundational Chicano texts of various genres, but with a focus on narratives, and learn how they create and sustain a national Chicano consciousness.

SPAN 439. Topics in Applied Spanish Linguistics
3 Credits (3)

Group study of selected topics to be identified by subtitle in the Schedule of Classes. May be repeated once under different subtitle for a maximum of 6 credits.

Prerequisite: SPAN 340.

SPAN 442. Formation of Hispanic National Identities
3 Credits (3)

Study of seminal texts on the formation of Hispanic national identities and counternarratives against homogenous notions of nationhood.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how Hispanic identities were formed through various narrative practices and how that informs media representations of Hispanic people and culture.
4. Analyze how Hispanic identities were formed and with what motivations.
5. Assess national narratives and counter-narratives to understand their political-social worlds better.

SPAN 444. Body Studies
3 Credits (3)

Interdisciplinary study of the body in Hispanic societies and others and its associated political meaning.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how the Hispanic body became a cultural and political object and how it is changing by the means of new media.
4. Analyze how the understanding of the Hispanic body has changed throughout history and how local politics affect it.
5. Learn how the body has served as the locus of culture and the principle of social interaction and politics.

SPAN 446. Speculative Fiction
3 Credits (3)

Study of Hispanic speculative fiction and its related utopian/dystopian societies.

Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how social anxieties produced a Hispanic literary corpus to deal with the past, the present, and the future.
4. Analyze and compare how genre fiction challenges or supports hegemonic national discourses.
5. Learn how speculative fiction serves as an expression of social desires.

SPAN 447. Hispanic Film
3 Credits (3)
Study of major films from Spain and Spanish-America. Restricted to: Main campus only.

SPAN 448. U.S.-Hispanic Film
3 Credits (3)
Study of major films about and/or by Hispanics of the U.S. Restricted to: Main campus only.

SPAN 449. Special Problems
1-3 Credits
Directed reading for graduate students in their specific fields to satisfy language requirement for master's or doctoral programs. May be repeated for a maximum of 6 credits.

SPAN 451. Hispanic Cultures
3 Credits (3)
Issues in Hispanic cultures of the U.S., Spanish-America and Spain. Also focuses on U.S.-Mexico border culture. Selected topics to be identified by subtitle in the Schedule of Classes.
Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn about various modes of Hispanic cultural production and how they create regional and national Hispanic identifies.

SPAN 461. Introduction to Spanish Phonetics
3 Credits (3)
An introduction to Spanish phonetics including basic dialectal variation and comparison with English.
Prerequisite: SPAN 340.

SPAN 474. Pragmatics
3 Credits (3)
The study of theory and pragmatic notions such as implicatures, presuppositions, deixis, speech acts, and politeness.
Prerequisite(s): SPAN 340.

SPAN 476. Semantics
3 Credits (3)
The investigation of language from a semantic-pragmatic perspective and the use of formal logic to communicate meaning.
Prerequisite(s): SPAN 340.

SPAN 483. Literature and Law
3 Credits (3)
The advanced study of Latin American and Latino literature and its historical and cultural connections to the development of laws and the influence of both on modern society.
Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of legal themes as found in literature.
5. Students will read foundational Hispanic texts of various genres and learn how they create a narrative that embodies or implies legal issues that affect the Hispanic community.

SPAN 485. Literature and Mental Health
3 Credits (3)
The advanced study of Latin American and Latino literature and how storytelling, through various literary genres, can inform our understanding of mental health issues and propose possible solutions to improve our quality of mental health.
Prerequisite: SPAN 380 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of mental health themes as found in literature.
5. Students will read foundational Hispanic texts of various genres and learn how they create a narrative that embodies or implies mental health issues that affect the Hispanic community.

SPAN 490. Special Topics
3 Credits (3)
Selected topic to be identified by subtitle in the Schedule of Classes.
Prerequisite: SPAN 316 or SPAN 318 or consent of instructor.

Learning Outcomes

1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will learn about various topics of Hispanic literature or linguistics that can be applied to advanced research projects.

SPAN 491. History of the Spanish Language
3 Credits (3)
The development of Spanish from its origins.
Prerequisite(s): SPAN 340.

SPAN 492. Structure of Spanish
3 Credits (3)
Topics in Spanish linguistics including phonology, morphology, syntax and semantics.
Prerequisite: SPAN 316 or SPAN 318 or SPAN 340.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the terms and concepts related to the structure of Spanish.
5. Students will learn about the formation of the structure of Spanish and how to apply these ideas to a greater linguistics body of knowledge.

SPAN 493. Espanol de los Estados Unidos
3 Credits (3)
Linguistic issues and studies of U.S. Spanish-speaking communities. Taught with SPAN 593. May be repeated up to 3 credits.
Prerequisite(s): SPAN 340.

SPAN 500. Methods of Research and Literary Criticism
3 Credits (3)
Advanced methods of research and literary criticism.

SPAN 502. Sentipensar Pedagogy: Anzaldúa and Other Theorists
3 Credits (3)
The course offers an overview of the theory, research and practice concerning Sentipensar pedagogy. Through the exploration of literature and cultural representations, students will interpret the works of theorist that promote the connections between the body, mind, and heart in their academic research and curriculum. The course will also discuss contemporary issues affecting our life, work, and expressions. The study of Gloria Anzaldúa's Coatlicue state, linguistic terrorism, Nepantla and Consciencia Mestiza, are only some of the approaches to academia that will be discussed in this course. We will also have a closer look at the work done by writers, poets, and artists who share a locus of enunciation. Most importantly, this course helps situating the individual experiences in relationship and connection to others in the world. This course focuses on strategies and techniques in curriculum development appropriate for teaching students at different levels. The materials and resources for the class are mostly written in English because the field research is done in this language. However, all work turned in for this class (discussions, quizzes, homework, presentations, etc.) must be written and developed in Spanish.
Learning Outcomes
1. Become familiar with the main theoretical and pedagogical aspects of Sentipensar pedagogy.
2. Reflect and explore on the diversity in the approaches and methodologies in Sentipensar pedagogy.
3. Observe the uniqueness in the field as compared to others.
4. Critically examine current research areas involving the interdisciplinary field.
5. Explore innovative theoretical research in history, politics and culture.

SPAN 503. Critical Language Awareness in Teaching SHL
3 Credits (3)
This course is designed to introduce students to the theory, research, and practice of Critical Language Awareness. Students will read about the theoretical framework established when teaching heritage language learners. The study of Critical Language Awareness will allow educators to take a closer look at their own sociocultural concerns and influences in their education. Most importantly, this course will help us understand how our individual experiences connect in relationship to other heritage and native language users in the world. The materials and resources for the class are mostly written in English because the field research is done in this language. However, all work turned in for this class (discussions, quizzes, homework, presentations, etc.) must be written and developed in Spanish.
Learning Outcomes
1. Become familiar with the main theoretical and pedagogical aspects of Critical Language Awareness.
2. Reflect on the diversity in the writings of scholars in the field.
3. Observe the uniqueness of Critical Language Awareness in heritage language pedagogy.
4. Critically examine current research areas involving the interdisciplinary field.
5. Explore innovative theoretical research in history, politics, and cultural topics.

SPAN 504. Culturally Sensitive Teaching in SHL: Teaching Spanish as a Heritage Language in the United States
3 Credits (3)
This course focuses on presenting the theories, strategies and techniques in curriculum development appropriate for teaching Spanish for Native Speakers (SNS/EHN) and Heritage Language Speakers (HLS/EHH) in a culturally and linguistically sensitive environment. Students will conduct classroom observations and prepare presentations on aspects of CLR and SHL instruction in addition to preparing a research project to illustrate all their preparation towards creating a more sensitive and responsive curriculum.
Learning Outcomes
1. Become familiar with the main theoretical and pedagogical aspects of culturally and linguistically responsive teaching of SHL.
2. Reflect on the linguistic diversity of SHL speakers.
3. Observe the uniqueness in the use of SHL as compared to the Spanish in other parts of the world.
4. Critically examine current research areas involving U.S. Spanish, family and community settings, policies, programs and curriculum.
5. Explore innovative techniques, materials and activities in culturally and linguistically responsive SHL instruction.
6. Design new evaluation practices in all four skills.

SPAN 507. Technology Enhanced Language Learning
3 Credits (3)
Strategies for enhancing language learning with emerging technologies. Course is taught in Spanish.

SPAN 508. Teaching Literature with Technology
3 Credits (3)
Strategies and techniques for enhancing the teaching of all literature genres using emerging technologies. Course is taught in Spanish. Co/

Prerequisite(s): SPAN 507, and/or consent of instructor.

SPAN 509. Teaching Culture with Technology
3 Credits (3)
Strategies and techniques for enhancing the teaching of culture using emerging technologies. Course is taught in Spanish. Co/
Prerequisite(s): SPAN 507, and/or consent of instructor.

SPAN 510. Assessing the National Standards
3 Credits (3)
Analysis of the National Standards for Foreign Language Learning (the 5 Cs) in the 21st Century. Course will also cover the Integrated Performance Assessment as applied to the national standards. Other assessments will be reviewed to evaluate effectiveness in all levels of Spanish language classrooms.

SPAN 512. Contemporary Spanish-American Poetry
3 Credits (3)
Readings and interpretation of Spanish-American poetry from the 20th century to the present.

SPAN 514. Coyolxauhqui: La literatura chicana femenil
3 Credits (3)
This course is designed to introduce students to Chicano Studies through the exploration of literature and cultural representations. Students will examine the history of Chican@s and discuss contemporary issues affecting their life, work, and expressions. The study of cultural representations such as Coyolxauhqui, La Malinche, La Virgen de Guadalupe, La Llorona, La Maqui-Loca, and La Chican@ Queer through a feminist perspective will allow a closer look at the work done by Chicana writers, poets, and artists who share a locus of enunciation. Most importantly, this course helps situating the individual experiences in relationship and connection to other Chican@s in the world.
Learning Outcomes
1. Become familiar with the main theoretical and pedagogical aspects of Chican@ Studies through a feminist perspective.
2. Reflect on the diversity of Chican@ scholars.
3. Observe the uniqueness in Chican@ Studies as compared to other fields.
4. Critically examine current research areas involving the interdisciplinary field.
5. Explore innovative theoretical research in history, politics and cultural topics.

SPAN 520. Adv. The Art of Storytelling
3 Credits (3)
The study of the genesis of storytelling and its structure, learning how and why to apply oral storytelling in our personal and professional lives, and practicing the art of storytelling in front of an audience.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the terms and concepts of storytelling and the significance of this skill in creating personal and national narratives.
5. Students will learn how to write and present original oral stories, myths, and other forms of oral storytelling for a public audience.

SPAN 521. Advanced Culture and Literature of New Mexico
3 Credits (3)
The advanced study of the development and flourishing of New Mexican culture and literature.

SPAN 522. Adv. Cultural Production of Hispanic Revolutions and Wars
3 Credits (3)
The study of Hispanic literature, art, and film dealing with revolutionary movements and wars.
Learning Outcomes
1. Students will strengthen their written and oral communication in Spanish for personal, academic, and professional success to serve as conduits for a bilingual community.
2. Students will improve their critical thinking skills through deep-level readings and engaged dialogue.
3. Students will improve their academic research, writing, and presentation skills through advanced investigative and writing projects.
4. Students will develop comprehension of the basic terms and concepts of revolutions and wars as they relate to literary production and other modes of cultural expression.
5. Students will learn about various revolutions and wars throughout Spain and Latin America and how they have helped form regional and national identities, especially through a cultural production lens

SPAN 523. Colonial Legacy: Representations in Chican@ Literature & Culture
3 Credits (3)
The course offers an overview of the research surrounding the legacy of colonial practices. Presents key concepts in colonial studies (colonialism, colonies, colonization, enclosures, exploitation, settlements), along with the ideologies of colonialism, to build the theoretical framework that will help analyze our colonial legacy through the exploration of Chican@ literature and cultural representations of writers, poets, and artists. Students will reflect on their own colonial/postcolonial ideologies and practices. The course helps situate the individual experiences in relationship and connection to others in the world.
Learning Outcomes
1. Become familiar with the main theoretical and pedagogical aspects of colonial studies.
2. Reflect, observe and explore the colonial practices and approaches.
3. Critically examine current research areas involving the interdisciplinary field.
4. Explore innovative theoretical research in history, politics, literature and culture.

SPAN 528. Advanced U.S. Latino Culture and Literature
3 Credits (3)
The advanced study of major works by Latino writers in the U.S.

SPAN 540. Introduccion a la Linguistica
3 Credits (3)
Introduces students to the foundational topics of linguistic study with particular reference given to the Spanish language: properties of language and communication, morphology, syntax, phonetics, phonology, language variation and change.
Prerequisite(s): Eligibility to take graduate level courses.

SPAN 542. Adv. Formation of Hispanic National Identities
3 Credits (3)

Study of seminal texts on the formation of Hispanic national identities and counternarratives against homogenous notions of nationhood.

Learning Outcomes

1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how Hispanic identities were formed through various narrative practices and how that informs media representations of Hispanic people and culture.
4. Analyze how Hispanic identities were formed and with what motivations.
5. Assess national narratives and counter-narratives to understand their political-social worlds better.

SPAN 544. Adv. Body Studies
3 Credits (3)
Interdisciplinary study of the body in Hispanic societies and others and its associated political meaning.

Learning Outcomes

1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how the Hispanic body became a cultural and political object and how it is changing by the means of new media.
4. Analyze how the understanding of the Hispanic body has changed throughout history and how local politics affect it.
5. Learn how the body has served as the locus of culture and the principle of social interaction and politics.

SPAN 545. Advanced Dialectos del Espanol
3 Credits (3)
Advanced research of Spanish dialects including their formal characteristics, historical formation and regional variation.

SPAN 546. Adv. Speculative Fiction
3 Credits (3)
Study of Hispanic speculative fiction and its related utopian/dystopian societies.

Learning Outcomes

1. Improve critical thinking skills through deep-level readings and class discussions.
2. Strengthen academic research and writing skills through high-level research and writing projects.
3. Understand how social anxieties produced a Hispanic literary corpus to deal with the past, the present, and the future.
4. Analyze and compare how genre fiction challenges or supports hegemonic national discourses.
5. Learn how speculative fiction serves as an expression of social desires.

SPAN 547. Advanced Hispanic Film
3 Credits (3)
Advanced study of major films from Spain and Spanish-America.
Restricted to: Main campus only.

SPAN 548. Advanced U.S.-Hispanic Film
3 Credits (3)
Advanced study of major films about and/or by Hispanics of the U.S.
Restricted to: Main campus only.

SPAN 550. Advanced Chicana and Chicano Studies
3 Credits (3)
Multidisciplinary examination of issues that have historically affected/influenced the Chicana/o community regionally, in the borderlands, and beyond borders.

Learning Outcomes

1. Students will become better equipped to teach this material at the high school or community college levels.
2. Students will become better equipped to attend a PhD program in a related field.
3. Students will gain access to a more diverse curriculum which broaden their educational and cultural perspectives.
4. Students will be able to develop their scholarship on a more creative level.
5. Students will strengthen their academic writing, which will help in their graduate studies and/or post-graduate careers.

SPAN 551. Advanced Hispanic Cultures
3 Credits (3)
Advanced study on Hispanic cultures of the U.S., Spanish-America and/or Spain. Selected topic to be identified by subtitle. Taught with SPAN 451. May be repeated up to 6 credits.

SPAN 558. Bilinguismo
3 Credits (3)
Examines the topics of bilingualism from a psycholinguistic perspective including the development of the bilingual brain, lexical acquisition, retrieval and storage, and experimental techniques in measuring language competence.
Prerequisite(s): SPAN 540 or consent of instructor.

SPAN 561. Advanced Spanish Phonetics
3 Credits (3)
Advanced study of Spanish phonetics, including basic dialectal variation and comparisons with English.

SPAN 562. Advanced Spanish Phonology
3 Credits (3)
An advanced formal examination of the sound system of Spanish including formal characterizations, dialectal variation and laboratory data. May be repeated up to 3 credits.
Prerequisite(s): SPAN 561 or consent of instructor.

SPAN 563. Advanced Study in Mexican Literature
3 Credits (3)
Mexican literature from the Pre-Columbian period to the present.

SPAN 564. Advanced Post-Modern Hispanic Literature
3 Credits (3)
The advanced study of Post-Modern experimental literary genres, from Post-boom to the present.

SPAN 566. Contemporary Spanish-American Novel
3 Credits (3)
The Spanish-American novel from the 20th century to the present.

SPAN 567. Advanced Study in Chicano Literature
3 Credits (3)
Study of all genres of Chicano literature.

SPAN 570. Advanced Study in Technical Translation
3 Credits (3)
Translation of a variety of non-literary texts from English to Spanish and from Spanish to English. Course is taught in Spanish.

SPAN 573. Advanced Study in Creative Writing
3 Credits (3)

Advanced creative writing in Spanish.

SPAN 574. Advanced Pragmatics
3 Credits (3)
The study of theory and pragmatic notions such as implicatures, presuppositions, deixis, speech acts, and politeness.
Prerequisite(s): SPAN 540 or consent of instructor.

SPAN 576. Advanced Semantics
3 Credits (3)
The investigation of language from a semantic-pragmatic perspective and the use of formal logic to communicate meaning.
Prerequisite(s): SPAN 540 or consent of instructor.

SPAN 580. Research Methodology in Spanish Linguistics
3 Credits (3)
Study and practical application of techniques in linguistic research.

SPAN 583. Advanced Study in Spanish-American Women Writers
3 Credits (3)
All genres of Spanish-American literature written by women. Research paper required.

SPAN 584. Spanish Morphosyntax
3 Credits (3)
Examination of the morphological and syntactic structure of the Spanish language as well as their interaction. Practical applications are also explored.

SPAN 586. Contemporary Spanish-American Essay
3 Credits (3)
Main currents in the Spanish-American thought from the 20th century to the present.

SPAN 587. Contemporary Spanish-American Short Story
3 Credits (3)
The Spanish-American short story from the 20th century to the present.

SPAN 588. Contemporary Spanish-American Drama
3 Credits (3)
The Spanish-American drama from the 20th century to the present.

SPAN 589. Spanish Sociolinguistics
3 Credits (3)
Relationship between language and society in the Spanish-speaking world.

SPAN 590. Advanced Special Topics
3 Credits (3)
Specific subject to be announced in the Schedule of Classes. May be repeated up to 6 credits.

SPAN 591. Advanced Study in History of the Spanish Language
3 Credits (3)
The development of Spanish from its origins.

SPAN 592. Advanced Structure of Spanish
3 Credits (3)
Advanced study of Spanish linguistics topics such as phonology, morphology, syntax and semantics.

SPAN 594. Theory and Methodology of Spanish Pedagogy
3 Credits (3)
Advanced studies in current theories and methodologies of Spanish language pedagogy. Taught as a practicum.

SPAN 595. Advanced Topics in Applied Spanish Linguistics
3 Credits (3)
Selected topics to be identified by subtitle in the Schedule of Classes. May be repeated for a total of 9 credits under a different subtitle.

SPAN 597. Advanced Strategies for Teaching Spanish for Heritage/Native Speakers
3 Credits (3)
Advanced overview of the main theories, research, pedagogical approaches, assessment and practice concerning the teaching of Spanish to heritage learners and native speakers.

SPAN 598. Independent Reading, Research, and/or Creative Writing
1-3 Credits
Individual study of selected readings and problems; or individual research, either analytical or experimental, or creative writing.

SPAN 599. Master's Thesis
15 Credits
Thesis.

SPED-SPECIAL EDUCATION

SPED 2996. Topics
3 Credits (3)
Offered under various subtitles that indicate the subject matter to be covered. May be repeated up to 9 credits.
Learning Outcomes
1. Varies

SPED 3105. Introduction to Special Education in a Diverse Society
3 Credits (3)
Characteristics, identification, and educational needs of exceptional learners. Attention is given to the various types of programs serving exceptional learners. Designed for all professional personnel who work with exceptional learners. May be repeated up to 3 credits.
Learning Outcomes
1. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
3. Explain the major components of an IEP and its processes, as well as the roles of learners, families and professionals on the team.
4. Discuss the different service delivery models and discuss the principles, practices, and pragmatics of inclusion co-teaching.
5. Analyze the disability categories under (IDEA, 2004), (characteristics, etiology, and diagnostic criteria).
6. Examine educational considerations for exceptional learners (educational approaches [Universal design and differentiated instruction], assistive technology, accommodations/modifications, and related supports and services).
7. Employ culturally responsive evidence-based practices to create family/school/community partnerships to promote academic achievement and prepare students for their post-school transitions.
8. Evaluate and synthesize research literature on a selected topic from current special education research.

SPED 3110. Bilingual/Multicultural Special Education
3 Credits (3)
Introduction to issues related to the provision of services to culturally and linguistically diverse students with exceptionalities.

Learning Outcomes

1. Students will identify implicit and explicit biases.
2. Students will discuss the cultural characteristics of families from culturally and linguistically diverse backgrounds and the barriers of parent engagement in their child's education.
3. Students will identify how privilege, power, and inequities exist in the school system and how it impacts the academic achievement of students from culturally linguistically diverse (CLD) backgrounds.
4. Students will identify culturally relevant strategies to employ in the classroom to meet the individual learner needs of students from culturally and linguistically diverse backgrounds.
5. Students will develop a lesson plan that embeds culturally responsive pedagogy that addresses the individual needs of students from culturally and linguistically diverse backgrounds.

SPED 3120. Elementary Curriculum, Methods, and Materials for Special Education in a Diverse Society
3 Credits (3)

Curriculum theory and development for special education programs. Various teaching methods utilized with elementary exceptional learners and techniques involved in identifying, adapting, and developing materials will be addressed.

Corequisite: EDUC 4310, EDUC 4320, READ 4310.

Learning Outcomes

1. Evaluate historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Describe the RTI process and its role in determining eligibility for special education services.
3. Discuss learner diversity (ability, exceptionality, developmental level, learning style, language, gender, ethnicity, etc.) and employ individualized evidence-based culturally responsive instructional practices that build on learners' strengths and interests.
4. Create safe, inclusive, culturally responsive learning environments to engage learners with exceptionalities in meaningful learning activities and social interactions that develop communication, emotional well-being, positive social interactions, and self-determination.
5. Apply classroom management techniques that support learners and focus, on routines, procedures, rules, and positive behavior supports to address behavior.
6. Apply culturally responsive instructional practices to individualize learning for learners with exceptionalities; taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences for learners with exceptionalities.
7. Design differentiated lesson plans that employ the tenets of universal design.

SPED 4110. Low Incidence Disabilities in a Diverse Society
3 Credits (3)

Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations.

Learning Outcomes

1. Analyze Low Incidence Disabilities (characteristics, etiology, and diagnostic criteria) (IDEIA, 2004).
2. Identify the types of related supports and services—assistive technology, environmental and Instructional accommodations/ modifications, and related services—available to students with low incidence disabilities to maximize participation in inclusive settings.
3. Apply culturally responsive instructional practices to individualize learning for learners with low incidence disabilities, taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences of learners with low incidence disabilities in inclusive environment.
4. Employ culturally responsive strategies for creating effective family, school, community partnerships.
5. Discuss culturally responsive strategies that promote collaboration between families, schools, and community agencies/organizations during the student's transition planning process.
6. Identify current educational issues impacting students with low incidence disabilities.

SPED 4120. High Incidence Disabilities in a Diverse Society
3 Credits (3)

Examines those areas of disability that most frequently occur in the special education population, including intellectual disabilities, learning disabilities, communication disorders, and behavioral and emotional disorders.

Learning Outcomes

1. Describe and compare the major approaches to identifying, placement, assessing, planning for instruction, and classifying high incidence disabilities.
2. Identify and discuss school-based, sociological, cultural, and economic differences as they relate to etiology and identification of mild disabilities.
3. Describe and critically evaluate classroom instructional practices that can improve the educational success of students with high incidence disabilities.
4. Describe and critically evaluate classroom management practices that can improve the educational success of students with high incidence disabilities.
5. Describe how the educational experiences of persons with mild disabilities is shaped by their cognitive, perceptual, language, academic, and social / emotional characteristics.

SPED 4130. Reading for Elementary Exceptional Learners in a Diverse Society, K-6
3 Credits (3)

Emphasizes reading diagnosis and materials for students with special developmental and learning problems. Taught with SPED 5130. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate the sources of reading difficulty
2. Evaluate the characteristics exhibited by children with reading difficulties and reading disabilities.
3. Demonstrate how to use non-biased, culturally responsive assessments and progress monitoring data to monitor and evaluate reading performance to drive instruction.
4. Discuss the stages in literacy development and the factors that influence development of student literacy in reading, writing, speaking, viewing, and listening, including phonological, orthographic, semantic, and syntactic processing.
5. Implement research-based reading strategies and instruction to promote the development of print awareness, phonological and phonemic awareness, fluency, vocabulary, spelling, comprehension, reading, and writing for learners with reading difficulties.

6. Evaluate research-based strategies, methods, and commercial programs for different domains of reading.
7. Create a lesson plan and teach an elementary level reading lesson.

SPED 4140. Reading for Elementary Exceptional Learners in a Diverse Society, 7-12
3 Credits (3)
Extends information covered in SPED 5130, which covers grades K 6. Strategies and materials are addressed. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate a knowledge of the major component of the reading process.
2. Increase their repertoire of reading instruction procedures which may be used with students of differing reading abilities and from diverse backgrounds at the middle and secondary levels.
3. Increase their knowledge of theory and related discipline-specific learning strategies designed to assist middle and secondary students in reading and learning through research based practices.
4. Participate in discussion of current literacy issues.
5. Explore the presentation of new teaching and learning strategies as they are related to content area literacy.

SPED 4150. Secondary Curriculum, Methods, and Materials for Special Education in a Diverse Society
3 Credits (3)
Curriculum theory and development for elementary special education programs. Various teaching methods utilized with secondary exceptional learners and techniques for identifying, adapting, and developing materials will be addressed. Taught with SPED 5150.
Learning Outcomes
1. Discuss learner diversity (ability, exceptionality, developmental level, learning style, language, gender, ethnicity).
2. Apply effective methods for planning and implementing culturally responsive secondary differentiated content area instruction for exceptional learners in inclusive settings.
3. Identify demands of learning environments of secondary exceptional learners.
4. Identify basic classroom management theories and strategies for individuals with diverse learning needs in secondary environments.
5. Employ culturally responsive evidence-based practices to create family/school/community partnerships to promote academic achievement and prepare students for their post-school transitions.

SPED 4210. Introduction to Assessment of Diverse Exceptional Learners
3 Credits (3)
Theory and use of norm and criterion-referenced instruments and learning theories in the classroom; planning of prescriptive instructional programs. May be repeated up to 3 credits.
Learning Outcomes
1. Compare and contrast the different types of assessment and their purposes.
2. Identify legislation and litigation, which has impacted assessment.
3. Explain the applications and uses of assessments results.
4. Identify widely used (common) measures of psycho-educational assessment and their appropriate application.
5. Identify a variety of techniques for obtaining information regarding students' academic functioning and learning techniques.
6. Identify techniques for assessing students' socio-emotional functioning.
7. Outline the process for identifying exceptional learners and subsequent educational planning utilizing learning theories.
8. Analyze and identify assessment strategies for specific populations (Culturally and Linguistically Diverse, Preschool, Elementary School, etc.)
9. Integrate information gathered through comprehensive assessment procedures into a whole picture of the student's areas of strength, weakness and needs.

SPED 4220. Classroom Management for Diverse Learners
3 Credits (3)
Behavior-change strategies for exceptional learners. May be repeated up to 3 credits.
Learning Outcomes
1. Plan the organization of a classroom illustrating optimum use of instructional resources (computers, books, writing materials, reference material, manipulatives, creative constructive materials, etc.) that facilitates efficiency and effectiveness of access, use, maintenance, and storage of such resources.
2. Manage student progress data electronically for visual representation of performance for individual students and whole class averages.
3. Design the organization of the physical aspects of a classroom (furniture, areas, etc) for ease of transition, use, safety and traffic flow based on effective designs presented in the literature.
4. Establish classroom procedures and expectation (rules) to promote a positive, effective and efficient learning environment.
5. Construct the organization of a classroom schedule/time management plan that includes various content areas, instructional strategies, grouping strategies, levels of energy use, etc. Within large blocks of time or for an entire day school day.
6. Demonstrate knowledge and skill of affective domain-based theoretical models for (1) setting and managing the emotional tone of a classroom, (2) managing the psycho-social atmosphere of the classroom and individual students, and (3) managing motivation of students to succeed in learning academic content, social skills, self-responsibility skills, and inter-relationship skills with other class members.
7. Analyze a given classroom situation for legal, ethical and professional issues and concerns, by applying legal, ethical, and professional reactions to the situation and provide resolutions to align the classroom legally, ethically, and professionally. This will include all legal bases (state and federal) involving all students, including students with disabilities, ESL and at-risk students.
8. Observe, analyze and document student behavior to match an appropriate intervention strategy to change behavior in a desired direction. This will also include the successful implementation of behavior management strategies for entire classes, small groups, and individual students along with development and maintenance of electronic data collection graphing and analysis.

SPED 4310. Introduction to Autism
3 Credits (3)
This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Taught with SPED 5310 and SPED 6310. May be repeated up to 3 credits.
Learning Outcomes
1. Analyze Autism Spectrum Disorders ASD (characteristics, etiology, co-morbid conditions, differential diagnosis).

2. Describe the criteria used to screen and diagnose ASD.
3. Examine evidence-based practices used to effectively support students with ASD in accessing general education and grade level standards (classroom structure, differentiated instruction, peer mediated supports, structured teaching, and emotional supports).
4. Describe strategies related to promoting a successful transition from school to adult life for individuals with ASD.
5. Examine the strategies for effective collaboration and communication with families of children with ASD and key stakeholders for the purpose of information sharing and collaborative planning with families.
6. Identify and investigate current educational issues impacting students with ASD.

SPED 4320. Behavior and Autism
3 Credits (3)
This course will cover the first of the triad of impairments. Students will gain an understanding of the behaviors of children with autism. Students will examine several behavior management philosophies and research based interventions and how they can be applied in the educational setting. Attention will also be given to play skills. The family perspective and participation in the proactive behavior management process will be incorporated throughout the course. Taught with SPED 532 with differentiated assignments. May be repeated up to 3 credits.
Prerequisite/Corequisite: SPED 4310 or SPED 5310 or SPED 6310.
Learning Outcomes
1. Explain the definition of Autism Spectrum Disorder (ASD) and associated characteristics of students with ASD as measured by required readings, discussions, and article reviews.
2. Explain behavior impairments and characteristics associated with students with ASD as measured by required readings, discussions, and article reviews
3. Explain Applied Behavior Analysis strategies as measured by completion of required paper(s) summarizing peer-reviewed journal article related to diversity, behavior management interventions, and/or behavior analysis.
4. Explain information related to individuals with ASD and behavior challenges as measured by participation in online chat with instructor or group power point presentation.
5. Discuss evidence-based treatment approaches that are useful in improving behavior management skills of students with ASD as measured by participation in required readings and discussions

SPED 4330. Social Skills and Autism
3 Credits (3)
This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 5330 and SPED 6330 with differentiated assignments. May be repeated up to 3 credits.
Prerequisite/Corequisite: SPED 4310 or SPED 5310 or SPED 6310.
Learning Outcomes
1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate Social Skills characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess Social Skills problems in children with ASD.
4. Use assessment results to identify the Social Skills needs of children with ASD
5. Analyze the types of evidence-based practices used to address the Social Skills needs of children with ASD.
6. Design an intervention plan to address the Social Skills needs of a child with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.
8. Employ data collection procedures to evaluate the effectiveness of evidence-based practices for students with ASD.

SPED 4340. Communication and Autism
3 Credits (3)
This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 5340 and SPED 640 with differentiated assignments. May be repeated up to 3 credits.
Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.
Learning Outcomes
1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate communication characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess communication problems in children with ASD.
4. Analyze the types of interventions used to address the communication needs of children with ASD.
5. Design an intervention plan to address the communication needs of a child with ASD.
6. Employ data collection procedures to evaluate the effectiveness of research-based interventions for students with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.

SPED 4810. Early Childhood SPED Student Teaching
9 Credits (9P)
Synthesis of knowledge and skills appropriate to teaching in PreK - 3rd grade educational settings. Restricted to: TEP-ECED majors. Grading (S/U, Audit). Students must be Admitted into student teaching.
Corequisite: ECED 4810.
Learning Outcomes
1. Varies.

SPED 4811. Practicum in Education, Equity and Cultural Diversity
3 Credits (3)
This is a supervised experience in providing special education services to local preK-12 students. In the context of the public school classroom, teacher candidates are guided to apply content knowledge from the seminar meetings and from prior coursework. Restricted to: SPED majors.
Prerequisite: SPED 3105 and SPED 3120 or consent of instructor.

Learning Outcomes

1. Candidates demonstrate an understanding of the critical concepts and principles in their discipline and of the pedagogical content knowledge necessary to engage students' learning of concepts and principles in the discipline.
2. Candidates create and implement learning experiences that motivate K-8 students, establish a positive learning environment, and support K-8 students' understanding of the central concepts and principles in the content discipline.
3. Candidates design, adapt, and select a variety of valid and reliable assessments and employ analytical skills necessary to inform ongoing planning and instruction, as well as to understand, and help students understand their own, progress and growth.
4. Candidates engage students in reasoning and collaborative problem solving related authentic local, state, national, and global issues, incorporating new technologies and instructional tools appropriate to such tasks.
5. Candidates design and implement appropriate and challenging learning experiences, based on an understanding of how children learn and develop and they ensure inclusive learning environments that encourage and help all K-8 students reach their full potential across a range of learner goals.
6. Candidates work with K-8 students and families to create classroom cultures that support individual and collaborative learning and encourage positive social interaction, engagement in learning, and independence.
7. Candidates build strong relationships with students, families, colleagues, other professionals, and community members, so that all are communicating effectively and collaborating for student growth, development, and well-being.
8. Candidates reflect on their personal biases and access resources that deepen their own understanding of cultural, ethnic, gender, sexual orientation, language, and learning differences to build stronger relationships and to adapt practice to meet the needs of each learner.
9. Candidates use research and evidence to continually evaluate and improve their practice, particularly the effects of their choices and actions on others, and they adapt their teaching to meet the needs of each learner.

SPED 4820. Student Teaching SPED
9 Credits (9)

Supervised teaching in a special education classroom and participation in a required seminar. Students must be admitted to student teaching program in order to enroll. Restricted to: SPED majors.

Prerequisite: SPED 4811.

Learning Outcomes

1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

SPED 4830. Special Education/Elementary Student Teaching Seminar
3 Credits (3)

Discussion of elementary Special Education school issues related to student teaching.

Prerequisite: SPED 4811.

Corequisite: SPED 4820.

Learning Outcomes

1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.
4. The teacher candidate understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.
5. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.
6. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
7. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.
8. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.
9. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner. 1
10. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

SPED 4840. Special Education/ Secondary Student Teaching Seminar
3 Credits (3)

Discussion of secondary school issues related to student teaching.

Prerequisite: SPED 4821.

Corequisite: SPED 4820.

Learning Outcomes

1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social,

emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.
4. The teacher candidate understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.
5. The teacher candidate understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.
6. The teacher candidate understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
7. The teacher candidate plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.
8. The teacher candidate understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.
9. The teacher candidate engages in ongoing professional learning and uses evidence to continually evaluate his/her practice, particularly the effects of his/her choices and actions on others (learners, families, other professionals, and the community), and adapts practice to meet the needs of each learner. 1
10. The teacher candidate seeks appropriate leadership roles and opportunities to take responsibility for student learning, to collaborate with learners, families, colleagues, other school professionals, and community members to ensure learner growth, and to advance the profession.

SPED 4992. Directed Study courses in Special Education
1-3 Credits (1-3)
Each course shall be identified by a qualifying subtitle. A maximum of 3 credits per semester and a grand total of 9 credits. May be repeated up to 9 credits.
Learning Outcomes
1. Varies

SPED 4996. Topics
3 Credits (3)
Offered under various subtitles which indicate the subject matter to be covered. May be repeated up to 9 credits.
Learning Outcomes
1. Varies

SPED 5105. Introduction to Special Education in a Diverse Society
3 Credits (3)
This course introduces the field of special education to regular educators. May be repeated up to 3 credits.
Learning Outcomes
1. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Discuss historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
3. Explain the major components of an IEP and its processes, as well as the roles of learners, families and professionals on the team.
4. Discuss the different service delivery models and discuss the principles, practices, and pragmatics of inclusion co-teaching.
5. Analyze the disability categories under (IDEA, 2004), (characteristics, etiology, and diagnostic criteria).
6. Examine educational considerations for exceptional learners (educational approaches [Universal design and differentiated instruction], assistive technology, accommodations/modifications, and related supports and services).
7. Employ culturally responsive evidence-based practices to create family/school/community partnerships to promote academic achievement and prepare students for their post-school transitions.
8. Evaluate and synthesize research literature on a selected topic from current special education research.

SPED 5110. Low Incidence Disabilities in a Diverse Society
3 Credits (3)
Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations. Taught with SPED 6110 with differentiated assignments. May be repeated up to 3 credits.
Learning Outcomes
1. Analyze Low Incidence Disabilities (characteristics, etiology, and diagnostic criteria) (IDEIA, 2004).
2. Identify the types of related supports and services—assistive technology, environmental and Instructional accommodations/modifications, and related services—available to students with low incidence disabilities to maximize participation in inclusive settings.
3. Apply culturally responsive instructional practices to individualize learning for learners with low incidence disabilities, taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences of learners with low incidence disabilities in inclusive environment.
4. Employ culturally responsive strategies for creating effective family, school, community partnerships.
5. Discuss culturally responsive strategies that promote collaboration between families, schools, and community agencies/organizations during the student's transition planning process.
6. Identify current educational issues impacting students with low incidence disabilities.

SPED 5120. High Incidence Disabilities in a Diverse Society
3 Credits (3)
Examines those areas of disability that most frequently occur in the special education population, including intellectual disabilities, learning disabilities, communication disorders, and behavioral and emotional disorders. May be repeated up to 3 credits.
Learning Outcomes
1. Describe and compare the major approaches to identifying, placement, assessing, planning for instruction, and classifying high incidence disabilities.

2. Identify and discuss school-based, sociological, cultural, and economic differences as they relate to etiology and identification of mild disabilities.
3. Describe and critically evaluate classroom instructional practices that can improve the educational success of students with high incidence disabilities.
4. Describe and critically evaluate classroom management practices that can improve the educational success of students with high incidence disabilities.
5. Describe how the educational experiences of persons with mild disabilities is shaped by their cognitive, perceptual, language, academic, and social / emotional characteristics.

SPED 5130. Reading for Elementary Exceptional Learners in a Diverse Society, K-6
3 Credits (3)
Emphasizes reading diagnosis and materials for students with special developmental and learning problems. Taught with SPED 4130. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate the sources of reading difficulty
2. Evaluate the characteristics exhibited by children with reading difficulties and reading disabilities.
3. Demonstrate how to use non-biased, culturally responsive assessments and progress monitoring data to monitor and evaluate reading performance to drive instruction.
4. Discuss the stages in literacy development and the factors that influence development of student literacy in reading, writing, speaking, viewing, and listening, including phonological, orthographic, semantic, and syntactic processing.
5. Implement research-based reading strategies and instruction to promote the development of print awareness, phonological and phonemic awareness, fluency, vocabulary, spelling, comprehension, reading, and writing for learners with reading difficulties.
6. Evaluate research-based strategies, methods, and commercial programs for different domains of reading.
7. Create a lesson plan and teach an elementary level reading lesson.

SPED 5140. Reading for Secondary Exceptional Learners in a Diverse Society, 7-12
3 Credits (3)
Extends information covered in SPED 5130, which covers grades K 6. Strategies and materials are addressed. Taught with SPED 4140. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate a knowledge of the major component of the reading process.
2. Increase their repertoire of reading instruction procedures which may be used with students of differing reading abilities and from diverse backgrounds at the middle and secondary levels.
3. Increase their knowledge of theory and related discipline-specific learning strategies designed to assist middle and secondary students in reading and learning through research based practices.
4. Participate in discussion of current literacy issues.
5. Explore the presentation of new teaching and learning strategies as they are related to content area literacy.

SPED 5150. Curriculum, Methods, and Materials for Secondary Special Education
3 Credits (3)
Curriculum theory and development for elementary special education programs. Various teaching methods utilized with secondary exceptional learners and techniques for identifying, adapting, and developing materials will be addressed. May be repeated up to 3 credits.

SPED 5160. Technology and Exceptionality in a Diverse Society
3 Credits (3)
This class will address the unique educational needs of learners with exceptionalities, and will provide information and practice in addressing those needs through the use of technology-based interventions. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate familiarity in variety of assistive technology devices and services that are abailable for students with diverse range of disabilities
2. Demonstrate an understanding of functional approaches to the assessment of assistive technology needs.
3. Describe and implement inter disciplinary approaches to the assessment, selection and the use of technolgy to meet the educational and transitional demands of individuals with diverse range of disabilities.
4. Identify and describe the function of the range of assistive technology devices and services in diverse settings.
5. Demonstrate an understanding of the legal obligations of different entities in providing training and services that are relevant to assistive technologies.

SPED 5210. Introduction to Assessment of Diverse Exceptional Learners
3 Credits (3)
Required for students seeking licensure at graduate level. Theory and use of norm-and criterion-referenced instruments and learning theories in the classroom; planning of prescriptive instructional programs with differentiated assignments for graduate students. Restricted to: SPED majors.

SPED 5220. Classroom Management for Diverse Learners
3 Credits (3)
Behavior-change strategies for exceptional learners. Taught with SPED 4220 with differentiated assignments for graduate students. May be repeated up to 3 credits.

SPED 5230. Advanced Curriculum for Diverse Exceptional Learners
3 Credits (3)
Strategies for developing curricula appropriate to handicapped and gifted learners. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate historical and current legislation pertaining to exceptional learners and their families and its impact on professional practice in the field.
2. Describe the RTI process and its role in determining eligibility for special education services.
3. Discuss learner diversity (ability, exceptionality, developmental level, learning style, language, gender, ethnicity, etc.) and employ individualized evidence-based culturally responsive instructional practices that build on learners' strengths and interests.
4. Create safe, inclusive, culturally responsive learning environments to engage learners with exceptionalities in meaningful learning activities and social interactions that develop communication, emotional well-being, positive social interactions, and self-determination.
5. Apply classroom management techniques that support learners and focus, on routines, procedures, rules, and positive behavior supports to address behavior.

6. Apply culturally responsive instructional practices to individualize learning for learners with exceptionalities; taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences for learners with exceptionalities.
7. Design differentiated lesson plans that employ the tenets of universal design.

SPED 5310. Introduction to Autism
3 Credits (3)
This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and family issues. Taught with SPED 4310 and SPED 6310. Differentiated Assignments. May be repeated up to 3 credits.
Learning Outcomes
1. Analyze Autism Spectrum Disorders ASD (characteristics, etiology, co-morbid conditions, differential diagnosis).
2. Describe the criteria used to screen and diagnose ASD.
3. Examine evidence-based practices used to effectively support students with ASD in accessing general education and grade level standards (classroom structure, differentiated instruction, peer mediated supports, structured teaching, and emotional supports).
4. Describe strategies related to promoting a successful transition from school to adult life for individuals with ASD.
5. Examine the strategies for effective collaboration and communication with families of children with ASD and key stakeholders for the purpose of information sharing and collaborative planning with families.
6. Identify and investigate current educational issues impacting students with ASD.

SPED 5320. Behavior and Autism
3 Credits (3)
This course will cover the first of the triad of impairments. Students will gain an understanding of the behaviors of children with autism. Students will examine several behavior management philosophies and research based interventions and how they can be applied in the educational setting. Attention will also be given to play skills. The family perspective and participation in the proactive behavior management process will be incorporated throughout the course. Taught with SPED 4320 and SPED 6320 with differentitated assignments. May be repeated up to 3 credits.
Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.
Learning Outcomes
1. Explain the definition of Autism Spectrum Disorder (ASD) and associated characteristics of students with ASD as measured by required readings, discussions, and article reviews.
2. Explain behavior impairments and characteristics associated with students with ASD as measured by required readings, discussions, and article reviews
3. Explain Applied Behavior Analysis strategies as measured by completion of required paper(s) summarizing peer-reviewed journal article related to diversity, behavior management interventions, and/or behavior analysis.
4. Explain information related to individuals with ASD and behavior challenges as measured by participation in online chat with instructor or group power point presentation.
5. Discuss evidence-based treatment approaches that are useful in improving behavior management skills of students with ASD as measured by participation in required readings and discussions

SPED 5330. Social Skills and Autism
3 Credits (3)
This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 4330 and SPED 6330 with differentiated assignments. May be repeated up to 3 credits.
Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.
Learning Outcomes
1. Understand and explore the foundations of TESOL instruction.
2. Analyze the sociocultural theory of teaching English as a second/foreign language.
3. Demonstrate an understanding of culturally responsive pedagogy in language teaching and academic achievement.
4. Evaluate principles of best practices instruction and applications of TESOL methods.
5. Explore assessment issues and concepts related to English Language Learners.
6. Examine the impact of polices, national laws, school and community partnerships, and personal professional development on TESOL instruction.
7. Develop, select, and implement second language teaching methods.

SPED 5340. Communication and Autism
3 Credits (3)
This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 4340 and SPED 6340 with differentiated assignments. May be repeated up to 3 credits.
Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.
Learning Outcomes
1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate communication characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess communication problems in children with ASD.
4. Analyze the types of interventions used to address the communication needs of children with ASD.
5. Design an intervention plan to address the communication needs of a child with ASD.
6. Employ data collection procedures to evaluate the effectiveness of research-based interventions for students with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.

SPED 5405. Foundations of Visual Impairment
3 Credits (3)
This course provides an overview of the history and theory of teaching students with visual impairments, including those with additional disabilities. The impact of educational, legislative, and societal trends on the psychosocial adjustment, quality of life, and post-school outcomes of individuals with visual impairments is explored. May be repeated up to 3 credits.

Learning Outcomes

1. Differentiate between the impact that visual impairment (both congenital and adventitious) has on a child's/youth's cognitive, language, communication, motor, social-emotional, and autonomous development.
2. Predict the impact that familial, societal, cultural, and professional attitudes have on the self-esteem/self-identity of a child/youth who has a visual impairment and propose culturally responsive strategies to combat low self-esteem/lack of self-acceptance.
3. Identify appropriate educational adaptations, including universal design for learning principles, for teaching students with visual impairments based on predominant sensory channel(s).
4. Describe the prevalence and incidence of visual impairment, educational and legal classifications, service delivery options and regulations, and the roles of educational staff.
5. Analyze how historical foundations shape current issues and trends in the education of students who are visually impaired.
6. Locate sources of specialized materials, service networks, consumer/parent organizations, and professional associations and publications.

SPED 5410. Functional Implications of Low Vision
3 Credits (3)
This course examines the structure and function of the visual system in relation to associated diseases and syndromes with an emphasis on measuring functional vision and determining appropriate educational adaptations. Consent of Instructor required. May be repeated up to 3 credits.
Prerequisite: SPED 5405.

Learning Outcomes

1. Use basic terminology to describe the structure and functions of the visual system and describe how the visual system typically develops.
2. Identify the etiology and characteristics of the most common eye conditions and their impact on the development and education of individuals who have these conditions.
3. Describe effects of medications on the visual system and on visual performance, Select, adapt, and use appropriate instruments for assessing functional vision, Follow legal, ethical, and technical procedures while conducting vision screenings or functional vision evaluations in order to determine educational services (including eligibility) and supports.
4. Interpret the results of vision screenings, eye reports, and functional vision evaluations in ways that help students, families and other members of the educational team understand the impact the visual impairment has on learning, experience, and social-emotional well-being.
5. Select individualized strategies for the enhancement of visual/sensory efficiency (including the use of environmental modifications, print material adaptations, optical aids, and non-optical aids) based on performance/assessment data

SPED 5420. Strategies for Teaching Students with Visual and Multiple Impairments
3 Credits (3)
This course defines the roles and responsibilities of the teacher of students with visual impairments as part of the transdisciplinary team that serves students with visual impairments and additional disabilities. Emphasis is on assessment, curricula (both academic and functional), communication, behavior management, assistive technologies, inclusion, transition, and independent living. Consent of Instructor required. May be repeated up to 3 credits.
Prerequisite: SPED 5410.

Learning Outcomes

1. Describe the impact that a concomitant visual impairment and additional disability has on a child's/youth's cognitive, language, communication, motor, social-emotional, autonomous, and sensory development.
2. Recommend appropriate educational and environmental adaptations, including access technologies, for students with concomitant disabilities (including a visual impairment) related to the core curriculum (especially literacy) that are based on their unique needs, which transcend the effects of each individual disability.
3. Recommend appropriate educational and environmental adaptations, including access technologies, for students with concomitant disabilities (including a visual impairment) related to the expanded core curriculum that are based on their unique needs, which transcend the effects of each individual disability.
4. Choose specialized assessment tools appropriate for learners with visual impairments and additional disabilities.
5. Summarize special considerations related to eligibility determination, educational placement, and service delivery models for students with visual impairments and additional disabilities.
6. Describe special considerations related to effective collaboration with educators, related service providers, educational assistants, community agencies, and families of students with visual impairments and additional disabilities

SPED 5430. Braille I: Literacy for Students with Visual Impairments
3 Credits (3)
This course facilitates an in depth study of the Uncontracted and Contracted Literary Braille codes as well as methods of teaching pre-braille, braille reading, and braille writing skills to tactual learners. Consent of Instructor required. May be repeated up to 3 credits.
Prerequisite: SPED 5450.

Learning Outcomes

1. Transcribe print content into Unified English Braille following appropriate formatting rules.
2. Read, interline, and proof materials transcribed in Unified English Braille.
3. Read, interline, and proof materials produced in English Braille American Edition.
4. Transcribe, print content into a foreign language using the appropriate braille code.
5. Read, interline, and proof materials produced in foreign language braille.
6. Transcribe a simple score in music braille.
7. Read and interline a simple score in music braille.
8. Produce braille materials using various tools, including a Perkins Brailler, slate and stylus, and six-key keyboard entry.

9. Delineate the ways that congenital and adventitious visual impairments impact literacy and the unique instructional strategies used with each of these groups. 1
10. Identify pre-braille activities that develop essential tactual, motor, and reading readiness skills. 1
11. Compare language arts and braille curricula/assessments for different types of tactual learners. 1
12. Identify sources for obtaining braille resources, services and supports

SPED 5440. Braille II: Numeracy for Students with Visual Impairments
3 Credits (3)
This course facilitates an indepth study of the Nemeth Braille Code for Mathematics and Science Notation as well as instructional strategies for using the abacus and developing numeracy. Specialized braile codes for computers, music, and foreign languages will be introduced. Consent of Instructor required. May be repeated up to 3 credits.
Prerequisite: SPED 5430.
Learning Outcomes
1. Transcribe mathematical and scientific notation into Nemeth Braille following appropriate rules.
2. Read, and proof materials transcribed in Nemeth Braille
3. Transcribe, print content into a foreign language using the appropriate braille code.
4. Read, interline, and proof materials produced in foreign language braille.
5. Transcribe a simple score in music braille.
6. Read and interline a simple score in music braille.
7. Produce braille materials, including tactile graphics, using various tools, including a Perkins Brailler, six-key keyboard entry, braille translation software, and tactile graphics.
8. Create different task analysis on computational steps for solving problems with the Cranmer abacus using both the counting and indirect methods for beginning abacus users and aligning them to numeracy standards.
9. Delineate the ways that visual impairment impacts literacy and numeracy and describe adapted instructional and assessment materials and resources that make math meaningfully accessible. 1
10. Delineate the ways that visual impairment impacts scientific understandings and describe adapted instructional and assessment materials and resources that make science and social studies meaningfully accessible. 1
11. Delineate the ways that visual impairment impacts understanding of health and sexuality and describe adapted instructional and assessment materials and resources that make health and sex education meaningfully accessible

SPED 5450. Strategies for Teaching Students with Visual Impairments
3 Credits (3)
This course covers individualized educational programming in both the core and expanded core curriculums for children and youth with visual impairments with an emphasis on assessment, curricular adaptions, IFSP/IEP/ITP planning, and evidence-based practices. Restricted to: SPED majors. Consent of Instructor required. May be repeated up to 3 credits.
Prerequisite: SPED 5410.
Learning Outcomes
1. The learner will analyze core curriculum standards and benchmarks in order to determine necessary instruction in the expanded core curriculum so that learners with visual impairments can meaningfully participate in the common core curriculum.
2. The learner will describe professional roles and ethical responsibilities of the teacher of students with visual impairments in relation to effective collaboration with all members of the educational team (particularly families, para educators, and general educators).
3. The learner will select, adapt, and use appropriate assessments for determining effective and efficient primary and secondary learning modalities, literacy media, and access technologies needed for reading and writing.
4. The learner will follow legal, ethical, and technical procedures while conducting learning media assessments and access technology evaluations, reporting findings, and making recommendations regarding necessary educational services and supports.
5. The learner will demonstrate the procurement and use of different access technologies needed to make educational materials and learning activities accessible to learners with visual impairments

SPED 5460. Introduction to Orientation and Mobility
3 Credits (3)
This course provides an overview of the history and theory of formalized orientation and mobility instruction as it relates to the ability to live independently. The impact of visual impairment and concomittant impairments on the development of spatial concepts and motor skills in relation to independent locomotion is emphasized. Topics covered include mobility aids; navigation, familiarization, and protective techniques; structured pre-cane assessment and instruction; the development and use of tactual maps; and the relationship of orientation and mobility to other areas of the expanded core curriculum. Consent of Instructor required. Restricted to: SPED,EDUC majors. Consent of Instructor required. May be repeated up to 3 credits.
Prerequisite: SPED 5420.
Learning Outcomes
1. Describe components of orientation and mobility, the role of the certified orientation and mobility specialist, and the role of the teacher of students with visual impairments/developmental vision specialist in teaching travel skills to students who are blind and visually impaired, including those with additional disabilities.
2. Describe significant historical events and legal provisions related to the formalized profession of orientation and mobility and how this affects the provision of orientation and mobility services.
3. Identify the pros, cons, and prerequisite skills related to different modes of mobility and use of different mobility aids and transportation systems.
4. Describe the impact of impaired vision on cognitive, motor, language, social, and self-help skills and effective interventions that promotes the development of independent locomotion and personal autonomy.
5. Execute (and teach the execution of) basic orientation and mobility techniques under conditions that simulate various degrees of visual and additional impairments using all available sensory information (with and without optical aids) in a variety of environments.
6. Task analyze and adapt activities of daily living to allow individuals with visual impairments to lead productive and healthy lifestyles.
7. Identify sources of adapted products and specialized assessments related to the Expanded Core Curriculum that facilitate participation in home, work, and community activities for employment, self-care, and leisure

SPED 5470. Beginning Orientation and Mobility
3 Credits (3)
This course provides an overview of the profession of orientation and mobility and how sensory, motor, and psychosocial function affects

movement and spatial orientation. Consent of Instructor required. Restricted to: SPED majors. May be repeated up to 3 credits.
Prerequisite: SPED 5460.

Learning Outcomes

1. Describe how perception and movement develops and is used to enhance safe and independent travel
2. Describe how a traveler is able to acquire, maintain and improve orientation
3. Describe the most common functional mobility problems for students with low vision and what a COMS should consider when providing OM instruction to students with low vision.
4. Describe how development impacts movement and describe issues that impact gait and posture. Describe ways to support and improve sensorimotor development.
5. Describe the psychosocial factors that impact behavior as one learns how to travel and describe ways to teach travelers to deal with
6. Describe the fundamentals of hearing including principles of sound, audition, localization and traffic sounds. Describe ways to develop and improve orientation using hearing
7. Describe the origins of the OM profession and its progression into the present, how OM services are provided around the world and the fundamentals of research in the profession.
8. Evaluate and synthesize literature (publications, research literature) on a selected topic of their choice

SPED 5480. Intermediate Orientation and Mobility
3 Credits (3)

This course focuses on strategies and methods for conducting assessments and appropriately sequencing skill acquisition for learners across the lifespan who may or may not have additional disabilities. Adaptive technology and other aids that assist with travel in a variety of environmental conditions using different mobility systems will also be covered. Consent of Instructor required. Restricted to: SPED majors. May be repeated up to 3 credits.
Prerequisite: SPED 5470.

Learning Outcomes

1. Determine how to modify orientation and mobility instruction, depending on the age of the students, in the following ways: A) describe ways to teach OM to very young children; B) describe ways to teach OM to school age children; C) describe ways to teach OM to adults; and D) describe ways to teach OM to older adults.
2. Demonstrate an understanding of mobility systems and adaptations used by blind and visually impaired travelers in the following ways: A) describe how adaptive technology is used in travel; B) describe how dog guides are used in travel; C) describe orientation aids that can be used for students with vision loss; D) describe issues around environmental accessibility for student with vision loss; and E) describe how to teach OM in adverse weather conditions
3. Demonstrate understanding of how to teach OM to students who have different disabilities in the following ways: A) describe ways to teach OM to learners with vision and hearing loss; B) describe ways to teach OM to learners with vision, physical and health impairments; C) describe ways to teach OM to learners with cognitive impairments and vision loss; D) describe ways to teach OM to learners with cortical visual impairments; and E) describe how to teach travel skills to learners with nonvisual disabilities
4. Conduct an OM assessment and teach OM in the following ways: A) describe the components of a comprehensive OM assessment; B) describe creative ways to provide OM instruction; C) describe theories and best practices for teaching orientation and mobility; and D) describe ways to teach concepts creatively

SPED 5490. Advanced Orientation and Mobility
3 Credits (3)

This course focuses on the development and monitoring of cane skills needed for safe and efficient travel in indoor, residential, and business districts, including the use of public transportation systems. Development, administration, and supervision of orientation and mobility services is also covered. Consent of Instructor required. Restricted to: SPED majors. May be repeated up to 3 credits.
Prerequisite: SPED 5480.

Learning Outcomes

1. Use orientation and mobility techniques to travel independently, safely and efficiently in a variety of environments including indoor, residential, small business and business areas while blindfolded or under low vision simulator.
2. Provide appropriate and safe orientation and mobility instruction to fellow students, who are blindfolded or wearing low vision simulators, while traveling in indoor, residential, small business and business areas
3. Describe modifications to traditional OM techniques for diverse learners of various ages with different degrees of visual functioning and with a variety of additional disabilities
4. Use public transportation while blindfolded or under low vision simulatorand provide instruction to fellow students who are blindfolded or wearing low vision simulators in the use of public transportation
5. Critically analyze one's teaching and monitoring through self-observation and reflective practices

SPED 5810. Student Teaching SPED
6 Credits (6)

Culminating course required for graduate level students seeking initial licensure. Students must have completed a Bachelor's degree and be admitted to student teaching program to enroll. Restricted to: SPED majors.
Prerequisite: SPED 5811.

Learning Outcomes

1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

SPED 5811. Field Experience in Education, Equity & Cultural Diversity
3 Credits (3)

This is a supervised experience in providing special education services to local preK-12 students. In the context of the public school classroom, teacher candidates are guided to apply content knowledge from the seminar meetings and from prior coursework. This experience is designed for both the practicing general education classroom teacher pursuing special education licensure and for graduate teacher candidates pursuing initial special education licensure. Restricted to: SPED majors.

Prerequisite: SPED 3105 and SPED 3120, or SPED 5105 and SPED 5230, or consent of instructor.

Learning Outcomes

1. Learners will demonstrate critical thinking skills and critical reflection and use current special education research to make and evaluate instructional decisions across the full range of learning tasks (including identifying appropriate learning objectives, selecting methods and materials, assessing student progress in relation to learning objectives, making classroom management decisions, and evaluating the results of decisions and implementation of lessons).
2. Learners will create access to grade level general education curriculum for a broad range of students with diverse learning needs. This will be accomplished by using grade level standards and extended standards (as appropriate), following the requirements expressed in IEP's, and designing and implementing appropriate instruction that addresses students' needs, learning styles, motivation, and cultural and linguistic differences. Universal design, differentiation, accommodation, and modification will be used to address diverse learning needs.
3. Learners will further develop, refine, and demonstrate the dispositions necessary to enter student teaching, with the ultimate goal of entering and advancing the teaching profession. This includes a) building rapport, positive communication, and a cooperative work environment with students, families, teachers, supervisors, instructors, educational/instructional assistants, service providers, and others in the school community b) demonstrating respectful and responsive attitudes toward individuals with exceptionalities from diverse backgrounds, as well as their families and service providers c) demonstrating responsible task performance d) adhering to the CEC code of ethics and university/site policies and procedures.
4. Learners will select and use appropriate technology to support student learning.
5. Learners will apply knowledge of the historical background and current laws and procedures within the field of special education to contextualize, explain, and evaluate special education services.

SPED 5820. Masters Degree Seminar
3 Credits (3)

Capstone review of current issues in special education. Each student will participate in a practice comprehensive oral exam. May be repeated up to 3 credits.

Learning Outcomes

1. Varies

SPED 5830. Special Education/Elementary Student Teaching Seminar
3 Credits (3)

Discussion of elementary Special Education school issues related to student teaching.

Prerequisite: SPED 5811.

Corequisite: SPED 5810.

Learning Outcomes

1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

SPED 5840. Special Education/Secondary Student Teaching Seminar
3 Credits (3)

Discussion of secondary Special Education school issues related to student teaching.

Prerequisite: SPED 5811.

Corequisite: SPED 5810.

Learning Outcomes

1. The teacher candidate understands how learners grow and develop, recognizing that patterns of learning and development vary individually within and across the cognitive, linguistic, social, emotional, and physical areas, and designs and implements developmentally appropriate and challenging learning experiences.
2. The teacher candidate uses understanding of individual differences and diverse cultures and communities to ensure inclusive learning environments that enable each learner to meet high standards.
3. The teacher candidate works with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation.

SPED 5850. Current Research in Special Education
3 Credits (3)

Current investigations and research techniques. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate current research in special Education.
2. Read and evaluate original research articles published in peer reviewed academic journals.
3. Describe the elements of research.
4. Analyze the designs, methods, and applications of quantitative research in special education
5. Analyze the designs, methods, and applications of qualitative research in special education
6. Examine ethical issues and guidelines for conducting special education research.
7. Evaluate the elements of a research proposal.

SPED 5860. Current Issues in Special Education for Teaching in Culturally Responsive Society
3 Credits (3)

Theoretical and empirical bases for special education practices. Skill development in critical thinking, reading, and writing in relation to contemporary problems. Taught with SPED 6860. May be repeated up to 3 credits.

Learning Outcomes

1. Students will learn several concepts, issues, and theories in contemporary special education in order to be a more intelligent consumer of information about special education.
2. Students will analyze, evaluate, and make decisions concerning complex contemporary issues in special education.
3. Students will demonstrate communications skills, both written and oral, in order to enhance their effectiveness in expressing their view on the issues related to special education.
4. Students will examine issues related to the human experience as it relates to diversity and a culturally and linguistically diverse world.

5. Students will debate the pros and cons of current special education issues

SPED 5870. Early Childhood SPED Student Teaching
6 Credits (6)
A student teaching experience designed for students studying early childhood special education. Restricted to TEP-ECED majors. Students must be admitted to student teaching to enroll. May be repeated up to 9 credits.
Learning Outcomes
1. Our mission is to serve the people of New Mexico through education, research, extension education, and public service with specific emphasis on innovative practices, overcoming barriers to learning, international activities, technology, and literacy for the diverse populations of New Mexico, surrounding states and border communities.

SPED 5990. Practicum in Reading Disabilities
3 Credits (3)
Supervised experience in assessing a student with reading disability, developing and intervention plan, and implementing and monitoring the interventions across time. May be repeated up to 3 credits.
Learning Outcomes
1. Varies

SPED 5991. Special Research Problems
1-3 Credits (1-3)
Individual investigation either analytical or experimental. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

SPED 5996. Topics in Special Education
1-3 Credits (1-3)
Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester. May be repeated up to 6 credits.
Learning Outcomes
1. Varies

SPED 5999. Master's Thesis
1-15 Credits (1-15)
Thesis. May be repeated up to 88 credits.
Learning Outcomes
1. Varies

SPED 6110. Low Incidence Disabilities
3 Credits (3)
Examines those disabilities that occur less frequently in the special education population, including hearing loss, visual disorders, autism, and other severe manifestations. Taught with SPED 5110 with differentiated assignments. May be repeated up to 3 credits.
Learning Outcomes
1. Analyze Low Incidence Disabilities (characteristics, etiology, and diagnostic criteria) (IDEIA, 2004).
2. Identify the types of related supports and services—assistive technology, environmental and Instructional accommodations/ modifications, and related services—available to students with low incidence disabilities to maximize participation in inclusive settings.
3. Apply culturally responsive instructional practices to individualize learning for learners with low incidence disabilities, taking into consideration individual abilities, interests, learning environments, and cultural and linguistic factors in the planning, selection, development, and adaptation of learning experiences of learners with low incidence disabilities in inclusive environment.
4. Employ culturally responsive strategies for creating effective family, school, community partnerships.
5. Discuss culturally responsive strategies that promote collaboration between families, schools, and community agencies/organizations during the student's transition planning process.
6. Identify current educational issues impacting students with low incidence disabilities.

SPED 6120. High Incidence Disabilities in a Diverse Society
3 Credits (3)
Examines those areas of disability that most frequently occur in the special education population, including mental retardation, learning disabilities, communication disorders, and behavioral and emotional disorders. Taught with SPED 5120. Master's Degree. Restricted to SPED and C D majors. May be repeated up to 3 credits.
Learning Outcomes
1. Describe and compare the major approaches to identifying, placement, assessing, planning for instruction, and classifying high incidence disabilities.
2. Identify and discuss school-based, sociological, cultural, and economic differences as they relate to etiology and identification of mild disabilities.
3. Describe and critically evaluate classroom instructional practices that can improve the educational success of students with high incidence disabilities.
4. Describe and critically evaluate classroom management practices that can improve the educational success of students with high incidence disabilities.
5. Describe how the educational experiences of persons with mild disabilities is shaped by their cognitive, perceptual, language, academic, and social / emotional characteristics.

SPED 6160. Technology and Exceptionality in a Diverse Society
3 Credits (3)
This class will address the unique educational needs of learners with exceptionalities, and will provide information and practice in addressing those needs through the use of technology-based interventions. Taught with SPED 5160.
Learning Outcomes
1. Carry out effective practicum practices for using technology with diverse learners.

SPED 6170. School Intervention and Organization in a Diverse Society
3 Credits (3)
Introduces public school organization and laws and the psycho-sociological perspective of education. Curriculum and theory, teaching methods and materials will be presented and operationalized through a psycho-educational point of view. May be repeated up to 3 credits.
Learning Outcomes
1. Understand and implement effective interventions in a variety of classroom and organizational settings.

SPED 6310. Introduction to Autism
3 Credits (3)
This course will provide an overview of autism spectrum disorders as a triad of impairments, including historical and theoretical perspectives, assessment issues, characteristics of autism, intervention programs, and

family issues. Differentiated Assignments.Taught with SPED 5310 and SPED 4310. May be repeated up to 3 credits.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (characteristics, etiology, co-morbid conditions, differential diagnosis).
2. Describe the criteria used to screen and diagnose ASD.
3. Examine evidence-based practices used to effectively support students with ASD in accessing general education and grade level standards (classroom structure, differentiated instruction, peer mediated supports, structured teaching, and emotional supports).
4. Describe strategies related to promoting a successful transition from school to adult life for individuals with ASD.
5. Examine the strategies for effective collaboration and communication with families of children with ASD and key stakeholders for the purpose of information sharing and collaborative planning with families.
6. Identify and investigate current educational issues impacting students with ASD.

SPED 6330. Social Skills and Autism
3 Credits (3)

This course will cover the second of the triad of impairments. As a blend of researched based models and evidenced based practical applications, students will gain an understanding of the social skill deficits often associated with autism spectrum disorders. Review a variety of social cognition theories and explore effective social skill interventions for children functioning at a variety of levels along the autism spectrum. Taught with SPED 4330 and SPED 5330 with differentiated assignments. May be repeated up to 3 credits.

Prerequisite/Corequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate Social Skills characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess Social Skills problems in children with ASD.
4. Use assessment results to identify the Social Skills needs of children with ASD
5. Analyze the types of evidence-based practices used to address the Social Skills needs of children with ASD.
6. Design an intervention plan to address the Social Skills needs of a child with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.
8. Employ data collection procedures to evaluate the effectiveness of evidence-based practices for students with ASD.

SPED 6340. Communication and Autism
3 Credits (3)

This course will cover the third of the triad of impairments. Students will gain an overview of communication characteristics and difficulties often associated with autism spectrum disorders. Review current tools and strategies used to assess speech, language, and interaction skills. Use assessment results to identify needs and implement appropriate interventions. Explore a variety of intervention strategies aimed at building receptive, expressive, and pragmatic language of children functioning at a variety of levels along the autism spectrum. Taught with SPED 4340 and SPED 5340 and differentiated assignments. May be repeated up to 3 credits.

Prerequisite: SPED 4310 or SPED 5310 or SPED 6310.

Learning Outcomes

1. Analyze Autism Spectrum Disorders ASD (definition, characteristics, etiology).
2. Evaluate communication characteristics and difficulties often associated with ASD.
3. Appraise current tools and strategies used to assess communication problems in children with ASD.
4. Analyze the types of interventions used to address the communication needs of children with ASD.
5. Design an intervention plan to address the communication needs of a child with ASD.
6. Employ data collection procedures to evaluate the effectiveness of research-based interventions for students with ASD.
7. Incorporate family preferences and values into the educational process of students with ASD.

SPED 6810. Doctoral Seminar
1-4 Credits (1-4)

The seminar will engage doctoral students in scholarly dialogue and production. It will assist in preparing them for future careers in leadership roles. May be repeated up to 4 credits.

Learning Outcomes

1. Varies

SPED 6830. Current Research in Special Education
3 Credits (3)

Required for students seeking the Ed.D./Ph.D. M.A. degree. Restricted to majors. May be repeated up to 3 credits.

Learning Outcomes

1. Evaluate current research in special Education.
2. Read and evaluate original research articles published in peer reviewed academic journals.
3. Describe the elements of research.
4. Analyze the designs, methods, and applications of quantitative research in special education
5. Analyze the designs, methods, and applications of qualitative research in special education
6. Examine ethical issues and guidelines for conducting special education research.
7. Evaluate the elements of a research proposal.

SPED 6840. Current Issues in Special Education for Teaching in a Culturally Responsive Society
3 Credits (3)

Required for students seeking the Ed.D./Ph.D. May be repeated up to 3 credits.

SPED 6991. Doctoral Research
1-15 Credits (1-15)

Research. May be repeated up to 88 credits.

Learning Outcomes

1. Varies

SPED 6996. Selected Topics in Special Education
1-6 Credits (1-6)

Offered under various subtitles which indicate the subject matter to be covered. Maximum of 6 credits, 3 credits per semester. May be repeated up to 6 credits.

Learning Outcomes
1. Varies

SPED 6997. Independent Study Topics in Special Education
1-6 Credits (1-6)
A problem and seminar course for those pursuing an advanced graduate degree. Each course to bear an appropriate subtitle. May be repeated up to 99 credits.
Learning Outcomes
1. Varies

SPED 6998. Internship in Special Education
1-6 Credits (1-6)
Each course bears a qualifying subtitle. Maximum of 6 credits per semester. May be repeated up to 99 credits.

SPED 7000. Dissertation
1-9 Credits (1-9)
Credit may be earned by students who have successfully completed their doctoral comprehensive exams and presented their dissertation proposals to their committees. At least 18 credits are required during the course of dissertation study. May be repeated up to 24 credits.
Learning Outcomes
1. Varies

SPHS-SPEECH & HEARING SCIENCE

SPHS 2110. Introduction to Communication Disorders
3 Credits (3)
This introductory course provides an overview of common speech, language, and hearing disorders in children and adults including etiologies, characteristics, prevention, identification, assessment and intervention. The course provides an overview of the field of speech-language pathology and audiology. May be repeated up to 3 credits.
Learning Outcomes
1. Describe normal human communication anatomy and processes as they relate to speech and language production.
2. Describe the nature of speech, language, and hearing disorders and differences.
3. Describe the principles of prevention, assessment and intervention of communication disorders.
4. List requirements for licensure, certification, and other relevant professional credentials.
5. Exhibit basic knowledge of contemporary professional issues in speech-language pathology.
6. List possible psychosocial implications of various communication disorders.
7. Identify cultural, educational, legal, and ethical issues related to communication disorders.
8. Describe the scope of practice of speech-language pathologists and audiologists.

SPHS 3110V. Autism Spectrum Disorders - a Lifespan Perspective
3 Credits (3)
This course will introduce students to concepts related to autism spectrum disorder across the lifespan. Diagnostic criteria, etiologies, assessment, and intervention will be explored from a historical perspective. May be repeated up to 6 credits.
Learning Outcomes
1. Summarize the diagnostic criteria for autism spectrum disorder as presented in the DSM-5-TR and provide examples of its core features.
2. Discuss how to individualize an autism assessment based on an individual's developmental level (e.g., chronological age, language skills), including the specific materials/assessment(s) used.
3. Describe the continuum of autism intervention (discrete to naturalistic) and the pros and cons of methods on the continuum.
4. Describe specific issues for autistic individuals across the lifespan and how intervention/supports may be individualized to their needs.

SPHS 4510. Phonetics
3 Credits (3)
This course introduces you to articulatory and acoustic phonetics as well as transcription. In this course, you will gain the ability to recognize and describe phonetic symbols. You will learn to transcribe American English using the International Phonetic Alphabet (IPA). By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Prerequisite: B or better in SPHS 2110; Cumulative GPA of 3.0 or better.
Learning Outcomes
1. Students will be able to identify articulatory, acoustic and perceptual characteristics of speech sounds.
2. Students will be able to utilize the International Phonetic Alphabet (IPA) to transcribe speech sounds in single words, phrases, and connected speech.
3. Students will be able to classify speech sounds into natural classes, and describe the phonological organization of speech sounds, including prosodic organization.
4. Students will be able to identify common phonological processes during language acquisition and in varieties of English.
5. Students will be able to recognize phonological processes in disordered speech.

SPHS 4520. Audiology
3 Credits (3)
This course is an introductory course to the science and profession of Audiology. Simply stated, Audiology is the clinical profession that deals with hearing and balance disorders (Gelfand, 2009). By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Prerequisite: B or better in SPHS 2110, and a minimum GPA of 3.0 or better.
Learning Outcomes
1. Recall aspects of the history of the profession of Audiology.
2. Explain the key concepts related to sound.
3. Identify the anatomical structures of the auditory system and their respective function to hearing.
4. Explain the tests performed during a comprehensive hearing assessment.
5. Demonstrate the protocols used during hearing assessments.
6. Classify audiometric test results.

SPHS 4610. Language Acquisition
3 Credits (3)
This course introduces students to the study of the development of language, speech, and communication. Includes language sampling. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Prerequisite: B or better in SPHS 2110 Introduction to Communication Disorders; Cumulative GPA of 3.0 or higher.

Learning Outcomes

1. Describe the development of phonology, semantics, morphology, syntax, and pragmatics.
2. Describe biological, cognitive, social aspects of language acquisition.
3. Evaluate the current methods for studying language acquisition and critically evaluate their contributions to our understanding of how children learn language.
4. Compare and contrast current theories of language acquisition in relation to the available data and to each other.
5. Apply basic observational methods to draw conclusions about a child's level of language knowledge.

SPHS 4620. Speech and Hearing Science
3 Credits (3)

This course will introduce you to the field of speech and hearing science, including basic acoustics, the acoustics of speech sounds (consonants and vowels), and speech perception. You will examine the acoustic properties of speech sounds using acoustic analysis software (Praat). By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Prerequisite: B or better in SPHS 2110, C- or better in SPHS 4510, SPHS 4520; and minimum 3.0 GPA.

Learning Outcomes

1. Students will describe concepts of basic acoustic physics such as simple harmonic motion, complex waveforms, and resonances.
2. Students will correlate the acoustic properties of the sound source in human speech with characteristics of vocal fold function.
3. Students will describe and measure the acoustic characteristics of vowels and correlate these characteristics to the articulatory parameters of tongue height, tongue advancement, and lip rounding.
4. Students will describe and measure the acoustic properties of the consonant like approximants, nasals, fricatives, stops, and affricates.
5. Students will describe basic human hearing and psychoacoustic properties and understand and describe important theories of speech perception.

SPHS 4710. Speech Disorders Across the Lifespan
3 Credits (3)

This course explores the bases, etiologies, and clinical management of disabilities specific to articulation, phonology, voice, resonance, motor speech, stuttering, and cluttering disorders. Building upon fundamental theories and knowledge regarding communication, we will review characteristics of various speech disabilities along with evidence-based methods of assessment and treatment. Throughout the course, we will critically examine and reflect upon the importance of identities specific to race, gender, language, socioeconomic status, and culture as it pertains to communication and the provision of clinical services. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Prerequisite: A grade of B or better in SPHS 2110, SPHS 4510, SPHS 4610 and minimum GPA of 3.0.

Learning Outcomes

1. Describe diverse etiologies of speech disorders and compare/contrast assessment procedures (ASHA Standard III-B).
2. Define and compare/contrast the classification for a variety of speech disorders (ASHA Standard III-C).
3. Differentiate between a speech disorder vs a difference that can be attributed to culturally and linguistically different groups (ASHA Standard III-D).
4. Describe evidence-based treatment; evaluate treatment-efficacy evidence for a variety of speech disorders (ASHA Standard III-D).

SPHS 4715. Language Disorders Across the Life Span
3 Credits (3)

In this course, we will learn about developmental and acquired language disorders, including assessment and intervention. We will explore the bases, symptoms, etiologies, and treatment of language disorders. This course includes a short review of normal language acquisition. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Prerequisite: Grade of B or better in SPHS 2110 and SPHS 4610, minimum cumulative GPA of 3.0.

Learning Outcomes

1. Describe diverse etiologies of language disorders and compare/contrast assessment procedures (ASHA Standard III-B).
2. Define and compare/contrast the classification for a variety of language disorders (ASHA Standard III-C).
3. Differentiate between a disorder vs a difference that can be attributed to culturally and linguistically different groups (ASHA Standard III-D).
4. Describe evidence-based treatment; evaluate treatment-efficacy evidence for a variety of language disorders (ASHA Standard III-D).

SPHS 4720. Anatomy and Physiology of Speech Mechanisms
3 Credits (3)

In this course, we will delve into the intricate mechanisms that enable human speech. From the complexities of vocal fold vibrations to the nervous system processes involved in speech production, we will explore how the human body orchestrates the art of communication. In this course, you will gain a comprehensive understanding of the biological foundations that shape our ability to speak. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Prerequisite: B or better in SPHS 2110, and minimum 3.0 GPA.

Learning Outcomes

1. Students will recognize key anatomical structures associated with speech swallowing.
2. Students will be able to explain the physiological function of systems involved in speech swallowing.
3. Students will be able to evaluate the functional integrity of systems involved in speech swallowing.
4. Students will classify speech swallowing symptoms according to their associated clinical syndromes.

SPHS 4810. Clinical Methods and Procedures
3 Credits (3)

Clinical Methods and Procedures in Speech-Language Pathology is designed to provide the undergraduate Communication Disorders major with an introduction to clinical methods, clinical oral and written reporting, and clinical observation skills. May be repeated up to 6 credits. Must have completed SPHS 4510, SPHS 4520, SPHS 4620, SPHS 4610; and have a minimum GPA of 3.0.

Prerequisite: B or better in SPHS 2110.

Learning Outcomes

1. Articulate the scope of practice and the roles and responsibilities of Speech-Language Pathologists (SLP), Speech-Language Pathology Assistants (SLPAs), and graduate clinicians.
2. Use basic professional terminology specific to the field of Speech-Language Pathology.
3. Apply principles and therapeutic techniques to oral and written clinical reporting.

4. Identify on- and off-target behaviors, procedures, data collection, and maintenance strategies.
5. Summarize basic procedures for comprehensive clinical assessments.
6. Complete 25 of the 25 American Speech-Language-Hearing Association (ASHA) clock hours of required supervised clinical observation of speech, language, and hearing services.
7. Identify factors to consider when serving culturally and linguistically diverse patient populations.
8. Recognize the ASHA Code of Ethics.

SPHS 4820. Neural Bases of Communication Disorders
3 Credits (3)
This course will cover the neurological bases for speech, language, and hearing. We will explore topics on neuroanatomy and neurophysiology of sensory and motor systems. Specific topics include Central Nervous System development, the structure and function of brain cells, and organization and function of the brain and spinal cord. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Prerequisite: B or better in SPHS 2110, must have taken SPHS 4720 and 3.0 GPA or better.
Learning Outcomes
1. Explain foundational principles of human neuroscience, including neuronal signaling, embryology, neuroplasticity, sensation/perception, and motor function.
2. Describe and identify the organization and function of major neural structures and pathways involved in speech, language, swallowing, and hearing processes.
3. Evaluate current research on the neural underpinnings of language and speech processing.
4. Interpret clinical case studies and neurological assessment results to hypothesize the likely site and nature of neural damage affecting communication.

SPHS 4830. Aural Rehabilitation
3 Credits (3)
This course introduces you to the theories and procedures used to provide aural/audiological rehabilitation to children and adults who have hearing loss and to provide concomitant services to their family members. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Prerequisite: B or better in SPHS 2110, SPHS 4520, and 3.0 GPA or higher.
Learning Outcomes
1. Knowledge and understanding of basic concepts and components of aural/audiological rehabilitation.
2. Understanding of assessment procedures for determining aural rehabilitation needs, including means for assessing hearing status, auditory and audiovisual speech recognition, hearing-related disabilities, and conversational fluency.
3. Knowledge about the importance of auditory and visual cues in spoken communication.
4. Knowledge about how hearing loss affects conversational fluency.
5. Knowledge about auditory and speechreading training and communication strategies training.
6. Knowledge about counseling, psychosocial support, and assertiveness training.
7. Understanding how to develop and implement aural rehabilitation plans for children, adults, and their family members.
8. Procedures for developing and implementing auditory training for the pediatric population.
9. Knowledge about the challenges hearing loss poses for acquiring speech and language and learning to read and related assessments and interventions. 1
10. Define and use the appropriate terminology when discussing hard of hearing and deafness 1
11. Describe the effects of hearing impairment on various aspects of life (cognitive, educational, occupational, and psycho-social aspects in all age ranges). 1
12. Identify the communication needs and develop a basic understanding of common intervention options including communication strategies, auditory training, speech reading, hearing aids, assistive devices, and cochlear implantation. 1
13. Be acquainted with the relevant public laws.

SPHS 5010. Phonetics
3 Credits (3)
This course introduces you to articulatory and acoustic phonetics as well as transcription. In this course, you will gain the ability to recognize and describe phonetic symbols. You will learn to transcribe American English using the International Phonetic Alphabet (IPA). By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Students will be able to identify articulatory, acoustic and perceptual characteristics of speech sounds.
2. Students will be able to utilize the International Phonetic Alphabet (IPA) to transcribe speech sounds in single words, phrases, and connected speech.
3. Students will be able to classify speech sounds into natural classes, and describe the phonological organization of speech sounds, including prosodic organization.
4. Students will be able to identify common phonological processes during language acquisition and in varieties of English.
5. Students will be able to recognize phonological processes in disordered speech.

SPHS 5015. Audiology
3 Credits (3)
This course is an introductory course to the science and profession of Audiology. Simply stated, Audiology is the clinical profession that deals with hearing and balance disorders (Gelfand, 2009). By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Recall aspects of the history of the profession of Audiology.
2. Explain the key concepts related to sound.
3. Identify the anatomical structures of the auditory system and their respective function to hearing.
4. Explain the tests performed during a comprehensive hearing assessment.
5. Demonstrate the protocols used during hearing assessments.
6. Classify audiometric test results.

SPHS 5020. Language Acquisition
3 Credits (3)
This course introduces students to the study of the development of language, speech, and communication. Includes language sampling. By

the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Learning Outcomes

1. Describe the development of phonology, semantics, morphology, syntax, and pragmatics.
2. Describe biological, cognitive, social aspects of language acquisition.
3. Evaluate the current methods for studying language acquisition and critically evaluate their contributions to our understanding of how children learn language.
4. Compare and contrast current theories of language acquisition in relation to the available data and to each other.
5. Apply basic observational methods to draw conclusions about a child's level of language knowledge.

SPHS 5025. Language Disorders Across the Life Span
3 Credits (3)

In this course, we will learn about developmental and acquired language disorders, including assessment and intervention. We will explore the bases, symptoms, etiologies, and treatment of language disorders. This course includes a short review of normal language acquisition. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Learning Outcomes

1. Describe diverse etiologies of language disorders and compare/contrast assessment procedures (ASHA Standard III-B).
2. Define and compare/contrast the classification for a variety of language disorders (ASHA Standard III-C).
3. Differentiate between a disorder vs a difference that can be attributed to culturally and linguistically different groups (ASHA Standard III-D).
4. Describe evidence-based treatment; evaluate treatment-efficacy evidence for a variety of language disorders (ASHA Standard III-D).

SPHS 5030. Anatomy and Physiology of Speech Mechanisms
3 Credits (3)

In this course, we will delve into the intricate mechanisms that enable human speech. From the complexities of vocal fold vibrations to the nervous system processes involved in speech production, we will explore how the human body orchestrates the art of communication. In this course, you will gain a comprehensive understanding of the biological foundations that shape our ability to speak. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Learning Outcomes

1. Students will recognize key anatomical structures associated with speech swallowing.
2. Students will be able to explain the physiological function of systems involved in speech swallowing.
3. Students will be able to evaluate the functional integrity of systems involved in speech swallowing.
4. Students will classify speech swallowing symptoms according to their associated clinical syndromes.

SPHS 5035. Speech and Hearing Science
3 Credits (3)

This course will introduce you to the field of speech and hearing science, including basic acoustics, the acoustics of speech sounds (consonants and vowels), and speech perception. You will examine the acoustic properties of speech sounds using acoustic analysis software (Praat). By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Learning Outcomes

1. Students will describe concepts of basic acoustic physics such as simple harmonic motion, complex waveforms, and resonances.
2. Students will correlate the acoustic properties of the sound source in human speech with characteristics of vocal fold function.
3. Students will describe and measure the acoustic characteristics of vowels and correlate these characteristics to the articulatory parameters of tongue height, tongue advancement, and lip rounding.
4. Students will describe and measure the acoustic properties of the consonant like approximants, nasals, fricatives, stops, and affricates.
5. Students will describe basic human hearing and psychoacoustic properties and understand and describe important theories of speech perception.

SPHS 5040. Speech Disorders Across the Lifespan
3 Credits (3)

This course explores the bases, etiologies, and clinical management of disabilities specific to articulation, phonology, voice, resonance, motor speech, stuttering, and cluttering disorders. Building upon fundamental theories and knowledge regarding communication, we will review characteristics of various speech disabilities along with evidence-based methods of assessment and treatment. Throughout the course, we will critically examine and reflect upon the importance of identities specific to race, gender, language, socioeconomic status, and culture as it pertains to communication and the provision of clinical services. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Learning Outcomes

1. Describe diverse etiologies of speech disorders and compare/contrast assessment procedures (ASHA Standard III-B).
2. Define and compare/contrast the classification for a variety of speech disorders (ASHA Standard III-C).
3. Differentiate between a speech disorder vs a difference that can be attributed to culturally and linguistically different groups (ASHA Standard III-D).
4. Describe evidence-based treatment; evaluate treatment-efficacy evidence for a variety of speech disorders (ASHA Standard III-D).

SPHS 5045. Clinical Methods and Procedures
3 Credits (3)

Clinical Methods and Procedures in Speech-Language Pathology is designed to provide the undergraduate Communication Disorders major with an introduction to clinical methods, clinical oral and written reporting, and clinical observation skills. May be repeated up to 6 credits.

Learning Outcomes

1. Articulate the scope of practice and the roles and responsibilities of Speech-Language Pathologists (SLP), Speech-Language Pathology Assistants (SLPAs), and graduate clinicians.
2. Use basic professional terminology specific to the field of Speech-Language Pathology.
3. Apply principles and therapeutic techniques to oral and written clinical reporting.
4. Identify on- and off-target behaviors, procedures, data collection, and maintenance strategies.
5. Summarize basic procedures for comprehensive clinical assessments.
6. Complete 25 of the 25 American Speech-Language-Hearing Association (ASHA) clock hours of required supervised clinical observation of speech, language, and hearing services.

7. Identify factors to consider when serving culturally and linguistically diverse patient populations.
8. Recognize the ASHA Code of Ethics.

SPHS 5050. Neural Bases of Communication Disorders
3 Credits (3)
This course will cover the neurological bases for speech, language, and hearing. We will explore topics on neuroanatomy and neurophysiology of sensory and motor systems. Specific topics include Central Nervous System development, the structure and function of brain cells, and organization and function of the brain and spinal cord. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Explain foundational principles of human neuroscience, including neuronal signaling, embryology, neuroplasticity, sensation/perception, and motor function.
2. Describe and identify the organization and function of major neural structures and pathways involved in speech, language, swallowing, and hearing processes.
3. Evaluate current research on the neural underpinnings of language and speech processing.
4. Interpret clinical case studies and neurological assessment results to hypothesize the likely site and nature of neural damage affecting communication.

SPHS 5055. Aural Rehabilitation
3 Credits (3)
This course introduces you to the theories and procedures used to provide aural/audiological rehabilitation to children and adults who have hearing loss and to provide concomitant services to their family members. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Knowledge and understanding of basic concepts and components of aural/audiological rehabilitation.
2. Understanding of assessment procedures for determining aural rehabilitation needs, including means for assessing hearing status, auditory and audiovisual speech recognition, hearing-related disabilities, and conversational fluency.
3. Knowledge about the importance of auditory and visual cues in spoken communication.
4. Knowledge about how hearing loss affects conversational fluency.
5. Knowledge about auditory and speechreading training and communication strategies training.
6. Knowledge about counseling, psychosocial support, and assertiveness training.
7. Understanding how to develop and implement aural rehabilitation plans for children, adults, and their family members.
8. Procedures for developing and implementing auditory training for the pediatric population.
9. Knowledge about the challenges hearing loss poses for acquiring speech and language and learning to read and related assessments and interventions. 1
10. Define and use the appropriate terminology when discussing hard of hearing and deafness. 1
11. Describe the effects of hearing impairment on various aspects of life (cognitive, educational, occupational, and psycho-social aspects in all age ranges). 1
12. Identify the communication needs and develop a basic understanding of common intervention options including communication strategies, auditory training, speech reading, hearing aids, assistive devices, and cochlear implantation. 1
13. Be acquainted with the relevant public laws.

SPHS 5110. Research Methods
3 Credits (3)
This course focuses on introduction to basic research methodology in CSD. The course presents information pertaining to research design and statistical analyses used in speech-language pathology with special consideration of the role of research in evidence-based practice. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Students will demonstrate understanding of the concepts of research ethics and integrity including protection of human subjects.
2. Students will comprehend of concepts of evidence-based practice.
3. Students will locate, use, and critically evaluate library and online sources that support the investigation of research questions pertinent to speech-language and hearing science.
4. Students will interpret basic single variable and two-variable statistical procedures appropriate for single and group designs.
5. Students will read and critically evaluate pertinent research.

SPHS 5120. Assessment of Communication Disorders
3 Credits (3)
Diagnostic theories and management of communication disorders using standardized and descriptive methodology. Includes the practice of interviewing, testing, and oral and written reporting. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Demonstrate knowledge of testing statistics and basic concepts in psychometric assessment.
2. Formulate, implement and summarize one complete successful and efficient assessments: including pre-planning meeting, interview design and implementation, administration of instruments, analysis and integration of results and report writing.
3. Review, summarize and critique one assessment tool for design, use, interpretation and cultural/linguistic inclusivity to classmates.
4. Given case study information, students will be able to: choose an appropriate instrument from assessment tools reviewed; develop an assessment plan for a client; write a report and develop treatment goals.

SPHS 5130. Pediatric Language and Disorders
3 Credits (3)
Normal communication development of neonates, infants, toddlers, and preschoolers; etiologies, and treatment of cognitive, linguistic and social elements of communication problems in family systems. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Demonstrate a working knowledge of the major theories of language acquisition and theoretical perspectives of disorders.
2. Demonstrate an understanding of the aspects related to dialect and second language acquisition of English.
3. Demonstrate knowledge of the core principles of language assessment for the pediatric population (zero-five year old).

4. Summarize and interpret content material relating to pediatric language development/disorders.

SPHS 5140. Speech Sound Disorders
3 Credits (3)
The purpose of this course is to provide graduate students with the knowledge necessary to effectively assess and provide intervention for individuals with speech sound disorders. The content of this course includes the anatomical, linguistic, cultural, and physiological basis of speech sound production; speech sound disorders of differing etiologies; phonetic transcription; culturally sensitive assessment and treatment approaches; appraisal of evidence-based treatment approaches; and discussion of power, privilege, and positionality in the field of speech, language and hearing sciences. Video examples and hands-on learning experiences will be provided to bolster student learning. Students will demonstrate their understanding through multiple modalities. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Identify the impact of anatomical, motor, sensory, cognitive-linguistic, and social factors in speech acquisition associated with typical and atypical development.
2. Transcribe American English speech using the International Phonetic Alphabet and identify the presence of phonological processes.
3. Identify and implement components of a comprehensive, culturally sensitive evaluation for a child with a suspected speech sound disorder.
4. Describe different treatment approaches, generate developmentally appropriate treatment goals, and design activities for a child with a speech sound disorder.
5. Analyze and interpret current and foundational research in the area of speech sound disorders.

SPHS 5210. School Age Language and Disorders
3 Credits (3)
This course will discuss normal communication-learning development of elementary, secondary, and postsecondary students; etiologies, diagnosis, and treatment of interpersonal communication and language-based academic disorders. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Demonstrate a working knowledge of legislation governing service provision in the schools (IDEIA, NCLB) and implementation practices (IEP, five-hundred-four plan, RtI).
2. Demonstrate knowledge of normal language development of school-age children.
3. Demonstrate understanding of language disorders relevant to school-age children.
4. Demonstrate knowledge of evidence-based intervention methodologies for the treatment of language disorders in the school-aged population.

SPHS 5220. Adult Neurogenic Language Disorders
3 Credits (3)
Of the estimated 800,000 strokes that occur each year in the United States, more than one-third result in chronic aphasia or right-hemisphere disorder. Individuals with aphasia and right-hemisphere disorder following stroke report that their communicative difficulties contribute to feelings of social isolation and reduced functional autonomy, which together result in negative long-term mental health outcomes and reduced quality of life. Speech-language therapy may help to alleviate these hardships, and the skills that you learn in this course will prepare you to do so. As we progress through this course, we'll work to explore the neuropathological underpinnings of aphasia and RHD, while learning more about how such impairments may be assessed and treated. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Characterize aphasia and its sub-types based on lesion data and behavioral profiles.
2. Specify standardized and non-standardized measures to evaluate clients with aphasia.
3. Describe principles and techniques to maximize linguistic recovery in individuals with aphasia.
4. Describe the etiology and patterns of recovery associated with aphasia and right-hemisphere disorder.
5. Describe cognitive processes and systems, including language, attention, memory, and executive function, and their relationship to adult neurogenic language disorders.
6. Apply theoretical perspectives of language, cognition, and neurological function as they relate to adult neurogenic language disorders.

SPHS 5230. Fluency Disorders
3 Credits (3)
This course explores theories, perspectives, advocacy, and clinical management relating to children and adults who stutter and/or clutter. We will discuss theoretical perspectives relating to topics such as etiology, persistence, disability, and identity through the evaluation of peer-reviewed research as well as the insights and lived experiences of people who stutter. You will learn about assessment practices, intervention strategies, and counseling principles specific to individuals who stutter and/or clutter. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.
Learning Outcomes
1. Identify terminology and theories associated with stuttering, cluttering, and typical disfluency.
2. Label, describe and discern typical from atypical disfluency across speakers of one or more languages.
3. Describe and practice using the variety of evidence-based assessment measures and intervention strategies appropriate for individuals who stutter and/or clutter.
4. Demonstrate an understanding of the lived experiences and intersecting identities (culture, gender, race, socioeconomic status) of people who stutter and/or clutter and their family members.
5. Design an advocacy project on behalf of the stuttering and/or cluttering community that may be implemented at the local, regional, national, or international level.

SPHS 5310. Introduction to Augmentative and Alternatice Communication
3 Credits (3)
Assessment and intervention for children and adults with developmental disabilities; Alternative communication strategies and systems for individuals with severe speech and/or language impairments. Restricted to: C DS,C D majors. May be repeated up to 3 credits.
Prerequisite: Graduate standing; overall GPA of 3.0.

Learning Outcomes

1. Understand and consider physical and psycho-social, linguistic, and cognitive characteristics of AAC users.
2. Describe assessment methods to determine the best fit of AAC systems to meet the needs of AAC users.
3. Understand how to provide training in the use of various AAC systems for AAC users, their families, and caregivers and educators.

SPHS 5320. Cognitive Communication Disorders
3 Credits (3)

What does it mean to be human? And what are the contents and functions of the human mind? Central to the human experience is cognition—the brain functions that allow us to reason, remember, attend, and communicate. While cognitive processes occur automatically for most people, those with neurological pathologies (such as dementia or traumatic brain injury) often experience cognitive impairments. In this course, we'll work to explore the nature of human cognition, the brain networks that support it, the underlying pathologies that lead to cognitive impairment, and how such impairments may be assessed and treated. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Learning Outcomes

1. Describe dementing diseases and how they affect cognitive-communicative functioning.
2. Specify standardized and non-standardized measures to evaluate clients with dementia.
3. Describe principles and techniques to maximize communicative functioning of individuals with dementia.
4. Describe the epidemiology and etiology of traumatic brain injury.
5. Specify the relationships between the mechanisms of traumatic brain injury and the nature and severity of cognitive-communicative impairments.
6. Specify appropriate diagnostic and treatment methods for individuals with different severity levels of traumatic brain injury.
7. Describe cognitive processes and systems, including attention, memory, and executive function, and their relationship to cognitive communication disorders.

SPHS 5330. Dysphagia
3 Credits (3)

Study of the anatomy and physiology of swallowing and upper aerodigestive systems. Review of the bases and etiologies of child and adult swallowing disorders, including diagnosis, assessment, and treatment. Restricted to: C DS,C D majors. May be repeated up to 3 credits.

Prerequisite: A course grade of B- or higher in all graduate courses and an overall GPA of 3.0 or higher.

Learning Outcomes

1. Define the anatomy and physiology of normal swallowing and causes of abnormal swallow in the pediatric to geriatric age ranges.
2. Define dysphagia team components.
3. Describe protocol for clinical and instrumental dysphagia evaluation.
4. Describe dysphagia diagnosis and treatment.

SPHS 5335. Swallowing and its Disorders in the Pediatric Population
2 Credits

This class is an introduction to swallowing disorders, normal and abnormal swallow function for the pediatric population. The primary focus of instruction will include normal and impaired swallow function, evaluation and treatment. Your instruction will include lecture, videos, small group discussion, and occasional labs. Of note, this is an introductory course to build a strong foundation of pediatric dysphagia. Your internships, fellowships and professional careers will help build upon this foundation. May be repeated up to 2 credits.

Prerequisite/Corequisite: SPHS 5330.

Learning Outcomes

1. Students will be able to define the anatomy and physiology of normal swallowing and causes of abnormal swallow in the pediatric population.
2. Students will be able to define dysphagia team components and describe protocol for clinical dysphagia evaluation in infants and children.
3. Students will demonstrate knowledge of dysphagia diagnosis and treatment as well as demonstrate ability to document diagnostic findings for the pediatric population.
4. Students will be able to explain indications and methods of non-oral nutrition and ethical considerations when working with pediatric clients from different cultural backgrounds.

SPHS 5340. Motor Speech Disorders
3 Credits (3)

The course will explore role of the central and peripheral motor systems in speech production and speech disorders related to abnormalities in these motor systems. We will emphasize the clinical characteristics, etiologies, neurological bases, and pathologies, assessment, and clinical management of the dysarthrias and apraxia of speech across the lifespan. Students will be able to recognize, assess, and serve the multiple needs of clients with dysarthria and apraxia. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Learning Outcomes

1. Analyze the neurological and physiological mechanisms underlying motor speech disorders, differentiating between dysarthria types (flaccid, spastic, unilateral upper motor neuron, ataxic, hypokinetic hyperkinetic mixed dysarthria and apraxia of speech).
2. Apply evidence-based assessment techniques to diagnose motor speech disorders across diverse clinical populations.
3. Develop individualized treatment plans incorporating motor learning principles and augmentative communication strategies for individuals with motor speech disorders.
4. Critique current research on motor speech disorders to determine best practices for clinical decision-making.
5. Synthesize patient data, interdisciplinary input, and clinical observations to formulate differential diagnoses and prognostic outcomes for individuals with motor speech disorders.
6. Justify the selection of treatment approaches for motor speech disorders based on current theories of neuroplasticity and motor learning.

SPHS 5350. Voice Disorders/Head and Neck Anomalies
3 Credits (3)

In this course, you will review the laryngeal and respiratory anatomy and physiology necessary for normal voice production. The course will further introduce you to the etiology of different voice disorders of structural, neurological, and psychogenic origin, including phonotraumatic behaviors. We will discuss the assessment and differential diagnosis of these voice disorders and you will have an opportunity to synthesize this knowledge by researching treatment protocols that adequately meet the needs of clients with different voice disorders. Restricted to: C DS,C D

majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Learning Outcomes

1. Students will be able to recognize and describe relevant anatomy and physiology of normal voice production including laryngeal and respiratory anatomy and physiology.
2. Students will be able to identify and discuss structural/organic voice disorders.
3. Students will be able to identify and differentially diagnose functional voice disorders.
4. Students will be able to rate different degrees of voice quality and voice characteristics using perceptual rating scales.
5. Students will be able to explain and demonstrate selected therapy techniques for functionally and structurally based voice disorders.

SPHS 5360. Communication Disorders in Neurodiverse Populations
3 Credits (3)

This course is primarily aimed at providing meaningful foundations for the application of evidence-based intervention designs that enhance the development of communication skills for individuals with Autism Spectrum Disorders across the lifespan. May be repeated up to 6 credits.

Learning Outcomes

1. Identify and implement evidence-based interventions for individuals with ASD across a range of ages and abilities
2. Evaluate several evidence-based interventions and determine the best fit based on a client scenario
3. Discuss key features of evidence-based interventions for individuals with ASD
4. Implement evidenced communication interventions with individuals with ASD

SPHS 5410. Professional Issues and Multicultural Practices in Communication Disorders
3 Credits (3)

This course examines professional ethics and issues, reviews regulations and requirements for professional practice, provides an overview and discusses cultural considerations for studying, assessing and treating communication and swallowing disorders in culturally and linguistically diverse (CLD) populations. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Learning Outcomes

1. Demonstrate use of ASHA code of ethics to interpret specific situations and determine whether they have followed the code.
2. Demonstrate knowledge of professional issues that affect speech-language pathology: may include but are not limited to trends in professional practice; academic program accreditation standards; ASHA practice policies and guidelines; cultural competency and patient centered care; educational legal requirements or policies; and reimbursement procedures.
3. Demonstrate knowledge of appropriate ASHA certification and state licensure requirements.

SPHS 5510. Advanced Spanish Morpho-Syntax for Education Professionals
3 Credits (3)

This class has been designed for Heritage Speakers of Spanish who work in educational settings. It will cover the essential linguistic theory and fundamental structures of the Spanish language. This includes, but is not limited to, verb morphology, morphosyntactic and syntactic structures. The main goal of this course is to determine what usages fall within the norms of an individual's speech community, or if there are elements that fall outside those norms. Students have to be fluent in Spanish as course will be conducted in Spanish.

SPHS 5520. Best Practices in Bilingual/Multicultural Assessment for Practitioners
3 Credits (3)

The purpose of this course is to provide future speech-language pathologists, educational diagnosticians and special educators with a foundation for evaluating the linguistic, cognitive and academic skills of students from any cultural linguistic background. The course covers a review of the literature on best practices for working with interpreters during assessments. Practitioners will be expected to gather qualitative information about cultural/linguistic and educational histories of school-age children and integrate those results with the results of standardized tests. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 6 credits.

Learning Outcomes

1. Students will be able to summarize cross-cultural differences in communication styles of various cultural groups, and analyze and critically evaluate how these differences impact speech-language services.
2. Students will be able to identify cultural and linguistic variables that may impact speech-language pathology services to members of specific culturally and linguistically diverse (CLD) groups.
3. Students will be able to use culturally and linguistically appropriate assessment tools and practice for diagnosing and distinguishing language disorder vs language difference, describe potential limitations of standardized tests with CLD clients and explain how to use alternative, nonstandardized methods for nonbiased assessment.
4. Students will learn to use culturally and linguistically appropriate intervention strategies for CLD children with speech-language disorders.

SPHS 5988. Clinical Education
1 Credit (1)

This course will provide students with the knowledge base necessary to initiate and successfully complete clinical practicum in Communication Disorders. This course will complement SPHS 5990 (Clinical Practicum) during the first fall and spring semester of the the graduate program. Students will be introduced to current knowledge of the principles and methods of prevention, assessment, and intervention for persons with communication and swallowing disorders, including standards of ethical conduct and interprofessional education. Restricted to: C DS,C D majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 4 credits.

Prerequisite/Corequisite: SPHS 5990.

Learning Outcomes

1. Students will recognize treatment strategies used in various clinical settings to work with clients and their families from various cultural backgrounds.
2. Students will understand the importance of ethical and confidential service delivery, including HIPAA and the ASHA Code of Ethics.
3. Students will be able to identify characteristics of professional communication, including report writing, clinical documentation, and the creation of short and long-term clinical goals.
4. Students will demonstrate understanding of critical elements of professional verbal communication with clients, their families, and other professionals.

SPHS 5989. Externship in Communication Disorders
3-9 Credits (3-9)
Students will engage in diagnostic and therapeutic contact with individuals who exhibit speech, language, communication, feeding and/or swallowing disorders. Students will be supervised by licensed Speech-Language Pathologists at the designated setting. The experience will include treatment planning, goal and report writing, patient/parent/family counseling and education, and any additional tasks required. Restricted to: C DS majors. By the time of graduation, all SPHS courses need to be passed with a B or better. May be repeated up to 15 credits.
Prerequisite: Completion of a minimum of 8 credits of SPHS 5990 with a grade of B or better.
Learning Outcomes
1. Students will demonstrate the skills necessary to plan and execute an assessment of clients with communication and swallowing disorders at varying severity levels while under the direction of a certified SLP.
2. Students will demonstrate the skills necessary to plan and implement the treatment of clients with communication and swallowing disorders at varying severity levels while under the direction of a certified SLP.
3. Students will demonstrate the principles and methods of identifying and preventing communication swallowing disorders.

SPHS 5990. Practicum in Speech-Language Pathology
1-4 Credits (1-4)
Students will have the opportunity to engage in diagnostic and therapeutic contact with individuals who exhibit speech, language and feeding/swallowing disorders. The experience will include treatment planning, report writing, and patient/parent counseling. Students will be assigned to clients in the ERG Speech and Hearing Center, and may also be assigned to outside mini-externship sites. All students will be supervised by licensed Speech-Language Pathologists. Restricted to: C DS,C D majors. May be repeated up to 15 credits.
Prerequisite: Good standing in the graduate school; a course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.
Learning Outcomes
1. Students will be able to explain a variety of therapeutic approaches, and how to apply these approaches to different communication disorders.
2. Students will be able to select appropriate methods of assessment and treatment based on client presentation.
3. Students will collect clinical data and analyze the data to determine appropriate treatment goals.
4. Students will create and implement treatment plans to target treatment goals.

SPHS 5996. Special Topics
1-9 Credits (1-9)
Individual and/or group study of special topics identified by subtitle. Restricted to: C DS majors. May be repeated up to 9 credits.
Prerequisite: Prior arrangement with faculty; a course grade of B or higher in all graduate courses and an overall GPA of 3.0 or higher.
Learning Outcomes
1. Varies

SPHS 5999. Master's Thesis
1-15 Credits (1-15)
This is a thesis course and will require you to work with your thesis advisor independently to complete a thesis that meets the requirements of the Graduate School. May be repeated up to 15 credits.
Learning Outcomes
1. Formulate research question(s) by (a) identifying a specific focus of research and (b) reviewing the current literature to identify gaps in the research.
2. Implement an appropriate research method (experimental research project, literature review) – including, as appropriate, IRB approval, data collection, and data analysis – that (a) is aligned with standard procedures in the field, (b) sufficiently addresses the question(s) posed, and (c) is feasible given the time and resources available.
3. Prepare a thesis that meets the standards set by the thesis advisor, the committee, and the Graduate School.

SPMD-SPORTS MEDICINE

SPMD 1110. Introduction to Athletic Training
3 Credits (3)
Introduction to the principles of athletic training. May be repeated up to 3 credits.
Learning Outcomes
1. Understand the historical development of athletic training and sports medicine.
2. Understand the knowledge and experiences needed to become a Certified Athletic Trainer.
3. Understand the specific responsibilities and duties of an athletic trainer.
4. Understand the diverse jobs settings within the profession of athletic training.
5. Understand the relationship between the athletic trainer and the sports medicine team.
6. Understand some of the general and specific injuries and medical conditions that occur in athletics;their causes, signs and symptoms, treatments, rehabilitation, and prevention.
7. Understand some of the contemporary issues and problems facing the athletic training profession.

SPMD 1120. Medical Terminology
3 Credits (3)
Study of the structure of medical language with emphasis on sports medicine-related terminology. To include analysis and interpretation of medical documentation. Restricted to: Las Cruces campus only.
Learning Outcomes
1. Master the fundamentals of word analysis, including the separation of terms into word roots or combining forms, common prefixes, and suffixes.
2. Differentiate types of medical terms and the relationships among terms.
3. Develop a proficiency in the use of physiological and anatomical terms as reflected in medical documents.
4. Master the terms, words, phrases, and symbols that describe the human body in its various states of health and disease, including essential anatomical terms.

SPMD 1190. Clinical Practicum I
2 Credits (2)
Introduction to the clinical aspects of the athletic training education program. Must maintain at least 3.0 GPA. May be repeated up to 4 credits.
Learning Outcomes
1. The Athletic Training Program application procedures.
2. The ability to perform selected taping and wrapping techniques.

3. Knowledge of HIPAA guidelines, pre-participation physical examinations, environmental illnesses, the history of Athletic Training and its governing bodies, Evidence Based Practice and its implications in the field of athletic training, evaluation procedures for the injured athlete, NMSU AT program and its affiliated clinical sites.
4. Proper documentation for the athletic training environment including SOAP notes.

SPMD 1195. Clinical Practicum II
3 Credits (3)
Athletic training related content and psycho-motor skills are introduced, enhanced, and assessed in the classroom and clinical rotations. Emphasis is on competencies and proficiencies previously instructed in didactic courses while providing increased depth of understanding and clinical practice. Must maintain a 3.0 GPA. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate knowledge and skill in emergency situation prevention, recognition, and management.
2. Demonstrate proficiency in basic skills of musculoskeletal injury recognition and management.
3. Demonstrate competency in basic pre-participation exam skills, including but not limited to taking vital signs.
4. Demonstrate competency in wound care and first aid.

SPMD 1310. Introduction to Kinesiology
3 Credits (3)
An introduction to the field of Kinesiology which will explore areas such as exercise physiology, sport and exercise psychology, motor behavior, biomechanics, strength and conditioning, exercise prescription, as well as professional and graduate programs, and allied health and applied careers opportunities.
Learning Outcomes

SPMD 1350. Social Foundations of Physical Activity
3 Credits (3)
Historical and cultural foundations and vocational, scientific, and educational data on careers in health education, physical education, and recreation.
Learning Outcomes
1. Improve students' knowledge of foundations of physical education. (Research) (Standard 4 j, k, l, m, o, p)
2. Improve students' abilities to analyze current physical activity issues based on historical, philosophical, sociological, and psychological perspectives. (Research) (Standard 4 l, m, e, g)
3. Improve students' knowledge of and ability to critically analyze how gender, race, social class, sexual orientation, and ability issues affect physical education and performance programs. (Research, Diversity) (Standard 4j, k, l, m, o; Standard 2 d, g, j, f, k)
4. Improve students' knowledge of forces influencing the development of physical education programs. In particular, attitudes, values, and beliefs about gender, race, social class, sexual orientation, and ability, etc. (Diversity, Practitioners, Reflection, Pedagogy) (Standard 1 a, b, h, l; Standard 4 j, k, l, m, o; Standard 2 a, d, g, j, f, k)
5. Improve students' knowledge of strategies for becoming an advocate in the school and/or community to promote a variety of physical activity opportunities. (Practitioners) (Standard 2 m, n; Standard 3 n, o, p, q, r; Standard 10 d, j, p
6. Improve students' knowledge of current educational issues and trends. In particular, socio-cultural issues that affect educational, fitness, and sports settings. (Diversity, Research) (Standard 4 j, k, l, m,o, p Standard 9 a, c, e, f m, n)
7. Improve students' knowledge of how students' learning is influenced by individual experiences, talents, and prior learning, including language and family/community values and conditions. (Diversity, Research) (Standard 1 b, h, l; Standard 2 d, g, j, k, m, n, o; Standard 3 l)
8. Improve students' knowledge of the impact of international changes on the content of physical education, fitness, and sports programs. (Research) (Standard 4 j, k, l, m, o, p)
9. Improve students' ability to critically analyze how gender, race, sexuality and social class issues affect how we view the body, and how these views can affect students' health and participation in physical education, fitness, and sports programs. (Diversity, Reflection) (Standard 2 d, g, j, f, k, m, o) 1
10. Improve students' ability to become critically aware of how their feelings, beliefs, and values in relation to gender, race, social class, sexual orientation, and ability issues will affect their abilities to work as professionals in the fields of physical education, sport, or fitness. (Diversity, Reflection) (Standard 2d, g, j, f, k, m, o Standard 9 e, d, g, l, m) 1
11. Improve students' knowledge of and ability to critically analyze cultural stereotypes of diverse populations of people. (Diversity) (Standard 2 d, g, j, f, k, m, o) 1
12. Improve students' knowledge of how cultural stereotypes influence the development of physical education, fitness and sport programs. (Research, Diversity) (Standard 2 d, g, j, f, k, m, o; Standard 4 j, k, m, o, p, q Standard 8 p) 1
13. Improve students' knowledge of how groups influence individuals, and how individuals influence groups in a democratic society. (Diversity) (Standard 2 d, g, j, f, k, m, o; Standard 4 m, p;) 1
14. Improve students' abilities to communicate in ways that demonstrate sensitivity to all learners. (Diversity, Effectiveness) (Standard 1 d, h, l; Standard 2 d, g, j, f, k, m, o) 1
15. Students will demonstrate through writing the ability to apply the issues discussed in class to their specific fields in ways that benefit society. (Evaluation) (Standard 9 e, g, l, m) 1
16. Students will improve their ability to take the content from readings and present it in thought provoking ways to their classmates. (Research, Evaluation, Reflection) (Standard 9 e, g, l, m; Standard 10 a, d, h, n) 1
17. Writing proficiency is required for a passing grade in this course. (Standard 4 l) 1
18. Improve students' abilities to use computers and other technologies to communicate, network, and/or foster inquiry. (Standard 10 g) 1
19. Consult professional literature, colleagues, and other resources to develop as a professional.(Standard 10 e, f, h, l, n, r)

SPMD 2210. Anatomy and Physiology I
3 Credits (3)
Detailed study of the structure and function of the human musculoskeletal, cardiovascular, respiratory, and peripheral nervous systems. Designed specifically for students interested in allied health professions.
Learning Outcomes
1. The student will learn and identify bones, connective tissue, joints and muscular structures of the human body.
2. The student will study joints and associated structures of the body.
3. The student will learn about skeletal muscle, origins, insertions, and actions.

4. The student will learn about the fundamentals of the nervous system and associated structures.
5. The student will learn about smooth and cardiac muscle and their association actions.
6. The student will learn the structures associated with the cardiovascular system (heart and blood vessels).
7. The student will learn the location of all visceral organs.
8. Evaluation of knowledge is determined through practical identification of anatomical structures via written opened ended exams.

SPMD 2210L. Anatomy and Physiology Laboratory
1 Credit (1P)
Students will engage in activities designed to enhance appreciation of the anatomical structures related to the content areas for SPMD 2210. Restricted to Las Cruces campus only.
Learning Outcomes
1. The student will learn and identify bones, connective tissue, joints and muscular structures of the human body.
2. The student will study joints and associated structures of the body.
3. The student will learn about skeletal muscle, origins, insertions, and actions.
4. The student will learn about the fundamentals of the nervous system and associated structures.
5. The student will learn about smooth and cardiac muscle and their association actions.
6. The student will learn the structures associated with the cardiovascular system (heart and blood vessels).
7. The student will learn the location of all visceral organs.
8. Evaluation of knowledge is determined through practical identification of anatomical structures via written opened ended exams.

SPMD 2225. Anatomy and Physiology II
3 Credits (3)
This course is the second of two that serve as an introduction to human anatomy and physiology for any student interested in allied health and/or kinesiology. The course entails describing, explaining, and analyzing structure and function from the submicroscopic to the organismal level with emphasis on specific cellular, tissue, and organ structure and physiology, and organ system structure and function# specifically the endocrine, urinary, digestive, integumentary, renal, central nervous, and reproductive systems. Additionally, an analysis of these concepts is included: fluid and electrolyte balance, pregnancy, growth and development from zygote to newborn, and heredity.
Prerequisite: SPMD 2210 or BIOL 2210.
Learning Outcomes
1. Identify and describe the major anatomical features of the endocrine, lymphatic, digestive, integumentary, renal, urinary, and reproductive systems.
2. Analyze the physiological roles of the endocrine, lymphatic, digestive, urinary, central nervous, immune, and reproductive systems in maintaining homeostasis in the human body.
3. Explain how fluid and electrolyte balance is maintained in the human body.
4. Compare and contrast the anatomy and physiology of male and female reproductive systems.
5. Describe pregnancy from conception to parturition including human growth and development from zygote to newborn.
6. Explain heredity and genetic control.

SPMD 2225L. Anatomy and Physiology II Lab
1 Credit (1)
This is the second in a series of two laboratory courses designed to introduce laboratory practices and techniques for human anatomy and physiology, from the basic cell structure through the organ system level# specifically the endocrine, digestive, lymphatic, respiratory, urinary, and reproductive systems.
Prerequisites: SPMD 2210; SPMD 2210L; or BIOL 2210; BIOL 2210L.
Learning Outcomes
1. Apply the scientific method correctly.
2. Collect, analyze, and interpret scientific data.
3. Use laboratory equipment correctly and safely.
4. Identify the anatomical components of human tissues, organs, and organ systems using models, diagrams, illustrations, or cadaver specimens.
5. Describe the functional characteristics of human tissues, organs, and organ systems using models, diagrams, illustrations, or cadaver specimens.
6. Analyze the physiological processes of the endocrine, lymphatic, respiratory, digestive, urinary, and reproductive systems.
7. Analyze the physiological processes of fluid and electrolyte balance and acid base balance in the human body.
8. Analyze heredity and genetic control.

SPMD 2250. Fitness for Health and Sport
3 Credits (3)
A study of the fitness needs for health enhancement and sport participation.
Learning Outcomes
1. Recognize the importance of incorporating positive fitness/wellness habits within one's lifestyle in terms of enhancing longevity, disease prevention, and overall quality of life.
2. Examine various physiological benefits and adaptations to such factors as muscular strength, muscular endurance, cardiovascular fitness, flexibility, and body composition when certain stimuli are applied to each. Assessment of these characteristics will be witnessed primarily in practical experiences within the course's laboratory settings.
3. Identify current trends and/or health patterns within society in regards to scientific findings, declination in health habits, and increases in health ailments.
4. Compare various nutritional concepts, specifically proper dietary habits and their impact on weight management aspects.
5. Describe the role physical activity and sport specific training play on competitive athletic performance.

SPMD 2310. Career Preparation
1 Credit (1)
From concept to implementation: Career exploration, setting up degree plans, finding graduate programs, developing professional resumes, writing letters of application, seeking letters of recommendation, and interview preparation.
Learning Outcomes
1. Career opportunities within human movement and allied health fields
2. Chose both a primary and secondary career of their interest

3. Search for appropriate graduate schools to match their career choices
4. Create a plan by aligning their undergraduate curriculum with their career choices
5. Explore additional education (dual majors, minors, and certifications specific to their chosen field)
6. Study and create a professional resume
7. Create a curriculum vita as a historical reference for future job prospects
8. Write a professional letter of application for jobs and school applications
9. Learn how to seek "outstanding' letters of recommendation 1
10. Study appropriate interview protocol 1
11. Practice interviews (one on one, panel and group)

SPMD 3050. Therapeutic Modalities
4 Credits (4)
The physiological effects, indications, contraindication, dosage, and maintenance of therapeutic modalities related to the treatment of athletic or activity-related injuries. May be repeated up to 4 credits.
Prerequisite: SPMD 2210 or BIOL 2210; 2.75 GPA.
Learning Outcomes
1. Demonstrate proper assessment techniques to identify appropriate therapeutic modalities for the treatment of injury and illnesses.
2. Design treatment plans based upon sound clinical assessment and appropriate selection of modalities that address the physiological and psychological needs of the patient.
3. Demonstrate competence with the application of a wide variety of modalities including patient preparation, modality application and modification based upon clinical findings using principles of evidence based practice.
4. Perform appropriate documentation of treatments to include patient history, evaluation, treatment goals, expectations and treatment outcomes.
5. Demonstrate competence with the collection and analysis of baseline and post-treatment data to evaluate and interpret treatment outcomes based upon principles of evidence-based practice.

SPMD 3110. Racquet Sports
2 Credits (2)
Knowledge and skills related to the racquet sports of tennis, badminton, and pickleball with emphasis on developmental strategies and skill performance that influences pedagogical content knowledge. Administrative issues will be addressed.

SPMD 3120. Theory and Technique of Lifelong Outdoor Leisure Activities
2 Credits (2)
Knowledge and skills related to lifelong outdoor leisure activities, including the examination of environmental science and awareness, kinesiology, and fundamental motor skills.

SPMD 3130. Theory and Technique of Sports and Games
2 Credits (2)
Knowledge and skills related to team sports and games, with emphasis on developmental strategies and skill performance that influence pedagogical content knowledge. Administrative issues will also be addressed.

SPMD 3140. Designing Student Centered Afterschool Physical Activity Clubs
3 Credits (3)
Knowledge, skills and field based practical application for creating student centered and student designed after school physical activity clubs.

SPMD 3150. Theory and Technique of Dance and Rhythms
2 Credits (2)
Knowledge and skills related to dance and rhythms, with emphasis on the analysis of dance elements and its role in physical education.

SPMD 3160. Elementary School Physical Education
3 Credits (2+2P)
Methods for teaching physical education at the elementary level. Primary focus on creating a learning environment for the acquisition and enhancement of developmentally appropriate locomotor, manipulative, and nonmanipulative skills. Field experience included. Consent of Instructor required.
Prerequisite: GPA of 2.5.
Learning Outcomes
1. Improve your knowledge of K-5 physical education content, disciplinary concepts, and tools of inquiry related to the development of a physically educated person.
2. Improve your knowledge of and ability to plan instruction based on curriculum goals/objectives and students' experiences.
3. Improve your ability to design and teach developmentally appropriate K-5 physical education curriculum for diverse learners.
4. Improve your knowledge of, and ability to, teach a variety of manipulative, nonmanipulative and locomotor skills and concepts.
5. Improve your ability to teach using a variety of strategies such as cooperative learning, problem-based learning, direct instruction that facilitate learning.
6. Improve your ability to plan effective units/lessons to insure equity and sensitivity to the needs of students with diverse characteristics, including, critically analyzing content/curriculum in light of broad goals for education and b) structuring a safe, educational environment that facilitates learning for all students.
7. Improve your knowledge of and ability to help individuals work productively and cooperatively with others.
8. Improve your ability to create an equitable learning climate in which individual differences are respected and be able to model, teach, and integrate multicultural awareness, acceptance, and appreciation.
9. Improve your knowledge of and ability to incorporate critical thinking, problem solving and creative exploration into your lessons. 1
10. Improve your knowledge of professional literature, research, organizations, and other technological resources for continuing professional development. 1
11. Improve your knowledge of and ability to use appropriate professional behavior. 1
12. Improve your ability to model appropriate verbal and written communications. 1
13. Improve your ability to encourage students to recognize, question, and interpret ideas from a variety of perspectives.

SPMD 3240. Research Methods in Kinesiology
3 Credits (3)
This course will provide you with a foundational understanding of research methods. Specifically, the course is designed to prepare you to critically read, understand, and evaluate research; retrieve scholarly articles; and develop research-related skills for future graduate education and/or professional work in kinesiology.

Learning Outcomes

1. Research a topic of interest using scholarly sources.
2. Identify a research problem based on relevant literature.
3. Compare research methods in various kinesiology subdisciplines.
4. Discuss ethical issues in research.
5. Design a research methodology to answer a kinesiology question.

SPMD 3250. Introduction to Exercise Science: Exercise Physiology and Biomechanics
3 Credits (3)
This course serves to provide a broad introduction to both the physiology of exercise and the mechanics of human movement. The conceptual framework of the course will allow for the development of a broad knowledge base regarding these concepts and the latter portions of the course will focus on real world application of the concepts.
Learning Outcomes

1. Students will learn a basic introduction to both exercise physiology and biomechanics and describe physiological systems and their relationship to exercise.
2. Explain how different forces affect human movement.
3. Evaluate current research in exercise physiology and biomechanics.
4. Apply exercise science concepts to real-world examples.
5. Integrate exercise science concepts into a physical activity lesson.

SPMD 3310. Lifetime Activities
2 Credits (2)
Knowledge and skills related to the lifetime activities of swimming, weight training, and other fitness promoting activities with emphasis on learning progressions.
Prerequisite: GPA 2.5.
Learning Outcomes

1. All course objectives are linked to the InTASC Teaching Standards
2. Improve your ability to design and teach developmentally appropriate fitness lesson plans for diverse learners (e.g. aerobics, yoga, strength training). (Standard 7 a, b, c, l, j Standard 8 a, b, d)
3. Improve your ability to modify instructions, lesson plans and tasks based on students' strengths and needs. (Standard 1 b, Standard 3 e, Standard 7 b, c, i, j, l, Standard 8 a, b, d)
4. Improve your knowledge of, and ability to teach a variety fitness content (Standard 7 a, g, h, k, l, n)
5. Improve your ability to plan effective lesson plans to insure equity and sensitivity to students with diverse characteristics. This includes structuring a safe, educational environment that facilitates learning for all students. (Standard 3, e, Standard 7 q, i)
6. Improve your ability to use self-assessment and peer-assessment to reflect on your teaching and plan for adaptations/adjustments (Standard 8 b, d, Standard 9 g).
7. Improve your ability to evaluate and modify instructional resources and curriculum to better meet the needs of their students. (Standard 4 f, Standard 7 g, Standard 8 a)

SPMD 3350. Inferential Statistics in Sport and Exercise Science
3 Credits (3)
Statistical concepts and methods basic to experiential research to include normal distribution, z-tests, t-tests, analysis of variance and regression analysis. An understanding of sport and exercise science theory is required for students enrolling in this course.
Learning Outcomes

1. Express mathematical information symbolically, visually, numerically, and verbally.
2. Employ quantitative methods, such as arithmetic, algebra, geometry, or statistics to solve problems.
3. Evaluate mathematical results for reasonableness.
4. Employ technology to organize, analyze, and present statistical information.
5. Interpret and draw inferences from mathematical models such as formulas, graphs, tables, and schematics.
6. Critically evaluate statistical outcomes for their practical significance.

SPMD 3410. Exercise Physiology
3 Credits (3)
Basic physiological principles as they apply to exercise and fitness programs. Laboratory experiences included. Requires 2.75 GPA.
Prerequisite: SPMD 2210 or BIOL 2210; GPA 2.75.
Learning Outcomes

1. Describe the structure and function of skeletal muscle.
2. Illustrate physiological responses and adaptations to acute bout of exercise as well as to exercise training.
3. Describe the structure and function of the cardiorespiratory system.
4. Describe age and sex considerations in sport and exercise.
5. Demonstrate effects of physical activity for health and fitness.
6. Explain the intervention strategies for athletic success.
7. Describe the laboratory procedures used to study the human body system.

SPMD 3410L. Exercise Physiology Lab
1 Credit (1P)
Laboratory experiments emphasizing the understanding of fundamental physiological mechanisms, regulating responses, and adaptation to exercise. Basic analytical methodologies pertaining to the energy, muscular and circulatorespiratory systems. Includes factors affecting physiological performance capacities and experimental basis of exercise assessment and training.
Prerequisite: SPMD 2210, SPMD 2210L.
Corequisite: SPMD 3410.
Learning Outcomes

1. Develop basic skills and competencies in clinical and experimental laboratory assessment techniques. Emphasis is placed on a healthy population with introductory concepts for special populations.
2. Understand the theory behind basic tests used in the exercise physiology laboratory.

SPMD 3450. Biomechanics
3 Credits (3)
The application of anatomical, mechanical and electrical concepts to better understand the fundamental nature of human movement.
Prerequisite: SPMD 2210 or BIOL 2210, and GPA of 2.75.
Learning Outcomes

1. Understand how human motion is generated using basic anatomical, kinematic, and kinetic concepts, laws, and principles.
2. Demonstrate an understanding of linear and angular motion.
3. Describe human motion using appropriate, well-defined terminology.
4. Demonstrate an understanding of how the body is affected by forces.
5. Utilize kinematic and kinetic concepts to solve computational and practical problems.

SPMD 3450L. Biomechanics Laboratory
1 Credit (1)
This course serves to provide an introduction to human movement and its analysis. The conceptual framework of the course will allow for the

application of anatomical, mechanical, and electrical concepts in order to better understand the fundamental nature of movement.
Prerequisite: SPMD 2210 or BIOL 2210, GPA 2.75.
Corequisite: SPMD 3450.
Learning Outcomes
1. Utilize kinematic and kinetic concepts to solve computational and practical problems.
2. Gain exposure to the various data collection and analysis tools in biomechanics.
3. Apply conceptual biomechanics knowledge to biomechanics datasets.
4. Collaborate in student teams to develop a biomechanics research proposal.

SPMD 3550. Psychology of Sport
3 Credits (3)
Development of coaching techniques to enhance sport performance based on understanding and use of psychological principles.
Prerequisite: GPA 2.75.
Learning Outcomes
1. Identify psychological characteristics associated with peak performance.
2. Recognize and define the psychological constructs including, but not limited to, confidence, motivation, stress/anxiety, and arousal.
3. Understand how personal factors and situational factors can affect human performance.
4. Describe and explain factors practitioners should consider when diagnosing, designing, and implementing a mental training intervention.
5. Read, evaluate, and apply sport psychology literature.

SPMD 3610. Health and Exercise Psychology
3 Credits (3)
The course examines the reciprocal relationship among physical activity, exercise behavior, and psychological determinants associated with adopting and maintaining an exercise program. Topics include theories of behavioral change, exercise psychology interventions, the benefits/pitfalls of exercise, and psychological factors influencing patient rehabilitation.
Prerequisite: GPA 2.75.
Learning Outcomes
1. Describe and compare various theories for explaining health and exercise behaviors.
2. Define key constructs prevalent in motivating clients to maintain or enhance health and exercise behaviors.
3. Describe and explain relationships between various antecedents of exercise and exercise as well as between exercise and various outcomes.
4. Apply health and exercise psychology constructs, such as motivation, mental health, and personality, to realistic scenarios to help promote health and exercise behaviors.

SPMD 3650V. Motor Development
3 Credits (3)
Covers development of motor skills from infancy through maturity. Focus on the principles of motor development, early motor behavior, stage theory, and assessment. Field experiences will augment lecture and readings.
Prerequisite: GPA 2.5.
Learning Outcomes
1. Define and discuss key terms, concepts, and theories related to lifespan motor development.
2. Analyze the various constraints that surround the development of motor skills and discuss how they contribute to the resulting motor skill behavior.
3. Explain key processes, sequences, factors, and milestones related to various stages of motor development across the life span.
4. Apply theoretical knowledge in a real-world setting through structured field observations of children at various lifespan and developmental stages.
5. Understand basic biomechanical processes as they apply to developmental change.
6. Describe the qualitative as well as quantitative changes that occur in fundamental motor skills (walking, running, jumping, hopping, throwing, kicking, catching, and striking).
7. Assess developmental levels of fundamental motor skills on video and in real-world settings.
8. Identify motor development phenomena that are universal while applying concepts of environmental and sociocultural constraints that contribute to individual variability in motor development.

SPMD 3710. Motor Learning
3 Credits (3)
An examination of the theoretical foundations and related literature that underline the learning, performing, and retention of motor skills with implications for effective teaching and coaching.
Prerequisite: GPA 2.5.
Learning Outcomes
1. Assess functional differences between motor skill types.
2. Compare motor control theories and how they control human movement.
3. Critically evaluate current research in motor learning.
4. Recommend strategies to improve motor learning in both therapy and sport settings.
5. Facilitate a practical example of motor learning over time.

SPMD 4015. Therapeutic Exercise
3 Credits (3)
The physiological effects, indications, contraindications, dosage, and maintenance of therapeutic modalities related to the treatment of athletic or activity-related injuries. Must maintain a 3.0 GPA. May be repeated up to 3 credits.
Learning Outcomes
1. Apply appropriate clinical reasoning to the selection of therapeutic exercises based upon evidence-based practice guidelines, relevant physical findings, indications, contradictions and precautions.
2. Demonstrate appropriate application of therapeutic exercises and techniques including selection, application, patient instruction, and documentation.
3. Design an individualized therapeutic exercise program incorporating appropriate modifications for tissue repair timelines, physiological and psychological factors, and any additional clinical findings.
4. Demonstrate effective assessment skills to determine safe levels of physical activity for patients.

SPMD 4095. Clinical Practicum VII
3 Credits (3)
Athletic training psycho-motor skills are enhanced and assessed by a preceptor during clinical rotations. Emphasis is on competencies and

proficiencies previously instructed in didactic courses. Students may complete a general medical rotation as part of this course. Must maintain 3.0 GPA. Consent of Instructor required. Restricted to: Athletic Training majors.

Learning Outcomes

1. Be prepared to sit for the Board of Certification (BOC) examination.
2. Confidently understand the BOC exam format, and method of delivery.
3. Meet the requirements to maintain certification, including evidence based practice requirements and continuing education units and their reporting cycles.
4. Demonstrate competence in in the following educational content areas for the practice of Athletic Training: evidence-based practice, prevention and health promotion, clinical examination and diagnosis, acute care of injury and illness, therapeutic interventions, psychosocial strategies and referral, healthcare administration, professional development and responsibility.

SPMD 4210. Advanced Exercise Physiology
3 Credits (3)

Detailed study of the integrated response of neuromuscular, cardiovascular, and respiratory systems to acute and chronic exercise, nutrition, and environmental conditions with a strong emphasis on laboratory experiences.

Prerequisite: SPMD 3410 and GPA of 2.75 or consent of instructor.

Learning Outcomes

1. Fundamental concepts about nutrition and it application to human performance
2. Advanced understanding of nutrition and its association with human bioenergetics
3. Human bioenergetics and its responsibility for performance enhancement and outcomes
4. Energy transfer and expenditure under various physical and environmental conditions
5. Pulmonary and cardiovascular responses to exercise
6. Cardiovascular and cellular adaptations to altitude

SPMD 4250. Principles of Strength and Conditioning
3 Credits (3)

Application of research, theory, and methods of high-intensity, resistive overload training. Performance-specific topics include management, nutrition. Requires SPMD 2210 and SPMD 3410; GPA of 2.75.

Prerequisite: SPMD 3410; SPMD 2210 or BIOL 2210; GPA 2.75.

Learning Outcomes

1. Students will examine both applied and theory-based strength conditioning concepts by applying designated guidelines set forth by the National Strength and Conditioning Association (NSCA).
2. Students will discuss various acute and chronic human performance adaptations by examining practical examples involving (but not limited to) musculoskeletal adaptation, muscular power output, speed and agility characteristics, plyometric training, body composition characteristics, and cardiovascular characteristics, among many others.
3. Students will recognize strength and conditioning adaptations regarding specific groups, such as youth, female, and elderly populations by contrasting various case studies that feature these populations.
4. Students will examine the administration of human performance testing/assessments on subjects of various skill-levels, experience, and athletic backgrounds, while understanding reliability and validity concerns of said assessments, accomplishing this by participating in practical-based performance testing featured in the course's lab component.
5. Students will analyze strength and conditioning testing results in order to properly prescribe a complete exercise regimen for an individual, based on their sport- or fitness-specific goals, accomplishing this primarily through the course's capstone final project.
6. Students will examine the practicality of strength training towards today's athlete as well as how proper periodization implementation affects this mode of activity, accomplishing this by applying both traditional and undulated periodization guidelines.
7. This course will prepare students to sit for the NSCA's Certified Strength Conditioning Specialist (CSCS) exam by relying upon human performance guidelines set forth by the NSCA along with implementing published study resources provided by the NSCA.

SPMD 4250L. Principles of Strength and Conditioning Laboratory
1 Credit (2P)

An applied examination of the theory, principles, rules and regulations associated with various strength and conditioning exercises to include but not limited to Olympic lifting, powerlifting, bodybuilding, plyometrics, speed, agility and speed-endurance development. Lab required for Kinesiology majors.

Prerequisite: SPMD 2210 or BIOL 2210, and SPMD 3410; GPA 2.75.

Corequisite: SPMD 4250.

Learning Outcomes

1. Students will examine commonly relied upon human performance testing practices towards various exercise science-based concepts by applying guidelines set forth by the National Strength and Conditioning Association (NSCA).
2. Students will assess various physiological adaptations by conducting performance tests that target muscular power output, speed, agility, anaerobic capacity, aerobic capacity, vertical jumping, plyometric training, and non-traditional training modes (among numerous others).
3. Students will demonstrate proficiency towards proper administration of human performance assessments by effectively conducting, instructing, and demonstrating said assessments and physical capabilities.
4. Students will properly evaluate and interpret human performance testing results by documenting their own performance test results as well their peers' and applying these data to set norms commonly relied upon by professionals in the field.
5. Students will value the importance of effective and efficient training methodologies based on the varying needs of today's physically active population, accomplished by examining the role physical activity and sport-specific training play on competitive athletic performance.
6. Students will use this lab to prepare and sit for the NSCA's Certified Strength Conditioning Specialist (CSCS) exam by relying upon human performance guidelines set forth by the NSCA along with implementing published study resources provided by the NSCA.

SPMD 4350. Exercise Testing and Prescription
3 Credits (3)

This combined lecture and lab class introduces students to the scientific basis for and principles of exercise testing and prescription. The focus is on basic approaches to exercise testing and prescription for healthy adults, while application to some special populations with chronic disease will be discussed.

Prerequisite: SPMD 2210 or BIOL 2210; SPMD 3410; GPA 2.75.

Learning Outcomes

1. Students will examine the application and procedures of both fitness and clinical based exercise tests commonly used in the Kinesiology field by participating in practical lab sessions conducted within this course.
2. Students will examine appropriate exercise prescription principles designed for healthy adults by applying published ACSM guidelines to various hypothetical subjects and case studies used in this course.
3. Students will analyze appropriate exercise programming strategies used by today's practitioners by studying such concepts as established physical activity (PA) minimums and defined lifestyle risks for cardiovascular disease (CVD).
4. Students will compare various pre-participation measures for exercise by utilizing such instruments as the PAR-Q and ACSM Algorithm screening tools.
5. This course will prepare students to sit for ACSM's credential-based exams by relying upon exercise prescription guidelines set forth by ACSM along with implementing published study resources provided by ACSM.

SPMD 4410. Exercise for Special Populations
3 Credits (3)

Fundamentals of kinesiology adapted for adults with various diseases and disabilities. Focus will be on the application of exercise assessment and prescription for selected conditions.

Prerequisite: SPMD 3410 or consent of instructor; GPA of 2.75.

Learning Outcomes

1. To develop an understanding of the pathophysiology of various cardiovascular, pulmonary, metabolic, skeletal muscle, orthopedic, and mental diseases.
2. To provide a medical perspective in the treatment and management of individuals with these conditions in which exercise therapy may be beneficial.
3. To provide a sound understanding of exercise testing and prescription for a variety of chronic disease states.
4. To be able to assess, interpret, and evaluate case studies of diseased individuals and to develop comprehensive rehabilitation programs based on this information.
5. To develop the ability to articulate / present information of various diseases / conditions in a professional manner both formally and in a one on one setting.

SPMD 4450. Pathophysiology and Human Function(s)
3 Credits (3)

Students will discuss basic concepts of pathophysiology such as inflammation & repair, infectious diseases, neoplasms, and diseases of specific physiological systems. In addition, students will discuss a variety of case studies, and in so doing will be able to relate pathophysiologic conditions to symptoms, activity restrictions and disability.

Prerequisite: SPMD 2210 or BIOL 2210; SPMD 2210L or BIOL 2210L; SPMD 3410; GPA 2.75.

Learning Outcomes

1. Students will develop knowledge about basic neurophysiological function of the central and peripheral nervous system
2. Individuals will develop knowledge about motor control theory and assessment of human movement.
3. Students will demonstrate their knowledge about the control processes of both gross and fine motor skills.
4. Students will apply knowledge of sensory physiology to the relationship with human performance.
5. Individuals will develop and improve their ability to communicate complex theories and physiological processes through both oral and written work.

SPMD 4510. Neurophysiology and Human Function
3 Credits (3)

Students will be introduced to a comprehensive study of the human nervous system. Fundamental structures of the central and peripheral nervous system will be discussed to understand the physiology of the brain and rest of the nervous system. This course will also enhance the understanding how sensory information reaches the brain and how information is processed, leading to effective action. In addition, students will be introduced to the basic concepts regarding neurodynamics, neurological mechanisms of pain, and pathophysiology of neurologic disorders/conditions, with emphasis placed on recognition, pathophysiologic signs/symptoms, assessment, and management of selected conditions.

Prerequisite: SPMD 2210 or BIOL 2210; SPMD 2210L or BIOL 2210L; SPMD 3410; and GPA of 2.75.

Learning Outcomes

1. Identify and describe the organization of the central and peripheral nervous systems, the structure and function of neurons and glia, and the anatomy of the brain and its internal and external structures.
2. Develop knowledge about the basic neurophysiological function of the central and peripheral nervous systems.
3. Describe the neurobiology and pathways of the special senses.
4. Identify and analyze major neurological disorders and mental health disorders and describe their clinical presentations.
5. Describe and understand the clinical examination process relevant to neurological injury, illness, and disease.

SPMD 4520. Adapted Physical Education
3 Credits (3)

Selection and scope of corrective activities in posture and body mechanics, and the adaptation of movement activities for the exceptional student.

Learning Outcomes

1. Students will learn to implement principles of inclusion into the practice of physical education.

SPMD 4530. Methods of Teaching Secondary Physical Education
6 Credits (6)

Theoretical and practical applications of curriculum, pedagogy and assessment for teaching secondary physical education. Provides the students opportunities to develop curriculum, teach, and assess student learning through a supervised practicum in both middle and high school physical education settings. Consent of Instructor required.

Prerequisite: SPMD 3160.

Learning Outcomes

1. Improve your knowledge of 6-12 physical education content, disciplinary concepts, and tools of inquiry related to the development of a physically educated person.
2. Improve your knowledge of and ability to plan instruction based on curriculum goals/objectives and students' experiences.
3. Improve your ability to design and teach developmentally appropriate 6-12 physical education curriculum for diverse learners.
4. Improve your knowledge of, or ability to, teach a variety of skills and concepts a Student-Centered Inquiry as Curriculum approach.
5. Improve your ability to teach using a variety of strategies such as cooperative learning, problem-based learning, direct instruction,

divergent convergent discovery, that facilitate student learning across difference.

6. Improve your ability to plan effective units/lessons to insure equity and sensitivity to the needs of students with diverse characteristics: this includes a) critically analyzing content/curriculum in light of broad goals for education and b) structuring a safe, educational environment that facilitates learning for all students.
7. Improve your knowledge of and ability to help individuals work productively and cooperatively with others to produce quality work.
8. Improve your ability to create an equitable learning climate in which individual differences are respected and be able to model, teach, and integrate multicultural awareness, acceptance, and appreciation.
9. Improve your knowledge of and ability to incorporate inquiry, critical thinking, problem solving and creative exploration into your lessons. 1
10. Improve your knowledge of professional literature, research, organizations, and other technological resources for continuing professional development. 1
11. Improve your knowledge of and ability to use appropriate professional behavior. 1
12. Improve your ability to model appropriate verbal and written communications. 1
13. Improve your ability to encourage students to recognize, question, and interpret health related ideas from a variety of perspectives. 1
14. Improve your ability to reflect on your teaching in relation to sound educational philosophy, social, moral and other educational issues, theoretical knowledge, research, and your personal beliefs and values. 1
15. Improve your ability to design and implement formal and informal practical assessments with students as a way to check for student learning. 1
16. Use a variety of formal and informal assessment techniques to assess learner performance, provide feedback, and communicate learner progress.

SPMD 4540. Psychology of Coaching in Sport
3 Credits (3)
This course is designed to focus on major topics and theories dealing with the social-psychological factors affecting the performance of athletes and teams, with practical suggestions for enhancing the effectiveness of teachers and coaches. The course will also focus on team and group dynamics that influence physical performance.
Prerequisite: SPMD 3550 or SPMD 3610.
Learning Outcomes

1. Examine current literature and popular media to consider the influence of coaching behaviors on human performance in sport and non-sport activities.
2. Compare coaching from a psychological perspective to current understandings in motor learning.
3. Evaluate coaching behavior using evidence-based sources and measurement tools.
4. Develop a coaching portfolio for a sport program of choice.

SPMD 4550. Exploring Extreme Human Performance
3 Credits (3)
A reading, writing and documentary based course studying human's quest and the related sacrifices associated with participating in extreme performance activities such as the Olympics, wakeboarding, snowboarding, military special forces, ultra-run events, marathons, etc. Consent of Instructor required.
Prerequisite: Consent of instructor and GPA 2.75.

SPMD 4610. Research Seminar
3 Credits (3P)
Capstone course for Kinesiology/Pre-Health minors. Consent of Instructor required.
Prerequisite: GPA 2.75.
Learning Outcomes

1. The Student Learning Outcomes are dependent on instructor and specific direction of course with individual group of students, similar to an independent study/research/practicum experience

SPMD 4620. Nutrition and Metabolism of Sport
3 Credits (3)
This course addresses the aspects of nutrition that are related to exercise performance. Emphasis will be placed on the bioenergetics systems, the components of nutrition, nutritional and body composition assessments, ergogenic aids, and diet modifications for physically active individuals and athletes.
Prerequisite: SPMD 2210, SPMD 3410.
Learning Outcomes

1. Describe the metabolism of macronutrients and micronutrients.
2. Clarify the effects of high and low-carbohydrate diets on exercise performance.
3. Explain the potential athletic benefits of manipulating fat content in our diet.
4. Discuss increasing protein intake to promote exercise adaptations.
5. Explain specific physiological functions of micronutrients.
6. Specify fluid intake recommendations before, during, and after exercise.
7. Calculate macronutrient recommendations for endurance athletes, strength/power athletes, and team sport athletes.
8. Provide nutritional recommendations for special populations of athletes.
9. Recommend nutrition strategies related to weight management goals . 1
10. Discuss the benefits and challenges of unique body composition assessments. 1
11. Provide macronutrient recommendations within a periodized training program. 1
12. Compare and contrast the ergogenic benefits of popular dietary supplements.

SPMD 4805. Emergency Response
2 Credits (2)
Comprehensive approach to the identification of risk factors, preparation of emergency action plans, and recognition and care of emergency medical conditions including those that may lead to sudden death. This is a hybrid course combining online instructional components and clinical skills experience including clinical safety (blood-borne pathogens, ECC, first-aid, etc), and on-field emergency management. Consent of Instructor required.
Learning Outcomes

1. Identify the individuals involved in the Emergency Response Team
2. Construct the components of an effective Emergency Action Plan.
3. Assess the scene and patient during an emergency situation.
4. Demonstrate proper universal precautions and wound care.
5. Demonstrate effective Cardiopulmonary Resuscitation, AED use.
6. Demonstrate effective Rescue Breathing Airway Management techniques.

7. Demonstrate effective splinting techniques.
8. Demonstrate understanding of the techniques utilized in cervical stabilization
9. Identify components of acute care for general medical and orthopedic emergencies

SPMD 4997. Problems
1-3 Credits (1-3)
Independent study in either Kinesiology and/or Athletic Training May be repeated up to 9 credits.
Learning Outcomes
1. Varies

SPMD 4998. Internship
6 Credits (6P)
A part-time internship in an approved wellness, fitness, athletic, recreation, research lab or other program as agreed upon by the internship supervisor. The student will gain experience in all phases of management and operation. This is a 6-hour internship which can be repeated for an additional 6-credit hours at the same or a different location allowing the student to gain one or multiple field experiences. Field instructor supervision will oversee the students performance. This internship may require relocation to a site outside of the Las Cruces area.
Learning Outcomes
1. Students will apply their academic program didactic knowledge, skills and abilities at a professional site gaining hands-on learning experiences under the supervision of a practicing professional
2. Students will learn in a working environment such that the internship becomes the capstone of their undergraduate education allowing them practical experience in a career field of their choice.

SPMD 5005. Foundations of Athletic Training
3 Credits (3)
This course provides an introduction to clinical decision making and covers standard techniques and procedures for the evaluation and diagnosis of musculoskeletal injuries and common illnesses, injury prevention concepts, documentation and management. Consent of Instructor required.
Learning Outcomes
1. Demonstration of clinical decision making skills
2. Articulation of standard techniques and procedures for evaluation and diagnosis
3. Produce standardized documentation of clinical findings.

SPMD 5010. Clinical & Functional Anatomy in Athletic Training
3 Credits (3)
This course allows students to develop applied knowledge and hands-on skills for future athletic training practitioners. Emphasizes skills for identifying musculoskeletal structures visually and via palpation, and then assessing their function. Use of anatomical and live human models to develop and demonstrate skills. Acceptance into the MSAT program.
Learning Outcomes
1. Demonstrate knowledge of human musculoskeletal structures and function.
2. Identification of boney landmarks for assessment of musculoskeletal conditions.
3. Demonstrate appropriate palpation of muscles, bones and joints for musculoskeletal assessment.
4. Demonstrate knowledge of actions, origins, insertions and innervations of the major muscle groups of the human body.
5. Demonstrate appropriate techniques for assessment of functional movements.

SPMD 5015. Behavioral Health, Wellness, and Prevention
3 Credits (3)
Exploration of models of patient care delivery in athletic training, behavioral health, wellness and prevention principles as they apply to an athletic or physically active population.
Learning Outcomes
1. Identify, refer and give support to athletes/patients with behavioral health conditions.
2. Collaborate with other healthcare providers to provide appropriate interventions for behavioral health and overall wellness.
3. Develop and implement strategies to mitigate risks associated with long-term health conditions across the lifespan including patient education.
4. Demonstrate competent communication and patient education strategies within a variety of behavioral health and wellness scenarios.
5. Articulate the importance and key components of a mental health emergency action plan.
6. Explore and analyze the impact of group identification including the intersectionality of multiple identities on health disparities, patient care and patient outcomes.

SPMD 5020. Graduate Athletic Training Research I
1-3 Credits (1-3)
Advanced research topics in athletic training. Students will explore research and evidence based practices within the field of athletic training. Students will work under the direct supervision of a Commission on Accreditation of Athletic Training Education (CAATE) accredited Athletic Training Program faculty member. Students should be prepared to further explore research topics within a specific discipline with the intent of disseminating and sharing information with the athletic training community. topics previously covered in SPMD 5310 (Graduate Athletic Training Seminar I) Students may engage in teaching and research opportunities in unique areas May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate increased knowledge within the designated topic areas identified for the semester.
2. Demonstrate increased skill in assessing and conducting research for the athletic training community

SPMD 5025. Graduate Athletic Training I
1-3 Credits (1-3)
Advanced clinical experiences and education in athletic training. Students will examine topics in athletic training in conjunction with faculty members within the Commission on the Accreditation of Athletic Training Education (CAATE) Athletic Training Program at New Mexico State University . Assessment of Athletic Training Program clinical proficiencies as described by the National Athletic Trainers' Association Education Council. May be repeated up to 3 credits.
Learning Outcomes
1. Demonstrate increased knowledge within the designated topic areas identified for the semester.
2. Demonstrate increased skill in teaching or academic preparation techniques as identified for the semester.

SPMD 5030. Graduate Athletic Training II
3 Credits (3)

Advanced clinical experiences and education in athletic training. Assessment of Athletic Training Program clinical proficiencies as described by the National Athletic Trainers' Association Education Council. May be repeated up to 3 credits.

Learning Outcomes

1. Demonstrate increased knowledge within the designated topic areas identified for the semester.
2. Demonstrate increased skill in teaching or academic preparation techniques as identified for the semester.

SPMD 5050. Clinical Education I
3 Credits (3)

Integration of clinical competencies with classroom instruction and a supervised field based experience in athletic training to link theory into practice. Consent of Instructor required.

Learning Outcomes

1. Demonstrate basic evaluation, taping, bracing and emergency care skills.
2. Select and properly fit protective equipment for a variety of injury and sport scenarios.
3. Demonstrate proper equipment removal for emergency care of the injured athlete.
4. Perform a pre-participation examination including physical evaluation, documentation and referral if needed.

SPMD 5120. Lower Extremity Injury Evaluation + Lab
4 Credits (4)

This course provides a comprehensive approach to the pathomechanics, clinical examination, diagnosis, role of clinical outcome measures and appropriate medical referral and treatment of orthopedic injuries and other conditions to the lower extremity. Consent of Instructor required.

Learning Outcomes

1. Demonstrate knowledge and ability to apply current best practices in acute care, diagnosis and treatment of injuries involving the lower extremity
2. Demonstrate strong clinical examination skills in order to accurately diagnose and effectively treat the patient.
3. Demonstrate the knowledge and skills necessary to evaluate and provide immediate management of acute injuries.
4. Determine and apply therapeutic interventions designed to maximize the patient's participation and health-related quality of life.
5. Develop and implement strategies and programs to prevent the incidence and/or severity of injuries.

SPMD 5150. Clinical Education II
3 Credits (3)

Integration of clinical competencies with classroom instruction and a supervised field based experience in athletic training to link theory into practice.

Prerequisite: SPMD 5050.

Learning Outcomes

1. Students will become effective practitioners in the field of Athletic Training and Sports Medicine by utilizing critical thinking strategies based in evidence based practice theories combined with pedagogical knowledge of the concepts in Athletic Training.
2. Students will utilize their clinical experience and knowledge of injury evaluation to enhance their athletic training skills working with an athletic population under the supervision of a preceptor.

SPMD 5180. Therapeutic Interventions I
4 Credits (3+1P)

Stud of physical rehabilitation theory and techniques used as therapeutic intervention for orthopedic injuries and conditions.

Learning Outcomes

1. Demonstrate appropriate application techniques for therapeutic modalities to include thermal, electrical, ultrasound and mechanical therapeutic modalities.
2. Demonstrate proper clinical assessment techniques to establish treatment and rehabilitation plans for a variety of orthopedic injuries and conditions including proper documentation procedures.
3. Demonstrate knowledge of the physiological and pathological processes of trauma, wound healing and tissue repair and their role/ implications within the therapeutic intervention process.

SPMD 5205. Evidence Based Practice
2 Credits (2)

This course investigates the concepts of evidence based practice as it relates to musculoskeletal assessment, diagnosis and therapeutic interventions with a primary focus on clinician- and patient-oriented outcome measures and appropriate referral decisions. Students will explore primary literature focused on clinical questions related to a comprehensive approach to injury evaluation.

Learning Outcomes

1. Define evidence-based practice as it relates to athletic training clinical practice.
2. Explain the role of evidence in the clinical decision-making process.
3. Describe and differentiate the types of quantitative and qualitative research, research components, and levels of research evidence.
4. Describe a systematic approach (eg, five step approach) to create and answer a clinical question through review and application of existing research.
5. Develop a relevant clinical question using a pre-defined question format (eg, PICO= Patients, Intervention, Comparison, Outcomes; PIO = Patients, Intervention, Outcomes).

SPMD 5220. Upper Extremity Injury Evaluation + Lab
4 Credits (3+1P)

This course provides a comprehensive approach to the pathomechanics, clinical examination, diagnosis, role of clinical outcome measures and appropriate medical referral and treatment of orthopedic injuries and other conditions to the upper extremity. Consent of Instructor required.

Learning Outcomes

1. Demonstrate knowledge and ability to apply current best practices in acute care, diagnosis and treatment of injuries involving the upper extremity
2. Demonstrate strong clinical examination skills in order to accurately diagnose and effectively treat the patient.
3. Demonstrate the knowledge and skills necessary to evaluate and provide immediate management of acute injuries.
4. Determine a therapeutic intervention designed to maximize the patient's participation and health-related quality of life.
5. Develop and implement strategies and programs to prevent the incidence and/or severity of injuries and optimize their patient's overall health and quality of life.

SPMD 5250. Immersive Clinical Experience
3 Credits (3P)

Integration of clinical competencies during an immersive, supervised, field based experience in athletic training to link theory into practice. May be repeated up to 6 credits.

Prerequisite: SPMD 5150.

Learning Outcomes

1. Students will be proficient in the day to day operations of an athletic training room.
2. This immersive experience will prepare students for future employment as a full-time athletic trainers.
3. Students will demonstrate skills in all aspects of athletic training including patient-centered care, clinical examination, diagnosis and intervention, prevention, health promotion and wellness and healthcare administration.

SPMD 5280. Therapeutic Interventions II
4 Credits (3+1P)
A detailed study of the physiological effects, indications, contraindication, dosage, and maintenance of modern therapeutic devices related to the treatment and rehabilitation of orthopedic injuries and conditions.
Prerequisite: SPMD 5180.
Learning Outcomes

1. Demonstrate proper clinical assessment techniques to establish treatment and rehabilitation plans for a variety of orthopedic injuries and conditions including proper documentation procedures.
2. Demonstrate knowledge of the physiological and pathological processes of trauma, wound healing and tissue repair and their role/implications within the therapeutic intervention process.
3. Design treatment plans based upon sound clinical assessment and appropriate selection of modalities that address the physiological and psychological needs of the patient.
4. Demonstrate competence with the collection and analysis of baseline and post-treatment data to evaluate and interpret treatment outcomes based upon principles of evidence-based practice.
5. Demonstrate competence with the application of a wide variety of modalities including patient preparation, modality application and modification based upon clinical findings using principles of evidence based practice.

SPMD 5310. Inferential Statistics in Sports and Exercise Science
3 Credits (3)
This course serves to provide an introduction to statistical analyses. The conceptual framework of the course will allow for the application of a variety of statistical concepts in order to better understand the nature of data associated with scientific literature publications. Consent of Instructor required for registration.
Learning Outcomes

1. Exhibit an understanding of basic statistical concepts and techniques that are consistent with contemporary and valid research in the field of exercise science.
2. Effectively organize data and accurately calculate appropriate statistics for specific research applications.
3. Exhibit an understanding of specific factors that affect validity, reliability and subjectivity of various data gathering techniques.
4. Exhibit knowledge of how to analyze and interpret data using current appropriate technology (SPSS).
5. Interpret performance and fitness data in order to make appropriate and relevant conclusions.
6. Select an appropriate statistical test upon being presented with a data set, interpret the statistical test, and present the results in APA format.

SPMD 5350. Principles of Strength and Conditioning
3 Credits (3)
Application of research, theory, and methods of high-intensity, resistance training. Performance-specific topics include management, nutrition, exercise prescription, periodization, lifting techniques, testing, and evaluation. Course will emphasize standards set forth by the National Strength and Conditioning Association preparing students interested in sitting for the NSCA certification examinations. Consent of Instructor
Learning Outcomes

1. Understanding of general physiology and its responses to acute and chronic exercise
2. Understanding of cardiovascular effects of exercise, training and sport
3. Understanding of strength training affects on special populations such as youth, women and the elderly
4. Understanding of musculoskeletal changes from exercise, training and sport
5. Practicality and application of power and strength training
6. Comprehension of training programs and how they pertain to different training aspects
7. Demonstrate principles of plyometrics and training
8. Understand and demonstrate principles of periodization

SPMD 5370. Research Methods in Kinesiology
3 Credits (3)
This course will provide students with graduate-level understanding of research methods. Specifically, the course is designed to prepare students to critically read, understand, and evaluate research; retrieve scholarly articles; and develop research-related skills for further graduate education and professional work. Students will be trained to become scientific thinkers rather than anecdotal thinkers.
Learning Outcomes

1. Be able to accurately identify a research problem.
2. Conduct a literature search and summarize literature to develop a research problem.
3. Develop a hypothesis and research statement appropriate to their specific research interests.
4. Determine an appropriate study design/method to test the hypothesis.
5. Demonstrate understanding of measurement concepts such as validity, reliability, scales of measurement, field tests, and laboratory tests.
6. Interpret statistical analyses, tables, and summaries presented in research.
7. Understand research ethics.
8. Use written and verbal forms for reporting research.

SPMD 5410. Biomechanics
3 Credits (3)
The application biomechanical analysis of human movement as it relates to human performance through the use of anatomical, mechanical and electrical concepts. Consent of Instructor
Learning Outcomes

1. The student will be able to competently assess physical anatomy, analyze linear and angular forces, examine gait, understand the relationships between kinetics and kinematics, understand how muscle and bone architecture impact human movement, and be familiar with the utilization of various data collection methods used in evaluating and improving human movement.

SPMD 5450. Exercise for Special Populations
3 Credits (3)

Fundamentals of kinesiology adapted for adults with various diseases and disabilities. Focus will be on the application of exercise assessment and prescription for selected conditions. Consent of Instructor

Learning Outcomes

1. To develop an understanding of the pathophysiology of various cardiovascular, pulmonary, metabolic, skeletal muscle, orthopedic, and mental diseases.
2. To provide a medical perspective in the treatment and management of individuals with these conditions in which exercise therapy may be beneficial.
3. To provide a sound understanding of exercise testing and prescription for a variety of chronic disease states.
4. To be able to assess, interpret, and evaluate case studies of diseased individuals and to develop comprehensive rehabilitation programs based on this information.
5. To develop the ability to articulate / present information of various diseases / conditions in a professional manner both formally and in a one on one setting.

SPMD 5510. Psychology of Sport
3 Credits (3)

Development of coaching techniques to enhance sport performance based on understanding and use of psychological principles. Consent of Instructor

Learning Outcomes

1. Identify psychological characteristics associated with peak performance
2. Describe and explain factors practitioners should consider when diagnosing, designing, and implementing a mental training intervention.
3. Recognize and define the psychological constructs of –for example but not limited to—concentration, confidence, motivation, stress/anxiety, and arousal.
4. Understand how personality attributes and the environment affect human performance and injury rehabilitation.

SPMD 5550. Skill Acquisition and Performance
3 Credits (3)

Behavioral and physiological examination factors that influence the acquisition and performance of motor skills. Consent of Instructor

Learning Outcomes

1. Describe and explain the principles and processes underlying skilled performance
2. Know the factors to consider when diagnosing, designing, and assessing learning experiences
3. Understand the elements of an effective instructional plan for skill acquisition

SPMD 5575. Advanced Motor Development
3 Credits (3)

Advanced coverage of motor development topics including: Theoretical perspectives of motor development; the sequential, age-related, continuous process of physical growth and maturation; changes in movement behavior from infancy to older adulthood; external influences on development of motor skills; research approaches in motor development. Consent of Instructor

Learning Outcomes

1. Describe the historical progression of motor development within the broader field of kinesiology
2. Explain the various theories and foundational concepts of motor development
3. Understand and apply the processes (social, cognitive, perceptual) involved in motor skill development throughout the lifespan (infancy, childhood, adolescence, adulthood)
4. Identify procedures and methodologies used to assess various aspects of motor development
5. Interpret the supporting literature and research related to the fundamental principles of motor development
6. Apply and transfer the knowledge gained to develop a research proposal to enhance understanding of a motor development topic of interest

SPMD 6005. Athletic Training Research I
2 Credits (2)

Instruction and development of research skills through the study of published reports and readings in athletic training and related fields. Consent of Instructor required.

Learning Outcomes

1. Describe a systematic approach (eg, five step approach) to create and answer a clinical question through review and application of existing research.
2. Develop skill in utilizing multiple scales for critical appraisal of literature and research studies.
3. Develop a relevant clinical question utilizing a predefined question format and conduct a literature review on the subject.
4. Describe multiple forms of research, research and literature resources and the differences between narrative reviews, systematic reviews and meta analyses.
5. Describe and apply concepts of diagnostic accuracy and clinical prediction rules as they pertain to patient centered care and evidence based practice.

SPMD 6010. Organization and Administration in Athletic Training
3 Credits (3)

Organization and administration of athletic training services including management, leadership, financial, human resources, facility, information technology and risk management.

Learning Outcomes

1. Students will employ values consistent with the NATA code of ethics for all health care administration actions.
2. Demonstrate knowledge of legal, ethical and risk management concepts in athletic training and health care administration.
3. Demonstrate mastery of a variety of health care management concepts.
4. Demonstrate comprehension of fiscal management strategies, resource management and facility design as it relates to athletic training.

SPMD 6020. Evaluation of the Head, Neck, Spine and Torso
3 Credits (3)

This course provides a comprehensive approach to the pathomechanics, clinical examination, diagnosis, role of clinical outcome measures and appropriate medical referral and treatment of orthopedic injuries and other conditions to the head, neck and spine.

Prerequisite: SPMD 5220.

Learning Outcomes

1. Demonstrate knowledge and ability to apply current best practices in acute care, diagnosis and treatment of injuries involving the head, neck, spine and torso.

2. Demonstrate strong clinical examination skills in order to accurately diagnose and effectively treat the patient.
3. Demonstrate the knowledge and skills necessary to evaluate and provide immediate management of acute injuries and illnesses.
4. Determine a therapeutic intervention designed to maximize the patient's participation and health-related quality of life.
5. Develop and implement strategies and programs to prevent the incidence and/or severity of injuries and optimize their patients' overall health and quality of life.

SPMD 6050. Clinical Education III
3 Credits (3)
Integration of clinical competencies with classroom instruction and a supervised field based experience in athletic training to link theory into practice.
Prerequisite: SPMD 5150.
Learning Outcomes
1. Students will become effective practitioners in the field of Athletic Training and Sports Medicine by utilizing critical thinking strategies based in evidence based practice theories combined with pedagogical knowledge of the concepts in Athletic Training.
2. Students will utilize their clinical experience and knowledge of injury evaluation to enhance their athletic training skills working with an athletic population under the supervision of a preceptor.

SPMD 6110. Professional Preparation
3 Credits (3)
Knowledge and skills for successful pursuit of athletic training credentials, employment and continuing professional competency; emphasis on current topics and issues contributing to the professional preparation of athletic training. Student must be enrolled in their final semester of the MSAT program to enroll in this course.
Learning Outcomes
1. Students will create a profile with the Board of Certification (BOC) in preparation for their BOC Examination
2. Students will analyze their individual strengths and weaknesses through practice examinations in order to prepare for a successful challenge of the BOC Examination
3. Students will demonstrate knowledge of basic human resources policies and procedures and the hiring process for athletic trainers.
4. Students will self-assess professional competence and create professional development plans according to personal and professional goals and requirements

SPMD 6150. Clinical Education IV
3 Credits (3)
Integration of clinical competencies with classroom instruction and a supervised field based experience in athletic training to link theory into practice.
Prerequisite: SPMD 6050.
Learning Outcomes
1. Students will become effective practitioners in the field of Athletic Training and Sports Medicine by utilizing critical thinking strategies based in evidence based practice theories combined with pedagogical knowledge of the concepts in Athletic Training.
2. Students will utilize their clinical experience and knowledge of injury evaluation to enhance their athletic training skills working with an athletic population under the supervision of a preceptor.
3. Students will demonstrate professional behaviors congruent with the ethical standards of the profession of athletic training.
4. Students will develop, implement, and revise policies that pertain to prevention, preparedness, and response to medical emergencies and other critical incidents.

SPMD 6280. General Medical Conditions & Therapeutic Medications
4 Credits (3+1P)
Pathophysiology, assessment, and appropriate intervention and referral for general medical conditions and disabilities; common diagnostic tests and imaging assessment tools; commonly used therapeutic medications.
Prerequisite: SPMD 5280.
Learning Outcomes
1. Recognition of general medical conditions including emergent physical and psychological conditions for intervention, referral or return to play criteria as appropriate.
2. Demonstrate proper clinical examination techniques for the assessment of general medical conditions including signs and symptoms of catastrophic and emergent conditions.
3. Demonstrate knowledge of common therapeutic medications and the general medical conditions they treat within the fields of athletic training and sports medicine.
4. Demonstrate knowledge of the principles of pharmacology, including pharmacokinetics and pharmacodynamics, as they relate to the fields of athletic training and sports medicine.
5. Demonstrate knowledge of federal, state and local laws, regulations and procedures for proper storage, disposal, transportation, dispensing and documentation dealing with prescription and non-prescription medications.

SPMD 6310. The Social Construction of the Body
3 Credits (3)
This course will explore how people's health and physical activity experiences and choices are often shaped by cultural narratives and expectations of the male and female body. Designed for graduate students in allied health and physical activity professions

SPMD 6350. Advanced Exercise Physiology
3 Credits (3)
Detailed study of the integrated response of neuromuscular, cardiovascular and respiratory systems to acute and chronic exercise, nutrition and environmental conditions with a strong emphasis on laboratory experience. Consent of Instructor
Learning Outcomes
1. Fundamental concepts about nutrition and it application to human performance
2. Advanced understanding of nutrition and its association with human bioenergetics
3. Human bioenergetics and its responsibility for performance enhancement and outcomes
4. Energy transfer and expenditure under various physical and environmental conditions
5. Pulmonary and cardiovascular responses to exercise
6. Cardiovascular and cellular adaptations to altitude

SPMD 6410. Cardiovascular Physiology
3 Credits (3)
This graduate level course provides an in-depth study of cardiovascular structure and function. The course assumes that students have a strong background in human physiology. Topics include, but are not limited to: cellular structure of the heart and vascular system; cardiac function, including electrophysiology of the heart; vascular function; neurohumoral control of the heart and circulation, organ blood flow, exchange function

of the microcirculation; the impact of common cardiovascular diseases on cardiovascular structure and function, and cardiovascular adaptations to chronic exercise. Consent of Instructor

Learning Outcomes

1. The student will demonstrate a comprehensive knowledge cardiovascular structure and function
2. The student will be able to relate common cardiovascular pathophysiology to cardiovascular functional impairments and physical functional limitations.
3. The student will be able to discuss chronic exercise training adaptations on the cardiovascular system and their value as a treatment strategy for cardiovascular diseases.

SPMD 6450. Skeletal Muscle: Structure and Function
3 Credits (3)
Basic muscle morphology and physiology with molecular and cellular adaptations in skeletal muscle as consequences to varying exercise regimens. Consent of Instructor

Learning Outcomes

1. To gain knowledge of the structure and function of skeletal muscle
2. To gain knowledge related to the skeletal muscle in reference to cellular and molecular responses and adaptions to exercise
3. To understand laboratory procedures used to study muscle metabolism
4. To develop ability to scientifically critique published papers and present them in a professional manner

SPMD 6510. Designing Resistance Training Program
3 Credits (3)
Detailed study of the physiological concepts associated with designing resistance-training programs for children, women, seniors, athletic performance and rehabilitation. Consent of Instructor

Learning Outcomes

1. Fundamental components associated with resistance training and exercise prescription
2. Compare and contrast isometric, dynamic, variable, isokinetic, eccentric, concentric resistance training
3. Design programs guided by a needs analysis
4. Demonstrate appropriate techniques and implement systems for training
5. Study physiological adaptations of resistance training for women, children, seniors, athletics and rehabilitation
6. Understand anatomical and physiological changes associated with detraining
7. Integrate components and concepts of resistance training for program design (periodization)
8. Explore alternative training programs

SPMD 6710. Project
1-12 Credits (1-12)
Selected projects for doctoral students. May be repeated up to 12 credits.

Learning Outcomes

1. Students will develop research skills through the work on projects with faculty members.

SPMD 6750. Kinesiology Research
1-3 Credits (1-3)
Research to be conducted under the direction of a Kinesiology faculty member May be repeated up to 15 credits.

SPMD 6996. Special Topics
1-3 Credits (1-3)
Offered under various subtitles that indicate the subject matter. May be repeated up to 9 credits.

Learning Outcomes

1. Varies

SPMD 6999. Capstone Project
1,3 Credits (1,3)
Students will prepare an individualized capstone project and prepare for the board exams.
Prerequisite: SPMD 5205.

Learning Outcomes

1. Utilize evidence-based research and data from the field of athletic training to create a scholarly capstone project.
2. Disseminate communicate project findings to appropriate stakeholders by various presentation methods.
3. Advocate for the profession of athletic training via the capstone project.

SPMD 7000. Doctoral Dissertation
1-18 Credits (1-18)
Doctoral Dissertation hours to be conducted under the direction of a Kinesiology Faculty. May be repeated up to 18 credits.

Learning Outcomes

1. Varies

STAT-STATISTICS

STAT 3110. Statistics for Engineers and Scientists
3 Credits (3)
Modern probability and statistics with applications to the engineering sciences.
Prerequisite: C - or better in MATH 1521G or MATH 1521H.

Learning Outcomes

1. Apply probability concepts and statistical methods to analyze data relevant to engineering and scientific problems.
2. Interpret descriptive statistics, probability distributions, and inferential techniques in context-specific applications.
3. Construct confidence intervals and perform hypothesis tests to support decision-making in engineering contexts.
4. Use statistical software and tools to model, visualize, and communicate results from experimental and observational data.

STAT 4210. Probability: Theory and Applications
3 Credits (3)
Basic probability distributions including binomial, normal; random variables, expectation; laws of large numbers; central limit theorem.
Prerequisite(s): C- or better in MATH 2530G and C- or better in at least one-3000 level MATH or STAT course.

Learning Outcomes

1. Be able to compute discrete probabilities using combinatorial methods.
2. Understand and use conditional probability, independence and Bayes' Formula to compute probabilities.
3. Demonstrate understanding and use of discrete and continuous random variables including Bernoulli, Binomial, Poisson, Geometric, Normal, Exponential and Gamma.
4. Understand joint and conditional probability distributions and use them to compute probabilities.

5. Learn about basic limit theorems such as the Central Limit Theorem and the Laws of Large Numbers.

STAT 4220. Statistics: Theory and Applications
3 Credits (3)
Point and interval estimation; sufficiency; hypothesis testing; regression; analysis of variance; chi-square tests.
Prerequisite: C- or better in STAT 4210.
Learning Outcomes
1. Explain and apply the principles of point and interval estimation, including properties such as unbiasedness and consistency.
2. Analyze statistical models using concepts of sufficiency and likelihood to support inference procedures.
3. Conduct and interpret hypothesis tests, including those based on regression, ANOVA, and chi-square methods.
4. Evaluate the appropriateness of statistical techniques for real-world data and communicate results effectively in applied contexts.

STAT 5210. Probability: Theory and Applications
3 Credits (3)
Same as STAT 4210 with additional work for graduate students.
Learning Outcomes
1. Be able to compute discrete probabilities using combinatorial methods.
2. Understand and use conditional probability, independence and Bayes' Formula to compute probabilities.
3. Demonstrate understanding and use of discrete and continuous random variables including Bernoulli, Binomial, Poisson, Geometric, Normal, Exponential and Gamma.
4. Understand joint and conditional probability distributions and use them to compute probabilities.
5. Learn about basic limit theorems such as the Central Limit Theorem and the Laws of Large Numbers.

STAT 5220. Statistics: Theory and Applications
3 Credits (3)
Same as STAT 4220 with additional work for graduate students.
Learning Outcomes
1. Explain and apply the principles of point and interval estimation, including properties such as unbiasedness and consistency.
2. Analyze statistical models using concepts of sufficiency and likelihood to support inference procedures.
3. Conduct and interpret hypothesis tests, including those based on regression, ANOVA, and chi-square methods.
4. Evaluate the appropriateness of statistical techniques for real-world data and communicate results effectively in applied contexts.

STAT 5230. Elementary Stochastic Processes
3 Credits (3)
Markov chains, Poisson processes, Brownian motion, branching processes, and queuing processes, with applications to the physical, biological, and social sciences.
Prerequisite: STAT 5210 or consent of instructor.
Learning Outcomes
1. Apply conditional expectation and generating functions to analyze simple stochastic processes.
2. Describe and distinguish among key stochastic processes (Markov chains, Poisson processes).
3. Apply stochastic models to evaluate problems in the physical, biological, and social sciences.
4. Evaluate the long-term behavior of stochastic processes using transition probabilities and limiting distributions.
5. Analyze the Brownian motion process and its fundamental properties.

STAT 5310. Foundations of Probability
3 Credits (3)
Probability spaces, expectation and conditional expectation, limit theorems and laws of large numbers.
Prerequisite: MATH 5460.
Learning Outcomes
1. Define an abstract probability space via measure theory, regarding expectation as abstract integration and study its properties such as linearity and monotonicity.
2. Study the convergence of random variables and Weak and Strong Laws of Large Numbers.
3. Compare and employ almost sure convergence, convergence in probability, convergence in Lp, and convergence in distribution to analyze the behavior of sequences of random variables.
4. Define the weak convergence of probability measures, apply it to characterize the weak convergence on the set of real numbers, and study Central Limit Theorems.
5. Introduce the concept of stochastic process, define martingales and study the martin-gale convergence theorems.

STAT 5320. Advanced Topics in Stochastic Processes
3 Credits (3)
Markov processes, martingales, Brownian motion, the Ito calculus, stochastic differential equations.
Prerequisite: STAT 5310.
Learning Outcomes
1. Analyze the structure and behavior of continuous-time Markov processes and martingales.
2. Derive the fundamental properties of Brownian motion and explain its role in stochastic modeling.
3. Apply Ito calculus to solve stochastic differential equations in theoretical contexts.
4. Formulate stochastic differential equations from applied problems.
5. Explain and apply the Feynman-Kac formula, the martingale problem, and the Girsanov formula.
6. Evaluate stochastic models arising in various disciplines.
7. Interpret the solutions of stochastic models using advanced probability theory.

STAT 5330. Continuous Multivariate Analysis
3 Credits (3)
Theory and applications of the multivariate normal distribution.
Prerequisite: STAT 5220, or consent of instructor.
Learning Outcomes
1. Explain the theoretical foundations and properties of the multivariate normal distribution.
2. Apply principal component analysis and linear discriminant analysis to solve multivariate problems.
3. Evaluate the structure and relationships among multiple continuous variables using matrix-based statistical methods.
4. Interpret results from multivariate analyses in real-world applications.
5. Communicate findings from multivariate analyses clearly in a written report.

STAT 5335. Linear Models
3 Credits (3)

Core topics include distribution of quadratic forms, theory of regression, analysis of variance and covariance in linear models. Advanced topics chosen from random and mixed linear models, generalized linear, growth curve, and nonlinear models, quartile and copula regression. May be repeated up to 6 credits.
Prerequisite: STAT 5330.
Learning Outcomes

1. Analyze linear models using the distribution of quadratic forms and the theory of least squares estimation.
2. Apply regression, ANOVA, and ANCOVA models to determine relationships among variables.
3. Evaluate the assumptions and limitations of linear modeling frameworks (random and mixed effects models).
4. Explain the theory behind generalized linear models, nonlinear models, and quantile regression.
5. Assess the applicability of advanced modeling techniques to complex data sets.

STAT 5340. Advanced Theory of Statistics I
3 Credits (3)
Testing hypotheses, probability and sufficiency, uniformly most powerful tests, unbiasedness, invariance, and minimax principle.
Prerequisite: STAT 5220 or consent of instructor.
Learning Outcomes

1. Explain foundational concepts in statistical inference (hypothesis testing, sufficiency).
2. Construct statistical tests using criteria such as unbiasedness and invariance.
3. Analyze the properties of statistical tests using the minimax principle.
4. Apply the Neyman-Pearson lemma to derive uniformly most powerful (UMP) tests.
5. Evaluate the theoretical properties of statistical procedures.
6. Justify the use of statistical procedures in complex inference problems based on theoretical properties.

STAT 5345. Advanced Theory of Statistics II
3 Credits (3)
Estimation of parameters; unbiased estimators; equivariance; Bayes properties; large sample theory and optimality.
Prerequisite: STAT 5340 or consent of instructor.
Learning Outcomes

1. Analyze methods for estimating parameters and their properties (unbiased, consistent, efficient).
2. Apply the principles of equivariance to construct and evaluate estimators.
3. Construct and evaluate Bayes estimators in various contexts.
4. Evaluate estimators using large sample theory and asymptotic optimality criteria.
5. Compare classical and Bayesian approaches to estimation.
6. Justify the selection of estimation methods based on theoretical and practical considerations.

STAT 5348. Topics in Probability and Statistics
3 Credits
Topics in modern probability and statistics. The material covered will reflect current research topics in the field and may vary each time the course is offered. To be taken up to 3 times. May be repeated up to 9 credits.
Learning Outcomes

1. Gain knowledge of advanced methods in the areas of probability and statistics.
2. Develop potential to explore literature in the areas of of probability and statistics.
3. Develop potential to conduct supervised research in the areas of of probability and statistics.

SUR-SURVEYING

SUR 143. Civil Drafting Fundamentals
3 Credits (2+2P)
Introduction to drafting in the field of Civil Engineering. Drawings, projects, and terminologies related to topographic, contour drawings, plan and profiles, and street/highway layout. Restricted to Community Colleges only. Taught with E T 143 and DRFT 143.
Prerequisite: DRFT 109.
Learning Outcomes

1. Use appropriate drafting/technical terminology.
2. Identify of the different types of Civil Engineering work drawing plan sets.
3. Understanding and the use of the terminologies used in the industry.
4. Use AutoCAD Civil 3D.
5. Enter appropriate data into AutoCAD software in order to retrieve necessary outcomes.
6. Plot/Print different types of civil engineering working plans.
7. Read, interpret and understand engineering drawings.
8. Define and understand the different types of engineering drawings.

SUR 222. Introduction to Geomatics
3 Credits (2+3P)
Theory and practice of geomatics as applied to plane surveying in the areas of linear measurements, angle measurements, area determination, differential and trigonometric leveling, and topographic mapping.
Prerequisite: A grade of C- or better in both, E T 109 and (MATH 1250G or higher).
Learning Outcomes

1. Perform basic distance and angular measurements.
2. Evaluate the quality of collected measurements.
3. Utilize a measuring tape.
4. Determine a plumb line.
5. Set up a level line.
6. Set up a tripod and total station.
7. Utilize a plumb rod.
8. Understand the role of surveying in civil engineering and construction-related fields.
9. Understand new technologies is surveying.

SUR 285. Precise Digital Mapping
3 Credits (3)
Photogrammetric Mapping Principles, digital sensor including optical cameras, terrestrial, surveying control, IMU & GPS integration, stereo photography, analytical triangulation, orthorectification, precision and accuracy of measurement systems, sUAS (Small Unmanned Aerial Vehicles) data collection project fight/pre planning, introduction to laser scanning systems.
Learning Outcomes

1. Understand the basic principles of photogrammetry.
2. Perform photo measurements and computation.

3. Be able to design aerial surveying projects.
4. Define the basic principles of analytical photogrammetry.
5. Explain the different steps in aerial triangulation.

SUR 292. Legal Principles and Boundary Law I
3 Credits (3)
Fundamentals of real property law; principles of land description; survey evidence and procedure in boundary determination, order of importance of conflicting elements; liability, ethical and professional principles in boundary surveying; NM professional practice act; NM Minimum Standards, contemporary issues in boundary determination.
Prerequisite: C- or better in SUR 222.
Learning Outcomes
1. Demonstrate an understanding of surveying boundary laws.
2. Describe procedures for locating real property boundaries.
3. Read, interpret, and write legal descriptions of real property.
4. Perform legal research of case and statutory law.
5. Communicate research findings through written and oral presentations.

SUR 312. Public Land Survey System Boundaries
3 Credits (3)
Fundamentals of the U.S. Public Land Survey System; rules for the survey of the public lands, field surveys; the rectangular system, corners, monuments, evidence; dependent and independent resurveys, corner restoration; plats and field notes, patents.
Prerequisite: A grade of C- or better in SUR 222.
Learning Outcomes
1. Understand how the USPLSS was developed and used.
2. Develop the ability to locate and identify USPLSS survey monuments.
3. Recognize the need for restoring lost corners and apply proportionate methods.
4. Perform computations for simple PLSS section subdivisions.
5. Demonstrate an ability to read, write and interpret USPLSS legal descriptions.

SUR 315. Advanced Mapping Technologies
2 Credits (2)
Advanced applications of airborne sUAS (Small Unmanned Aerial Vehicles) in 3D data acquisition, sensor specifications, selection, and platform compatibility. Principles of lidar data collection, airborne and terrestrial. LiDAR data processing including registration, modeling, and analysis. Point cloud principles, processing, and applications. DEMs principles, processing and analysis. Principles and applications of GPR in surveying.
Prerequisite: SUR 285 and Junior Standing.
Corequisite: SUR 315L.
Learning Outcomes
1. Identify the basic principles and applications of advanced mapping technologies.
2. Compare and contrast different UAS-based aerial surveying techniques for 3D data acquisition principles and applications of Ground Penetrating Radar (GPR).
3. Process, analyze, and interpret point clouds and DEMs.
4. Recognize the principles of terrestrial LiDAR data collection.
5. Explain the principles and applications of Ground Penetrating Radar (GPR).

SUR 315L. Advanced Mapping Technologies Lab
1 Credit (1P)
Hands-on application of using optical and LiDAR UASs in surveying and mapping. Design and conduct UAV surveys, including flight planning and pre-planning with an understanding of sensor limitations, control point configuration, and FAA regulations and restrictions. Applications of terrestrial scanners in collecting accurate 3D models. Process, analyze, and visualize different types of point clouds.
Prerequisite: SUR 285.
Corequisite: SUR 315.
Learning Outcomes
1. Identify lab safety, workflow overview, and liability considerations.
2. Apply UAS technologies in surveying and mapping projects through hands-on flight operations.
3. Develop 3D point clouds for surveying, engineering, and mapping applications.

SUR 328. Construction Surveying & Automation Technologies
3 Credits (2+3P)
Construction Surveying Principles: conventional and machine controlled. Layout alignments, grades, various infrastructure, buildings. Understand error identification, common quality control checks and blunder identification. Alignments and station/off set, types of construction layout of infrastructure: roads, bridges, utilities (including subsurface), buildings, industrial; reading and interpreting construction plans, data management, horizontal, vertical and spiral curves, slope staking, machine control basics, applications and data managements. Use of electronic files and liability issues. Layout alignments, grades, various infrastructure, buildings. Ability to understand data integration in automated machine control, work flow processes.
Prerequisite: A grade of C- or better in both, (SUR 222 or DRFT 222) and (ENGR 190 or MATH 1511G or MATH 1511H).
Learning Outcomes
1. Acquire the ability to answer test questions on professional surveying exams.
2. Develop the ability to appropriately collect, analyze, interpret and apply surveying and surveying-related data.
3. Develop the ability to recognize, analyze, and solve surveying and surveying-related problems.
4. Develop the ability to work on teams.

SUR 328L. Construction Surveying & Automation Technologies Lab
1 Credit (1P)
Hands-on application of surveying equipment such as GNSS and total stations to perform construction stakeout for different types of construction layouts, including buildings, horizontal and vertical alignments. Reading and interpreting construction plans. Integrating machine-controlled surveys in different applications.
Prerequisite: A grade of C- or better in both, (SUR 222 or DRFT 222) and (ENGR 190 or MATH 1511G or MATH 1511H).
Corequisite: SUR 328.
Learning Outcomes
1. Identify lab safety, workflow overview, and liability considerations.
2. Apply surveying technologies in construction stakeout.
3. Recognize different forms of construction plans.

SUR 351. Spatial Data Adjustment I
3 Credits (3)
Theory of random error in observations/measurements. Use of statistics in spatial data analysis, statistical testing, advanced data structures. Emphasis on computer based problem solving and programming to solve spatial data problems.

Prerequisite: A grade of C- or better in the following: (SUR 222 or DRFT 222) and (A ST 311G or MATH 1350G) and (ENGR 190 or MATH 1511G or MATH 1511H).

Learning Outcomes

1. Acquire the ability to answer questions on professional surveying exams.
2. Acquire a sound and fundamental understanding of the mathematical principles underlying surveying measurements and computations.
3. Develop the ability to appropriately analyze, interpret, and apply survey and survey-related data.
4. Develop the ability to recognize, analyze, and solve survey and survey-related problems.

SUR 361. Geodesy/Geodetic Control Surveying
3 Credits (3)

Horizontal and vertical control network design and consideration. Understand ellipsoid, geoid, horizontal and vertical datum, coordinates, precise leveling, astronomic, establishment of state plane zones, understanding reporting. Transform data between geodetic Latitude/Longitude, state plane, ground data, perform geodetic computations, ability to design GPS networks utilizing CORS stations, network adjustments. Perform a control survey, process data, adjust network, and prepare control report with Meta-data.

Prerequisite: A grade of C- or better in the following: (SUR 222 or DRFT 222) and (ENGR 190 or MATH 1511G or MATH 1511H).

Learning Outcomes

1. Define the different coordinate systems and geometric models used to represent the shape of the Earth.
2. Be able to perform surveying computations on the sphere and ellipsoid.
3. Distinguish between the different map projections systems.
4. Explain the effects of gravity in survey measurements, especially in precise leveling.
5. Outline how earth motions affect surveying measurements and the different time systems.
6. Explicitly indicate which of the student outcomes listed in Criterion III or any other outcomes are addressed by the course.

SUR 401. Ethics and Professionalism in Surveying and Mapping
3 Credits (3)

Ethics as applied to the surveying profession. Includes case studies and problems. May be repeated up to 3 credits.

Learning Outcomes

1. An ability to communicate effectively with a range of audiences.
2. An ability to understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental, and societal contexts.

SUR 412. Advanced Topics in Boundary Surveying
3 Credits (2+3P)

Advanced land boundary topics including water boundaries, mineral claims, Spanish and Mexican land grants, state and national boundaries. May be repeated up to 3 credits.

Prerequisite: A grade of C- or better in SUR 312.

Learning Outcomes

1. Identify land boundary topics

SUR 440. Geomatics Laboratories
2 Credits (6P)

Layout alignments, grades, various infrastructure, buildings. Performing GNSS surveys including RTK, rapid-static, static data collection and processing. Laser scanning and photogrammetric data collection and processing. Surveying applications in the U.S. Public Land Survey System (PLSS).

Prerequisite: A grade of C- or better in, SUR361, (SUR 222 or DRFT 222) and (MATH 1435 or MATH 1511G).

Prerequisite/Corequisite: SUR 328 and SUR 461.

Learning Outcomes

1. An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.
2. An ability to communicate effectively with a range of audiences.
3. An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty.

SUR 450. Senior Project
3 Credits (3)

Research project prepared by student. Includes class presentation. Students will learn how to research after the end of their formal education. Students must be in Senior Standing to enroll.

Learning Outcomes

1. An ability to identify, formulate, and solve broadly defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to the discipline.
2. An ability to formulate or design a system, process, procedure or program to meet desired needs.
3. An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.
4. An ability to communicate effectively with a range of audiences.

SUR 451. Spatial Data Adjustment II
3 Credits (3)

Rigorous analysis of the theory of observations as applied to spatial data, application of least squares adjustments, ability to perform statistical analysis to determine accuracy of final product, constrained/free geospatial data integration, error ellipses, and pre-analysis of spatial data acquisition procedures.

Prerequisite: A grade of C- or better in SUR 351.

Learning Outcomes

1. Understand the theory of least squares as applied to survey measurements
2. Understand the relevance of weighting survey observations
3. Be able to adjust vertical, horizontal and 3D networks by least squares
4. Be able to transform coordinates between similar coordinate systems
5. Be able to analyze survey errors and detect survey blunders

SUR 452. Surveying Practicum
3 Credits (3)

Surveying practice under the direction of a licensed, professional land surveyor requiring an approved number of hours. Planned work between the student and the surveyor should be designed to be part of a project that integrates spatial data. An individualized syllabus should be developed collaboratively with the industrial partner and approved by the geomatics faculty. The final deliverable must be certified by the licensed professional land surveyor. A written report by the student is required. Credit is given to past work experience in cases where students can demonstrate that requirements for the practicum are met and should be approved by geomatics faculty.

Learning Outcomes

1. Demonstrate a level of technical competency, based upon completing the requirements of a geomatics technology curriculum.
2. Students are expected to successfully and professional complete a "real" project. Additionally, student work is employed to assess most of the program's outcomes for program assess.

SUR 461. GNSS Positioning
2 Credits (2)
Logistics of GNSS data collection, the GPS signal, codes and biases, error sources, differences between relative and autonomous GNSS positioning, code phase carrier phase, DGPS static and RTK surveys. Geodetic and GPS standards and specifications GNSS data processing, network adjustments, and evaluation of spatial data accuracy practical applications of GNSS.
Prerequisite: A grade of C- or better in SUR 361.
Corequisite: SUR 461L.
Learning Outcomes

1. Outline the relationship of geodesy to satellite positioning systems.
2. Describe the procedure of GNSS surveys.
3. Differentiate between different GNSS surveying techniques.
4. Identify GPS standards and specifications.

SUR 461L. GNSS Positioning Lab
1 Credit (1P)
Hands-on experience using different types of surveying-grade GNSS equipment in collected geospatial data for surveying and engineering applications. Mastering field procedures, understanding equipment functionality, and learning to process and evaluate real-world GNSS data. May be repeated up to 3 credits.
Prerequisite: A grade of C- or better in SUR 361.
Corequisite: SUR 461.
Learning Outcomes

1. Identify lab safety, workflow overview, and liability considerations.
2. Conduct different types of GNSS surveys for mapping and engineering applications.
3. Assess the quality and reliability of spatial data collected by different GNSS surveying techniques.

SUR 464. Legal Principles and Boundary Law II
3 Credits (3)
Advanced boundary determination, evaluation of written and field evidence. Advanced application of PLSS subdivision, special surveys (water, mineral, and reservations), NM Standards, and laws. Preparation of boundary survey plats and reports. ALTA/NSPS Surveys and Standards.
Prerequisite: A grade of C- or better in both, SUR 292 and SUR 312.
Learning Outcomes

1. Application of the rules of evidence as concerning to boundary surveys.
2. Demonstrate understanding between original, resurveys, and retracements.
3. Acquire the ability to perform advanced section subdivisions.
4. Understand the issues of professional liability and ethical practice.

SUR 485. Emerging Techniques in Geospatial Technologies
3 Credits (3)
Hydrographic, Altimetry, Space borne Imaging Systems, Mobile Mapping Systems, Mining and Agriculture Surveying Principles, Ranging technologies and applications such as LiDAR, SAR, and Bathymetry. Principles of terrestrial & airborne laser scanning, point cloud data management & extraction, scan registration and processing, and advanced ranging data acquisition systems. Consent of Instructor required.
Prerequisite(s): Senior standing.
Learning Outcomes

1. Outline the different techniques in mapping seabed.
2. Describe the procedure of LIDAR mapping.
3. Outline the remote sensing technologies used in mapping.
4. Recognize the UAV mapping technologies.
5. Produce surveying products from new technologies in geomatics.

TBGD-TRANSBORDER & GLOBAL HUMAN DYNAMICS

TBGD 5110. Introduction to Transborder and Global Human Dynamics
3 Credits (3)
Overview of current theories, concepts and issues concerning transborder and global humani dynamids. introduction to key debates and areas of inquiry.
Learning Outcomes

1. Develop knowledge of current interdisciplinary scholarship and debates regarding theories, concepts and issues in the study of transborder and global human dynamics
2. Develop skills in critical analysis of key debates and in the oral and written presentation.

TBGD 6991. Research Design in Transborder and Global Human Dynamics
1-6 Credits (1-6)
Development of individual research projects through critical reflection on debates concerning culturally appropriate methodologies, collaborative work with community partners, and the responsible conduct of reaearch with regard to transborder and global human dynamics.
Learning Outcomes

1. Develop individual research project through identification of main research questions, methods of data collection and analysis, significance to the broader field of transborder and global human dynamics and goals for application of findings in society.
2. Develop skills in the Responsible Conduct of Research and completion of proposals for IRB approval.
3. Develop appreciation for conducting research in collaboration with community partners to address societal needs.

TBGD 6998. Fieldwork and Community Engagement in Transborder and Global Human Dynamics
1-6 Credits (1-6)
Implementation of research projects through field work, individually or in direct collaboration with community partners.
Learning Outcomes

1. Completion of projects designed to collect date individually and /or in collaboration with community partners using a Community-Based patricipatory Research (SCBPR) framework.
2. Dissemination of findings to the scholarly community as well as community partners and the general public.

TBGD 7000. Dissertation
1-18 Credits (1-18)
Completion of major research project on a significant aspect of transborder and global human dynamics. Dissemination of findings in

academic and community forums. Students must have approval of from their doctoral committee to enroll.

Learning Outcomes

1. Completion of a significant and in-depth research project in the area of transborder and global human dynamics.
2. Presentation of findings in academic conferences.
3. Preparation of publishable work from the dissertation research.
4. Dissemination of findings in alternative formats for community partners and the general public.

TCEN-ENVIRONMENTAL/ENERGY TECH

TCEN 101. Energy for the Next Generation
3 Credits (2+2P)

This course will survey a broad range of sources of energy, types of energy, energy storage, and the forms of energy. Students will be exposed to theory in the classroom, laboratory exercises, and field trips to provide them with a solid foundation for all subsequent energy related environmental courses. Crosslisted with: OETS 101.

Prerequisite(s)/Corequisite(s): OETS 118 or MATH 1215. Restricted to: Community Colleges only.

Learning Outcomes

1. Analyze cost comparisons for different types of energy applications to assess their relative value.
2. Apply energy consumption analysis techniques to accurately evaluate energy usage.
3. Identify safety hazards and demonstrate compliance with relevant safety regulations.
4. Collaborate effectively as a team.
5. Apply course-specific calculations accurately to solve problems and make informed decisions.

TCEN 105. Building Analyst I
3 Credits (2+2P)

This course is designed to provide the foundational knowledge and expertise necessary for the energy auditor and home performance contractor. Crosslisted with: OETS 105. Restricted to: Community Colleges only.

Learning Outcomes

1. Express technical information through oral communication.
2. Explain technical information through written communication.
3. Interpret information and instructions.
4. Work effectively as a team.
5. Demonstrate an understanding of sustainable and alternative building practices (i.e., LEED/Green).
6. Demonstrate how related industry theories apply to real world settings.
7. Evaluate mechanical processes found in building trades.
8. Locate data and information utilizing various sources.
9. Interpret information and instructions. 1
10. Determine the appropriate ethical action that should occur in a given circumstance. 1
11. Differentiate between situational and the other various theories of ethics.

TCEN 106. Building Analyst II
3 Credits (2+2P)

Designed to prepare the student for the BPI Building Analyst Certification. This course will walk the student through the hands-on process of conducting visual building inspections, diagnostic testing, identifying improvement opportunities, documenting a home's performance and preparing a scope of work. Crosslisted with: OETS106.

Prerequisite(s)/Corequisite(s): TCEN 105 or OETS 105. Restricted to: Community Colleges only.

Learning Outcomes

1. Describe sustainable and alternative building practices (i.e., LEED/Green).
2. Formulate how current changes can create future issues within a structure.
3. Assess environmental problems arising from conventional building practices.
4. Evaluate mechanical processes found in building trades.
5. Work effectively as a team.
6. Demonstrate an understanding of sustainable and alternative building practices (i.e.,LEED/Green).
7. Present technical information through oral communication.
8. Determine the appropriate ethical action that should occur in a given circumstance.
9. Identify appropriate governing bodies and associated regulations.

TCEN 110. Photovoltaic Application
4 Credits (3+2P)

This course will provide an introduction to Photovoltaic (PV) installation. The course will provide instruction on site selection, prep, installation, and maintenance for photovoltaic applications. Students that complete the course and have the opportunity to take the entry level exam with the North American Board of Certified Energy Practitioners (NABCEP) en route to becoming Certified Installers. Restricted to: Community Colleges only. May be repeated up to 4 credits.

Prerequisite/Corequisite: TCEN 101.

Learning Outcomes

1. Write a detailed analysis using a 6-step problem solving approach to an equipment or process problem
2. Categorize and document system malfunctions, which will be discussed during the pass-down period in a production environment
3. Organize relevant training material to be discussed during teamwork training sessions
4. Identify safety hazards associated with electro-mechanical industrial production systems
5. Use a systematic approach to troubleshoot, identify, and perform corrective maintenance procedures in a system
6. Identify the subsystems of an industrial system and their function
7. Demonstrate the startup, operation, and power down programming sequences for an automated system
8. Apply automated troubleshooting programs to locate / identify fault in a production system
9. Evaluate real time statistical process control data (SPC) to determine (+ -) control limit corrections in a production environment 1
10. Identify personal areas in which student may be able to strengthen student’s professional skills 1
11. Assess personal “development” paths, which will ensure a constant advancement through evolving technology careers 1
12. Demonstrate required skills for changing or creating and evaluating real time statistical process control (SPC) data associated with an industrial production process/program

TCEN 111. Basic Electrical Principles I, DC Circuits
4 Credits (3+2P)
Course begins with the basics of electricity and DC circuits. Includes categorization of material properties within conductors, semiconductors, and insulators. Gradual progression tackles more complex topics like DC circuit analysis of series and parallel circuits, including Kirchhoff's laws, Thevenin's & Norton's theorems, and superposition. Finally DC combination circuits, magnetism and electromagnetism, generators and motors are covered. Emphasis on safety throughout. May be repeated up to 4 credits.
Prerequisite(s)/Corequisite(s): OETS 104 or MATH 1215. Restricted to Community Colleges campuses only.

TCEN 112. PV Power Generation Design Fundamentals
3 Credits (2+2P)
A study of photo voltaic design basics, photo voltaic (PV) Cells, modules, and system components; electrical circuits; grid-tied/grid-interactive PV system design and sizing for use on homes; solar electric products and applications; and understanding energy conversion from sunlight to electricity, and working with solar conversion equipment. May be repeated up to 3 credits.
Prerequisite(s)/Corequisite(s): TCEN 111 and (OETS 104 or MATH 1215). Restricted to Community Colleges campuses only.

TCEN 113. OSHA 10 Hour Construction Hazard Identifications
1 Credit
Intended for entry-level participants to provide instruction on a variety of construction safety and health standards. Topics include Introduction to OSHA, Electrical, Ladder, Excavation, Scaffold, and Forklift Hazards, Fall Protection, Materials Handling, Personnel Protective Equipment and Confined Space Entry Hazards. Meets OSHA 10-Hour Requirements.

TCEN 115. Wind Power Generation Design Fundamentals
3 Credits (2+2P)
Course covers wind turbine module descriptions and functions and wind system installation, operation, and troubleshooting. Additional topics include wind energy harvesting and the conversion process from the generator system to electricity. May be repeated up to 3 credits.
Prerequisite(s)/Corequisite(s): TCEN 111 and (OETS 104 or MATH 1215). Restricted to Community Colleges campuses only.

TCEN 121. Basic Electrical Principles II, AC Circuits
4 Credits (3+2P)
Course begins with an overview of the primary components of AC circuits, such as resistors, inductors, rectifiers, transformers and capacitors, and then gradually introduces new, more complicated topics like applying AC principles in power generation and generators, motors, parallel and combination circuits, troubleshooting and evaluation of circuit conditions. May be repeated up to 4 credits.
Prerequisite(s)/Corequisite(s): TCEN 111 and (OETS 104 or MATH 1215). Restricted to Community Colleges campuses only.

TCEN 156. Building Envelope
3 Credits (2+2P)
Designed to prepare the student for the BPI Building Envelope Certification. This course will provide the principles behind building performance testing and the purpose of completing a comprehensive energy audit. Through lecture and subsequent field training, the student will learn how to use building diagnostics to develop a prescriptive plan for enhancing comfort, health & safety, building durability, and energy savings. The student will learn how to outline the follow-up process required after completion of the retrofit. Crosslisted with: OETS156. Restricted to: Community Colleges only. Campus restriction updated to reflect description of community colleges only.
Prerequisite(s): Grade of C- or better in TCEN 106 or OETS 106.

Learning Outcomes
1. Apply oral communication skills to effectively present technical information.
2. Apply written communication skills to effectively present technical information.
3. Demonstrate the correct identification and safe use of hand tools and/or power tools for a specific application.
4. Collaborate effectively as a team.
5. Employ various sources to locate data and information.
6. Analyze and interpret information and instructions.
7. Differentiate between situational ethics and other various theories of ethics.
8. Identify relevant governing bodies and associated regulations.
9. Describe sustainable and alternative building practices (e.g., LEED/Green). 1
10. Apply related industry theories to real-world settings. 1
11. Evaluate mechanical processes in building trades. 1
12. Assess environmental problems resulting from conventional building practices.

TCEN 205. NEC for Alternative Energy
4 Credits (2+4P)
This hands-on course will cover the National Electrical Code specifics concerning photovoltaic installation. Also code compliant wiring of basic electrical systems will be covered. Existing installations will be visited and studied. Restricted to Community College campuses only. May be repeated up to 4 credits.
Prerequisite: TCEN 101 and ELT 105.
Learning Outcomes
1. Identify all code sections relevant to the different types of Alternative energy systems.
2. Locate problems in alternative energy sources and provide solutions to correct them.
3. Student will have a basic understanding of different types of renewable energy and how to apply the NEC to each type of renewable energy source.
4. Explain what types of renewable energies work best for different geographical locations.
5. Students will also gain hands on experience working with solar photovoltaics, wind turbines and solar thermal panels.
6. Effectively present technical information through written communication
7. Accurately perform course specific calculations
8. Work effectively as a team
9. Locate data and information utilizing the NEC and other various sources 1
10. Interpret information and instructions 1
11. Identify appropriate governing bodies and associated regulations 1
12. Assess cost comparisons for different types of energy applications 1
13. Accurately perform energy production analysis

TCEN 220. Cooperative Experience
1-3 Credits (1-3)
Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. May be repeated up to 6 credits. Consent of Instructor required.

Prerequisite(s)/Corequisite(s): MAT 235. Prerequisite(s): TCEN 180. Restricted to: TCEN majors. Graded: S/U Grading (S/U, Audit). Restricted to: Community Colleges only.

TCEN 221. Roofing Materials and Methods
3 Credits (2+2P)
Covers application techniques and estimation of asphalt and wood roofing products and accesories including gutters and flashing. Presents roof penetration, roof loading issues, and energy system installation requirements for mounting photo voltaic or solar thermal systems.
Prerequisite(s): TCEN 112.

TCEN 222. Photo Voltaic Grid Tie Installation
4 Credits (3+2P)
This is a more advanced course culminating in a PV system-to-grid connection. This course includes gathering site specific data, design, wire type and sizing specific to project, installation of all solar modules and balance of system (BOS)components, and grounding and bonding of system components, all in accordance with the latest NEC. Upon project design approval a system will be commissioned for the grid. Decommissioning will commence after measurements and troubleshooting as directed by the instructor. May be repeated up to 4 credits.
Prerequisite(s)/Corequisite(s): TCEN 121 and TCEN 223. Prerequisite(s): TCEN 111 and TCEN 112. Restricted to Community Colleges campuses only.

TCEN 223. National Electric Code Principles in Relation to Photo Voltaic
2 Credits (2+1P)
Focuses on all sections of the National Electrical Code and local code requirements applicable to photo voltaic electrical installation. A partial list of areas covered is chapters one through four and section 690, "Solar Photovoltaic Systems" of the National Electrical Code.
Prerequisite: TCEN 112.
Prerequisite/Corequisite: TCEN 222.
Learning Outcomes
1. Identify the requirements for safe and practical solar PV installations.
2. Accurately reference, read, and interpret NEC code as it relates to PV installations (Code 690).
3. Present a compelling case of when the PV electricity market will reach "grid¬ parity."

TCEN 224. Field Experience
1-3 Credits (1-3)
Student will collaborate with instructor in proposing, defining, implementing, and analyzing outcomes of a project in the Environmental and Energy fields of study. May be repeated up to 6 credits. Consent of Instructor required. Restricted to: TCEN majors. Restricted to: Community Colleges only.

TCEN 246. Building Weatherization & Auditor Fundamentals
3 Credits (3)
Course provides information on how to locate air leaks and identify heat losses or gains through specific testing. Students will learn how to inspect and evaluate building envelopes, mechanical systems, and ventilation systems to determine the safety and energy consumption for each system. May be repeated up to 3 credits. Restricted to Community Colleges campuses only.
Prerequisite(s): TCEN 113 and OETS 104.
Corequisite(s): TCEN 221.

TCEN 251. Advanced Photo Voltaic On/Off Grid Installation
3 Credits (2+2P)
Photo Voltaic advanced topics to include panel racking and installation, battery storage, charge controllers, mechanical integration of arrays on buildings, and key elements involved in choosing a mounting system. May be repeated up to 3 credits.
Prerequisite(s)/Corequisite(s): TCEN 222. Restricted to Community Colleges campuses only.

TCEN 252. NABCEP Entry-Level Exam Review
2 Credits (2)
Course presents knowledge, key terms, and concepts of photovoltaic systems and solar hot water systems as related to the NABCEP Entry-level exam. This exam is for those wanting to enter the workforce in either solar thermal or solar PV. Scheduling and taking the exam is the responsibility of the student. Consent of Instructor required. Restricted to Community Colleges campuses
Prerequisite(s): TCEN 222.
Learning Outcomes
1. Analyze photovoltaic markets and application trends
2. Complete practice questions for the NABCEP PV Associate Exam
3. Develop a practice of safe work environment as it relates to the installation and maintenance of photovoltaic systems according to OSHA standards
4. Apply electrical concepts to the operation and maintenance of photovoltaic systems and related equipment
5. Apply solar energy fundamentals, i.e. photovoltaic module essentials, system components, system sizing principles, system electrical design, system mechanical design, performance analysis, maintenance, and troubleshooting
6. Pass the NABCEP PV Associate exam with at least 70 percentile.

TCEN 254. Renewable Energy Internship
2 Credits (2)
Student will receive industry-related renewable energy experiences at an approved industry location. Typical areas of hands-on practices will be installing solar PV, solar hot-water systems, or wind energy systems. May be repeated up to 6 credits. Consent of Instructor required. Restricted to Community Colleges campuses only.
Prerequisite(s): TCEN 112 and 113 and 222.

THEA-THEATER

THEA 1110G. Introduction to Theatre
3 Credits (3)
This course provides an introduction to the study of theatre. Students will examine various components that comprise theatre, such as acting, directing, playwriting, dramaturgy, scenic and costume design, stagecraft, spectatorship, history, theory, and criticism.
Learning Outcomes
1. Define and discuss basic theater terms and concepts.
2. Discuss the fundamental elements of theatre, and the ways in which theatre differs from other art forms.
3. Analyze and critique the elements of a live theatrical production.
4. Identify and describe the roles of various theatre artists including actors, directors, playwrights, dramaturges, and designers.

THEA 1210G. Acting for Non-Majors
3 Credits (3)
This class gives non-majors experience in the depth and craft of the actor's art. Students will learn various terms, techniques, and practices of acting and will demonstrate their understanding in class. Through exercises and improvisations, partnered scenes, and group work, students will be better able to appreciate the work of others as they learn techniques of performing. May be repeated up to 3 credits.

Learning Outcomes

1. Develop fundamental physical, vocal, analytical, and imaginative skills for acting for the stage.
2. Apply fundamental techniques of voice and movement for the stage.
3. Apply principles of play text analysis to understand story, character, and meaning.
4. Gain a better understanding of an actor's approach to goals, tactics, and obstacles.
5. Engage in character creation and development while preparing and performing monologues and scenes.
6. Learn a common vocabulary to help discuss the process of acting.
7. Employ collaborative methods of work with a partner and in groups.
8. Observe and evaluate acting skills of other actors.
9. Increase verbal and physical communication skills which are applicable in any field. 1
10. Develop personal and social responsibility via group work, research and self-reflection. 1
11. Increase confidence and self-esteem via continuous presentations with supportive feedback.

THEA 1221. Beginning Acting
3 Credits (3)
Basic understanding of self-expression through a variety of physical exercises, improvisation, and character study, culminating in scene or monologue work. Restricted to: THTR majors.
Learning Outcomes

1. Apply a common vocabulary that serves as a foundation in acting for the theatre major and minor.
2. Communicate effectively in front of an audience, applying learned concepts while exercising freedom and control of voice, body, and imagination.
3. Analyze the written character and live performance.
4. Provide objective feedback to your classmate's work as well as your own, that supports a greater understanding of our craft while building trust within the collaborative ensemble.

THEA 1222. Stage Movement
3 Credits (3)
Physical techniques for the actor to develop kinesthetic awareness and skills in characterization, archetypes, and stage combat. Restricted to: THTR majors.
Learning Outcomes

1. To provide fundamental training in a variety of movement techniques which can be applied to both theatrical performance and physical communication in everyday life.
2. Observation and critical skills will be advanced through class participation and outside assignments
3. Class exercises are aimed at guiding participants to uncover their own creative expression, while working with efficient, healthy body alignment

THEA 1223. The Art of Theatre
3 Credits (3)
This course introduces the variety and scope of theatre professions, the value and goals of the theatre major and an analysis of the art form from script to stage. Restricted to: Required for THTR majors majors.
Learning Outcomes

1. An overview of the history of theatre in the Western world
2. A general understanding of the artistic roles and functions within the theatre industry (including within NMSU Theatre as a model)
3. A strong preparation for independent in-depth script analysis and theatre critique

THEA 1310. Introduction to Costuming
3 Credits (3)
This course introduces students to basic skills generally used in creating costumes for theatre. During the semester students will be introduced to the costume shop, equipment, supplies, and processes. They will learn the process of sewing a garment and running a stage production.
Prerequisite(s)/Corequisite(s): THEA 1310L. Restricted to: THTR majors.
Learning Outcomes

1. Demonstrate basic hand and machine sewing skills.
2. Use basic costume craft tools and techniques.
3. Analyze fabric selection for the stage.
4. Draft and use patterns.
5. Take body measurements for patterning and construct a costume from those measurements.
6. Combine interpersonal communication skills with costume construction skills.
7. Analyze a script for costume design purposes.
8. Build a garment.

THEA 1310L. Costume Craft Lab
1 Credit (1)
Class members will assist in construction for productions in a studio environment.
Prerequisite(s)/Corequisite(s): THEA 1310.
Learning Outcomes

1. This laboratory class compliments THEA 1310: Costume Crafts.
2. It gives the student an opportunity to put into practice the skills learned in THEA 1310 as well as be introduced to and participate in the day-to-day operations of the Costume Shop.

THEA 1415. Running Crew I
2 Credits (1+2P)
Students learn about backstage and front of house production positions and work on a technical aspect of a product in a rehearsal and performance environment.
Learning Outcomes

1. Students will learn one, or more, of the basic technical elements of theatrical crew work.

THEA 2310. Stagecraft
3 Credits (3)
Student will explore basic skills for scenic designers and techniques of set construction for the stage, including building scenery, rigging, painting and properties.
Prerequisite(s)/Corequisite(s): THEA 2310L.
Learning Outcomes

1. Demonstrate a range of technical skills, which will qualify them to assist in the basic technical production of a play.
2. Demonstrate and apply how to safely and competently use hand tools, power tools, electrical, and electronic stage equipment.
3. Analyze the technical aspects of a play in performance.
4. Read and construct scenery from ground plans, elevations, and drawings.

5. Analyze a script from the perspective of a designer, artistic, and/ or technical director.

THEA 2310L. Stagecraft Laboratory
1 Credit (1)
Class members will assist with construction for productions in a studio environment.
Prerequisite(s)/Corequisite(s): THEA 2310.
Learning Outcomes
1. History of scenic design and the development of present day stage design.
2. How to create and interpret basic scenic ground plans, elevations, and detail drawings.
3. To construct basic scenic structures to include flats and platforms.
4. Various techniques of scenic painting and decorating.
5. The installations of theatre lighting instruments and sound equipment.

THEA 2340. Introduction to Design
3 Credits (3)
Introduction into our visual world via the language of designers, focusing on collaboration, creative thinking and presentation skills. The varied design professions in theatre and the performing arts will be explored. Restricted to: Required of all THTR Majors.
Learning Outcomes
1. Apply design vocabulary and descriptions when speaking about design.
2. Identify design tools and make choices about where to use them.
3. Apply the foundation information in understanding how design tools work.
4. Apply correct terminology in assessing design and script analysis.
5. Read and understand some of the design documents commonly used in the industry.

THEA 2415. Running Crew II
1 Credit (1)
Students learn about backstage and front of house production positions and work on a technical aspect of a product in a rehearsal and performance environment.
Learning Outcomes
1. To provide students with “hands on” experience participating in being a member of a running crew on a theatrical production.
2. Students will learn one, or more, of the basic technical elements of theatrical crew work.

THEA 2421. Vocal Production for the Actor
3 Credits (3)
Exploration and development of the actor's vocal instrument, including relaxation, projection, diction and articulation.
Learning Outcomes
1. Apply concepts of alignment, relaxation, breath support, resonance, projection, and articulation for your personal and professional benefit.
2. Refine vocal 'problem solving' which will carry into your personal and professional life.
3. Apply vocal concepts to a variety of text in order to understand and appreciate your voice and its capabilities, both intellectually and sensorially.
4. Apply the vocal/speech tools consciously and behavior-ally, as an aid in the search for musicality of the voice in conjunction with truth and believability.

THEA 2993. Theatre Workshop I
0.5 Credits (.5)
Required for all freshman and sophomore theatre majors, this course coordinates all processes within Theatre Arts, providing a forum for discussion and feedback. May be repeated up to 4 credits. Restricted to Las Cruces campus only.
Learning Outcomes
1. This lab course is designed to create community via group meetings with your peers while providing a platform for our guest artists to present information regarding our profession.
2. As time allows, group discussions and sharing will further the sense of community and collaboration with your peers.
3. This forum also provides an opportunity to discuss and provide feedback for each production in the ASTC season.

THEA 2996. Theatre Topics
1-3 Credits (1-3)
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits.
Learning Outcomes
1. Varies

THEA 300. Theatre Workshop II
0.5 Credits (.5)
Required for all junior and senior theatre majors, this course coordinates all processes within Theatre Arts, providing a forum for discussion and feedback. May be repeated up to 4 credits. Restricted to Las Cruces campus only.

THEA 303. Theatre History I
3 Credits (3)
History of theatre and drama from ancient Greece to the English Renaissance.

THEA 304. Theatre History II
3 Credits (3)
History of theatre and drama from the Restoration to the 20th century.
Prerequisite: THEA 303 or Permission of Instructor.
Learning Outcomes
1. To gain the ability to analyze and interpret various texts from varied time periods.
2. To connect historical knowledge of theatre to contemporary situations.
3. To understand how theatre of the past influences theatre of the present.

THEA 305. Advanced Vocal Production
3 Credits (.3)
Advanced exploration and development of the actor's vocal instrument. May be repeated up to 3 credits.
Prerequisite(s): THEA 2421.

THEA 306. Script Analysis
3 Credits (3)
This class is designed to give you tools and specific processes to help you read and break down a text, so that you can make it come alive for audiences in the varied genres of theatre, film and animation.

Learning Outcomes

1. Determine the dramatic structure of a script
2. Write an analysis of a script for production
3. Verbally communicate an analysis of a script for production
4. Analyze a script from a specific perspective such as actor, director, designer, animator, etc.

THEA 307V. Society in Style: Fashion, History and Culture
3 Credits (3)
History of clothing for theatrical purposes, origins and evolution of period clothing in relation to social, political, and aesthetic factors of different periods.
Learning Outcomes

1. Students will be able to connect changes in clothing styles, applicable to the stage, to various social, political, historical, and cultural contexts.
2. Students will be able to analyze a theatrical or film script for what style of clothing would be appropriate in order to stage the text.
3. Students will present creative projects, based on research, thereby enhancing their analytical and practical design skills.

THEA 308. Creative Writing: Playwriting
3 Credits (3)
Technique of one-act playwriting, and analysis of dramatic structure. Crosslisted with: ENGL 308
Prerequisite(s): ENGL 1110G.

THEA 310. Styles in Acting
3 Credits (3)
Analysis of differing styles of acting through scene work representing various time periods and genres. Consent of Instructor required. May be repeated up to 3 credits.
Prerequisite: THEA 1221 or THEA 1210 with a C- or better.

THEA 311. Acting for Film and Television
3 Credits (3)
Specific techniques of acting for the camera are explored via hands-on experiential learning and an introduction to the business of the TV/Film industry.
Learning Outcomes

1. To understand the acting techniques needed for film and TV work.
2. To understand the differences between acting for live theatre and acting for the camera.
3. To self-reflect on individual performances in order to further grow in the art.

THEA 313. Improvisation
3 Credits (3)
Long and/or short form improvisation techniques in addition to a variety of exercises exploring terminology, character work and the elements of comedy.
Prerequisite(s): THEA 1210 or THEA 1221.

THEA 315. Theatre in New York City
3 Credits (3)
Students are introduced to the professional world of theatre via productions, speakers, and tours during this travel course. May be repeated up to 6 credits.
Learning Outcomes

1. To gain insight into professional theatre by viewing and reviewing Broadway productions in NYC.
2. To receive information about the business of theatre via guests who are theatre professionals.
3. To become familiar with job opportunities backstage via guided tours of professional theatre spaces in New York.

THEA 317. Musical Theatre
3 Credits (3)
Acting class focused on developing and refining skills necessary for performing in musicals. May be repeated up to 9 credits.
Prerequisite(s): THEA 1221 or THEA 1210 with a C- or better.

THEA 323. American Drama
3 Credits (3)
Masterworks of American drama from the 20th century to the present. Crosslisted with: ENGL 323.

THEA 324. Singing for Musical Theatre
3 Credits (3)
Students will gain an understanding of stronger vocal health, aural skills, and rehearsal practice strategies as they work on musical theatre singing techniques and performances including solos, duets and small groups, and a final public showcase.
Learning Outcomes

1. The ability to practice strong vocal habits in order to independently maintain vocal health.
2. Identify and utilize proper vocal warm-up techniques.
3. Display an improved level of music reading and aural awareness.
4. Analyze and break down a piece of theatrical music into components for focused learning.
5. Perform pieces of music theatre both individually and in a group with increased ease

THEA 330. Special Topics: Variable
3 Credits (3)
Specific subjects to be announced in the Schedule of Classes.
Learning Outcomes

1. To gain knowledge and/or skill in a specialty area of theatre

THEA 334. Introduction to Stage Makeup
3 Credits (3)
Basic principles of stage makeup: straight, character, and specialty. Includes study of various products, methods of application, and the effects of lighting on makeup.

THEA 337. Independent Study
1-3 Credits (1-3)
Students propose and design their own course not covered through regular course offerings under the guidance of faculty. Consent of Instructor required. May be repeated up to 6 credits.

THEA 341. Scene Painting
3 Credits (3)
Use of historical painting techniques in a project-driven classroom. Projects include 2-D and 3-D work, color mixing and theory, painting scenery, and the use of paint for effects.
Prerequisite(s): THEA 2310.

THEA 343. Costume Patterning
3 Credits (3)
Basic techniques in the production of flat patterns for modern and period silhouettes including some draping techniques. Consent of Instructor required. May be repeated up to 3 credits.
Learning Outcomes

1. Advanced training in costume design; the ability to create an original pattern in order to be able to make a costume item that is original

THEA 345. Costume Practicum
1 Credit (1)
A practical course intended to provide students additional experience and greater responsibility within the workings of the Costume Shop. May be repeated up to 1 credits.
Prerequisite(s): THEA 1310.

THEA 346. Scenic Practicum
1 Credit (1)
A practical course intended to provide students additional experience and greater responsibility within the workings of the Scene Shop. May be repeated up to 2 credits. Graded: S/U Grading (S/U, Audit).
Prerequisite(s): THEA 2310.

THEA 347. Lighting Practicum
1 Credit (1)
A practical course intended to provide students hands-on experience executing theatrical lighting.

THEA 348. Running Crew III
1 Credit (1)
Students will work on a technical aspect of a production in a rehearsal and performance environment. May be repeated up to 1 credit.
Prerequisite: THEA 1310,THEA 1415, and THEA 2415.
Learning Outcomes
1. To gain practical experience via work on a production.

THEA 349. Running Crew IV
1 Credit
Students will work on a technical aspect of a production in a rehearsal and performance environment.
Prerequisite(s): THEA 1415.

THEA 352. Costume Design
3 Credits (3)
Basic principles of costume design, including script analysis, principles of design, drawing and painting. May be repeated up to 3 credits.
Prerequisite: THEA 2340.
Learning Outcomes
1. To analyze a text in order to make appropriate design decisions.
2. To understand the principles of costume design and be able to communicate designs via various methods.

THEA 353. Scene Design
3 Credits (3)
Design for the performing arts. Basic design skills and projects to exercise those skills, history of design in the theatre and the designer's role in the production process. Final project includes a finished scene design.
Prerequisite: THEA 2310 and 2340 or consent of instructor.
Learning Outcomes
1. Gain the ability to communicate a set design via various means.
2. To understand the designer's role in the production process.
3. To communicate design ideas to collaborators.

THEA 354. Sound Design
3 Credits (3)
Hands-on training in theatrical sound design and implementation.
Prerequisite: THEA 2340.
Learning Outcomes
1. To understand the design elements of theatre sound.
2. To work with software in order to create sound for theatre.

THEA 355. Lighting Design
3 Credits (3)
Basic aspects of theatre lighting, including electricity, color theory, history, and types of lighting instruments.
Prerequisite: THEA 2340.
Learning Outcomes
1. To understand lighting equipment and how it functions.
2. To be able to create lighting using elements of design such as color theory.

THEA 356. Theatre Production
1-3 Credits
Participation in the production of theatrical performances by stage managing, acting, designing, dramaturgy, or directing. May be repeated for a maximum of 6 credits. Graded S/U.

THEA 357. Computer Scenographics
3 Credits (3)
Project-oriented course teaching basic computer modeling skills. Projects focus on the creation of communication tools designers use in the theatrical process. Students will develop portfolios of completed projects. Consent of instructor required. May be repeated up to 3 credits.
Prerequisite: THEA 2340 and THEA 352, THEA 353, or THEA 355.
Learning Outcomes
1. To gain the ability to draft via computer programs.
2. To create a portfolio of design projects.
3. To gain the ability to communicate using various design tools.

THEA 366. Summer Theatre
1-3 Credits
Experience in professional or academic summer theatre. May be repeated for a maximum of 3 credits. Graded: S/U. Restricted to THTR majors.
Prerequisite(s): Consent of department head.

THEA 384. Stage Management
3 Credits (3)
Study of stage management techniques and their application to play production. A working knowledge of union rules, and the procedure to facilitate these through proper communication skills.

THEA 395. Directing I
3 Credits (3)
Study and application of basic stage directing techniques.
Prerequisite(s): THEA 1210 or THEA 1221.

THEA 408. Shakespeare I
3 Credits (3)
Study in Shakespeare's early poems and plays. Repeatable for up to six credits under different subtitles.
Learning Outcomes
1. Analyze Shakespeare's poetry using the methods of close reading
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays;
3. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance

THEA 409. Shakespeare II
3 Credits (3)
Study in Shakespeare's later plays. ENGL 408 is not a prerequisite. Repeatable for up to six credits under different subtitles. Crosslisted with ENGL 409.

Learning Outcomes

1. Analyze Shakespeare's poetry using the methods of close reading;
2. Demonstrate ability to read and develop persuasive literary-critical interpretations of Shakespeare's poems and plays;
3. Demonstrate skill in working with relevant secondary resources and research tools including the MLA bibliography to write a research paper on a topic related to our course material;
4. Work effectively in small groups to interpret a scene through performance.

THEA 410. Advanced Acting: Contemporary Methods
3 Credits (3)
Acting techniques will be explored focusing on current trends in the profession, from Stanislavski, to Hagen to Meisner. Restricted to: THTR majors.
Prerequisite: THEA 1210 or THEA 1221.

THEA 414. Collaborative Theatre-Making
3 Credits (3)
This course introduces students to the techniques, skills and practice of the collaborative creation of new theatrical material. May be repeated up to 6 credits.
Learning Outcomes

1. Students will be introduced to research methods which allow for the creation of original theatrical work.
2. Students will be assigned teams and will learn the collaborative process, from the sharing of research to clear communication skills.
3. Students will be able to present original work, via a directed rehearsal process with peers.

THEA 417. Musical Theatre II
3 Credits (3)
A continuation of THEA 317, allowing for more advanced musical theatre techniques.
Prerequisite(s): THEA 317.

THEA 430. Special Topics
1-3 Credits
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 9 credits.

THEA 435. Directed Reading
1-3 Credits
Directed individualized studies. May be repeated for a maximum of 3 credits.

THEA 439. Senior Seminar
3 Credits (3)
Course preparing students for professions in and related to the theatre. Restricted to: THTR majors.

THEA 450. The Michael Chekhov Acting Intensive
3 Credits (3)
An intensive overview of the performance techniques attributed to Michael Chekhov, applied to theatrical scenes and presentations. May be repeated up to 6 credits. Consent of Instructor required.

THEA 535. Directed Study
1-3 Credits (1-3)
For the highly motivated student. Independent projects and individual guidance. Graduate standing and consent of instructor required. May be repeated up to 6 credits.

TOX-TOXICOLOGY

TOX 361. Basic Toxicology
3 Credits (3)
Introduction to the principles of toxicology, discussion of toxic agents, environmental problems, testing procedures, and regulations. Prior course work in biology and chemistry recommended.
Prerequisite: CHEM 2120 or CHEM 313 or ANSC 1170 and BIOL 2610G or BIOL 2110G.
Learning Outcomes

1. Learn how toxins are absorbed, distributed, metabolized, and excreted from living systems.
2. Demonstrate how metabolism can appreciably alter the toxicity of compounds as well as dictate the resultant toxicity with an emphasis on target organ(s).
3. Explain the specific mechanism(s) of actions of toxins targeting the liver, lung, kidney, and nervous systems.
4. Delineate how certain toxins induce cancer and/or promote the development of cancer.
5. Understand how and why certain plants and animals are poisonous and venomous, specifically linking discreet chemicals or complex mixtures to the resultant toxic manifestation.

TOX 461. Toxicology I
3 Credits (3)
Introduction to principles of toxicology. Crosslisted with: TOX 361.
Prerequisite(s): (CHEM 1226 or CHEM 1225G) and (BIOL 2610G or BIOL 2110G).

TOX 598. Special Research Programs
1-3 Credits
Individual investigations, either analytical or experimental. Graded S/U.

UNIV-UNIVERSITY STUDIES

UNIV 300. Preparing for the Graduate Record Examination
1 Credit (1)
Preparation for taking the Graduate Record Examination including review, test taking strategies and practice for the verbal, quantitative and analytical sections. Graded S/U.

UNIV 350. Peer Education
3 Credits (3)
Overview of college student development theory and its application to college student learning and peer education. Supervised experience as a peer educator with training in structured group facilitation.
Prerequisite: consent of instructor.

UNIV 361. NMSU Gospel Choir
1 Credit (1)
Students will gain performance experience and exposure to urban contemporary gospel music. Open to all majors. May be taken for unlimited credit.

UNIV 395. Independent Study
1-3 Credits
Individualized projects related to the field of learning assistance. May be repeated for a maximum of 3 credits.

UNIV 450. Faculty Led International Travel
1-3 Credits (1-3)
This is an intensive Faculty Led International Program and earns an additional credit(s) for participation the FLiP. May be repeated up to 3 credits.

Learning Outcomes
1. Varies

UNIV 495. Independant Study
1-3 Credits (1-3)
Individualized projects related to the field of learning assistance. Taught with UNIV 395.

WATR-WATER UTILITIES

WATR 120. Introduction to Water Systems
3 Credits (3)
Introduction to and theory of groundwater sources, production, treatment, and distribution.
Learning Outcomes
1. Effectively present technical information through oral communication.
2. Effectively work as a team.
3. Identify appropriate process changes for different water processes.

WATR 130. Wastewater Collection and Basic Treatment Systems
3 Credits (3)
Introduction to wastewater characteristics, collection, and basic treatment operations.
Learning Outcomes
1. Effectively present technical information through oral and written communication.
2. Identify appropriate process changes for different water processes.

WATR 140. Applied Water and Wastewater Math I
3 Credits (3)
Introduction to basic water and wastewater mathematics, flows through distribution networks and collection systems, and fundamentals of flow measurement.
Prerequisite: CCDM 114 N with a C- or better, or equivalent.
Learning Outcomes
1. Apply problem solving techniques to solve math problems and career related technical problems.
2. Apply estimation techniques to solve problems and check answers for reasonableness.
3. Analyze and solve problems using basic technical tools and techniques.
4. Demonstrate the ability to work as a member of a team to solve problems and complete projects.
5. Display the positive attitude and good work habits necessary for successful employment.

WATR 160. Systems Maintenance
4 Credits (2+4P)
Basic tools, equipment, maintenance schedules, chlorinator trouble-shooting, and chlorine safety. Hands-on training with valves, pumps, meters and chlorination equipment. May be repeated up to 4 credits.
Learning Outcomes
1. Effectively work as part of a team.
2. Identify cause(s) of mechanical/equipment/system failure.
3. Identify corrective actions for mechanical/equipment/system failure.

WATR 175. Programmable Logic Controllers
2 Credits (2)
This course will introduce students to electrical safety, theory, and the function, operations, programming and troubleshooting of the PLC controlling common electrical components utilized in control circuits associated with the water and wastewater industry.
Learning Outcomes
1. Identify corrective actions for equipment failure.
2. Utilize knowledge to develop a treatment facility schematic/design.
3. Identify the sampling points for data collection.
4. Perform operational duties safely.

WATR 180. Water Chemistry
3 Credits (3)
Basic chemistry with applications to water and wastewater analysis.
Prerequisite: CCDM 114 N grade of C- or better, or consent of instructor.
Learning Outcomes
1. Apply critical thinking (includes communicating effectively, applying numerical information appropriately, problem solving effectively and demonstrating appropriate technical skills).
2. Identify information/data required to complete calculations.
3. Use mathematics and problem-solving techniques to analyze and find answers to work- related technical problems.

WATR 182. Water Chemistry Analysis
1 Credit (3P)
Beginning water and wastewater laboratory analysis including gravimetric, volumetric, and quality control techniques.
Prerequisite: Grade of C- or better in CCDM 114 N or equivalent, or consent of instructor.
Learning Outcomes
1. Students will be able to use written communication to effectively present technical information.
2. Students will be able to conduct appropriate lab analysis.

WATR 190. Water and Wastewater Microbiology
3 Credits (3)
Overview of microorganisms associated with water and wastewater. Growth and reproduction, energy production, and methods of counting.
Prerequisite: Grade of C- or better in WATR 130 and WATR 180, or consent of instructor.
Learning Outcomes
1. Effectively present technical information through oral and written communication.
2. Effectively work as part of a team.
3. Evaluate treatment processes utilizing collected or given data.
4. Identify appropriate process control changes for different treatment processes based on process evaluation.
5. Identify correct operational parameters for treatment processes.
6. Identify sampling points for data collection from treatment processes.
7. Integrate multiple, related concepts to determine appropriate operational response.

WATR 192. Water and Wastewater Microbiological Analysis
1 Credit (3P)
Introduction to water and wastewater treatment operational tests such as BODs, solids testing, activated sludge control tests, use of microscope, and bacteriological techniques.
Prerequisite: Grade of C- or better in WATR 130 and WATR 182, or consent of instructor.
Learning Outcomes
1. Identify information/data required to complete calculations and accurately perform them.

2. Identify correct operational parameters for treatment processes.
3. Identify sampling points for data collection from treatment processes.
4. Demonstrate correct/accurate laboratory technique.
5. Perform appropriate lab analyses with acceptable accuracy.
6. Perform operational/laboratory duties safely.

WATR 200. Internship
3-5 Credits
On-the-job training/work experience with municipalities or industries, working in water or wastewater treatment plants, high purity water plants, industrial waste plants, distribution systems, or wastewater collection systems. May be repeated up to 5 credits.
Learning Outcomes
1. Be able to successfully perform on the job duties of a Water or Waste Water technician.
2. Be able to evaluate treatment processes utilizing collected or given data.
3. Be able to successfully work as part of a water or waste water operations team.
4. Demonstrate knowledge of applicable regulations.

WATR 220. Water Treatment Systems
3 Credits (3)
Theory of water systems operation including surface water treatment, fluoridation, sodium zeolite softening, corrosion control, iron removal, various filtration methods, and overview of SDWA.
Prerequisite: Grade of C- or better in WATR 180 and WATR 182, or consent of instructor.
Learning Outcomes
1. Effectively present technical information through written and oral communication.
2. Evaluate treatment processes utilizing collected or given data.
3. Identify appropriate process control changes for different treatment processes based on process evaluation.
4. Identify information/data required to complete calculations and accurately perform them.
5. Identify correct operational parameters for treatment processes.
6. Identify sampling points for data collection from treatment processes.
7. Demonstrate knowledge of applicable regulations and their application.
8. Integrate multiple, related concepts to determine appropriate operational response.

WATR 222. Water Systems Operation
1 Credit (3P)
Operations of various water treatment systems including surface water treatment, sodium zeolite softeners, and various filtration methods.
Prerequisite: C- or better in WATR 220, or consent of instructor.
Learning Outcomes
1. Effectively present technical information through written and oral communication.
2. Evaluate treatment processes utilizing collected or given data.
3. Identify appropriate process control changes for different treatment processes based on process evaluation.
4. Identify information/data required to complete calculations and accurately perform them.
5. Identify correct operational parameters for treatment processes.
6. Identify sampling points for data collection from treatment processes.
7. Demonstrate knowledge of applicable regulations and their application.
8. Integrate multiple, related concepts to determine appropriate operational response.

WATR 230. Advanced Wastewater Treatment
4 Credits (4)
Calculations and operations involved in wastewater and water reclamation plants.
Prerequisite: Grade of C- or better in WATR 140, WATR 190, and WATR 192, or consent of instructor.
Learning Outcomes
1. Students will be able to use written communication to effectively present technical information.
2. Students will be able to conduct appropriate lab analysis.

WATR 232. Wastewater Systems Operations
1 Credit (3P)
Operation of pretreatment, primary, and biological treatment units.
Prerequisite: Grace of C- or better in WATR 230, or consent of instructor.
Learning Outcomes
1. Effectively present technical information through written and oral communication.
2. Evaluate treatment processes utilizing collected or given data.
3. Identify appropriate process control changes for different treatment processes based on process evaluation.
4. Evaluate invalid labs analysis to determine corrective actions.
5. Identify information/data required to complete calculations and accurately perform them.
6. Identify correct operational parameters for treatment processes.
7. Identify sampling points for data collection from treatment processes.
8. Demonstrate correct/accurate laboratory technique.
9. Perform appropriate lab analysis with acceptable accuracy. 1
10. Perform appropriate process control changes for various treatment processes. 1
11. Perform operational/laboratory duties safely. 1
12. Demonstrate knowledge of applicable regulations and their application. 1
13. Integrate multiple, related concepts to determine appropriate operational response.

WATR 240. Advanced Water and Wastewater Math II
3 Credits (2+2P)
Advanced water and wastewater mathematics. Flow measurement. Systems head and pump curves. May be repeated up to 3 credits.
Prerequisite: Grade of C- or better in WATR 140.
Learning Outcomes
1. Identify information/data required to complete calculations and accurately perform them.
2. Use written communication to effectively present technical information.

WATR 250. Municipal Systems Management
4 Credits (4)
Management of water utility systems including laws, finance, records, and safety.

Prerequisite: Grade of C- or better in WATR 120 and WATR 130.
Learning Outcomes
1. Effectively work as a team leader.
2. Evaluate responsibilities of utility management.
3. Identify appropriate planning, organization, and recordkeeping.
4. Evaluate appropriate practices for interviewing, hiring, supervising, and disciplining employees.
5. Evaluate and identify the development of policies and procedures for dealing with harassment, grievances, and violence in the workplace.
6. Implement effective oral and written communication, including formal and informal public relations.
7. Identify and implement assessing the financial strength and stability of a water/wastewater utility, budgeting and fund capital improvements.

WATR 270. Special Topics
1-4 Credits
Specific subjects to be announced in the Schedule of Classes. May be repeated for a maximum of 12 credits.

WATR 275. Certification Review
3 Credits (3)
Review of water and wastewater plant operations and laws in preparation for state certification exams. Restricted to Community Colleges campuses only.
Prerequisite: WATR 120, WATR 130, WATR 140, WATR 160.
Learning Outcomes
1. Identify appropriate process changes for different wastewater processes.
2. Identify appropriate process changes for different water processes.
3. Identify corrective actions for equipment failure.
4. Identify analytical data required to complete process control calculations.
5. Accurately complete water process control calculations.
6. Accurately complete wastewater process control calculations.
7. Evaluate operational problems.
8. Identify the sampling points for data collection.

WATR 285. High Purity Water Treatment Systems
3 Credits (3)
Principles of high purity water production including microfiltration, ultra-filtration, reverse osmosis, and deionization.
Prerequisite: Grade of C- or better in WATR 220.
Learning Outcomes
1. Effectively present technical information through oral and written communication.
2. Evaluate treatment processes utilizing collected or given data.
3. Identify appropriate process control changes for different treatment processes bason on process evaluation.
4. Identify information/data required to complete calculations and accurately perform them.
5. Identify correct operational parameters for treatment processes.
6. Identify sampling points for data collection from treatment processes.
7. Integrate multiple, related concepts to determine appropriate operational response.

WATR 287. Advanced Water Chemistry Analysis
3 Credits (6P)
Sampling techniques, analysis, and evaluation of potable water contaminants using gravimetric, volumetric, spectrophotometric, and other instrumentation methods.
Prerequisite/Corequisite: WATR 285. Restricted to Community Colleges campuses only.
Learning Outcomes
1. Evaluate invalid labs analysis to determine corrective actions.
2. Identify information/data required to complete calculations.
3. Accurately perform calculations.
4. Demonstrate correct/accurate laboratory technique.
5. Demonstrate correct/accurate laboratory technique.
6. Perform operational/laboratory duties safely.

WATR 290. Advanced Wastewater Microbiology and Chemistry
3 Credits (3)
Covers NPDES permits and DMR calculations and reporting; 503 sludge regs, including pathogen and vector attraction reduction and pollutants; wetlands, composting, and wastewater treatment ponds microbiology; activated sludge bulking and foaming microbiology and treatment; and use of selector to remove nutrients and prevent the growth of filamentous bacteria.
Prerequisite: Grade of C- or better in WATR 190 and WATR 192.
Learning Outcomes
1. Effectively present technical information through oral and written communication.
2. Evaluate treatment processes utilizing collected or given data.
3. Identify appropriate process control changes for different treatment processes based on process evaluation.
4. Identify cause(s) of mechanical/equipment/system failure and identify the corrective actions to take.
5. Identify information/data required to complete calculations and accurately perform them.
6. Identify correct operational parameters for treatment processes.
7. Identify sampling points for data collection from treatment processes.
8. Demonstrate knowledge of applicable regulations and their application.
9. Integrate multiple, related concepts to determine appropriate operational response.

WATR 292. Advanced Wastewater Analysis
3 Credits (6P)
Covers sampling techniques, analysis, and evaluation of wastewater contaminants using gravimetric, volumetric, spectrophotometric, and other instrumentation methods.
Prerequisite: Grade of C- or better in WATR 190 and WATR 192.
Learning Outcomes
1. Perform titrations and document the necessary quality control.
2. Perform microbiological analysis and document the necessary quality control.
3. Perform spectrophotometric analysis and document the necessary quality control.
4. Perform BOD/COD analysis and document the necessary quality control.
5. Complete performance evaluation samples satisfactorily.
6. Effectively present technical information through oral and written communication.
7. Identify information/data required to complete calculations and accurately perform calculations.

8. Demonstrate knowledge of applicable regulations and their application.

WELD-WELDING TECHNOLOGY

WELD 1110. Introduction to Welding Fundamentals
3 Credits (2+2P)
This course focuses on the fundamental techniques employed in the welding field. It is a laboratory approach to understanding and building skills in welding related areas including shop safety, hand and portable power tool usage, and welding.
Learning Outcomes
1. Demonstrate knowledge of basic welding processes.
2. Demonstrate shop safety including the proper use of welding hand and machine tools.
3. Practice and demonstrate SMAW with various electrodes in all positions.

WELD 1120. Print Reading for Welders
3 Credits (3)
Provides students with the knowledge to read and interpret prints and welding symbols and transfer this knowledge to the workplace with layout tools and measuring instruments.
Learning Outcomes
1. Identify, read and follow AWS welding symbols.
2. Demonstrate the ability to interpret orthographic and isometric drawings.
3. Demonstrate the ability to read/interpret pipe welding drawing and schematics.
4. Demonstrate proficiency in the mathematics utilized in welding and fabrication.

WELD 1130. SMAW (Shielded Metal Arc Welding) I
6 Credits (3+6P)
This course will cover introductory theory and practical applications of structural plate welding, welding safety, handheld torch cutting operations and equipment set up. The development of student skills using the Shielded Metal Arc Welding process in all positions will be stressed. The standards of this course are set by the American Welding Society and utilized in both classroom study and laboratory work.
Learning Outcomes
1. Perform welds on various joints in all positions.
2. Perform welds on various joints in all positions.
3. Demonstrate proficiency in identification of electrode classification and proper storage.
4. Identify SMAW power sources and their characteristics.
5. Maintain, use, and safely operate SMAW equipment.

WELD 1140. GMAW-Gas Metal Arc Welding I
3 Credits (2+2P)
Introduces Gas Metal Arc Welding (GMAW) short circuit welding safety, machine set up and shutdown procedures. Topics include personal protective equipment (PPE), GMAW uses, advantages and disadvantages, constant voltage (CV) power source, polarity, electrode types, shielding gasses, and weld discontinuities and defects identification and corrective practices. Lab exercises will include various joints in all positions.
Learning Outcomes
1. Demonstrate the ability to safely operate the Gas Metal Arc Welding equipment.
2. Demonstrate Gas Metal Arc Welding theory and application.
3. Demonstrate the ability to perform Gas Metal Arc Welding on various joints in all positions.
4. Demonstrate the ability to fabricate assigned projects while applying proper tolerance to finished projects.

WELD 1155. GTAW-Gas Tungsten Arc Welding I
3 Credits (2+2P)
A basic course designed to provide the student with the ability to setup, maintain and operate Gas Tungsten Arc Welding (GTAW) equipment safely. Develop skills to weld structural joints to bend tests standards utilizing various metals. Weld quality will be measured in accordance with American Welding Society standards.
Learning Outcomes
1. Demonstrate the ability set up GTAW equipment for use, inspect equipment prior to use, perform minor maintenance, and identify potential hazards.
2. Demonstrate the ability to perform GTAW on various base metals in all positions.
3. Demonstrate the understanding of basic metallurgical differences in various base and filler metals.
4. Demonstrate an understanding of welding currents and power sources.

WELD 1171. Layout and Fabrication
3 Credits (1+4P)
This class is an introduction to general layout and fabrication techniques as related to structural welding. Emphasis will be on construction of small projects to tolerances using prints. A variety of welding processes will be used in all positions.
Prerequisites: WELD 1130, WELD 1120, WELD 1140, and OETS 104 or OETS 118.
Learning Outcomes
1. Demonstrate the ability to fabricate projects.
2. Use shop drawing and/or prints to create projects and develop the bill of materials for the project.
3. Demonstrate ability to properly follow WPS (Welding Procedure Specification) during fabrication.

WELD 1191. Welded Art
3 Credits (1+4P)
Students explore the possibilities of welded art.
Prerequisite: WELD 1110.
Learning Outcomes
1. Demonstrate knowledge of the different forms of welded art.

WELD 1210. Flux Cored Arc Welding
3 Credits (2+2P)
Principles of flux cored arc welding (FCAW) terminology, safety procedures, and equipment set-up. Students will practice welding structural joints in all positions using the FCAW process.
Learning Outcomes
1. Demonstrate the set up of FCAW equipment.
2. Demonstrate safe operations of FCAW equipment.
3. Demonstrate minor repairs/maintenance of equipment.
4. Perform FCAW welds to minimum required specifications.

WELD 1220. Pipe Welding I
3 Credits (2+2P)
Stresses the theory and practical application of pipe welding in the 1-G and 2-G positions. This course will develop skills in the fit-up and technique of welding pipe, using electrodes and various Welding process.

Prerequisite(s): WELD 1130, WELD 1140, and WELD 1155, or consent of instructor.

Learning Outcomes

1. Demonstrate an understanding of 1-G and 2-G pipe welding using a variety of pipe sizes.
2. Demonstrate the ability to produce destructive test samples to AWS and/or API standards.
3. Demonstrate the ability to prepare, fit and tack pipe to specifications, getting pipe ready to weld.
4. Demonstrate knowledge of appropriate pipe fitting terminology and calculations.

WELD 1310. Metallurgy
3 Credits (3)

This course includes a study of ferrous and nonferrous metals from ore to the finished products. Emphasis is placed on metal alloys, heat-treating, hard surfacing, welding techniques, forging, foundry processes, and mechanical properties of metal including hardness, machinability, and ductility. Technical terms used in the various phases of metallurgy, from early history to present.

Prerequisites: WELD 1130 or consent of instructor.

Learning Outcomes

1. Describe metals and alloys commonly used in industry.
2. Describe mechanical properties of metals including stresses and failures.
3. Describe the metalworking processes of casting, forming, and machining.
4. Describe the two basic processes, and state the four major purposes of heat treatment.

WELD 2130. SMAW (Shielded Metal Arc Welding) II
6 Credits (3+6P)

Reviews and builds upon SMAW-1 skills. Students will learn joint design and AWS standards for welder qualification testing. Continuation of WELD 1130. May be repeated up to 6 credits.

Prerequisite: WELD 1130.

Learning Outcomes

1. Meet AWS acceptance criteria for weld quality and destructive tests (bend test).

WELD 2155. GTAW-Gas Tungsten Arc Welding II
3 Credits (2+2P)

A continuation of GTAW I. This course is designed to provide the student with the ability to setup, maintain and operate Gas Tungsten Arc Welding (GTAW) equipment safely. Develop skills to weld structural joints to bend tests standards utilizing various metals. Weld quality will be measured in accordance with American Welding Society standards.

Prerequisite: WELD 1155 or consent of instructor.

Learning Outcomes

1. Demonstrate the ability to perform increasingly complex welds.
2. Demonstrate the ability set up GTAW equipment for use, inspect equipment prior to use, perform minor maintenance, and identify potential hazards.
3. Demonstrate the ability to perform GTAW on various base metals in all positions.
4. Demonstrate the understanding of basic metallurgical differences in various base and filler metals.
5. Demonstrate an understanding of welding currents and power sources.

WELD 2220. Pipe Welding II
3 Credits (2+2P)

Stresses the theory and practical application of 5-G and 6-G pipe welding. This course will develop skills in the technique of pipe welding, using various Welding processes.

Prerequisite: WELD 2120.

Learning Outcomes

1. Demonstrate an understanding of 5-G and 6-G pipe welding using a variety of pipe sizes.
2. Demonstrate the ability to produce destructive test samples to AWS and/or API standards.
3. Demonstrate the ability to prepare, fit and tack pipe to specifications, getting pipe ready to weld.
4. Demonstrate knowledge of appropriate pipe fitting terminology and calculations.

WELD 2290. Welder Qualifications
6 Credits (3+6P)

Laboratory and classroom instruction on AWS and ASME Welder Performance Qualification Tests. All position plate and pipe techniques and tests for SMAW, GMAW, GTAW, FCAW, and SAW. Nondestructive and destructive examination methods, and basics of welding codes. Restricted to Welding majors.

Prerequisites: OETS 104 or OETS 118; and WELD 1130, WELD 1120, WELD 1310, WELD 1140, WELD 1155, WELD 1210 and WELD 2155 or consent of instructor.

Learning Outcomes

1. Pass the AWS and ASME Welder Performance Qualification Tests in all processes and all positions.
2. Recognize the role of welding inspection and testing in industry.
3. Identify essential information for welding procedure and performance qualification.
4. Identify essential welding and inspection information from Welding Procedure Specifications (WPS's).
5. Identify essential welding and inspection information from AWS D1 1, Structural Welding Code — Steel.
6. Identify essential welding and inspection information from ASME, Boiler and Pressure Vessel Code - Section IX.
7. Describe the basic principles of non-destructive testing methods.

WELD 2995. Cooperative Education in Welding
1-6 Credits

Supervised cooperative work program. Student is employed in an approved occupation and supervised and rated by the employer and instructor. Student will meet in a weekly class. May be repeated up to 6 credits.

Learning Outcomes

1. Varies.

WELD 2996. Topics in Welding
1-6 Credits

Individual studies in areas of welding technology. May be repeated up to 12 credits.

Learning Outcomes

1. Varies.

WELD 2997. Independent Study
1-4 Credits

Individual Studies related to Welding.

Learning Outcomes
1. Varies.

WSAM-WATER SCIENCE & MGT

WSAM 470. Environmental Impacts of Land Use and Contaminant Remediation
3 Credits (3)
The course will cover the integrated assessment of soil erosion, contaminant transport in soil and water, and contaminant remediation from site scale to watershed scales. Understanding of the controlling factors for each type land use impact will be gained through the use of risk assessment, case studies, and computer modeling. Case studies will illustrate the processes under various environmental applications. This course will also cover the application of solute transport principles and methods for the remediation of contaminated soil and groundwater. It will also discuss the contaminated site characterization, monitoring, and remediation design. Discussions of innovative methodologies will be supported with case studies.
Learning Outcomes
1. Apply knowledge of mathematics, science, and engineering to identify, formulate, and solve environmental problems.
2. Function on multidisciplinary teams and exhibit professional and ethical responsibility and communicate findings effectively.
3. Recognize the need for, and an ability to engage in, life-long learning.
4. Describe contemporary land-use impact and cleanup issues.
5. Use the techniques, skills, and modern environmental science and engineering tools necessary for current industry practice.

WSAM 550. Special Topics
1-4 Credits (1-4)
Specific subjects to be announced in the Schedule of Classes. May be repeated up to 9 credits.
Learning Outcomes
1. Readings, discussions, and/or field and laboratory investigation of selected problems.

WSAM 551. Earth Data Retrieval
3 Credits (3)
This course covers topics related to identifying sources, preprocessing, utilizing earth data that can be used to monitor some hydrological and water related variables, vegetation growth and related biophysical properties. The course focuses on developing students' skills on how to handle and analyze high-level large amounts of research data in different formats (i.e. .hdf). The course highlights the use of remote sensing and land surface models-based (NLDAS) earth observation datasets (e.g. NDVI, LST, Ta, and ET). The course uses some open-source tools including Python, API as well as MATLAB. Crosslisted with: RGSC 551.
Learning Outcomes
1. Identify, retrieve, and visualize earth observation datasets that are relevant to individual research activities.
2. Understand the nature and formats of earth observation data.
3. Handle, process, and conduct quantitative analysis of earth observation datasets using python, MATLAB, and cloud computing (GEE).
4. Development of qualitative reasoning and analytical thinking skills to address research questions related to earth observation datasets.

WSAM 575. Climate Studies, Water and Society
3 Credits (3)
The course provides a brief description of the Earth's climate system, an in-depth review and methodologies used to investigate climate change and variability, evidence of climate change on natural systems (water availability) vulnerability of human systems (e.g. agriculture) to climate change, and mitigation and adaptation strategies.
Learning Outcomes
1. Know, identify, and interrogate Earth's climate observation datasets.
2. Evaluate and understand Earth's climate systems.
3. Conduct meaningful investigations, prediction, and inferencing.
4. Critical thinking about climate change impacts on human and natural resources.

WSAM 585. Land Cover Analysis for Natural Resources
3 Credits (3)
This course is designed to help students understand, manipulate and extract Earth Observation (EO) data and to conduct land cover analysis related to natural resources including water and vegetation. The course provides and highlights means to identify and access EO data in different formats, extract meaningful information, and to help students developing critical thinking skills. The course introduces tools such as python and ArcGIS Pro to handle different data formats (e.g. hdf) efficiently; develop and present creative maps. The course provides basic information about how to conduct land use, land cover change analysis, mapping vegetation, water related variables and plant and animal distribution analysis. Crosslisted with: RGSC 585.
Learning Outcomes
1. Identify sources of and obtain land cover GIS data.
2. Handle GIS data in different formats.
3. Extract meaningful information.
4. Development of qualitative reasoning and analytical thinking skills to address research questions related to natural resources.

WSAM 589. Landscape Hydrology Modeling
3 Credits (3)
The course "Landscape Hydrology Modeling" offers topics related to the physical hydrological processes that occur at different spatial and temporal scales in terms of understanding, quantitative evaluation, modeling, and visualization. It addresses precipitation, runoff, infiltration, and evaporation, as well as understanding impact of land use change on these processes. The course highlights and provide training on the use of hydrological modeling tools including WMS software, HydroVIS and ArcGIS software to help students understand, model, manipulate, and visualize hydrological data processes. The course offers hands-on learning experience on the use of these tools.
Learning Outcomes
1. Identify the different components of a landscape scale hydrologic system and quantitatively evaluate the associated physical processes including precipitation, runoff, streamflow, infiltration, evapotranspiration.
2. Retrieve and visualize a hydrologic system data along with the associated datasets.
3. Be able to model hydrological processes within a watershed and understand the streamflow generation process and the effect of vegetation and topography on streamflow generation.
4. Gain knowledge about, and be able to use, some of the available tools that can be used in spatial and temporal hydrological process modeling.

WSAM 590. System Dynamics
3 Credits (3)

This course takes a system dynamics approach to the study of economics and natural resources management. We will examine some of the example theories such as Solow-Swan model and endogenous growth theories as well as the tragedy of the commons, using system dynamics tools to uncover the feedback and explicitly examine its impact on the dynamic behavior of the system. Through these examples, we will learn how to develop, validate, and use system dynamics models for policy design and analysis.

Learning Outcomes

1. Identify common generic structures and behavioral modes in socioeconomic and ecological systems.
2. Define important feedback theories that explain the behavioral modes in socioeconomic and ecological systems.
3. Implement the system dynamics method to translate the feedback theories into dynamic simulation models.

WSAM 595. Hands-On Transboundary Aquifer and Community System Convergence Seminar
1 Credit (1)

An opportunity for graduate researchers to build partnerships with their colleagues in the IWR cohort and with our expert collaborators. Graduate researchers present their research methods, share lessons from their research activities, and report on experiences in the field and in the IWR program. An opportunity for academic, industry, and stakeholder project partners to share career development and research convergence insight with the cohort. May be repeated up to 18 credits.

Learning Outcomes

1. Students will learn about natural and social science convergence.
2. Convergence tool skill-building.
3. Students will learn how to lead the coordination of international, multidisciplinary research collaboration.

WSAM 598. Internship
1-9 Credits (1-9)

Out-of-classroom learning experiences to gain relevant education, experience, and expertise. Field-based learning providing transformative education and hands-on training. May be repeated up to 18 credits.

Learning Outcomes

1. Gain the experience necessary to engage confidently in community-centered hydrologic and social science approaches to water research.
2. Students will learn how to lead the coordination of international, cross-disciplinary research collaboration.
3. Gain experience applying academic and research knowledge in professional capacities.
4. Develop cross-sector communication skillsets.

WSAM 599. Masters Thesis
1-15 Credits (1-15)

Thesis. May be repeated up to 88 credits. Consent of Instructor required. Restricted to: Water and Science Management majors. Thesis/Dissertation Grading.

WSAM 600. Doctoral Research
1-15 Credits (1-15)

Assigned credit for research preformed. May be repeated up to 15 credits. Consent of Instructor required.

Learning Outcomes

1. Identify appropriate research methodologies.
2. Reflect on their own research, identifying lessons learned, strengths, and ways to improve.
3. Communicate confidently and constructively with faculty advisors.

WSAM 605. Arid Land Water Resources
3 Credits (2+2P)

The course will cover various issues of relevance to water resources and water supply management within the Southwest US and other semiarid and arid regions. Discussions may include development and sustainability, climate change and drought, socioeconomic and cultural, and transboundary issues. May be repeated up to 3 credits. Crosslisted with: ENVS 605.

WSAM 610. Water and Sustainable Economic Development
3 Credits (3)

For graduate students in the Water Science and Management or other research degree programs, use the water economics literature as a model for student research leading to an M.S. thesis or Ph.D. dissertation.

WSAM 700. Doctoral Dissertation
1-15 Credits (1-15)

Dissertation for Water Sciences and Management Majors May be repeated up to 88 credits. Restricted to: Water Sciences and Management majors. Thesis/Dissertation Grading.

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Executive Director

Title IX Coordinator and ADA

O'Loughlin House

Las Cruces, NM 88003

(575) 646-3635

Website: equity.nmsu.edu

Email: equity@nmsu.edu

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